

Instruction Manual for AC Generators

QAS 38 YdS TNV USA

**Instruction Manual
for AC Generators**

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Warranty and Liability Limitation

Use only authorized parts.

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This applies in particular to trademarks, model denominations, part numbers and drawings.

Congratulations on the purchase of your QAS 38 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.

**CALIFORNIA
Proposition 65 Warning**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

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1 Safety precautions for portable generators

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

1.1 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.

1.2 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 vapor 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 jewelry.
 - 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.

1.3 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 tires 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.

1.4 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, Adour, 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 lightening 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.

1.5 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.

- 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 vapors 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 shut down devices function correctly.

1.6 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.

1.7 Battery safety precautions

Batteries

When servicing batteries, always wear protecting clothing and glasses.

- 1 The electrolyte in batteries is a sulfuric 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.

2 Leading particulars

2.1 General description

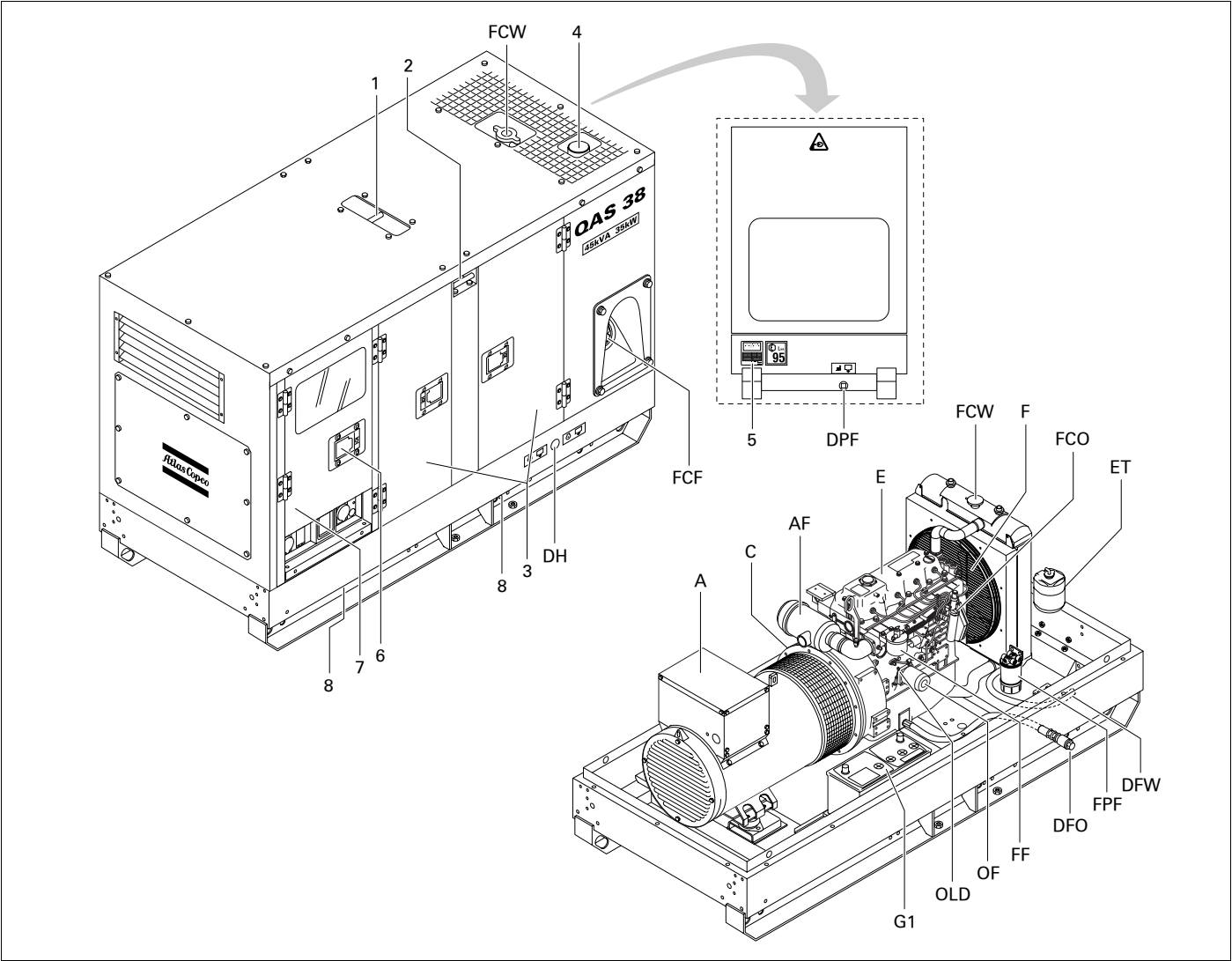
The QAS 38 is an AC generator, built for continuous running at sites where no electricity is available or as stand-by in cases of interruption of the mains.

The QAS 38 generator is driven by a water-cooled diesel engine, manufactured by YANMAR.

The generator can run in 3 different modes:

1 phase	60 Hz	240 V	37.15 hp / 27.7 kW
3 phase - lower voltage	60 Hz	208 V	43.31 hp / 32.3 kW
3 phase - higher voltage	60 Hz	480 V	43.31 hp / 32.3 kW

An overview of the main parts is given in the diagram below.



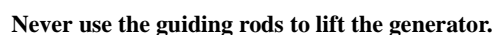
1	Lifting rod
2	Guiding rod
3	Side doors, access to engine and alternator
4	Engine exhaust
5	Data Plate
6	Side door, access to control and indicator panel
7	Output terminal board
8	Hole for forklift
A	Alternator
AF	Air filter
C	Coupling
DFO	Drain flexible engine oil
DFW	Drain flexible cooling water

DH	Drain and access hole (in the frame)
DPF	Drain plug fuel
E	Engine
ET	Expansion tank engine cooling system
F	Fan
FCF	Filler cap fuel
FCO	Filler cap engine oil
FCW	Filter cap cooling water
FF	Fuel filter
FPF	Fuel pre-filter
G1	Battery
OF	Oil filter
OLD	Engine oil level dipstick

2.2 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).

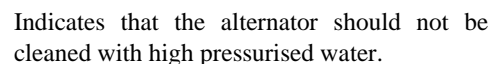
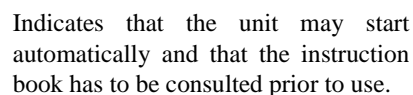
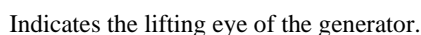
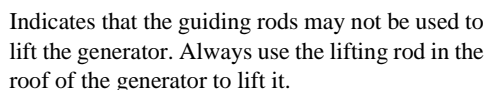
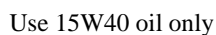
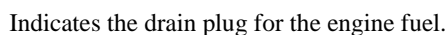
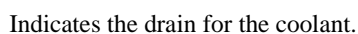
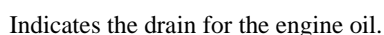
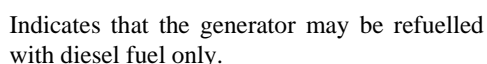
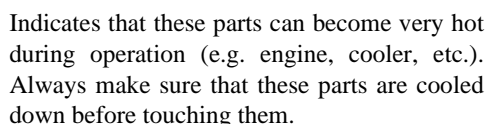
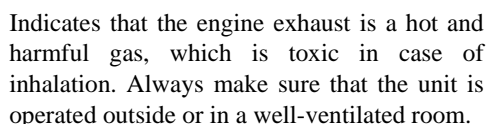
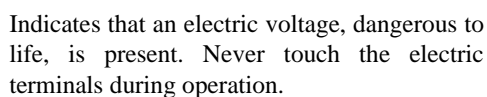
The recess in the roof has a lifting rod in the middle and a guiding rod at both sides.



To be able to lift the QAS 38 by means of a forklift, rectangular holes are provided in the frame.

2.3 Markings

A brief description of all markings provided on the QAS 38 is given hereafter.



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

2.4 Drain plugs and filler caps

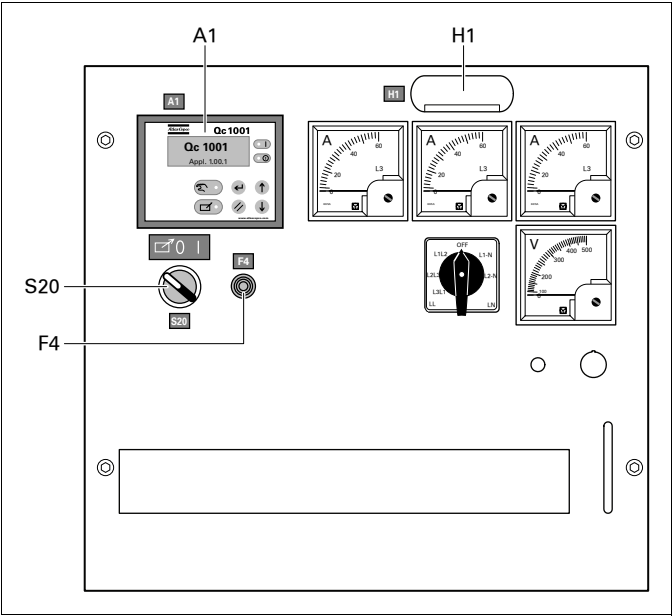
The drain holes for the engine oil, the coolant and the plug for the fuel, are located and labelled on the frame; the fuel drain plug at the front, the others at the service side.

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

The filler cap for the engine coolant is accessible via an opening in the roof. The fuel filler cap is located in the side panel.

2.5 Control and indicator panel Qc1001™

2.5.1 General description Qc1001™ control panel



A1..... Qc1001™ display

F4..... Fuse

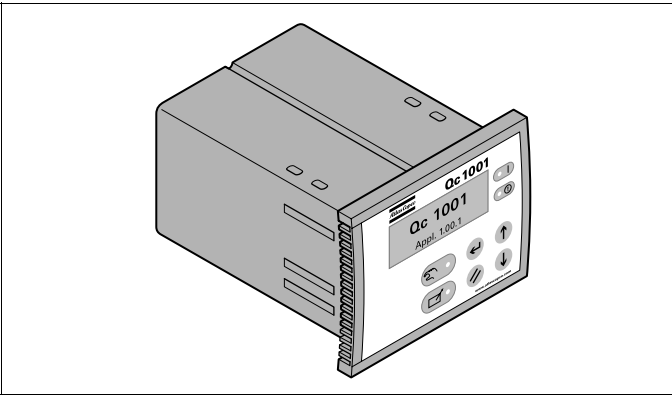
The fuse activates when the current from the battery to the engine control circuit exceeds its setting. The fuse can be reset by pushing the button.

H1..... Panel light

S20.... ON/OFF/REMOTE switch

To start up the unit (locally or remote).

2.5.2 Qc1001™ Module



The Qc1001™ 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 Qc1001™ module can be used for several applications.

2.5.3 Pushbutton and LED functions

Following pushbuttons are used on the Qc1001™



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



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



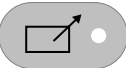
DOWN: Is used to scroll through the display information and to adjust parameter value downwards.



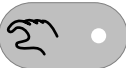
When **UP & DOWN** are pressed at the same time for 3s, Configuration Mode will be entered (see page 17).



BACK: Is used to leave/enter the Warnings pop-up window, to leave the Configuration Mode and to leave menu's without change.

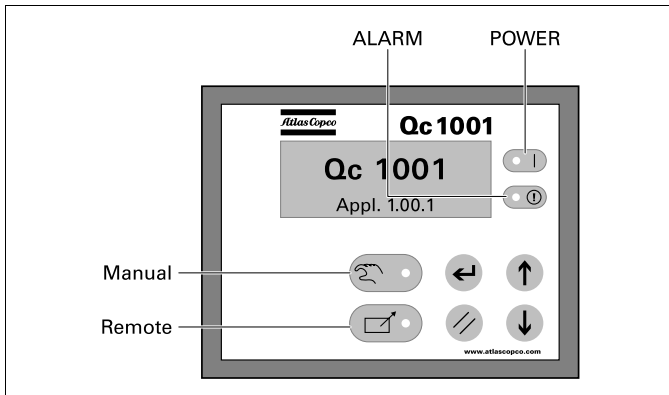


REMOTE MODE: The LED indicates if the gen-set is put in Remote Mode.



MANUAL MODE: The LED indicates if the gen-set is put in Manual Mode.

Following LEDs are used on the Qc1001™



Power	Green LED indicates that the unit is powered up.
Manual	Green LED indicates that the Manual Mode is selected.
Remote	Green LED indicates that the Remote Mode is selected.
Alarm	Flashing red LED indicates that a shutdown is present. Continuous red LED indicates a warning. The exact warning/shutdown is shown at the display.

2.5.4 Qc1001™ Menu Overview

At Qc1001™, 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, ...)
 - Running hours
 - Battery Voltage
 - Service Timer 1
 - Service Timer 2
 - Generator Frequency
- in **Warning** condition (scroll through the information using **UP** and **DOWN**):
 - a list of all active Warnings
- in **Shutdown** condition:
 - the cause of shutdown

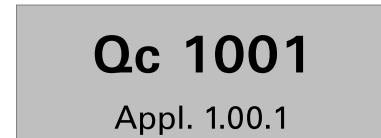
It's possible to scroll through the views, using the **UP** and **DOWN** buttons. The scrolling is continuous.

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

If a Warning comes up, the Warning Display is shown.

If a Shutdown comes up, the Shutdown Display is shown.

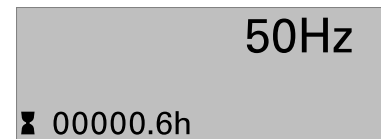
View 0



This view will show the ASW version number.

When there has been no button activity for three minutes, the display will return to the Default View.

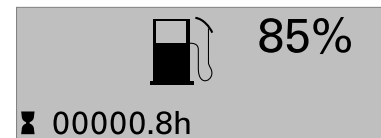
View 1 (Qc1001™-Default Display)



The frequency value is centered in the top-right corner area.

The running hours value is at the bottom-left corner. The service timer indication(s) are shown in the bottom-right corner when the service timer(s) have run out. They will disappear when the service timer(s) have been resetted.

View 2 (Fuel Level Display)

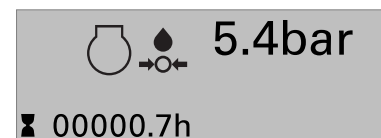


This view shows the fuel level icon.

When the English text view is selected, this view will mention: "FUEL LEVEL ***%".

When there has been no button activity for three minutes, the display will return to the Default View.

View 3 (Engine Oil Pressure Display)



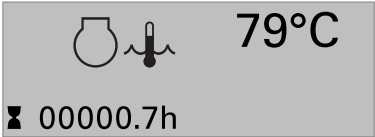
This view shows the oil pressure icons.

When the English text view is selected, this view will mention: "OIL PRESSURE **.*bar".

When there has been no button activity for three minutes, the display will return to the Default View.

See also "Configuration Mode View" on page 17 for selection between bar and psi.

View 4 (Engine Coolant Temperature Display)



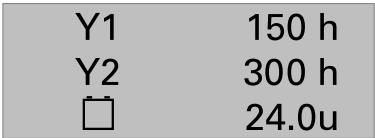
This view shows the coolant temperature icons.

When the English text view is selected, this view will mention: “COOLANT TEMP. ***°C”.

When there has been no button activity for three minutes, the display will return to the Default View.

See also “Configuration Mode View” on page 17 for selection between °C and °F.

View 5 (Service Timers and Battery Voltage)



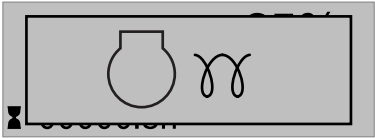
The service timer indications count upwards and give an alarm when the configured value is reached.

Resetting of the Service Timers is possible through a display Configuration Menu.

View 10 (reserved for normal English text)

In case that normal English text is selected i.s.o. icons, view 2 is changed into this three-row display format.

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:

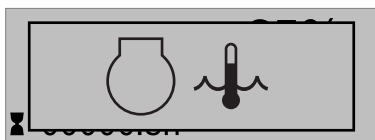
PREHEAT	
START OFF	
COOLDOWN	
EXTENDED STOP TIME	
DIAGNOSTIC	

If a special status has elapsed, the default view will be entered again automatically.

If a Warning comes up, the Warning Display is shown.

If a Shutdown comes up, the Shutdown Display is shown.

Warning Display (pop-up window)



In case a Warning occurs, a pop-up window will automatically be entered for as long as the warning is active, no matter which view is active. The warning icons will be shown (together with a continuous lit alarm LED at the fascia), which is centered at the display. The Warning Display can always be left or entered again by pushing the BACK button.

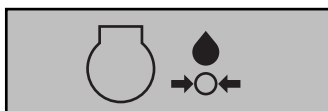
If more than one warning comes up, it's possible to scroll through the warning messages with the UP and DOWN pushbuttons. The newest warning will be placed at the bottom of the list (meaning that the older warning stays at the display when a newer warning comes up).

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

If a Shutdown comes up, the Shutdown Display is shown.

List of possible warnings:

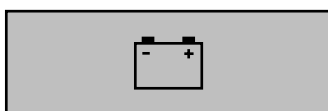
LOW OIL PRESSURE



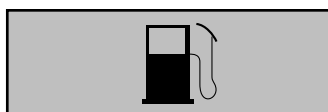
HIGH COOLANT TEMPERATURE



CHARGING ALTERNATOR



LOW FUEL LEVEL



LOW COOLANT LEVEL



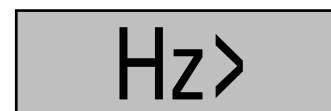
GENERATOR OVERVOLTAGE



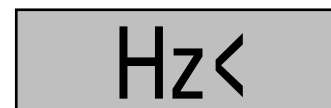
GENERATOR UNDERVOLTAGE



GENERATOR OVERFREQUENCY



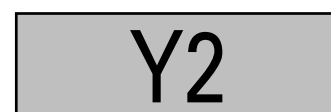
GENERATOR UNDERFREQUENCY



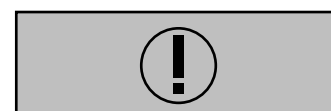
SERVICE TIMER 1



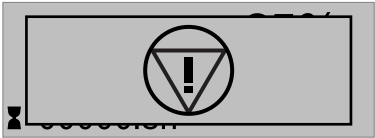
SERVICE TIMER 2



ALARM



Shutdown Display (pop-up window)



In case a Shutdown occurs, a pop-up window will automatically be entered, no matter which view is active.

This pop-up window will stay present until the unit is put in OFF.

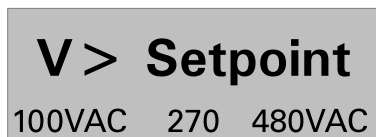
The shutdown icon will be shown (together with a flashing alarm LED at the fascia), which is centered at the display.

List of possible shutdowns:

LOW OIL PRESSURE	
HIGH COOLANT TEMPERATURE	
CHARGING ALTERNATOR	
LOW FUEL LEVEL	
LOW COOLANT LEVEL	
GENERATOR OVERVOLTAGE	
GENERATOR UNDERVOLTAGE	
GENERATOR OVERFREQUENCY	
GENERATOR UNDERFREQUENCY	

SERVICE TIMER 1	
SERVICE TIMER 2	
ALARM	
EMERGENCY STOP	
START FAILURE	
STOP FAILURE	

Configuration Mode View



The Configuration Menu's are pre-programmed!

The Configuration Mode is entered by detection of activation of pushbuttons UP and DOWN at the same time for 3 seconds.

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

By entering the configuration mode, pushbuttons MANUAL, REMOTE are disposed of their normal operations and will not perform any functionality.

Menu's shown on the LCD in Configuration Mode:

- Language selection
- Diagnostics Menu
- Running hours adjust

- Service Timer 2 reset
- Service Timer 1 reset
- Start Prepare Time
- Unit Menu
- Unit Type



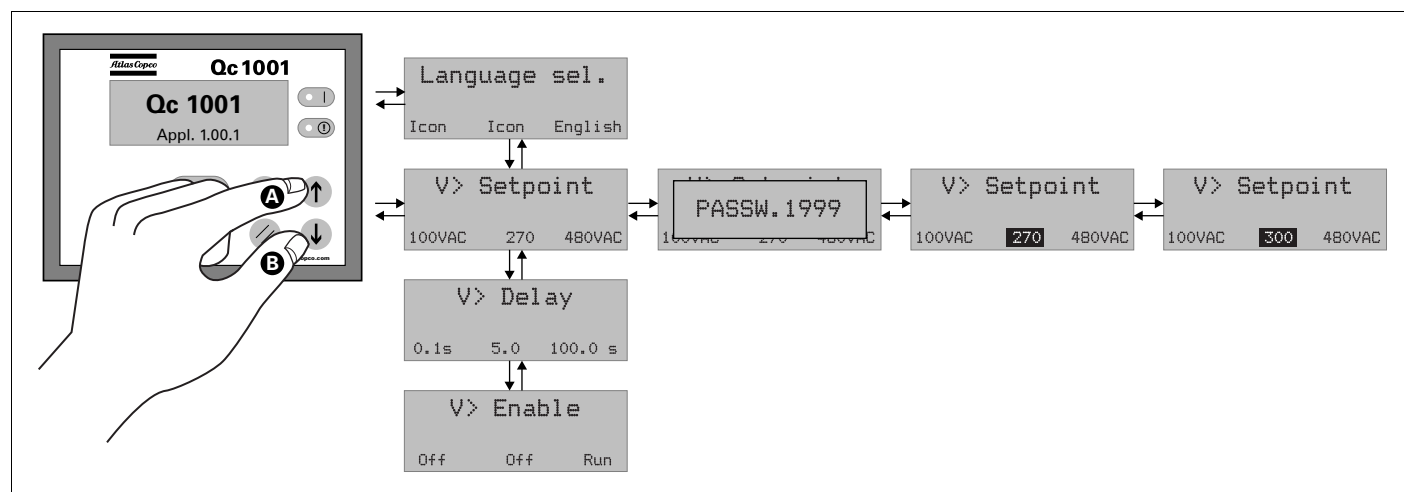
Unit type 2 for QAS 38 YdS USA !

- Generator Underfrequency: failclass, enable, delay, setpoint.
- Generator Overfrequency: failclass, enable, delay, setpoint.
- Generator Undervoltage: failclass, enable, delay, setpoint.
- Generator Overvoltage: failclass, enable, delay, setpoint.

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 (push A and B together for 3 seconds):



2.5.5 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/closed).

2.5.6 Fail classes

All the activated alarms of the Qc1001™ 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)

2.5.7 Event Log

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

Events are:

- shutdowns
- service timer 1 reset
- service timer 2 reset
- unit type changes

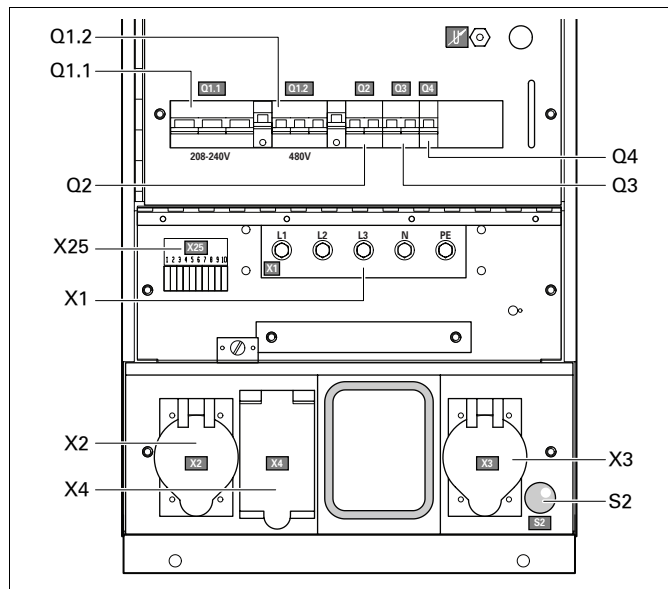
Together with each event, the running hours at the time of the event will be stored.

The events can only be read by means of the QcUSW.

X1..... Main power supply - Terminal board

2.6 Output connections

The output connections are situated below the control and indicator panel.



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, by turning it anti-clockwise, before the generator can be restarted.

Q1.1 .. Circuit breaker for low voltage

Interrupts the low voltage power supply towards X1, X2, X3 and X4 when a short-circuit occurs at the load side, or when the overcurrent protection (125 A) is activated. It must be reset manually after eliminating the problem.

Q1.2 .. Circuit breaker for high voltage

Interrupts the high voltage power supply towards X1, X2, X3 and X4 when a short-circuit occurs at the load side, or when the overcurrent protection (50 A) is activated. It must be reset manually after eliminating the problem.

Q2 Circuit breaker

Interrupts phases L1 and L2 towards X2 when a short-circuit occurs at the load side, or when the overcurrent protection (50 A) is activated. It must be reset manually after eliminating the problem.

Q3 Circuit breaker

Interrupts line L1 and L2 towards X3 when a short-circuit occurs at the load side, or when the overcurrent protection (50 A) is activated. It must be reset manually after eliminating the problem.

Q4 Circuit breaker

Interrupts line L2 towards X4 when a short-circuit occurs at the load side, or when the overcurrent protection (20 A) is activated. It must be reset manually after eliminating the problem.

Terminals L1, L2, L3, N (=neutral) and PE (=grounding), hidden behind the control panel door and behind a small transparent door.

X2.....Single phase outlet socket

Provides lines L1, L2, and N (=neutral).

X3.....Single phase outlet socket

Provides lines L1, L2, and N (=neutral).

X4.....Single phase outlet socket

Provides lines L2, N (=neutral) and PE (=grounding).

X25....Connection block

Allows easy connection for a remote start switch.



Refer to the circuit diagrams for the correct connection.

2.7 Spillage free

A Spillage free skid with forklift slots allows the customer to transport the generator easily with a forklift.

It avoids accidental spilling of engine fluids.

2.8 Engine coolant heater

To make sure that the engine can start and accept load immediately, an external coolant heater (1000 W, 240 V) is provided which keeps the engine temperature between 38°C and 49°C.

2.9 Triple voltage (3V)

The generator can run in three different modes:

- 1 phase
- 3 phase, lower voltage
- 3 phase, higher voltage

Depending on which mode the generator is running in, circuit breaker Q1.1 or Q1.2 will be operational.

Circuit breakers Q1.1 and Q1.2 cannot be switched on at the same time. This is prevented by means of the auxiliary voltage selection relays K11 and K12 (refer to the circuit diagram).

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

S10....Output voltage selector switch

Allows to select a 3 phase high output voltage, a 3 phase low output voltage or a 1 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 R11 to the required value.

1 phase

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

3 phase lower voltage

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

3 phase higher voltage

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

3 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 1,000 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.

3.1 Installation

- Place the generator on a horizontal, even and solid floor.
- Protect the generator against dust and rain if it is operated outside.
- 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.

3.2 Connecting the generator

3.2.1 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 converters 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.

3.2.2 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 must be used.

3.2.3 Connecting the load

Site distribution panel

If outlet sockets are required, 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.

3.3 Operating Qc1001™

3.3.1 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 water level must be near to the FULL mark. Add coolant if necessary.
- Drain any water 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 watervapor 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 fuse F4 is not activated and that the emergency stop is in the "OUT" position.
- Check that the load is switched off.
- Check that circuit breakers Q1.1 and Q1.2 are switched off.
- Check the correct position of the voltage selector switch (S10) on the alternator.

3.3.2 Starting

To start up the unit locally, proceed as follows:

- Switch on the battery switch.
- Switch off circuit breaker Q1. This is not necessary when a plant contactor is installed between Q1 and the load.
- Put the starter switch S20 in position I (ON). 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 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 .
- Switch on circuit breaker Q1.
- 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.

3.3.3 During operation

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.

3.3.4 Stopping

To stop the unit locally, proceed as follows:


- Switch off the load.
- Switch off circuit breaker Q1.
- Let the engine run for about 5 minutes.
- Stop the engine by putting the starter switch S20 in position O (OFF).
- 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 putting the starter switch in position O.
- Cooldown period default 15 sec.
- Lock the side doors and the door of the indicators and control panel to avoid unauthorized access.

4 Maintenance

4.1 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	Initial 50 hours	Small 250 hours	Normal 500 hours	Yearly 2000 hours
Service pak	-	With unit	2912 6038 00	2912 6039 00	2912 6040 00
<i>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.</i>					
Coolant level	Check	Check	Check	Check	Check
Tension and condition of drive belt(s)		Check	Check	Check	Replace
Radiator and intercooler fins		Check/Clean	Check/Clean	Check/Clean	Check/Clean
Fuel pre-filter/Water separator	Check/Drain	Check/Drain	Check/Drain	Check/Drain	Check/Drain
Fuel filter element		Replace	Replace	Replace	Replace
Fuel injectors					Check
Oil level in sump	Check	Check	Check	Check	Check
Oil pressure on gauge	Check	Check	Check	Check	Check
Lubrication oil		Change	Change	Change	Change
Oil filter(s)		Replace	Replace	Replace	Replace
Air cleaner and dust bowl		Clean	Clean	Clean	Clean
Air filter element (1)			Clean	Replace	Replace
Safety cartridge					Replace
Valve clearance		Check/adjust	Check/adjust	Check/adjust	Check/adjust
Oil, fuel and water leaks		Check	Check	Check	Check
Mechanical links (e.g. fuel solenoid link)			Grease	Grease	Grease
Level battery electrolyte (2)		Check	Check	Check	Check
Condition of vibration dampers		Check	Check	Check	Check
Alternator insulation resistance (*)		Measure	Measure	Measure	Measure
Tightness of nuts and bolts		Check			Check
Door hinges and locks		Grease			Grease
Fixation of hoses, cables and pipes				Check	Check
Inspection by Atlas Copco Service technician					

Notes:

- (1) More frequently when operating in a dusty environment. Evacuate dust from the airfilter valve daily.
- (2) A Service Bulletin (ASB) dealing elaborately with batteries and due care is available on request.

4.2 Engine maintenance

Refer to the engine's operator manual for full maintenance, including instructions for changing the oil and cooling water and replacing the fuel, oil and air filters.

4.3 (*)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. Disconnect the radio interference suppressor.

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 5 MΩ.

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

4.4 Engine oil specifications



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

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.

Engine	Type of lubricant
between -15°C (5°F) and 40°C (104°F)	PAROIL 15W40
between -25°C (-13°F) and 30°C (86°F)	PAROIL 5W30



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.

4.4.1 Specifications PAROIL

PAROIL from Atlas Copco is the ONLY oil tested and approved for use in all engines built into Atlas Copco compressors and 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 is optimized for the latest low emission EURO -3 & -2, EPA TIER II & III engines running on low sulphur diesel for lower oil and fuel consumption.

4.4.2 PAROIL 5W30 and PAROIL 15W40

Synthetic engine oil PAROIL 5W30

PAROIL 5W30 is a Synthetic ultra high performance diesel engine oil with a high viscosity- index. Atlas Copco PAROIL 5W30 is designed to provide excellent lubrication from start-up in temperatures as low as -25°C (-13°F).

	Liter	US gal	Imp gal	cu.ft	Order number
can	5	1.3	1.1	0.175	1604 6060 00
barrel	210	55.2	46	7.35	1604 6059 00

Mineral engine oil PAROIL 15W40

PAROIL 15W40 is a mineral based high performance diesel engine oil with a high viscosity- index. Atlas Copco PAROIL 15W40 is designed to provide a high level of performance and protection in standard ambient conditions as from -15°C (5°F).

	Liter	US gal	Imp gal	cu.ft	Order number
can	5	1.3	1.1	0.175	1615 5953 00
can	20	5.3	4.4	0.7	1615 5954 00
barrel	210	55.2	46	7.35	1615 5955 00

4.5 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 22.

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

4.6 Engine oil and oil filter change

See section “Maintenance schedule” on page 22.

4.7 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 (41°F). 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.

4.7.1 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 compressors and 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 (-40°F).

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.

4.8 Coolant check

4.8.1 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.

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.

4.8.2 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.

4.8.3 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.

5 Storage of the generator

5.1 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 silicagel 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.

5.2 Preparing for operation after storage

Before operating the generator again, remove the wrapping, VCI paper and silicagel bags and check the generator thoroughly (go through the checklist Before starting).

- Consult the engine's operator manual.
- Check that the insulation resistance of the generator exceeds 5 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.

6 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).

6.1 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.

6.2 Checking ammeters P1, P2 en P3

- Measure during the load, by means of a clamp-on probe, the outgoing current in the three phases.
- Compare the measured current with the current indicated on ammeters on the corresponding ammeters P1, P2 and P3. Both readings should be the same.

6.3 Alternator trouble shooting

Symptom	Possible cause	Corrective action
<i>Alternator does not excite.</i>	Blown fuse. Insufficient residual voltage. No residual voltage.	Replace fuse. Increase the speed by 15 %. For an instant apply on the + and – terminals of the electronic regulator a 12 V battery voltage with a 30 Ω resistor in series respecting the polarities.
<i>After being excited alternator does not excite.</i>	Connections are interrupted.	Check connection cables as per attached drawings.
<i>Low voltage at no load.</i>	Voltage potentiometer out of setting. Intervention of protection. Winding failure.	Reset voltage. Check rpm. Check windings.
<i>High voltage at no load.</i>	Voltage potentiometer out of setting. Failed regulator.	Reset voltage. Substitute regulator.
<i>Lower than rated voltage at load.</i>	Voltage potentiometer out of setting. Intervention by protection. Failed regulator. Rotating bridge failure.	Reset voltage potentiometer. Current too high, power factor lower than 0.8; speed lower than 10 % of rated speed. Substitute regulator. Check diodes, disconnect cables.
<i>Higher than rated voltage at load.</i>	Voltage potentiometer out of setting. Loose sensing wires on AVR. Failed regulator.	Reset voltage potentiometer. Check sensing wires on AVR. Substitute regulator.
<i>Unstable voltage.</i>	Speed variation in engine. Regulator out of setting.	Check regularity of rotation. Regulate stability of regulator by acting on “STABILITY” potentiometer.

6.4 Engine troubleshooting

The table below gives an overview of the possible engine problems and their possible causes.

The starter motor turns the engine too slowly

- Battery capacity too low.
- Bad electrical connection.
- Fault in starter motor.
- Wrong grade of lubricating oil.

The engine does not start or is difficult to start

- Starter motor turns engine too slowly.
- Fuel tank empty.
- Fault in fuel control solenoid.
- Restriction in a fuel pipe.
- Fault in fuel lift pump.
- Dirty fuel filter element.

- Air in fuel system.
- Fault in atomisers.
- Cold start system used incorrectly.
- Fault in cold start system.
- Restriction in fuel tank vent.
- Wrong type or grade of fuel used.
- Restriction in exhaust pipe.

Not enough power

- Restriction in a fuel pipe.
- Fault in fuel lift pump.
- Dirty fuel filter element.
- Restriction in air filter/cleaner or induction system.
- Air in fuel system.

- Fault in atomisers or atomisers of an incorrect type.
- Restriction in fuel tank vent.
- Wrong type or grade of fuel used.
- Restricted movement of engine speed control.
- Restriction in exhaust pipe.
- Engine temperature is too high.
- Engine temperature is too low.

Misfire

- Restriction in a fuel pipe.
- Fault in fuel lift pump.
- Dirty fuel filter element.
- Air in fuel system.
- Fault in atomisers or atomisers of an incorrect type.
- Fault in cold start system.
- Engine temperature is too high.
- Incorrect valve tip clearances.

The pressure of the lubricating oil is too low

- Wrong grade of lubricating oil.
- Not enough lubricating oil in sump.
- Defective gauge.
- Dirty lubricating oil filter element.

High fuel consumption

- Restriction in air filter/cleaner or induction system.
- Fault in atomisers or atomisers of an incorrect type.
- Fault in cold start system.
- Wrong type or grade of fuel used.
- Restricted movement of engine speed control.
- Restriction in exhaust pipe.
- Engine temperature is too low.
- Incorrect valve tip clearances.

Black exhaust smoke

- Restriction in air filter/cleaner or induction system.
- Fault in atomisers or atomisers of an incorrect type.
- Fault in cold start system.
- Wrong type or grade of fuel used.
- Restriction in exhaust pipe.
- Engine temperature is too low.

- Incorrect valve tip clearances.
- Engine overload.

Blue or white exhaust smoke

- Wrong grade of lubricating oil.
- Fault in cold start system.
- Engine temperature is too low.

The engine knocks

- Fault in fuel lift pump.
- Fault in atomisers or atomisers of an incorrect type.
- Fault in cold start system.
- Wrong type or grade of fuel used.
- Engine temperature is too high.
- Incorrect valve tip clearances.

The engine runs erratically

- Fault in fuel control.
- Restriction in a fuel pipe.
- Fault in fuel lift pump.
- Dirty fuel filter element.
- Restriction in air filter/cleaner or induction system.
- Air in fuel system.
- Fault in atomisers or atomisers of an incorrect type.
- Fault in cold start system.
- Restriction in fuel tank vent.
- Restricted movement of engine speed control.
- Engine temperature is too high.
- Incorrect valve tip clearances.

Vibration

- Fault in atomisers or atomisers of an incorrect type.
- Restricted movement of engine speed control.
- Engine temperature is too high.
- Fan damaged.
- Fault in engine mounting or flywheel housing.

The pressure of the lubricating oil is too high

- Wrong grade of lubricating oil.
- Defective gauge.

The engine temperature is too high

- Restriction in air filter/cleaner or induction system.

- Fault in atomisers or atomisers of an incorrect type.
- Fault in cold start system.
- Restriction in exhaust pipe.
- Fan damaged.
- Too much lubricating oil in sump.
- Restriction in air or coolant passages of radiator.
- Insufficient coolant in system.

Crankcase pressure

- Restriction in breather pipe.
- Vacuum pipe leaks or fault in exhauster.

Bad compression

- Restriction in air filter/cleaner or induction system.
- Incorrect valve tip clearances.

The engine starts and stops

- Dirty fuel filter element.
- Restriction in air filter/cleaner or induction system.
- Air in fuel system.

The engine shuts down after approx. 15 sec.

- Bad connection towards oil pressure switch/coolant temperature switch.

7 Technical specifications

7.1 Readings on gauges

<i>Gauge</i>	<i>Reading</i>	<i>US</i>	<i>Metric</i>
Ammeter L1 (P1)	Below max. rating	A	A
Ammeter L2 (P2)	Below max. rating	A	A
Ammeter L3 (P3)	Below max. rating	A	A
Voltmeter (P4)	Depends upon selector switch	V	V
Hourmeter (P6)	Adding up	h	h
Fuel level (P7)	Above 0	Fuel tank full	Fuel tank full
Engine temperature (P8)	Below 221 °F or 105 °C	°F	°C
Engine oil pressure (P9)	Below maximum rating	psi	bar

7.2 Settings of switches

<i>Switch</i>	<i>Function</i>	<i>Activates at</i>	<i>Activates at</i>
Engine oil pressure	shut down	7.25 psi	0.5 bar
Engine coolant temperature	shut down	221 °F	105 °C

7.3 Specifications of the engine/alternator/unit

		<i>US</i>	<i>Metric</i>
<i>Reference conditions 1)</i>	Rated frequency	60 Hz	60 Hz
	Rated speed (optional)	1800 rpm	1800 rpm
	Generator service duty	PRP	PRP
	Absolute inlet pressure	100 kPa	100 kPa
	Relative air humidity	30 %	30 %
	Air inlet temperature	77 °F	25 °C
<i>Limitations 2)</i>	Maximum ambient temperature	104 °F	40 °C
	Altitude capability	3281 ft	1000 m
	Relative air humidity maximum	85 %	85 %
	Minimum starting temperature	-0.4 °F	-18 °C
<i>Performance data 2) 3) 5)</i>	Rated active power (PRP) 3ph	43.31 hp	32.3 kW
	Rated active power (PRP) 1ph (optional)	37.15 hp	27.7 kW
	Rated power factor (lagging) 3phase	0.8	0.8
	Rated power factor (lagging) 1phase (optional)	1.0	1.0
	Rated apparent power (PRP) 3ph	40 kVA	40 kVA
	Rated apparent power (PRP) 1ph (optional)	27.7 kVA	27.7 kVA
	Rated voltage 3ph. line to line	480 V	480 V
	Rated voltage 3ph. line to line lower voltage (optional)	208 V	208 V
	Rated voltage 1ph. line to line (optional)	240V	240V
	Rated current 3ph.	48.1 A	48.1 A
	Rated current 3ph. lower voltage (optional)	111 A	111 A
	Rated current 1ph. (optional)	115.5 A	115.5 A
	Performance class (acc.ISO 8528-5:1993)	G2	G2
	Frequency droop	<5	<5
	(optional)	isochronous	isochronous
	Fuel consumption at full load/no load	17.49/3.20 lb/h	7.93/1.45 kg/h
	Specific fuel consumption	0.52 lb/kWh	0.236 kg/kWh
	Fuel autonomy at full load	8.8 h	8.8 h
	Max. oil consumption at full load	0.70 oz/h	20 g/h
	Maximum sound power level (LWA) measured according to 2000/14/EC OND	95 dB(A)	95 dB(A)
	Capacity of fuel tank	21.38 Us gal	81 l
	Single step load acceptance	100 %	100 %

<i>Application data</i>	Mode of operation	PRP	PRP
	Site	land use	land use
	Operation	single	single
	Start-up and control mode (optional)	manual/auto.	manual/auto.
	Start-up time	unspecified	unspecified
	Mobility/ Config. acc. to ISO 8528-1:1993 (optional)	transportable/D	transportable/D
	Mounting	mobile/E	mobile/E
	Climatic exposure	fully resilient	fully resilient
<i>Alternator</i>	Degree of protection (cubicle)	open air	open air
	Status of neutral	IP54	IP54
		earthed	earthed
	Standard	IEC34-1	IEC34-1
		ISO8528-3	ISO8528-3
	Make	MECC ALTE	MECC ALTE
	Model	ECO 32 3S	ECO 32 3S
	Rated output, class H temp. rise	48 kVA	48 kVA
<i>Engine</i>	Degree of protection	IP 21	IP 21
	Insulation stator class	H	H
	Insulation rotor class	H	H
	Number of wires	12	12
	Standard	ISO 3046	ISO 3046
		ISO 8528-2	ISO 8528-2
	Type YANMAR	4TNV98-GGE	4TNV98-GGE
	Rated net output	48.81 hp	36.4 kW
<i>Power circuit</i>	rating type acc. ISO 3046-7	ICXN	ICXN
	production tolerance	± 3%	± 3%
	Coolant	water	water
	Combustion system	direct injection	direct injection
	Aspiration	natural aspirated	natural aspirated
	Number of cylinders	4	4
	Swept volume	0.88 Usgal	3.319 l
	Speed governing	mechanical	mechanical
<i>Outlet sockets</i>	Capacity of oil sump	2.64 Usgal	10 l
	Capacity of cooling system	2.64 Usgal	10 l
	Electrical system	12 Vdc	12 Vdc
	Circuit-breaker, 3ph (optional)		
	Number of poles	3	3
	Thermal release It	50 A	50 A
	Magnetic release Im	3..5xIn	3..5xIn
	Circuit-breaker, 3ph, lower voltage (optional)		
<i>Unit</i>	Number of poles	3	3
	Thermal release It	125 A	125 A
	Magnetic release Im	3..5xIn	3..5xIn
	Fault current protection		
	Residual current release IDn		
	Insulation resistance (optional)		
		GFCI duplex (1x)	GFCI duplex (1x)
		2p+E	2p+E
		20A 125V	20A 125V
		Temp Power (2x)	Temp Power (2x)
		2p + N + E	2p + N + E
		50 A 125/250 V	50 A 125/250 V
	Dimensions (LxWxH)	81.12 x 37.09 x 45.12in	2080 x 951 x 1157 mm
	Weight net mass	1986.71 lb	901 kg
	Weight wet mass	2242.49 lb	1017 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 (77.00 °F).
 - 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 80%.
- 5) Specific mass fuel used: 0.86 kg/l (1.90 lb/Usgal).

Derating factor %

Height (m)	Temperature (°C)								
	0	5	10	15	20	25	30	35	40
0	100	100	100	100	100	100	98	96	94
500	97	97	97	97	97	97	95	93	91
1000	94	94	94	94	94	94	92	90	89
1500	91	91	91	91	91	91	89	87	85
2000	86	86	86	86	86	86	85	83	81
2500	81	81	81	81	81	81	79	78	76
3000	75	75	75	75	75	75	73	72	70
3500	67	67	67	67	67	67	66	64	63
4000	67	67	67	67	67	67	66	64	63

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

7.4 Conversion list of SI units into British units

1 bar	=	14.504 psi	1 m	=	3.281 ft
1 g	=	0.035 oz	1 mm	=	0.039 in
1 kg	=	2.205 lb	1 m³/min	=	35.315 cfm
1 km/h	=	0.621 mile/h	1 mbar	=	0.401 in wc
1 kW	=	1.341 hp (UK and US)	1 N	=	0.225 lbf
1 l	=	0.264 US gal	1 Nm	=	0.738 lbf.ft
1 l	=	0.220 imp gal (UK)	t°F	=	32 + (1.8 x t°C)
1 l	=	0.035 cu.ft	t°C	=	(t°F - 32)/1.8

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

7.5 Dataplate

1

2

3

ATLAS COPCO AIRPOWER n.v.

YA3-*****-*****

**** kg

**** kg

**** kg

A

B

C

Model/Modell/Modèle

f_N

*** *

Hz **

P_N

*** *

kVA ***

P_N

*

kW ***

U_N

*

V ***

I_N

*

A ***

cos phi

**

Manuf. year/Baujahr/Année de fabrication

MADE BY ATLAS COPCO AIRPOWER n.v. WILRIJK, BELGIUM

CE

15 6945 00

Atlas Copco

15

16

17

4

5

6

7

8

9

10

11

12

13

14

15

16

17

A

B

C

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

Maximum permitted loaden weight of the vehicle

Maximum permitted road weight of the front axle

Maximum permitted road weight of the rear axle

Company code

Product code

Unit serial number

Name of the manufacturer

EEC or national type approval number

Vehicle identification number

Model number

Frequency

Apparent power

Active power

Nominal rated voltage

Nominal rated current

Power factor

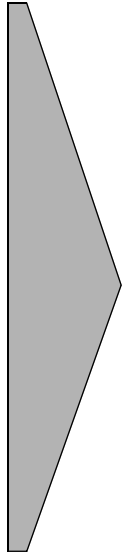
Manufacturing year

EEC mark in accordance with Machine Directive 89/392E

Mode of operation

Winding connections

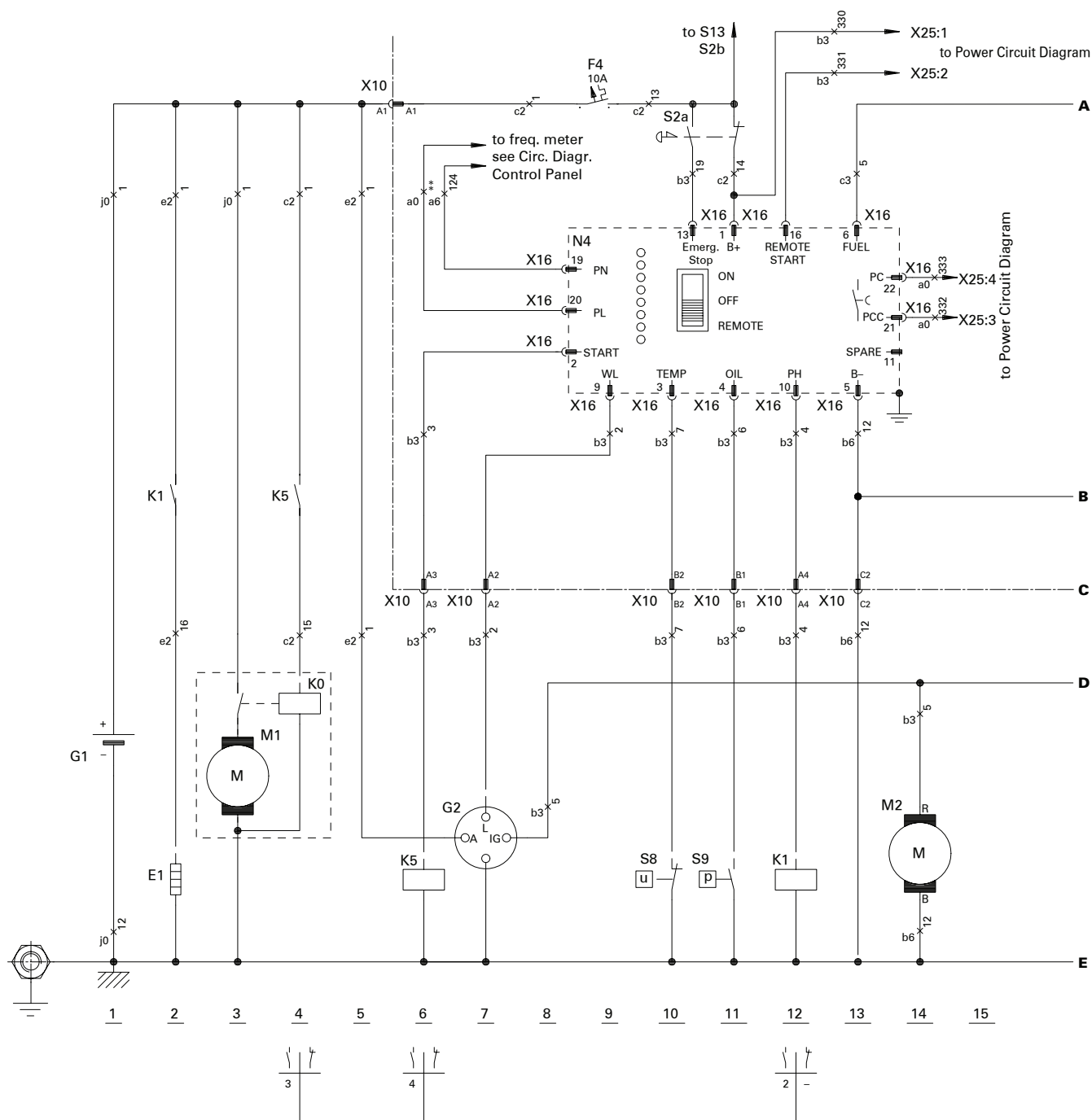
Circuit diagrams



CIRCUIT DIAGRAM

9822 0888 78/00

Applicable for QAS 38 YdS TNV USA, Engine Circuit



B7	Fuel level sensor
B8	Coolant temperature sensor
B9	Oil pressure sensor
E1	Preheat resistor
F4	Fuse
G1	Battery 12 V
G2	Charging alternator

H1	Panel light
K0	Starter solenoid
K1	Preheat relay
K5	Starter relay
K6	Aux. relay pull solenoid
KT1	Timer pull solenoid
M1	Starter motor

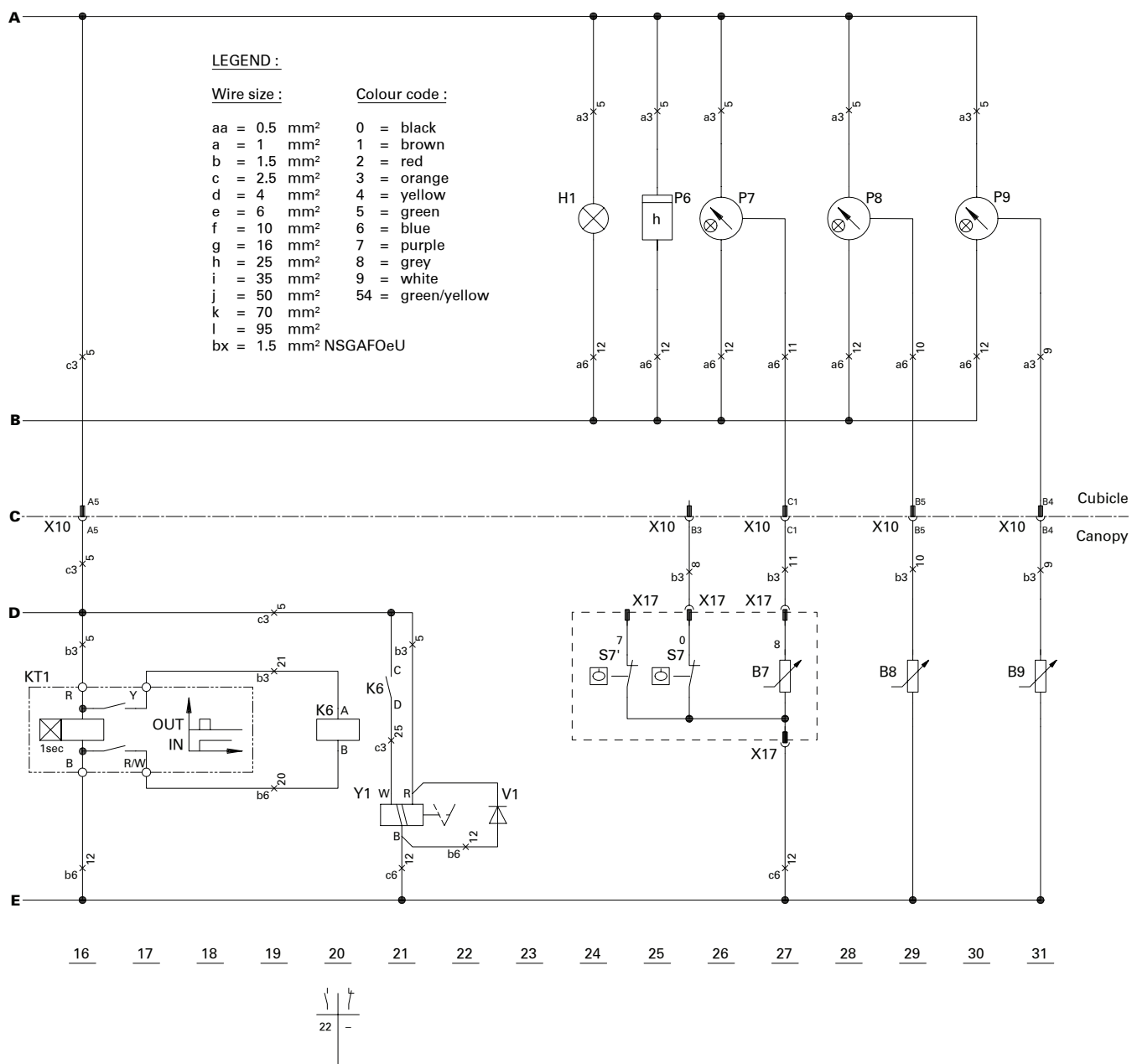
M2	Fuel feed pump
N4	Control module
P6	Hourmeter
P7	Fuel level gauge
P8	Coolant temperature gauge
P9	Oil pressure gauge

CIRCUIT DIAGRAM

Note:

** : wire nr 110 for 115V

** : wire nr 127 for 230V

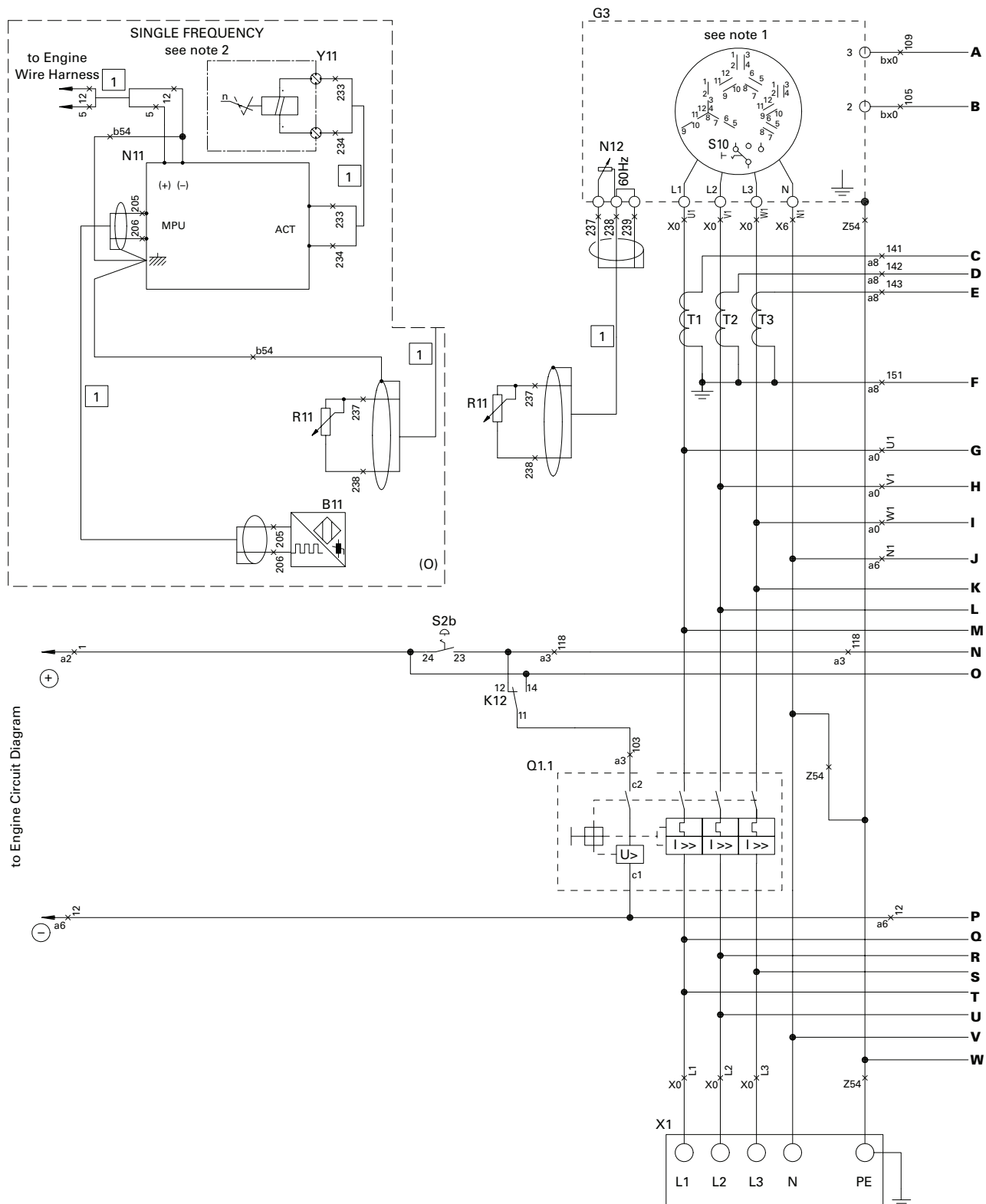


S2a	Emergency stop button (S2b, Power Circ.)	S8	Coolant high temperature switch	X16	Module connector
S7	Low fuel level switch	S9	Engine oil low pressure switch	X17	Fuel level unit connector
S7'	Low fuel level switch, warning	V1	Free-wheeling diode	Y1	Fuel control solenoid
		X10	15-pole connector		

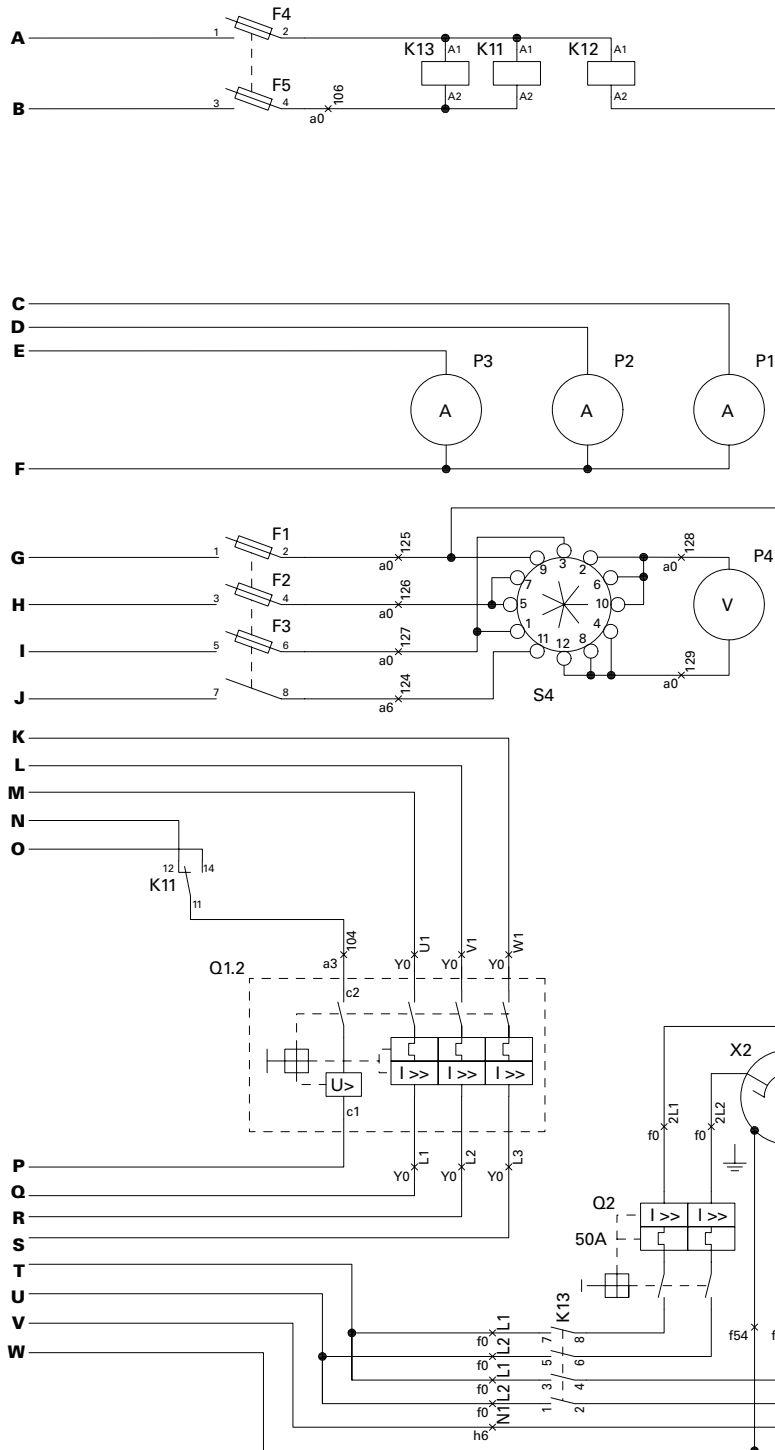
CIRCUIT DIAGRAM

9822 0981 43/01

Applicable for QAS 38 YdS TNV USA, Power Circuit



CIRCUIT DIAGRAM



Legend

Wire size :

aa	=	0.5 mm ²
a	=	1 mm ²
b	=	1.5 mm ²
c	=	2.5 mm ²
d	=	4 mm ²
e	=	6 mm ²
f	=	10 mm ²
g	=	16 mm ²
h	=	25 mm ²
i	=	35 mm ²
j	=	50 mm ²
k	=	70 mm ²
l	=	95 mm ²
bx	=	1.5 mm ² NSGAFOeU

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

	Q1.1	Q1.2	P1	Wire size		
				X	Y	Z
QAS 38	125A	50A	0-100A	j	f	h

NOTE 1 :

3ph higher voltage : connect 2-3; 6-7; 10-11; 4-8-12(N)
 3ph lower voltage : connect 1-3; 5-7; 9-11; 2-4-6-8-10-12(N)
 1ph lower voltage : connect 1-3; 5-7; 2-4-10-12(N); 6-8-9-11

NOTE 2 :

The actuator replaces the fuel stop solenoid valve (mentioned on the Engine Control Circuit diagram).

B11	Speed sensor	P4	Voltmeter 0-500 V	T13	Earth fault current detector
F1-5	Fuse 4 A	Q1.1	Circuit breaker 3-pole	X1	Terminal board
G3	Alternator	Q1.2	Circuit breaker 3-pole	Y1	Actuator
K11	Aux. relay (lower volt.)	R11	Supply voltage adjust	1	Wire harness
K12	Aux. relay (higher volt.)	S2b	Emergency stop (S2a, Engine Circ.)		
K13	Contactor	S4	Voltmeter change-over switch		
N11	Speed controller	S10	Supply voltage switch		
N12	Automatic voltage regulator	T1-3	Current transformer		
P1-3	Amperemeter				

CIRCUIT DIAGRAM

9822 0981 50/01
Applicable for QAS 38 YdS TNV USA

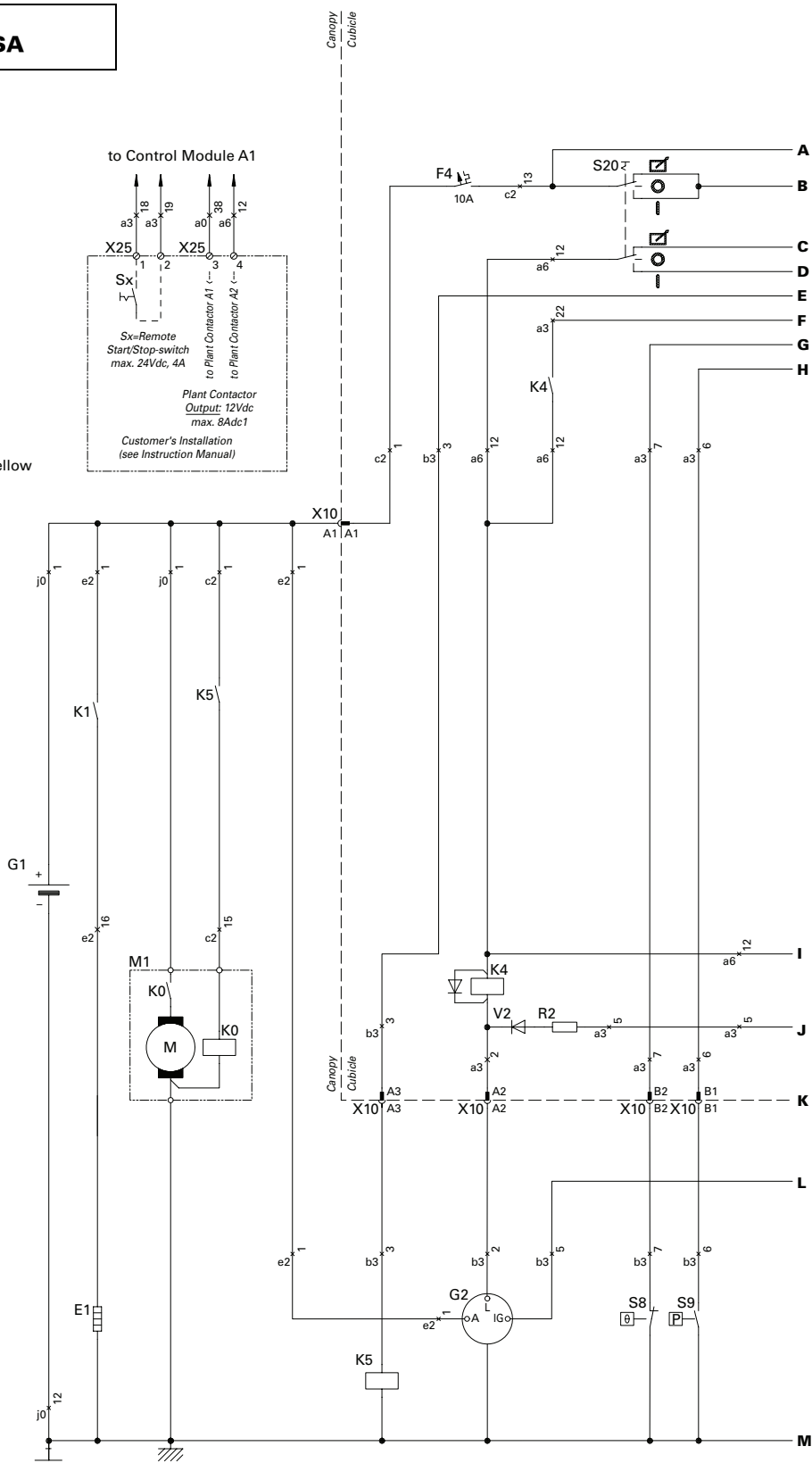


Wire size :

Colour code :

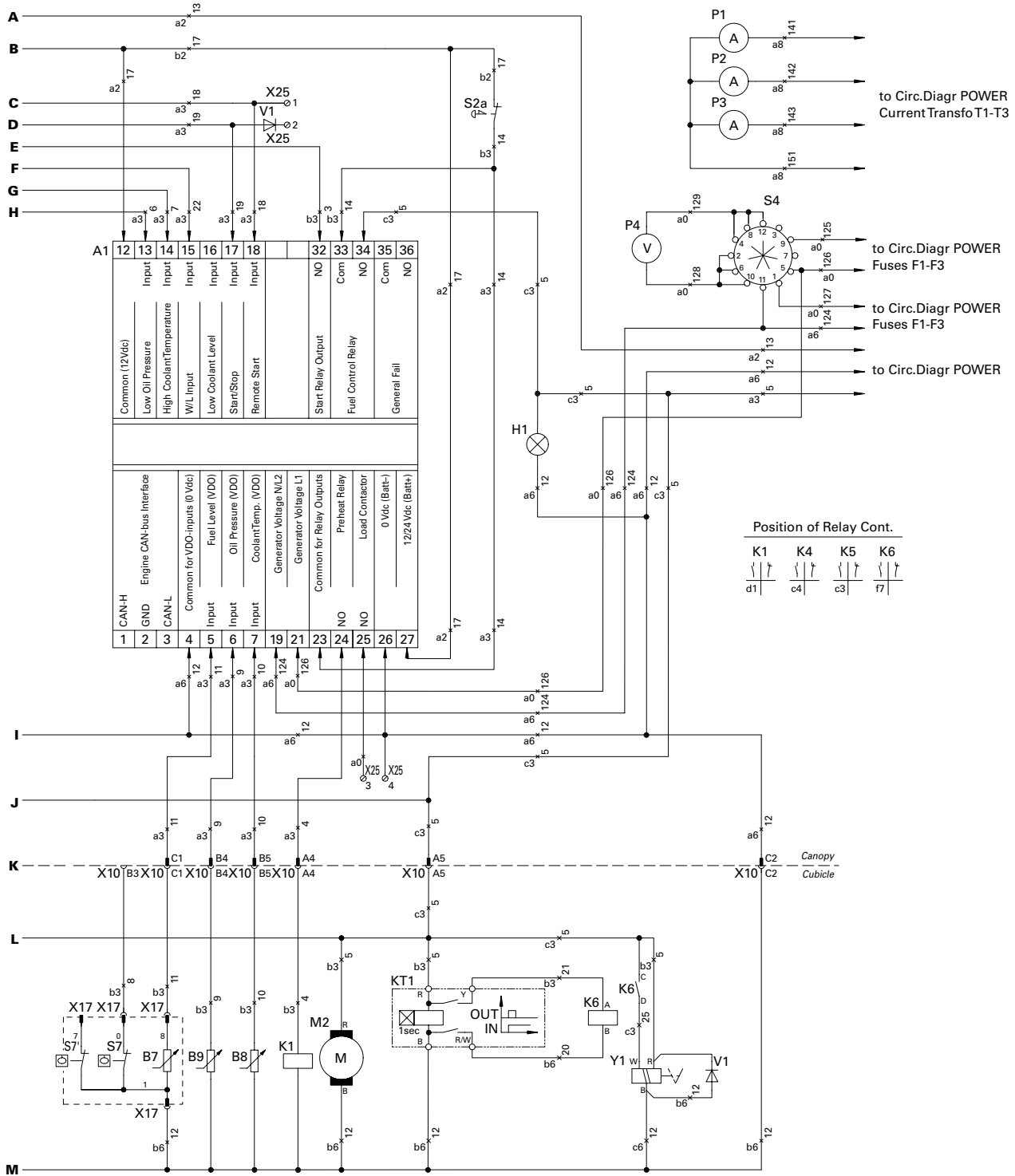
aa	=	0.5 mm ²
a	=	1 mm ²
b	=	1.5 mm ²
c	=	2.5 mm ²
d	=	4 mm ²
e	=	6 mm ²
f	=	10 mm ²
g	=	16 mm ²
j	=	50 mm ²

```
0 = black
2 = red
3 = orange
4 = yellow
5 = green
6 = blue
7 = purple
8 = grey
54 = green/yellow
```



A1	Generator control unit	G2	Charging alternator	KT1	Timer pull relay
B7	Fuel level sensor	H1	Panel light	M1	Starter motor
B8	Coolant temperature sensor	K0	Starter solenoid	M2	Fuel feed pump
B9	Oil pressure sensor	K1	Preheat relay	P1-3	A-meter
E1	Preheat resistor	K4	W/L inverter relay	P4	V-meter
F4	Fuse	K5	Starter relay	R2	Excit. resistor 47 ohm
G1	Battery 12 V	K6	Aux. relay pull solenoid		

CIRCUIT DIAGRAM



S2a	Emergency stop button (S2b, Power Circ.)	S8	Coolant high temperature switch	X10	Connector wire harness
S4	V-meter change-over switch	S9	Engine oil low pressure switch	X17	Fuel level unit connector
S7	Low fuel level switch	S20	ON/OFF/Remote switch	X25	Customer's terminal strip
S7'	Low fuel level switch, warning	V1	Free-wheeling diode	Y1	Fuel stop solenoid
		V2	Diode		

CIRCUIT DIAGRAM

Automatic voltage regulator

