**Instruction Manual**
**for AC Generators**

# QAS14 Yd(S)
# QAS14 YdS IT



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ATLAS COPCO - PORTABLE AIR DIVISION
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*Congratulations on the purchase of your QAS14 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

# 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 neet. 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.

## 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.

## 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. Currect 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.

## 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 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

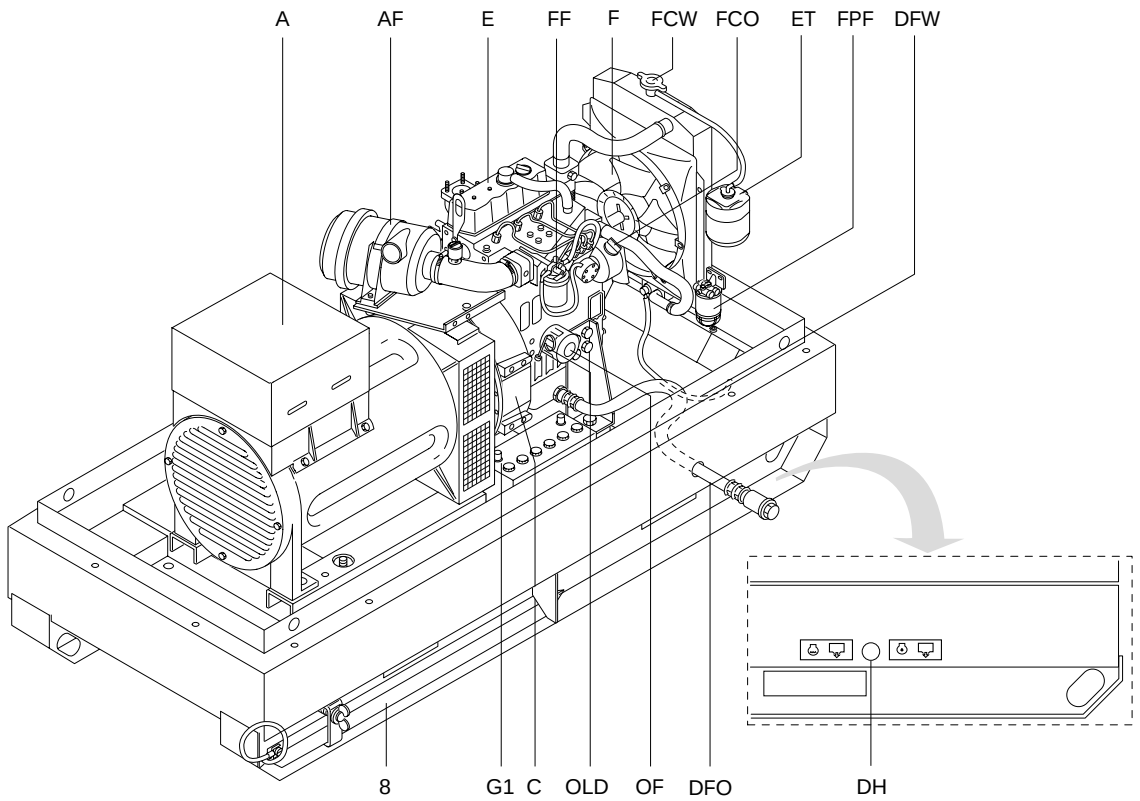
The QAS14 is an AC generator, built for continuous running at sites where no electricity is available or as stand-by in cases of interruption of the mains.

The generator operates at 50/60 Hz, 230/220 V in line-to-neutral mode and 400/480 V in line-to-line mode. The rated output is 13/16 kVA.

The QAS14 generator is driven by a water-cooled diesel engine, manufactured by YANMAR.

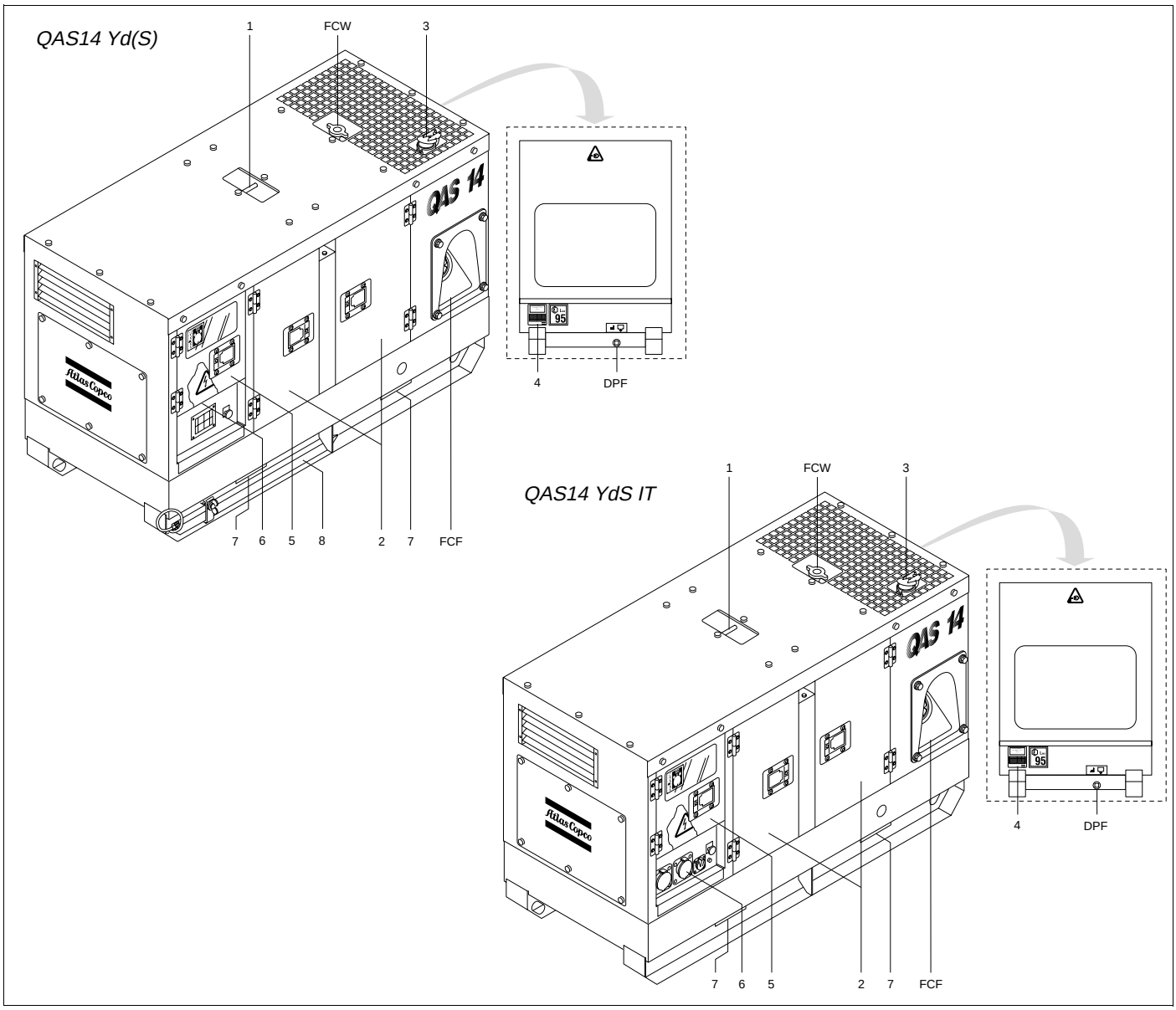
An overview of the main parts is given in the diagram below.

*QAS14 Yd(S) & QAS14 YdS IT*




| | |
|---|---|
| 8 | Earthing rod (QAS14 Yd(S)) |
| 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) |
| E | Engine |
| ET | Expansion tank engine cooling system |
| F | Fan |
| FCO | Filler cap engine |
| FCW | Filter cap cooling water |
| FF | Fuel filter |
| FPF | Fuel pre-filter |
| G1 | Battery |
| OF | Oil filter |
| OLD | Engine oil level dipstick |

The QAS14 AC generator is available in 2 versions: QAS14 Yd(S) and QAS14 YdS IT. Some parts of the unit are different, depending on which version.




*QAS14 Yd(S)*

| | |
|---|---|
| 1 | Lifting rod |
| 2 | Side doors |
| 3 | Engine exhaust |
| 4 | Data Plate |
| 5 | Side door, access to control and indicator panel |
| 6 | Output terminal board |
| 7 | Hole for forklift |
| 8 | Earthing rod |
| DPF | Drain plug fuel |
| FCF | Filler cap fuel |
| FCW | Filler cap cooling water |

*QAS14 Yd IT*

| | |
|---|---|
| 1 | Lifting rod |
| 2 | Side doors |
| 3 | Engine exhaust |
| 4 | Data Plate |
| 5 | Side door, access to control and indicator panel |
| 6 | Output terminal board |
| 7 | Hole for forklift |
| DPF | Drain plug fuel |
| FCF | Filler cap fuel |
| FCW | Filler cap cooling water |

## 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.

To be able to lift the QAS14 by means of a forklift, rectangular holes are provided in the frame.

*QAS14 Yd(S)*

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

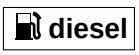
## MARKINGS

A brief description of all markings provided on the QAS14 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 (eg. engine, cooler, etc.). Always make sure that these parts are cooled down before touching them.




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

Indicates the drain for the engine oil.

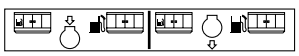
Indicates the drain for the coolant.

Indicates the drain plug for the engine fuel.

Indicates the different earthing connections on the generator.

Indicates the lifting eye of the generator

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



Indicates the 3-way valve.

## 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.

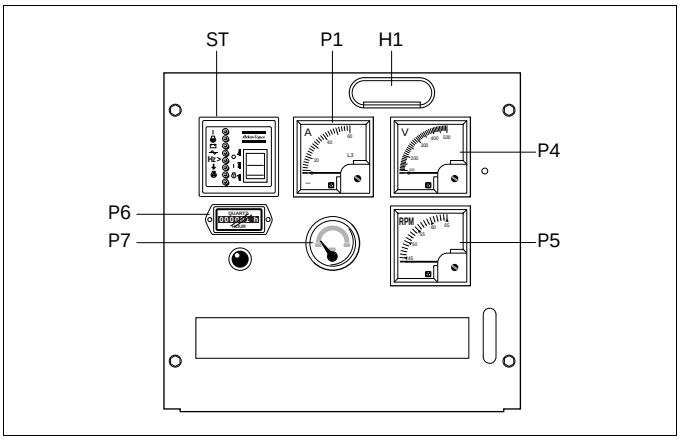
The drain flexible for engine oil can be brought to the outside of the generator through the drain hole.

**The drain hole can also be used to guide external fuel tank connections. When connecting an external fueltank, use the 3-way valves. Refer to the option "External fueltank connection".**

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.

## CONTROL AND INDICATOR PANEL

The control and indicator panel is located behind a door in the side panel. The hinged door is partly transparent and allows easy access to the parts mounted behind it. Panel light H1 lights up as soon as the starter switch is turned into position I, indicating that the fuel solenoid is energized.




### Engine gauges

*P6..... Hourmeter*

*P7..... Fuel level gauge*

## Generator gauges

*P1 ..... Ammeter line L3*

Indicates the outgoing current in the third phase (L3).

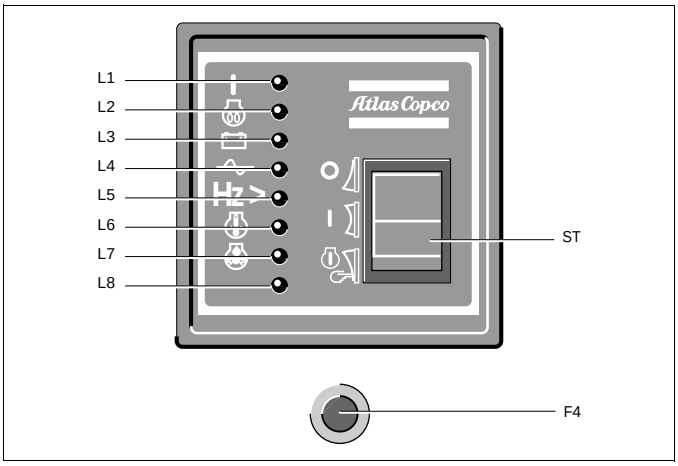
*P4 ..... Voltmeter*

Indicates the voltage between L1 and L3.

*P5 ..... Frequency / RPM meter*

Indicates the frequency of the supply voltage and the speed of the engine.

## Engine controls and lamps




*ST ..... Starter switch*

The starter switch is a three-position switch.

O : the voltage supply from the battery is switched off.

I : the electrical system of the engine, except the starting circuit is energized.

⏱ : the starter motor is energized. As soon as the engine fires, the switch can be released. The switch automatically returns to position I.

**After approximately 20 seconds in position ⏱ without starting, the control system will automatically shut down (battery saving purpose) indicating a low oil pressure failure. In this case, a reset of the control system by putting the switch in position O is necessary.**

*F4 ..... Fuse*

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

*L1 ..... Electrical system indicator*

Lights up when the electrical system of the engine is energized.

*L2..... Engine preheating system indicator*

Lights up when the glow plugs in the engine, used to facilitate starting, are warming up. Extinguishes after approximately 10 seconds. Bypassing of the preheattime is allowed e.g. when starting a hot engine, but the preheat system remains active.

*L3..... Alternator charging indicator*

Goes out after starting, indicating that the alternator is charging. A failing alternator however will not shut the engine down.

*L4..... AC shut down indicator*

Lights up when no AC input (< 75 V line-to-neutral) is present.

*L5..... Overspeed shut down indicator*

Lights up when the engine's speed has exceeded 115 % of the nominal speed. The nominal speed is determined by means of the dipswitch at the back of the control module (50 Hz or 60 Hz).

*L6..... Engine coolant temperature fault indicator*

Lights up when the high engine coolant temperature was the cause of shut down.

*L7..... Engine oil pressure fault indicator*

Lights up when the low engine oil pressure was the cause of shut down.

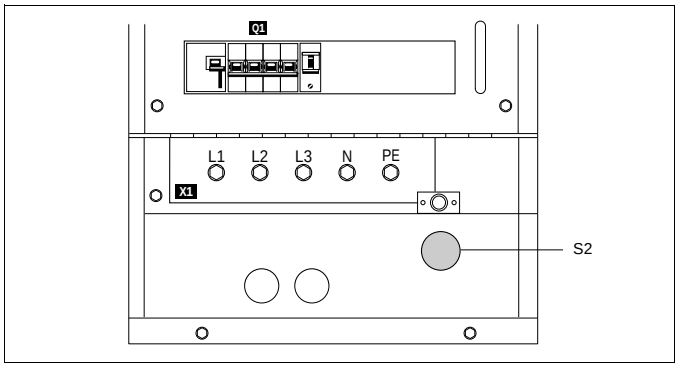
*L8..... Spare shut down indicator*

Can be used to wire an extra shut down, e.g. for low fuel level in case a switch is incorporated in the fuel tank.

## OUTPUT TERMINAL BOARD

*QAS14 Yd(S)*

The output terminal board is 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. The emergency stop button can be secured in the locked position with the key, to avoid unauthorized use. Use this button only in case of an emergency.

*Q1 ..... Main circuit breaker and minimum voltage relay*

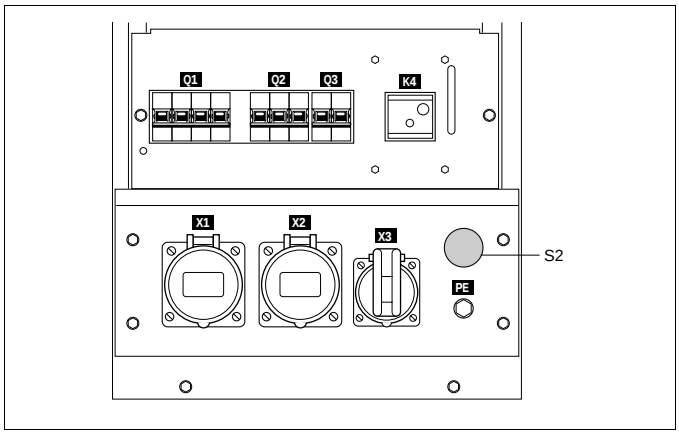
Interrupts the power supply to X1 when a short-circuit occurs at the load side, or when the earth leak detector (30 mA) or the overcurrent protection (20 A) is activated or when the DC hold coil is not energized. It must be reset manually after eliminating the problem and after each start.

*X1..... Main power supply (400 V AC)*

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

*QAS14 YdS IT*

The output terminal board is situated below the control and indicator panel.




*K4..... Insulation monitoring relay*

Checks the insulation resistance and activates Q1 when the insulation resistance is too low.

*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. The emergency stop button can be secured in the locked position with the key, to avoid unauthorized use. Use this button only in case of an emergency.

*Q1 ..... Circuit breaker for X1*

Interrupts the power supply X1 when a short-circuit occurs at the load side, or when the overcurrent protection (20 A) is activated. When activated, Q1 interrupts the three phases towards X1. It must be reset manually after eliminating the problem.

*Q2 ..... Circuit breaker for X2*

Interrupts the power supply X2 when a short-circuit occurs at the load side, or when the overcurrent protection (16 A) is activated. When activated, Q2 interrupts the three phases towards X2. It must be reset manually after eliminating the problem.

*Q3 ..... Circuit breaker for X3*

Interrupts the power supply X3 when a short-circuit occurs at the load side, or when the overcurrent protection (16 A) is activated. When activated, Q3 interrupts phases L3 and the neutral towards X3. It must be reset manually after eliminating the problem.

*X1..... 3-phase outlet socket (400 V AC)*

Provides phases L1, L2, and L3, neutral and earthing

*X2..... 3-phase outlet socket (400 V AC)*

Provides phases L1, L2, and L3, neutral and earthing

*X3..... 1-phase outlet socket (230 V AC)*

Provides phase L3, neutral and earthing

# 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.**

*QAS14 Yd(S)*

**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.**

*QAS14 YdS IT*

**At each start-up and any time a new load is connected, the insulation resistance must be verified. Check for the correct setting of the insulation monitoring relay.**

**The generator is wired for an IT network i.e. no supply lines of the power supply are directly earthed. A failure in insulation resulting in too low an insulation resistance, is detected by the insulation monitoring relay.**

**The generator shall not be operated with other networks (such as TT or TN). Doing so will cause tripping of the insulation monitoring relay.**

## 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.

*QAS14 Yd(S)*

– Install the earthing rod as near as possible to the generator and measure its diffusion resistance (max. 1 kΩ) in order not to have a contact voltage higher than 25 V at 30 mA leakage current.

– Check that the cable end of the earthing rod is connected to the earth terminal.

*QAS14 YdS IT*

– Check the setting of the insulation monitoring relay (factory set at 13 kΩ).

## 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 (mm²)* | *2,5* | *4* | *6* | *10* | *16* | *25* | *35* | *50* | *70* | *95* |
|---|---|---|---|---|---|---|---|---|---|---|
| *Max. current (A)* | | | | | | | | | | |
| *Multiple core* | *22* | *30* | *38* | *53* | *71* | *94* | *114* | *138* | *176* | *212* |
| *Single core* | *25* | *33* | *42* | *57* | *76* | *101* | *123* | *155* | *191* | *228* |
| *H07 RN-F* | *21* | *28* | *36* | *50* | *67* | *88* | *110* | *138* | *170* | *205* |

The lowest acceptable wire section and the corresponding maximum cable or conductor length for multiple core cable or H07 RN-F, at rated current (20 A), for a voltage drop e lower than 5 % and at a power factor of 0.80, are respectively 2.5 $mm^2$ 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 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.

*QAS14 Yd(S)*

– 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.

*QAS14 YdS IT*

– Fit the cable plug into the corresponding socket X1, X2 or X3.

## 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 waterdamp 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.

*QAS14 Yd(S)*

– Check that circuit breaker Q1 is switched off.

*QAS14 YdS IT*

– Check that circuit breaker Q1, Q2 and Q3 are switched off.

## STARTING

– Put the starter switch in position I. The instrument panel lights light up, the fuel solenoid is energized and the preheating of the engine starts. After approximately 10 seconds, the preheat lamp on the engine control module goes out.

– Push down the starter switch into position ⏱ and release it as soon as the engine fires. The switch automatically returns to position I.

**Do not keep the switch in its utmost position for more than 10 seconds (maximum 20 seconds in extremely cold conditions). Wait two minutes between each starting attempt.**

**When the ambient temperature is below 0 °C, start the engine as follows: put the starter switch in position I until the preheat lamp goes out. Put the switch back into position O and then immediately put it into position ⏱ . Release the switch as soon as the engine fires.**

**If the engine fails to start and for starting in extremely cold conditions, consult your local Atlas Copco dealer.**

– Check that the warning lamps on the control and indicator panel are out.

– Run the engine for approximately 5 minutes to warm up.

– Check the voltmeter P4 and the frequency meter P5.

*QAS14 Yd(S)*

– Switch circuit breaker Q1 to off and then to on.

– Switch on the load and check the ammeter P1, voltmeter P4 and frequency meter P5.

*QAS14 YdS IT*

– Switch on circuit breaker Q1, together with trip coil. If power supply is done by means of X2 or X3, repectively switch on Q2 or Q3 as well.

– Switch on the load and check the ammeter P1, voltmeter P4 and frequency meter P5.

## 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 cooling water.

– 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 side doors may only remain opened for short periods during operation, to carry out checks for example.

## STOPPING

– Switch off the load.

– Switch off circuit breakers.

– Let the engine run for about 5 minutes.

– Stop the engine by putting the starter switch in position O.

– Lock the side doors and the door of the indicators and control panel to avoid unauthorized access.

# MAINTENANCE

**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 | Small | Normal | Yearly |
|---|---|---|---|---|---|
| | | *50 hours* | *250 hours* | *500 hours* | *2000 hours* |
| **SERVICE PAK** | **-** | **With unit** | **2912 4112 05** | **2912 4113 06** | **2912 4114 07** |
| 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. | | | | | |
| 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** | | | | | ⚠ |

(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.

## 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.

## (*) 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 5 MΩ.

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

# 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 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.

# 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, odors, 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 (eg. 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 FREQUENCYMETER P5

– Run the unit at normal speed.

– Put a voltmeter in parallel with frequencymeter P5.

– If the measured voltage is higher than 200 V, the frequencymeter has to work properly.

  If not, remove the frequencymeter, connect it with the mains (230 V) and check that it indicates 50 Hz.

## CHECKING AMMETER P1

– Measure during the load, by means of a clamp-on probe, the outgoing current in the third phase (L3).

– Compare the measured current with the current indicated on ammeter P1. Both readings should be the same.

## ALTERNATOR TROUBLE SHOOTING

| *Symptom* | Possible cause | Corrective action |
|---|---|---|
| *Alternator does not excite.* | Blown fuse. | Replace fuse. |
| | Insufficient residual voltage. | Increase the speed by 15 %. |
| | No residual voltage. | 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. |
| *After being excited alternator does not excite.* | Connections are interrupted. | Check connection cables as per attached drawings. |
| *Low voltage at no load.* | Voltage potentiometer out of setting. | Reset voltage. |
| | Intervention of protection. | Check rpm. |
| | 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 4 % 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. |

## ENGINE TROUBLE SHOOTING

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 water 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 approximately 15 seconds**

– Bad connection towards oil pressure switch/coolant temperature switch.
– DIP switch on back of module wrong positioned.

# OPTIONS AVAILABLE FOR QAS14 UNITS

## CIRCUIT DIAGRAMS

The engine control circuit diagrams and the power circuit diagrams for the standard QAS14 unit, for the units with options and for the units with combined options are:

| *Unit* | *Power circuit* | *Engine control circuit* |
|---|---|---|
| QAS14 Yd (standard unit) | 9822 0888 01 | 9822 0888 07 |
| QAS14 Yd RS | 9822 0888 01 | 9822 0888 08 |
| QAS14 Yd AMF | 9822 0888 01 | 9822 0888 09 |
| | 9822 0773 55 | |
| QAS14 Yd DV DF RS | 9822 0888 04 | 9822 0888 08 |
| QAS14 YdS | 9822 0888 01 | 9822 0888 07 |
| QAS14 YdS SF | 9822 0888 01 | 9822 0888 07 |
| QAS14 YdS RS | 9822 0888 01 | 9822 0888 08 |
| QAS14 YdS IT | 9822 0888 02 | 9822 0888 07 |

## OVERVIEW OF THE ELECTRICAL OPTIONS

The following “electrical” options are available for the QAS14 unit:

– outlet sockets (S)
– remote start (RS)
– automatic mains failure (AMF)
– single frequency with electronic speed control (SF)
– dual frequency with electronic speed control (DF)
– dual voltage (DV)

## DESCRIPTION OF THE ELECTRICAL OPTIONS

### Outlet sockets (S)

The “Outlet sockets” option provides the following extra outlet sockets and circuit breakers:

*X1 .....3-phase outlet socket (400 V AC)*

Provides phases L1, L2 and L3, neutral and earthing.

*X2 .....3-phase outlet socket (400 V AC)*

Provides phases L1, L2 and L3, neutral and earthing.

*X3 .....1-phase outlet socket (230 V AC)*

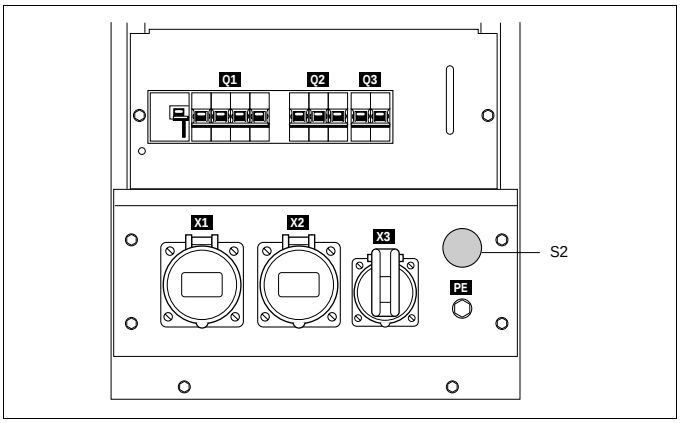
Provides phase L3, neutral and earthing.

*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 (16 A) is activated. When activated, Q2 interrupts the three phases 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 (16 A) is activated. When activated, Q3 interrupts phase L3 and the neutral towards X3. It can be activated again after eliminating the problem.




**When the sockets-option is installed, circuit breaker Q1 does not only interrupt the power supply towards X1 but also towards X2 and X3.**

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

## Remote start (RS)

The “Remote start” option allows to switch the unit on or off without using the control panel located on the unit. The start module of the control panel is replaced by a special module which provides extra connections for the remote start/stop switch and the plant contactor (voltage free contact), both to be installed by the customer.

**The plant contactor should be sized according to the load. The maximum current through the voltage free contact is 3 A.**

**The remote start/stop switch Sx has to meet the following specifications: 12 V DC, 4 A.**

**Refer to the circuit diagram for the correct connection of the plant contactor and the remote start/stop switch.**

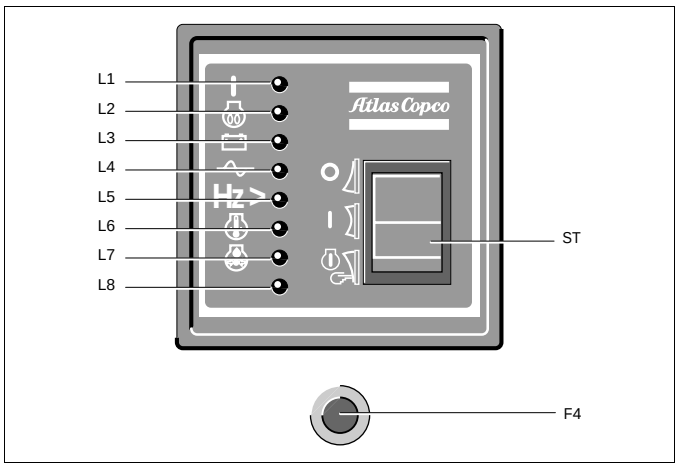
**The minimum voltage relay on the main circuit breaker of the standard unit is eliminated and replaced by a current coil which switches off Q1 in case of an emergency stop or an earth fault.**

### *The different positions of the starter switch ST are:*

– ⏱: used to select normal start and to disable remote start.

– O : used to switch off the power supply from the battery. The unit will not be able to start up.

– ⏱: used to select remote start.




### *To start up the unit locally, without using the remote start/stop switch, proceed as follows:*

– Switch off circuit breaker Q1. This is not necessary when a plant contactor is installed between Q1 and the load.

– Put the starter switch in position ⏱. 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.

– Approximately 15 seconds after starting (stabilisation time for the generator), the timer relay closes the voltage free contact and the plant contactor is energized (if installed).

– Switch on circuit breaker Q1 in case no contactor is installed.

### *To stop the unit when the starter switch is in position ⏱, 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 in position O.

– Lock the side doors and the door of the indicators and control panel to avoid unauthorized access.

### *To start up the unit from a remote location using the remote start/stop switch, proceed as follows:*

– Put the starter switch 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.

– Approximately 15 seconds after starting (stabilisation time for the generator), the timer relay closes the voltage free contact and the plant contactor is energized (if installed).

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

– Switch off the load.

– Let the engine run for about 5 minutes.

– Stop the engine by putting the remote start/stop switch in position stop or by putting the starter switch in position O.

## Automatic mains failure (AMF)

The "Automatic mains failure" option offers the following features:

– continuous monitoring of four input lines

– an automatic battery charger, "trickle charge"

– an engine cooling water heating

– an extended control module

– a remote start possibility

### *Continuous monitoring*

The "Automatic mains failure" option continuously monitors four input lines of the main power supply: the three phases and neutral.

When the mains (one or all phases) is not available for approximately 0.5 seconds, the following timing applies:

– The mains contactor opens and disconnects the load from the mains.

– The unit starts 3 seconds (crank delay) after the mains failure. If the unit does not start immediately, it will carry out another 3 starting attempts, each consisting of 10 seconds cranking and 5 seconds interval (crank time).

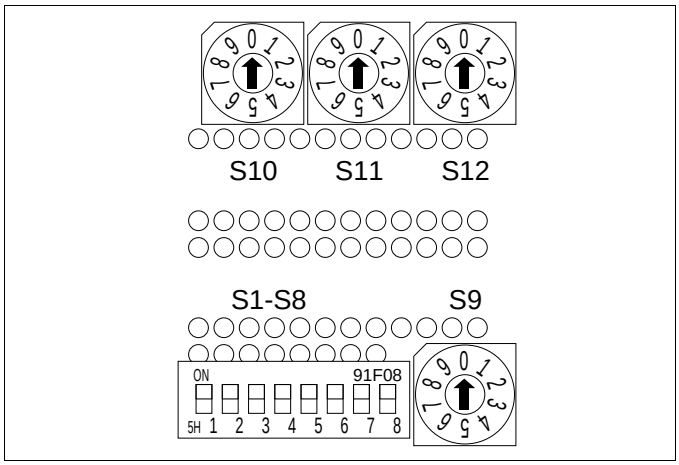
– After 10 seconds generator stabilisation time (plant settle time), the generator contactor is energized and the generator supplies power towards the load.

When the mains (all phases) is available again for at least 10 seconds (mains restore time), the following timing applies:

– The generator contactor opens and the mains contactor closes (1 second change over time).

– The generator shuts down 1 minute later (delay run on time).

The timing can be adjusted by means of the potentiometers located at the back of the AMF control module:




*S9 .....Crank timer*

*S10 ....Plant settle timer*

*S11 ....Mains restore timer*

*S12 ....Delay run on timer*

The table below summarises the relation between the position of the potentiometers and the value of the timers.

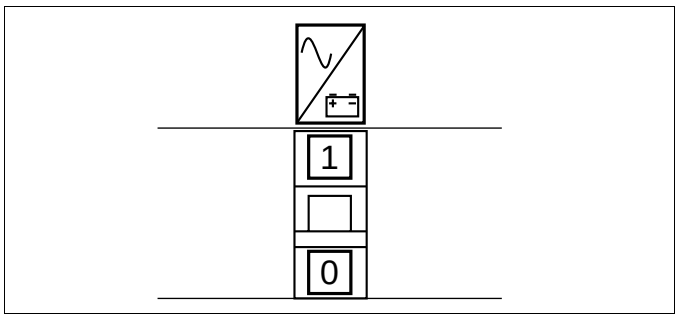
| Potentiometer | S9 | | S10 |
|---|---|---|---|
| Position | Crank delay | Crank time | Plant settle time |
| 0 | 3 sec | 10 sec | 10 sec |
| 1 | 10 sec | 10 sec | 15 sec |
| 2 | 10 sec | 15 sec | 20 sec |
| 3 | 15 sec | 10 sec | 25 sec |
| 4 | 15 sec | 15 sec | 30 sec |
| 5 | 25 sec | 10 sec | 35 sec |
| 6 | 25 sec | 15 sec | 40 sec |
| 7 | 25 sec | 25 sec | 45 sec |
| 8 | 50 sec | 15 sec | 50 sec |
| 9 | 50 sec | 25 sec | 60 sec |

| Potentiometer | S11 | S12 |
|---|---|---|
| Position | Mains restore time | Delay run on |
| 0 | 10 sec | 1 min |
| 1 | 20 sec | 2 min |
| 2 | 40 sec | 3 min |
| 3 | 1 min | 4 min |
| 4 | 2 min | 5 min |
| 5 | 3 min | 6 min |
| 6 | 4 min | 7.5 min |
| 7 | 7.5 min | 10 min |
| 8 | 10 min | 12.5 min |
| 9 | 15 min | 15 min |

**The timers are factory set at position 0.**

### *Automatic battery charger*

The “trickle charger” charges the battery completely and is disconnected once the unit starts up.




To prolong the lifespan of the batteries, the battery continuously discharges via the lock-out switch of the battery charger and a small resistor.

**When the unit is shut down for a longer period or will be stored, make sure to switch off the lock-out switch of the battery charger to prevent the battery from discharging completely.**

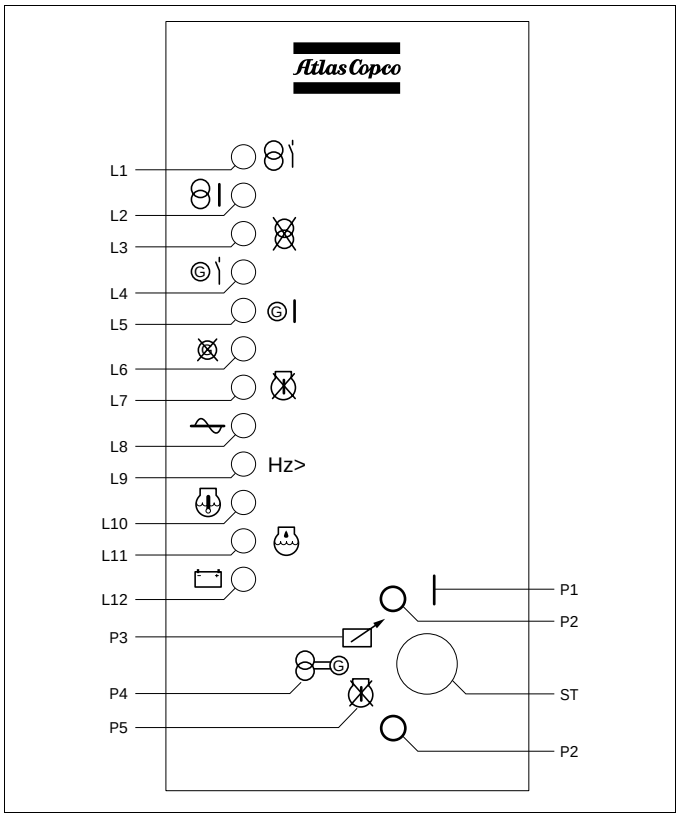
### *Engine cooling water heater*

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

### *Extended control module*

The standard control module is replaced by an extended module which allows more detailed control of the unit.

The controls and indicators on the AMF control module are:




*L1..... Mains available*

Lights up when the mains is available.

*L2..... Mains on load*

Lights up when the mains supplies power towards the load.

*L3 ..... Mains failed*

Lights up when a failure occured on the mains.

*L4 ..... Plant available*

Lights up when the generator is running.

*L5 ..... Plant on load*

Lights up when the generator supplies power towards the load.

*L6 ..... Plant fail*

Lights up when a failure occured on the generator.

*L7 ..... Start fail*

Indicates that four start attempts were not sufficient to start up the engine.

*L8 ..... Undervoltage shut down*

Lights up when AC input interruption or failure was the cause of shut down.

*L9 ..... Overspeed shut down*

Lights up when the engine's speed has exceeded 115 % of the nominal speed. The nominal speed is determined by means of the dipswitch S8 at the back of the control module.

*L10 .... Engine coolant temperature shut down*

Lights up when the high engine coolant temperature was the cause of shut down.

*L11 .... Engine oil pressure shut down*

Lights up when the low oil pressure was the cause of shut down.

*L12 .... Charge fail indicator*

Goes out after starting, indicating that the alternator is charging. A failing alternator however will not shut the engine down.

*ST..... Starter switch*

P1 : the generator starts immediately. The load will be transferred if a mains failure occurs.

P2 : the generator will never start.

P3 : the generator will start when the remote start/stop contact is closed.

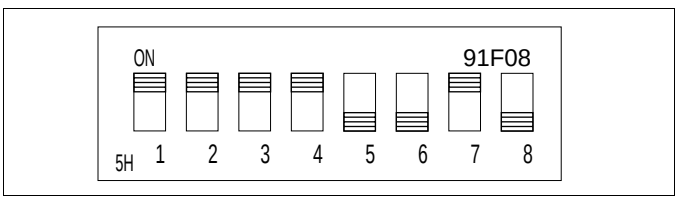
P4 : the generator will take over when a mains failure occurs.

P5 : the generator will not start when a mains failure occurs. Nevertheless, the mains remains monitored and the mains contactor will trip in case of a mains failure.

**Besides dipswitch S8, located at the back of the control module and used for the selection of the nominal speed (50 Hz or 60 Hz), dipswitch S1 can be used for enabling or disabling a spare shut down contact.**

**The contactors between the mains, the unit and the load are not included in the option but should be sized according to the load. Nevertheless, they are also available as sales kit at Atlas Copco. Refer to circuit diagram 9822 0773 55 of the "Automatic mains failure" option for the correct connection.**

For correct functioning of the module, the DIP switches at the back of the module should be positioned as follows:




***Remote start possibility***

The "Remote start" feature of the "Automatic mains failure" option allows to switch the unit on or off without using the control panel located on the unit. For this purpose, the control module provides a voltage free contact for the connection of the remote start/stop switch (to be installed by the customer).

The unit will start in case the contact is closed (start/stop switch in position start) and the starter switch of the control module is in position ⊿ (position P3).

## Single frequency with electronic speed control (SF)

The "Single frequency" option provides an electronic speed controller which makes sure that the output frequency of the generator is 50/60 Hz with an accuracy of 0.25 % at constant load.

*R11 .... Supply voltage adjust potentiometer*

Allows to adjust the output voltage.

## Dual frequency with electronic speed control (DF)

The "Dual frequency with electronic speed control" option allows the unit to work at 50 Hz or at 60 Hz with an accuracy of 0.25 % at constant load. The frequency selection is done by means of switch S11.

*R11 .... Supply voltage adjust potentiometer*

Allows to adjust the output voltage.

*S11 .... Frequency selector switch (50 Hz / 60 Hz)*

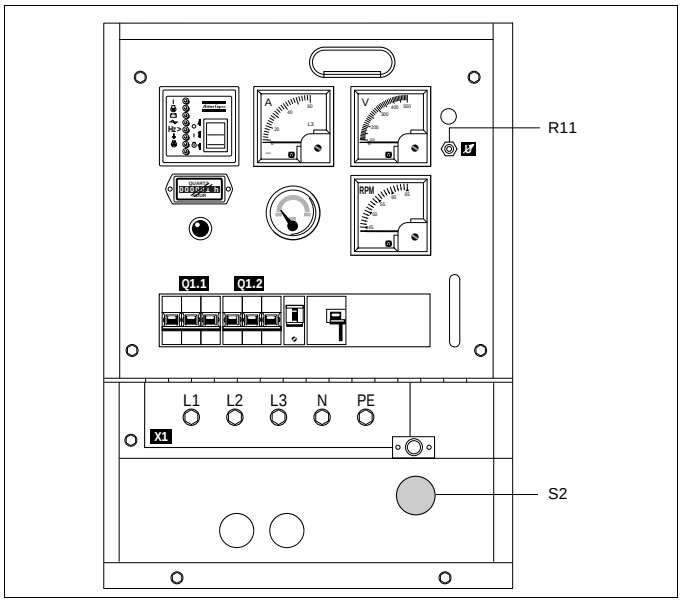
Allows to choose the frequency of the output voltage: 50 Hz or 60 Hz.

**Changing the output frequency is only allowed after shutdown.**

**After changing the output frequency, adjust the output voltage by means of potentiometer R11 to the required value.**

## Dual voltage (DV)

The "Dual voltage" option allows to select a high (3-phase, e.g. 400 V) or a low (3-phase, e.g. 230 V) output voltage.




*Q1.1 .. Circuit breaker for low voltage, high current*

Interrupts the low voltage power supply towards X1 when a short-circuit occurs at the load side or when the overcurrent protection (32 A) is activated. It must be reset manually after eliminating the problem and after each start.

*Q1.2 .. Circuit breaker for high voltage, low current*

Interrupts the high voltage power supply towards X1 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 and after each start.

*R11.... Output voltage adjust potentiometer*

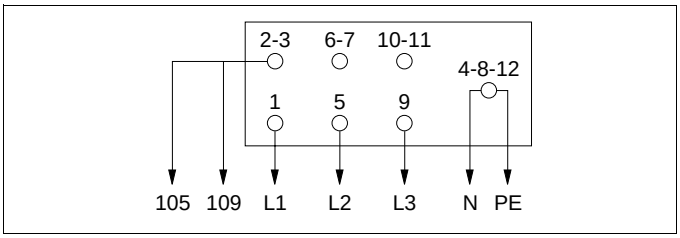
Allows to adjust the output voltage.

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).

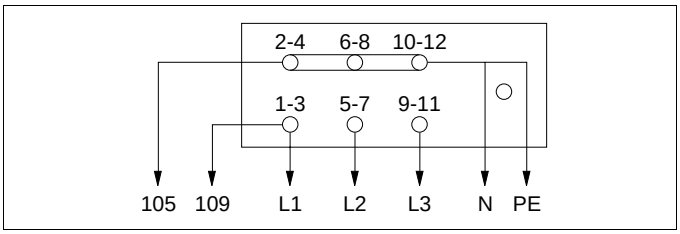
The selection of high or low voltage is done by means of connections on the terminal board of the alternator.

**Changing the output voltage is only allowed after shutdown.**

***To select high voltage, connect the terminal board as follows:***




***To select low voltage, connect the terminal board as follows:***




After changing the output voltage, adjust the output voltage by means of potentiometer R11 to the required value.

**The dual voltage option cannot be combined with the sockets option because the sockets may not be used at low voltage.**

## OVERVIEW OF THE MECHANICAL OPTIONS

The following "mechanical" options are available for the QAS14 units:

– external fueltank connection

– undercarriage (axle and towbar)

– lighting tower

## DESCRIPTION OF THE MECHANICAL OPTIONS

### External fueltank connection

The option "External fueltank connection" allows to bypass the internal fueltank and to connect an external fueltank to the unit.

When using this option, make sure to connect the fuel supply line as well as the fuel return line. Always put both valves in the same position (either internal or external tank) and make sure that they are in the extreme (horizontal) position. Connections to fuellines ought to be air-tight to prevent air from entering the fuel system.

Indicates the fuel supply line from the tank to the engine.

Indicates the fuel return line from the engine to the tank.

Indicates the internal fueltank.

Indicates the external fueltank.

### Undercarriage (axle and towbar)

The undercarriage is equipped with an adjustable towbar with DIN-eye, AC-eye or ball coupling and with road signalisation which is approved by EC legislation.

#### *When using this option:*

– Make sure that the towing equipment of the vehicle matches the towing eye before towing the generator.

– Never move the generator while electrical cables are connected to the unit.

– Always apply the hand brake when parking the generator.

– Leave enough space for operation, inspection and maintenance (at least 1 meter at each side).

#### *To maintain the undercarriage:*

– Check the tightness of the towbar bolts, the axle bolts and the wheel nuts at least twice a year and after the initial 50 hours of operation.

– Grease the wheel axle suspension bearings, the drawbar to the steering gear shaft and the spindle of the brake handle at least twice a year. Use ball bearing grease for the wheel bearings and graphite grease for the drawbar and spindle.

– Check the brake system twice a year.

– Check the condition of the vibration dampers twice a year.

– Repack the wheel hub bearings once a year using grease.

### Lighting tower

The "Lighting tower" option provides an undercarriage (frame, axle and towbar) and 6 halogen projectors of 1500 W each. The lighting tower is very useful for construction sites where no electricity nor lighting is available.

Before raising the tower, install the four props for stability. To switch the lamps on, plug the connector of the power supply cables towards the lamps in outlet socket X3 of the generator.

#### *To maintain the lighting tower:*

– Refer to the maintenance instructions mentioned in the chapter dealing with the "Undercarriage" option.

– Check the condition of the tower, the tightness of its bolts and the fixation of the elevation cable at least twice a year.

# TECHNICAL SPECIFICATIONS

## READINGS ON GAUGES

| *Gauge* | | *Reading* | *Unit* |
|---|---|---|---|
| Ammeter L3 (P3) | | Below max. rating | A |
| Voltmeter (P4) | | Depends upon selector switch | V |
| Frequencymeter (P5) | *50 Hz:* | Between 50 and 52.5 | Hz |
| | *60 Hz:* | Between 60 and 62.5 | Hz |
| Hourmeter (P6) | | Adding up | h |
| Fuel level (P7) | | Above 0 | Fuel tank full |

## SETTINGS OF SWITCHES

| *Switch* | *Function* | *Activates at* |
|---|---|---|
| Engine oil pressure | shut down | 0.5 bar |
| Engine coolant temperature | shut down | 105 °C |

## SPECIFICATIONS OF THE ENGINE/ALTERNATOR/UNIT

| | | *50 Hz* | *60 Hz* |
|---|---|---|---|
| *Reference values* | Absolute air inlet pressure | 100 kPa | 100 kPa |
| | Air inlet temperature | 27 °C | 27 °C |
| | Relative air humidity | 60 % | 60 % |
| | Generator load | Continuous | Continuous |
| *Limitations without derating* | Maximum ambient temperature | 40 °C | 40 °C |
| | Maximum altitude | 1000 m | 1000 m |
| | Maximum relative air humidity | 85 % | 85 % |
| | Minimum starting temperature | -18 °C | -18 °C |
| *Engine* | Type YANMAR | 3TNE88-ACG | 3TNE88-ACG |
| | Rated net output | 12.8 kW | 14.8 kW |
| | Load speed | 1500 rpm | 1800 rpm |
| | Electrical system | 12 V | 12 V |
| | Battery | 12 V / 66 Ah | 12 V / 66 Ah |
| | Oil circuit capacity | 7 l | 7 l |
| | Cooling circuit capacity | 3 + 1 l | 3 + 1 l |
| | Fuel tank capacity | 85 l | 85 l |
| | Fuse F4 | 10 A | 10 A |
| | Fuel consumption at full load/no load | 2.7/0.8 l/h | 3.3/1.0 l/h |
| | Maximum run time with fuel tank | 26 h | 21 h |
| *Alternator* | Type | ECN 28 S | ECN 28 S |
| | Rated net output | 16 kVA | 19 kVA |
| | Voltage line-to-neutral | 230 V | 220 V |
| | Voltage line-to-line | 400 V | 480 V |
| | Frequency | 50 Hz | 60 Hz |
| | Speed | 1500 rpm | 1800 rpm |
| | Power factor | 0.8 | 0.8 |
| | Number of phases | 3 + neutral | 3 + neutral |
| | Winding connections | Star | Star |
| | Insulation armature winding, class | H | H |
| | Insulation field winding, class | H | H |
| *QAS14 Yd(S):* | Sensitivity of earth leak detector | 30 mA | 30 mA |
| *QAS14 Yd(S):* | Maximum diffusion resistance of earthing rod | 1 kΩ | 1 kΩ |
| | Setting of Q1 | 20 A | 20 A |
| *QAS14 YdS IT:* | Setting of Q2 | 16 A | 16 A |
| *QAS14 YdS IT:* | Setting of Q3 | 16 A | 16 A |
| | Fuses F1, F3 | 4 A | 4 A |
| *QAS14 YdS IT:* | Sensitivity of insulation monitoring relay | 10 .... 100 kΩ | 10 .... 100 kΩ |

| | | | |
|---|---|---|---|
| *Unit* | Dimensions (LxWxH) | 1860 x 811 x 957 mm | 1860 x 811 x 957 mm |
| | Weight net mass | 670 kg | 670 kg |
| | Weight wet mass | 749 kg | 749 kg |

## SPECIFICATIONS OF THE OPTIONS

### Specifications of the sockets option

| | | | |
|---|---|---|---|
| *QAS14 Yd(S):* | Setting of circuit breaker Q2 | 16 A | 16 A |
| *QAS14 Yd(S):* | Setting of circuit breaker Q3 | 16 A | 16 A |

### Specifications of the dual frequency option

| | | | |
|---|---|---|---|
| *QAS14 Yd(S):* | Frequency | 50/60 Hz | 50/60 Hz |

### Specifications of the dual voltage option

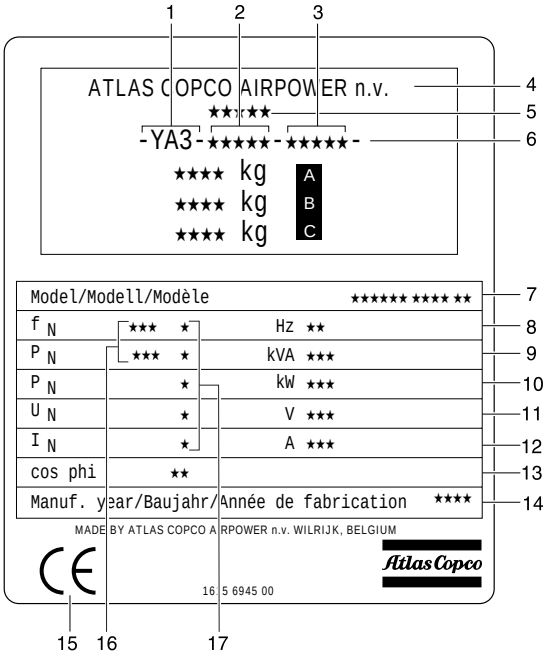
| | | | |
|---|---|---|---|
| *QAS14 Yd(S):* | Output voltage | 230/400 V | 220/480 V |
| *QAS14 Yd(S):* | Setting of circuit breaker Q1.1 | 32 A | 32 A |
| *QAS14 Yd(S):* | Setting of circuit breaker Q1.2 | 20 A | 20 A |

## 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 $m^3$/min | = | 35.315 cfm |
| 1 km/h | = | 0.621 mile/h | 1 mbar | = | 0.401 in wc |
| 1 kW | = | 1.431 hp (UK and US) | 1 N | = | 0.225 lbf |
| 1 l | = | 0.264 US gal | 1 Nm | = | 0.738 lbf.ft |
| 1 l | = | 0220 lmp gal (UK) | $t_{°F}$ | = | $32 + (1.8 \times t_{°C})$ |
| 1 l | = | 0.035 cu.ft | $t_{°C}$ | = | $(t_{°F} - 32)/1.8$ |

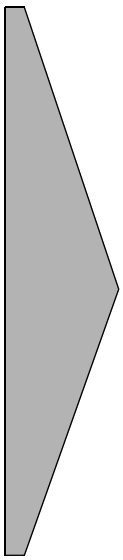
– A temperature difference of 1°C = a temperature difference of 1.8 °F

## DATAPLATE

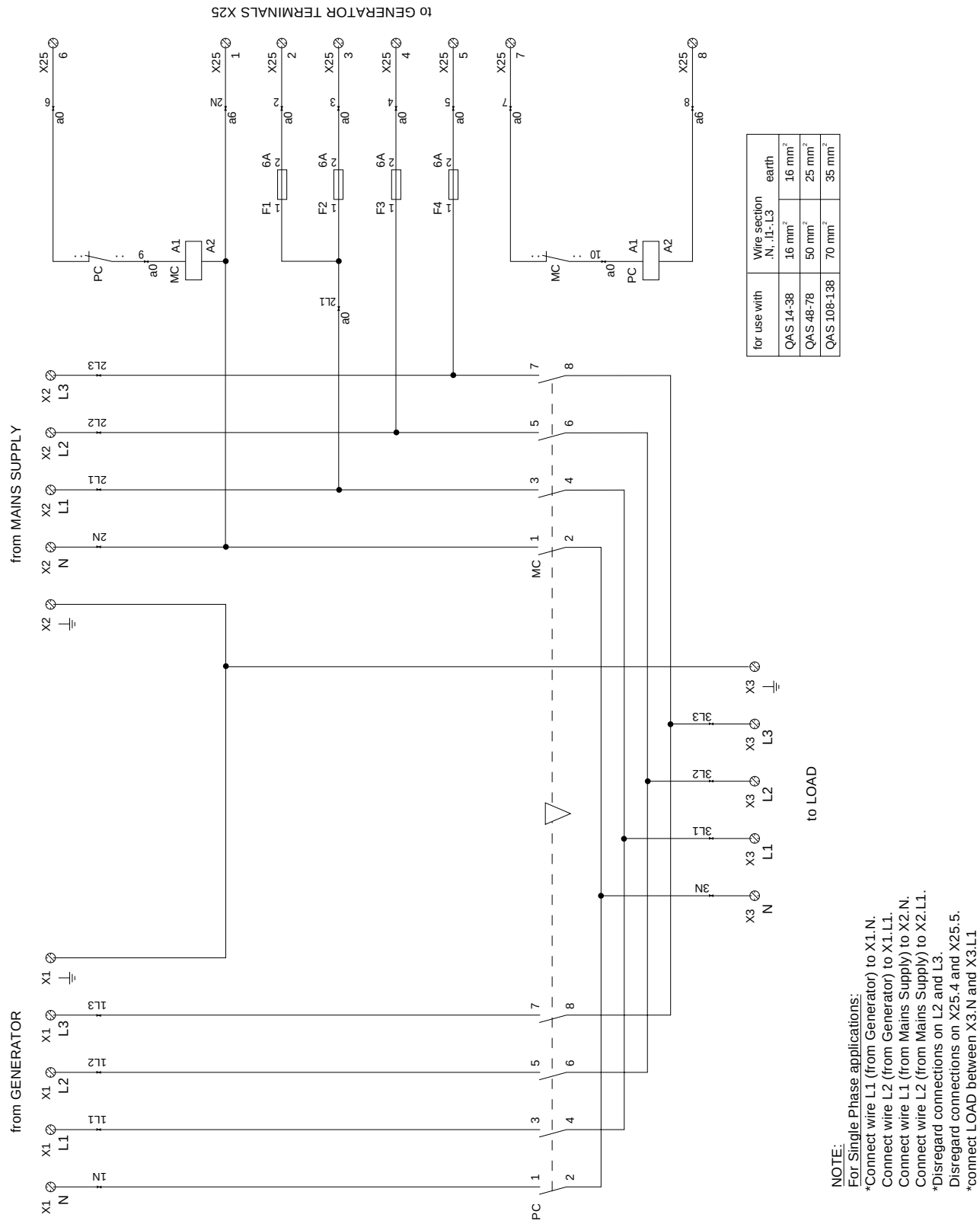



| | |
|---|---|
| A | Maximum permitted loaden weight of the vehicle |
| B | Maximum permitted road weight of the front axle |
| C | Maximum permitted road weight of the rear axle |
| 1 | Company code |
| 2 | Product code |
| 3 | Unit serial number |
| 4 | Name of the manufacturer |
| 5 | EEC or national type approval number |
| 6 | Vehicle identification number |
| 7 | Model number |
| 8 | Frequency |
| 9 | Apparant power - COP |
| 10 | Active power - COP |
| 11 | Nominal rated voltage |
| 12 | Nominal rated current |
| 13 | Power factor |
| 14 | Manufacturing year |
| 15 | EEC mark in accordance witt Machine Directive 89/392E |
| 16 | Mode of operation |
| 17 | Winding connections |

**Circuit diagrams**
**Elektrisch schema**
**Schéma de circuit**
**Schaltpläne**
**Esquema de conexiones**
**Kopplingsscheman**
**Diagrammi dei circuiti**
**Kretsskjema**
**Kredsløbsdiagrammer**
**Διαγράμματα κυκλωμάτων**
**Esquemas eléctricos**
**Sähkökaaviot**



**9822 0773 55**
**Applicable for Automatic Mains Failure (AMF)**




NOTE:
For Single Phase applications:
*Connect wire L1 (from Generator) to X1.N.
Connect wire L2 (from Generator) to X1.L1.
Connect wire L1 (from Mains Supply) to X2.N.
Connect wire L2 (from Mains Supply) to X2.L1.
*Disregard connections on L2 and L3.
Disregard connections on X25.4 and X25.5.
*connect LOAD between X3.N and X3.L1

CIRCUIT DIAGRAM
ELEKTRISCH SCHEMA
SCHEMA DE CIRCUIT
VERDRAHTUNGSPLAN
DIAGRAMA DE CIRCUITOS
KOPPLINGSSCHEMA

DIAGRAMMA DEL CIRCUITO
KRETSSKJEMA
STRØMDIAGRAM
ΔΙΑΓΡΑΜΜΑ ΚΥΚΛΩΜΑΤΟΣ
DIAGRAMMA DOS CIRCUITOS
SÄHKÖKAAVIO

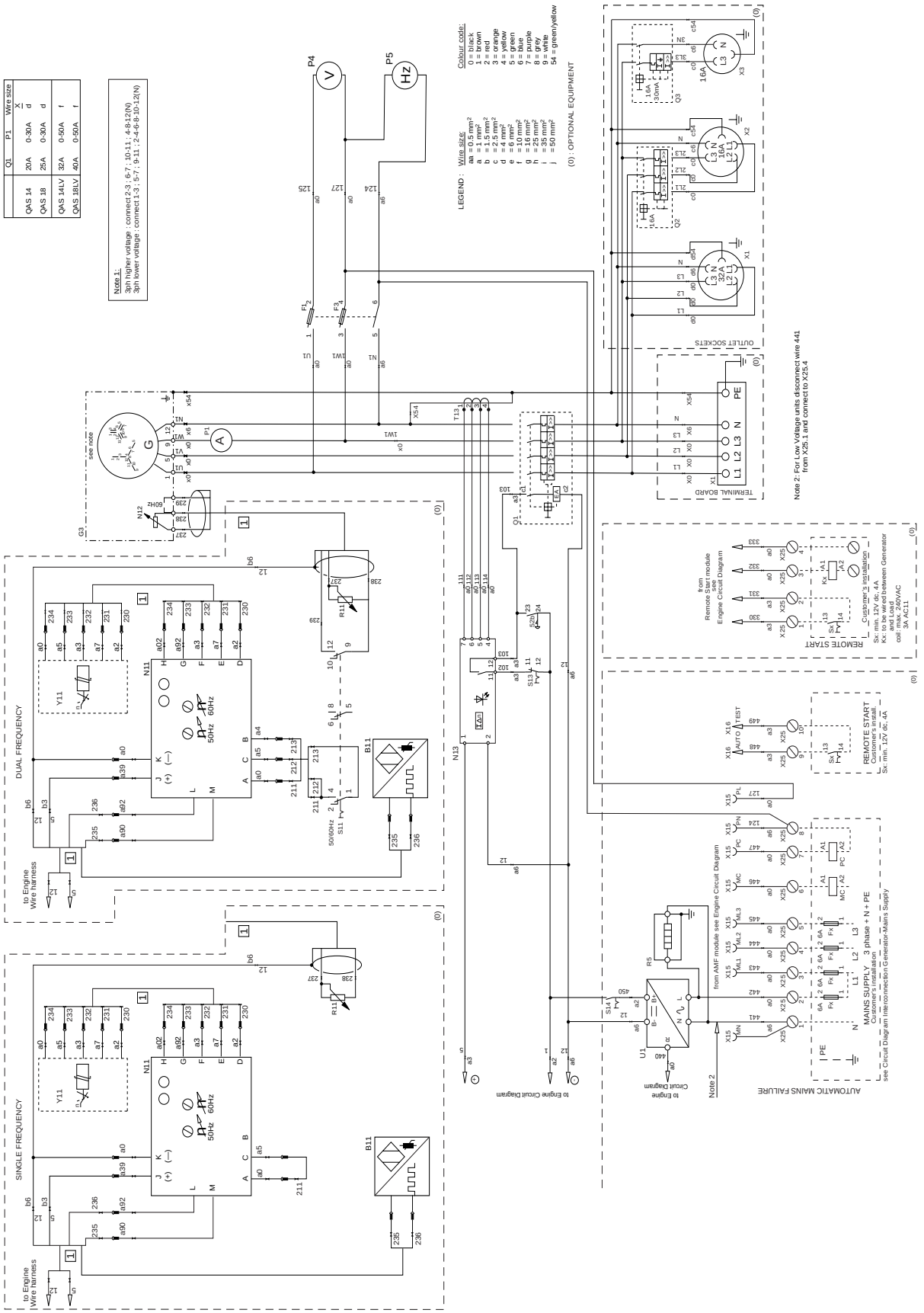
| | ENGLISH | NEDERLANDS | FRANCAIS | DEUTSCH |
|---|---|---|---|---|
| F1-4 | Fuse 6A | Zekering 6A | Fusible 6A | Sicherung 6A |
| MC | Contactor mains supply | Contactor voor de netspanning | Alimentation secteur de contacteur | Schütz Netzanschlub |
| PC | Contactor generator | Contactor voor de generator | Générateur de contacteur | Schütz Generator |
| X1 | Terminal strip | Klemmenstrook | Barrette de raccordement | Klemmenleiste |
| X2 | Terminal strip | Klemmenstrook | Barrette de raccordement | Klemmenleiste |
| X3 | Terminal strip | Klemmenstrook | Barrette de raccordement | Klemmenleiste |
| X25 | Terminal strip | Klemmenstrook | Barrette de raccordement | Klemmenleiste |

| | ESPAÑOL | SVENSKA | ITALIANO | NORSK |
|---|---|---|---|---|
| F1-4 | Fusible 6A | Säkring 6A | Fusibile 6A | Sikring 6A |
| MC | Suministro principal del contactor | Nätströmsanslutning | Alimentazione contattore | Kontaktorstrømforsyning |
| PC | Dínamo del contactor | Generatoranslutning | Generatore del contattore | Kontaktorgenerator |
| X1 | Bloque de terminales | Anslutningslist | Morsettiera | Koplingssplint |
| X2 | Bloque de terminales | Anslutningslist | Morsettiera | Koplingssplint |
| X3 | Bloque de terminales | Anslutningslist | Morsettiera | Koplingssplint |
| X25 | Bloque de terminales | Anslutningslist | Morsettiera | Koplingssplint |

| | DANSK | ΕΛΛΗΝΙΚΑ | PORTUGUÊS | SUOMI |
|---|---|---|---|---|
| F1-4 | Sikring 6A | Ασφάλεια 6 A | Fusível 6A | Varoke 6A |
| MC | Kontaktor til strømforsyning | Παροχή ηλεκτρικών αγωγών επαφέα | Contactor de corrente principal | Verkkosyötön liitin |
| PC | Kontaktor til generator | Γεννήτρια επαφέα | Contactor do gerador | Generaattorin liitin |
| X1 | Klemliste | Λωρίδα ακροδέκτη | Cablagem de terminais | Liitäntärima |
| X2 | Klemliste | Λωρίδα ακροδέκτη | Cablagem de terminais | Liitäntärima |
| X3 | Klemliste | Λωρίδα ακροδέκτη | Cablagem de terminais | Liitäntärima |
| X25 | Klemliste | Λωρίδα ακροδέκτη | Cablagem de terminais | Liitäntärima |

**9822 0773 55**

**9822 0888 01**
**Applicable for QAS14 Yd(S), Yd(S) RS, YdS SF, Yd AMF**



CIRCUIT DIAGRAM
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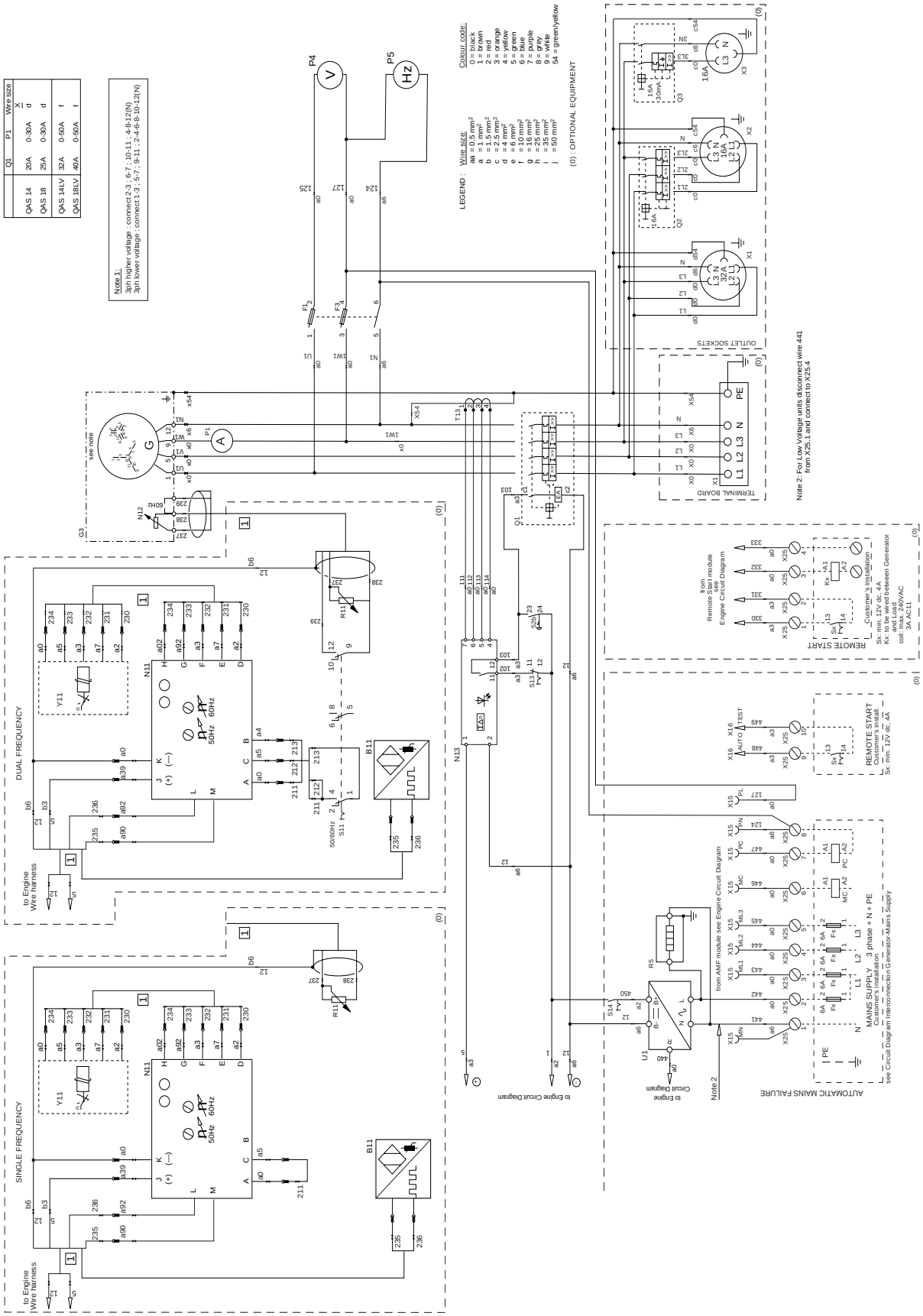
DIAGRAMMA DOS CIRCUITOS
SÄHKÖKAAVIO

| | ENGLISH | NEDERLANDS | FRANCAIS | DEUTSCH |
|---|---|---|---|---|
| B11 | Speed sensor | Snelheidssensor | Capteur de vitesse | Drehzahlfühler |
| F1,F3 | Fuse 4A | Zekering 4A | Fusible 4A | Sicherung 4 A |
| G3 | Generator | Generator | Groupe électrogène | Generator |
| N11 | Speed controller | Snelheidsregelaar | Régulateur de vitesse | Drehzahlregler |
| N12 | Automatic voltage regulator | Automatische spanningsregelaar | Régulateur de tension automatique | Automatischer Spannungsregler |
| N13 | Earth fault-current relay | Aardlekrelais | Relais de fuite à la terre | Erdschlußrelais |
| P1 | Amperemeter 0-500A | Ampèremeter 0-500A | Ampèremètre 0-500A | Amperemeter 0 - 500A |
| P4 | Voltmeter 0-500V | Voltmeter 0-500V | Voltmètre 0-500V | Voltmeter 0 - 500 V |
| P5 | Frequencymeter 45-65Hz | Frekwentiemeter 45-65Hz | Fréquencemètre 45-65Hz | Frequenzmesser 45 - 65 Hz |
| Q1 | Circuit breaker | Vermogenschakelaar | Disjoncteur | Leistungsschalter |
| Q2 | Circuit breaker | Vermogenschakelaar | Disjoncteur | Leistungsschalter |
| Q3 | Circuit breaker | Vermogenschakelaar | Disjoncteur | Leistungsschalter |
| R5 | Engine Coolant Heater | Verwarmer motorkoelvloeistof | Réchauffeur de réfrigérant du moteur | Heizelement Motorkühlmittel |
| R11 | Supply voltage adjust potentiometer | Regelpotentiometer, voedingsspanning | Potentiomètre de réglage de la tension d'alimentation | Potentiometer für Einstellung der Versorgungsspannung |
| S2b | Emergency stop | Noodstopknop | Arrêt d'urgence | Notabschaltung |
| S11 | Frequency selector switch 50Hz/60Hz | Frequentiekeuzeschakelaar 50Hz/60Hz | Sélecteur de fréquence 50Hz/60Hz | Frequenz Wahlschalter 50Hz/60Hz |
| S13 | Earth fault relay lock-out switch | Blokkeerschakelaar verliesstroomrelais | Commutateur d'arrêt de relais des défauts à la terre | Riegelschalter Erdschlußrelais |
| S14 | Battery charger lock-out switch | Blokkeerschakelaar van de batterijlader | Interrupteur de verrouillage du chargeur de batterie | Verriegelungsschalter Batterieladagerät |
| T13 | Earth fault-current detector | Aardlekdetector | Détecteur de fuite à la terre | Erdschlußanzeiger |
| U1 | Static battery charger | Statische batterijlader | Chargeur de batterie statique | Feststehendes Batterieladegerät |
| X1 | Terminal board | Klemmenbord | Tablette à bornes | Klemmenbrett |
| X1 | Outlet socket | Uitlaatpunt | Prise femelle | Anschlußdose |
| X2 | Outlet socket | Uitlaatpunt | Prise femelle | Anschlußdose |
| X3 | Outlet socket | Uitlaatpunt | Prise femelle | Anschlußdose |
| X15 | 15-pole connector | Konnektor, 15 stiften | Connecteur 15 broches | 15-poliger Stecker |
| X25 | Terminal strip | Klemmenstrook | Barrette de raccordement | Klemmenleiste |
| Y11 | Actuator | Actuator | Actuateur | Stellorgan |
| Sx | Remote start/stop switch | Afstands start-/stopschakelaar | Interrupteur de démarrage/arrêt à distance | Schalter Fernstart/-stop |
| Kx | Plant contactor | Installatiecontactor | Contacteur d'installation | Anlagenseitiges Schütz |
| 1 | Wire Harness | Kabelbundel | Harnais de câbles | Kabelbaum |

| | ESPAÑOL | SVENSKA | ITALIANO | NORSK |
|---|---|---|---|---|
| B11 | Sensor de velocidad | Varvtalssensor | Sensore velocità | Hastighetsføler |
| F1,F3 | Fusible 4A | Säkring 4A | Fusibile 4A | Sikring 4 A |
| G3 | Generador | Generator | Generatore | Generator |
| N11 | Controlador de velocidad | Varvtalsregulator | Unità di controllo velocità | Hastighetsregulator |
| N12 | Regulador automático de voltaje | Automatisk spänningsregulator | Regolatore di tensione automatico | Automatisk spenningsregulator |
| N13 | Relé de pérdida a tierra | Relä för jordläckage | Relè corrente di terra | Jordfeilrelé |
| P1 | Amperímetro 0-500A | Amperemätare 0-500A | Amperometro 0–500A | Amperemeter 0-500 A |
| P4 | Voltímetro 0-500V | Spänningsmätare 0-500V | Voltimetro 0–500V | Spenningsmåler 0-500 V |
| P5 | Frecuencímetro 45-65Hz | Frekvensmätare 45-65 Hz | Frequenziometro 45-65 Hz | Frekvensmåler 45-65 Hz |
| Q1 | Disyuntor | Strömbrytare | Interruttore | Kretsbryter |
| Q2 | Disyuntor | Strömbrytare | Interruttore | Kretsbryter |
| Q3 | Disyuntor | Strömbrytare | Interruttore | Kretsbryter |
| R5 | Calentador del refrigerante del motor | Motorns kylvätskevärmare | Riscaldatore del liquido refrigerante del motore | Kjølevæskevarmer for motor |
| R11 | Potenciómetro de ajuste del voltaje de alimentación | Potentiometer för justering av spänningsmatningen | Potenziometro regolazione tensione di alimentazione | Potensiometer for justering av strømtilførsel |
| S2b | Parada de emergencia | Nödstopp | Arresto di emergenza | Nødstopp |
| S11 | Conmutador selector 50Hz/60Hz | Väljare 50Hz/60Hz | Interruttore di selezione 50Hz/60Hz | Velgerbryteren 50Hz/60Hz |
| S13 | Interruptor de bloqueo del relé de pérdida a tierra | Avstängningsbrytare för jordfelsrelä | Interruttore chiusura relé guasto di terra | Avstengingsbryter for jordfeilrelé |
| S14 | Interruptor para bloquar el cargador de batéria | Batteriladdarens spärrkontakt | Interruttore di bloccaggio caricatore batteria | Läsebryter for batterilader |
| T13 | Detector de pérdida a tierra | Detektor för jordläckage | Rilevatore corrente di terra | Jordfeilføler |
| U1 | Cargador estático de batería | Statisk batteriladdare | Carica batteria statica | Statisk batterilader |
| X1 | Cuadro de bornas | Anslutningsplint | Morsettiera | Koplingstavle |
| X1 | Casquillo de toma de corriente | fas uttag | Presa esterna | Uttak |
| X2 | Casquillo de toma de corriente | fas uttag | Presa esterna | Uttak |
| X3 | Casquillo de toma de corriente | fas uttag | Presa esterna | Uttak |
| X15 | Conector 15-polar | 15-poligt kontaktdon | Connettore a 15 poli | 15-polet kontakt |
| X25 | Bloque de terminales | Anslutningslist | Morsettiera | Koplingssplint |
| Y11 | Actuador | Manöverorgan | Attuatore | Aktuator |
| Sx | Interruptor remoto de arranque/parada | Start/stopp fjärrströmbrytare | Interruttore a distanza avvio/arresto | Bryter for fjernstart/-stopp |
| Kx | Contactor para instalación | Anläggningsanslutning | Contattore dell'impianto | Anleggskontaktor |
| 1 | Arnés de cableado | Kabel | Cablaggio | Ledningsnett |

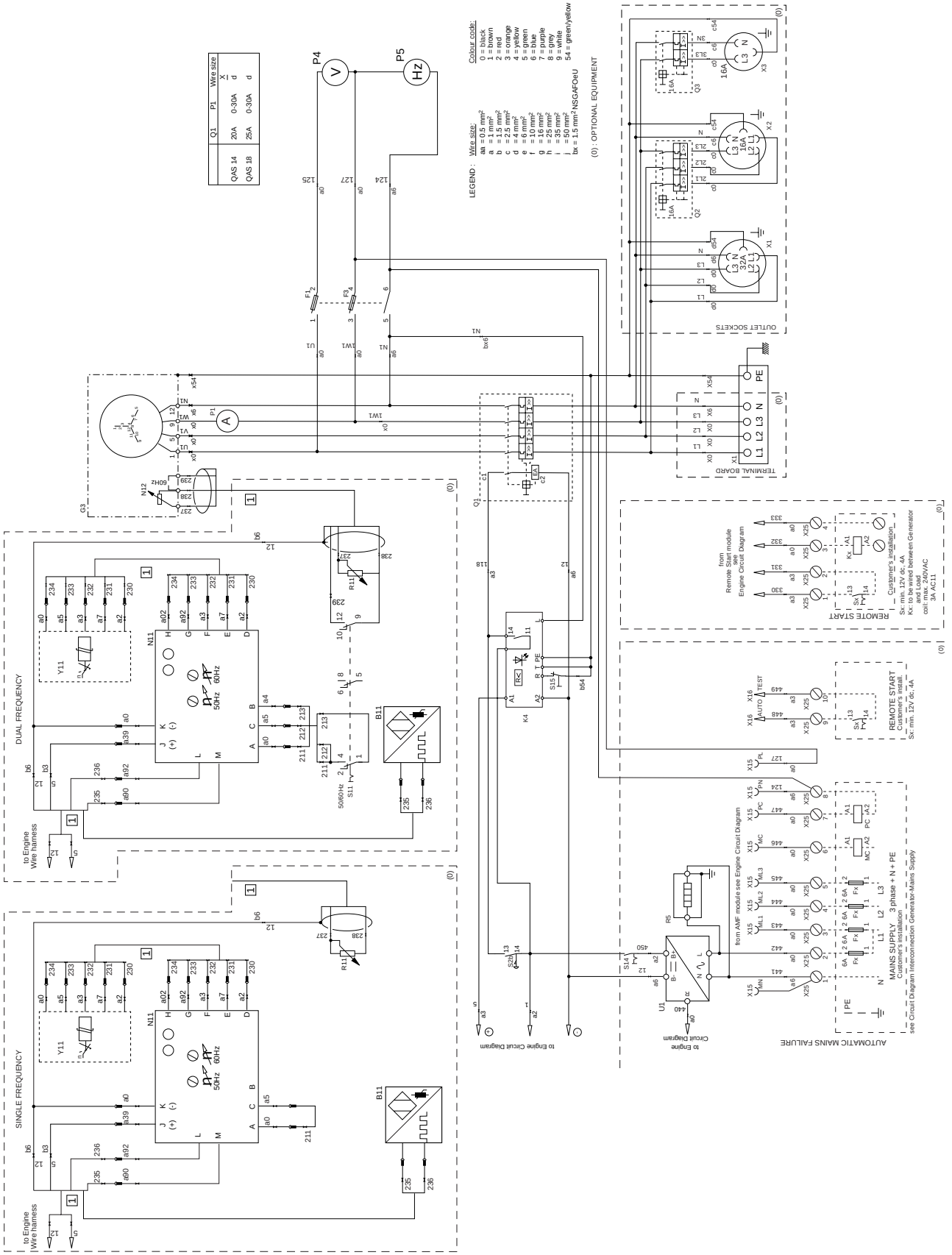
**9822 0888 01**

**9822 0888 01**
**Applicable for QAS14 Yd(S), Yd(S) RS, YdS SF, Yd AMF**



| | DANSK | ΕΛΛΗΝΙΚΑ | PORTUGUÊS | SUOMI |
|---|---|---|---|---|
| B11 | Hastighedsføler | Αισθητήρας στάθμης καυσίμου | Sensor de velocidade | Nopeusanturi |
| F1,F3 | Sikring 4A | Αντίσταση προθέρμανσης | Fusível 4A | Varoke 4A |
| G3 | Generator | Μπαταρία 24V | Gerador | Vaihtovirtageneraattori |
| N11 | Hastighedsregulator | Φορτιστής γεννήτριας | Controlador da velocidade | Nopeuden valvoja |
| N12 | Automatisk spændingsregulator | Λυχνία πίνακα | Regulador automático da potência | Automaattinen jännitteensäädin |
| N13 | Jordfejlstrømsrelæ | Σωληνοειδές εκκίνησης | Relé de detecção de falha de terra | Maavuotorele |
| P1 | Amperemeter 0-500A | Ρελιέ προθέρμανσης | Amperímetro 0-500A | Ampeerimittari 0-500 A |
| P4 | Voltmeter 0-500V | Αναμετάδοση Μίζας | Voltímetro 0-500 V | Volttimittari 0-500 V |
| P5 | Frekvensmåler 45-65Hz | Μίζα | Frequencímetro 45-65Hz | Taajuusmittari 45-65 Hz |
| Q1 | Afbryder | Στοιχείο ελέγχου | Disjuntor | Virrankatkaisin |
| Q2 | Afbryder | Ωρομετρητής | Disjuntor | Virrankatkaisin |
| Q3 | Afbryder | Οργανο μέτρησης στάθμης καυσίμου | Disjuntor | Virrankatkaisin |
| R5 | Opvarmning af kølemiddel til motor | Μπουτόν σβησίματος έκτακτης ανάγκης | Aquecedor do líquido de arrefecimento do motor | Moottorin jäähdytysnesteen lämmitysvastus |
| R11 | Potentiometer til justering af fødespændingen | Διακόπτης χαμηλής σταθμής καυσίμου | Potenciómetro de ajuste da tensão de alimentação | Syöttöjännitteen säätöpotentiometri |
| S2b | Nødstop | Διακόπτης χαμηλής σταθμής καυσίμου | Paragem de emergência | Hätäpysäytys |
| S11 | Omskifterkontakt 50Hz/60Hz | Διακόπτης υψηλής θερμοκρασίας ψυκτικού | Comutador-selector 50Hz/60Hz | Valintakytkin 50Hz/60Hz |
| S13 | Afbryderkontakt til jordfejlstrømsrelæ | Διακόπτης χαμηλής πίεσης λαδιού κινητήρα | Interruptor selector do relé de corrente de defeito à terra | Maavuodon tunnistimen sulkukytkin |
| S14 | Afbryder til batterilader | 12-πολικός σύνδεσμος | Comutator de bloqueio do carregator de bateria | Akkulaturin suojauskytkin |
| T13 | Jordfejlstrømsdetektor | Συνδεσμος διακόπτη στάθμης ψυκτικού | Detector de falha de corrente de terra | Maavuodon tunnistin |
| U1 | Statisk batterioplader | Αναλογικός σύνδεσμος | Carregador de baterias estático | Kiinteä akkulaturi |
| X1 | Klembrædt | Σύνδεσμος μονάδος στάθμης καυσίμου | Quadro de terminais | Liitäntälevy |
| X1 | Stikkontakt | Σωληνωειδές ανακοπής καυσίμου | Tomada de saída | Pistorasia |
| X2 | Stikkontakt | Αισθητήρας στάθμης καυσίμου | Tomada de saída | Pistorasia |
| X3 | Stikkontakt | Αντίσταση προθέρμανσης | Tomada de saída | Pistorasia |
| X15 | 15 -faset kontaktklemme | Μπαταρία 24V | Ligação em 15 polos | 15-napainen liitin |
| X25 | Klemliste | Φορτιστής γεννήτριας | Faixa de terminais | Liitäntärima |
| Y11 | Aktuator | Λυχνία πίνακα | Accionador | Toimilaite |
| Sx | Kontakt til fjernstyring af start/stop | Σωληνοειδές εκκίνησης | Interruptor remoto de arranque/paragem | Kaukokäynnistys-/kaukopysäytyskytkin |
| Kx | Maskinkontaktor | Ρελιέ προθέρμανσης | Contactor geral | Laitteiston liitin |
| 1 | Ledningsnet | Αναμετάδοση Μίζας | Cablagem geral | Johtosarja |

**9822 0888 02**
**Applicable for QAS14 YdS IT**



CIRCUIT DIAGRAM
ELEKTRISCH SCHEMA
SCHEMA DE CIRCUIT
VERDRAHTUNGSPLAN
DIAGRAMA DE CIRCUITOS
KOPPLINGSSCHEMA

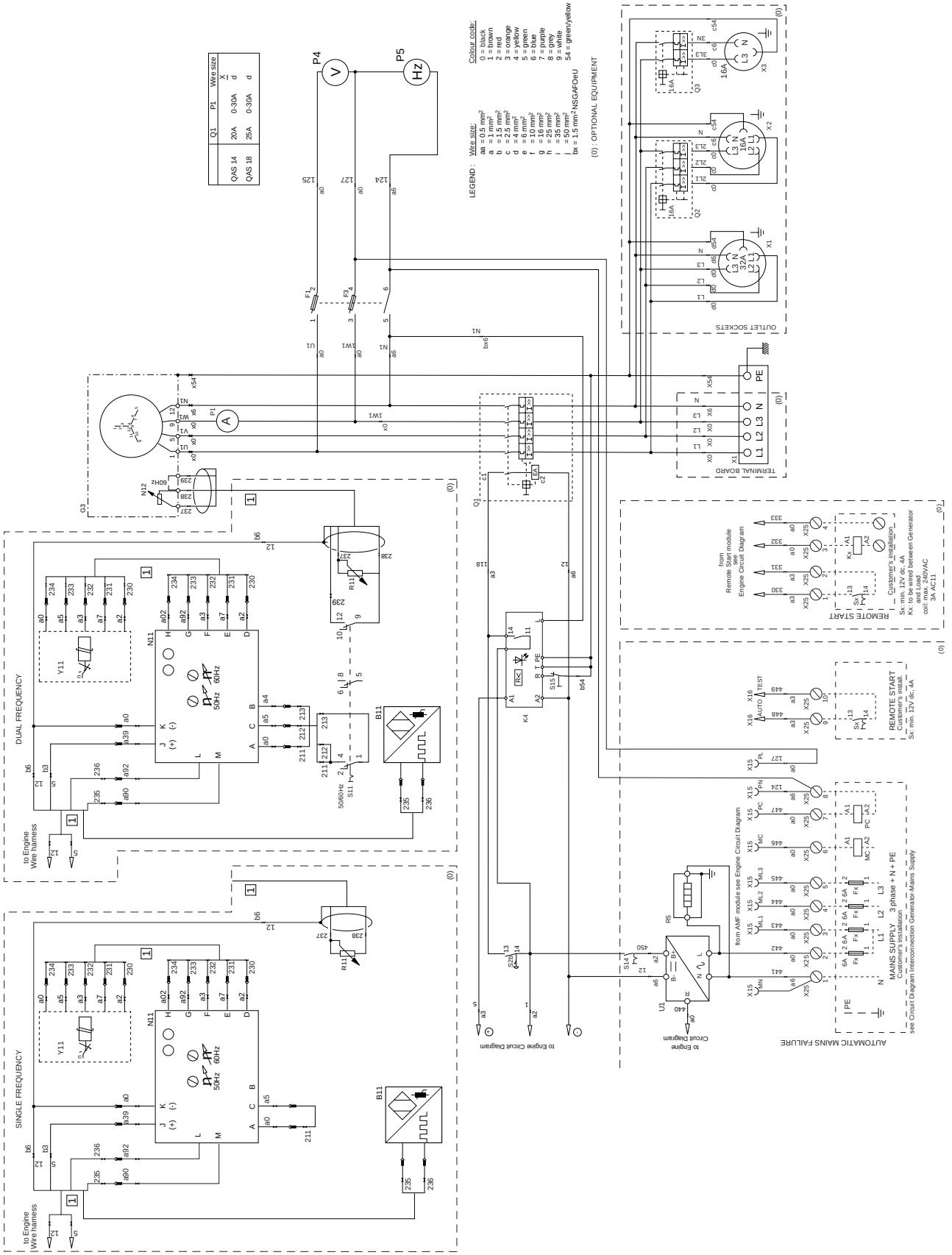
DIAGRAMMA DEL CIRCUITO
KRETSSKJEMA
STRØMDIAGRAM
ΔΙΑΓΡΑΜΜΑ ΚΥΚΛΩΜΑΤΟΣ
DIAGRAMMA DOS CIRCUITOS
SÄHKÖKAAVIO

| | ENGLISH | NEDERLANDS | FRANCAIS | DEUTSCH |
|---|---|---|---|---|
| B11 | Speed sensor | Snelheidssensor | Capteur de vitesse | Drehzahlfühler |
| F1,F3 | Fuse 4A | Zekering 4A | Fusible 4A | Sicherung 4 A |
| G3 | Generator | Generator | Groupe électrogène | Generator |
| K4 | Insulation monitoring relay | Isolatiebewakingsrelais | Relais de surveillance d'isolement | Isolations-Überwachungsrelais |
| N11 | Speed controller | Snelheidsregelaar | Régulateur de vitesse | Drehzahlregler |
| N12 | Automatic voltage regulator | Automatische spanningsregelaar | Régulateur de tension automatique | Automatischer Spannungsregler |
| P1 | Amperemeter 0-500A | Ampèremeter 0-500A | Ampèremètre 0-500A | Amperemeter 0 - 500A |
| P4 | Voltmeter 0-500V | Voltmeter 0-500V | Voltmètre 0-500V | Voltmeter 0 - 500 V |
| P5 | Frequencymeter 45-65Hz | Frekwentiemeter 45-65Hz | Fréquencemètre 45-65Hz | Frequenzmesser 45 - 65 Hz |
| Q1 | Circuit breaker | Vermogenschakelaar | Disjoncteur | Leistungsschalter |
| Q2 | Circuit breaker | Vermogenschakelaar | Disjoncteur | Leistungsschalter |
| Q3 | Circuit breaker | Vermogenschakelaar | Disjoncteur | Leistungsschalter |
| R5 | Engine Coolant Heater | Verwarmer motorkoelvloeistof | Réchauffeur de réfrigérant du moteur | Heizelement Motorkühlmittel |
| R11 | Supply voltage adjust potentiometer | Regelpotentiometer, voedingsspanning | Potentiomètre de réglage de la tension d'alimentation | Potentiometer für Einstellung der Vsorgungsspannung |
| S2b | Emergency stop | Noodstopknop | Arrêt d'urgence | Notabschaltung |
| S11 | Frequency selector switch 50Hz/60Hz | Frequentiekeuzeschakelaar 50Hz/60Hz | Sélecteur de fréquence 50Hz/60Hz | Frequenz Wahlschalter 50Hz/60Hz |
| S14 | Battery charger lock-out switch (Option) | Blokkeerschakelaar van de batterijlader (Optie) | Interrupteur de verrouillage du chargeur de batterie (Option) | Verriegelungsschalter batterieladegereät (Sonderausstattung) |
| S15 | Button | Knop | Bouton | Taste |
| U1 | Static battery charger | Statische batterijlader | Chargeur de batterie statique | Feststehendes Batterieladegerät (Sonderausstattung |
| X1 | Terminal board | Klemmenbord | Tablette à bornes | Klemmenbrett |
| X1 | Outlet socket | Uitlaatpunt | Prise femelle | Anschlußdose |
| X2 | Outlet socket | Uitlaatpunt | Prise femelle | Anschlußdose |
| X3 | Outlet socket | Uitlaatpunt | Prise femelle | Anschlußdose |
| X15 | 15-pole connector | Konnektor, 15 stiften | Connecteur 15 broches | 15-poliger Stecker |
| X25 | Terminal strip | Klemmenstrook | Barrette de raccordement | Klemmenleiste |
| Y11 | Actuator | Actuator | Actuateur | Stellorgan |
| Sx | Remote start/stop switch | Afstands start-/stopschakelaar | Interrupteur de démarrage/arrêt à distance | Schalter Fernstart/-stop |
| Kx | Plant contactor | Installatiecontactor | Contacteur d'installation | Anlagenseitiges Schütz |
| 1 | Wire Harness | Kabelbundel | Harnais de câbles | Kabelbaum |

| | ESPAÑOL | SVENSKA | ITALIANO | NORSK |
|---|---|---|---|---|
| B11 | Sensor de velocidad | Varvtalssensor | Sensore velocità | Hastighetsføler |
| F1,F3 | Fusible 4A | Säkring 4A | Fusibile 4A | Sikring 4 A |
| G3 | Generador | Generator | Generatore | Generator |
| K4 | Relé de cotrol del aislamiento | Isoleringsskydd | Relé di monitoraggio isolamento | Isolasjonsovervåkingsrelé |
| N11 | Controlador de velocidad | Varvtalsregulator | Unità di controllo velocità | Hastighetsregulator |
| N12 | Regulador automático de voltaje | Automatisk spänningsregulator | Regolatore di tensione automatico | Automatisk spenningsregulator |
| N13 | Relé de pérdida a tierra | Relä för jordläckage | Relè corrente di terra | Jordfeilrelé |
| P1 | Amperímetro 0-500A | Amperemätare 0-500A | Amperometro 0–500A | Amperemeter 0-500 A |
| P4 | Voltímetro 0-500V | Spänningsmätare 0-500V | Voltimetro 0–500V | Spenningsmåler 0-500 V |
| P5 | Frecuencímetro 45-65Hz | Frekvensmätare 45-65 Hz | Frequenziometro 45-65 Hz | Frekvensmåler 45-65 Hz |
| Q1 | Disyuntor | Strömbrytare | Interruttore | Kretsbryter |
| Q2 | Disyuntor | Strömbrytare | Interruttore | Kretsbryter |
| Q3 | Disyuntor | Strömbrytare | Interruttore | Kretsbryter |
| R5 | Calentador del refrigerante del motor | Motorns kylvätskevärmare | Riscaldatore del liquido refrigerante del motore | Kjølevæskevarmer for motor |
| R11 | Potenciómetro de ajuste del voltaje de alimentación | Potentiometer för justering av spänningsmatningen | Potenziometro regolazione tensione di alimentazione | Potensiometer for justering av strømtilførsel |
| S2b | Parada de emergencia | Nödstopp | Arresto di emergenza | Nødstopp |
| S11 | Conmutador selector 50Hz/60Hz | Väljare 50Hz/60Hz | Interruttore di selezione 50Hz/60Hz | Velgerbryteren 50Hz/60Hz |
| S14 | Interruptor para bloquar el cargador de bateria (Opción) | Batteriladarens spärrkontakt (Option) | Interruttore di bloccaggio caricatore batteria (Opzione) | Läsebryter for batterilader (Ekstrautstyr) |
| S15 | Botón | Knapp | Pulsante | Knapp |
| U1 | Cargador estático de batería | Statisk batteriladdare | Carica batteria statica | Statisk batterilader |
| X1 | Cuadro de bornas | Anslutningsplint | Morsettiera | Koplingstavle |
| X1 | Casquillo de toma de corriente | fas uttag | Presa esterna | Uttak |
| X2 | Casquillo de toma de corriente | fas uttag | Presa esterna | Uttak |
| X3 | Casquillo de toma de corriente | fas uttag | Presa esterna | Uttak |
| X15 | Conector 15-polar | 15-poligt kontaktdon | Connettore a 15 poli | 15-polet kontakt |
| X25 | Bloque de terminales | Anslutningslist | Morsettiera | Koplingssplint |
| Y11 | Actuador | Manöverorgan | Attuatore | Aktuator |
| Sx | Interruptor remoto de arranque/parada | Start/stopp fjärrströmbrytare | Interruttore a distanza avvio/arresto | Bryter for fjernstart/-stopp |
| Kx | Contactor para instalación | Anläggningsanslutning | Contattore dell'impianto | Anleggskontaktor |
| 1 | Arnés de cableado | Kabel | Cablaggio | Ledningsnett |

**9822 0888 02**

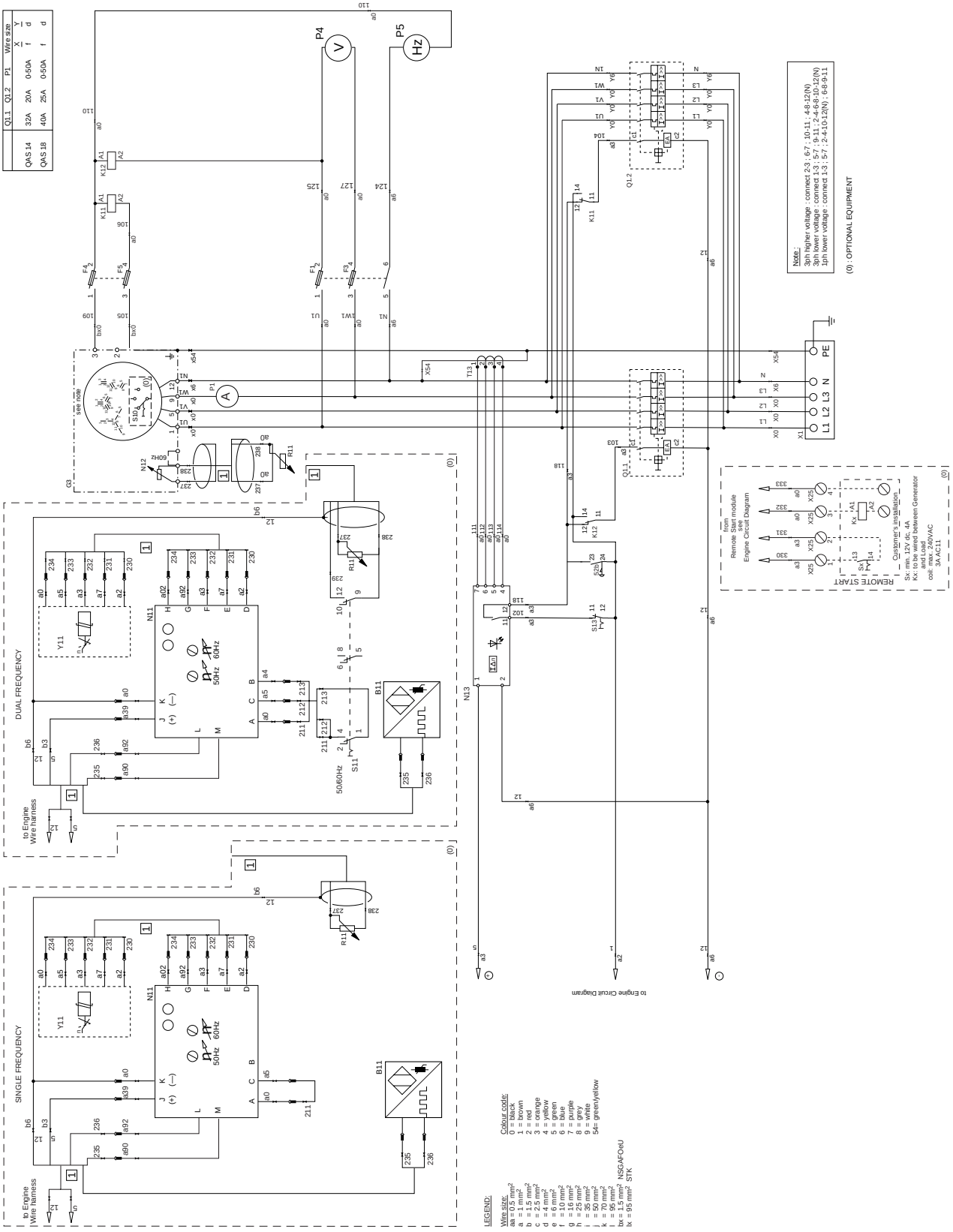
**9822 0888 02**
**Applicable for QAS14 YdS IT**



| | DANSK | ΕΛΛΗΝΙΚΑ | PORTUGUÊS | SUOMI |
|---|---|---|---|---|
| B11 | Hastighedsføler | Αισθητήρας ταχύτητας | Sensor de velocidade | Nopeusanturi |
| F1,F3 | Sikring 4A | Ασφάλεια 4 A | Fusível 4A | Varoke 4A |
| G3 | Generator | Γεννήτρια | Gerador | Vaihtovirtageneraattori |
| K4 | Isoleringskontrolrelæ | Ρελέ ελέγχου μόνωσης | Relé de monitorização do isolamento | Eristysvastuksen valvontarele |
| N11 | Hastighedsregulator | Ελεγκτής ταχύτητας | Controlador da velocidade | Nopeuden valvoja |
| N12 | Automatisk spændingsregulator | Αυτόματος ρυθμιστής τάσης | Regulador automático da potência | Automaattinen jännitteensäädin |
| N13 | Jordfejlstrømsrelæ | Ρελέ ρεύματος γείωσης | Relé de detecção de falha de terra | Maavuotorele |
| P1 | Amperemeter 0-500A | Αμπερόμετρο 0 - 500A | Amperímetro 0-500A | Ampeerimittari 0-500 A |
| P4 | Voltmeter 0-500V | Βολτόμετρο 0 - 500 V | Voltímetro 0-500 V | Volttimittari 0-500 V |
| P5 | Frekvensmåler 45-65Hz | Μετρητής συχνότητας 45 - 65 Hz | Frequencímetro 45-65Hz | Taajuusmittari 45-65 Hz |
| Q1 | Afbryder | Διακόπτης κυκλώματος | Disjuntor | Virrankatkaisin |
| Q2 | Afbryder | Διακόπτης κυκλώματος | Disjuntor | Virrankatkaisin |
| Q3 | Afbryder | Διακόπτης κυκλώματος | Disjuntor | Virrankatkaisin |
| R5 | Opvarmning af kølemiddel til motor | Θερμαντήρας ψυκτικού μηχανής | Aquecedor do líquido de arrefecimento do motor | Moottorin jäähdytysnesteen lämmitysvastus |
| R11 | Potentiometer til justering af fødespændingen | Δυναμόμετρο ρύθμισης τάσης παροχής | Potenciómetro de ajuste da tensão de alimentação | Syöttöjännitteen säätöpotentiometri |
| S2b | Nødstop | Στοπ έκτακτης ανάγκης | Paragem de emergência | Hätäpysäytys |
| S11 | Omskifterkontakt 50Hz/60Hz | Διακόπτης επιλογεα 50Hz/60Hz | Comutador-selector 50Hz/60Hz | Valintakytkin 50Hz/60Hz |
| S14 | Afbryder til batterilader (Ekstraudstyr) | Διακοπτης απομονωσης φορτίστη μπαταριας (ροερατίχα) | Comutator de bloqueio do carregator de bateria (Opção) | Akkulaturin suojauskytkin (Lisävaruste) |
| S15 | Knap | Κογμπι, μπογτοη | Botão | Panike |
| U1 | Statisk batterioplader | Γομωτής στατικής μπαταρίας | Carregador de baterias estático | Kiinteä akkulaturi |
| X1 | Klembrædt | Πίνακας ακροδέκτη | Quadro de terminais | Liitäntälevy |
| X1 | Stikkontakt | ακροδέκτη εξόδου | Tomada de saída | Pistorasia |
| X2 | Stikkontakt | ακροδέκτη εξόδου | Tomada de saída | Pistorasia |
| X3 | Stikkontakt | ακροδέκτη εξόδου | Tomada de saída | Pistorasia |
| X15 | 15 -faset kontaktklemme | 15-πολικός σύνδεσμος | Ligação em 15 polos | 15-napainen liitin |
| X25 | Klemliste | Λωρίδα ακροδέκτη | Faixa de terminais | Liitäntärima |
| Y11 | Aktuator | Ενεργοποιητής | Accionador | Toimilaite |
| Sx | Kontakt til fjernstyring af start/stop | Τηλεχειριζόμενος διακόπτης εκκίνησης/ανακοπής | Interruptor remoto de arranque/paragem | Kaukokäynnistys-/kaukopysäytyskytkin |
| Kx | Maskinkontaktor | Επαφέας εγκατάστασης | Contactor geral | Laitteiston liitin |
| 1 | Ledningsnet | Συνδεσμολογία συρμάτων | Cablagem geral | Johtosarja |

9822 0888 02

**9822 0888 04**
**Applicable for QAS14 Yd DV DF RS**



| | ENGLISH | NEDERLANDS | FRANCAIS | DEUTSCH |
|---|---|---|---|---|
| B11 | Speed sensor | Snelheidssensor | Capteur de vitesse | Drehzahlfühler |
| F1..F5 | Fuse 4A | Zekering 4A | Fusible 4A | Sicherung 4 A |
| G3 | Generator | Generator | Groupe électrogène | Generator |
| K11, 12 | Auxiliary relay voltage selection | Bijkomende relais spanningskeuze | Sélection de tension de relais auxiliaire | Hilfsrelais Spannungswahl |
| N11 | Speed controller | Snelheidsregelaar | Régulateur de vitesse | Drehzahlregler |
| N12 | Automatic voltage regulator | Automatische spanningsregelaar | Régulateur de tension automatique | Automatischer Spannungsregler |
| N13 | Earth fault-current relay | Aardlekrelais | Relais de fuite à la terre | Erdschlußrelais |
| P1 | Amperemeter 0-500A | Ampèremeter 0-500A | Ampèremètre 0-500A | Amperemeter 0 - 500A |
| P4 | Voltmeter 0-500V | Voltmeter 0-500V | Voltmètre 0-500V | Voltmeter 0 - 500 V |
| P5 | Frequencymeter 45-65Hz | Frekwentiemeter 45-65Hz | Fréquencemètre 45-65Hz | Frequenzmesser 45 - 65 Hz |
| Q1.1 | Circuit breaker (lower voltage) | Vermogenschakelaar (lage spanning) | Disjoncteur (tension inférieure) | Leistungsschalter (niedrigere Spannung) |
| Q2.2 | Circuit breaker (higher voltage) | Vermogenschakelaar (hoge spanning) | Disjoncteur (tension supérieure) | Leistungsschalter |
| R11 | Supply voltage adjust potentiometer | Regelpotentiometer, voedingsspanning | Potentiomètre de réglage de la tension d'alimentation | Potentiometer für Einstellung der Versorgungsspannung |
| S2b | Emergency stop | Noodstopknop | Arrêt d'urgence | Notabschaltung |
| S10 | Output voltage selector switch | Keuzeschakelaar uitgangsspanning | Sélecteur de tension de sortie | Wahlschalter Ausgangsspannung |
| S13 | Earth fault relay lock-out switch | Blokkeerschakelaar verliesstroomrelais | Commutateur d'arrêt de relais des défauts à la terre | Riegelschalter Erdschlußrelais |
| T13 | Earth fault-current detector | Aardlekdetector | Détecteur de fuite à la terre | Erdschlußanzeiger |
| X1 | Terminal board | Klemmenbord | Tablette à bornes | Klemmenbrett |
| X25 | Terminal strip | Klemmenstrook | Barrette de raccordement | Klemmenleiste |
| Y11 | Actuator | Actuator | Actuateur | Stellorgan |
| Sx | Remote start/stop switch | Afstands start-/stopschakelaar | Interrupteur de démarrage/arrêt à distance | Schalter Fernstart/-stop |
| Kx | Plant contactor | Installatiecontactor | Contacteur d'installation | Anlagenseitiges Schütz |
| 1 | Wire Harness | Kabelbundel | Harnais de câbles | Kabelbaum |

| | ESPAÑOL | SVENSKA | ITALIANO | NORSK |
|---|---|---|---|---|
| B11 | Sensor de velocidad | Varvtalssensor | Sensore velocità | Hastighetsføler |
| F1..F5 | Fusible 4A | Säkring 4A | Fusibile 4A | Sikring 4 A |
| G3 | Generador | Generator | Generatore | Generator |
| K11, 12 | Selección de voltaje del relé auxiliar | Väljare för hjälpreläspänning | Selezione voltaggio relé ausiliario | Spenningsvalg for hjelperelé |
| N11 | Controlador de velocidad | Varvtalsregulator | Unità di controllo velocità | Hastighetsregulator |
| N12 | Regulador automático de voltaje | Automatisk spänningsregulator | Regolatore di tensione automatico | Automatisk spenningsregulator |
| N13 | Relé de pérdida a tierra | Relä för jordläckage | Relè corrente di terra | Jordfeilrelé |
| P1 | Amperímetro 0-500A | Amperemätare 0-500A | Amperometro 0–500A | Amperemeter 0-500 A |
| P4 | Voltímetro 0-500V | Spänningsmätare 0-500V | Voltimetro 0–500V | Spenningsmåler 0-500 V |
| P5 | Frecuencímetro 45-65Hz | Frekvensmätare 45-65 Hz | Frequenziometro 45-65 Hz | Frekvensmåler 45-65 Hz |
| Q1.1 | Disyuntor (bajo voltaje) | Strömbrytare (lägre spänning) | Interruttore (voltaggio inferiore) | Kretsbryter (lavere spenning) |
| Q2.2 | Disyuntor (alto voltaje) | Strömbrytare (högre spänning) | Interruttore (voltaggio superiore | Kretsbryter (høyere spenning) |
| R11 | Potenciómetro de ajuste del voltaje de alimentación | Potentiometer för justering av spänningsmatningen | Potenziometro regolazione tensione di alimentazione | Potensiometer for justering av strømtilførsel |
| S2b | Parada de emergencia | Nödstopp | Arresto di emergenza | Nødstopp |
| S10 | Uniselector de voltaje de salida | Utspänningens väljaromkopplare | Interruttore selettore di voltaggio di uscita | Valgbryter for utgangsspenning |
| S13 | Interruptor de bloqueo del relé de pérdida a tierra | Avstängningsbrytare för jordfelsrelä | Interruttore chiusura relé guasto di terra | Avstengingsbryter for jordfeilrelé |
| T13 | Detector de pérdida a tierra | Detektor för jordläckage | Rilevatore corrente di terra | Jordfeilføler |
| X1 | Cuadro de bornas | Anslutningsplint | Morsettiera | Koplingstavle |
| X25 | Bloque de terminales | Anslutningslist | Morsettiera | Koplingssplint |
| Y11 | Actuador | Manöverorgan | Attuatore | Aktuator |
| Sx | Interruptor remoto de arranque/parada | Start/stopp fjärrströmbrytare | Interruttore a distanza avvio/arresto | Bryter for fjernstart/-stopp |
| Kx | Contactor para instalación | Anläggningsanslutning | Contattore dell'impianto | Anleggskontaktor |
| 1 | Arnés de cableado | Kabel | Cablaggio | Ledningsnett |



9822 0888 04

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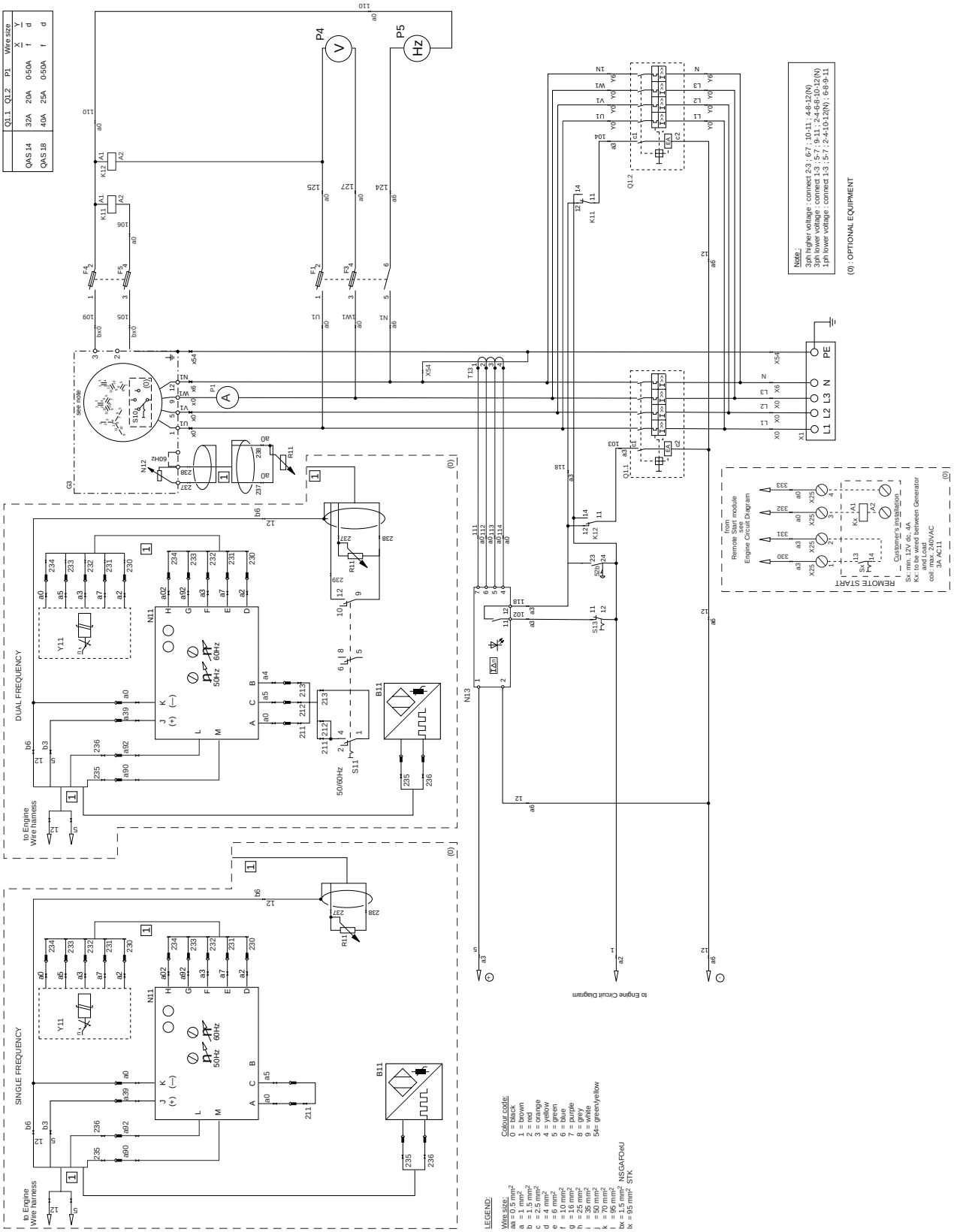
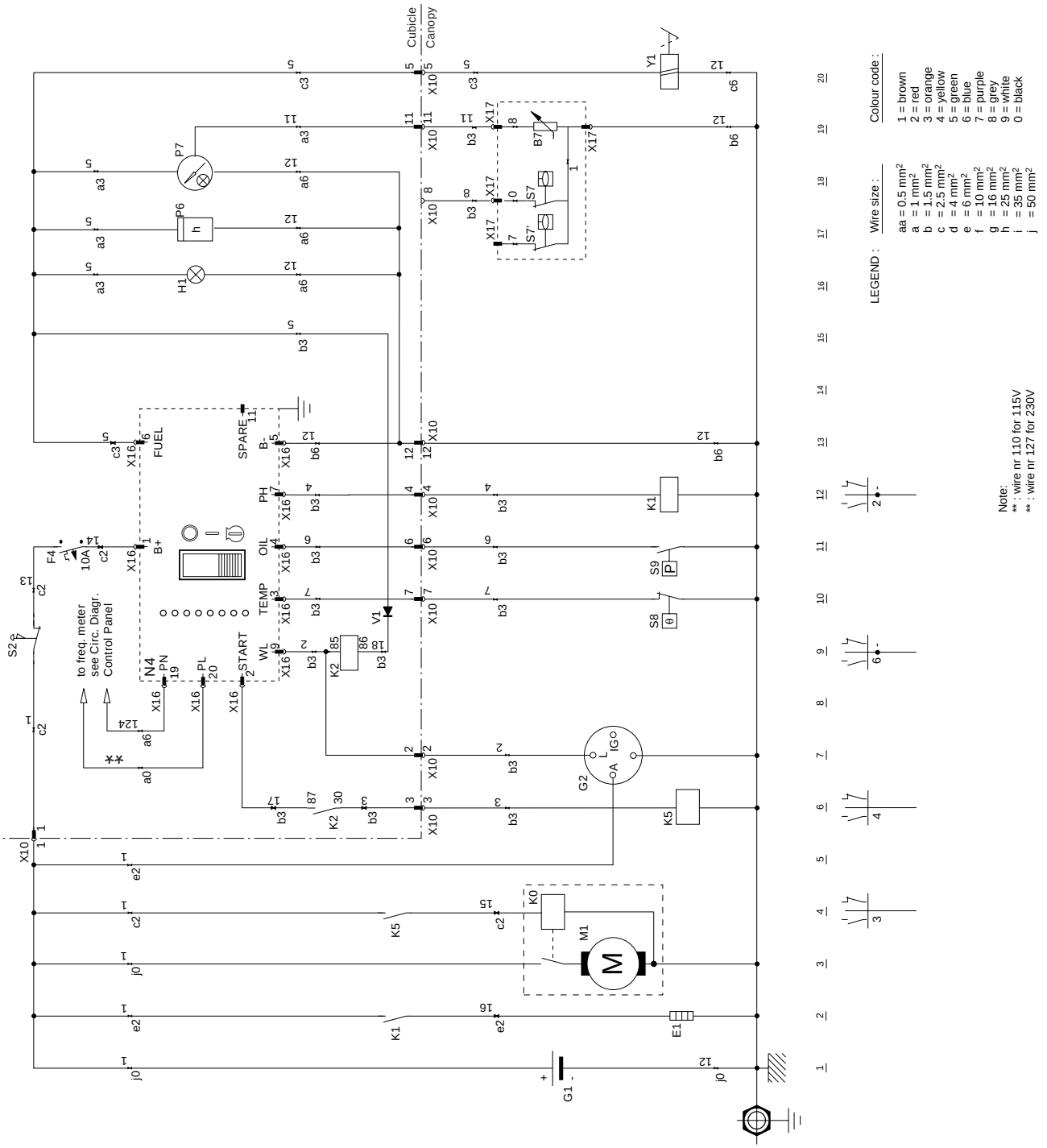


| | DANSK | ΕΛΛΗΝΙΚΑ | PORTUGUÊS | SUOMI |
|---|---|---|---|---|
| B11 | Hastighedsføler | Αισθητήρας ταχύτητας | Sensor de velocidade | Nopeusanturi |
| F1..F5 | Sikring 4A | Ασφάλεια 4 A | Fusível 4A | Varoke 4A |
| G3 | Generator | Γεννήτρια | Gerador | Vaihtovirtageneraattori |
| K11, 12 | Hjælperelæ for spændingsudsnit | Βοηθητική επιλογή τάσης ρελέ | Relé auxiliar de selecção de voltagem | Apureleen jännitteenvalitsin (matalampi jännite) |
| N11 | Hastighedsregulator | Ελεγκτής ταχύτητας | Controlador da velocidade | Nopeuden valvoja |
| N12 | Automatisk spændingsregulator | Αυτόματος ρυθμιστής τάσης | Regulador automático da potência | Automaattinen jännitteensäädin |
| N13 | Jordfejlstrømsrelæ | Ρελέ ρεύματος γείωσης | Relé de detecção de falha de terra | Maavuotorele |
| P1 | Amperemeter 0-500A | Αμπερόμετρο 0 - 500A | Amperímetro 0-500A | Ampeerimittari 0-500 A |
| P4 | Voltmeter 0-500V | Βολτόμετρο 0 - 500 V | Voltímetro 0-500 V | Volttimittari 0-500 V |
| P5 | Frekvensmåler 45-65Hz | Μετρητής συχνότητας 45 - 65 Hz | Frequencímetro 45-65Hz | Taajuusmittari 45-65 Hz |
| Q1.1 | Afbryder (nedre spænding) | Διακόπτης κυκλώματος (χαμηλότερης τάσης) | Disjuntor (tension inférieure) | Virrankatkaisin (matalampi jännite) |
| Q2.2 | Afbryder (øvre spænding) | Διακόπτης κυκλώματος (υψηλότερης τάσης) | Disjuntor (tension supérieure) | Virrankatkaisin (korkeampi jännite) |
| R11 | Potentiometer til justering af fødespændingen | Δυναμόμετρο ρύθμισης τάσης παροχής | Potenciómetro de ajuste da tensão de alimentação | Syöttöjännitteen säätöpotentiometri |
| S2b | Nødstop | Στοπ έκτακτης ανάγκης | Paragem de emergência | Hätäpysäytys |
| S10 | Omskifterkontakt til udgangsspænding | Διακόπτης επιλογής τάσης εξόδου | Interruptor selector de voltagem de saída | Lähtöjännitteen valintakytkin |
| S13 | Afbryderkontakt til jordfejlstrømsrelæ | Διακόπτης αποκλεισμού μετάδοσης λάθους στη γείωση | Interruptor selector do relé de corrente de defeito à terra | Maavuodon tunnistimen sulkukytkin |
| T13 | Jordfejlstrømsdetektor | Ανιχνευτής ρεύματος γείωσης | Detector de falha de corrente de terra | Maavuodon tunnistin |
| X1 | Klembrædt | Πίνακας ακροδέκτη | Quadro de terminais | Liitäntälevy |
| X25 | Klemliste | Λωρίδα ακροδέκτη | Faixa de terminais | Liitäntärima |
| Y11 | Aktuator | Ενεργοποιητής | Accionador | Toimilaite |
| Sx | Kontakt til fjernstyring af start/stop | Τηλεχειριζόμενος διακόπτης εκκίνησης/ανακοπής | Interruptor remoto de arranque/paragem | Kaukokäynnistys-/kaukopysäytyskytkin |
| Kx | Maskinkontaktor | Επαφέας εγκατάστασης | Contactor geral | Laitteiston liitin |
| 1 | Ledningsnet | Συνδεσμολογία συρμάτων | Cablagem geral | Johtosarj |

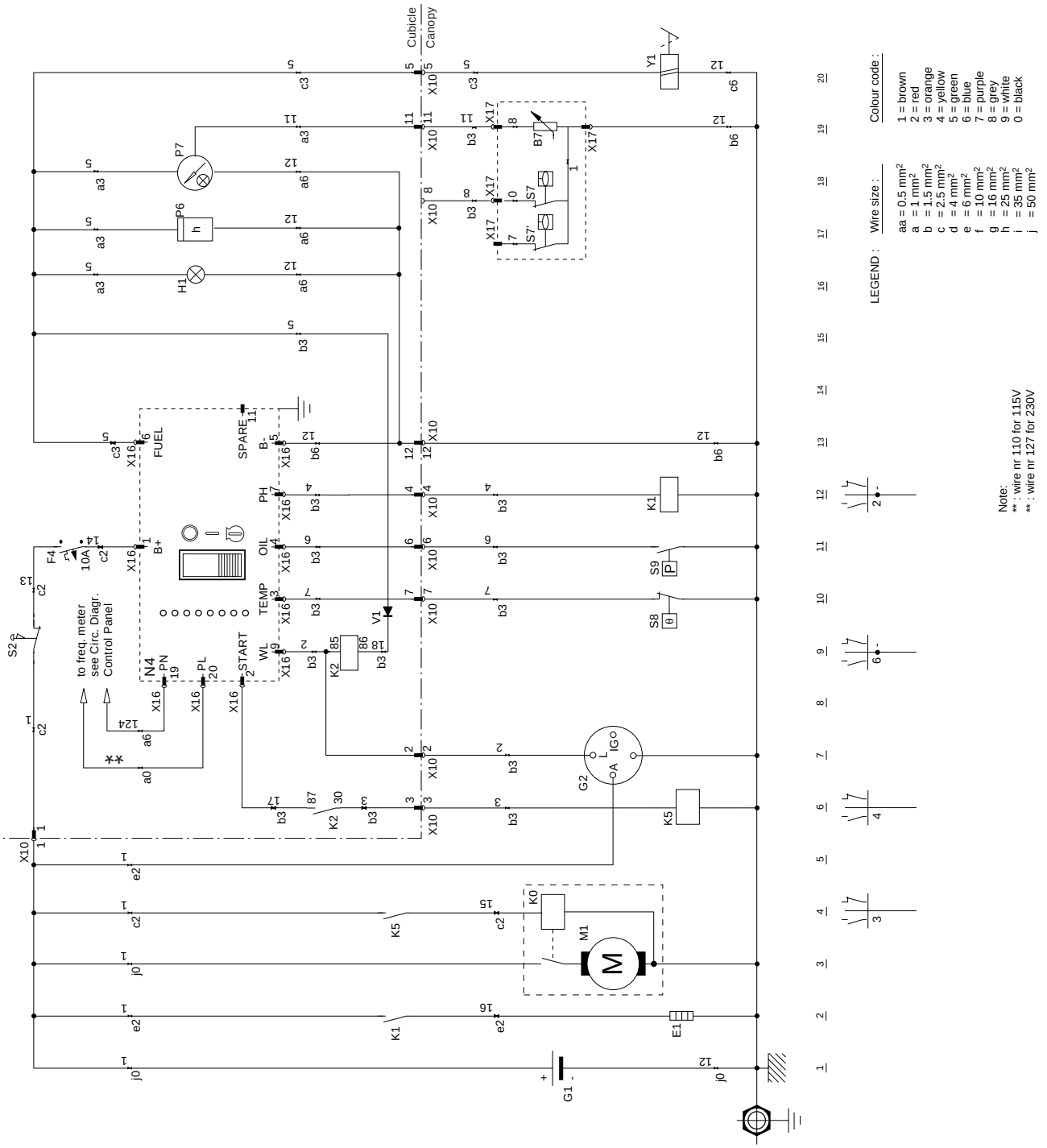
**9822 0888 07**
**Applicable for QAS14 Yd(S), YdS IT, YdS SF**



| | ENGLISH | NEDERLANDS | FRANCAIS | DEUTSCH |
|---|---|---|---|---|
| B7 | Fuel level sensor | Sensor, brandstofpeil | Capteur, niveau de carburant | Kraftstoffstandfühler |
| E1 | Preheat resistor | Voorverwarmingsweerstand | Résistance de préchauffage | Vorwärmwiderstand |
| F4 | Fuse 10A | Zekering 10A | Fusible 10A | Sicherung 10A |
| G1 | Battery 12V | Batterij 12V | Batterie 12V | Batterie 12V |
| G2 | Charging generator | Laad alternator | Alternateur, charge | Lademaschine |
| H1 | Panel light | Paneelverlichting | Eclairage panneau | Instrumentenleuchte |
| K0 | Starter solenoid | Startersolenoïde | Solénoide du démarreur | Startermagnet |
| K1 | Preheat relay | Relais voorverwarmingssysteem | Relais de préchauffage | Vorwärmrelais |
| K2 | Start prevention relay | Startpreventierelais | Relais inhibiteur de démarrage | Startverhinderungsrelais |
| K5 | Starter relay | Starterrelais | Relais de démarreur | Startrelais |
| M1 | Starter motor | Startermotor | Démarreur | Startmotor |
| N4 | Control module | Stuurmodule | Module de commande | Steuermodul |
| P6 | Hourmeter | Urenteller | Compteur d'heures | Stundenzähler |
| P7 | Fuel level gauge | Brandstofpeilindicator | Indicateur de niveau de carburant | Meßinstrument für Kraftstoffstand |
| S2 | Emergency stop button | Noodstopknop | Bouton arrêt d'urgence | Not-Aus-Taste |
| S7 | Low fuel level switch | Schakelaar, laag brandstofpeil | Interrupteur niveau de carburant bas | Schalter für niedrigen Kraftstoffstand |
| S7' | Low fuel level switch | Schakelaar, laag brandstofpeil | Interrupteur niveau de carburant bas | Schalter für niedrigen Kraftstoffstand |
| S8 | Coolant high temperature switch | Schakelaar, hoge koelwatertemperatuur | Thermostat, basse température eau de refroidissement | Schalter für hohe Temperatur |
| S9 | Engine oil low pressure switch | Schakelaar, lage motoroliedruk | Interrupteur basse pression d'huile moteur | Schalter für geringen Motoröldruck |
| V1 | Diode | Diode | Diode | Diode |
| X10 | 15-pole connector | Konnektor, 15 stiften | Connecteur 15 broches | 15-poliger Stecker |
| X16 | Module connector | Modulekonnektor | Connecteur de module | Modulstecker |
| X17 | Fuel level unit connector | Konnektor brandstofpeil module | Connecteur du module de niveau d'huile | Stecker für Kraftstoffstandeinheit |
| Y1 | Fuel stop solenoid | Brandstofstopsolenoïde | Solénoïde d'arrêt de carburant | Kraftstoffabsperrmagnet |

| | ESPAÑOL | SVENSKA | ITALIANO | NORSK |
|---|---|---|---|---|
| B7 | Sensor del nivel de combustible | Sensor - bränslenivå | Sensore del livello di combustibile | Føler for drivstoffnivå |
| E1 | Resistencia de precalentamiento | Föruppvärmningsresistor | Resistenza di preriscaldamento | Forvarmeresistor |
| F4 | Fusible 10A | Säkring 10A | Fusibile 10A | Sikring 10A |
| G1 | Batería de 12V | Batteri 12V | Batteria a 12V | Batteri 12 V |
| G2 | Generador de carga | Laddningsgenerator | Generatore di carica | Ladegenerator |
| H1 | Luz de panel | Panelljus | Luci del pannello | Panellys |
| K0 | Solenoide de arranque | Startsolenoid | Solenoide dell'avviatore | Magnetkontakt for starter |
| K1 | Relé, sistema de precalentamiento | Föruppvärmningsrelä | Relé di preriscaldamento | Forvarmerrelé |
| K2 | Relé de prevención de arranque | Startblockeringsrelä | Relé di bloco dell'avvio | Startblokkeringsrelé |
| K5 | Relé arrancador | Startrelä | Relé di avviamento | Startrelé |
| M1 | Motor de arranque | Startmotor | Motore dell'avviatore | Starter |
| N4 | Módulo de control | Kontrollmodul | Modulo di controllo | Kontrollmodul |
| P6 | Cuentahoras | Timmätare | Contaore | Timeteller |
| P7 | Indicador del nivel de combustible | Bränslenivåmätare | Indicatore di livello del combustibile | Drivstoffmåler |
| S2 | Botón de parada de emergencia | Knapp för nödstopp | Pulsante di arresto di emergenza | Knapp for sikkerhetsstopp |
| S7 | Interruptor bajo nivel de combustible | Brytare för låg bränslenivå | Interruttore di basso livello del combustibile | Bryter for lavt drivstoffnivå |
| S7' | Interruptor bajo nivel de combustible | Brytare för låg bränslenivå | Interruttore di basso livello del combustibile | Bryter for lavt drivstoffnivå |
| S8 | Interruptor alta temperatura de refrigerante | Brytare för hög kylvätsketemperatur | Interruttore di temperatura alta del refrigerante | Bryter for høy kjølevæsketemperatur |
| S9 | Interruptor baja presión aceite del motor | Brytare för lågt oljetryck | Interruttore di bassa pressione dell'olio | Bryter for lavt oljetrykk i motoren |
| V1 | Diode | Diod | Diodo | Diode |
| X10 | Conector de 12 polos | 10-poligt kontaktdon | Connettore a 12 poli | 12-polet kontakt |
| X16 | Conector de módulo | Modul-kontaktdon | Connettore del modulo | Modulkontakt |
| X17 | Conector unidad nivel de combustible | Bränslenivåenhetens kontaktdon | Connettore dell'unitá livello del combustibile | Kontakt for drivstoffnivåenhet |
| Y1 | Solenoide de detención del combustible | Bränslestoppsmagnet | Solenoide di arresto carburante | Stoppsolenoid for drivstoff |

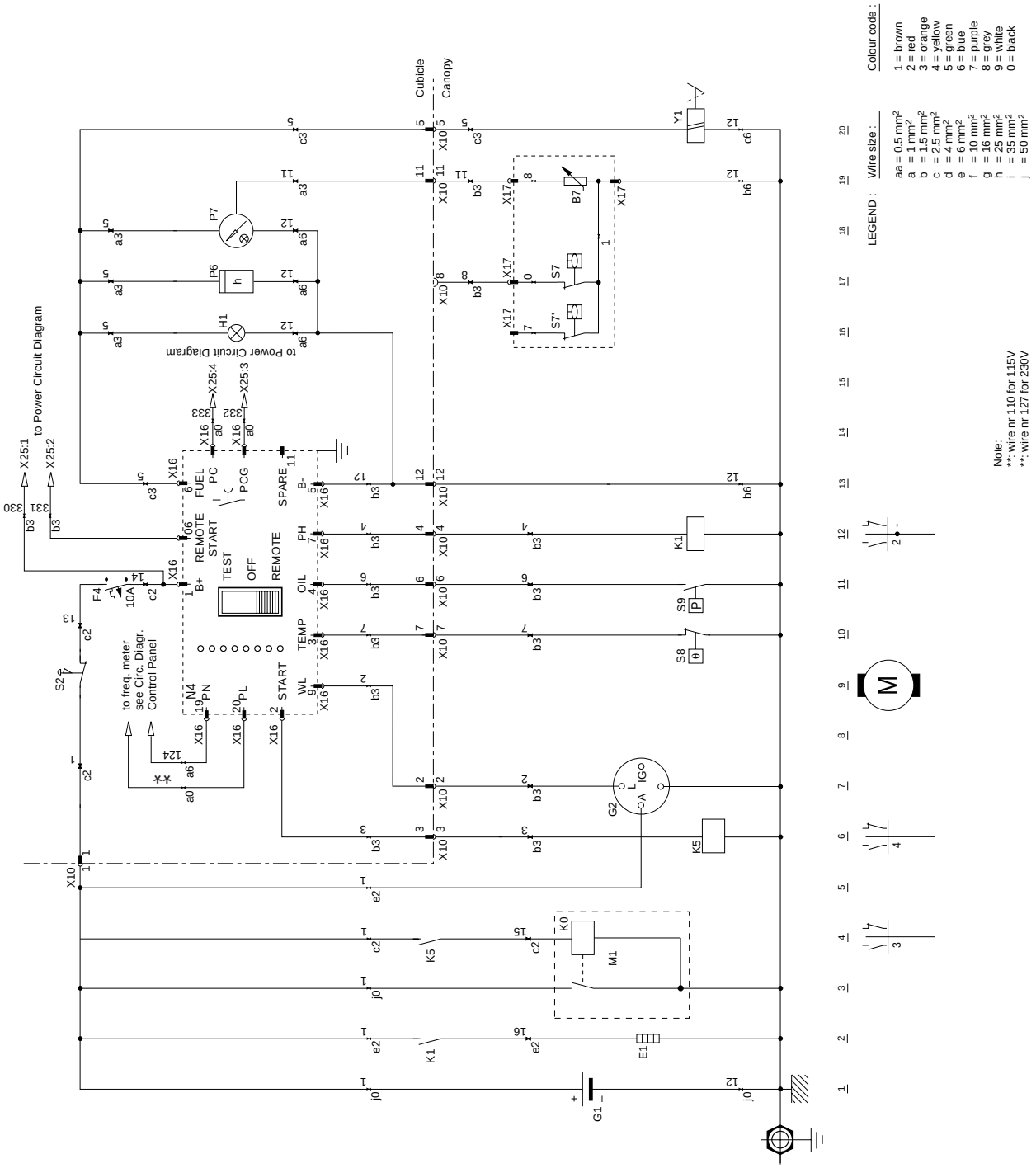
**9822 0888 07**
**Applicable for QAS14 Yd(S), YdS IT, YdS SF**



| | DANSK | ΕΛΛΗΝΙΚΑ | PORTUGUÊS | SUOMI |
|---|---|---|---|---|
| B7 | Brændstofniveauføler | Αισθητήρας στάθμης καυσίμου | Sensor do nível de combustível | Polttoainemäärän anturi |
| E1 | Modstand i forvarmersystem | Αντίσταση προθέρμανσης | Resistência do pré-aquecimento | Hehkuvastus |
| F4 | Sikring 10A | Ασφάλεια 10A | Fusível 10A | Varoke 10A |
| G1 | Batteri 12V | Μπαταρία 12V | Bateria 12V | Akku 12 V |
| G2 | Ladegenerator | Φορτιστής γεννήτριας | Gerador de carga | Latausgeneraattori |
| H1 | Lampe | Λυχνία πίνακα | Luz do painel | Kojetaulun valo |
| K0 | Startmagnet | Σωληνοειδές εκκίνησης | Solenóide do motor de arranque | Käynnistyssolenoidi |
| K1 | Relæ, forvarmersystem | Ρελιέ προθέρμανσης | Relé de corte do pré-aquecimento | Hehkurele |
| K2 | Afbryderrelæ | Ρελιέ προστασίας εκκίνησης | Relé de prevenção do arranque | Käynnistyksen estorele |
| K5 | Startrelæ | Αναμετάδοση Μίζας | Relé do motor de arranque | Käynnistysrele |
| M1 | Startermotor | Μίζα | Motor de arranque | Käynnistysmoottori |
| N4 | Kontrolmodul | Στοιχείο ελέγχου | Módulo de controlo | Ohjainmoduli |
| P6 | Timetæller | Ωρομετρητής | Contador de horas | Käyttötuntimittari |
| P7 | Brændstofniveaumeter | Οργανο μέτρησης στάθμης καυσίμου | Indicador do nível de combustível | Polttoainemittari |
| S2 | Nødstopknap | Μπουτόν σβησίματος έκτακτης ανάγκης | Botão de paragem de emergência | Hätäpysäytyskytkin |
| S7 | Brændstofniveaukontakt | Διακόπτης χαμηλής σταθμής καυσίμου | Comutador do nível baixo de combustível | Alhaisen polttoainemäärän merkkivalon kytkin |
| S7’ | Brændstofniveaukontakt | Διακόπτης χαμηλής σταθμής καυσίμου | Comutador do nível baixo de combustível | Alhaisen polttoainemäärän merkkivalon kytkin |
| S7 | Brændstofniveaukontakt | Διακόπτης χαμηλής σταθμής καυσίμου | Comutador do nível baixo de combustível | Alhaisen polttoainemäärän merkkivalon kytkin |
| S8 | Kontakt, høj kølevandstemperatur | Διακόπτης υψηλής θερμοκρασίας ψυκτικού | Comutador da temperatura elevada do refrigerante | Korkean jäähdytysnesteen lämpötilan merkkivalon kytkin |
| S9 | Kontakt, lavt olietryk | Διακόπτης χαμηλής πίεσης λαδιού κινητήρα | Comutador da pressão do óleo do motor | Moottoriöljyn alhaisen paineen merkkivalon kytkin |
| V1 | Diode | Διολοσ | Diodo | Diodi |
| X10 | 12 -faset kontaktklemme | 12-πολικός σύνδεσμος | Ligação em 12 polos | 12-napainen liitin |
| X16 | Modulkontaktklemme | Αναλογικός σύνδεσμος | Ligação do módulo | Moduliliitin |
| X17 | Kontaktklemme for brændstofniveau | Σύνδεσμος μονάδος στάθμης καυσίμου | Ligação da unidade do nível de combustível | Polttoainemäärän ilmaisimen liitin |
| Y1 | Brændstofstopmagnet | Σωληνωειδές ανακοπής καυσίμου | Válvula electromagnética de corte de combustível | Polttoaineen sulkusolenoidi |

9822 0888 07

**9822 0888 08**
**Applicable for QAS14 Yd(S) RS, Yd DV DF RS**

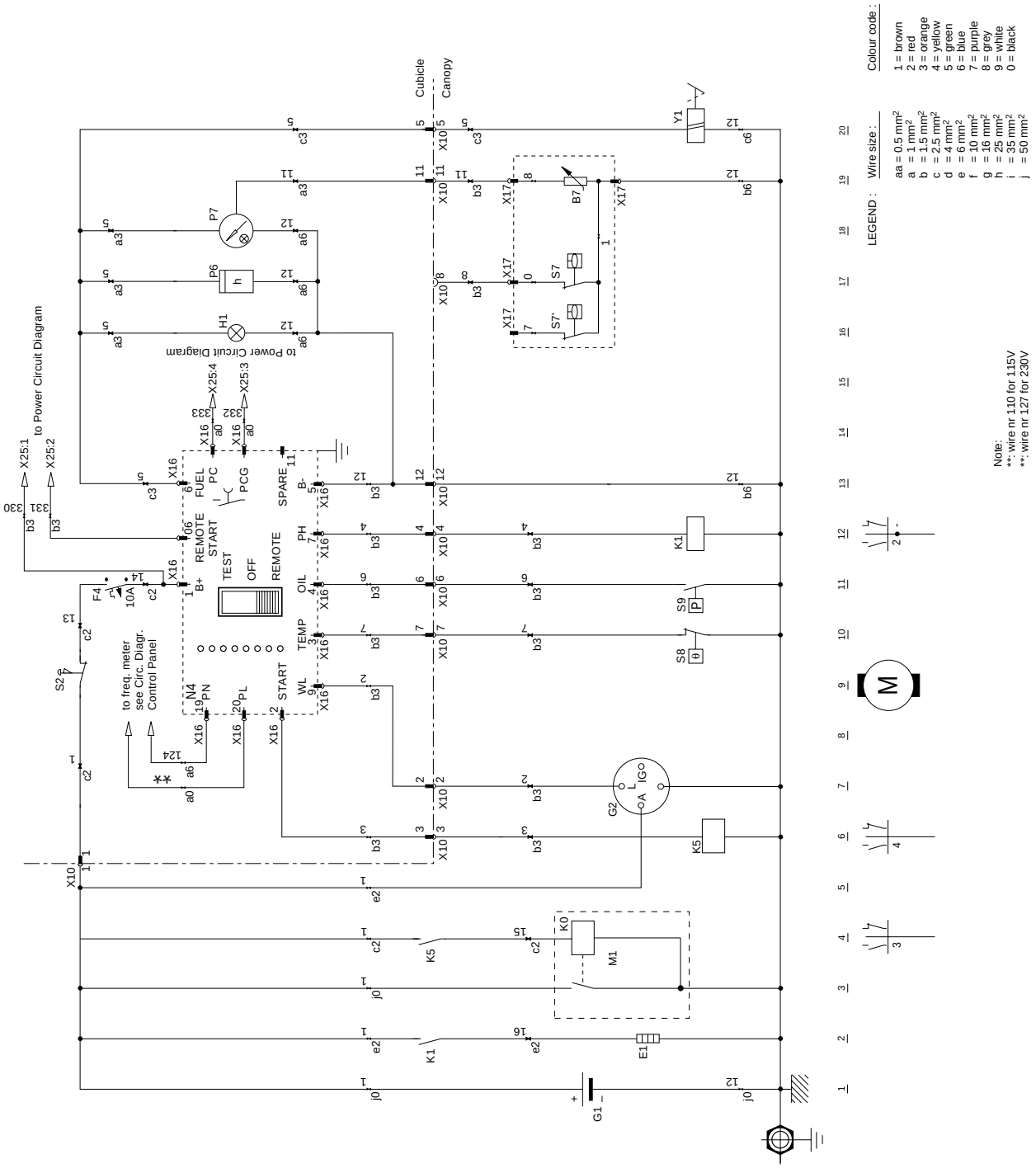


| | ENGLISH | NEDERLANDS | FRANCAIS | DEUTSCH |
|---|---|---|---|---|
| B7 | Fuel level sensor | Sensor, brandstofpeil | Capteur, niveau de carburant | Kraftstoffstandfühler |
| E1 | Preheat resistor | Voorverwarmingsweerstand | Résistance de préchauffage | Vorwärmwiderstand |
| F4 | Fuse 10A | Zekering 10A | Fusible 10A | Sicherung 10A |
| G1 | Battery 12V | Batterij 12V | Batterie 12V | Batterie 12V |
| G2 | Charging generator | Laad alternator | Alternateur, charge | Lademaschine |
| H1 | Panel light | Paneelverlichting | Eclairage panneau | Instrumentenleuchte |
| K0 | Starter solenoid | Startersolenoïde | Solénoide du démarreur | Startermagnet |
| K1 | Preheat relay | Relais voorverwarmingssysteem | Relais de préchauffage | Vorwärmrelais |
| K5 | Starter relay | Starterrelais | Relais de démarreur | Startrelais |
| M1 | Starter motor | Startermotor | Démarreur | Startmotor |
| N4 | Control module | Stuurmodule | Module de commande | Steuermodul |
| P6 | Hourmeter | Urenteller | Compteur d'heures | Stundenzähler |
| P7 | Fuel level gauge | Brandstofpeilindicator | Indicateur de niveau de carburant | Meßinstrument für Kraftstoffstand |
| S2 | Emergency stop button | Noodstopknop | Bouton arrêt d'urgence | Not-Aus-Taste |
| S7 | Low fuel level switch | Schakelaar, laag brandstofpeil | Interrupteur niveau de carburant bas | Schalter für niedrigen Kraftstoffstand |
| S7' | Low fuel level switch | Schakelaar, laag brandstofpeil | Interrupteur niveau de carburant bas | Schalter für niedrigen Kraftstoffstand |
| S8 | Coolant high temperature switch | Schakelaar, hoge koelwatertemperatuur | Thermostat, basse température eau de refroidissement | Schalter für hohe Temperatur |
| S9 | Engine oil low pressure switch | Schakelaar, lage motoroliedruk | Interrupteur basse pression d'huile moteur | Schalter für geringen Motoröldruck |
| X10 | 15-pole connector | Konnektor, 15 stiften | Connecteur 15 broches | 15-poliger Stecker |
| X16 | Module connector | Modulekonnektor | Connecteur de module | Modulstecker |
| X17 | Fuel level unit connector | Konnektor brandstofpeil module | Connecteur du module de niveau d'huile | Stecker für Kraftstoffstandeinheit |
| Y1 | Fuel stop solenoid | Brandstofstopsolenoïde | Solénoïde d'arrêt de carburant | Kraftstoffabsperrmagnet |

| | ESPAÑOL | SVENSKA | ITALIANO | NORSK |
|---|---|---|---|---|
| B7 | Sensor del nivel de combustible | Sensor - bränslenivå | Sensore del livello di combustibile | Føler for drivstoffnivå |
| E1 | Resistencia de precalentamiento | Föruppvärmningsresistor | Resistenza di preriscaldamento | Forvarmeresistor |
| F4 | Fusible 10A | Säkring 10A | Fusibile 10A | Sikring 10A |
| G1 | Batería de 12V | Batteri 12V | Batteria a 12V | Batteri 12 V |
| G2 | Generador de carga | Laddningsgenerator | Generatore di carica | Ladegenerator |
| H1 | Luz de panel | Panelljus | Luci del pannello | Panellys |
| K0 | Solenoide de arranque | Startsolenoid | Solenoide dell'avviatore | Magnetkontakt for starter |
| K1 | Relé, sistema de precalentamiento | Föruppvärmningsrelä | Relé di preriscaldamento | Forvarmerrelé |
| K5 | Relé arrancador | Startrelä | Relé di avviamento | Startrelé |
| M1 | Motor de arranque | Startmotor | Motore dell'avviatore | Starter |
| N4 | Módulo de control | Kontrollmodul | Modulo di controllo | Kontrollmodul |
| P6 | Cuentahoras | Timmätare | Contaore | Timeteller |
| P7 | Indicador del nivel de combustible | Bränslenivåmätare | Indicatore di livello del combustibile | Drivstoffmåler |
| S2 | Botón de parada de emergencia | Knapp för nödstopp | Pulsante di arresto di emergenza | Knapp for sikkerhetsstopp |
| S7 | Interruptor bajo nivel de combustible | Brytare för låg bränslenivå | Interruttore di basso livello del combustibile | Bryter for lavt drivstoffnivå |
| S7' | Interruptor bajo nivel de combustible | Brytare för låg bränslenivå | Interruttore di basso livello del combustibile | Bryter for lavt drivstoffnivå |
| S8 | Interruptor alta temperatura de refrigerante | Brytare för hög kylvätsketemperatur | Interruttore di temperatura alta del refrigerante | Bryter for høy kjølevæsketemperatur |
| S9 | Interruptor baja presión aceite del motor | Brytare för lågt oljetryck | Interruttore di bassa pressione dell'olio | Bryter for lavt oljetrykk i motoren |
| X10 | Conector de 12 polos | 10-poligt kontaktdon | Connettore a 12 poli | 12-polet kontakt |
| X16 | Conector de módulo | Modul-kontaktdon | Connettore del modulo | Modulkontakt |
| X17 | Conector unidad nivel de combustible | Bränslenivåenhetens kontaktdon | Connettore dell'unitá livello del combustibile | Kontakt for drivstoffnivåenhet |
| Y1 | Solenoide de detención del combustible | Bränslestoppsmagnet | Solenoide di arresto carburante | Stoppsolenoid for drivstoff |

9822 0888 08

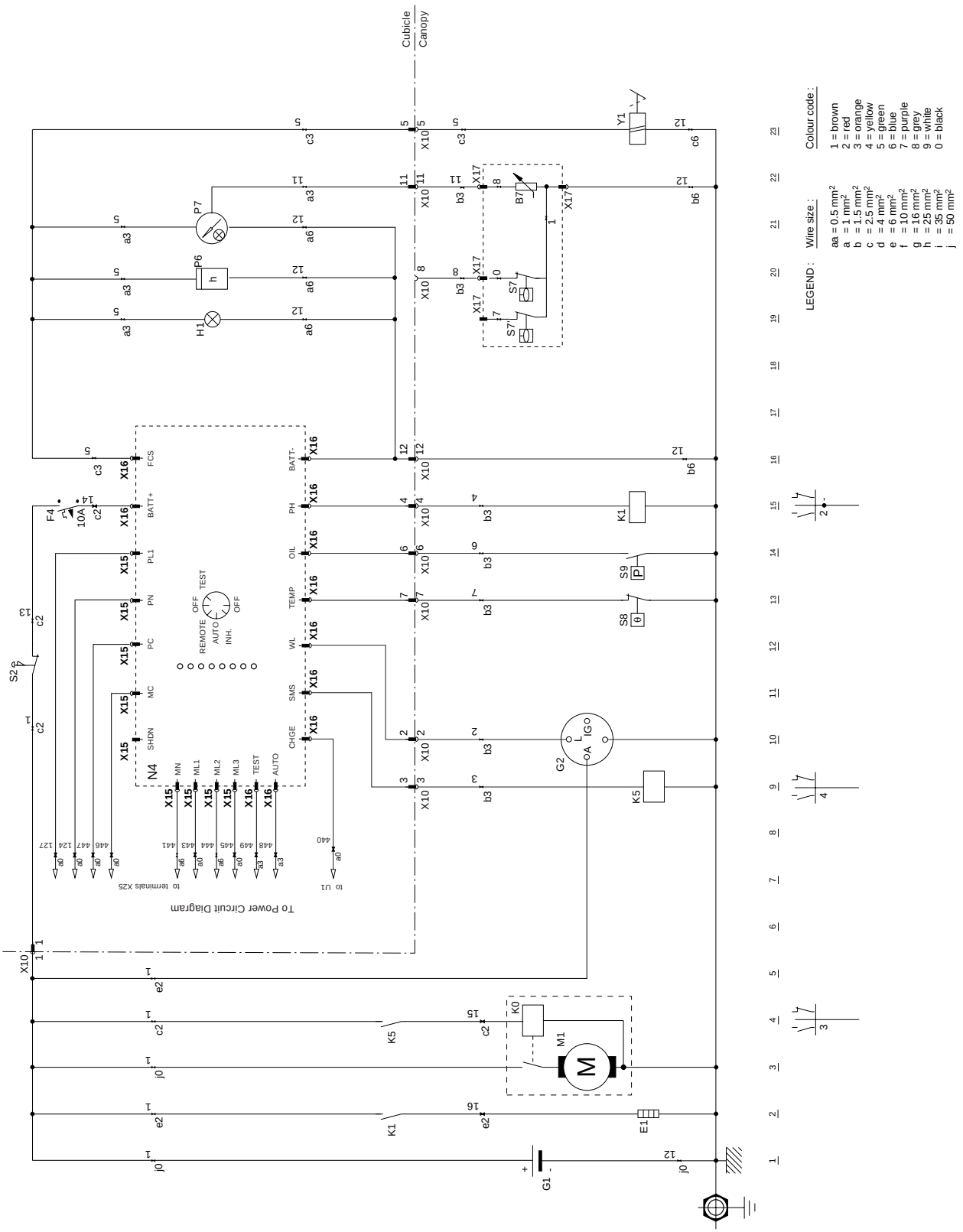
**9822 0888 08**
**Applicable for QAS14 Yd(S) RS, Yd DV DF RS**



**9822 0888 08**

| | DANSK | ΕΛΛΗΝΙΚΑ | PORTUGUÊS | SUOMI |
|---|---|---|---|---|
| B7 | Brændstofniveauføler | Αισθητήρας στάθμης καυσίμου | Sensor do nível de combustível | Polttoainemäärän anturi |
| E1 | Modstand i forvarmersystem | Αντίσταση προθέρμανσης | Resistência do pré-aquecimento | Hehkuvastus |
| F4 | Sikring 10A | Ασφάλεια 10Α | Fusível 10A | Varoke 10A |
| G1 | Batteri 12V | Μπαταρία 12V | Bateria 12V | Akku 12 V |
| G2 | Ladegenerator | Φορτιστής γεννήτριας | Gerador de carga | Latausgeneraattori |
| H1 | Lampe | Λυχνία πίνακα | Luz do painel | Kojetaulun valo |
| K0 | Startmagnet | Σολληνοειδές εκκίνησης | Solenóide do motor de arranque | Käynnistyssolenoidi |
| K1 | Relæ, forvarmersystem | Ρελέ προθέρμανσης | Relé de corte do pré-aquecimento | Hehkurele |
| K5 | Startrelæ | Αναμετάδοση Μίζας | Relé do motor de arranque | Käynnistysrele |
| M1 | Startermotor | Μίζα | Motor de arranque | Käynnistysmoottori |
| N4 | Kontrolmodul | Στοιχείο ελέγχου | Módulo de controlo | Ohjainmoduli |
| P6 | Timetæller | Ωρομετρητής | Contador de horas | Käyttötuntimittari |
| P7 | Brændstofniveaumeter | Οργανο μέτρησης στάθμης καυσίμου | Indicador do nível de combustível | Polttoainemittari |
| S2 | Nødstopknap | Μπουτόν σβησίματος έκτακτης ανάγκης | Botão de paragem de emergência | Hätäpysäytyskytkin |
| S7 | Brændstofniveaukontakt | Διακόπτης χαμηλής στάθμης καυσίμου | Comutador do nível baixo de combustível | Alhaisen polttoainemäärän merkkivalon kytkin |
| S7' | Brændstofniveaukontakt | Διακόπτης χαμηλής στάθμης καυσίμου | Comutador do nível baixo de combustível | Alhaisen polttoainemäärän merkkivalon kytkin |
| S8 | Kontakt, høj kølevandstemperatur | Διακόπτης υψηλής θερμοκρασίας ψυκτικού | Comutador da temperatura elevada do refrigerante | Korkean jäähdytysnesteen lämpötilan merkkivalon kytkin |
| S9 | Kontakt, lavt olietryk | Διακόπτης χαμηλής πίεσης λαδιού κινητήρα | Comutador da pressão do óleo do motor | Moottoriöljyn alhaisen paineen merkkivalon kytkin |
| X10 | 12 -faset kontaktklemme | 12-πολικός σύνδεσμος | Ligação em 12 polos | 12-napainen liitin |
| X16 | Modulkontaktklemme | Αναλογικός σύνδεσμος | Ligação do módulo | Moduuliliitin |
| X17 | Kontaktklemme for brændstofniveau | Σύνδεσμος μονάδος στάθμης καυσίμου | Ligação da unidade do nível de combustível | Polttoainemäärän ilmaisimen liitin |
| Y1 | Brændstofstopmagnet | Σολληνοειδές ανακοπής καυσίμου | Válvula electromagnética de corte de combustível | Polttoaineen sulkusolenoidi |

**9822 0888 09**
**Applicable for QAS14 Yd AMF**



| | ENGLISH | NEDERLANDS | FRANCAIS | DEUTSCH |
|---|---|---|---|---|
| B7 | Fuel level sensor | Sensor, brandstofpeil | Capteur, niveau de carburant | Kraftstoffstandfühler |
| E1 | Preheat resistor | Voorverwarmingsweerstand | Résistance de préchauffage | Vorwärmwiderstand |
| F4 | Fuse 10A | Zekering 10A | Fusible 10A | Sicherung 10A |
| G1 | Battery 24V | Batterij 24V | Batterie 24V | Batterie 24V |
| G2 | Charging generator | Laad alternator | Alternateur, charge | Lademaschine |
| H1 | Panel light | Paneelverlichting | Eclairage panneau | Instrumentenleuchte |
| K0 | Starter solenoid | Startersolenoïde | Solénoide du démarreur | Startermagnet |
| K1 | Preheat relay | Relais voorverwarmingssysteem | Relais de préchauffage | Vorwärmrelais |
| K5 | Starter relay | Starterrelais | Relais de démarreur | Startrelais |
| M1 | Starter motor | Startermotor | Démarreur | Startmotor |
| N4 | Control module | Stuurmodule | Module de commande | Steuermodul |
| P6 | Hourmeter | Urenteller | Compteur díheures | Stundenzähler |
| P7 | Fuel level gauge | Brandstofpeilindicator | Indicateur de niveau de carburant | Meßinstrument für Kraftstoffstand |
| S2 | Emergency stop button | Noodstopknop | Bouton arrêt d'urgence | Not-Aus-Taste |
| S7 | Low fuel level switch | Schakelaar, laag brandstofpeil | Interrupteur niveau de carburant bas | Schalter für niedrigen Kraftstoffstand |
| S7' | Low fuel level switch | Schakelaar, laag brandstofpeil | Interrupteur niveau de carburant bas | Schalter für niedrigen Kraftstoffstand |
| S8 | Coolant high temperature switch | Schakelaar, hoge koelwatertemperatuur | Thermostat, basse température eau de refroidissement | Schalter für hohe Temperatur |
| S9 | Engine oil low pressure switch | Schakelaar, lage motoroliedruk | Interrupteur basse pression díhuile moteur | Schalter für geringen Motoröldruck |
| X10 | 15-pole connector | Konnektor, 15 stiften | Connecteur 15 broches | 15-poliger Stecker |
| X16 | Module connector | Modulekonnektor | Connecteur de module | Modulstecker |
| X17 | Fuel level unit connector | Konnektor brandstofpeil module | Connecteur du module de niveau díhuile | Stecker für Kraftstoffstandeinheit |
| Y1 | Fuel stop solenoid | Brandstofstopsolenoïde | Solénoïde d'arrêt de carburant | Kraftstoffabsperrmagnet |

| | ESPAÑOL | SVENSKA | ITALIANO | NORSK |
|---|---|---|---|---|
| B7 | Sensor del nivel de combustible | Sensor - bränslenivå | Sensore del livello di combustibile | Føler for drivstoffnivå |
| E1 | Resistencia de precalentamiento | Föruppvärmningsresistor | Resistenza di preriscaldamento | Forvarmeresistor |
| F4 | Fusible 10A | Säkring 10A | Fusibile 10A | Sikring 10A |
| G1 | Bateria de 24V | Batteri 24V | Batteria a 24V | Batteri 24 V |
| G2 | Generador de carga | Laddningsgenerator | Generatore di carica | Ladegenerator |
| H1 | Luz de panel | Panelljus | Luci del pannello | Panellys |
| K0 | Solenoide de arranque | Startsolenoid | Solenoide dellíavviatore | Magnetkontakt for starter |
| K1 | Relé, sistema de precalentamiento | Föruppvärmningsrelä | Relé di preriscaldamento | Forvarmerrelé |
| K5 | Relé arrancador | Startrelä | Relé di avviamento | Startrelé |
| M1 | Motor de arranque | Startmotor | Motore dellíavviatore | Starter |
| N4 | Módulo de control | Kontrollmodul | Modulo di controllo | Kontrollmodul |
| P6 | Cuentahoras | Timmätare | Contaore | Timeteller |
| P7 | Indicador del nivel de combustible | BränslenivÂmätare | Indicatore di livello del combustibile | Drivstoffmåler |
| S2 | Botón de parada de emergencia | Knapp för nödstopp | Pulsante di arresto di emergenza | Knapp for sikkerhetsstopp |
| S7 | Interruptor bajo nivel de combustible | Brytare för låg bränslenivå | Interruttore di basso livello del combustibile | Bryter for lavt drivstoffnivå |
| S7' | Interruptor bajo nivel de combustible | Brytare för låg bränslenivå | Interruttore di basso livello del combustibile | Bryter for lavt drivstoffnivå |
| S8 | Interruptor alta temperatura de refrigerante | Brytare för hög kylvätsketemperatur | Interruttore di temperatura alta del refrigerante | Bryter for høy kjølevæsketemperatur |
| S9 | Interruptor baja presión aceite del motor | Brytare för lågt oljetryck | Interruttore di bassa pressione dellíolio | Bryter for lavt oljetrykk i motoren |
| X10 | Conector de 12 polos | 10-poligt kontaktdon | Connettore a 12 poli | 12-polet kontakt |
| X16 | Conector de módulo | Modul-kontaktdon | Connettore del modulo | Modulkontakt |
| X17 | Conector unidad nivel de combustible | Bränslenivåenhetens kontaktdon | Connettore dellíunit· livello del combustibile | Kontakt for drivstoffnivænhet |
| Y1 | Solenoide de detención del combustible | Bränslestoppsmagnet | Solenoide di arresto carburante | Stoppsolenoid for drivstoff |



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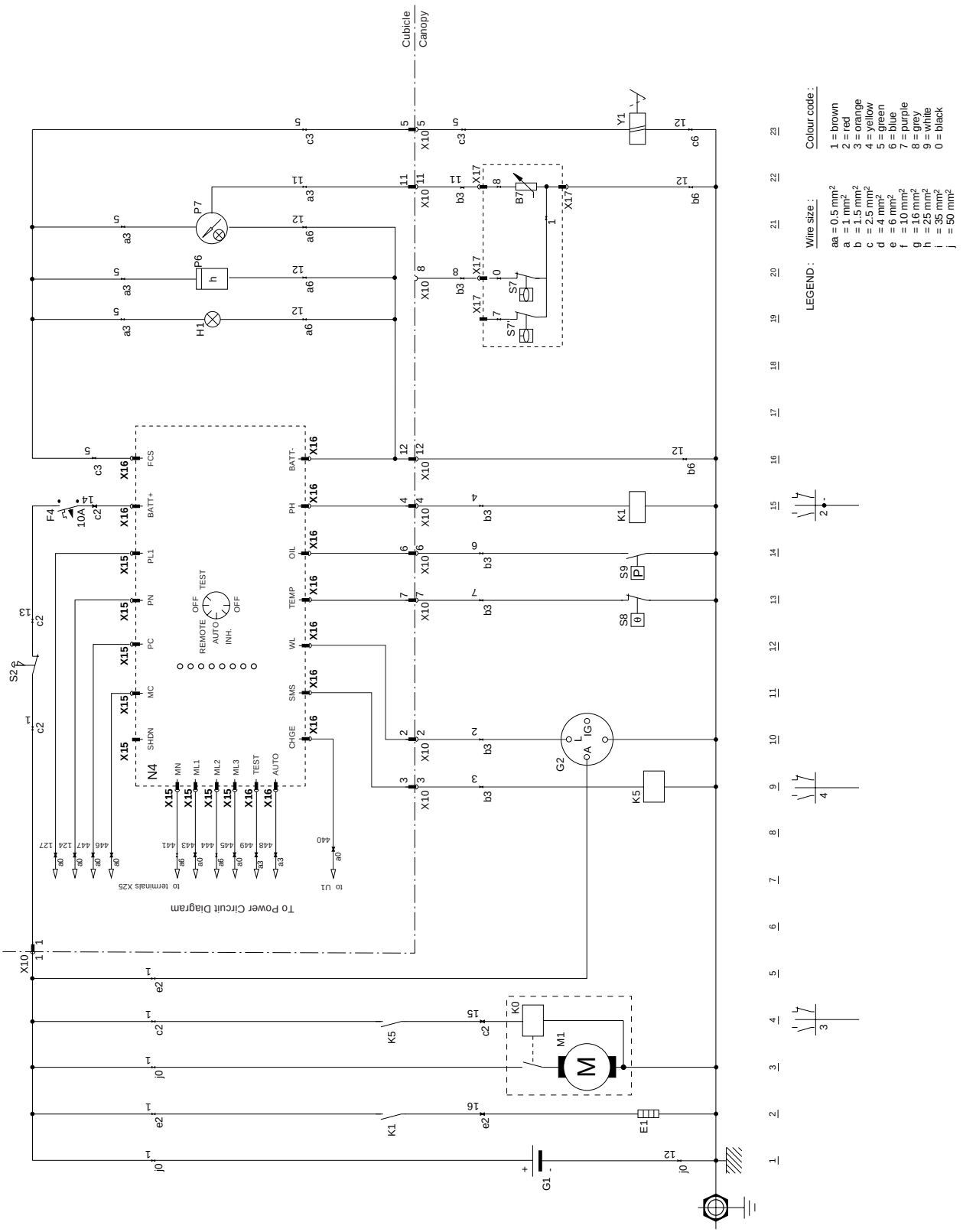
**9822 0888 09**
**Applicable for QAS14 Yd AMF**



**9822 0888 09**

| | DANSK | ΕΛΛΗΝΙΚΑ | PORTUGUÊS | SUOMI |
|---|---|---|---|---|
| B7 | Brændstofniveauføler | Αισθητήρας στάθμης καυσίμου | Sensor do nível de combustível | Polttoainemäärän anturi |
| E1 | Modstand i forvarmersystem | Αντίσταση προθέρμανσης | Resistência do pré-aquecimento | Hehkuvastus |
| G1 | Batteri 24V | Μπαταρία 24V | Bateria 24V | Akku 24 V |
| G2 | Ladegenerator | Φορτιστής γεννήτριας | Gerador de carga | Latausgeneraattori |
| H1 | Lampe | Λυχνία πίνακα | Luz do painel | Kojetaulun valo |
| K0 | Startmagnet | Σολληνοειδές εκκίνησης | Solenóide do motor de arranque | Käynnistyssolenoidi |
| K1 | Relæ, forvarmersystem | Ρελιέ προθέρμανσης | Relé de corte do pré-aquecimento | Hehkurele |
| K5 | Startrelæ | Αναμετάδοση Μίζας | Relé do motor de arranque | Käynnistysrele |
| M1 | Startermotor | Μίζα | Motor de arranque | Käynnistysmoottori |
| N4 | Kontrolmodul | Στοιχείο ελέγχου | Módulo de controlo | Ohjainmoduli |
| P6 | Timetæller | Ωρομετρητής | Contador de horas | Käyttötuntimittari |
| P7 | Brændstofniveaumeter | Οργανο μέτρησης στάθμης καυσίμου | Indicador do nível de combustível | Polttoainemittari |
| S2 | Nødstopknap | Μπουτόν σβησίματος έκτακτης ανάγκης | Botão de paragem de emergência | Hätäpysäytyskytkin |
| S7 | Brændstofniveaukontakt | Διακόπτης χαμηλής σταθμής καυσίμου | Comutador do nível baixo de combustível | Alhaisen polttoainemäärän merkkivalon kytkin |
| S7 | 'Brændstofniveaukontakt | Διακόπτης χαμηλής σταθμής καυσίμου | Comutador do nível baixo de combustível | Alhaisen polttoainemäärän merkkivalon kytkin |
| S8 | Kontakt, høj kølevandstemperatur | Διακόπτης υψηλής θερμοκρασίας ψυκτικού | Comutador da temperatura elevada do refrigerante | Korkean jäähdytysnesteen lämpötilan merkkivalon kytkin |
| S9 | Kontakt, lavt olietryk | Διακόπτης χαμηλής πίεσης λαδιού κινητήρα | Comutador da pressão do óleo do motor | Moottoriöljyn alhaisen paineen merkkivalon kytkin |
| X10 | 12 -faset kontaktklemme | 12-πολικός σύνδεσμος | Ligação em 12 polos | 12-napainen liitin |
| X11 | Kontaktkonnektor for kølevæskeniveau | Σύνδεσμος διακόπτη στάθμης ψυκτικού | Dispositivo de ligação do interruptor do nível do líquido de arrefecimento | Jäähdytysnestemäärän kytkin |
| X16 | Modulkontaktklemme | Αναλογικός σύνδεσμος | Ligação do módulo | Modululiitin |
| X17 | Kontaktklemme for brændstofniveau | Σύνδεσμος μονάδος στάθμης καυσίμου | Ligação da unidade do nível de combustível | Polttoainemäärän ilmaisimen liitin |
| Y1 | Brændstofstopmagnet | Σολληνοειδές ανακοπής καυσίμου | Válvula electromagnética de corte de combustível | Polttoaineen sulkusolenoidi |

CIRCUIT DIAGRAM
ELEKTRISCH SCHEMA
SCHEMA DE CIRCUIT
VERDRAHTUNGSPLAN
DIAGRAMA DE CIRCUITOS
KOPPLINGSSCHEMA

DIAGRAMMA DEL CIRCUITO
KRETSSKJEMA
STRØMDIAGRAM
ΔΙΑΓΡΑΜΜΑ ΚΥΚλΩΜΑΤΟΣ
DIAGRAMMA DOS CIRCUÍTOS
SÄHKÖKAAVIO