Instruction Manual
for AC Generators
English

QAS 150 JD7 T4A HOP

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Instruction Manual for Generators

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Atlas Copco

ATLAS COPCO - PORTABLE ENERGY DIVISION
www.atlascopco.com

Warranty and Liability Limitation

Use only authorized parts.
Any damage or malfunction caused by the use of unauthorized parts is not covered by Warranty or Product Liability.
The manufacturer does not accept any liability for any damage arising from modifications, additions or conversions made without the manufacturer's approval in writing.
Neglecting maintenance or making changes to the setup of the machine can result in major hazards, including fire risk.
While every effort has been made to ensure that the information in this manual is correct, Atlas Copco does not assume responsibility for possible errors.

Congratulations on the purchase of your AC generator. It is a solid, safe and reliable machine, built according to the latest technology. Follow the instructions in this booklet and we guarantee you years of troublefree operation. Please read the following instructions carefully before starting to use your machine.
While every effort has been made to ensure that the information in this manual is correct, Atlas Copco does not assume responsibility for possible errors. Atlas Copco reserves the right to make changes without prior notice.

Contents

Atlas Copco

Safety precautions for portable generators

To be read attentively and acted accordingly before towing, lifting, operating, performing maintenance or repairing the generator.

Introduction

The policy of Atlas Copco is to provide the users of their equipment with safe, reliable and efficient products. Factors taken into account are among others:

- the intended and predictable future use of the products, and the environments in which they are expected to operate,
- applicable rules, codes and regulations,
- the expected useful product life, assuming proper service and maintenance,
- providing the manual with up-to-date information.

Before handling any product, take time to read the relevant instruction manual. Besides giving detailed operating instructions, it also gives specific information about safety, preventive maintenance, etc.
Keep the manual always at the unit location, easy accessible to the operating personnel.

See also the safety precautions of the engine and possible other equipment, which are separately sent along or are mentioned on the equipment or parts of the unit.

These safety precautions are general and some statements will therefore not always apply to a particular unit.

Only people that have the right skills should be allowed to operate, adjust, perform maintenance or repair on Atlas Copco equipment. It is the responsibility of management to appoint operators with the appropriate training and skill for each category of job.

Skill level 1: Operator

An operator is trained in all aspects of operating the unit with the push-buttons, and is trained to know the safety aspects.

Skill level 2: Mechanical technician

A mechanical technician is trained to operate the unit the same as the operator. In addition, the mechanical technician is also trained to perform maintenance and repair, as described in the instruction manual, and is allowed to change settings of the control and safety system. A mechanical technician does not work on live electrical components.

Skill level 3: Electrical technician

An electrical technician is trained and has the same qualifications as both the operator and the mechanical technician. In addition, the electrical technician may carry out electrical repairs within the various enclosures of the unit. This includes work on live electrical components.

Skill level 4: Specialist from the manufacturer

This is a skilled specialist sent by the manufacturer or its agent to perform complex repairs or modifications to the equipment.

In general it is recommended that not more than two people operate the unit, more operators could lead to unsafe operating conditions. Take necessary steps to keep unauthorized persons away from the unit and eliminate all possible sources of danger at the unit.

When handling, operating, overhauling and/or performing maintenance or repair on Atlas Copco equipment, the mechanics are expected to use safe engineering practices and to observe all relevant local safety requirements and ordinances. The following list is a reminder of special safety directives and precautions mainly applicable to Atlas Copco equipment.

Neglecting the safety precautions may endanger people as well as environment and machinery:

- endanger people due to electrical, mechanical or chemical influences,
- endanger the environment due to leakage of oil, solvents or other substances,
- endanger the machinery due to function failures.

All responsibility for any damage or injury resulting from neglecting these precautions or by non-observance of ordinary caution and due care required in handling, operating, maintenance or repair, also if not expressly mentioned in this instruction manual, is disclaimed by Atlas Copco.

The manufacturer does not accept any liability for any damage arising from the use of non-original parts and for modifications, additions or conversions made without the manufacturer's approval in writing.

If any statement in this manual does not comply with local legislation, the stricter of the two shall be applied.

Statements in these safety precautions should not be interpreted as suggestions, recommendations or inducements that it should be used in violation of any applicable laws or regulations.

General safety precautions

1 The owner is responsible for maintaining the unit in a safe operating condition. Unit parts and accessories must be replaced if missing or unsuitable for safe operation.

2 The supervisor, or the responsible person, shall at all times make sure that all instructions regarding machinery and equipment operation and maintenance are strictly followed and that the machines with all accessories and safety devices, as well as the consuming devices, are in good repair, free of abnormal wear or abuse, and are not tampered with.

3 Whenever there is an indication or any suspicion that an internal part of a machine is overheated, the machine shall be stopped but no inspection covers shall be opened before sufficient cooling time has elapsed; this to avoid the risk of spontaneous ignition of oil vapour when air is admitted.

4 Normal ratings (pressures, temperatures, speeds, etc.) shall be durably marked.

5 Operate the unit only for the intended purpose and within its rated limits (pressure, temperature, speeds, etc.).

6 The machinery and equipment shall be kept clean, i.e. as free as possible from oil, dust or other deposits.

7 To prevent an increase in working temperature, inspect and clean heat transfer surfaces (cooler fins, intercoolers, water jackets, etc.) regularly. See the maintenance schedule.

8 All regulating and safety devices shall be maintained with due care to ensure that they function properly. They may not be put out of action.

9 Pressure and temperature gauges shall be checked regularly with regard to their accuracy. They shall be replaced whenever outside acceptable tolerances.

10 Safety devices shall be tested as described in the maintenance schedule of the instruction manual to determine that they are in good operating condition.

11 Mind the markings and information labels on the unit.

12 In the event the safety labels are damaged or destroyed, they must be replaced to ensure operator safety.

13 Keep the work area neat. Lack of order will increase the risk of accidents.

14 When working on the unit, wear safety clothing. Depending on the kind of activities these are: safety glasses, ear protection, safety helmet (including visor), safety gloves, protective clothing, safety shoes. Do not wear the hair long and loose (protect long hair with a hairnet), or wear loose clothing or jewellery.

15 Take precautions against fire. Handle fuel, oil and anti-freeze with care because they are inflammable substances. Do not smoke or approach with naked flame when handling such substances. Keep a fire-extinguisher in the vicinity.

16a **Portable generators (with earthing pin):**

Earth the generator as well as the load properly.

16b **Portable generators IT:**

Note: This generator is built to supply a sheer alternating current IT network.
Earth the load properly.

Safety during transport and installation

To lift a unit, all loose or pivoting parts, e.g. doors and towbar, shall first be securely fastened.

Do not attach cables, chains or ropes directly to the lifting eye; apply a crane hook or lifting shackle meeting local safety regulations. Never allow sharp bends in lifting cables, chains or ropes.

Helicopter lifting is not allowed.
It is strictly forbidden to dwell or stay in the risk zone under a lifted load. Never lift the unit over people or residential areas. Lifting acceleration and retardation shall be kept within safe limits.

1 Before towing the unit:
- check the towbar, the brake system and the towing eye. Also check the coupling of the towing vehicle,
- check the towing and brake capability of the towing vehicle,
- check that the towbar, jockey wheel or stand leg is safely locked in the raised position,
- ascertain that the towing eye can swivel freely on the hook,
- check that the wheels are secure and that the tyres are in good condition and inflated correctly,
- connect the signalisation cable, check all lights and connect the pneumatic brake couplers,
- attach the safety break-away cable or safety chain to the towing vehicle,
- remove wheel chocks, if applied, and disengage the parking brake.

2 To tow a unit use a towing vehicle of ample capacity. Refer to the documentation of the towing vehicle.

3 If the unit is to be backed up by the towing vehicle, disengage the overrun brake mechanism (if it is not an automatic mechanism).

4 Never exceed the maximum towing speed of the unit (mind the local regulations).

5 Place the unit on level ground and apply the parking brake before disconnecting the unit from the towing vehicle. Unclip the safety break-away cable or safety chain. If the unit has no parking brake or jockey wheel, immobilize the unit by placing chocks in front of and/or behind the wheels. When the towbar can be positioned vertically, the locking device must be applied and kept in good order.

6 To lift heavy parts, a hoist of ample capacity, tested and approved according to local safety regulations, shall be used.

7 Lifting hooks, eyes, shackles, etc., shall never be bent and shall only have stress in line with their design load axis. The capacity of a lifting device diminishes when the lifting force is applied at an angle to its load axis.

8 For maximum safety and efficiency of the lifting apparatus all lifting members shall be applied as near to perpendicular as possible. If required, a lifting beam shall be applied between hoist and load.

9 Never leave a load hanging on a hoist.

10 A hoist has to be installed in such a way that the object will be lifted perpendicular. If that is not possible, the necessary precautions must be taken to prevent load-swinging, e.g. by using two hoists, each at approximately the same angle not exceeding 30° from the vertical.

11 Locate the unit away from walls. Take all precautions to ensure that hot air exhausted from the engine and driven machine cooling systems cannot be recirculated. If such hot air is taken in by the engine or driven machine cooling fan, this may cause overheating of the unit; if taken in for combustion, the engine power will be reduced.

12 Generators shall be stalled on an even, solid floor, in a clean location with sufficient ventilation. If the floor is not level or can vary in inclination, consult Atlas Copco.

13 The electrical connections shall correspond to local codes. The machines shall be earthed and protected against short circuits by fuses or circuit breakers.

14 Never connect the generator outlets to an installation which is also connected to a public mains.

15 Before connecting a load, switch off the corresponding circuit breaker, and check whether frequency, voltage, current and power factor comply with the ratings of the generator.

16 Before transportation of the unit, switch off all the circuit breakers. Switch the ON/OFF switch to the OFF position. Depress E-Stop button and Insure the

battery negative terminal is disconnected and is not laying on top of the battery.

Safety during use and operation

1 When the unit has to operate in a fire-hazardous environment, each engine exhaust has to be provided with a spark arrestor to trap incendiary sparks.

2 The exhaust contains carbon monoxide which is a lethal gas. When the unit is used in a confined space, conduct the engine exhaust to the outside atmosphere by a pipe of sufficient diameter; do this in such a way that no extra back pressure is created for the engine. If necessary, install an extractor. Observe any existing local regulations.

Make sure that the unit has sufficient air intake for operation. If necessary, install extra air intake ducts.

3 When operating in a dust-laden atmosphere, place the unit so that dust is not carried towards it by the wind. Operation in clean surroundings considerably extends the intervals for cleaning the air intake filters and the cores of the coolers.

4 Never remove a filler cap of the cooling water system of a hot engine. Wait until the engine has sufficiently cooled down.

5 Never refill fuel while the unit is running, unless otherwise stated in the Atlas Copco Instruction Book (AIB). Keep fuel away from hot parts such as air outlet pipes or the engine exhaust. Do not smoke when fuelling. When fuelling from an automatic pump, an earthing cable should be connected to the unit to discharge static electricity. Never spill nor leave oil, fuel, coolant or cleansing agent in or around the unit.

6 All doors shall be shut during operation so as not to disturb the cooling air flow inside the bodywork and/ or render the silencing less effective. A door should be kept open for a short period only e.g. for inspection or adjustment.

7 Periodically carry out maintenance works according to the maintenance schedule.

8 Stationary housing guards are provided on all rotating or reciprocating parts not otherwise protected and which may be hazardous to personnel. Machinery shall never be put into operation, when such guards have been removed, before the guards are securely reinstalled.

9 Noise, even at reasonable levels, can cause irritation and disturbance which, over a long period of time, may cause severe injuries to the nervous system of human beings.
When the sound pressure level, at any point where personnel normally has to attend, is:
- below 70 dB(A): no action needs to be taken,
- above 70 dB(A): noise-protective devices should be provided for people continuously being present in the room,
- below 85 dB(A): no action needs to be taken for occasional visitors staying a limited time only,
- above 85 dB(A): room to be classified as a noise-hazardous area and an obvious warning shall be placed permanently at each entrance to alert people entering the room, for even relatively short times, about the need to wear ear protectors,
- above 95 dB(A): the warning(s) at the entrance(s) shall be completed with the recommendation that also occasional visitors shall wear ear protectors,
- above 105 dB(A): special ear protectors that are adequate for this noise level and the spectral composition of the noise shall be provided and a special warning to that effect shall be placed at each entrance.

10 Insulation or safety guards of parts the temperature of which can be in excess of 80°C (175°F) and which may be accidentally touched by personnel shall not be removed before the parts have cooled to room temperature.

11 Never operate the unit in surroundings where there is a possibility of taking in flammable or toxic fumes.

12 If the working process produces fumes, dust or vibration hazards, etc., take the necessary steps to eliminate the risk of personnel injury.

13 When using compressed air or inert gas to clean down equipment, do so with caution and use the appropriate protection, at least safety glasses, for the operator as well as for any bystander. Do not apply compressed air or inert gas to your skin or direct an air or gas stream at people. Never use it to clean dirt from your clothes.

14 When washing parts in or with a cleaning solvent, provide the required ventilation and use appropriate protection such as a breathing filter, safety glasses, rubber apron and gloves, etc.

15 Safety shoes should be compulsory in any workshop and if there is a risk, however small, of falling objects, wearing of a safety helmet should be included.

16 If there is a risk of inhaling hazardous gases, fumes or dust, the respiratory organs must be protected and depending on the nature of the hazard, so must the eyes and skin.

17 Remember that where there is visible dust, the finer, invisible particles will almost certainly be present too; but the fact that no dust can be seen is not a reliable indication that dangerous, invisible dust is not present in the air.

18 Never operate the generator in excess of its limits as indicated in the technical specifications and avoid long no-load sequences.

19 Never operate the generator in a humid atmosphere. Excessive moisture causes worsening of the generator insulation.

20 Do not open electrical cabinets, cubicles or other equipment while voltage is supplied. If such cannot be avoided, e.g. for measurements, tests or adjustments, have the action carried out by a qualified electrician only, with appropriate tools, and ascertain that the required bodily protection against electrical hazards is applied.

21 Never touch the power terminals during operation of the machine.

22 Whenever an abnormal condition arises, e.g. excessive vibration, noise, odour, etc., switch the circuit breakers to OFF and stop the engine. Correct the faulty condition before restarting.

23 Check the electric cables regularly. Damaged cables and insufficient tightening of connections may cause electric shocks. Whenever damaged wires or

dangerous conditions are observed, switch the circuit breakers to OFF and stop the engine. Replace the damaged wires or correct the dangerous condition before restarting. Make sure that all electric connections are securely tightened.

24 Avoid overloading the generator. The generator is provided with circuit breakers for overload protection. When a breaker has tripped, reduce the concerned load before restarting.

25 If the generator is used as stand-by for the mains supply, it must not be operated without control system which automatically disconnects the generator from the mains when the mains supply is restored.

26 Never remove the cover of the output terminals during operation. Before connecting or disconnecting wires, switch off the load and the circuit breakers, stop the machine and make sure that the machine cannot be started inadvertently or there is any residual voltage on the power circuit.

27 Running the generator at low load for long periods will reduce the lifetime of the engine.

Safety during maintenance and repair

Maintenance, overhaul and repair work shall only be carried out by adequately trained personnel; if required, under supervision of someone qualified for the job.

Disconnect the negative battery lead during any transport/ installation/service maintenance or storage.

1 Use only the correct tools for maintenance and repair work, and only tools which are in good condition.

2 Parts shall only be replaced by genuine Atlas Copco replacement parts.

3 All maintenance work, other than routine attention, shall only be undertaken when the unit is stopped. Steps shall be taken to prevent inadvertent starting. In addition, a warning sign bearing a legend such as “work in progress; do not start” shall be attached to the starting equipment.
On engine-driven units the battery shall be disconnected and removed or the terminals covered by insulating caps.
On electrically driven units the main switch shall be locked in open position and the fuses shall be taken out. A warning sign bearing a legend such as “work in progress; do not supply voltage” shall be attached to the fuse box or main switch.

4 Prior to stripping an engine or other machine or undertaking major overhaul on it, prevent all movable parts from rolling over or moving.

5 Make sure that no tools, loose parts or rags are left in or on the machine. Never leave rags or loose clothing near the engine air intake.

6 Never use flammable solvents for cleaning (fire-risk).

7 Take safety precautions against toxic vapours of cleaning liquids.

8 Never use machine parts as a climbing aid.

9 Observe scrupulous cleanliness during maintenance and repair. Keep away dirt, cover the parts and exposed openings with a clean cloth, paper or tape.

10 Never weld on or perform any operation involving heat near the fuel or oil systems. Fuel and oil tanks must be completely purged, e.g. by steam-cleaning, before carrying out such operations. Never weld on, or in any way modify, pressure vessels. Disconnect the alternator cables during arc welding on the unit.

11 Support the towbar and the axle(s) securely if working underneath the unit or when removing a wheel. Do not rely on jacks.

12 Do not remove any of, or tamper with, the sound-damping material. Keep the material free of dirt and liquids such as fuel, oil and cleansing agents. If any sound-damping material is damaged, replace it to prevent the sound pressure level from increasing.

13 Use only lubricating oils and greases recommended or approved by Atlas Copco or the machine manufacturer. Ascertain that the selected lubricants comply with all applicable safety regulations, especially with regard to explosion or fire-risk and the possibility of decomposition or generation of hazardous gases. Never mix synthetic with mineral oil.

14 Protect the engine, alternator, air intake filter, electrical and regulating components, etc., to prevent moisture ingress, e.g. when steam-cleaning.

15 When performing any operation involving heat, flames or sparks on a machine, the surrounding components shall first be screened with non-flammable material.

16 Never use a light source with open flame for inspecting the interior of a machine.

17 When repair has been completed, the machine shall be barred over at least one revolution for reciprocating machines, several revolutions for rotary ones to ensure that there is no mechanical interference within the machine or driver. Check the direction of rotation of electric motors when starting up the machine initially and after any alteration to the electrical connection(s) or switch gear, to check that the oil pump and the fan function properly.

18 Maintenance and repair work should be recorded in an operator’s logbook for all machinery. Frequency and nature of repairs can reveal unsafe conditions.

19 When hot parts have to be handled, e.g. shrink fitting, special heat-resistant gloves shall be used and, if required, other body protection shall be applied.

20 When using cartridge type breathing filter equipment, ascertain that the correct type of cartridge is used and that its useful service life is not surpassed.

21 Make sure that oil, solvents and other substances likely to pollute the environment are properly disposed of.

22 Before clearing the generator for use after maintenance or overhaul, submit it to a testrun, check that the AC power performance is correct and that the control and shutdown devices function correctly.

Tool applications safety

Apply the proper tool for each job. With the knowledge of correct tool use and knowing the limitations of tools, along with some common sense, many accidents can be prevented.

Special service tools are available for specific jobs and should be used when recommended. The use of these tools will save time and prevent damage to parts.

Battery safety precautions

Batteries

When servicing batteries, always wear protecting clothing and glasses.

1 The electrolyte in batteries is a sulphuric acid solution which is fatal if it hits your eyes, and which can cause burns if it contacts your skin. Therefore, be careful when handling batteries, e.g. when checking the charge condition.

2 Install a sign prohibiting fire, open flame and smoking at the post where batteries are being charged.

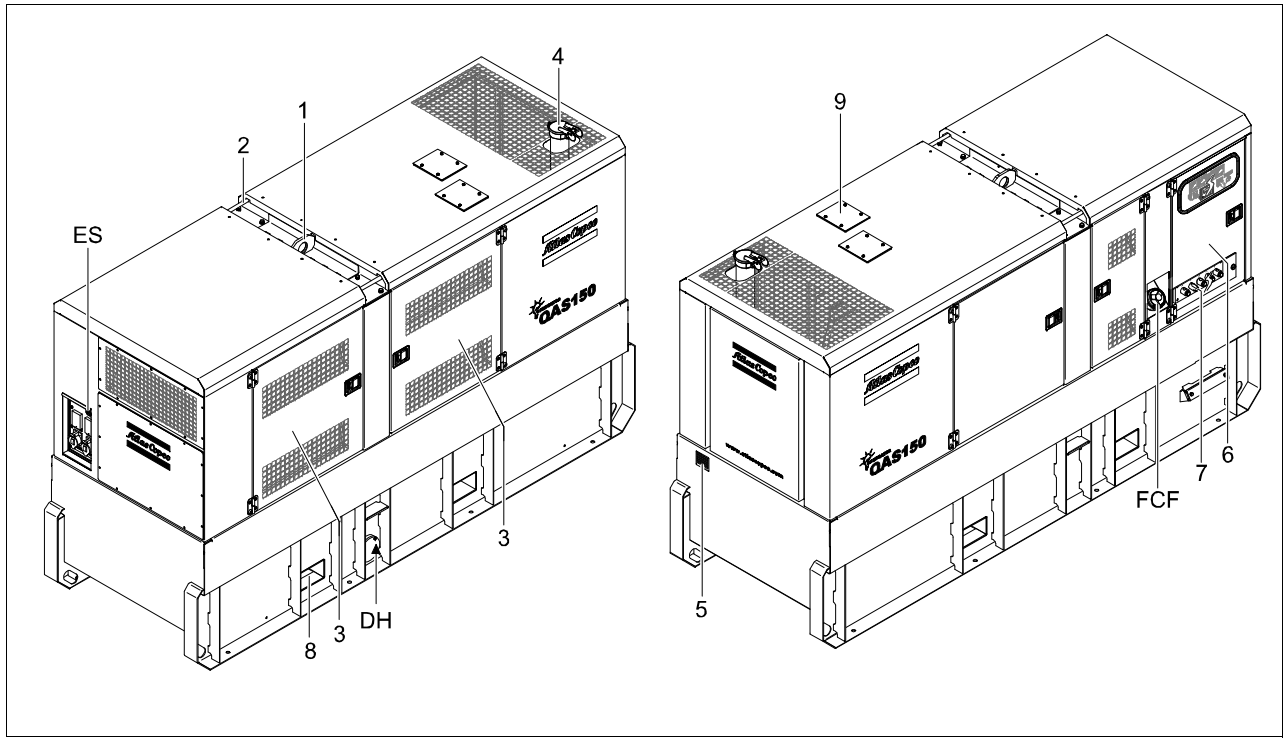
3 When batteries are being charged, an explosive gas mixture forms in the cells and might escape through the vent holes in the plugs.
Thus an explosive atmosphere may form around the battery if ventilation is poor, and can remain in and around the battery for several hours after it has been charged. Therefore:
- never smoke near batteries being, or having recently been, charged,
- never break live circuits at battery terminals, because a spark usually occurs.

4 When connecting an auxiliary battery (AB) in parallel to the unit battery (CB) with booster cables: connect the + pole of AB to the + pole of CB, then connect the - pole of CB to the mass of the unit. Disconnect in the reverse order.

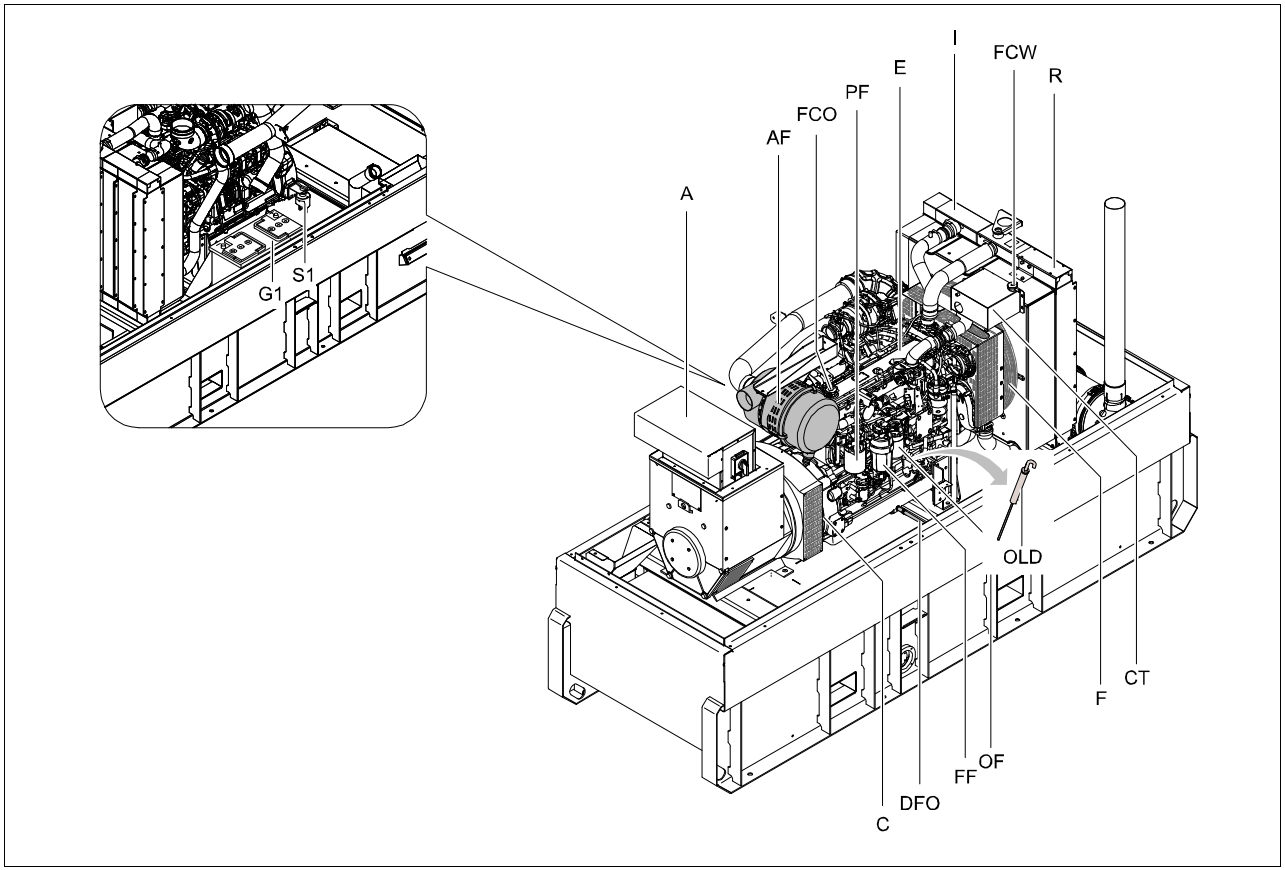
Leading particulars

General description

The QAS 150 John Deere is an AC generator, built for continuous running at sites where no electricity is available or as stand-by in cases of interruption of the mains. The generator can run in 3 different modes: 60Hz, 480 V - 3 phase, 60Hz, 208 V - 3 phase lower voltage and 60 Hz, 240 V - 1 phase. The QAS 150 generator is driven by an EPA interim tier 4 compiant watercooled diesel engine, manufactured by John Deere. An overview of the main parts is given in the diagram below.



1	Lifting beam
2	Guiding rod
3	Side doors
4	Engine exhaust
5	Data plate
6	Door, access to control and indicator panel
7	Output terminal board
8	Hole for forklift
9	Coolant filler access
DH	Drain and access hole (in the frame)
FCF	Filler cap fuel



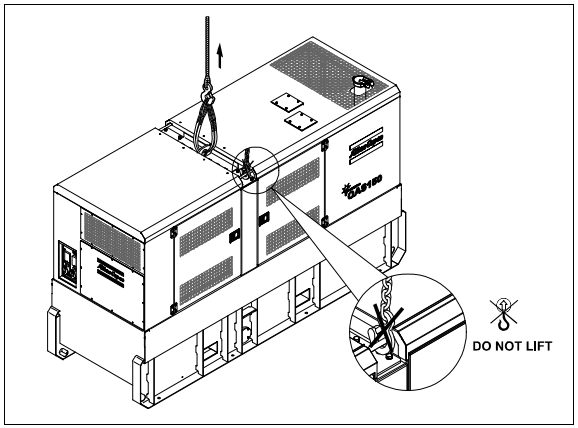
A	Alternator
AF	Air filter
C	Coupling
DFO	Drain flexible engine oil
E	Engine
F	Fan
FC	Fuel Cooler
FCO	Filler cap engine oil
FCW	Filler cap cooling water
FF	Fuel filter
G1	Battery
I	Intercooler
OF	Oil filter
OLD	Engine oil level dipstick
PF	Pre-Filter
R	Radiator
S1	Battery switch
CT	Coolant tank

Bodywork

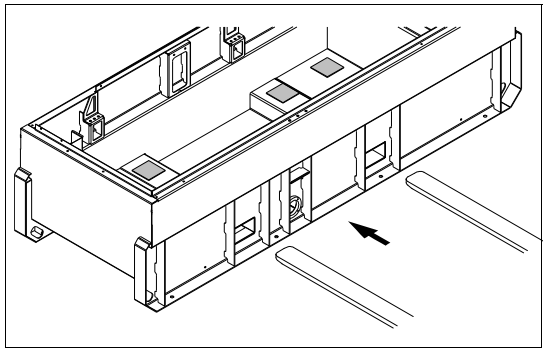
The alternator, the engine, the cooling system, etc. are enclosed in a sound-insulated bodywork that can be opened by means of side doors (and service plates).

The lifting beam, to lift the generator by means of a crane, is integrated in the bodywork and easily accessible from the outside. The recesses in the roof have guiding rods at both sides.

Never use the guiding rods to lift the generator.



To be able to lift the generator by means of a forklift, rectangular holes are provided at the bottom of the frame.



The earthing rod, connected to the generator's earth terminal is located at the bottom of the frame on the outside.

Markings

A brief description of all markings provided on the generator is given hereafter.

Indicates that an electric voltage, dangerous to life, is present. Never touch the electric terminals during operation.

Indicates that the engine exhaust is a hot and harmful gas, which is toxic in case of inhalation. Always make sure that the unit is operated outside or in a well-ventilated room.

Indicates that these parts can become very hot during operation (e.g. engine, cooler, etc.). Always make sure that these parts are cooled down before touching them.

Indicates that the guiding rods may not be used to lift the generator. Always use the lifting rod in the roof of the generator to lift it.

Indicates a lifting point of the generator.

diesel

Indicates that the generator may be refuelled with diesel fuel only.

Indicates the drain for the engine oil.

Indicates the drain for the coolant.

Indicates the drain plug for the engine fuel.

PAROIL E Mission green **Use PAROIL E Mission green.**

Indicates the external fueltank.

Indicates that the alternator should not be cleaned with high pressurised water.

Indicates the battery switch.

Indicates that the unit may start automatically and that the instruction book has to be consulted prior to use.

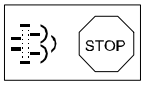
Indicates the 3-way valve.

Indicates the partnumbers of the different service packs and of the engine oil. These parts can be ordered to the factory.

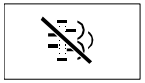
Exhaust Filter Cleaning Indicator

Exhaust Filter Indicator

Exhaust Filter and Warning Indicator



Exhaust Filter and Stop Indicator



Auto Cleaning and Disabled Indicator

Label Tier 4 Interiam

Label Engine Oil Requirements

Drain plugs and filler caps

The drain holes for the engine oil, the coolant and the plug for the fuel, are located and labelled on the frame, the fuel drain plug at the front, the others at the service side.

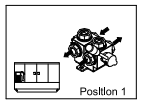
The drain flexibles for the engine oil and the engine coolant can be brought to the outside of the generator through the drain hole.

The drain hole can also be used to guide external fueltank connections. When connecting an external fueltank, use the 3-way valves.

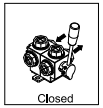
External fuel tank connection

The external fuel tank connection allows to bypass the internal fuel tank and to connect an external fuel tank to the unit.

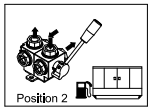
Make sure to connect the fuel supply line as well as the fuel return line. Connections to fuellines ought to be air-tight to prevent air from entering the fuel system.



Position 1: Indicates that the fuel supply line to the engine is connected to the internal fueltank.



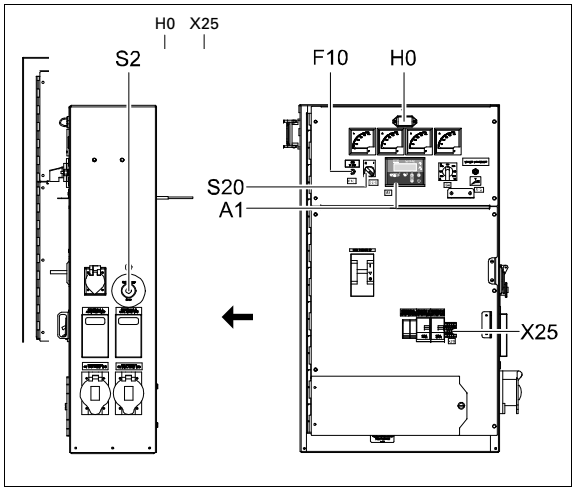
Position closed: Indicates that the fuel supply line to the engine is closed.



Position 2: Indicates that the fuel supply line to the engine is connected to the external fueltank.

Control and indicator panel Qc1002™

General description Qc1002™ control panel



A1 .... Qc1002™ display

F10... Fuse

The fuse activates when the current from the battery to the engine control circuit exceeds its setting. The fuse can be reset by pushing the button.

H0 .... Panel light

S2..... Emergency stop button

Push the button to stop the generator in case of an emergency. When the button is pressed, it must be unlocked, before the generator can be restarted. The emergency stop button can be secured in the locked position with the key, to avoid unauthorized use.

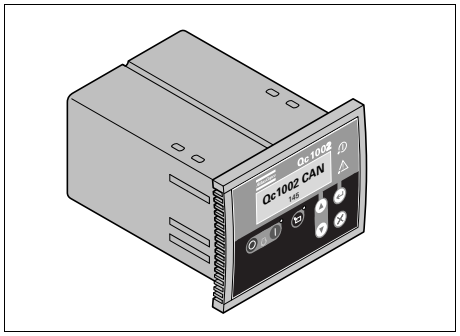
S20... ON/OFF switch

Position O: No voltage is applied to the Qc1002™ module, the generator will not start.

Position I: Voltage is applied to the Qc1002™ module, it is possible to start up the generator.

X25 .. Terminal strip

Qc1002™ Module



The Qc1002™ module is located inside the control panel. This control module will carry out all necessary tasks to control and protect a generator, regardless of the use of the generator.

This means that the Qc1002™ module can be used for several applications.

Pushbutton and LED functions

Following pushbuttons are used on the Qc1002™

ENTER: Is used to select and confirm changed settings in the Parameter list.

UP: Is used to scroll through the display information and to adjust parameter value upwards.

DOWN: Is used to scroll through the display information and to adjust parameter value downwards.

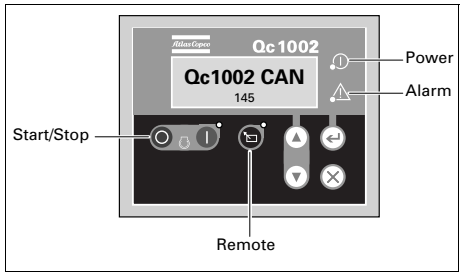
BACK: Is used to leave the Alarm pop-up window, to leave the Parameter list and to leave menu's without change.

REMOTE MODE: Is used to activate the remote mode. The LED indicates if the gen-set is put in Remote Mode.

START: Is used to start the unit in Manual Mode.

STOP: Is used to stop the unit in Manual or Remote Mode (always with shutdown!). When the unit is stopped with the STOP button in Remote mode, it will automatically go to Manual Mode.

Following LEDs are used on the Qc1002™



Power	Green LED indicates that the unit is powered up.
Remote	Green LED indicates that the Remote Mode is selected.
Start/Stop	Green LED indicates that the engine is running.
Alarm	Flashing red LED indicates that an alarm is present. A continuous red LED indicates that the alarm has been acknowledged by the user. The exact alarm is shown on the display.

Qc1002™ Menu Overview

At Qc1002™, the LCD will show following information:

– in **Normal** condition (scroll through the information using **UP** and **DOWN**):
  - Status (eg: preheat, crank, run, cooldown, extended stop time, …)
  - Controller type & version
  - Parameter list
  - Alarm list
  - LOG list
  - Service Timer 1 & Service Timer 2
  - Battery Voltage
  - Coolant temperature
  - Oil pressure
  - RPM (speed)
  - Fuel level
  - Voltage - frequency - running hours
– in **Alarm** condition (scroll through the information using **UP** and **DOWN**):
  - a list of all active Alarms

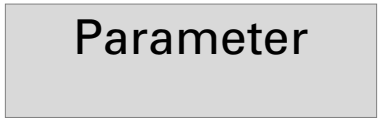
It's possible to scroll through the views, using the **UP** and **DOWN** buttons. The scrolling is continuous.

If a Special status comes up, the Status Display is shown. If an Alarm comes up, the Alarm Display is shown.

Controller type and version display

This view shows the controller type and the ASW version number.

Parameter display



This view shows a number of Parameter settings and gives access to them.

An overview is given in “Parameter list” on page 18.

Alarm list display

This view shows the number of active alarms and gives access to them.

An overview is given in “Control and indicator panel Qc1002™” on page 15.

LOG list display

This view shows the alarm memory and gives access to it.

An overview is given in “LOG list” on page 21.

Service timer 1 & Service timer 2 display

This view shows both Service timers. The service timer indication is shown when service time has run out. It can be removed by resetting the timers or acknowledging the Service timer indication.

The service timer indications count upwards and give an alarm when the set value is reached.

Resetting the Service Timers can be done through the Parameter display.

Battery Voltage display

This view shows the Battery voltage and the running hours.

Coolant temperature display

This view shows the Coolant temperature and the running hours.

See also “Parameter list” on page 18 for selection between °C and °F.

Oil pressure display

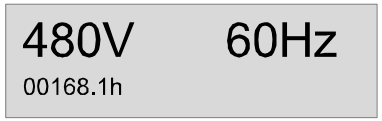
This view shows the Oil pressure and the running hours.

See also “Parameter list” on page 18 for selection between bar and psi.

Fuel level display

This view shows the Fuel level and the running hours.

Voltage - frequency - running hours display



This view shows the voltage, frequency and running hours.

Engine speed display

This view shows the engine speed and running hours.

Diagnostic menu

This menu is used to power up the engine electronics without starting the engine. When this setting is switched on, electric power will be supplied to the engine electronics after half a minute delay. The unit can not be started as long as this parameter is swiched on.

DPF - Diesel Particulate Filter

This view shows the DPF mode selected. When AUTO is selected the DPF will regenerate automatically. When OFF is selected, regeneration is disabled. When ON is selected manual regeneration is partially enabled (see STATION REGEN).

It is highly recommended that the genset be left in the AUTO mode at all times to prevent engine de-rate and

possible shutdown due to high soot level.

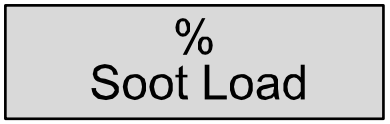
Station Regen.

Stationary or manual DPF regeneration. This view shows the stationary regeneration mode selected. When OFF is selected, manual regeneration is disabled. When ON is selected manual regeneration is enabled. The views DPF and STATION REGEN. must be set to ON for the unit to perform a stationary (manual) regeneration.

DPF and STATION REGEN. are password protected.

Note: Unit will not regenerate until soot level is ~72%

Soot Load Indicator

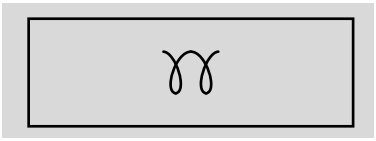


Available in EXTRA VIEWS on control panel

Only visible when unit is operating. This screen has been provided for the operator to monitor the soot load of the DPF (read in percent of load)

For stationary/manual regeneration instructions See page 22.

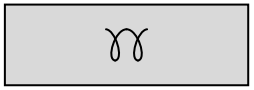
Status Display (pop-up window)

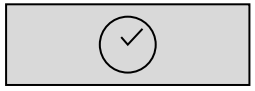


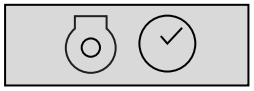
In case special statuses are entered, a pop-up window will automatically be entered for as long as the status is active.

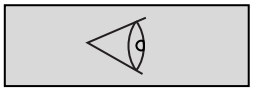
The background screen is not updated when the status pop-up window is active.

These special statuses are:

PREHEAT 

START OFF/ EXTENDED STOP TIMER 

COOLDOWN 

DIAGNOSTIC 

If a special status has elapsed, the active view will be entered again automatically.
If an Alarm comes up, the Alarm Display is shown.

Parameter list

The Parameter Menu's are pre-programmed!

A password will be asked for when an attempt to change a setting is about to be done (user password = 2003).

Menu's shown on the Parameter list LCD:

– Running hours adjust

  This menu is used to adjust the amount of running hours. The running hours can only be highered, not lowered.

– Unit Type

  Unit type 6 for QAS 150 T4A John Deere!

– Service Timer 2 reset

– Service Timer 1 reset

  These menus are used to reset the service timers. When a service timer alarm occurs and is acknowledged, the service timer will be reset automatically.

– Diagnostic Menu

  This menu is used to power up the engine electronics without starting the engine. When this setting is switched on, electric power will be supplied to the engine electronics after half a minute delay. The unit can not be started as long as this parameter is switched on.

– Unit Menu

  This menu is used to select whether tempreature and pressure should appear in °C/bar or °F/psi.

– Language selection

  Icons is the default factory set language, but 6 other languages can be selected: English, French, German, Italian, Spanish and Cyrillic (Russian). All information in the Parameter List display is always in English.

– Generator Underfrequency: failclass, enable, delay, setpoint

– Generator Overfrequency: failclass, enable, delay, setpoint

– Generator Undervoltage: failclass, enable, delay, setpoint

– Generator Overvoltage: failclass, enable, delay, setpoint

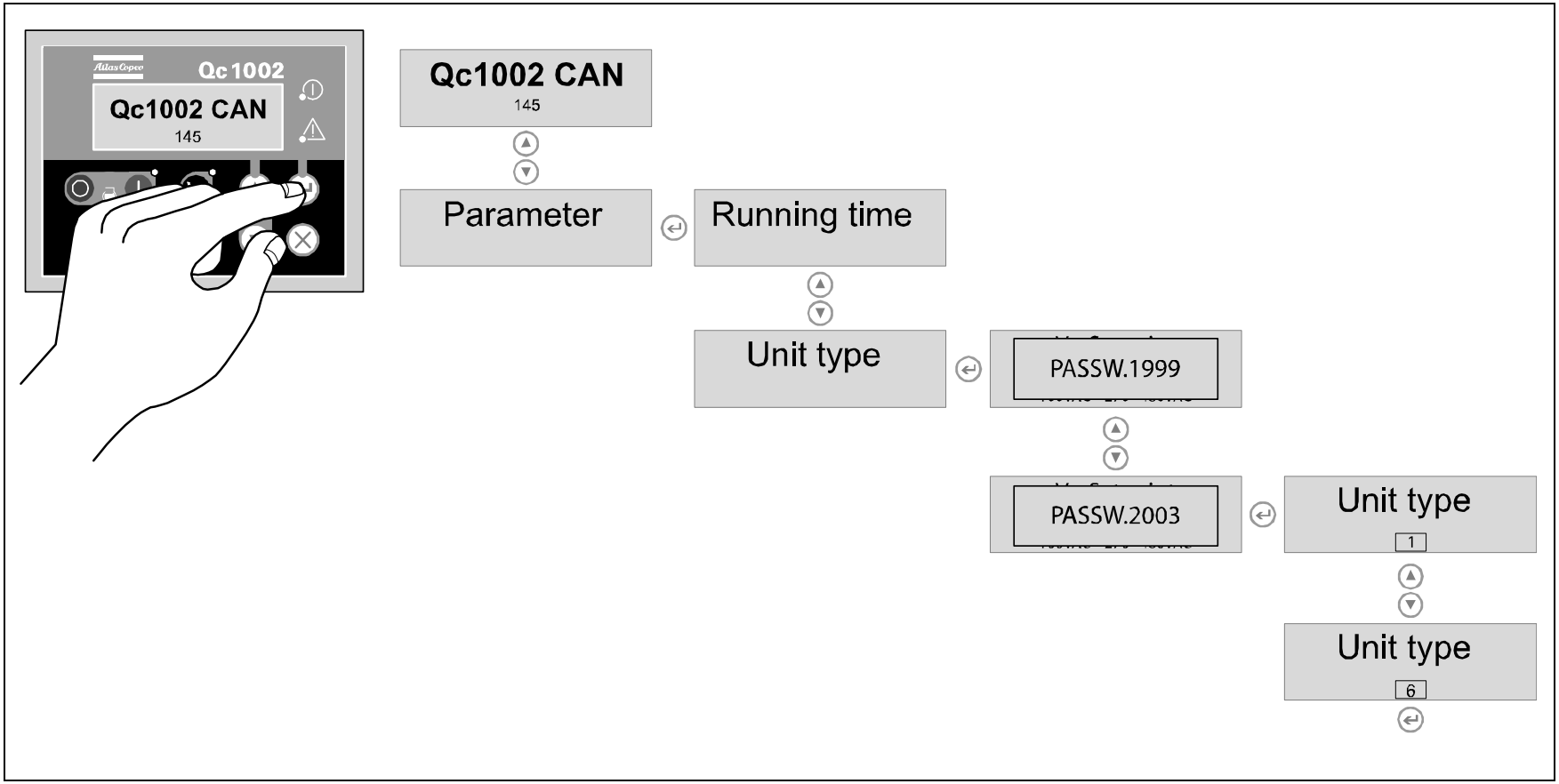
– Engine CAN communication

  This menu is used to select the type of engine electronics, the Qc1002™ controller should communicate with via the Canbus.

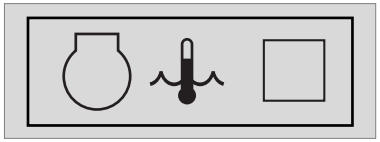
It's possible to scroll between configuration menu's by using the pushbuttons UP and DOWN.

Pushing the ENTER button activates the configuration menu which is shown at the display.

This is the described menu flow for changing the unit type:



Alarm Display (pop-up window)



In case an Alarm occurs, a pop-up window will automatically be displayed for as long as the alarm is active, no matter which view is active. The flashing red alarm LED will light up. The alarm icons will be shown together with an acknowledgement check-box. Push the ENTER button to acknowledge the alarm. When the alarm has been acknowledged, a V-marking will appear in the check-box and the red alarm LED will light up continuously.

An alarm should always be acknowledged before solving the problem that causes the alarm.

The Alarm Display can always be left or entered again by pushing the BACK button.

If more than one alarm comes up, it's possible to scroll through the alarm messages with the UP and DOWN pushbuttons. The newest alarm will be placed at the bottom of the list (meaning that the older alarm stays at the display when a newer alarm comes up).

If one or more than one alarm is present, an arrow at the right of the display will be shown.

Following general groups of Alarms exist:

Warning: Alarm LED lights up + Alarm pop-up appears on the display + Alarm relay is empowered (if configured)

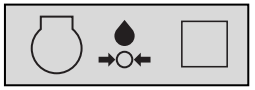
Trip of GB: 'Warning' actions + Generator Contactor opens

Trip and Stop: 'Trip of GB' actions + unit stops after Cooldown

Shutdown: 'Trip of GB' actions + unit stops immediately

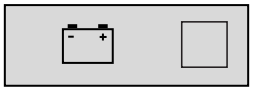
List of possible alarms:

LOW OIL PRESSURE

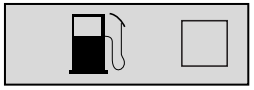


HIGH COOLANT TEMPERATURE

CHARGING ALTERNATOR

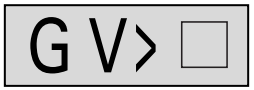


LOW FUEL LEVEL



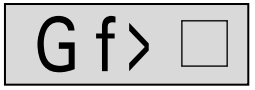
LOW COOLANT LEVEL

GENERATOR OVERVOLTAGE



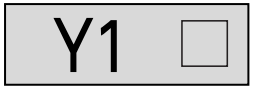
GENERATOR UNDER-VOLTAGE

GENERATOR OVER-FREQUENCY



GENERATOR UNDER-FREQUENCY

SERVICE TIMER 1

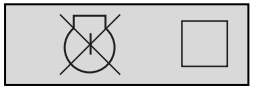


SERVICE TIMER 2

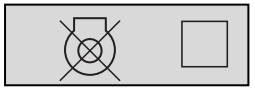
ENGINE ALARM

EMERGENCY STOP

START FAILURE



STOP FAILURE



Displaying the engine DM1 alarm

Besides some engine specific alarms shown in the standard alarm list, also all Diagnostic messages DM1 (active alarms) can be shown on the display.

Use the **UP** or **DOWN** buttons until DM1 is shown on the display and press **ENTER**. The DM1 alarm log will be shown on the display.

Use the **UP** and **DOWN** buttons to scroll through the list.

The DM1 alarm log will always show the SPN code (Diagnostics Codes) and the FMI code (Failure Modes) of every engine failure.

For example, the error code for “Low Coolant Level Shutdown” will be 111/01 (111 for “Coolant level” and 01 for “Low level shutdown”).

The list below shows the most common error codes. The DM1 alarm log for these codes will also show the alarm text:

SPN16	"FUEL FILTER DIFF P"
	pressure difference over fuel filter
SPN51	"THROTTLE POS"
	throttle position
SPN52	"INTERCOOL TEMP"
	intercooler temperature
SPN94	"FUEL PRESS"
	fuel pressure
SPN95	"FUEL FILTER DIFF P"
	pressure difference over fuel filter
SPN97	"WATER IN FUEL"
	water in fuel
SPN98	"OIL LEVEL"
	oil level
SPN99	"OIL FILTER DIFF P"
	pressure difference over oil filter
SPN100	"OIL PRESSURE"
	oil pressure
SPN101	"CRANKCASE PRESS"
	crankcase pressure
SPN102	"TURBO BOOST PRESS"
	turbo boost pressure
SPN104	"TURBO OIL PRESS"
	turbo oil pressure
SPN105	"INTAKE MANIF TEMP"
	intake manifold temperature
SPN106	"AIR INLET PRESSURE"
	air inlet pressure
SPN110	"COOLANT TEMP"
	coolant temperature
SPN111	"COOLANT LEVEL"
	coolant level
SPN158	"BATT VOLTAGE"
	battery voltage
SPN171	"AMBIENT AIR TEMP"
	ambient air temperature
SPN172	"AIR IN TEMP"
	air in temperature
SPN174	"FUEL TEMP"
	fuel temperature
SPN175	"OIL TEMP"
	oil temperature
SPN190	"SPEED"
	speed
FMI00	"HIGH LEVEL SHUTDOWN"
	high level shutdown
FMI01	"LOW LEVEL SHUTDOWN"
	low level shutdown
FMI15	"HIGH LEVEL WARNING"
	high level warning
FMI16	"HIGH LEVEL ALARM"
	high level alarm
FMI17	"LOW LEVEL WARNING"
	low level warning
FMI18	"LOW LEVEL ALARM"
	low level alarm

LOG list

The unit will keep an event log of the latest 30 events.

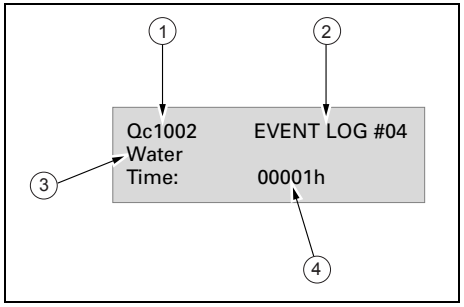
Events are:

– shutdowns

– service timer 1/2 reset

– unit type changes

Together with each event, the running hours at the time of the event will be stored.



1	Controller type
2	Event number
3	Event
4	Running hours

Remote start operation

Installation wirings:

– X25.1 & X25.2 to be wired for the remote start switch.

– X25.3 & X25.4 to be wired for the remote contactor (open/ close).

Fail classes

All the activated alarms of the Qc1002™ have their own pre-defined fail class.

All alarms are enabled according to one of these three statuses:

– disabled alarm, no supervision of alarm (OFF).

– enabled alarm, supervision of alarm all the time (ON).

– running alarm, only supervision when the machine is running (RUN).

Stationary Regeneration Procedure

Atlas Copco recommends that the DPF configuration be left in the AUTO mode at all times, however in the event that a stationary or manual regeneration in desired the following process should be followed.

– Go to the "STATION REGEN" screen. For normal operation this should be in OFF mode.

§ Press the enter button, this function is password protected contact Atlas Copco service department.

§ Use the up or down arrow to change the selection to ON and press the enter button.

– Go to the "DPF" screen. For normal operation this should be in the AUTO mode.

§ Press the enter button

§ Use the up or down arrow to change the selection to ON and press the enter button.

§ This will set the unit up for regeneration, after a few moments the regeneration icon should appear confirming the unit is regenerating.

Upon completion of the stationary/forced regeneration it is highly recommended to reset the unit to automatically regenerate to prevent engine derate & shutdown due to high soot load. Follow the process below to return the unit to AUTO mode for normal operation.

– Go to the "STATION REGEN" screen. (For normal operation this should be in OFF mode).

§ Press the enter button, this function is password protected contact Atlas Copco service department.

§ Use the up or down arrow to change the selection to OFF and press the enter button.

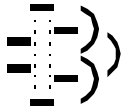
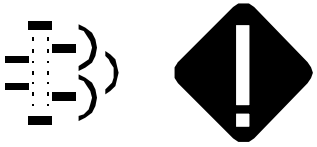
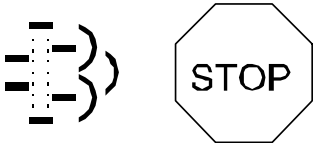
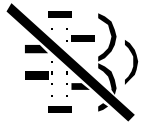
– Go to the "DPF" screen. For normal operation this should be in the AUTO mode.

§ Press the enter button,

§ Use the up or down arrow to change the selection to AUTO and press the enter button.

§ The unit is now ready for normal operation.

DPF INFORMATION - INDICATORS

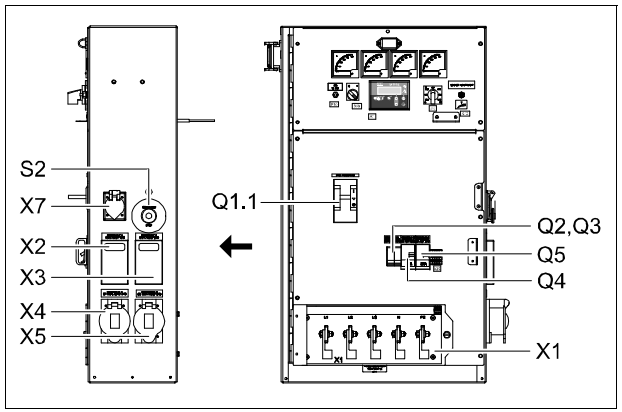
Indicators	Discription	Operator Action
Exhaust Filter Cleaning Indicator 	Active when: 1. Exhaust gas temperature is high. 2. Elevated idle is active. 3. Exhaust filter cleaning is in process.	Machine can be operated as normal. If operating in an area where high exhaust temperature may be an issue, abort exhaust filter cleaning by using the disable feature. Only use disable feature in emergency situation.
Exhaust Filter Indicator 	Active when: Soot level in the exhaust filter indicates need for an exhaust filter cleaning. Warning will be present on controller	Enable auto filter cleaning to allow a cleaning cycle. OR Begin a manual cleaning.
Exhaust Filter and Warning Indicators 	Active when: Machine performance is reduced due to moderately high soot level. Warning will be present on controller	Begin a manual cleaning.
Exhaust Filter and Stop Indicators 	Active when: Exhaust filter requires service, Machine performance is reduced due to Extremely High soot level and a stop engine request is made.	Service the exhaust filter. Contact your servicing dealer.
Auto Cleaning Disabled Indicator 	Active when: Auto exhaust filter cleaning is disabled.	If possible, enable auto cleaning.

Always leave machine in auto cleaning mode unless forced to use a manual cleaning.

Do not let machine operate unloaded excessively, exhaust filter performance is reduced.

Output terminal board

The cubicle provides a terminal board for easier connection of cables. It is situated below the control and indicator panel.



S2..... Emergency stop button

X1..... Terminal board

Provides a more easy connection of cables.

X2..... 1-phase outlet socket (125 V)

Provides phase L2, neutral and earthing.

X3..... 1-phase outlet socket (125 V)

Provides phase L1, neutral and earthing.

X4..... 2-phase outlet socket (125/250 V)

Provides phases L1, L2, neutral and earthing.

X5..... 2-phase outlet socket (125/250 V)

Provides phases L1, L2, neutral and earthing.

X7 ... Flanged Inlet

Used to supply power to the available coolant heater or battery charger (if ordered).

Q1.1 . Main circuit breaker

Interrupts the voltage power supply towards X1 when a short-circuit occurs at the load side or when the overcurrent protection limit is activated. It must be reset manually after eliminating the problem.

Q2 .... Circuit breaker for X2

Interrupts the power supply to X2 when a short-circuit occurs at the load side, or when the overcurrent protection (20 A) is activated. When activated, Q2 interrupts one phase towards X2. It can be activated again after eliminating the problem.

Q3 .... Circuit breaker for X3

Interrupts the power supply to X3 when a short-circuit occurs at the load side, or when the overcurrent protection (20 A) is activated. When activated, Q3 interrupts 2 phases towards X3. It can be activated again after eliminating the problem.

Q4 .... Circuit breaker for X4

Interrupts the power supply to X4 when a short-circuit occurs at the load side, or when the overcurrent protection (50 A) is activated. When activated, Q4 interrupts 2 phases towards X4. It can be activated again after eliminating the problem.

Q5 .... Circuit breaker for X5

Interrupts the power supply to X5 when a short-circuit occurs at the load side, or when the overcurrent protection (50 A) is activated. When activated, Q5 interrupts 2 phases towards X5. It can be activated again after eliminating the problem.

Make sure to switch on circuit breakers Q1.1 or Q2, Q3, Q4 and Q5 after starting the generator when power supply is done by means of X2, X3, X4 or X5.

Triple voltage (3V)

The generator can run in three different modes:

– 1 phase

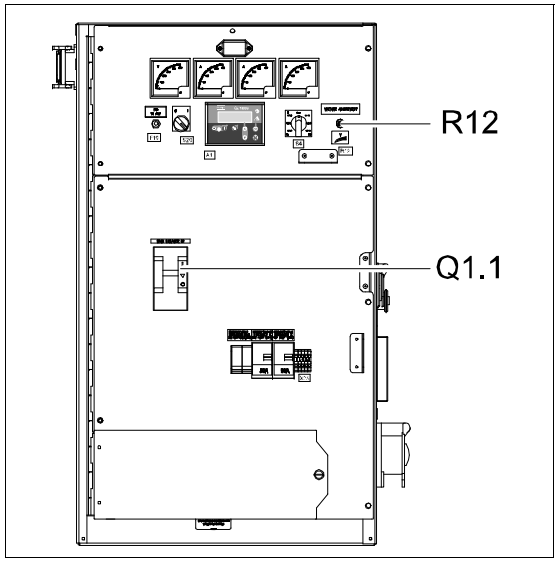
  When using this selection, the generator provides a 120/240 V output voltage.

– 3 phase, lower voltage

  When using this selection, the generator provides a 208/240 V output voltage.

– 3 phase, higher voltage

  When using this selection, the generator provides a 416/480 V output voltage.



Q1.1. Circuit breaker for

Interrupts the voltage power supply towards X1 when a short-circuit occurs at the load side or when the overcurrent protection is activated. It must be reset manually after eliminating the problem.

R12... Output voltage adjust potentiometer

Allows to adjust the output voltage.

The selection between the three modes is done by means of S10.

S10 .. Output voltage selection switch

Allows to select a 1 phase output voltage, a 3 phase high output voltage or a 3 phase low output voltage. Selector switch S10 is located on the alternator.

Changing the output voltage is only allowed after shutdown.
After changing the output voltage by means of the selection switch S10, adjust the output voltage by means of potentiometer R12 to the required value.

Connecting the generator

Precautions for non-linear and sensitive loads

Non-linear loads draw currents with high contents in harmonics, causing distortion in the wave form of the voltage generated by the alternator.

The most common non-linear, 3-phase loads are thyristor/ rectifier-controlled loads, such as convertors supplying voltage to variable speed motors, uninterruptable power supplies and Telecom supplies. Gas-discharge lighting arranged in single-phase circuits generate high 3rd harmonics and risk for excessive neutral current.

Loads most sensitive to voltage distortion include incandescent lamps, discharge lamps, computers, X-ray equipment, audio amplifiers and elevators.

Consult Atlas Copco for measures against the adverse influence of non-linear loads.

Quality, minimum section and maximum length of cables

The cable connected to the terminal board of the generator must be selected in accordance with local legislation. The type of cable, its rated voltage and current carrying capacity are determined by installation conditions, stress and ambient temperature. For flexible wiring, rubber-sheathed, flexible core conductors of the type H07 RN-F (Cenelec HD.22) or better must be used.

The following table indicates the maximum allowable 3-phase currents (in A), in an ambient temperature of 40°C, for cable types (multiple and single core PVC insulated conductors and H07 RN-F multiple core conductors) and wire sections as listed, in accordance with VDE 0298 installation method C3. Local regulations remain applicable if they are stricter than those proposed below.

Wire section	*Max. current (A)*		
(mm^2)	*Multiple core*	*Single core*	*H07 RN-F*
25	*94*	*101*	*88*
35	*114*	*123*	*110*
50	*138*	*155*	*138*
70	*176*	*191*	*170*
95	*212*	*228*	*205*
120	*245*	*273*	*239*
150	*282*	*314*	*250*
185	*323*	*358*	*313*
240	*379*	*421*	*371*
300	*429*	*477*	*428*

The lowest acceptable wire section and the corresponding maximum cable or conductor length for multiple core cable or H07 RN-F, at rated current, for a voltage drop e lower than 5% and at a power factor of 0.80, are respectively 2.5 mm² and 144 m. In case electric motors must be started, oversizing the cable is advisable.

The voltage drop across a cable can be determined as follows:

$$e = \frac{\sqrt{3} \cdot I \cdot L \cdot (R \cdot \cos\varphi + X \cdot \sin\varphi)}{1000}$$

e = Voltage drop (V)

I = Rated current (A)

L = Length of conductors (m)

R = Resistance (Ω/km to VDE 0102)

X = Reactance (Ω/km to VDE 0102)

Connecting the load

Site distribution panel

If outlet sockets are provided, they must be mounted on a site distribution panel supplied from the terminal board of the generator and in compliance with local regulations for power installations on building sites.

Protection

For safety reasons, it is necessary to provide an isolating switch or circuit breaker in each load circuit. Local legislation may impose the use of isolating devices which can be locked.

- Check whether frequency, voltage and current comply with the ratings of the generator.
- Provide for the load cable, without excessive length, and lay it out in a safe way without forming coils.
- Open the door of the control and indicator panel and the transparent door in front of the terminal board X1.
- Provide the wire ends with cable lugs suited for the cable terminals.
- Loosen the cable clamp and push the wire ends of the load cable through the orifice and clamp.
- Connect the wires to the proper terminals (L1, L2, L3, N and PE) of X1 and tighten the bolts securely.
- Tighten the cable clamp.
- Close the transparent door in front of X1.

Operating instructions

In your own interest, always strictly observe all relevant safety instructions.
Do not operate the generator in excess of the limitations mentioned in the Technical Specifications.
Local rules concerning the setting up of low voltage power installations (below 1000 V) must be respected when connecting site distribution panels, switch gear or loads to the generator.
At each start-up and at any time a new load is connected, the earthing of the generator must be verified. Earthing must be done either by the earthing rod or, if available, by an existing, suitable earthing installation. The protective system against excessive contact voltage is not effective unless a suitable earthing is made.
The generator is wired for a TN-system to IEC 364-3, i.e. one point in the power source directly earthed - in this case the neutral. The exposed conductive parts of the electric installation must be directly connected to the functional earth.

If operating the generator in another power system, e.g. an IT-system, other protective devices required for these types must be installed. In any case only a qualified electrician is authorized to remove the connection between the neutral (N) and earth terminals in the terminal box of the alternator.

Installation

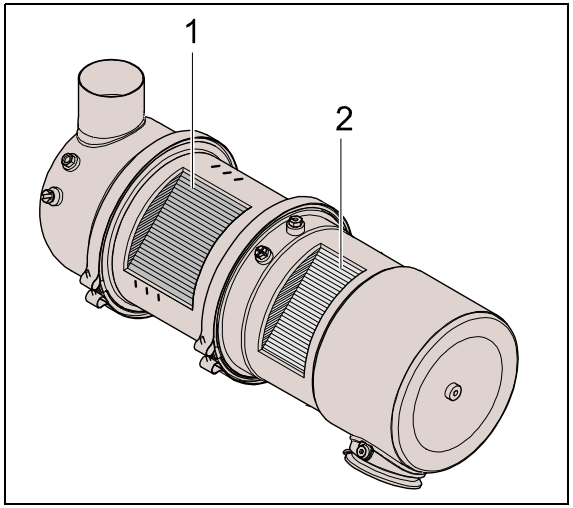
For information about indoor installation, consult your local Atlas Copco dealer.

- Place the generator on a horizontal, even and solid floor. The generator can operate in a slant position not exceeding 15° (in both senses: front/rear and left/right).
- The generator should be kept with the doors closed, in order to avoid the ingress of water and dust. Dust ingress reduces the lifetime of filters and may reduce your generator's performance.
- Check that the engine exhaust is not directed towards people. If the generator is operated indoors, install an exhaust pipe of sufficient diameter to duct the engine exhaust towards the outside. Check for sufficient ventilation so that the cooling air is not recirculated. If necessary, consult Atlas Copco.
- Leave enough space for operation, inspection and maintenance (at least 1 meter at each side).
- Check that the inner earthing system is in compliance with the local legislation.
- Use coolant for the engine cooling system. Refer to the Engine instruction book for the proper coolant mixture.
- Check the tightness of the bolts and nuts.
- Install the earthing rod as near as possible to the generator and make sure not to have a contact voltage higher than 25 V.
- Check that the cable end of the earthing rod is connected to the earth terminal.

Before starting

- With the generator standing level, check the engine oil level and top up if necessary. The oil level must be near to, but not exceed the high mark on the engine oil level dipstick.
- Check the coolant level in the expansion tank of the engine cooling system. The coolant level must be near to the FULL mark. Add coolant if necessary.
- Drain any coolant and sediment from the fuel pre-filter. Check the fuel level and top up if necessary. It is recommended to fill the tank after the day's operation to prevent coolantdamp in a nearly empty tank from condensing.
- Check the vacuum indicator of the air filter. If the red part shows completely, replace the filter element.
- Press the vacuator valve of the air filter to remove dust.
- Check the generator for leakage, tightness of wire terminals, etc. Correct if necessary.
- Check that circuit breaker Q1.1 is switched off.
- Check that fuse F10 has not tripped and that the emergency stop is in the OUT position.
- Check that the load is switched off.
- Check that the earth fault protection (N13) has not tripped (reset if necessary).

EXHAUST FILTER



1. Diesel Particulate Filter (DPF)
2. Diesel Oxidation Catalyst (DOC)

EXHAUST FILTER SYSTEM

An exhaust filter consisting of a diesel oxidation catalyst (DOC) and a diesel particulate filter (DPF) specifically to meet the demands of offhighway applications. The DOC reduces carbon monoxide, hydrocarbons, and some particulate matter. The downstream DPF traps and holds particulates remaining in the exhaust stream. Trapped particles are eventually oxidized within the DPF through a process known as regeneration or exhaust filter cleaning.

Under normal machine operation and with the system in AUTO mode, the exhaust filter system requires minimal operator interaction.

To avoid unnecessary buildup of diesel particulates or soot in the exhaust filter system;

1. Utilize the Automatic (AUTO) Exhaust Filter Cleaning mode.
2. Avoid operating for extended periods unloaded.
3. Use Atlas Copco “PAROIL E mission Green Low SAPS” engine oil.
4. Use only ultra low sulfur fuel.

In addition to soot, ash deposits will also slowly build up in the DPF and cannot be removed through the engine exhaust filter cleaning process.

When the exhaust filter has run several thousand hours, these ash deposits can restrict engine performance due to increased back pressure.

To correct this situation, replace the exhaust filter or have the exhaust filter cleaned in specialized equipment.

Do not power wash the filter assembly when external skin temperature of assembly exceeds 50° C (120° F).

DIESEL PARTICULATE FILTER MAINTENANCE AND SERVICE

The Exhaust Filter includes the Diesel Oxidation Catalyst (DOC) and Diesel Particulate Filter (DPF). The DPF is designed to retain residual ash, which is a noncombustible result of additives used in crankcase lubrication oils and the fuel. The DPF provides many hours of maintenance free operation. At some point the DPF will require professional service to remove the accumulated ash. The exact number of hours of operation before service is required will vary depending upon the engine’s power category, duty cycle and operating conditions, engine oil ash content, and fuel quality.

The exhaust filter’s dash lamp indicator or the dignostic codes will indicate when the DPF needs ash removal service.

The removal of DPF ash must be done by removing the DPF from the machine and placing it into specialized equipment. Do not remove ash by using water or other chemicals. Removing ash by these methods may damage the material securing the DPF in its canister, resulting in the loosening of the DPF element in the canister and subjecting it to damage from vibration.

EXHAUST FILTER / DIESEL PARTICULATE FILTER ASH HANDLING AND DISPOSAL

Under federal, state, and/or local laws or regulations, Diesel Particulate Filter ash may be classified as a hazardous waste. Hazardous wastes must be disposed of in accordance with all applicable federal, state and local laws or regulations governing hazardous waste disposal. Only a qualified service provider should remove ash from the DPF. Personal protective equipment and clothing, maintained in a sanitary and reliable condition, should be used when handling and cleaning a DPF. See your John Deere dealer or qualified service provider for assistance.

EXHAUST FILTER DISPOSAL

Proper management of an Exhaust Filter that has reached the end of its useful life is required, since the ash or catalyst material in the device may be classified as hazardous waste under federal, state, and/orlocal laws or regulations. Used Exhaust Filters,which include the Diesel Particulate Filter,may be exchanged at any Engine manufacturer’s dealeror qualified service provider.

See Engine operator’s manual for further information regarding the Exhaust Filter.

PRIMING INSTRUCTIONS

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the "ON/OFF" switch in position "OFF" when changing fuel filters or water separator elements. Clean up fuel spills immediately.

Prime the fuel system in order to fill the fuel filter. Prime the fuel system in order to purge trapped air. The fuel system should be primed under the following conditions:

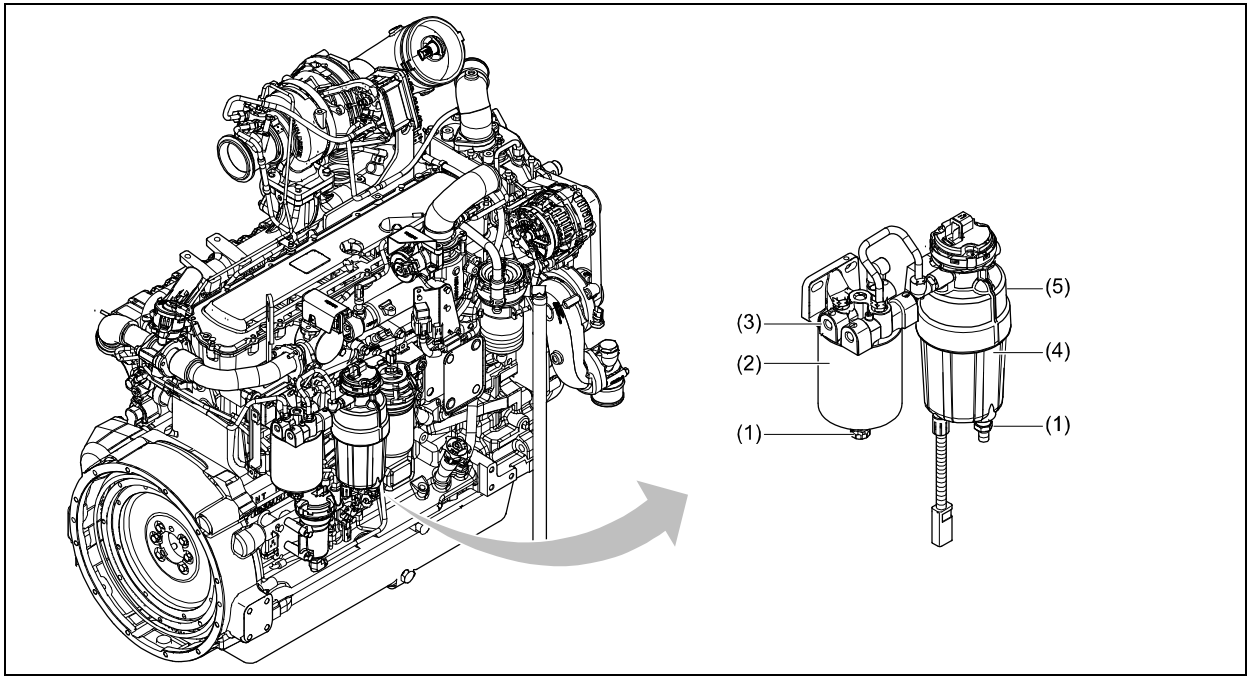
- Generator is put in operation for the first time
- Running out of fuel
- Storage
- Replacement of the fuel filter

Do not loosen the fuel lines at the fuel manifold. The fittings may be damaged and/or a loss of priming pressure may occur when the fuel lines are loosened.

Diesel fuel quality & fuel suffer content must comply with all existing emissions regulation for the area in which the unit operates.

Do not use diesel fuel with suffer content greater than 1% (10,000 ppm).

DRAINING INSTRUCTIONS



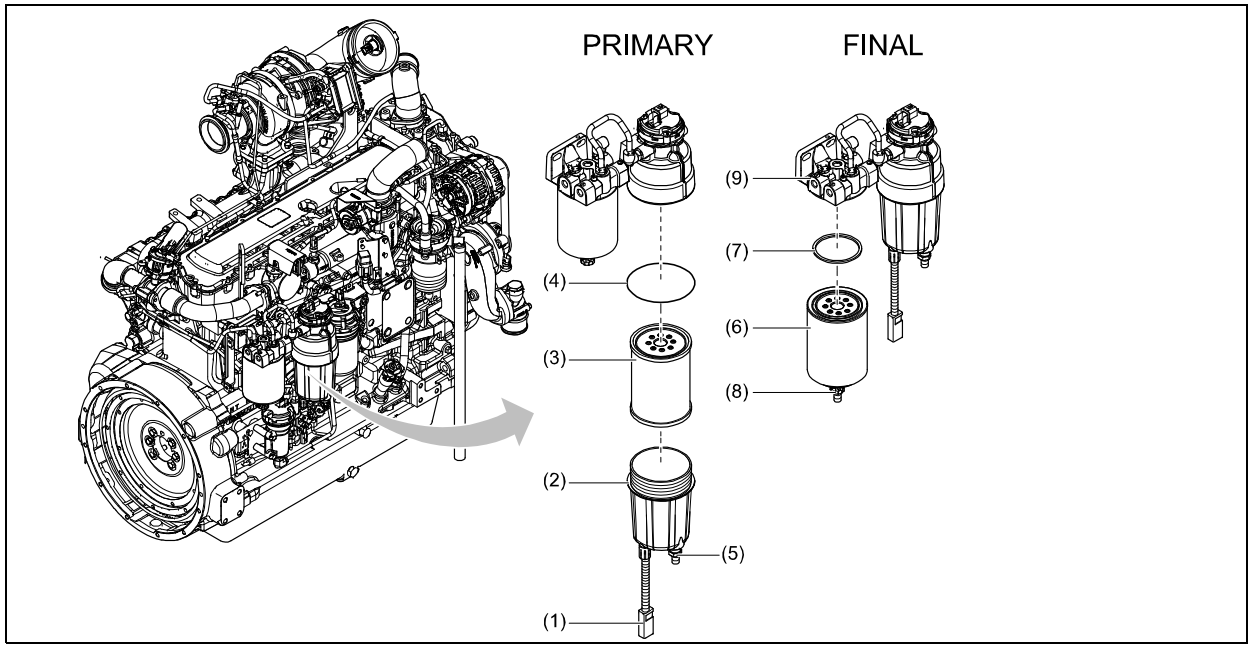
Check the fuel filters (2) and (4) for water or debris. If filter is fitted with a see-through bowl, drain as needed based on a daily visual inspection.

1. Loosen drain plugs (1) at bottom of fuel filters or bowls, if equipped, half turn to one turns.
2. When fuel starts to drain out, tighten drain plugs securely.

After draining water from the fuel filters, the filters must be primed by bleeding all air from the fuel system.

Drain water into a suitable container and dispose of properly.

FUEL FILTER REPLACEMENT



Engines are equipped with dual fuel filters: a primary filter with water bowl, and a final filter. Both filters are replaced at the same 500 hour interval or every 12 months.

☞ **Both the primary and the final fuel filter elements must be replaced at the same time.**

Remove primary fuel filter element

1. Thoroughly clean filter header and surrounding area to prevent dirt and debris from entering fuel system.
2. Connect a hose to filter drain valve (5) on bottom of filter and drain all fuel from filter canister.
3. Disconnect water in fuel sensor connector (1).
4. Remove fuel filter canister (2).
5. Pull filter element (3) down.

Install primary fuel filter element

1. Place new Oring (4) on filter canister.
2. Apply a thin film of fuel on O-ring.
3. Place filter element in canister with tangs on bottom going into canister.
4. Screw canister into filter header then tighten to specification.

Remove final fuel filter element

1. Thoroughly clean filter header and surrounding area to prevent dirt and debris from entering fuel system.
2. Connect a hose to filter drain valve (8) on bottom of filter and drain all fuel from filter element.
3. Loosen and remove fuel filter element (6).

Install final fuel filter element

1. Place new filter packing (7) on filter element.
2. Apply a thin film of fuel on packing.
3. Screw filter element into fuel filter header (9) then tighten to 10 N·m (7.5 lb.ft.).

☞ **To prime the fuel system, before starting engine, turn ignition key to ON for 60 sec.**

☞ **Fill the fuel tank at the end of each working day to reduce condensation & moisture build-up in the fuelsystem.**

☞ **Replace fuel filter elements anytime audible alarm sounds and trouble codes indicate plugged fuel filters (low fuel pressure). If no alarm sounds during the 12 month service interval, replace elements at that time, or after 500 hours operation, whichever comes first.**

⚠ **Do not open higher pressure fuel system .**

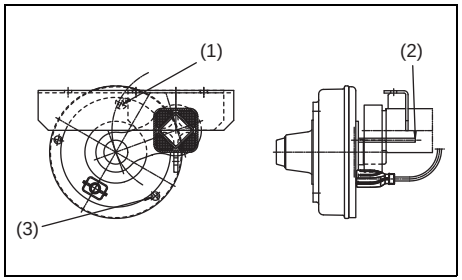
Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting fuel or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

If any fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.

BRAKE ADJUSTMENT

Before jacking up the Generator, connect it to a towing vehicle or attach a weight of minimum 50 kg (110 lb) to the towbar.

BRAKE SHOE ADJUSTMENT



Check the thickness of the brake lining.

- Remove both black plastic plugs (3) one on each wheel.
- Check the thickness of the brake lining.

- After inspection and/or replacement re-insert both plugs (3).

Brake shoe adjustment re-establishes the brake lining-to-drum clearance and compensates for lining wear.

When the brake lining has been worn to a minimum thickness, the brake shoes have to be replaced (Min. thickness brake lining: 1 mm (0.039 in)).

Operating Qc1002™

Starting Qc1002™

To start up the unit locally, proceed as follows:

– Switch on the battery switch.
– Switch off circuit breaker Q1.1. This is not necessary when a plant contactor is installed between Q1.1 and the load.
– Put the starter switch S20 in position I (ON). Voltage is applied to the Qc1002™ module.
– The unit can be started manually by pressing the START button on the Qc1002™ module.
– The unit starts a preheating cycle which takes 12 seconds.
– After the preheating period, the unit will start. The starting attempt will take maximum 12 seconds.
– Switch on circuit breaker Q1.1 in case no contactor is installed.

To start up the unit from a remote location, proceed as follows:

– Put the starter switch S20 in position I (ON). Voltage is applied to the Qc1002™ module.
– The unit can be started from a remote location by pressing the remote mode button  on the Qc1002™ module.
– Switch on circuit breaker Q1.1.
– Put the remote start/stop switch in position start.
– The unit starts a preheating cycle which takes 12 seconds.
– After the preheating period, the unit will start. The starting attempt will take maximum 12 seconds.

During operation Qc1002™

Following points should be carried out regularly:

– Check the engine gauges and the lamps for normal readings.

Avoid to let the engine run out of fuel. If it happened, priming will speed up the starting.

– Check for leakage of oil, fuel or coolant.
– Avoid long low-load periods (< 30%). In this case, an output drop and higher oil consumption of the engine could occur.
– Check, by means of the generator gauges, that the voltage between the phases is identical and that the rated current in the third phase (L3) is not exceeded.
– When single-phase loads are connected to the generator output terminals, keep all loads well-balanced.

If circuit breakers are activated during operation, switch off the load and stop the generator. Check and, if necessary, decrease the load.

The generator's doors may only remain opened for short periods during operation, to carry out checks for example.

Stopping Qc1002™

To stop the unit locally, proceed as follows:

– Switch off the load.
– Switch off circuit breaker Q1.1.
– Let the engine run for about 5 minutes.
– Stop the engine by using the STOP button on the Qc1002™ module.
– Put the starter switch S20 in position O (OFF) to shut down the voltage apply towards the Qc1002™ module.
– Lock the side doors and the door of the indicators and control panel to avoid unauthorized access.

To stop the unit when the starter switch is in position  , proceed as follows:

– Switch off the load.
– Stop the engine by putting the remote start/stop switch in position stop or by using the STOP button on the Qc1002™ module. When the unit is stopped with the STOP button in Remote Mode, it will automatically go to Manual Mode.
– Put the starter switch S20 in position O (OFF) to shut down the voltage apply towards the Qc1002™ module.
– Lock the side doors and the door of the indicators and control panel to avoid unauthorized access.

Maintenance

Maintenance schedule

Before carrying out any maintenance activity, check that the start switch is in position O and that no electrical power is present on the terminals.

Maintenance schedule	Daily	Every 500 hours or yearly
Service pak	-	~~*1310 3130 83*~~
For the most important subassemblies, Atlas Copco has developed service kits that combine all wear parts. These service kits offer you the benefits of genuine parts, save on administration costs and are offered at reduced price, compared to the loose components. Refer to the parts list for more information on the contents of the service kits.		
Check air/fuel/coolant & oil leakage	x	x
Check oil and coolant level	x	x
Check coolers	x	x
Clean coolers externally	x	x
Check condition of cooling fan assembly	x	x
Drain water in fuel filter	x	x
Clean air cleaner and dust bowl	x	x
Check electrolyte level and terminals of battery		x
Check oil and coolant level		x
Check tension and condition of the drive belt		x
Check conditions of the engine drive belts (1)		x
Grease door hinges and locks		x
Replace engine oil (2)		x
Replace engine oil filters		x
Replace engine oil filter (bypass)		x
Replace engine fuel filter element		x
Replace engine fuel prefilter element		x
Replace fuel prefilter element (3)		x
Replace fueltank filter (3)		x
Change air filter element		x
Replace safety cartridge		x
Check alternator and starter motor		x
Check electrical system: security of cables and wear		x
Grease mechanical links		x
Check condition of vibration dampers		x

Measure alternator insulation resistance		x
Check glycol level in coolant (4)		x
Check PH level of engine coolant (4)		x
Clean turbocharger impeller casing and turbocharger generator casing		
Check valve clearance (5)		
Inspection by Atlas Copco Service technician		

Notes:

In highly dusty environments, these service intervals do not apply. Check and/or replace filters and clean radiator on a regular basis.

Engine maintenance

Refer to the engine's operator manual for full maintenance schedule.

(*) Measuring the alternator insulation resistance

A 500 V megger is required to measure the alternator insulation resistance.

If the N-terminal is connected to the earthing system, it must be disconnected from the earth terminal. Disconnect the AVR.

Connect the megger between the earth terminal and terminal L1 and generate a voltage of 500 V. The scale must indicate a resistance of at least 2 MΩ.

Refer to the alternator operating and maintenance instructions for more details.

Engine fuel specifications

For fuel specifications, please contact your Atlas Copco Customer Center.

Engine oil specifications

It is strongly recommended to use Atlas Copco branded lubrication oils for engine .

High-quality, mineral, hydraulic or synthesized hydrocarbon oil with rust and oxidation inhibitors, anti-foam and anti-wear properties is recommended.
The viscosity grade should correspond to the ambient temperature and ISO 3448, as follows.

Never mix synthetic with mineral oil.
Remark:
When changing from mineral to synthetic oil (or the other way around), you will need to do an extra rinse.
After doing the complete change procedure to synthetic oil, run the unit for a few minutes to allow good and complete circulation of the synthetic oil. Then drain the synthetic oil again and fill again with new synthetic oil. To set correct oil levels, proceed as in normal instruction.

ENGINE OIL

PAROIL from Atlas Copco is the ONLY oil tested and approved for use in all engines built into Atlas Copco generators.

Extensive laboratory and field endurance tests on Atlas Copco equipment have proven PAROIL to match all lubrication demands in varied conditions. It meets stringent quality control specifications to ensure your equipment will run smoothly and reliably.

The quality lubricant additives in PAROIL allow for extended oil change intervals without any loss in performance or longevity.

PAROIL provides wear protection under extreme conditions. Powerful oxidation resistance, high chemical stability and rust- inhibiting additives help reduce corrosion, even within engines left idle for extended periods.

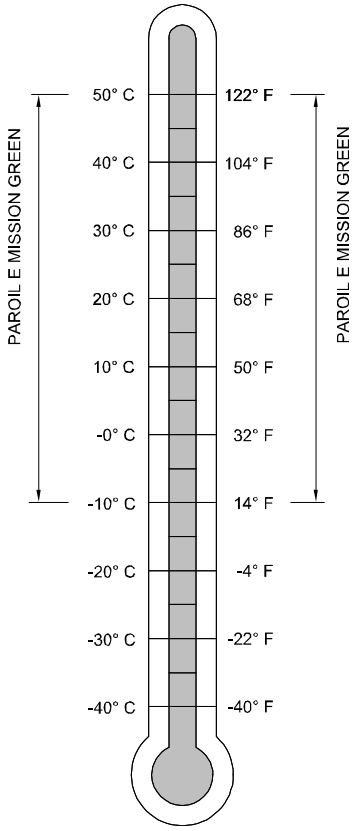
PAROIL contains high quality anti-oxidants to control deposits, sludge and contaminants that tend to build up under very high temperatures. PAROIL's detergent additives keep sludge forming particles in a fine suspension instead of allowing them to clog your filter and accumulate in the valve/rocker cover area.

PAROIL releases excess heat efficiently, whilst maintaining excellent bore-polish protection to limit oil consumption.

PAROIL has an excellent Total Base Number (TBN) retention and more alkalinity to control acid formation.

PAROIL prevents soot build-up.

PAROIL E mission Green is optimized for the latest low emission EURO -3 & -2, EPA TIER II & TIER III & IT4 engines running on low sulphur diesel for lower oil and fuel consumption.



Mineral engine oil PAROIL E mission Green Low SAPS Engine oil.

	Liter	US gal	Order number
can	5	1.3	1630 0471 00
can	20	5.3	1630 0472 00
barrel	210	55.2	1630 0473 00

Type of lubricant	Engine
between -10°C (14°F) and 50°C (122°F)	PAROIL E mission Green

Engine oil level check

Consult the Engine Operation Manual for the oil specifications, viscosity recommendations and oil change intervals.

For intervals, see section “Maintenance schedule” on page 33.

Check engine oil level according to the instructions in the Engine Operation Manual and if necessary top up with oil.

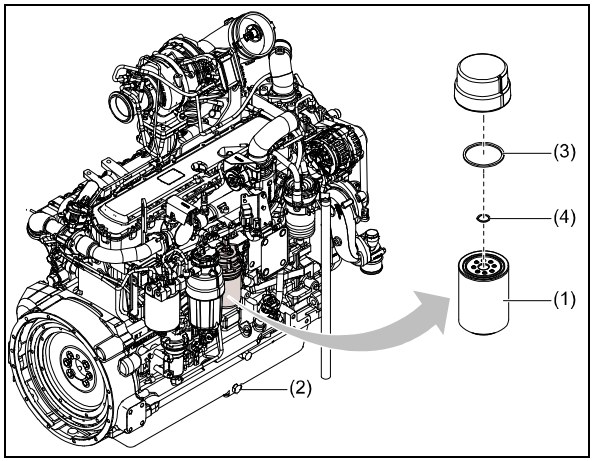
Engine oil and oil filter change

The table below shows the oil change interval according to the sulfur content in the fuel.

Sulfur content in fuel, by weight		
<0.5%	*0.5-1.0%*	*>1.0%*
Oil change interval, reached first in operation		
500h / 12 months	*250h / 12 months*	*125h / 12 months*

Oil and oil filter change

ENGINE OIL AND OIL FILTER CHANGE



1. Run engine approximately 5 minutes to warm up oil. Shut engine off.
2. Remove oil pan drain plug (2).
3. Drain crankcase oil from engine while warm.
4. Turn filter element (1) using a suitable filter wrench to remove. Discard oil filter element.
5. Apply clean engine oil to the new filter at the inner (4) and outer (3) seals and to filter threads.
6. Wipe both sealing surfaces of the header with a clean rag. Ensure notches in dust seal are properly installed in the slots in the housing. Replace dust seal if damaged.
2. Install and tighten oil filter by hand until firmly against dust seal . DO NOT apply an extra 3/4 to 11/ 4 turn after gasket contact as done with standard filters.
3. Tighten drain plug to specifications.

Engine coolant specifications

Never remove the cooling system filler cap while coolant is hot.
The system may be under pressure. Remove the cap slowly and only when coolant is at ambient temperature. A sudden release of pressure from a heated cooling system can result in personal injury from the splash of hot coolant.
It is strongly recommended to use Atlas Copco branded coolant.

The use of the correct coolant is important for good heat transfer and protection of liquid-cooled engines. Coolants used in these engines must be mixtures of good quality water (distilled or de-ionised), special coolant additives and if necessary freeze protection. Coolant that is not to manufacturer's specification will result in mechanical damage of the engine.

The freezing point of the coolant must be lower than the freezing point that can occur in the area. The difference must be at least 5°C. If the coolant freezes, it may crack the cylinder block, radiator or coolant pump.

Consult the engine's operation manual and follow the manufacturer's directions.

Never mix different coolants and mix the coolant components outside the cooling system.

Never replace the coolant filter on the engine! Just replace the coolant every 5 years or after 10.000 running hours.

Specifications PARCOOL EG

PARCOOL EG is the only coolant that has been tested and approved by all engine manufacturers currently in use in Atlas Copco generators.

Atlas Copco's PARCOOL EG extended life coolant is the new range of organic coolants purpose designed to meet the needs of modern engines. PARCOOL EG can help prevent leaks caused by corrosion. PARCOOL EG is also

fully compatible with all sealants and gasket types developed to join different materials used within an engine.

PARCOOL EG is a ready to use Ethylene Glycol based coolant, premixed in an optimum 50/50 dilution ratio, for antifreeze protection guaranteed to -40°C.

Because PARCOOL EG inhibits corrosion, deposit formation is minimized. This effectively eliminates the problem of restricted flow through the engine coolant ducts and the radiator, minimizing the risk for engine overheating and possible failure.

It reduces water pump seal wear and has excellent stability when subjected to sustained high operating temperatures.

PARCOOL EG is free of nitride and amines to protect your health and the environment. Longer service life reduces the amount of coolant produced and needing disposal to minimise environmental impact.

	Liter	US gal	Imp gal	cu.ft	Order number
can	*5*	*1.3*	*1.1*	*0.175*	*1604 5308 00*
can	*20*	*5.3*	*4.4*	*0.7*	*1604 5307 01*
barrel	*210*	*55.2*	*46*	*7.35*	*1604 5306 00*

To ensure protection against corrosion, cavitation and formation of deposits, the concentration of the additives in the coolant must be kept between certain limits, as stated by the manufacturer's guidelines. Topping up the coolant with water only, changes the concentration and is therefore not allowed.

Liquid-cooled engines are factory-filled with this type of coolant mixture.

Coolant check

Monitoring coolant condition

In order to guarantee the lifetime and quality of the product, thus to optimise engine protection, regular coolant-condition-analysis is advisable.

The quality of the product can be determined by three parameters.

Visual check

– Verify the outlook of the coolant regarding colour and make sure that no loose particles are floating around.

Long service intervals
5-year drain interval to minimize service costs (when used in accordance with the instructions).

pH measurement

– Check the pH value of the coolant using a pH-measuring device.
– The pH-meter can be ordered from Atlas Copco with part number 2913 0029 00.
– Typical value for EG = 8.6.
– If the pH-level is below 7 or above 9.5, the coolant should be replaced.

Glycol concentration measurement

– To optimise the unique engine protection features of the PARCOOL EG the concentration of the Glycol in the water should be always above 33 vol.%.
– Mixtures with more than 68 vol.% mix ratio in water are not recommended, as this will lead to high engine operating temperatures.
– A refractometer can be ordered from Atlas Copco with part number 2913 0028 00.

In case of a mix of different coolant products this type of measurement might provide incorrect values.

Topping up of coolant

– Verify if the engine cooling system is in a good condition (no leaks, clean,...).
– Check the condition of the coolant.
– If the condition of the coolant is outside the limits, the complete coolant should be replaced (see section “Replacing the coolant”).
– Always top-up with PARCOOL EG.
– Topping up the coolant with water only, changes the concentration of additives and is therefore not allowed.

Replacing the coolant

Drain

– Completely drain the entire cooling system.
– Used coolant must be disposed or recycled in accordance with laws and local regulations.

Flush

– Flush twice with clean water. Used coolant must be disposed or recycled in accordance with laws and local regulations.
– From the Atlas Copco Instruction book, determine the amount of PARCOOL EG required and pour into the radiator top tank.
– It should be clearly understood that the risk for contamination is reduced in case of proper cleaning.
– In case a certain content of ‘other’ coolant remains in the system, the coolant with the lowest properties influences the quality of the ‘mixed’ coolant.

Fill

– To assure proper operation and the release of trapped air, run the engine until normal engine operation temperature is reached. Turn off the engine and allow to cool.
– Recheck coolant level and add if necessary.

AIR FILTER ENGINE

The Atlas Copco air filters are specially designed for the application.

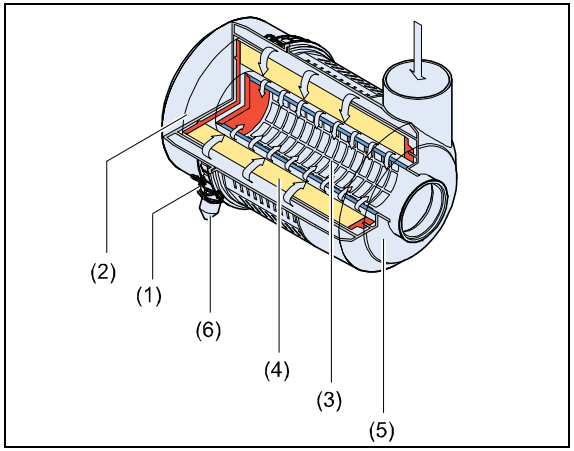
Never run the Engine without air filter element.

SERVICING

Always select the service point according to the vacuum indicator or display message. A regular inspection or cleaning as it is sometimes practiced in the field is more likely to be damaging than useful as there is a risk that the element will be damaged and dust will gain access to the engine.

Atlas Copco always recommends exchanging rather than cleaning the filter element in order to avoid damage and ensure maximum engine protection.

MAIN PARTS



1. Snap clips
2. Dust trap cover
3. Safety cartridge (option)
4. Filter element
5. Filter housing
6. Vacuator valve

CLEANING THE DUST TRAP

Remove dust daily.

To remove dust from the dust trap pinch the vacuator valve (6) several times.

CLEANING INSTRUCTIONS FILTER ELEMENT

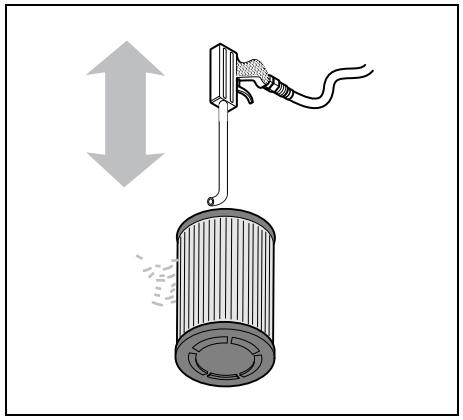
If element cleaning can not be avoided, care should be taken that the filter element (4) is not washed out. Please note that engine damage can cause considerable costs, which makes the cost of a new filter element seem insignificant.

Safety cartridges (3) can not be cleaned but must be exchanged.

Please note that a cleaned element will never match the service life and performance of a new element.

Take the element from the air filter housing (5) (see section Replacing the air filter element).

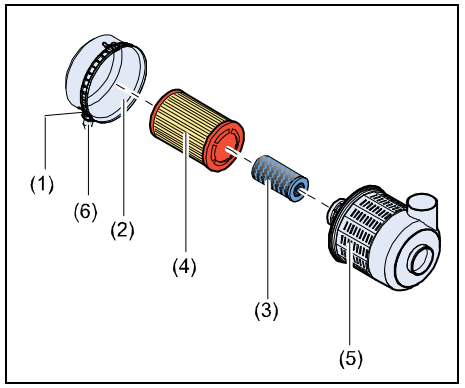
In order to clean, position a pipe with an end bent by approx. 90° on the end of a compressed-air pistol. The pipe must be long enough to reach the bottom of the filter element. Carefully blow out the filter element with dry compressed air (max. 5 bar (72.5 psi)) from the inside to the outside until there is no more development of dust. The end of the pipe must not touch the element.



Next carefully examine the element for possible damage. Never beat or knock the element as this will damage it and there will be a danger of damage to the engine.

Carefully clean the inside of the housing and put the element in the housing (see section Replacing the air filter element).

REPLACING THE AIR FILTER ELEMENT



New elements must also be inspected for tears or punctures before installation.

Discard the element (4) when damaged.

A dirty safety cartridge (3) is an indication of a malfunctioning air filter element. Replace the element and the safety cartridge in this case.

The safety cartridge cannot be cleaned.

1. Release the snap clips (1) and remove the dust trap (2). Clean the trap.
2. Remove the element (4) and the safety cartridge.
3. Reassemble in reverse order of dismantling. Make sure the vacuator valve (6) points down.
4. Inspect and tighten all air intake connections.

Storage of the generator

Storage

– Store the generator in a dry, frost-free room which is well ventilated.

– Run the engine regularly, e.g. once a week, until it is warmed up. If this is impossible, extra precautions must be taken:

  • Consult the engine's operator manual.

  • Remove the battery. Store it in a dry, frost-free room. Keep the battery clean and its terminals lightly covered with petroleum jelly. Recharge the battery regularly.

  • Clean the generator and protect all electrical components against moisture.

  • Place silica gel bags, VCI paper (Volatile Corrosion Inhibitor) or another drying agent inside the generator and close the doors.

  • Stick sheets of VCI paper with adhesive tape on the bodywork to close off all openings.

  • Wrap the generator, except the bottom, with a plastic bag.

Preparing for operation after storage

Before operating the generator again, remove the wrapping, VCI paper and silica gel bags and check the generator thoroughly (go through the checklist "Before starting" on page 27).

– Consult the engine's operator manual.

– Check that the insulation resistance of the generator exceeds 2 MΩ.

– Replace the fuel filter and fill the fuel tank. Vent the fuel system.

– Reinstall and connect the battery, if necessary after being recharged.

– Submit the generator to a test run.

Checks and trouble shooting

Never perform a test run with connected power cables. Never touch an electrical connector without a voltage check.
When a failure occurs, always report what you experienced before, during and after the failure. Information with regard to the load (type, size, power factor, etc.), vibrations, exhaust gas colour, insulation check, odours, output voltage, leaks and damaged parts, ambient temperature, daily and normal maintenance and altitude might be helpful to quickly locate the problem. Also report any information regarding the humidity and location of the generator (e.g. close to sea).

Checking voltmeter P4

- Put a voltmeter in parallel with voltmeter P4 on the control panel.
- Check that the read-out of both voltmeters is the same.
- Stop the generator and disconnect one terminal.
- Check that the internal resistance of the voltmeter is high.

Checking ammeters P1, P2 and P3

- Measure the outgoing current during the load, by means of a clamp-on probe.
- Compare the measured current with the current indicated on ammeter. Both readings should be the same.

Engine troubleshooting

- Refer to the engine's operator manual for the engine troubleshooting. An extensive Engine troubleshooting manual is available at John Deere Penta. For more information contact John Deere Penta.

Alternator troubleshooting

Symptom	*Possible cause*	*Corrective action*
Alternator gives 0 Volt	Blown fuse.	Replace fuse.
	No residual voltage.	Excite the alternator by applying a 12V battery voltage with a 30 Ω resistor in series on the + and - terminals of the electronic regulator, respecting the polarities.
After being excited the alternator still gives 0 Volt.	Connections are interrupted.	Check connection cables, measure winding resistances and compare with values mentioned in the alternator manual.
Low voltage at no load	Voltage potentiometer out of setting.	Reset voltage.
	Intervention of protection.	Check frequency/voltage regulator.
	Winding failure.	Check windings.
High voltage at no load	Voltage potentiometer out of setting.	Reset voltage.
	Failed regulator.	Substitute regulator.
Lower than rated voltage at load	Voltage potentiometer out of setting.	Reset voltage potentiometer.
	Intervention by protection.	Current too high, power factor lower than 0.8; speed lower than 10% of rated speed.
	Failed regulator.	Substitute regulator.
	Rotating bridge failure.	Check diodes, disconnect cables.
Higher than rated voltage at load	Voltage potentiometer out of setting.	Reset voltage potentiometer.
	Failed regulator.	Substitute regulator.
Unstable voltage	Speed variation in engine.	Check regularity of rotation.
	Regulator out of setting.	Regulate stability of regulator by acting on STABILITY potentiometer.

Options available for QAS 150 T4A John Deere units

Circuit diagrams

The engine control circuit diagrams and the power circuit diagrams for the standard QAS 150 T4A John Deere units, for the units with options and for the units with combined options are:

Power circuit

Unit	*Circuit*
QAS 150 JD T4A	1310 3200 29

Controller circuit

Unit	*Circuit*
QAS 150 JD T4A	1310 3200 00

Overview of the electrical options

The following electrical options are available:

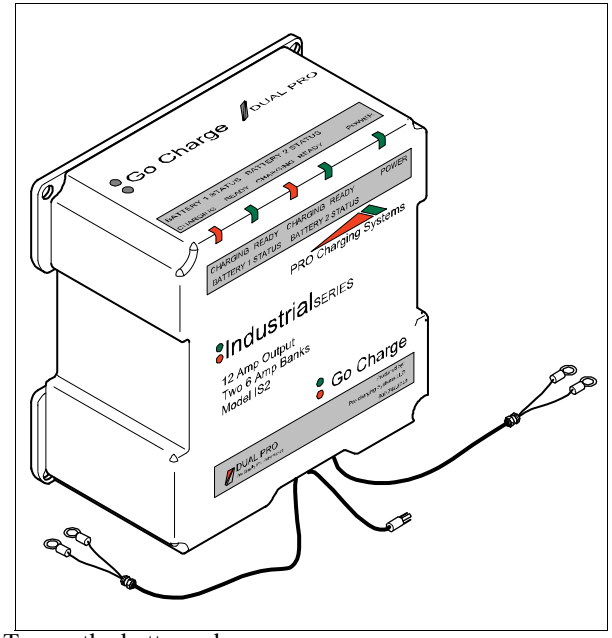
– Automatic battery charger

–

Description of the electrical options

Automatic battery charger

The automatic battery charger charges the battery when external power is provided via the X7 connection. When the battery is fully charged the charger automatically changes to maintenance mode and provides a trickle charge to maintain the battery level. The charger has LED's on the front panel to identify when power is applied to the charger and when the batteries are being charged.



To use the battery charger:

– Provide external power (120V) to the X7 connector, located on the side of the power cubicle.

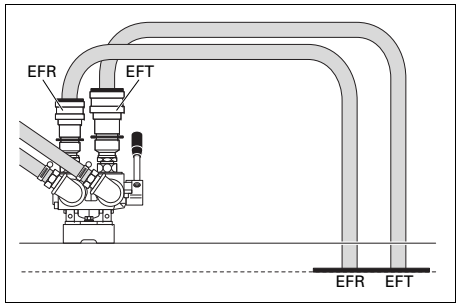
Battery switch

The battery switch is situated inside the sound-insulated bodywork. It allows to open or to close the electrical connection between the battery and the engine circuits.

Never turn the battery switch to OFF during operation.

EFT - Quick Coupling

The option Quick couplings allows to bypass the internal fueltank and to connect an external fueltank to the unit.



EFT	External fuel tank connection
EFR	External fuel tank return connection

Make sure that:

– the big size coupling is used for the inlet.

– the small size coupling is used for the outlet.

An extra clamp needs to be used to guide the fuellines.

Engine coolant heater

To make sure that the engine can start and accept load immediately, an engine block heater (immersion style) is provided - 120V 1500W.

Technical specifications

Technical specifications for QAS 150 JD T4i

Readings on gauges

Gauge	*Reading*	*Unit*
Ammeter L1-L3 (P1-P3)	Below max. rating	A
Voltmeter (P4)	Below max. rating	V

Settings of switches

Switch	*Function*	*Activates at*
Engine oil pressure	Shut down	0.5 bar
Engine coolant temperature	Shut down	103°C

Specifications of the engine/alternator/unit

		US	*Metric*
Reference conditions 1) 4)	Rated frequency	60 Hz	60 Hz
	Rated speed	1800 rpm	1800 rpm
	Generator service duty	PRP	PRP
	Absolute air inlet pressure	100 kPa	100 kPa
	Relative air humidity	30%	30%
	Air inlet temperature	77°F	25°C
Limitations 2)	Maximum ambient temperature	122°F	50°C
	Altitude capability	13,123 ft	4000 m
	Maximum relative air humidity	85%	85%
	Minimum starting temperature unaided	0°F	-18°C
	Minimum starting temperature with coolant heater	-4°F	-25°C
Performance data 2) 3) 4) 5)	Rated active power (PRP) 3ph 480V	161 hp	120 kW
	Rated active power (PRP) 3ph 240V	161 hp	120 kW
	Rated active power (PRP) 3ph 208V	154.2 hp	115 kW
	Rated active power (PRP) 1ph	111.3 hp	83 kW
	Rated power factor (lagging) 3ph	0.8 cos ϕ	0.8 cos ϕ
	Rated power factor (lagging) 1ph	1.0 cos ϕ	1.0 cos ϕ
	Rated apparent power (PRP) 3ph 480V	150 kVA	150 kVA
	Rated apparent power (PRP) 3ph 240V	150 kVA	150 kVA
	Rated apparent power (PRP) 3ph 208V	144 kVA	144 kVA
	Rated apparent power (PRP) 1ph	83 kVA	83 kVA
	Rated voltage 3ph line to line	480 V	480 V
	Rated voltage 3ph line to line	240 V	240 V

Technical specifications for QAS 150 JD T4i

		US	Metric
	Rated voltage 3ph line to line lower voltage	208 V	208 V
	Rated voltage 1ph	240 V	240 V
	Rated current 3 ph 480V	180 A	180 A
	Rated current 3 ph 240V	361 A	361 A
	Rated current 3 ph 208V	400 A	400 A
	Rated current 1 ph	400 A	400 A
	Performance class (acc.ISO 8528-5:1993)	G2	G2
	Single step load acceptance (0-PRP)	87%	87%
		140 hp	104.4 kW
	Frequency droop	isochronous	isochronous
	Fuel consumption at 0% load	3.70 lb/h	1.68 gph
	Fuel consumption at 50% load	10.36 lb/h	4.70 gph
	Fuel consumption at 75% load	14.4 lb/h	6.53 gph
	Fuel consumption at full load (100%)	18.87 lb/h	8.56 gph
	Specific fuel consumption at full load (100%)	0.50 lb/kWh	0.229 kg/kWh
	Fuel autonomy at full load	25.6 h	25.6 h
	Max. oil consumption at full load	-	-
	Maximum sound power level (LPA) measured according to Atlas Copco spec. 9822087700	71 dB(A)	71 dB(A)
	Useful capacity of fuel tank	219 gal	830 l
	Single step load capability (O-PRP)	100%	100%
		161 hp	120 kW
Application data	Mode of operation	PRP	PRP
	Site	land use	land use
	Operation	single	single
	Start-up and control mode	manual/automatic	manual/automatic
	Start-up time	unspecified	unspecified
	Mobility/Config. acc. to ISO 8528-1:1993	transportable/D	transportable/D
		mobile/E	mobile/E
	Mounting	fully resilient	fully resilient
	Climatic exposure	open air	open air
	Degree of protection (Cubicle)	IP 54	IP 54
	Status of neutral	earthed	earthed
Alternator	Standard	IEC 60034	IEC 60034
		ISO 8528	ISO 8528
	Make	LEROY SOMER	LEROY SOMER
	Model	LSA 44.2 S7	LSA 44.2 S7
	Rated output, class H temperature rise	155 kVA	155 kVA
	rating type acc. ISO 8528-3	“BR” 125/40°C	“BR” 125/40°C

Technical specifications for QAS 150 JD T4i

		US	*Metric*
	Degree of protection	IP 23	IP 23
	Insulation - stator	H class	H class
	-rotor	H class	H class
	Number of wires	12	12
	Excitation	AREP	AREP
Engine	Standard	ISO 3046	ISO 3046
		ISO 8528-2	ISO 8528-2
	Make	John Deere	John Deere
	Model	6068HFG94	6068HFG94
	Rated net output	201.15 hp	150 kW
	rating type acc. ISO 3046-7	ICXN	ICXN
	Coolant	water	water
	Combustion system	direct injection	direct injection
	Aspiration	turbocharged	turbocharged
		intercooled	intercooled
	Number of cylinders	6	6
	Swept volume	1.80 US gal	6.80 l
	Speed governing	electronic	electronic
		HPCR	HPCR
	Capacity of oil sump	7.13 US gal	27 l
	Capacity of cooling system	8.71 US gal	33 l
	Electrical system	12 Vdc	12 Vdc
	Emission compliance	USA TIER 4A	USA TIER 4A
Power circuit	Circuit-breaker, 3ph.		
	Number of poles	3	3
	Thermal release It (thermal release is higher at 25°C)	400 A	400 A
	Magnetic release Im	3,5 x In	3,5 x In
	Circuit-breaker, 3ph., lower voltage (optional)		
	Number of poles	3	3
	Thermal release It (thermal release is higher at 25°C)	633 A	633 A
	Magnetic release Im	3,5 x In	3,5 x In
	Outlet sockets (optional)	GFCL duplex (2x)	GFCL duplex (2x)
		2p+E	2p+E
		20A 125V	20A 125V
		Temp Power (2x)	Temp Power (2x)
		2p+N+E	2p+N+E
		50A 125/250V	50A 125/250V

Technical specifications for QAS 150 JD T4i

		US	*Metric*
Unit	Dimensions (L x W x H)	131.74 x 46.02 x 83.07 in	3378 x 1180 x 77.38 mm
	Weight net mass	5541.17 lb	2513 kg
	Weight wet mass	7239.02 lb	3283 kg

Notes

1) Reference conditions for engine performance to ISO 3046-1.

2) See derating diagram or consult the factory for other conditions.

3) At reference conditions unless otherwise stated.

4) Rating definition (ISO 8528-1):
LTP: Limited Time Power is the maximum electrical power which a generating set is capable of delivering (at variable load), in the event of a utility power failure (for up to 500 hours per year of which a maximum of 300 hours is continuous running). No overload is permitted on these ratings. The alternator is peak continuous rated (as defined in ISO 8528-3) at 25°C.
PRP: Prime Power is the maximum power available during a variable power sequence, which may be run for an unlimited number of hours per year, between stated maintenance intervals and under the stated ambient conditions. A 10% overload is permitted for 1 hour in 12 hours. The permissible average power output during a 24h period shall not exceed the stated load factor of 70%.

5) Specific mass fuel used: 0.86 kg/l.

6) Unless stated otherwise, data are given for 3ph 480 V
(a) optional equipment
(b) thermal release is higher at 25°C

Derating table (in %, 100% is declarated power at "Performance data")

Height (m)	Temperature (°C)										
	0	5	10	15	20	25	30	35	40	45	50
0	100	100	100	100	100	100	100	100	100	95	90
500	100	100	100	100	100	100	100	100	100	95	90
1000	100	100	100	100	100	100	100	100	100	95	90
1500	100	100	100	100	100	100	100	100	95	95	85
2000	95	95	95	95	95	95	95	95	95	90	85
2500	90	90	90	90	90	90	90	90	90	85	80
3000	90	90	90	90	90	90	90	90	90	85	80
3500	85	85	85	85	85	85	85	85	85	75	75
4000	85	85	85	85	85	85	85	85	85	75	75

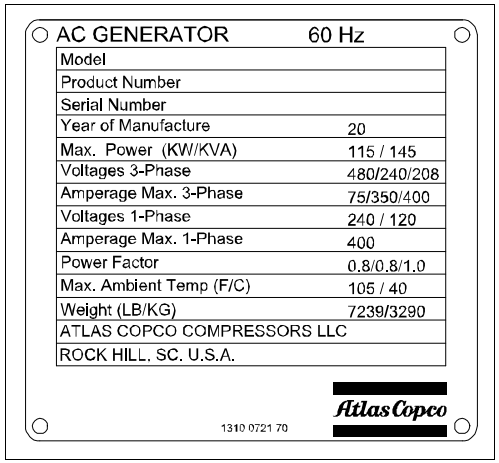
For use of generator outside these conditions, please contact Atlas Copco.

Conversion list of SI units into British units

1 bar	=	14.504 psi
1 g	=	0.035 oz
1 kg	=	2.205 lbs
1 km/h	=	0.621 mile/h
1 kW	=	1.341 hp (UK and US)
1 l	=	0.264 US gal
1 l	=	0.220 lmp gal (UK)
1 l	=	0.035 cu.ft
1 m	=	3.281 ft
1 mm	=	0.039 in
1 m^3/min	=	35.315 cfm
1 mbar	=	0.401 in wc
1 N	=	0.225 lbf
1 Nm	=	0.738 lbf.ft
$t_{°F}$	=	$32 + (1.8 \times t_{°C})$
$t_{°C}$	=	$(t_{°F} - 32)/1.8$

A temperature difference of 1°C = a temperature difference of 1.8°F.

Dataplate


AC GENERATOR 60 Hz
Model
Product Number
Serial Number
Year of Manufacture 20
Max. Power (KW/KVA) 115 / 145
Voltages 3-Phase 480/240/208
Amperage Max. 3-Phase 75/350/400
Voltages 1-Phase 240 / 120
Amperage Max. 1-Phase 400
Power Factor 0.8/0.8/1.0
Max. Ambient Temp (F/C) 105 / 40
Weight (LB/KG) 7239/3290
ATLAS COPCO COMPRESSORS LLC
ROCK HILL, SC. U.S.A.
1310 0721 70
Atlas Copco

Disposal

General

When developing products and services, Atlas Copco tries to understand, address, and minimize the negative environmental effects that the products and services may have, when being manufactured, distributed, and used, as well as at their disposal.

Recycling and disposal policy are part of the development of all Atlas Copco products. Atlas Copco company standards determine strict requirements.

Selecting materials the substantial recyclability, the disassembly possibilities and the separability of materials and assemblies are considered as well as the environmental perils and dangers to health during the recycling and disposal of the unavoidable rates of not recyclable materials.

Your Atlas Copco generator consists for the most part of metallic materials, that can be remelted in steelworks and smelting works and that is therefore almost infinite recyclable. The plastic used is labelled; sorting and fractioning of the materials for recycling in the future is forseen.

This concept can only succeed with your help. Support us by disposing professionally. By assuring a correct disposal of the product you help to prevent possible negative consequences for environment and health, that can occur with an inappropriate waste handling.
Recycling and re-usage of material helps to preserve natural resources.

Disposal of materials

Dispose contaminated substances and material separately, according to local applicable environmental legislations.

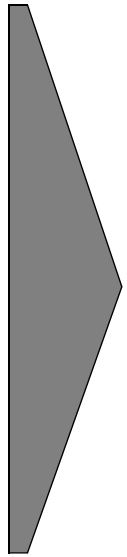
Before dismantling a machine at the end of its operating lifetime drain all fluids and dispose of according the applicable local disposal regulations.

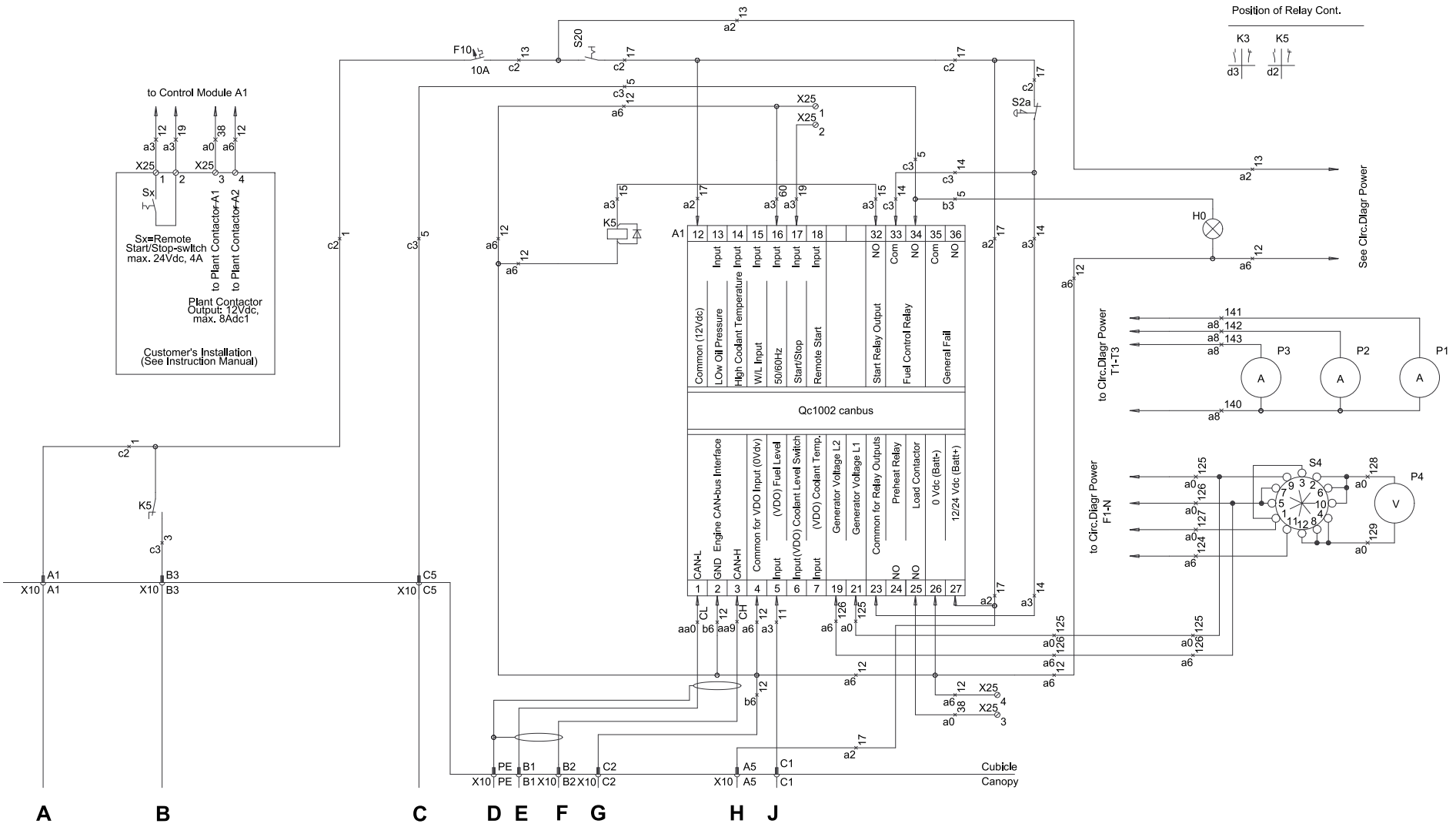
Remove the batteries. Do not throw batteries into the fire (explosion risk) or into the residual waste. Separate the machine into metal, electronics, wiring, hoses, insulation and plastic parts.

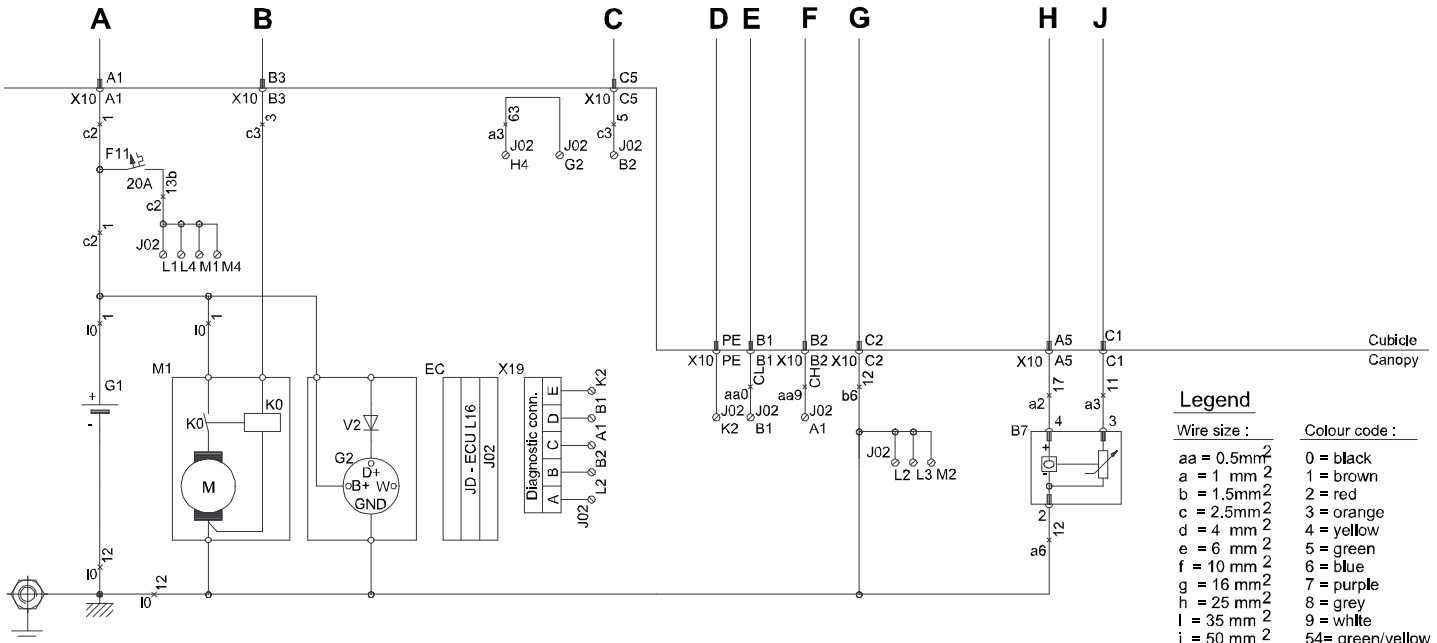
Dispose all components according to the applicable disposal regulations.

Remove spilled fluid mechanically; pick up the rest with absorbing agent (for example sand, sawdust) and dispose it according the applicable local disposal regulations. Do not drain into the sewage system or surface water.

Circuit diagrams



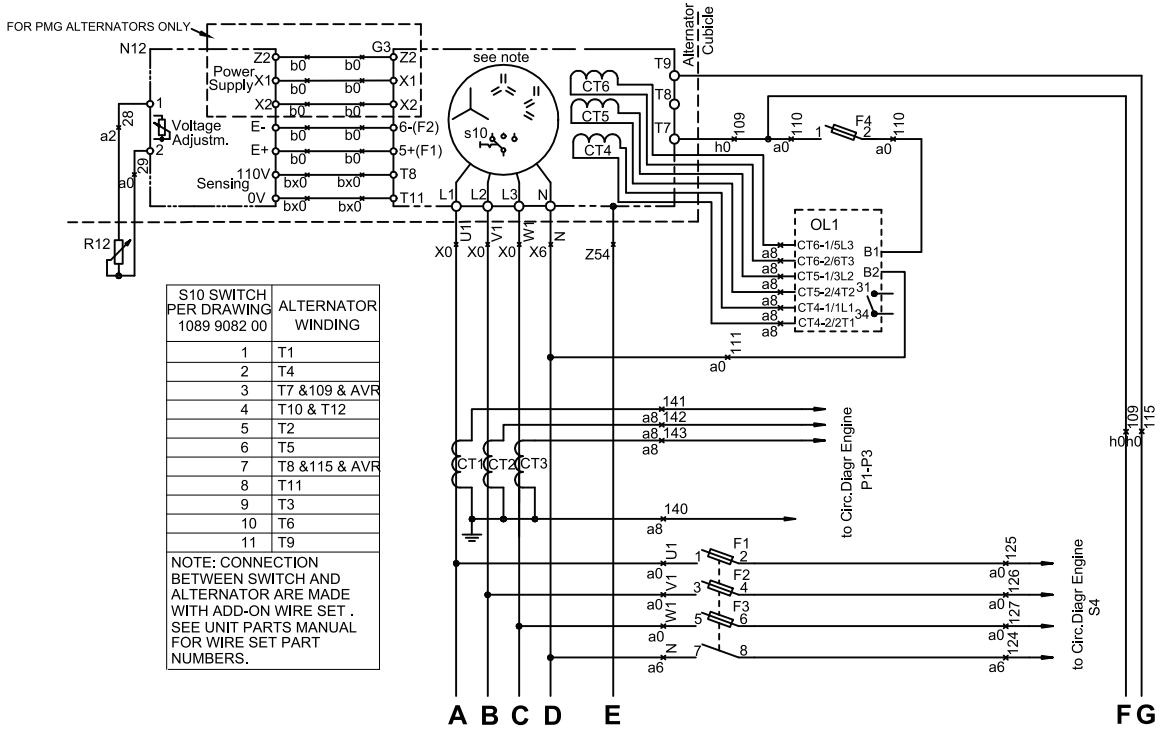

Position of Relay Cont.
K3
K5
d3
d2
to Control Module A1
X25
Sx
Sx=Remote Start/Stop-switch max. 24Vdc, 4A
to Plant Contactor A1
to Plant Contactor A2
Plant Contactor Output: 12Vdc, max. 8Adc1
Customer's Installation (See Instruction Manual)
F10
10A
S20
S2a
K5
H0
See Circ.Diagr Power
A1
Common (12Vdc)
LOw Oil Pressure
High Coolant Temperature
W/L Input
50/60Hz
Start/Stop
Remote Start
Start Relay Output
Fuel Control Relay
General Fail
Qc1002 canbus
CAN-L
GND
Engine CAN-bus Interface
CAN-H
Common for VDO Input (0Vdv)
(VDO) Fuel Level
Input
Input(VDO) Coolant Level Switch
(VDO) Coolant Temp.
Input
Generator Voltage L2
Generator Voltage L1
Common for Relay Outputs
Preheat Relay
Load Contactor
0 Vdc (Batt-)
12/24 Vdc (Batt+)
to Circ.Diagr Power T1-T3
to Circ.Diagr Power F1-N
P1
P2
P3
P4
S4
A
V
X10 A1
X10 B3
X10 C5
X10 PE
B1
B2
C2
A5
C1
Cubicle Canopy
A
B
C
D
E
F
G
H
J



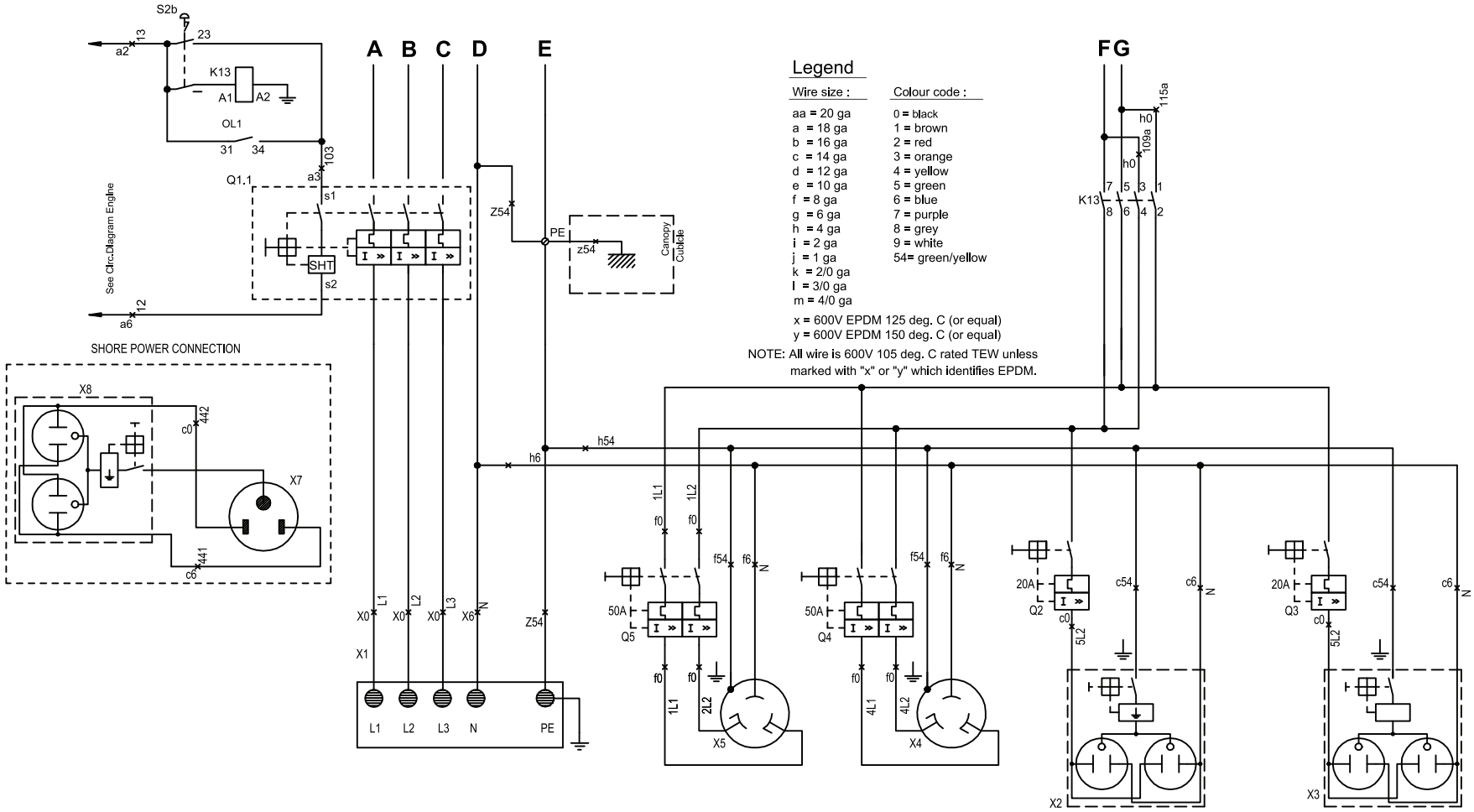
Legend

Wire size :	Colour code :
aa = 0.5mm^2	0 = black
a = 1 mm^2	1 = brown
b = 1.5mm^2	2 = red
c = 2.5mm^2	3 = orange
d = 4 mm^2	4 = yellow
e = 6 mm^2	5 = green
f = 10 mm^2	6 = blue
g = 16 mm^2	7 = purple
h = 25 mm^2	8 = grey
l = 35 mm^2	9 = white
j = 50 mm^2	54= green/yellow
k = 70 mm^2	
l = 95 mm^2	

Mark	Grid	Name
A1	b5	Control Module (Configure in UNIT-type 6)
B7	f6	Fuel Level Sensor
EC	f3	Engine controller
F10	a4	Fuse
F11	e1	Fuse
G1	f1	Battery 12V
H0	b9	Panel Light
J02	e1-f5	Engine connector
K5	b5	Starter Relay
M1	f2	Starter Motor
P1-3	c9-10	A-Meters
P4	d10	V-meter
S2a	a8	Emergency Stop Button (S2b: see Power Circuit)
S4	d10	Voltmeter change-over switch
S6	f7	Coolant Level Switch
S7	f6	Low Fuel Level Switch
S7	f6	Low Fuel Level Switch, Warning
S20	a5	ON/OFF Switch
V2	f2	Diode
X10	d1-f7	Terminal strip
X17	f6-g6	Fuel Level Unit Connector
X19	f3	Motor Diagnostic Plug
X25	a6,e7	Terminal strip
O	(0)	Optional Equipment



S10 SWITCH PER DRAWING 1089 9082 00	ALTERNATOR WINDING
1	T1
2	T4
3	T7 &109 & AVR
4	T10 & T12
5	T2
6	T5
7	T8 &115 & AVR
8	T11
9	T3
10	T6
11	T9
NOTE: CONNECTION BETWEEN SWITCH AND ALTERNATOR ARE MADE WITH ADD-ON WIRE SET . SEE UNIT PARTS MANUAL FOR WIRE SET PART NUMBERS.	


S2b
a2
13
23
K13
A1
A2
OL1
31
34
103
Q1.1
a3
s1
SHT
s2
12
a6
See Circ.Diagram Engine
A B C D E
Z54
PE
z54
Canopy Cubicle
Legend
Wire size :
aa = 20 ga
a = 18 ga
b = 16 ga
c = 14 ga
d = 12 ga
e = 10 ga
f = 8 ga
g = 6 ga
h = 4 ga
i = 2 ga
j = 1 ga
k = 2/0 ga
l = 3/0 ga
m = 4/0 ga
Colour code :
0 = black
1 = brown
2 = red
3 = orange
4 = yellow
5 = green
6 = blue
7 = purple
8 = grey
9 = white
54= green/yellow
x = 600V EPDM 125 deg. C (or equal)
y = 600V EPDM 150 deg. C (or equal)
NOTE: All wire is 600V 105 deg. C rated TEW unless marked with "x" or "y" which identifies EPDM.
SHORE POWER CONNECTION
X8
c0
442
X7
c6
441
X0
L1
L2
L3
N
X6
X1
PE
h54
h6
1L1
1L2
f0
f54
f6
50A
Q5
2L2
X5
Q4
4L1
4L2
X4
FG
115a
h0
109a
K13
7 5 3 1
8 6 4 2
20A
Q2
c54
c6
5L2
X2
Q3
X3

Mark	Name
F1,,4	Fuse 4A
G3	Alternator
K13	Contactor
N12	Automatic Voltage Regulator
O	Optional Equipment
OL1	Over Load Relay
Q1,1	Circuit breaker 3pole
Q2	Circuit breaker 1pole
Q3	Circuit breaker 1pole
Q4	Circuit breaker 2pole
Q5	Circuit breaker 2pole
R5	Coolant Heater Battery Charger
R12	Voltage Adjustnent Potmeter
S2b	Emergency stop (S2a see Engine Circ.)
S10	Supply voltage switch
CT1..6	Current transforner
X1	Terminal board
X2	Socket outlet - 120V GFCI
X3	Socket outlet - 120V GFCI
X4	Socket outlet - 240V 50A TWISTLOCK
X5	Socket outlet - 240V 50A TWISTLOCK
X7	Flanged inlet - Male 120V - SHORE POWER
X8	Socket outlet - 120V GFCI - SHORE POWER
X10	Terminal strip
X25	Terminal strip
Sx	Remote Start/Stop

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