Instruction Manual and Parts List
for AC Generators

QIX44 Dd

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Atlas Copco

ATLAS COPCO - PORTABLE AIR DIVISION
www.atlascopco.com

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Use only authorized parts.
Any damage or malfunction caused by the use of unauthorized parts is not covered by Warranty or Product Liability.
The manufacturer does not accept any liability for any damage arising for modifications, additions or conversions made without the manufacturer's approval in writing.

Congratulations on the purchase of your QIX44 Dd 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

1 SAFETY PRECAUTIONS FOR PORTABLE GENERATORS

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

1.1 INTRODUCTION

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

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

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

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

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

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

Skill level 1: Operator

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

Skill level 2: Mechanical technician

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

Skill level 3: Electrical technician

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

Skill level 4: Specialist from the manufacturer

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

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

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

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

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

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

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

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

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

1.2 GENERAL SAFETY PRECAUTIONS

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

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

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

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

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

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

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

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

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

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

11 Mind the markings and information labels on the unit.

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

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

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

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

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

Earth the generator as well as the load properly.

16b **Portable generators IT:**

Note: This generator is built to supply a sheer alternating current IT network.

Earth the load properly.

1.3 Safety during transport and installation

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

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

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

1 Before towing the unit:
- check the towbar, the brake system and the towing eye. Also check the coupling of the towing vehicle,
- check the towing and brake capability of the towing vehicle,
- check that the towbar, jockey wheel or stand leg is safely locked in the raised position,
- ascertain that the towing eye can swivel freely on the hook,
- check that the wheels are secure and that the 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.

1.4 Safety during use and operation

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

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

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

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

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

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

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

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

9 Noise, even at reasonable levels, can cause irritation and disturbance which, over a long period of time, may cause severe injuries to the nervous system of human beings.
When the sound pressure level, at any point where personnel normally has to attend, is:

below 70 dB(A):	no action needs to be taken,
above 70 dB(A):	noise-protective devices should be provided for people continuously being present in the room,
below 85 dB(A):	no action needs to be taken for occasional visitors staying a limited time only,
above 85 dB(A):	room to be classified as a noise-hazardous area and an obvious warning shall be placed permanently at each entrance to alert people entering the room, for even relatively short times, about the need to wear ear protectors,
above 95 dB(A):	the warning(s) at the entrance(s) shall be completed with the recommendation that also occasional visitors shall wear ear protectors,
above 105 dB(A):	special ear protectors that are adequate for this noise level and the spectral composition of the noise shall be provided and a special warning to that effect shall be placed at each entrance.

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

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

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

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

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

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

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

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

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

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

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

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

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

23 Check the electric cables regularly. Damaged cables and insufficient lightening of connections may cause electric shocks. Whenever damaged wires or dangerous conditions are observed, switch the circuit breakers to OFF and stop the engine. Replace the damaged wires or correct the dangerous condition before restarting. Make sure that all electric connections are securely tightened.

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

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

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

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

1.5 SAFETY DURING MAINTENANCE AND REPAIR

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

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

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

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

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

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

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

7 Take safety precautions against toxic 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.

1.6 TOOL APPLICATIONS SAFETY

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

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

1.7 BATTERY SAFETY PRECAUTIONS

Batteries

When servicing batteries, always wear protecting clothing and glasses.

1 The electrolyte in batteries is a 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.

2 LEADING PARTICULARS

2.1 GENERAL DESCRIPTION

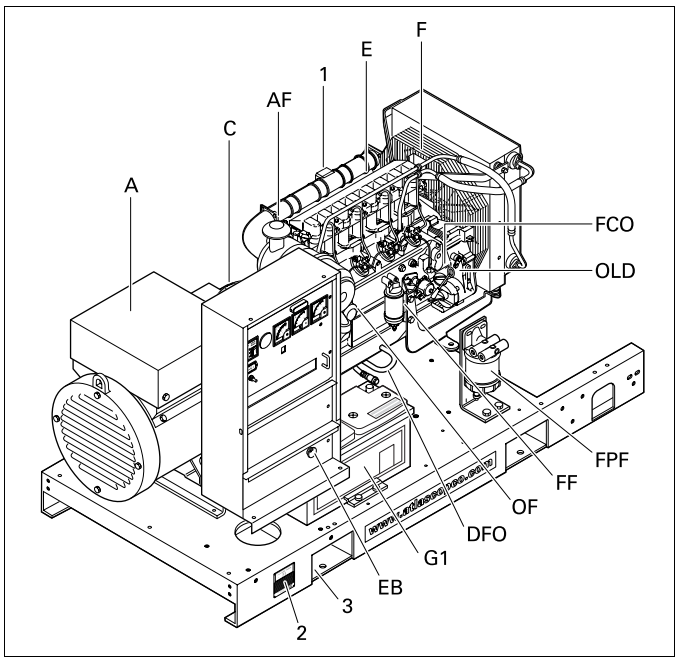
The QIX44 Dd AC generator is available in the following different versions:

50 Hz	400 V - 3 phase	windings in series star
50 Hz	230 V - 3 phase	windings in series delta
50 Hz	230 V - 1 phase	windings in parallel zig-zag

Some parts of the unit are different, depending on which version.

The QIX44 Dd generator is driven by a oil-cooled diesel engine, manufactured by DEUTZ.

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



1 ..... Engine exhaust
2 ..... Data plate
3 ..... Hole for forklift
A..... Alternator
AF..... Air filter
C..... Coupling
DFO... Drain flexible engine oil
E ..... Engine
EB..... Emergency stop button
F ..... Fan
FCO ... Filler cap engine oil
FF ..... Fuel filter
FPF .... Fuel pre-filter
G1 ..... Battery
OF ..... Oil filter
OLD... Engine oil level dipstick

2.2 MARKINGS

A brief description of all markings provided on the QIX44 Dd 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.

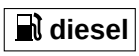
Indicates a lifting point of the generator

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

Indicates that the unit produces noise pollution. Always wear earprotection during operation.

Indicates that a rotating part is present. Never touch it during operation.

Use SAE 15W40 oil only



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

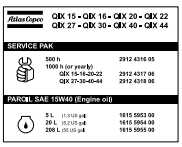
Indicates the drain for the engine oil.

Indicates the drain for the coolant.

Indicates the drain plug for the engine fuel.

Indicates the different earthing connections on the generator.

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



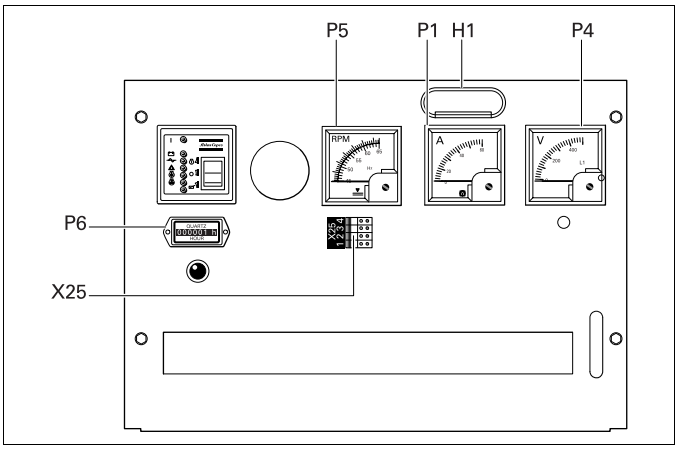
Indicates the partnumbers of the different service paks and of the engine oil. These parts can be ordered to the factory

2.3 DRAIN PLUGS

The drain plugs for the engine oil and the fuel are located at the service side.

2.4 CONTROL AND INDICATOR PANEL

The control and indicator panel is located on the cubicle. Panel light H1 goes on as soon as the starter switch is turned into position ⏱ or ⛽.



2.4.1 Engine gauges

P6 .....Hourmeter

2.4.2 Generator gauges

P1 .....Ammeter line L1

Indicates the outgoing current in the first phase (L1).

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.

2.4.3 Connections

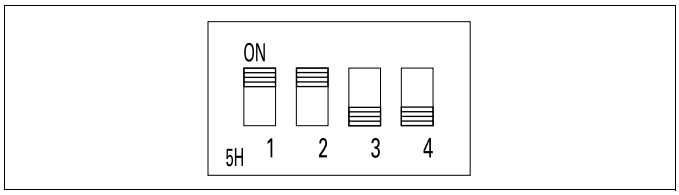
X25....Connection block

Allows easy connection for a remote start switch

Refer to the circuit diagrams for the correct connection.

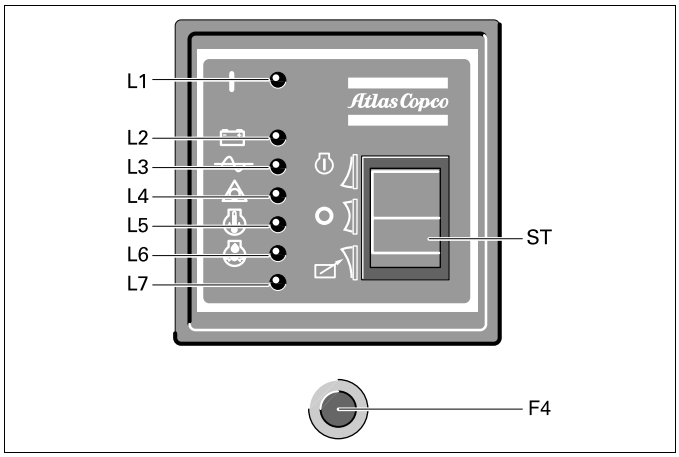
2.4.4 Control module

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



1. Oil Pressure
2. Oil Temperature
3. Spare
4. Start Delay

2.4.5 Engine controls and lamps



ST.....Starter switch

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.

F4.....Fuse

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

L1.....Electrical system indicator

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

L2.....Alternator charging indicator

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

L3.....AC shut down indicator

Lights up when no AC input (< 160 V line-to-neutral) is present.

L4 ..... Emergency stop indicator

L5 ..... Engine oil temperature fault indicator

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

L6 ..... Engine oil pressure fault indicator

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

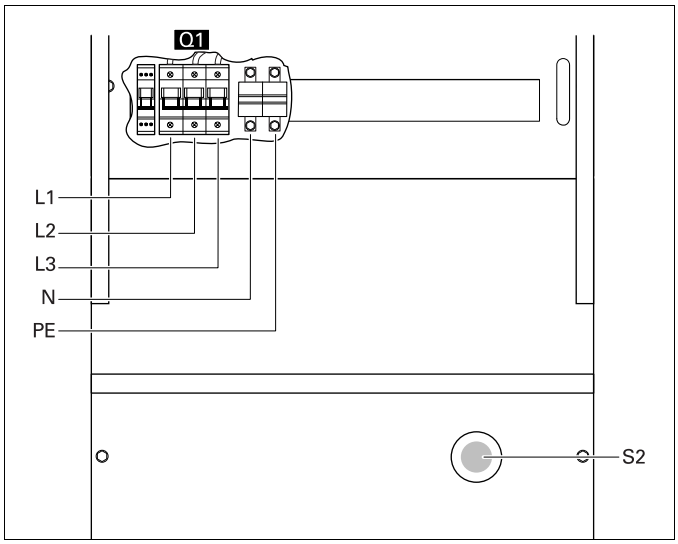
L7 ..... Spare shut down indicator

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.

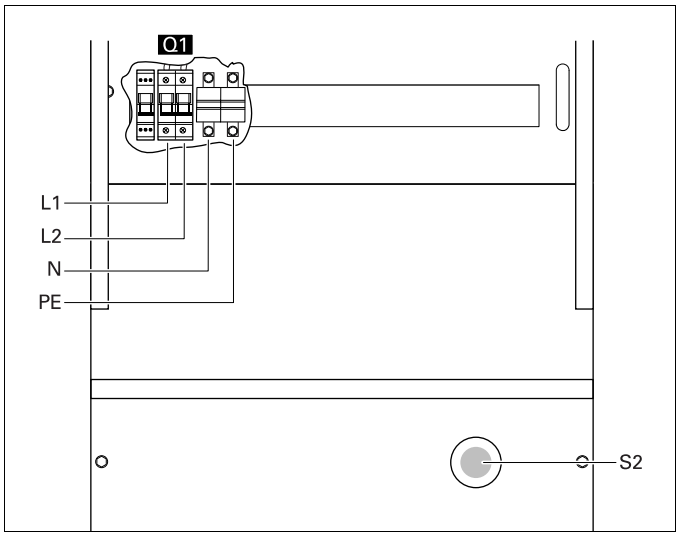
2.5 OUTPUT CONNECTIONS

The output connections are to be made directly on the main circuit breaker Q1, inside the cubicle.

230/400 V - 3 ph version



230 V - 1 ph version



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.

Q1 ..... Main circuit breaker

Interrupts the power supply when a short-circuit occurs at the load side, or when the overcurrent protection is activated, or when the emergency stop button is pushed. It can be activated again after eliminating the problem.

3 OPERATING INSTRUCTIONS

In your own interest, always strictly observe all relevant safety instructions.

Do not operate the generator in excess of the limitations mentioned in the Technical Specifications.

Local rules concerning the setting up of low voltage power installations (below 1,000 V) must be respected when connecting site distribution panels, switch gear or loads to the generator.

3.1 INSTALLATION

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

- To be able to lift the QIX44 Dd by means of a forklift, rectangular holes are provided in the frame.
- 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.
- Check the tightness of the bolts and nuts.

3.2 CONNECTING THE GENERATOR

3.2.1 Precautions for non-linear and sensitive loads

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

The most common non-linear, 3-phase loads are thyristor/rectifier-controlled loads, such as 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.

3.2.2 Quality, minimum section and maximum length of cables

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

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

Wire section	Max. current (A)		
(mm^2)	Multiple core	Single core	H07 RN-F
2.5	22	25	21
4	30	33	28
6	38	42	36
10	53	57	50
16	71	76	67
25	94	101	88
35	114	123	110
50	138	155	138
70	176	191	170
95	212	228	205
120	245	273	239
150	282	314	275
185	323	358	313
240	379	421	371
300	429	477	428

The maximum cable or conductor length can be determined as follows:

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

e = Voltage drop (V)

In = Nominal rated current (A)

L = Length of conductors (m)

R = Resistance (Ω/km to VDE 0102)

X = Reactance (Ω/km to VDE 0102)

The following table indicates the resistance (R) and reactance (X) values for a cable of type H07 RN-F:

Cable type	Wire section	R	X - 50 Hz	X - 60 Hz
H07 RN-F	(mm^2)	(Ω/km)	(Ω/km)	(Ω/km)
	2.5	8.21	0.09738	0.11690
	4	5.09	0.09110	0.10930
	6	3.39	0.08480	0.10179
	10	1.95	0.08168	0.09802
	16	1.24	0.07850	0.09425
	25	0.75	0.07692	0.09286
	35	0.56	0.07692	0.09286
	50	0.39	0.07534	0.09048
	70	0.28	0.06912	0.08294
	95	0.21	0.05969	0.07163

Example calculation of the maximum cable or conductor length:

Data:

– Generator type QIX16 Dd with:

Nominal rated current In = 25 A

Frequency = 50 Hz

Voltage V = 400 V

Cable of type H07 RN-F

What is the lowest acceptable wire section and the corresponding maximum cable or conductor length for a voltage drop e lower than 5 % and at a power factor of 0.80?

Calculation:

With In = 25 A, the lowest acceptable wire section is 4 mm².

For a cable of type H07 RN-F the values for R and X are:

R = 5.09 Ω/km

X = 0.1093 Ω/km

With a power factor of 0.80, cosφ = 0.80 and sinφ = 0.60

With a maximum acceptable voltage drop of 5 %, e = 20 V

Hence:

$$L = \frac{1000 \times e}{\sqrt{3} \times In \times (R \times \cos\varphi + X \times \sin\varphi)} = 111 m$$

The lowest acceptable wire section and the corresponding maximum cable or conductor length for multiple core cable or H07 RN-F, at rated current (25 A), for a voltage drop e lower than 5 % and at a power factor of 0.80, are respectively 4 mm^2 and 111 m. In case electric motors must be started, oversizing the cable is advisable.

3.2.3 Connecting the load

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.

– Provide the wire ends with cable lugs suited for the cable terminals.

– Route the cable trough the bottom hole in the cubicle and connect it directly on circuit breaker Q1.

3.3 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.

– Drain any water and sediment from the fuel pre-filter.

– Check the vacuum indicator of the air filter. If the red part shows completely, replace the filter element.

– Press the vacuator valve of the air filter to remove dust.

– Check the generator for leakage, tightness of wire terminals, etc. Correct if necessary.

– Check that circuit breaker Q1 is switched off.

– Check that fuse F4 is not activated and that the emergency stop is in the “OUT” position.

– Check that the load is switched off.

3.4 STARTING

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 will start cranking.

– The starting attempt will take maximum 12 seconds. If the unit does not start immediately, it will wait 12 seconds before carrying out another 2 starting attempts, each consisting of 12 seconds cranking and separated by 12 seconds waiting.

– Approximately 15 seconds after starting (stabilisation time for the generator), the timer relay closes the voltage free contact (between X25-3 and X25-4) and the plant contactor is energised (if installed).

– 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.

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

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

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.

– Connect X25-1 with X25-2. The unit will start cranking.

– The starting attempt will take maximum 12 seconds. If the unit does not start immediately, it will wait 12 seconds before carring out another 2 starting attempts, each consisting of 12 seconds cranking and separated by 12 seconds waiting.

– Approximately 15 seconds after starting (stabilisation time for the generator), the timer relay closes the voltage free contact (between X25-3 and X25-4) and the plant contactor is energised (if installed).

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

3.5 DURING OPERATION

Following points should be carried out regularly:

– Check the warning 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 or fuel.

– Avoid long low-load periods (<30 %). In this case, an output power drop and higher oil consumption of the engine could occur.

– When single-phase loads are connected to the generator output terminals, keep all loads well-balanced.

If circuit breaker Q1 trips during operation, switch off the load and stop the generator.

3.6 STOPPING

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.

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 disconnecting X25-1 from X25-2.

Lock the emergency stop button with the key to avoid unauthorized use of the unit.

4 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.

4.1 MAINTENANCE SCHEDULE	Daily	Initially	Normal	Yearly
		50 hours	*500 hours*	*1000 hours*
SERVICE PAK	**-**	**with unit**	**2912 4316 05**	**2912 4318 06**
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.				
Engine oil level	Check	Check	Check	Check
Air filter dust valve	Empty	Empty	Empty	Empty
Fuel filter water drain	Drain	Drain	Drain	Drain
Air intake vacuum indicator	Check	Check	Check	Check
Battery level		Check	Check	Check
Leaks in air-, oil-, fuelsystem		Check	Check	Check
Oil cooler package			Clean	Clean
Shut down switches				Check
Fan V-belt (2)		Adjust	Adjust	Adjust
Fueltank (optional)				Clean
Engine oil (2,3)		Change	Change	Change
Engine oil filter (2)		Replace	Replace	Replace
Fuel filter (2)		Replace	Replace	Replace
Fuel pre-filter			Replace	Replace
Air filter element (1)				Replace
Engine inlet and outlet valves (2,4)				Adjust
Test run for Emergency Generators	⚠	**Generators in standby application have to be tested on a regular basis. At least once a month the engine should run for one hour. If possible a high load (>30%) should be applied so that the engine reaches its operating temperature**		

4.1.1 Notes

(1) More frequently when operating in a dusty environment.

(2) Refer to the KHD Deutz instruction manual.

(3) 500 hours only valid when using PAROIL SAE 15 W 40.

(4) The valves need to be adjusted for the first time before 500 running hours.
The rocker cover gasket is not included in the 500 hours kit.
They are to be ordered seperately: PN 2914 8054 00.

4.2 ENGINE MAINTENANCE

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

Perform a testrun at least once a month! The engine should run for one hour, if possible at high load (>30%).

4.3 (*) MEASURING THE ALTERNATOR INSULATION RESISTANCE

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

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

Connect the megger between the earth terminal PE 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.

5 STORAGE OF THE GENERATOR

5.1 STORAGE

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

– Consult the engine's operator manual.

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

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

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

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

– Wrap the generator, except the bottom, in a plastic bag.

5.2 PREPARING FOR OPERATION AFTER STORAGE

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

– Consult the engine's operator manual.

– Check that the insulation resistance of the generator exceeds 5 MΩ.

– Replace the fuelfilter. Vent the fuelsystem.

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

– Submit the generator to a test run.

6 CHECKS AND TROUBLESHOOTING

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).

6.1 CHECKING VOLTMETER P4

– Put a voltmeter in parallel with voltmeter P4 on the control panel.

– Check that the read-out of both voltmeters is the same.

– Stop the generator and disconnect one terminal.

– Check that the internal resistance of the voltmeter is high.

6.2 CHECKING 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 (200-277 V) and check that it indicates the mains frequency (50 Hz).

6.3 CHECKING AMMETER P1

– Measure by means of a clamp-on probe the current, during the load.

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

6.4 ALTERNATOR TROUBLESHOOTING

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 10 % of rated speed.
	Failed regulator.	Substitute regulator.
	Rotating bridge failure.	Check diodes, disconnect cables.
Higher than rated voltage at load.	Voltage potentiometer out of setting.	Reset voltage potentiometer.
	Loose sensing wires on AVR.	Check sensing wires on AVR.
	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.

6.5 ENGINE TROUBLESHOOTING

Refer to the engine’s operator manual for the engine troubleshooting.

7 OPTIONS AVAILABLE FOR QIX44 Dd UNITS

7.1 CIRCUIT DIAGRAMS FOR QIX44 Dd UNITS

The engine control circuit diagrams and the power circuit diagrams for the QIX44 Dd units are:

Voltage	*Control system*	*Power circuit*	*Engine control circuit*
400 V - 3 ph	RS	9822 0908 01	9822 0908 08
400 V - 3 ph	AMF	9822 0908 01	9822 0908 09
230 V - 3 ph	RS	9822 0908 02	9822 0908 08
230 V - 3 ph	AMF	9822 0908 02	9822 0908 09
230 V - 1 ph	RS	9822 0908 03	9822 0908 08
230 V - 1 ph	AMF	9822 0908 03	9822 0908 09

7.2 OVERVIEW OF THE ELECTRICAL OPTIONS

The following “electrical” options are available for the QIX44 Dd unit:

- Remote Start
- Automatic mains failure
- Automatic battery charger
- Earth leakage relay
- IT-relay
- Terminal board (TB)
- Sockets
- Over and under voltage relay
- Electronic speed regulator
- Engine oil heater

7.3 DESCRIPTION OF THE ELECTRICAL OPTIONS

7.3.1 Remote start (RS)

For detailed information on the “Remote start” option, see the chapter “Control and indicator panel”.

7.3.2 Automatic mains failure (AMF)

The “Automatic mains failure” option offers the following features:

- continuous monitoring of four input lines
- a connection block for monitoring
- an extended control module
- a remote start possibility
- an automatic battery charger, “trickle charge” (option)
- an engine oil heating (option)

Continuous monitoring

The “Automatic mains failure” option continuously monitors the input lines of the main power supply. In case of 400 V - 3 ph or 230 V - 3 ph: the three phases and the neutral. In case of 230 V - 1 ph: L1 and L2.

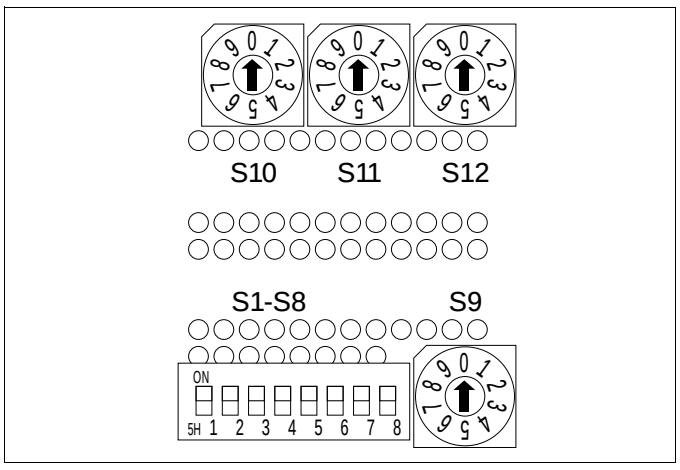
When the mains (one or all phases) is not available for approximately 0.5 seconds, the following timing applies:

- 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 energised 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:



S1-8...DIP switches

S9.....Crank timer

S10....Plant settle timer

S11....Mains restore timer

S12....Delay run on timer

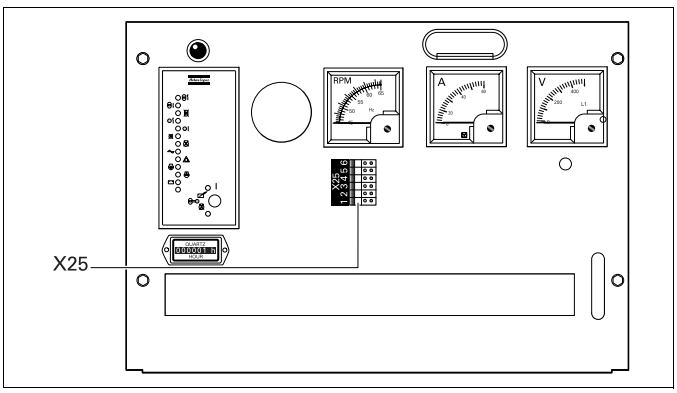
The table below summarises the relation between the position of the potentiometers and the value of the timers.

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.

Connection block for monitoring



X25.... Connection block

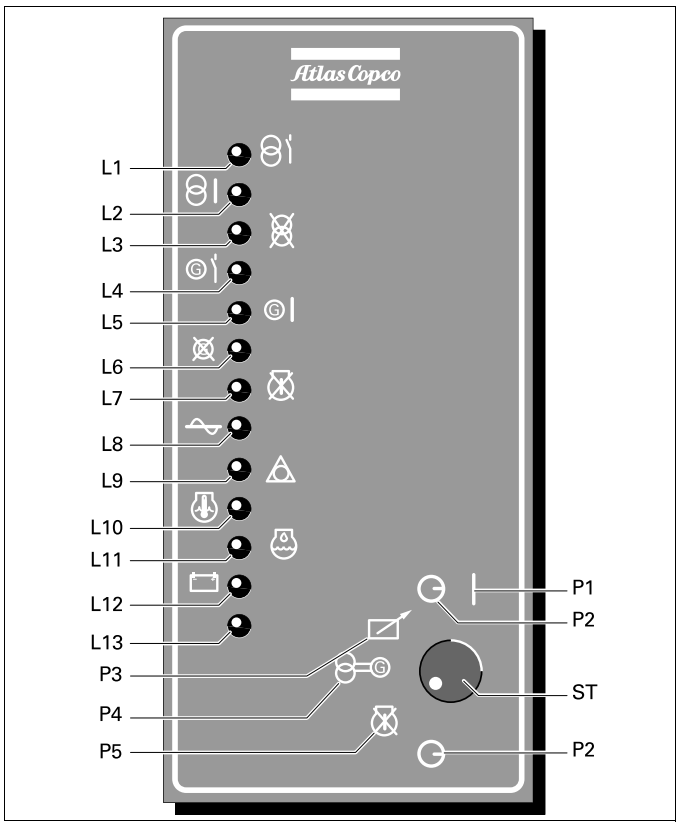
Allows easy connection for a remote start switch, for sensing of mains voltage and control of the mains and the plant contactor.

Refer to circuit diagram 9822 0773 55 of the "Automatic mains failure" option for the correct connection.

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 .....Emergency stop indicator

Lights up when an emergency stop was the cause of shut down.

L10 ....Engine oil temperature shut down

Lights up when the high engine oil 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 charging alternator is charging the battery. A failing alternator however will not shut the engine down.

L13 ....Spare shut down indicator

Can be used to wire an extra shut down.

ST.....Starter switch

P1 .....Position P1

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

P2 .....Position P2

The generator will never start.

P3 .....Position P3

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

P4 .....Position P4

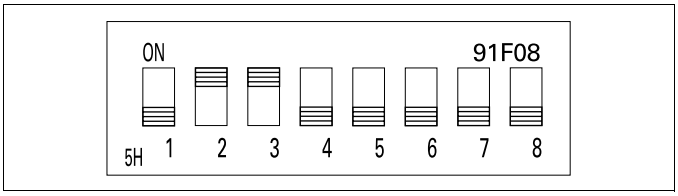
The generator will take over when a mains failure occurs.

P5 .....Position 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.

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:



1.	Spare	5.	Charge fail
2.	Oil pressure	6.	W/L input
3.	Oil temperature	7.	N/A
4.	Static charge	8.	Start delay

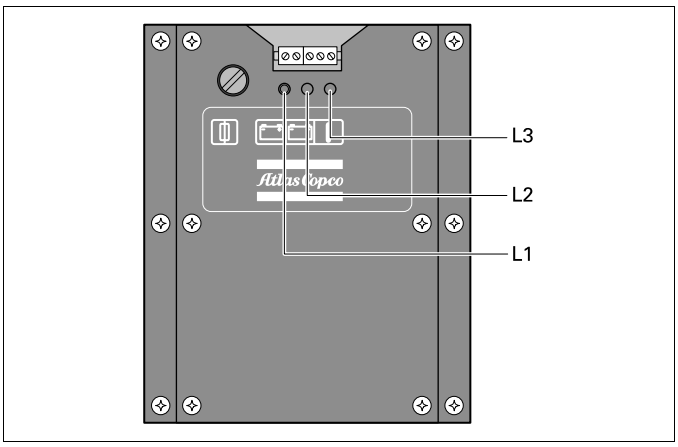
Remote start possibility

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).

7.3.3 Automatic battery charger

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



L1.....Red Led

Lights up when the battery is charging.

L2.....Yellow Led

Lights up when the battery is charged

L3.....Green Led

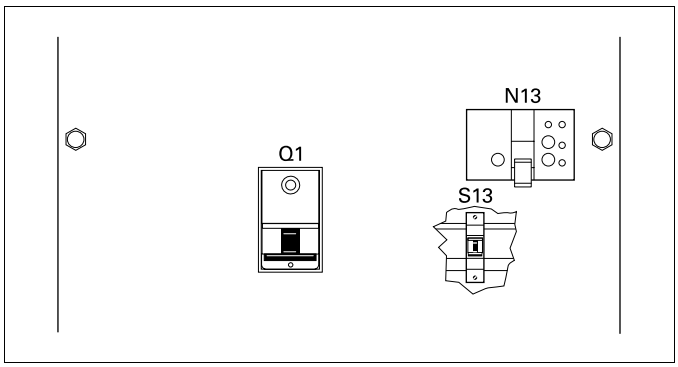
Lights up when AC power supply is available.

To use the batery charger:

– Provide the X7 connector, located at the side of the power cubicle, with external power to use the battery charger.

7.3.4 Earth leakage relay

The “Earth leakage relay” provides a detector that will trip the main circuit breaker Q1 when an earth fault current is detected.



N13 ... Earth Leak detector

Detects and indicates an earth fault current and activates the main circuit breaker Q1. The detection level is factory set at 0.03 A fixed with instantaneous trip but can also be adjusted. N13 has to be reset manually after eliminating the problem. It can be overridden by means of the earth leakage switch (S13, labelled IΔN) but has to be tested monthly (by pushing test button T13).

50 Hz - 400 V

Q1 ..... Main circuit breaker

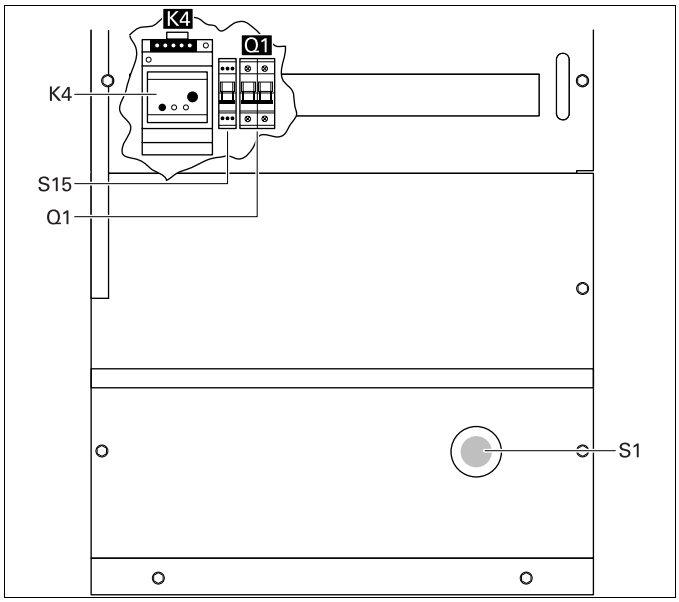
Together with the earth relay a 4-pole circuit breaker will be installed. It interrupts the power supply when a short-circuit occurs at the load side, or when the overcurrent protection is activated, or when the emergency stop button is pushed. When activated, Q1 interrupts L1, L2, L3 and N. Q1 can be activated again after eliminating the problem.

7.3.5 IT-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 a too low 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.

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. (factory set at 13 MΩ)



K4..... Insulation monitoring relay

Checks the insulation resistance and activates Q1 when the insulation resistance is too low. It can be reset by pushing the reset button S15.

S15.... Reset button

Resets the insulation monitoring relay K4.

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.

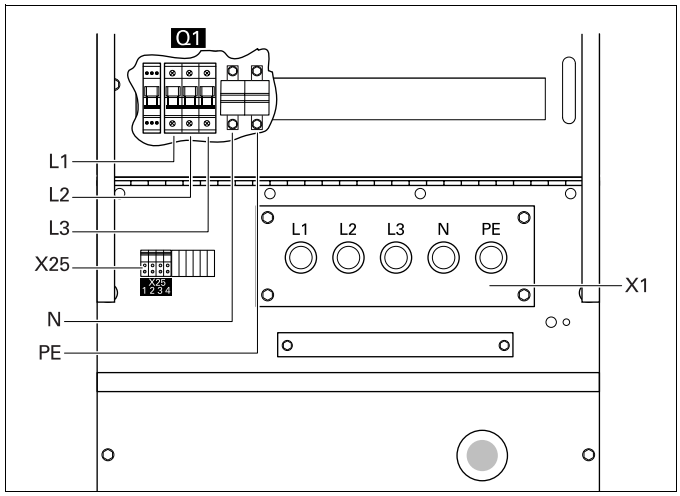
Q1 ..... Main circuit breaker

Interrupts the power supply when a short-circuit occurs at the load side, or when the overcurrent protection is activated, or when the emergency stop button is pushed. When activated, Q1 interrupts L1, L2 and L3. It can be activated again after eliminating the problem.

7.3.6 Terminal board (TB)

The “Terminal board” option provides a terminal board for more easy connection of cables.

230/400 V - 3 ph



Q1.....Main circuit breaker

It interrupts the power supply when a short-circuit occurs at the load side, or when the overcurrent protection is activated, or when the emergency stop button is pushed. When activated, Q1 interrupts L1, L2 and L3. Q1 can be activated again after eliminating the problem.

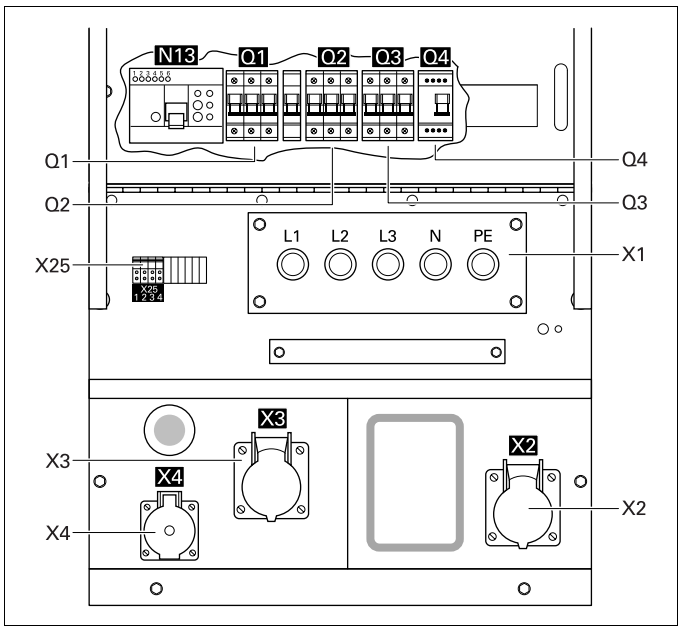
X1.....Main power supply

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

X25....Connection block

Allows easy connection for a remote start switch.

7.3.7 Outlet sockets (S)



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

X1.....Terminal board

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

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

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

X4.....1-phase outlet socket (230 V AC)

Provides phase L3, neutral and earthing.

X25....Terminal block

Allows easy connection for a remote start switch.

Q1.....Main circuit breaker

Interrupts the power supply when a short-circuit occurs at the load side, or when the overcurrent protection is activated (32 A), or when the emergency stop button is pushed. When activated, Q1 interrupts L1, L2 and L3. It can be activated again after eliminating the problem.

Q2.....Circuit breaker for X2

Interrupts the power supply to X2 when a short-circuit occurs at the load side, or when the overcurrent protection (32 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 the three phases towards X3. It can be activated again after eliminating the problem.

Q4.....Circuit breaker for X4

Interrupts the power supply to X4 when a short-circuit occurs at the load side, or when the overcurrent protection (16 A) is activated. When activated, Q4 interrupts the three phases towards X4. 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, X3 and X4.

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

7.3.8 Over and under voltage relay

The settings of this relay can be adjusted by the customer via the dedicated potentiometers. Factory settings are +8% / –8% / 5 seconds. Outside these limits the generator will shut down (voltage LED of the module will light up).

7.3.9 Electronic speed regulator

The electronic speed regulator makes sure that the output frequency of the generator is 50 Hz, independent of the amount of load. The accuracy at constant load is ± 0.25%.

7.3.10 Engine oil heater

To make sure that the engine can start and accept load immediately, an external engine oil heater can be provided.

Only possible when an automatic battery charger is installed.

7.4 OVERVIEW OF THE MECHANICAL OPTIONS

The following “mechanical” options are available for the QIX44 Dd unit:

- Built-in fueltank
- External fueltank connection
- Low fuel level shutdown
- Electrical fuel pump
- Stone guard
- Weather protected canopy
- Sound attanuated canopy
- Super sound attenuated canopy
- Loose industrial muffler
- Mounted industrial muffler
- Loose residential muffler
- Mounted residential muffler
- Lifting device
- Skid
- Spillage free skid
- Hot spot guards
- Oil drain pump
- No cubicle

7.5 DESCRIPTION OF THE MECHANICAL OPTIONS

7.5.1 External Fueltank connection

The 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. 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.

Only in combination with the built-in fueltank.

7.5.2 Low fuel level Shutdown

The engine is shut down when the fuel in the built-in-fueltank reaches the low fuel level.

Only in combination with the built-in fueltank.

7.5.3 Electrical fuel pump

The operation of the fuelpump is controlled by the 4 level switch:

- The fuelpump starts filling the internal fueltank when the fuel descends below level 2.
- The fuelpump stops when level 3 is reached.
- When the fuel level sinks below level 1 or rises above level 4, the generator will shut down.

Only in combination with the built-in fueltank.

7.5.4 Stone guard

Not applicable in combination with a canopy

7.5.5 Super sound attenuated Canopy

An extra exhaust pipe and a raincap are delivered loose inside the generator. They have to be installed before operation.

7.5.6 Loose industrial Muffler

Not applicable in combination with a canopy

7.5.7 Mounted Industrial muffler

Not applicable in combination with a canopy

7.5.8 Loose Residential mufller

Not applicable in combination with a canopy

7.5.9 Mounted Residential muffler

An extra raincap is delivered together with the unit.
It has to be installed before operation.

Only in combination with a canopy!

7.5.10 Skid

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

7.5.11 Spillage Free Skid

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

7.5.12 Hot Spot Guards

Hot spot guards prevent the customer from touching the hot parts of the engine.

7.5.13 No Cubicle

The QIX generator can be ordered without control cubicle (only by Atlas Copco audited customers).

For more information, please contact Atlas Copco.

8 TECHNICAL SPECIFICATIONS

8.1 READINGS ON GAUGES

Gauge	*Reading*	*Unit*
Ammeter L1 (P1)	Below max. rating	A
Voltmeter (P4)	Depends upon selector switch	V
Frequencymeter (P5)	Between 50 and 52.5	Hz
Hourmeter (P6)	Adding up	h
Engine oil pressure (P9) (optional)	Below max. rating	bar

8.2 SETTINGS OF SWITCHES

Switch	*Function*	*Activates at*
Engine oil pressure	shut down	2.1 bar
Engine coolant temperature	shut down	135 °C

8.3 SPECIFICATIONS OF THE ENGINE/ALTERNATOR/UNIT

		400 V-3 ph	*230 V-3 ph*	*230 V-1 ph*
Reference values	Absolute air inlet pressure	100 kPa	100 kPa	100 kPa
	Air inlet temperature	25 °C	25 °C	25 °C
	Relative air humidity	30 %	30 %	30 %
	Generator load	LTP	LTP	LTP
Limitations	Maximum ambient temperature	50 °C	50 °C	50 °C
	Maximum altitude	4000 m	4000 m	4000 m
	Maximum relative air humidity	< 100 %	< 100 %	< 100 %
	Minimum starting temperature	-10 °C	-10 °C	-10 °C
Engine	Type DEUTZ	BF 4M 1011F	BF 4M 1011F	BF 4M 1011F
	Rated net output	40.5 kW	40.5 kW	40.5 kW
	Load speed	1500 r/min	1500 r/min	1500 r/min
	Electrical system	12 V	12 V	12 V
	Battery	12 V / 65 Ah	12 V / 65 Ah	12 V / 65 Ah
	Oil circuit capacity	10 l	10 l	10 l
	Cooling circuit capacity	13.5 l	13.5 l	13.5 l
	Fuel tank capacity (optional)	70 l	70 l	70 l
	Fuse F4	10 A	10 A	10 A
	Fuel consumption at full load/no load	8.5/1.6 kg/h	8.5/1.6 kg/h	8.5/1.6 kg/h
	Maximum run time with fuel tank	6.8 h	6.8 h	6.8 h
Alternator	Type	ECO 32-3S/4	ECO 32-3S/4	ECO 32-2L/4
	Rated net output	45 kVA	45 kVA	44 kVA
	Voltage 3 ph line-to-line	400 V	-	-
	Voltage 3 ph line-to-line lower voltage	-	230 V	-
	Voltage 1 ph line-to-line	-	-	230 V
	Frequency	50 Hz	50 Hz	50 Hz
	Speed	1500 r/min	1500 r/min	1500 r/min
	Power factor	0.80	0.80	1
	Winding connections	Series Star	Series Delta	Parallel Zig-zag
	Insulation armature winding, class	H	H	H
	Insulation field winding, class	H	H	H
	Setting of Q1	63 A	100 A	125 A
	Fuses F1 - F2	4 A	4 A	4 A
	Sensitivity of earth leak detector	0.025 - 25 A	0.025 - 25 A	0.025 - 25 A

Due to OND (Outdoor Noise Directive) legislations for the European market, it is not authorised to install open frame and weather protected QIX generators outdoors.

Derating

Height(m)	Temperature (°C)										
	0	5	10	15	20	25	30	35	40	45	50
100	100	100	100	100	100	100	98	95	92	89	86
500	100	100	100	100	100	98	94	91	88	86	83
1000	100	99	98	97	96	93	90	88	85	82	79
1500	100	98	96	94	92	89	86	84	81	78	75
2000	100	97	94	92	89	86	82	80	77	74	71
2500	94	93	91	89	85	82	78	76	73	70	68
3000	94	93	91	86	81	79	74	72	69	66	64
3500	83	82	80	79	78	75	70	68	65	62	60
4000	83	82	79	76	73	70	68	65	63	60	58

Unit

Dimensions (L xW x H)	1802 x 872 x 956 mm
Weight net mass	685 kg
Weight wet mass	705 kg

8.4 SPECIFICATIONS OF THE OPTIONS

8.4.1 Specifications of the single frequency option

	400 V-3 ph
Frequencymeter (P5)	50 Hz
Load speed (50 Hz)	1500 rpm
Frequency tolerance	0.25 %

8.4.2 Specifications of the earth fault relay option

Setting of Q1	32 A

8.4.3 Specifications of the outlet sockets option

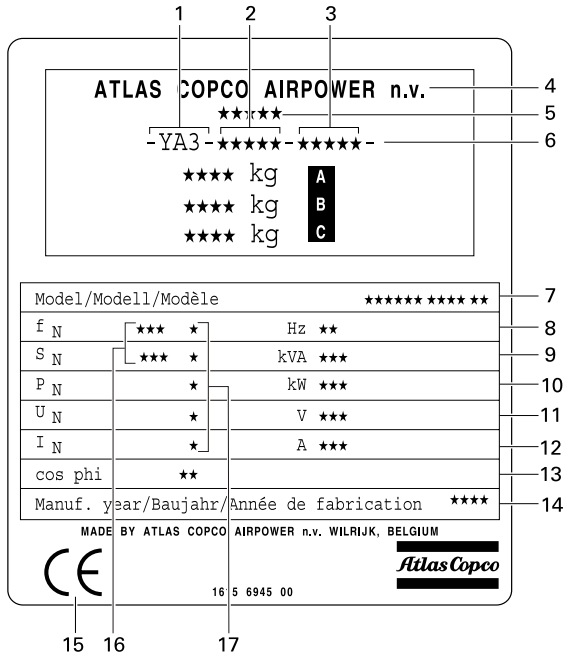
Setting of Q1	32 A
Setting of Q2	32 A
Setting of Q3	16 A
Setting of Q4	16 A

8.5 CONVERSION LIST OF SI UNITS INTO BRITISH UNITS

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

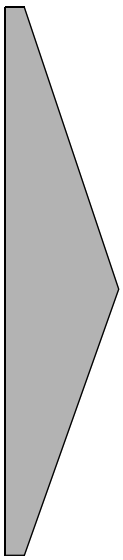
– A temperature difference of 1°C = a temperature difference of 1.8 °F

8.6 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	Continuous apparant power - LTP
10	Continuous active power - LTP
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



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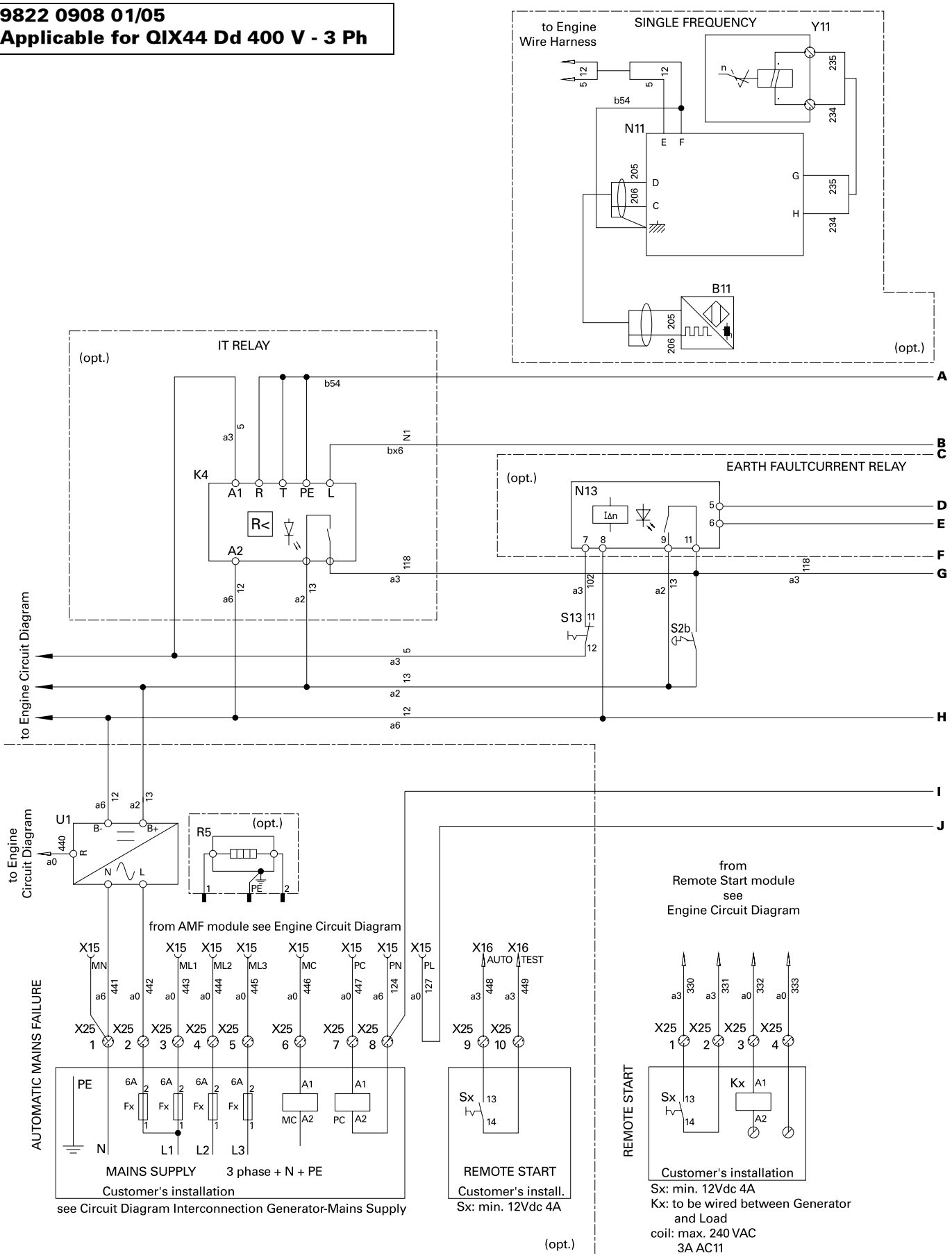
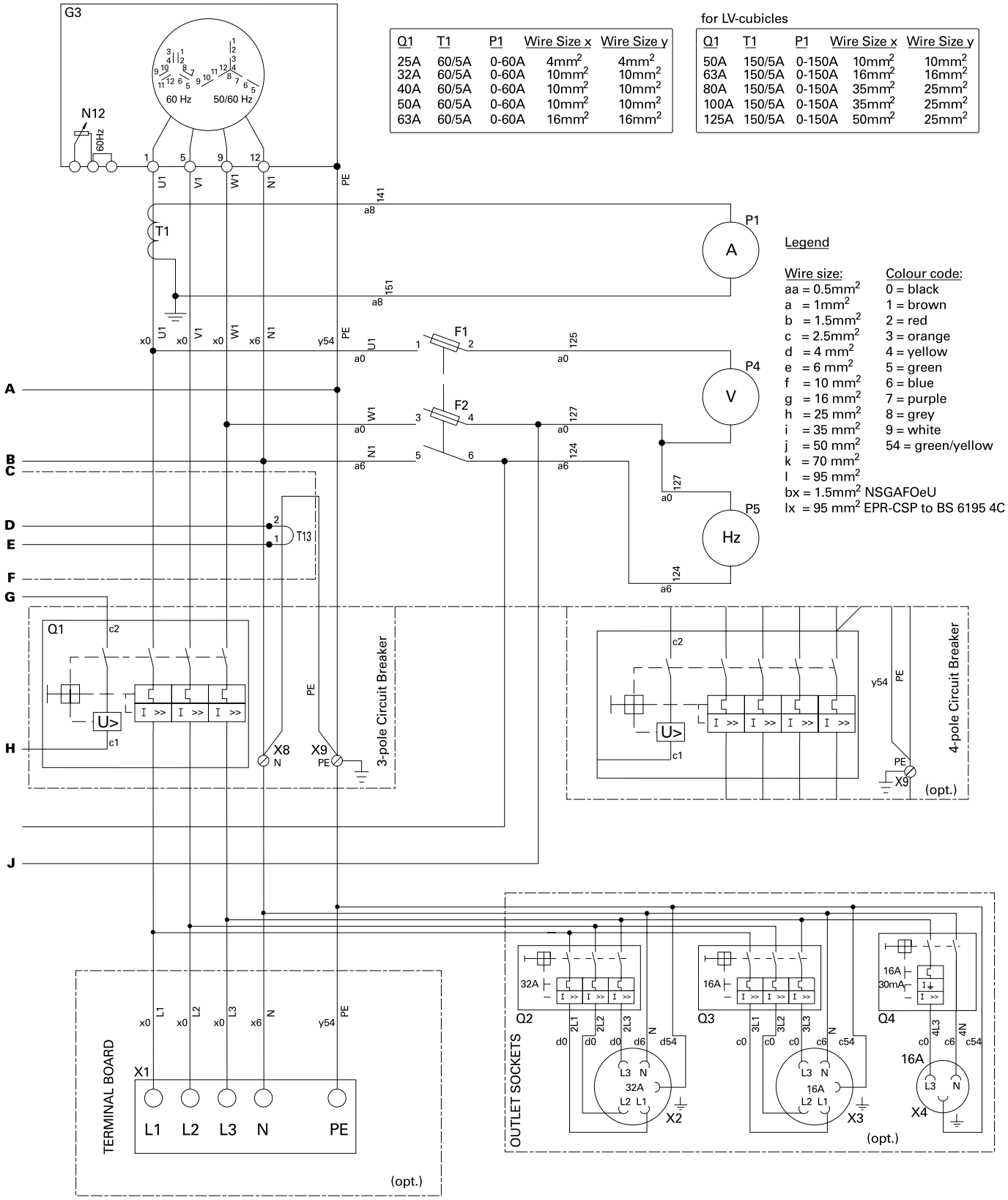
Applicable for QIX44 Dd 400 V - 3 Ph



Q1	T1	P1	Wire Size x	Wire Size y
25A	60/5A	0-60A	4mm²	4mm²
32A	60/5A	0-60A	10mm²	10mm²
40A	60/5A	0-60A	10mm²	10mm²
50A	60/5A	0-60A	10mm²	10mm²
63A	60/5A	0-60A	16mm²	16mm²

for LV-cubicles

Q1	T1	P1	Wire Size x	Wire Size y
50A	150/5A	0-150A	10mm²	10mm²
63A	150/5A	0-150A	16mm²	16mm²
80A	150/5A	0-150A	35mm²	25mm²
100A	150/5A	0-150A	35mm²	25mm²
125A	150/5A	0-150A	50mm²	25mm²



Note :

Q2 not used when Q1 ≤ 32A

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	ENGLISH	NEDERLANDS	FRANCAIS
B11	Speed sensor (Option)	Snelheidssensor (Optie)	Capteur de vitesse (Option)
F1-2	Fuse A4	Zekering A4	Fusible A4
G3	Alternator	Alternateur	Groupe électrogène
K4	IT Relay (Option)	IT-relais (Optie)	Relais informatique (Option)
N11	Speed controller (Option)	Snelheidsregelaar (Optie)	Régulateur de vitesse (Option)
N12	Automatic voltage regulator	Automatische spanningsregelaar	Régulateur de tension automatique
N13	Earth fault-current relay (Option)	Aardlekrelais (Optie)	Relais de fuite à la terre (Option)
P1	Amperemeter	Ampèremeter	Ampèremètre
P4	Voltmeter	Voltmeter	Voltmètre
P5	Frequencymeter	Frequentiemeter	Fréquencemètre
Q1	Circuit breaker	Vermogenschakelaar	Disjoncteur
Q2-4	Circuit breaker (Option)	Vermogenschakelaar (Optie)	Disjoncteur (Option)
R5	Engine Coolant Heater (Option)	Verwarmer motorkoelvloeistof (Optie)	Réchauffeur de réfrigérant du moteur (Option)
R11	Supply voltage adjust potentiometer (Option)	Regelpotentiometer, voedingsspanning (Optie)	Potentiomètre de réglage de la tension d'alimentation (Option)
S2b	Emergency stop	Noodstop	Arrêt d'urgence
S13	Lock-out switch for N13	Blokkeerschakelaar voor N13	Interrupteur de verrouillage pour N13
T1	Current transformer	Stroomtransformator	Transformateur de courant
T13	Earth fault current transformator (Option)	Aardlekdetector (Optie)	Détecteur de fuite à la terre (Option)
U1	Static battery charger (Option)	Statische batterijlader (Optie)	Chargeur de batterie statique (Option)
X1	Terminal board (Option)	Klemmenbord (Optie)	Tablette à bornes (Option)
X2-4	Outlet socket (Option)	Uitlaatpunt (Optie)	Prise femelle (Option)
X8	Terminal (N)	Klem (N)	Reglette à bornes (N)
X9	Terminal (PE)	Klem (PE)	Reglette à bornes (PE)
X15	10-pole connector (Option)	Konnektor, 10 stiften (Optie)	Connecteur 10 broches (Option)
X16	Module connector (Option)	Modulekonnektor (Optie)	Connecteur de module (Option)
X25	Terminal strip (Option)	Klemmenstrook (Optie)	Barrette de raccordement (Option)
Y11	Actuator (Option)	Actuator (Optie)	Actuateur (Option)
Sx	Remote start/stop switch (Option)	Afstands start-/stopschakelaar (Optie)	Interrupteur de démarrage/arrêt à distance (Option)
Kx	Plant contactor (Option)	Installatiecontactor (Optie)	Contacteur d'installation (Option)

	DEUTSCH	ESPAÑOL	SVENSKA
B11	Drehzahlfühler (Sonderausstattung)	Sensor de velocidad (Opción)	Varvtalssensor (Option)
F1-2	Sicherung A4	Fusible A4	Säkring A4
G3	Wechselstromgenerator	Alternador	Växelströmsgen
K4	IT-relais (Sonderausstattung)	Relé de ti (Opción)	IT-relä (Option)
N11	Drehzahlregler (Sonderausstattung)	Controlador de velocidad (Opción)	Varvtalsregulator (Option)
N12	Automatischer Spannungsregler	Regulador automático de voltaje	Automatisk spänningsregulator
N13	Erdschlußrelais (Sonderausstattung)	Relé de pérdida a tierra (Opción)	Relä för jordläckage (Option)
P1	Amperemeter	Amperímetro	Amperemätare
P4	Voltmeter	Voltímetro	Spänningsmätare
P5	Frequenzmesser	Frecuencímetro	Frekvensmätare
Q1	Leistungsschalter	Disyuntor	Strömbrytare
Q2-4	Leistungsschalter (Sonderausstattung)	Disyuntor (Opción)	Strömbrytare (Option)
R5	Heizelement Motorkühlmittel (Sonderausstattung)	Calentador del refrigerante del motor (Opción)	Motorns kylvätskevärmare (Option)
R11	Potentiometer für Einstel. der Versorgungssp. (Sonder-ausst.)	Potenciómetro de ajuste del voltaje de alimentación (Opción)	Potentiometer för justering av spänningsmatningen (Option)
S2b	Notabschaltung	Parada de emergencia	Nödstopp
S13	Riegelschalter für N13	Interruptor de bloqueo para N13	Avstängningsbrytare för N13
T1	Stromwandler	Transformador de corriente	Strömtransformator
T13	Erdschlußanzeiger (Sonderausstattung)	Detector de pérdida a tierra (Opción)	Detektor för jordläckage (Option)
U1	Feststehendes Batterieladegerät (Sonderausstattung)	Cargador estático de batería (Opción)	Statisk batteriladdare (Option)
X1	Klemmenbrett (Sonderausstattung)	Cuadro de bornas (Opción)	Anslutningsplint (Option)
X2-4	Steckdose (Sonderausstattung)	Zócalo de toma de corriente (Opción)	Uttag (Option)
X8	Klemme (N)	Terminale (N)	
X9	Klemme (PE)	Terminale (PE)	
X15	10-poliger Stecker (Sonderausstattung)	Conector 10-polar (Opción)	10-poligt kontaktdon (Option)
X16	Modulstecker (Sonderausstattung)	Conector de módulo (Opción)	Modul-kontaktdon (Option)
X25	Klemmenleiste (Sonderausstattung)	Bloque de terminales (Opción)	Anslutningslist (Option)
Y11	Stellorgan	Actuador	Manöverorgan
Sx	Schalter Fernstart/-stop (Sonderausstattung)	Interruptor remoto de arranque/parada (Opción)	Start/stopp fjärrströmbrytare (Option)
Kx	Anlagenseitiges Schütz (Sonderausstattung)	Contactor para instalación (Opción)	Anläggningsanslutning (Option)

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	ITALIANO	NORSK	DANSK
B11	Sensore velocità (Opzione)	Hastighetsføler (Ekstrautstyr)	Hastighedsføler (Ekstraudstyr)
F1-2	Fusibile A4	Sikring A4	Sikring A4
G3	Alternatore	Dynamo	Vekselstrømsgenerator
K4	Relè IT (Opzione)	IT-relé (Ekstrautstyr)	IT-relæ (Ekstraudstyr)
N11	Unità di controllo velocità (Opzione)	Hastighetsregulator (Ekstrautstyr)	Hastighedsregulator (Ekstraudstyr)
N12	Regolatore di tensione automatico	Automatisk spenningsregulator	Automatisk spændingsregulator
N13	Relè corrente di terra (Opzione)	Jordfeilrelé (Ekstrautstyr)	Jordfejlstrømsrelæ (Ekstraudstyr)
P1	Amperometro	Amperemeter	Amperemeter
P4	Voltimetro	Spenningsmåler	Voltmeter
P5	Frequenziometro	Hz-meter	Frekvensmåler
Q1	Interruttore	Kretsbryter	Kredsafbryder
Q2-4	Interruttore (Opzione)	Kretsbryter (Ekstrautstyr)	Kredsafbryder (Ekstraudstyr)
R5	Riscaldatore del liquido refrigerante del motore (Opzione)	Kjølevæskevarmer for motor (Ekstrautstyr)	Opvarmning af kølemiddel til motor (Ekstraudstyr)
R11	Potenziometro regolazione tensione di alimentazione (Opz.)	Potensiometer for justering av strømtilførsel (Ekstrautst.)	Potentiometer til justering af fødespændingen (Ekstraudst.)
S2b	Arresto di emergenza	Nødstopp	Nødstop
S13	Interruttore di blocco per N13	Låsebryter for N13	Spærreafbryder for N13
T1	Transformatore di corrente	Strøm A	Strømtransformere
T13	Rilevatore corrente di terra (Opzione)	Jordfeilføler (Ekstrautstyr)	Jordfejlstrømsdetektor (Ekstraudstyr)
U1	Carica batteria statica (Opzione)	Statisk batterilader (Ekstrautstyr)	Statisk batterioplader (Ekstraudstyr)
X1	Morsettiera (Opzione)	Koplingstavle (Ekstrautstyr)	Klembrædt (Ekstraudstyr)
X2-4	Presa esterna (Opzione)	Uttak, (Ekstrautstyr)	Stikkontakt (Ekstraudstyr)
X8	Morsetto (N)	Klemme (N)	Tilslutningsklemme (N)
X9	Morsetto (PE)	Klemme (PE)	Tilslutningsklemme (PE)
X15	Connettore a 10 poli (Opzione)	10-polet kontakt (Ekstrautstyr)	10 -faset kontaktklemme (Ekstraudstyr)
X16	Connettore del modulo (Opzione)	Modulkontakt (Ekstrautstyr)	Modulkontaktklemme (Ekstraudstyr)
X25	Morsettiera (Opzione)	Koplingssplint (Ekstrautstyr)	Klemliste (Ekstraudstyr)
Y11	Attuatore (Opzione)	Aktuator (Ekstrautstyr)	Aktuator (Ekstraudstyr)
Sx	Interruttore a distanza avvio/arresto (Opzione)	Bryter for fjernstart/-stopp (Ekstrautstyr)	Kontakt til fjernstyring af start/stop (Ekstraudstyr)
Kx	Contattore dell'impianto (Opzione)	Anleggskontaktor (Ekstrautstyr)	Maskinkontaktor (Ekstraudstyr)

	ΕΛΛΗΝΙΚΑ	PORTUGUÊS	SUOMI
B11	Αισθητήρας ταχύτητας (Προεραιτικα)	Sensor de velocidade (Opção)	Nopeusanturi (Lisävaruste)
F1-2	Ασφάλεια A4	Fusível A4	Varoke A4
G3	Εναλλακτης	Alternador	Vaihtovirtalaturi
K4	Ρελέ IT (Προεραιτικα)	Relé IT (Opção)	IT-rele (Lisävaruste)
N11	Ελεγκτής ταχύτητας (Προεραιτικα)	Controlador da velocidade (Opção)	Nopeuden valvoja (Lisävaruste)
N12	Αυτόματος ρυθμιστής τάσης	Regulador automático da potência	Automaattinen jännitteensäädin
N13	Ρελέ ρεύματος γείωσης (Προεραιτικα)	Relé de detecção de falha de terra (Opção)	Maavuotorele (Lisävaruste)
P1	Αμπερόμετρο	Amperímetro	Ampeerimittari
P4	Βολτόμετρο	Voltímetro	Volttimittari
P5	Μετρητής συχνότητας	Frequencímetro	Taajuusmittari
Q1	Διακόπτης κυκλώματος	Disjuntor	Virrankatkaisin
Q2-4	Διακόπτης κυκλώματος (Προεραιτικα)	Disjuntor (Opção)	Virrankatkaisin (Lisävaruste)
R5	Θερμαντήρας ψυκτικού μηχανής (Προεραιτικα)	Aquecedor do líquido de arrefecimento do motor (Opção)	Moottorin jäähdytysnesteen lämmitysvastus (Lisävaruste)
R11	Δυναμόμετρο ρύθμισης τάσης παροχής (Προεραιτικα)	Potenciómetro de ajuste da tensão de alimentação (Opção)	Syöttöjännitteen säätöpotentiometri (Lisävaruste)
S2b	Στοπ έκτακτης ανάγκης	Paragem de emergência	Hätäpysäytys
S13	Διακόπτης αποκλεισμού μετάδοσης λάθους στη γείωση	Interruptor selector do relé de corrente de defeito à terra	Maavuodon tunnistimen sulkukytkin
T1	Μετασχηματιστής ρεύματος	Transformador de corrente	Virtamuuntaja
T13	Μετασκηματιστης ρευματος σφαματος γειωσης (Προεραιτικα)	Detector de falha de corrente de terra (Opção)	Maavuodon tunnistin (Lisävaruste)
U1	Γομωτής στατικής μπαταρίας (Προεραιτικα)	Carregador de baterias estático (Opção)	Kiinteä akkulaturi (Lisävaruste)
X1	Πίνακας ακροδέκτη (Προεραιτικα)	Quadro de terminais (Opção)	Liitäntälevy (Lisävaruste)
X2-4	Υποδοχή εξόδου (Προεραιτικα)	Tomada de saída (Opção)	Pistorasia (Lisävaruste)
X8	Ακροδέκτης (N)	Terminal (N)	Liitin (N)
X9	Ακροδέκτης (PE)	Terminal (PE)	Liitin (PE)
X15	10-πολικός σύνδεσμος (Προεραιτικα)	Ligação em 10 polos (Opção)	10-napainen liitin (Lisävaruste)
X16	Αναλογικός σύνδεσμος (Προεραιτικα)	Ligação do módulo (Opção)	Moduliliitin (Lisävaruste)
X25	Λωρίδα ακροδέκτη (Προεραιτικα)	Faixa de terminais (Opção)	Liitäntärima (Lisävaruste)
Y11	Ενεργοποιητής (Προεραιτικα)	Accionador (Opção)	Toimilaite (Lisävaruste)
Sx	Τηλεχειριζόμενος διακόπτης εκκίνησης/ανακοπής (Προεραιτικα)	Interruptor remoto de arranque/paragem (Opção)	Kaukokäynnistys-/kaukopysäytyskytkin (Lisävaruste)
Kx	Επαφέας εγκατάστασης (Προεραιτικα)	Contactor geral (Opção)	Laitteiston liitin (Lisävaruste)

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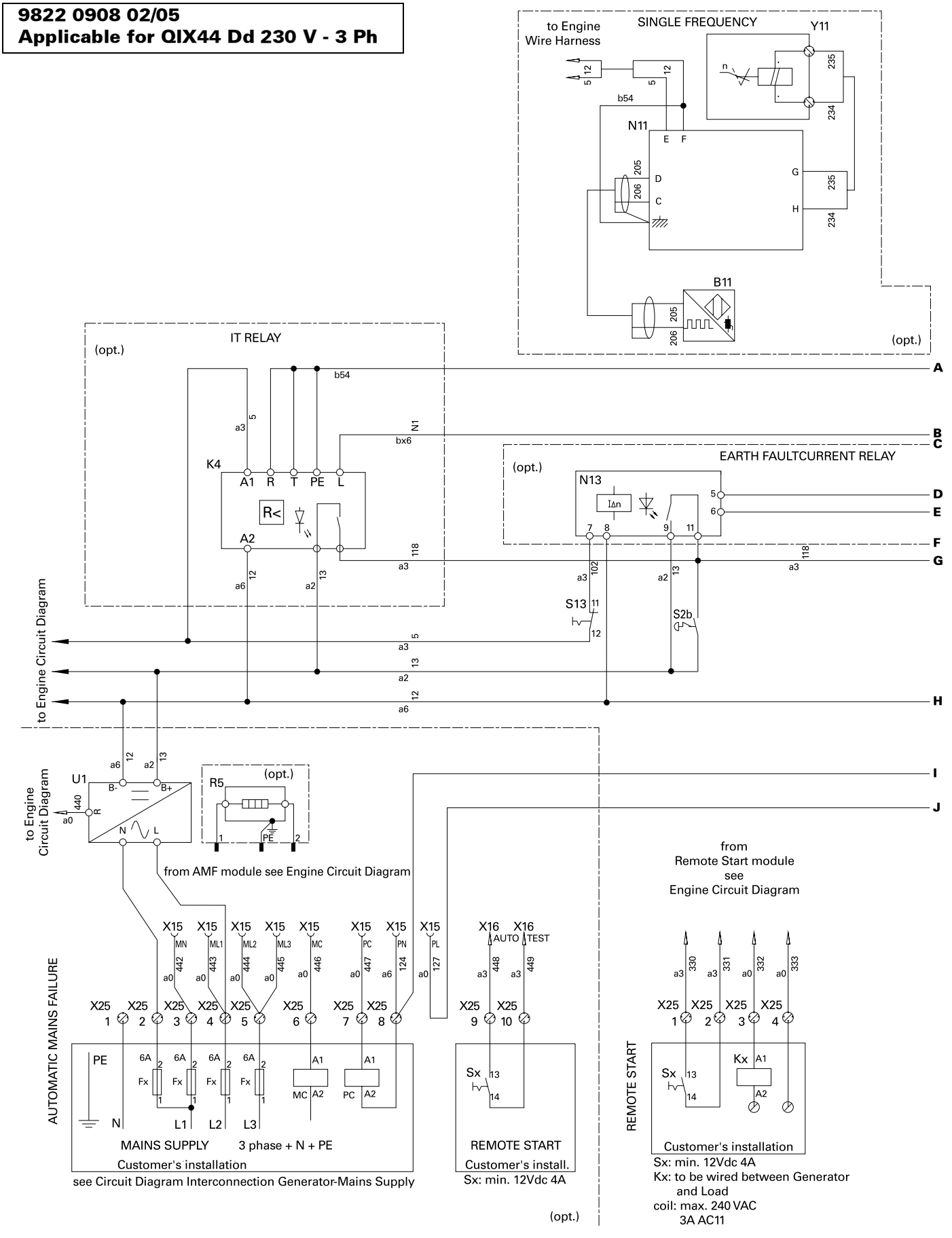

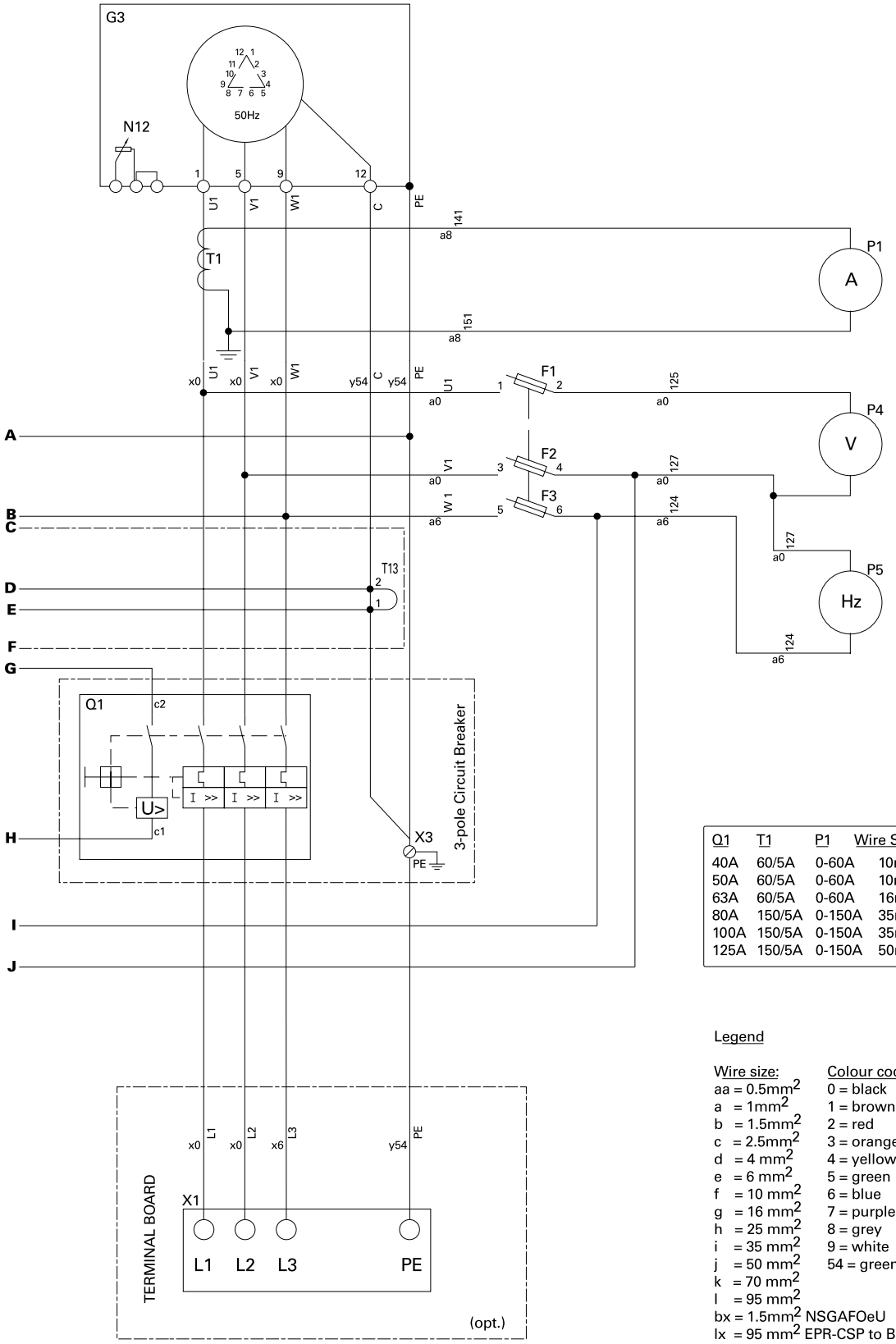

Q1	T1	P1	Wire Size x	Wire Size y
40A	60/5A	0-60A	10mm^2	10mm^2
50A	60/5A	0-60A	10mm^2	10mm^2
63A	60/5A	0-60A	16mm^2	16mm^2
80A	150/5A	0-150A	35mm^2	25mm^2
100A	150/5A	0-150A	35mm^2	25mm^2
125A	150/5A	0-150A	50mm^2	25mm^2

Legend

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

bx = 1.5mm^2 NSGAFOeU
lx = 95 mm^2 EPR-CSP to BS 6195 4C

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	ENGLISH	NEDERLANDS	FRANCAIS
B11	Speed sensor (Option)	Snelheidssensor (Optie)	Capteur de vitesse (Option)
F1-3	Fuse A4	Zekering A4	Fusible A4
G3	Alternator	Alternateur	Groupe électrogène
K4	IT Relay (Option)	IT-relais (Optie)	Relais informatique (Option)
N11	Speed controller (Option)	Snelheidsregelaar (Optie)	Régulateur de vitesse (Option)
N12	Automatic voltage regulator	Automatische spanningsregelaar	Régulateur de tension automatique
N13	Earth fault-current relay (Option)	Aardlekrelais (Optie)	Relais de fuite à la terre (Option)
P1	Amperemeter	Ampèremeter	Ampèremètre
P4	Voltmeter	Voltmeter	Voltmètre
P5	Frequencymeter	Frequentiemeter	Fréquencemètre
Q1	Circuit breaker	Vermogenschakelaar	Disjoncteur
R5	Engine Coolant Heater (Option)	Verwarmer motorkoelvloeistof (Optie)	Réchauffeur de réfrigérant du moteur (Option)
R11	Supply voltage adjust potentiometer (Option)	Regelpotentiometer, voedingsspanning (Optie)	Potentiomètre de réglage de la tension d'alimentation (Option)
S2b	Emergency stop	Noodstop	Arrêt d'urgence
S13	Lock-out switch for N13	Blokkeerschakelaar voor N13	Interrupteur de verrouillage pour N13
T1	Current transformer	Stroomtransformator	Transformateur de courant
T13	Earth fault current transformator (Option)	Aardlekdetector (Optie)	Détecteur de fuite à la terre (Option)
U1	Static battery charger (Option)	Statische batterijlader (Optie)	Chargeur de batterie statique (Option)
X1	Terminal board (Option)	Klemmenbord (Optie)	Tablette à bornes (Option)
X2	Terminal (N)	Klem (N)	Reglette à bornes (N)
X3	Terminal (PE)	Klem (PE)	Reglette à bornes (PE)
X15	10-pole connector (Option)	Konnektor, 10 stiften (Optie)	Connecteur 10 broches (Option)
X16	Module connector (Option)	Modulekonnektor (Optie)	Connecteur de module (Option)
X25	Terminal strip (Option)	Klemmenstrook (Optie)	Barrette de raccordement (Option)
Y11	Actuator (Option)	Actuator (Optie)	Actuateur (Option)
Sx	Remote start/stop switch (Option)	Afstands start-/stopschakelaar (Optie)	Interrupteur de démarrage/arrêt à distance (Option)
Kx	Plant contactor (Option)	Installatiecontactor (Optie)	Contacteur d'installation (Option)

	DEUTSCH	ESPAÑOL	SVENSKA
B11	Drehzahlfühler (Sonderausstattung)	Sensor de velocidad (Opción)	Varvtalssensor (Option)
F1-3	Sicherung A4	Fusible A4	Säkring A4
G3	Wechselstromgenerator	Alternador	Växelströmsgen
K4	IT-relais (Sonderausstattung)	Relé de ti (Opción)	IT-relä (Option)
N11	Drehzahlregler (Sonderausstattung)	Controlador de velocidad (Opción)	Varvtalsregulator (Option)
N12	Automatischer Spannungsregler	Regulador automático de voltaje	Automatisk spänningsregulator
N13	Erdschlußrelais (Sonderausstattung)	Relé de pérdida a tierra (Opción)	Relä för jordläckage (Option)
P1	Amperemeter	Amperímetro	Amperemätare
P4	Voltmeter	Voltímetro	Spänningsmätare
P5	Frequenzmesser	Frecuencímetro	Frekvensmätare
Q1	Leistungsschalter	Disyuntor	Strömbrytare
R5	Heizelement Motorkühlmittel (Sonderausstattung)	Calentador del refrigerante del motor (Opción)	Motorns kylvätskevärmare (Option)
R11	Potentiometer für Einstel. der Versorgungssp. (Sonder-ausst.)	Potenciómetro de ajuste del voltaje de alimentación (Opción)	Potentiometer för justering av spänningsmatningen (Option)
S2b	Notabschaltung	Parada de emergencia	Nödstopp
S13	Riegelschalter für N13	Interruptor de bloqueo para N13	Avstängningsbrytare för N13
T1	Stromwandler	Transformador de corriente	Strömtransformator
T13	Erdschlußanzeiger (Sonderausstattung)	Detector de pérdida a tierra (Opción)	Detektor för jordläckage (Option)
U1	Feststehendes Batterieladegerät (Sonderausstattung)	Cargador estático de batería (Sonderausstattung)	Statisk batteriladdare (Sonderausstattung)
X1	Klemmenbrett (Sonderausstattung)	Cuadro de bornas (Opción)	Anslutningsplint (Option)
X2	Klemme (N)	Terminale (N)	Koppling (N)
X3	Klemme (PE)	Terminale (PE)	Koppling (PE)
X15	10-poliger Stecker (Sonderausstattung)	Conector 10-polar (Opción)	10-poligt kontaktdon (Option)
X16	Modulstecker (Sonderausstattung)	Conector de módulo (Opción)	Modul-kontaktdon (Option)
X25	Klemmenleiste (Sonderausstattung)	Bloque de terminales (Opción)	Anslutningslist (Option)
Y11	Stellorgan	Actuador	Manöverorgan
Sx	Schalter Fernstart/-stop (Sonderausstattung)	Interruptor remoto de arranque/parada (Opción)	Start/stopp fjärrströmbrytare (Option)
Kx	Anlagenseitiges Schütz (Sonderausstattung)	Contactor para instalación (Opción)	Anläggningsanslutning (Option)

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	ITALIANO	NORSK	DANSK
B11	Sensore velocità (Opzione)	Hastighetsføler (Ekstrautstyr)	Hastighedsføler (Ekstraudstyr)
F1-3	Fusibile A4	Sikring A4	Sikring A4
G3	Alternatore	Dynamo	Vekselstrømsgenerator
K4	Relè IT (Opzione)	IT-relé (Ekstrautstyr)	IT-relæ (Ekstraudstyr)
N11	Unità di controllo velocità (Opzione)	Hastighetsregulator (Ekstrautstyr)	Hastighedsregulator (Ekstraudstyr)
N12	Regolatore di tensione automatico	Automatisk spenningsregulator	Automatisk spændingsregulator
N13	Relè corrente di terra (Opzione)	Jordfeilrelé (Ekstrautstyr)	Jordfejlstrømsrelæ (Ekstraudstyr)
P1	Amperometro	Amperemeter	Amperemeter
P4	Voltimetro	Spenningsmåler	Voltmeter
P5	Frequenziometro	Hz-meter	Frekvensmåler
Q1	Interruttore	Kretsbryter	Kredsafbryder
R5	Riscaldatore del liquido refrigerante del motore (Opzione)	Kjølevæskevarmer for motor (Ekstrautstyr)	Opvarmning af kølemiddel til motor (Ekstraudstyr)
R11	Potenziometro regolazione tensione di alimentazione (Opz.)	Potensiometer for justering av strømtilførsel (Ekstrautst.)	Potentiometer til justering af fødespændingen (Ekstraudst.)
S2b	Arresto di emergenza	Nødstopp	Nødstop
S13	Interruttore di blocco per N13	Låsebryter for N13	Spærreafbryder for N13
T1	Transformatore di corrente	Strøm A	Strømtransformere
T13	Rilevatore corrente di terra (Opzione)	Jordfeilføler (Ekstrautstyr)	Jordfejlstrømsdetektor (Ekstraudstyr)
U1	Carica batteria statica (Opzione)	Statisk batterilader (Ekstrautstyr)	Statisk batterioplader (Ekstraudstyr)
X1	Morsettiera (Opzione)	Koplingstavle (Ekstrautstyr)	Klembrædt (Ekstraudstyr)
X2	Morsetto (N)	Klemme (N)	Tilslutningsklemme (N)
X3	Morsetto (PE)	Klemme (PE)	Tilslutningsklemme (PE)
X15	Connettore a 10 poli (Opzione)	10-polet kontakt (Ekstrautstyr)	10 -faset kontaktklemme (Ekstraudstyr)
X16	Connettore del modulo (Opzione)	Modulkontakt (Ekstrautstyr)	Modulkontaktklemme (Ekstraudstyr)
X25	Morsettiera (Opzione)	Koplingssplint (Ekstrautstyr)	Klemliste (Ekstraudstyr)
Y11	Attuatore (Opzione)	Aktuator (Ekstrautstyr)	Aktuator (Ekstraudstyr)
Sx	Interruttore a distanza avvio/arresto (Opzione)	Bryter for fjernstart/-stopp (Ekstrautstyr)	Kontakt til fjernstyring af start/stop (Ekstraudstyr)
Kx	Contattore dell'impianto (Opzione)	Anleggskontaktor (Ekstrautstyr)	Maskinkontaktor (Ekstraudstyr)

	ΕΛΛΗΝΙΚΑ	PORTUGUÊS	SUOMI
B11	Αισθητήρας ταχύτητας (Προεραιτικα)	Sensor de velocidade (Opção)	Nopeusanturi (Lisävaruste)
F1-3	Ασφάλεια A4	Fusível A4	Varoke A4
G3	Εναλλακτης	Alternador	Vaihtovirtalaturi
K4	Ρελέ IT (Προεραιτικα)	Relé IT (Opção)	IT-rele (Lisävaruste)
N11	Ελεγκτής ταχύτητας (Προεραιτικα)	Controlador da velocidade (Opção)	Nopeuden valvoja (Lisävaruste)
N12	Αυτόματος ρυθμιστής τάσης	Regulador automático da potência	Automaattinen jännitteensäädin
N13	Ρελέ ρεύματος γείωσης (Προεραιτικα)	Relé de detecção de falha de terra (Opção)	Maavuotorele (Lisävaruste)
P1	Αμπερόμετρο	Amperímetro	Ampeerimittari
P4	Βολτόμετρο	Voltímetro	Volttimittari
P5	Μετρητής συχνότητας	Frequencímetro	Taajuusmittari
Q1	Διακόπτης κυκλώματος	Disjuntor	Virrankatkaisin
R5	Θερμαντήρας ψυκτικού μηχανής (Προεραιτικα)	Aquecedor do líquido de arrefecimento do motor (Opção)	Moottorin jäähdytysnesteen lämmitysvastus (Lisävaruste)
R11	Δυναμόμετρο ρύθμισης τάσης παροχής (Προεραιτικα)	Potenciómetro de ajuste da tensão de alimentação (Opção)	Syöttöjännitteen säätöpotentiometri (Lisävaruste)
S2b	Στοπ έκτακτης ανάγκης	Paragem de emergência	Hätäpysäytys
S13	Διακόπτης αποκλεισμού μετάδοσης λάθους στη γείωση	Interruptor selector do relé de corrente de defeito à terra	Maavuodon tunnistimen sulkukytkin
T1	Μετασχηματιστής ρεύματος	Transformador de corrente	Virtamuuntaja
T13	Μετασκηματιστης ρευματος σφαματος γειωσης (Προεραιτικα)	Detector de falha de corrente de terra (Opção)	Maavuodon tunnistin (Lisävaruste)
U1	Γομωτής στατικής μπαταρίας (Προεραιτικα)	Carregador de baterias estático (Opção)	Kiinteä akkulaturi (Lisävaruste)
X1	Πίνακας ακροδέκτη (Προεραιτικα)	Quadro de terminais (Opção)	Liitäntälevy (Lisävaruste)
X2	Ακροδέκτης (N)	Terminal (N)	Liitin (N)
X3	Ακροδέκτης (PE)	Terminal (PE)	Liitin (PE)
X15	10-πολικός σύνδεσμος (Προεραιτικα)	Ligação em 10 polos (Opção)	10-napainen liitin (Lisävaruste)
X16	Αναλογικός σύνδεσμος (Προεραιτικα)	Ligação do módulo (Opção)	Moduliliitin (Lisävaruste)
X25	Λωρίδα ακροδέκτη (Προεραιτικα)	Faixa de terminais (Opção)	Liitäntärima (Lisävaruste)
Y11	Ενεργοποιητής (Προεραιτικα)	Accionador (Opção)	Toimilaite (Lisävaruste)
Sx	Τηλεχειριζόμενος διακόπτης εκκίνησης/ανακοπής (Προεραιτικα)	Interruptor remoto de arranque/paragem (Opção)	Kaukokäynnistys-/kaukopysäytyskytkin (Lisävaruste)
Kx	Επαφέας εγκατάστασης (Προεραιτικα)	Contactor geral (Opção)	Laitteiston liitin (Lisävaruste)

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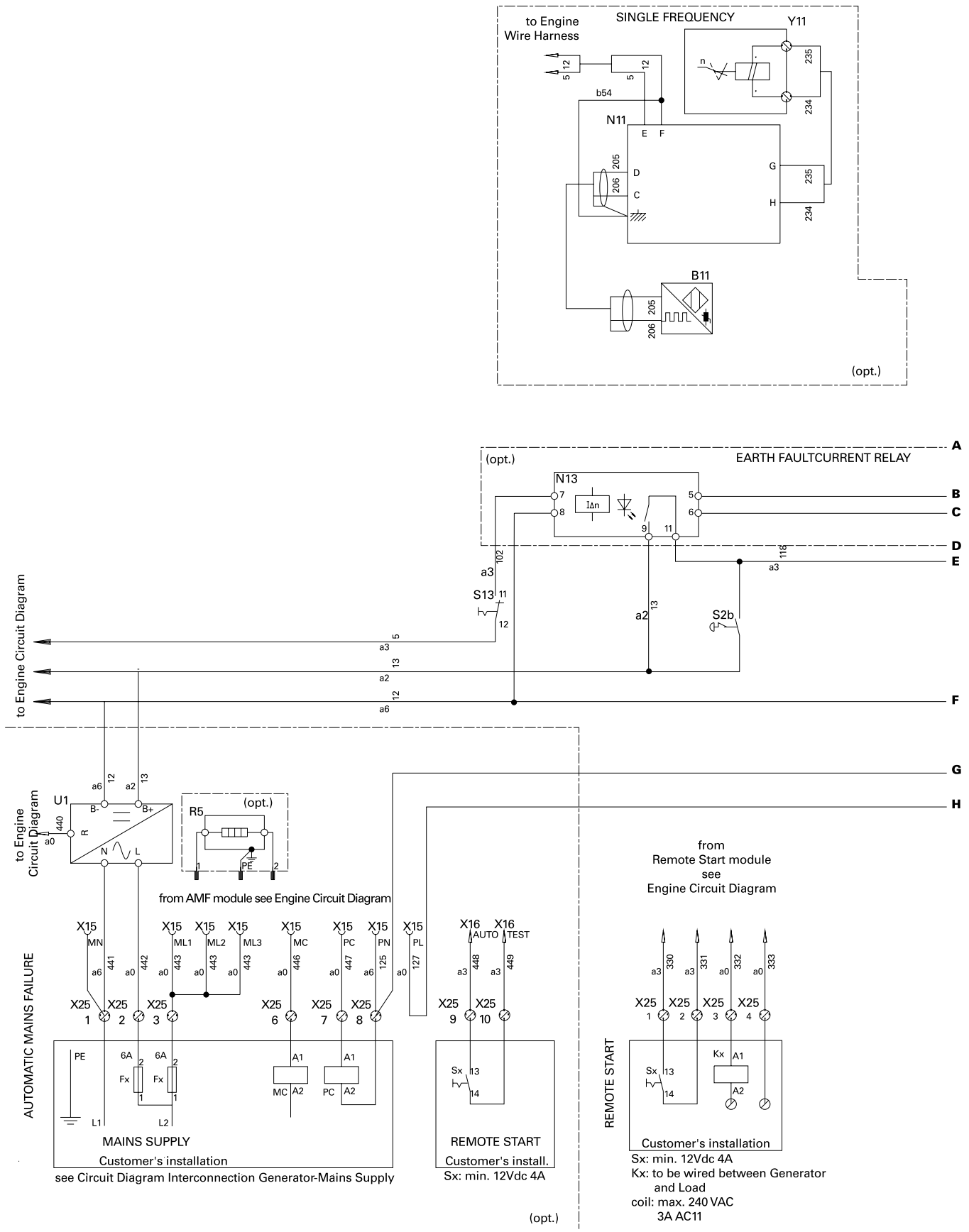

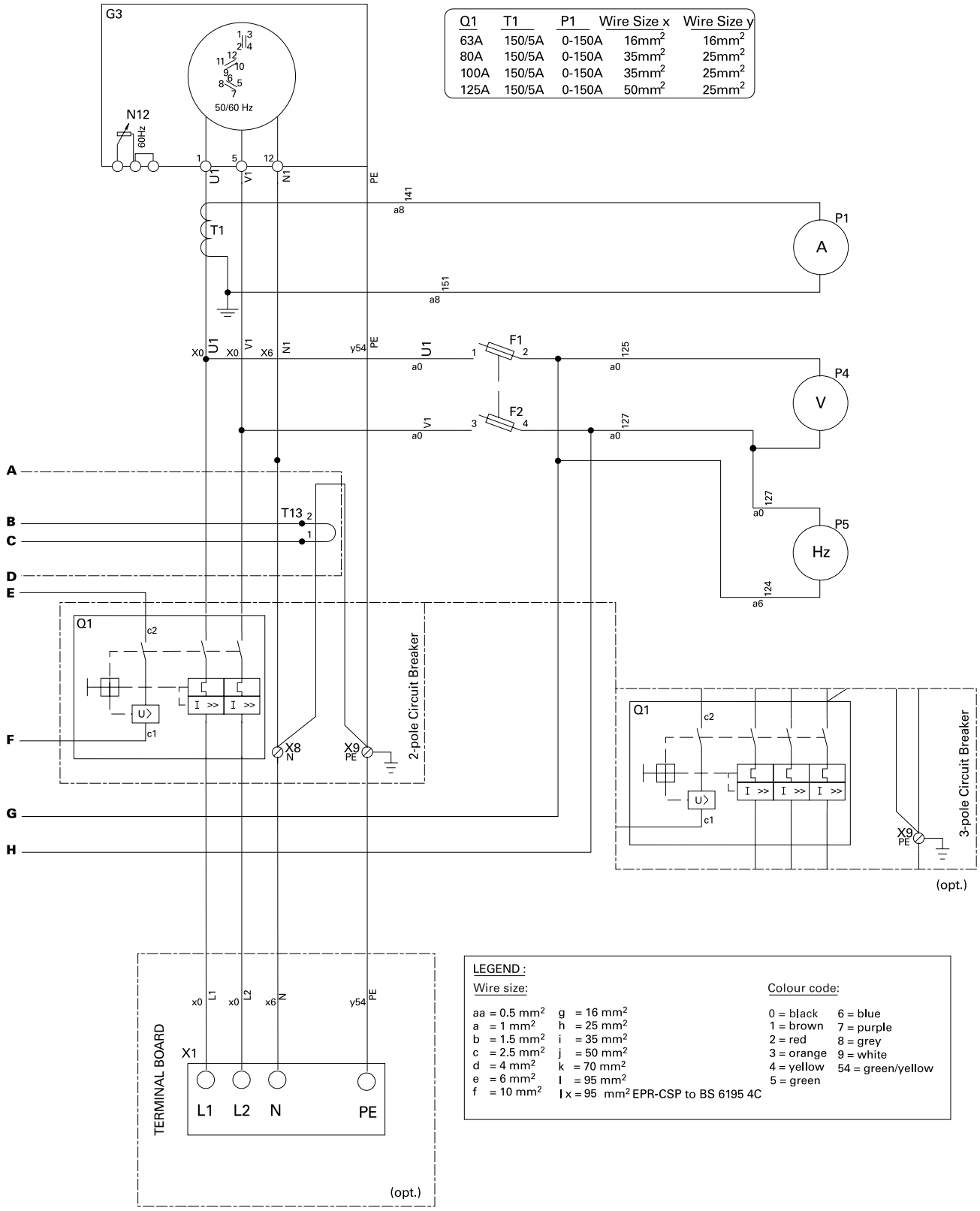

Q1	T1	P1	Wire Size x	Wire Size y
63A	150/5A	0-150A	16mm^2	16mm^2
80A	150/5A	0-150A	35mm^2	25mm^2
100A	150/5A	0-150A	35mm^2	25mm^2
125A	150/5A	0-150A	50mm^2	25mm^2

LEGEND :

Wire size:

aa	= 0.5 mm^2	g	= 16 mm^2
a	= 1 mm^2	h	= 25 mm^2
b	= 1.5 mm^2	i	= 35 mm^2
c	= 2.5 mm^2	j	= 50 mm^2
d	= 4 mm^2	k	= 70 mm^2
e	= 6 mm^2	l	= 95 mm^2
f	= 10 mm^2	l x = 95	mm^2 EPR-CSP to BS 6195 4C

Colour code:

0 = black	6 = blue
1 = brown	7 = purple
2 = red	8 = grey
3 = orange	9 = white
4 = yellow	54 = green/yellow
5 = green	

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	ENGLISH	NEDERLANDS	FRANCAIS
B11	Speed sensor (Option)	Snelheidssensor (Optie)	Capteur de vitesse (Option)
F1-2	Fuse A4	Zekering A4	Fusible A4
G3	Alternator	Alternateur	Groupe électrogène
N11	Speed controller (Option)	Snelheidsregelaar (Optie)	Régulateur de vitesse (Option)
N12	Automatic voltage regulator	Automatische spanningsregelaar	Régulateur de tension automatique
N13	Earth fault-current relay (Option)	Aardlekrelais (Optie)	Relais de fuite à la terre (Option)
P1	Amperemeter	Ampèremeter	Ampèremètre
P4	Voltmeter	Voltmeter	Voltmètre
P5	Frequencymeter	Frequentiemeter	Fréquencemètre
Q1	Circuit breaker	Vermogenschakelaar	Disjoncteur
R5	Engine Coolant Heater (Option)	Verwarmer motorkoelvloeistof (Optie)	Réchauffeur de réfrigérant du moteur (Option)
R11	Supply voltage adjust potentiometer (Option)	Regelpotentiometer, voedingsspanning (Optie)	Potentiomètre de réglage de la tension d'alimentation (Option)
S2b	Emergency stop	Noodstop	Arrêt d'urgence
S13	Lock-out switch for N13	Blokkeerschakelaar voor N13	Interrupteur de verrouillage pour N13
T1	Current transformer	Stroomtransformator	Transformateur de courant
T13	Earth fault current transformator (Option)	Aardlekdetector (Optie)	Détecteur de fuite à la terre (Option)
U1	Static battery charger	Statische batterijlader	Chargeur de batterie statique
X1	Terminal board (Option)	Klemmenbord (Optie)	Tablette à bornes (Option)
X8	Terminal (N)	Klem (N)	Reglette à bornes (N)
X9	Terminal (PE)	Klem (PE)	Reglette à bornes (PE)
X15	10-pole connector (Option)	Konnektor, 10 stiften (Optie)	Connecteur 10 broches (Option)
X16	Module connector (Option)	Modulekonnektor (Optie)	Connecteur de module (Option)
X25	Terminal strip (Option)	Klemmenstrook (Optie)	Barrette de raccordement (Option)
Y11	Actuator (Option)	Actuator (Optie)	Actuateur (Option)
Sx	Remote start/stop switch (Option)	Afstands start-/stopschakelaar (Optie)	Interrupteur de démarrage/arrêt à distance (Option)
Kx	Plant contactor (Option)	Installatiecontactor (Optie)	Contacteur d'installation (Option)

	DEUTSCH	ESPAÑOL	SVENSKA
B11	Drehzahlfühler (Sonderausstattung)	Sensor de velocidad (Opción)	Varvtalssensor (Option)
F1-2	Sicherung A4	Fusible A4	Säkring A4
G3	Wechselstromgenerator	Alternador	Växelströmsgen
N11	Drehzahlregler (Sonderausstattung)	Controlador de velocidad (Opción)	Varvtalsregulator (Option)
N12	Automatischer Spannungsregler	Regulador automático de voltaje	Automatisk spänningsregulator
N13	Erdschlußrelais (Sonderausstattung)	Relé de pérdida a tierra (Opción)	Relä för jordläckage (Option)
P1	Amperemeter	Amperímetro	Amperemätare
P4	Voltmeter	Voltímetro	Spänningsmätare
P5	Frequenzmesser	Frecuencímetro	Frekvensmätare
Q1	Leistungsschalter	Disyuntor	Strömbrytare
R5	Heizelement Motorkühlmittel (Sonderausstattung)	Calentador del refrigerante del motor (Opción)	Motorns kylvätskevärmare (Option)
R11	Potentiometer für Einstel. der Versorgungssp. (Sonder-ausst.)	Potenciómetro de ajuste del voltaje de alimentación (Opción)	Potentiometer för justering av spänningsmatningen (Option)
S2b	Notabschaltung	Parada de emergencia	Nödstopp
S13	Riegelschalter für N13	Interruptor de bloqueo para N13	Avstängningsbrytare för N13
T1	Stromwandler	Transformador de corriente	Strömtransformator
T13	Erdschlußanzeiger (Sonderausstattung)	Detector de pérdida a tierra (Opción)	Detektor för jordläckage (Option)
U1	Feststehendes Batterieladegerät	Cargador estático de batería	Statisk batteriladdare
X1	Klemmenbrett (Sonderausstattung)	Cuadro de bornas (Opción)	Anslutningsplint (Option)
X8	Klemme (N)	Terminale (N)	Koppling (N)
X9	Klemme (PE)	Terminale (PE)	Koppling (PE)
X15	10-poliger Stecker (Sonderausstattung)	Conector 10-polar (Opción)	10-poligt kontaktdon (Option)
X16	Modulstecker (Sonderausstattung)	Conector de módulo (Opción)	Modul-kontaktdon (Option)
X25	Klemmenleiste (Sonderausstattung)	Bloque de terminales (Opción)	Anslutningslist (Option)
Y11	Stellorgan	Actuador	Manöverorgan
Sx	Schalter Fernstart/-stop (Sonderausstattung)	Interruptor remoto de arranque/parada (Opción)	Start/stopp fjärrströmbrytare (Option)
Kx	Anlagenseitiges Schütz (Sonderausstattung)	Contactor para instalación (Opción)	Anläggningsanslutning (Option)

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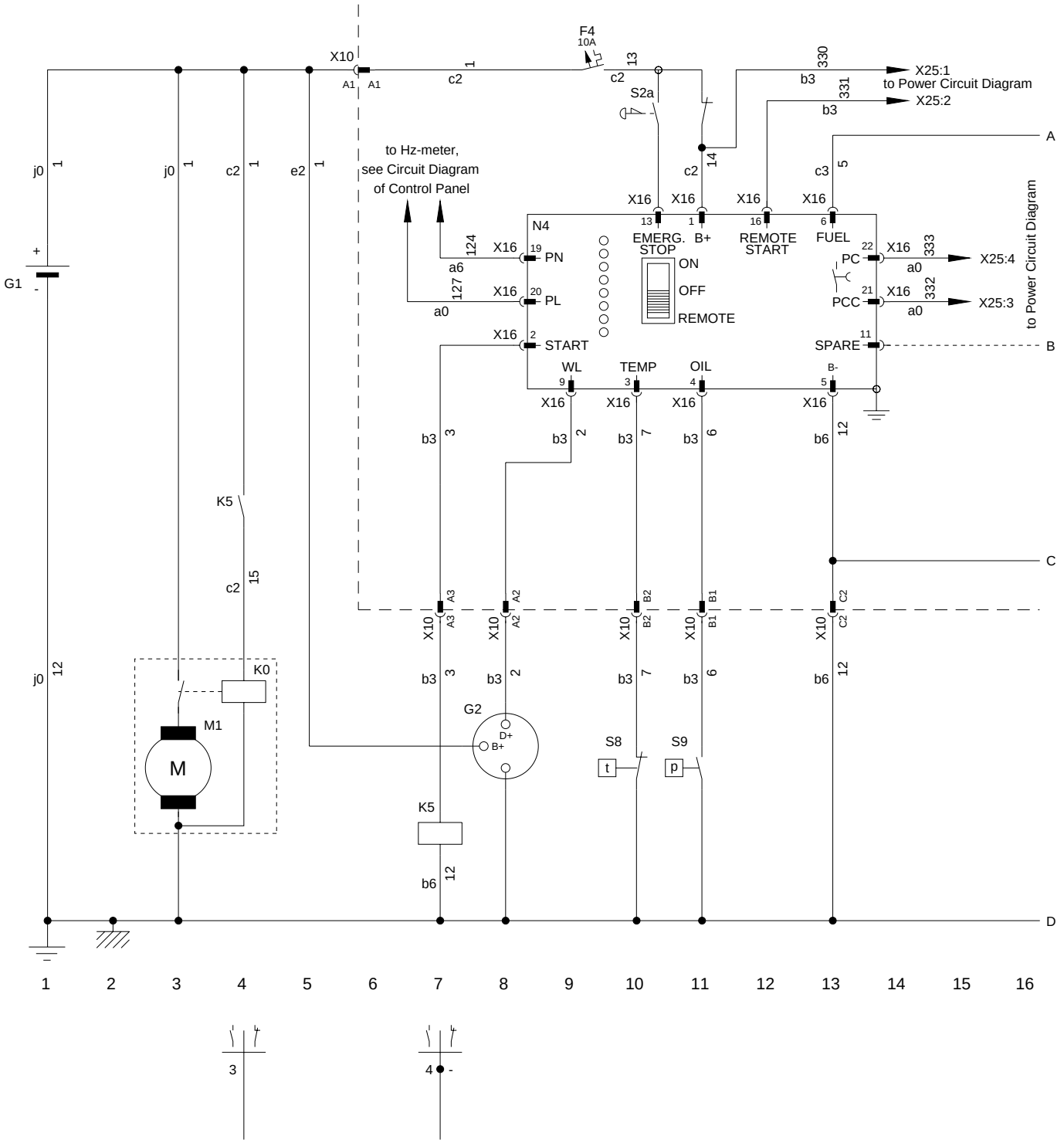
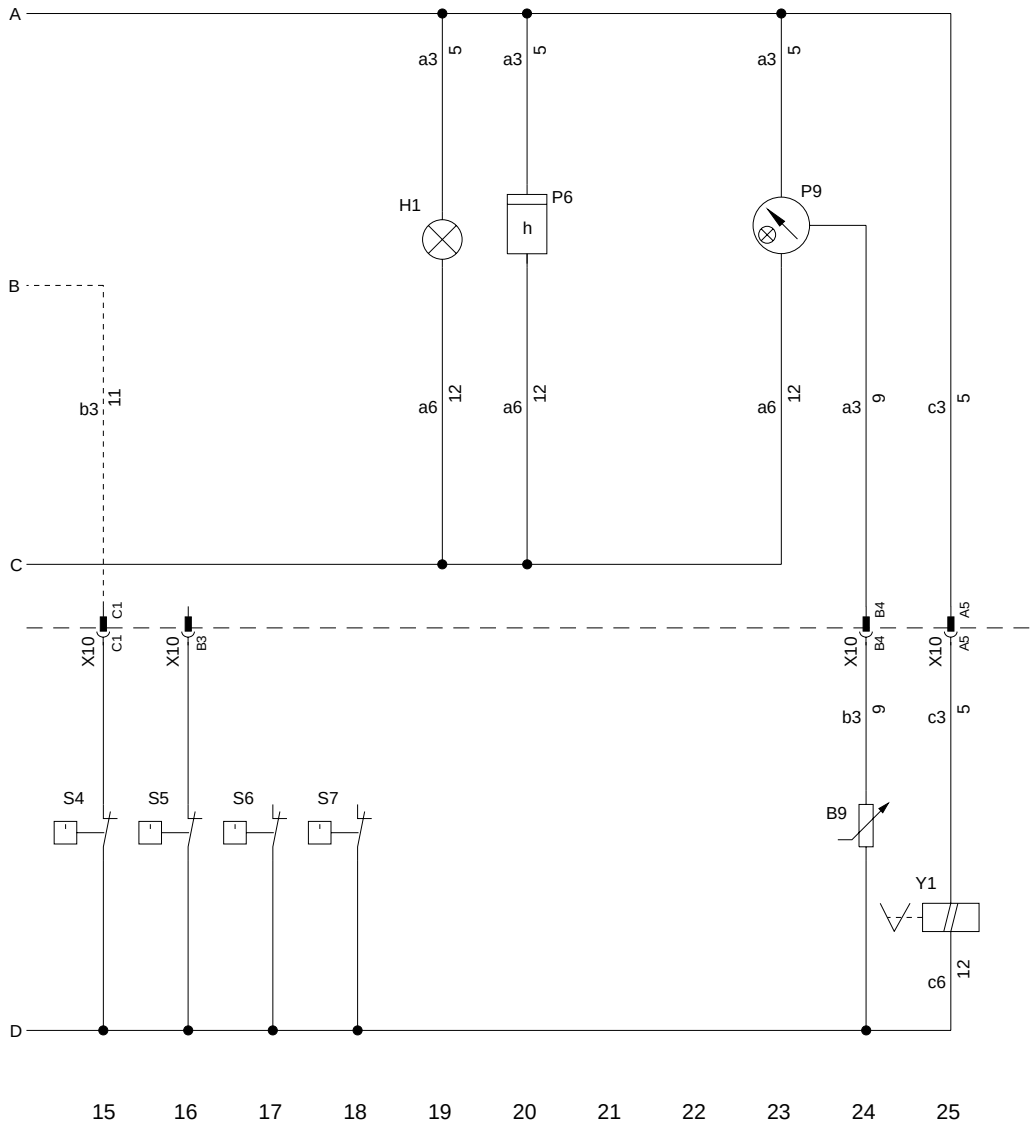
	ITALIANO	NORSK	DANSK
B11	Sensore velocità (Opzione)	Hastighetsføler (Ekstrautstyr)	Hastighedsføler (Ekstraudstyr)
F1-2	Fusibile A4	Sikring A4	Sikring A4
G3	Alternatore	Dynamo	Vekselstrømsgenerator
N11	Unità di controllo velocità (Opzione)	Hastighetsregulator (Ekstrautstyr)	Hastighedsregulator (Ekstraudstyr)
N12	Regolatore di tensione automatico	Automatisk spenningsregulator	Automatisk spændingsregulator
N13	Relè corrente di terra (Opzione)	Jordfeilrelé (Ekstrautstyr)	Jordfejlstrømsrelæ (Ekstraudstyr)
P1	Amperometro	Amperemeter	Amperemeter
P4	Voltimetro	Spenningsmåler	Voltmeter
P5	Frequenziometro	Hz-meter	Frekvensmåler
Q1	Interruttore	Kretsbryter	Kredsafbryder
R5	Riscaldatore del liquido refrigerante del motore (Opzione)	Kjølevæskevarmer for motor (Ekstrautstyr)	Opvarmning af kølemiddel til motor (Ekstraudstyr)
R11	Potenziometro regolazione tensione di alimentazione (Opz.)	Potensiometer for justering av strømtilførsel (Ekstraudst.)	Potentiometer til justering af fødespændingen (Ekstraudst.)
S2b	Arresto di emergenza	Nødstopp	Nødstop
S13	Interruttore di blocco per N13	Låsebryter for N13	Spærreafbryder for N13
T1	Transformatore di corrente	Strøm A	Strømtransformere
T13	Rilevatore corrente di terra (Opzione)	Jordfeilføler (Ekstrautstyr)	Jordfejlstrømsdetektor (Ekstraudstyr)
U1	Carica batteria statica	Statisk batterilader	Statisk batterioplader
X1	Morsettiera (Opzione)	Koplingstavle (Ekstrautstyr)	Klembrædt (Ekstraudstyr)
X8	Morsetto (N)	Klemme (N)	Tilslutningsklemme (N)
X9	Morsetto (PE)	Klemme (PE)	Tilslutningsklemme (PE)
X15	Connettore a 10 poli (Opzione)	10-polet kontakt (Ekstrautstyr)	10 -faset kontaktklemme (Ekstraudstyr)
X16	Connettore del modulo (Opzione)	Modulkontakt (Ekstrautstyr)	Modulkontaktklemme (Ekstraudstyr)
X25	Morsettiera (Opzione)	Koplingssplint (Ekstrautstyr)	Klemliste (Ekstraudstyr)
Y11	Attuatore (Opzione)	Aktuator (Ekstrautstyr)	Aktuator (Ekstraudstyr)
Sx	Interruttore a distanza avvio/arresto (Opzione)	Bryter for fjernstart/-stopp (Ekstrautstyr)	Kontakt til fjernstyring af start/stop (Ekstraudstyr)
Kx	Contattore dell'impianto (Opzione)	Anleggskontaktor (Ekstrautstyr)	Maskinkontaktor (Ekstraudstyr)

	ΕΛΛΗΝΙΚΑ	PORTUGUÊS	SUOMI
B11	Αισθητήρας ταχύτητας (Προεραιτικα)	Sensor de velocidade (Opção)	Nopeusanturi (Lisävaruste)
F1-2	Ασφάλεια A4	Fusível A4	Varoke A4
G3	Εναλλακτης	Alternador	Vaihtovirtalaturi
N11	Ελεγκτής ταχύτητας (Προεραιτικα)	Controlador da velocidade (Opção)	Nopeuden valvoja (Lisävaruste)
N12	Αυτόματος ρυθμιστής τάσης	Regulador automático da potência	Automaattinen jännitteensäädin
N13	Ρελέ ρεύματος γείωσης (Προεραιτικα)	Relé de detecção de falha de terra (Opção)	Maavuotorele (Lisävaruste)
P1	Αμπερόμετρο	Amperímetro	Ampeerimittari
P4	Βολτόμετρο	Voltímetro	Volttimittari
P5	Μετρητής συχνότητας	Frequencímetro	Taajuusmittari
Q1	Διακόπτης κυκλώματος	Disjuntor	Virrankatkaisin
R5	Θερμαντήρας ψυκτικού μηχανής (Προεραιτικα)	Aquecedor do líquido de arrefecimento do motor (Opção)	Moottorin jäähdytysnesteen lämmitysvastus (Lisävaruste)
R11	Δυναμόμετρο ρύθμισης τάσης παροχής (Προεραιτικα)	Potenciómetro de ajuste da tensão de alimentação (Opção)	Syöttöjännitteen säätöpotentiometri (Lisävaruste)
S2b	Στοπ έκτακτης ανάγκης	Paragem de emergência	Hätäpysäytys
S13	Διακόπτης αποκλεισμού μετάδοσης λάθους στη γείωση	Interruptor selector do relé de corrente de defeito à terra	Maavuodon tunnistimen sulkukytkin
T1	Μετασχηματιστής ρεύματος	Transformador de corrente	Virtamuuntaja
T13	Μετασκηματιστης ρευματος σφαματος γειωσης (Προεραιτικα)	Detector de falha de corrente de terra (Opção)	Maavuodon tunnistin (Lisävaruste)
U1	Γομωτής στατικής μπαταρίας (Προεραιτικα)	Carregador de baterias estático (Opção)	Kiinteä akkulaturi (Lisävaruste)
X1	Πίνακας ακροδέκτη (Προεραιτικα)	Quadro de terminais (Opção)	Liitäntälevy (Lisävaruste)
X8	Ακροδέκτης (N)	Terminal (N)	Liitin (N)
X9	Ακροδέκτης (PE)	Terminal (PE)	Liitin (PE)
X15	10-πολικός σύνδεσμος (Προεραιτικα)	Ligação em 10 polos (Opção)	10-napainen liitin (Lisävaruste)
X16	Αναλογικός σύνδεσμος (Προεραιτικα)	Ligação do módulo (Opção)	Moduliliitin (Lisävaruste)
X25	Λωρίδα ακροδέκτη (Προεραιτικα)	Faixa de terminais (Opção)	Liitäntärima (Lisävaruste)
Y11	Ενεργοποιητής (Προεραιτικα)	Accionador (Opção)	Toimilaite (Lisävaruste)
Sx	Τηλεχειριζόμενος διακόπτης εκκίνησης/ανακοπής (Προεραιτικα)	Interruptor remoto de arranque/paragem (Opção)	Kaukokäynnistys-/kaukopysäytyskytkin (Lisävaruste)
Kx	Επαφέας εγκατάστασης (Προεραιτικα)	Contactor geral (Opção)	Laitteiston liitin (Lisävaruste)

9822 0908 08/02
Applicable for QIX44 Dd RS





LEGEND :

Wire size :			Colour code :
aa =	0.5 mm²		1 = brown
a =	1 mm²		2 = red
b =	1.5 mm²		3 = orange
bx =	1.5 mm²	NSGAFOeU	4 = yellow
c =	2.5 mm²		5 = green
d =	4 mm²		6 = blue
e =	6 mm²		7 = purple
f =	10 mm²		8 = grey
g =	16 mm²		9 = white
h =	25 mm²		0 = black
i =	35 mm²		54 = green/yellow
j =	50 mm²		
k =	70 mm²		
l =	95 mm²		
lx =	95 mm²	STK	

9822 0908 08/02

	ENGLISH	NEDERLANDS	FRANCAIS
B9	Oil pressure sensor	Sensor, oliedruk	Capteur, pression d'huile
F4	Fuse 10A	Zekering 10A	Fusible 10A
G1	Battery 24V	Batterij 24V	Batterie 24V
G2	Charging generator	Laad alternator	Alternateur, charge
H1	Panel light	Paneelverlichting	Eclairage panneau
K0	Starter solenoid	Startersolenoïde	Solénoide du démarreur
K5	Starter relay	Starterrelais	Relais de démarreur
M1	Starter motor	Startermotor	Démarreur
N4	Control module	Stuurmodule	Module de commande
P6	Hourmeter	Urenteller	Compteur d'heures
P9	Oil pressure gauge	Manometer, oliedruk	Indicateur, pression d'huile
S2a	Emergency stop button (S2b: see Power Circuit)	Noodstopknop	Bouton arrêt d'urgence
S4	Fuel level switch	Schakelaar, brandstofpeil	Interrupteur niveau de carburant
S5	Fuel level switch	Schakelaar, brandstofpeil	Interrupteur niveau de carburant
S6	Fuel level switch	Schakelaar, brandstofpeil	Interrupteur niveau de carburant
S7	Fuel level switch	Schakelaar, brandstofpeil	Interrupteur niveau de carburant
S8	Coolant high temperature switch	Schakelaar, hoge koelwatertemperatuur	Interrupteur, haute température eau de refroidissement
S9	Engine oil low pressure switch	Schakelaar, lage motoroliedruk	Interrupteur basse pression d'huile moteur
X10	15-pole connector	Konnektor, 15 stiften	Connecteur 15 broches
X16	Module connector	Modulekonnektor	Connecteur de module
Y1	Fuel stop solenoid	Brandstofstopsolenoïde	Solénoïde d'arrêt de carburant

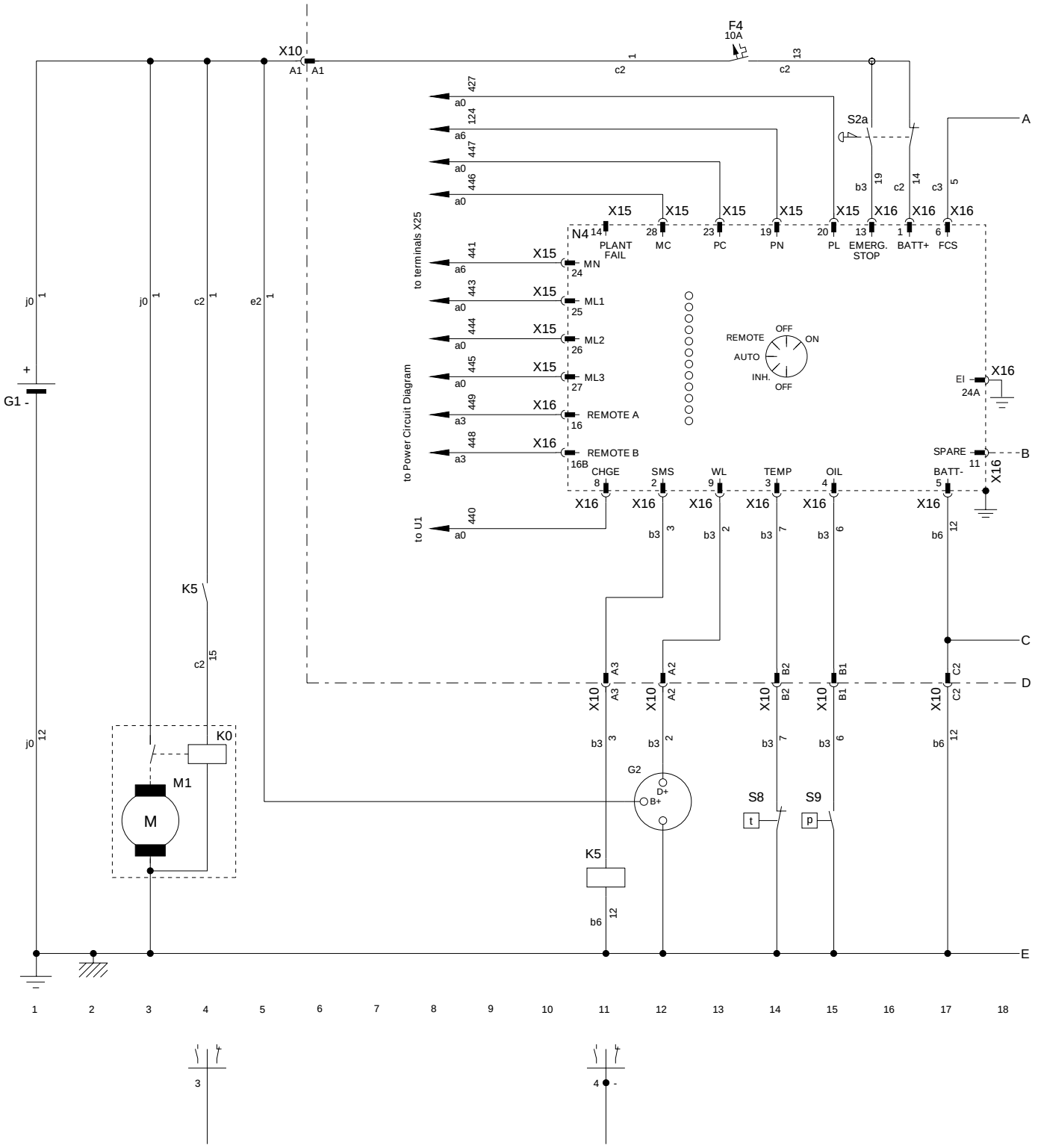
	DEUTSCH	ESPAÑOL	SVENSKA
B9	Öldruckfühler	Sensor de presión de aceite	Oljetryckssensor
F4	Sicherung 10A	Fusible 10A	Säkring 10A
G1	Batterie 24V	Batería de 24V	Batteri 24V
G2	Lademaschine	Generador de carga	Laddningsgenerator
H1	Instrumentenleuchte	Luz de panel	Panelljus
K0	Startermagnet	Solenoide de arranque	Startsolenoid
K5	Startrelais	Relé arrancador	Startrelä
M1	Startmotor	Motor de arranque	Startmotor
N4	Steuermodul	Módulo de control	Kontrollmodul
P6	Stundenzähler	Cuentahoras	Timmätare
P9	Meßinstrument für Öldruck	Indicador de la presión de aceite	Oljetrycksmätare
S2	Not-Aus-Taste	Botón de parada de emergencia	Knapp för nödstopp
S4	Schalter für Kraftstoffstand	Interruptor nivel de combustible	Brytare för bränslenivå
S5	Schalter für Kraftstoffstand	Interruptor nivel de combustible	Brytare för bränslenivå
S6	Schalter für Kraftstoffstand	Interruptor nivel de combustible	Brytare för bränslenivå
S7	Schalter für Kraftstoffstand	Interruptor nivel de combustible	Brytare för bränslenivå
S8	Schalter für hohe Temperatur	Interruptor alta temperatura de refrigerante	Brytare för hög kylvätsketemperatur
S9	Schalter für geringen Motoröldruck	Interruptor baja presión aceite del motor	Brytare för lågt oljetryck
X10	15-poliger Stecker	Conector de 15 polos	15-poligt kontaktdon
X16	Stecker Steuermodul	Conector de módulo	Modul-kontaktdon
Y1	Kraftstoffabsperrmagnet	Solenoide de detención del combustible	Bränslestoppsmagnet

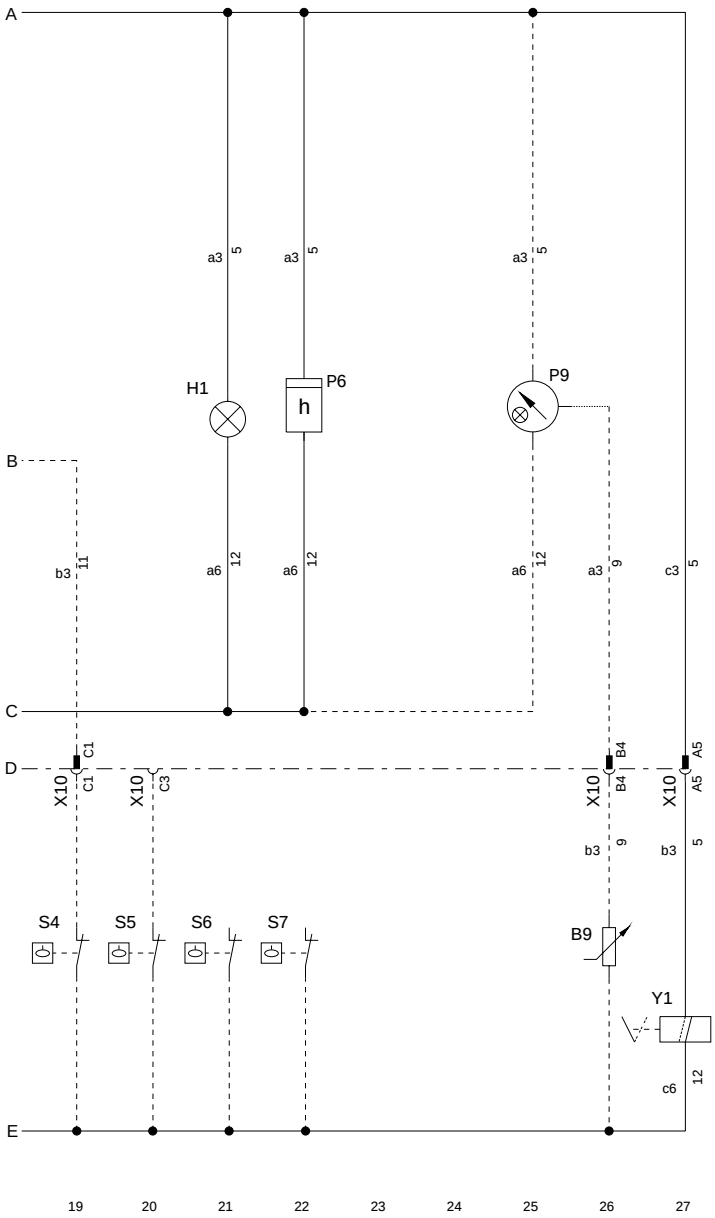
9822 0908 08/02

	ITALIANO	NORSK	DANSK
B9	Sensore della pressionde dell'olio	Oljetrykkføler	Olietryksføler
F4	Fusibile 10A	Sikring 10A	Sikring 10A
G1	Batteria a 24V	Batteri 24 V	Batteri 24V
G2	Generatore di carica	Ladegenerator	Ladegenerator
H1	Luci del pannello	Panellys	Lampe
K0	Solenoide dell'avviatore	Magnetkontakt for starter	Startmagnet
K5	Relé di avviamento	Startrelé	Startrelæ
M1	Motore dell'avviatore	Starter	Startermotor
N4	Modulo di controllo	Kontrollmodul	Kontrolmodul
P6	Contaore	Timeteller	Timetæller
P9	Indicatore della pressione dell'olio	Oljetrykkmåler	Manometer, olietryk
S2	Pulsante di arresto di emergenza	Knapp for sikkerhetsstopp	Nødstopknap
S4	Interruttore di livello del combustibile	Bryter for drivstoffnivå	Brændstofniveaukontakt
S5	Interruttore di livello del combustibile	Bryter for drivstoffnivå	Brændstofniveaukontakt
S6	Interruttore di livello del combustibile	Bryter for drivstoffnivå	Brændstofniveaukontakt
S7	Interruttore di livello del combustibile	Bryter for drivstoffnivå	Brændstofniveaukontakt
S8	Interruttore di temperatura alta del refrigerante	Bryter for høy kjølevæsketemperatur	Kontakt, høj kølevandstemperatur
S9	Interruttore di bassa pressione dell'olio	Bryter for lavt oljetrykk i motoren	Kontakt, lavt olietryk
X10	Connettore a 15 poli	15-polet kontakt	15 -faset kontaktklemme
X16	Connettore del modulo	Modulkontakt	Modulkontaktklemme
Y1	Solenoide di arresto carburante	Stoppsolenoid for drivstoff	Brændstofstopmagnet

	ΕΛΛΗΝΙΚΑ	PORTUGUÊS	SUOMI
B9	Αισθητήρας πίεσης λαδιού	Sensor da pressão do óleo	Öljynpaineanturi
F4	Ασφάλεια 10Α	Fusível 10A	Varoke 10A
G1	Μπαταρία 24V	Bateria 24V	Akku 24 V
G2	Φορτιστής γεννήτριας	Gerador de carga	Latausgeneraattori
H1	Λυχνία πίνακα	Luz do painel	Kojetaulun valo
K0	Σωληνοειδές εκκίνησης	Solenóide do motor de arranque	Käynnistyssolenoidi
K5	Αναμετάδοση Μίζας	Relé do motor de arranque	Käynnistysrele
M1	Μίζα	Motor de arranque	Käynnistysmoottori
N4	Στοιχείο ελέγχου	Módulo de controlo	Ohjainmoduli
P6	Ωρομετρητής	Contador de horas	Käyttötuntimittari
P9	Οργανο μέτρησης πίεσης λαδιού	Indicador da pressão de óleo	Öljynpainemittari
S2	Μπουτόν σβησίματος έκτακτης ανάγκης	Botão de paragem de emergência	Hätäpysäytyskytkin
S4	Διακόπτης χαμηλής σταθμής καυσίμου	Comutador do nível baixo de combustível	Alhaisen polttoainemäärän merkkivalon kytkin
S5	Διακόπτης χαμηλής σταθμής καυσίμου	Comutador do nível baixo de combustível	Alhaisen polttoainemäärän merkkivalon kytkin
S6	Διακόπτης χαμηλής σταθμής καυσίμου	Comutador do nível baixo de combustível	Alhaisen polttoainemäärän merkkivalon kytkin
S7	Διακόπτης χαμηλής σταθμής καυσίμου	Comutador do nível baixo de combustível	Alhaisen polttoainemäärän merkkivalon kytkin
S8	Διακόπτης υψηλής θερμοκρασίας ψυκτικού	Comutador da temperatura elevada do refrigerante	Korkean jäähdytysnesteen lämpötilan merkkivalon kytkin
S9	Διακόπτης χαμηλής πίεσης λαδιού κινητήρα	Comutador da pressão do óleo do motor	Moottoriöljyn alhaisen paineen merkkivalon kytkin
X10	15-πολικός σύνδεσμος	Ligação em 15 polos	15-napainen liitin
X16	Αναλογικός σύνδεσμος	Ligação do módulo	Moduliliitin
Y1	Σωληνωειδές ανακοπής καυσίμου	Válvula electromagnética de corte de combustível	Polttoaineen sulkusolenoidi

9822 0908 09/03
Applicable for QIX44 Dd AMF





LEGEND :

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

9822 0908 09/03

	ENGLISH	NEDERLANDS	FRANCAIS
B9	Oil pressure sensor (opt.)	Sensor, oliedruk	Capteur, pression d'huile
F4	Fuse	Zekering	Fusible
G1	Battery 12V	Batterij 12V	Batterie 12V
G2	Charging generator	Laad alternator	Alternateur, charge
H1	Panel light	Paneelverlichting	Eclairage panneau
K0	Starter solenoid	Startersolenoïde	Solénoide du démarreur
K5	Starter relay	Starterrelais	Relais de démarreur
M1	Starter motor	Startermotor	Démarreur
N4	Control module	Stuurmodule	Module de commande
P6	Hourmeter	Urenteller	Compteur d'heures
P9	Oil pressure gauge (opt.)	Manometer, oliedruk	Indicateur, pression d'huile
S2a	Emergency stop button (S2b: see Power Circuit)	Noodstopknop	Bouton arrêt d'urgence
S8	Coolant high temperature switch	Schakelaar, hoge koelwatertemperatuur	Interrupteur, haute température eau de refroidissement
S9	Engine oil low pressure switch	Schakelaar, lage motoroliedruk	Interrupteur basse pression d'huile moteur
X10	15-pole connector	Konnektor, 15 stiften	Connecteur 15 broches
X16	Module connector	Modulekonnektor	Connecteur de module
Y1	Fuel stop solenoid	Brandstofstopsolenoïde	Solénoïde d'arrêt de carburant

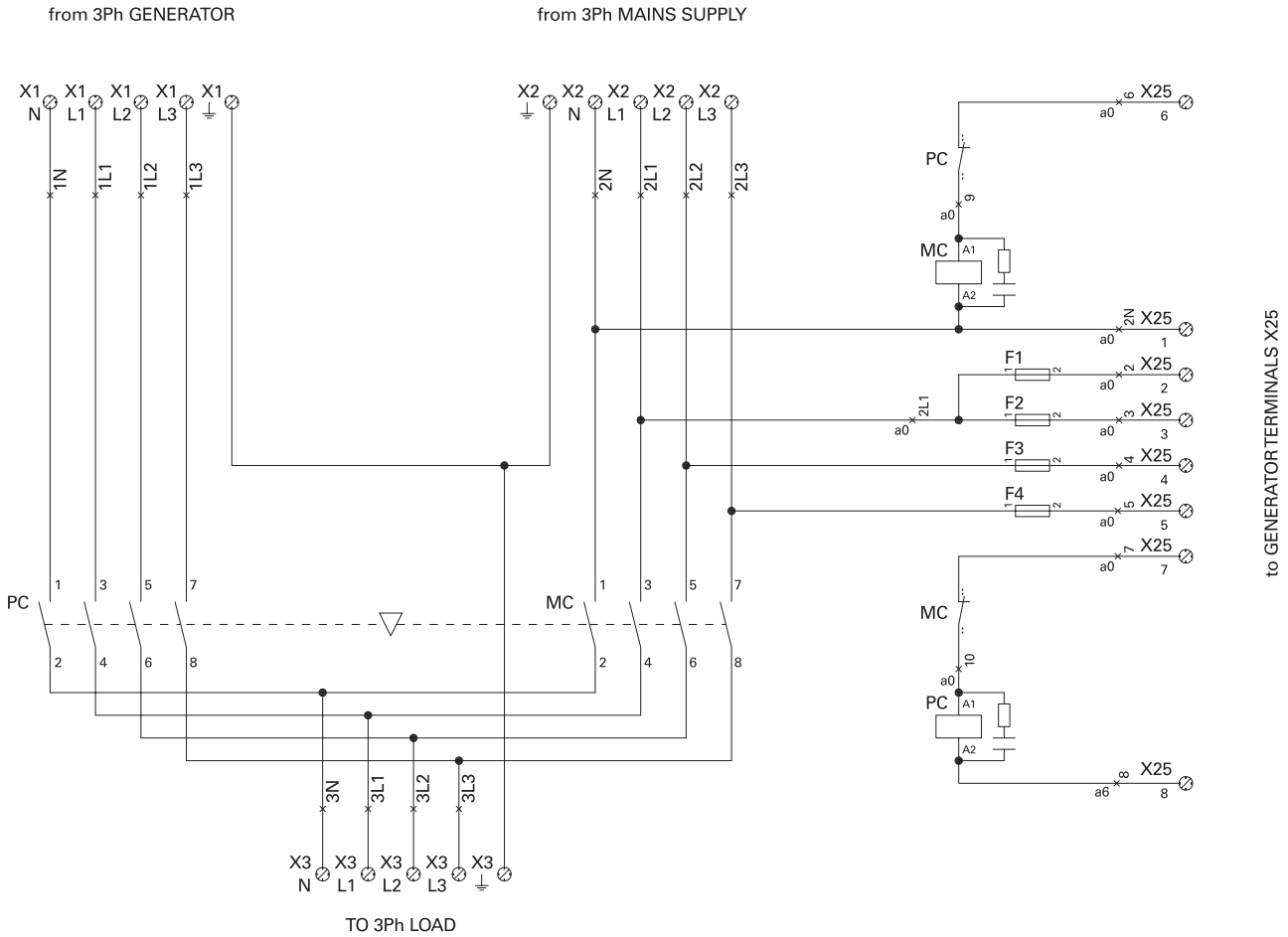
	DEUTSCH	ESPAÑOL	SVENSKA
B9	Öldruckfühler	Sensor de presión de aceite	Oljetryckssensor
F4	Sicherung	Fusible	Säkring
G1	Batterie 12V	Batería de 12V	Batteri 12V
G2	Lademaschine	Generador de carga	Laddningsgenerator
H1	Instrumentenleuchte	Luz de panel	Panelljus
K0	Startermagnet	Solenoide de arranque	Startsolenoid
K5	Startrelais	Relé arrancador	Startrelä
M1	Startmotor	Motor de arranque	Startmotor
N4	Steuermodul	Módulo de control	Kontrollmodul
P6	Stundenzähler	Cuentahoras	Timmätare
P9	Meßinstrument für Öldruck	Indicador de la presión de aceite	Oljetrycksmätare
S2a	Not-Aus-Taste	Botón de parada de emergencia	Knapp för nödstopp
S8	Schalter für hohe Temperatur	Interruptor alta temperatura de refrigerante	Brytare för hög kylvätsketemperatur
S9	Schalter für geringen Motoröldruck	Interruptor baja presión aceite del motor	Brytare för lågt oljetryck
X10	15-poliger Stecker	Conector de 15 polos	15-poligt kontaktdon
X16	Modulstecker	Conector de módulo	Modul-kontaktdon
Y1	Kraftstoffabsperrmagnet	Solenoide de detención del combustible	Bränslestoppsmagnet

9822 0908 09/03

	ITALIANO	NORSK	DANSK
B9	Sensore della pressionde dell'olio	Oljetrykkføler	Olietryksføler
F4	Fusibile	Sikring	Sikring
G1	Batteria a 12V	Batteri 12V	Batteri 12V
G2	Generatore di carica	Ladegenerator	Ladegenerator
H1	Luci del pannello	Panellys	Lampe
K0	Solenoide dell'avviatore	Magnetkontakt for starter	Startmagnet
K5	Relé di avviamento	Startrelé	Startrelæ
M1	Motore dell'avviatore	Starter	Startermotor
N4	Modulo di controllo	Kontrollmodul	Kontrolmodul
P6	Contaore	Timeteller	Timetæller
P9	Indicatore della pressione dell'olio	Oljetrykkmåler	Manometer, olietryk
S2a	Pulsante di arresto di emergenza	Knapp for sikkerhetsstopp	Nødstopknap
S8	Interruttore di temperatura alta del refrigerante	Bryter for høy kjølevæsketemperatur	Kontakt, høj kølevandstemperatur
S9	Interruttore di bassa pressione dell'olio	Bryter for lavt oljetrykk i motoren	Kontakt, lavt olietryk
X10	Connettore a 15 poli	15-polet kontakt	15 -faset kontaktklemme
X16	Connettore del modulo	Modulkontakt	Kontrolmodulkonnektor
Y1	Solenoide di arresto carburante	Stoppsolenoid for drivstoff	Brændstofstopmagnet

	ΕΛΛΗΝΙΚΑ	PORTUGUÊS	SUOMI
B9	Αισθητήρας πίεσης λαδιού	Sensor da pressão do óleo	Öljynpaineanturi
F4	Ασφάλεια	Fusível	Varoke
G1	Μπαταρία 12V	Bateria 12V	Akku 12V
G2	Φορτιστής γεννήτριας	Gerador de carga	Latausgeneraattori
H1	Λυχνία πίνακα	Luz do painel	Kojetaulun valo
K0	Σωληνοειδές εκκίνησης	Solenóide do motor de arranque	Käynnistyssolenoidi
K5	Αναμετάδοση Μίζας	Relé do motor de arranque	Käynnistysrele
M1	Εκκίνησης	Motor de arranque	Käynnistysmoottori
N4	Στοιχείο ελέγχου	Módulo de controlo	Ohjainmoduli
P6	Ωρομετρητής	Contador de horas	Käyttötuntimittari
P9	Οργανο μέτρησης πίεσης λαδιού	Indicador da pressão de óleo	Öljynpainemittari
S2a	Μπουτόν σβησίματος έκτακτης ανάγκης	Botão de paragem de emergência	Hätäpysäytyskytkin
S8	Διακόπτης υψηλής θερμοκρασίας ψυκτικού	Comutador da temperatura elevada do refrigerante	Korkean jäähdytysnesteen lämpötilan merkkivalon kytkin
S9	Διακόπτης χαμηλής πίεσης λαδιού κινητήρα	Comutador da pressão do óleo do motor	Moottoriöljyn alhaisen paineen merkkivalon kytkin
X10	15-πολικός σύνδεσμος	Ligação em 15 polos	15-napainen liitin
X16	Αναλογικός σύνδεσμος	Ligação do módulo	Moduliliitin
Y1	Σωληνωειδές ανακοπής καυσίμου	Válvula electromagnética de corte de combustível	Polttoaineen sulkusolenoidi

9822 0773 55/04 A
Applicable for QIX44 Dd 3ph



	Wire section .N, .L1-.L3	earth
60A (3ph) kit	16 mm2	16 mm2
110A (3ph) kit	50 mm2	25 mm2
200A (3ph) kit	95 mm2	50 mm2
325A (3ph) kit	Cu strips	central earth bolt
400A (3ph) kit	Cu strips	central earth bolt
500A (3ph) kit	Cu strips	central earth bolt

LEGEND :

Wire size :
aa = 0.5 mm2
a = 1 mm2
b = 1.5 mm2
c = 2.5 mm2
d = 4 mm2
e = 6 mm2
f = 10 mm2
g = 16 mm2
h = 25 mm2
i = 35 mm2

Colour code :
0 = black
1 = brown
2 = red
3 = orange
4 = yellow
5 = green
6 = blue
7 = purple
8 = grey
9 = white

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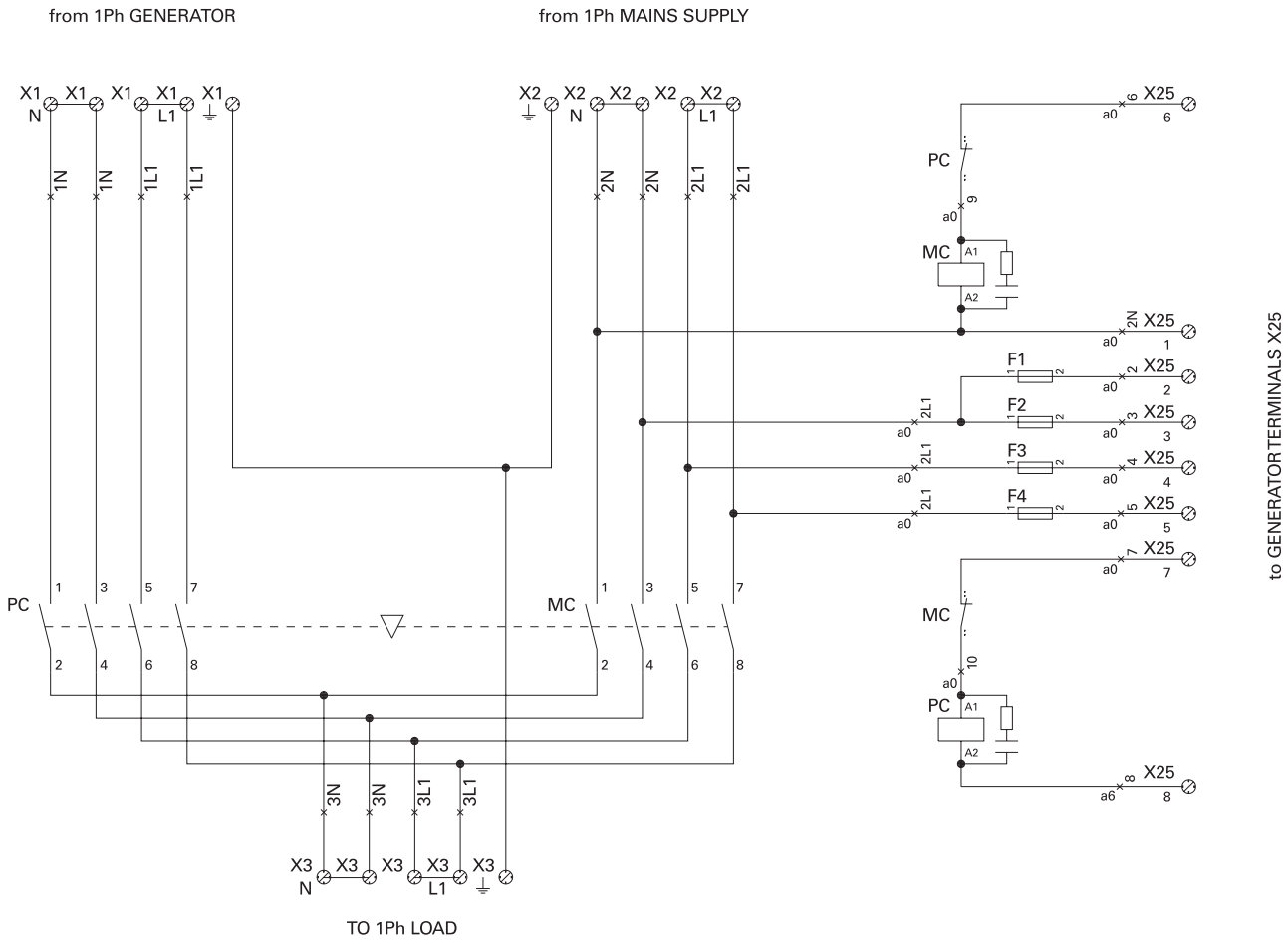
Applicable for QIX44 Dd 1ph



NOTE :
for Single Phase applications :
Modifications to be done by the customer :

1) Connect terminals X1, X2 and X3 -two by two- as indicated on the drawing. (for paralleling of the contacts)
2) Rename terminals and wire numbers as indicated on the drawing.
3) 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.
4) Connect load between X3.N and X3.L1.

LEGEND :

Wire size :	Colour code :
aa = 0.5 mm2	0 = black
a = 1 mm2	1 = brown
b = 1.5 mm2	2 = red
c = 2.5 mm2	3 = orange
d = 4 mm2	4 = yellow
e = 6 mm2	5 = green
f = 10 mm2	6 = blue
g = 16 mm2	7 = purple
h = 25 mm2	8 = grey
i = 35 mm2	9 = white

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	ENGLISH	NEDERLANDS	FRANCAIS
F1-2	Fuse (6A or 10A)	Zekering (6A or 10A)	Fusible (6A or 10A)
F3-4	Fuse (0.25 A)	Zekering (0,25 A)	Fusible (0,25 A)
MC	Contactor mains supply	Contactor voor de netspanning	Alimentation secteur de contacteur
PC	Contactor generator	Contactor voor de generator	Générateur de contacteur
X1	Terminal strip	Klemmenstrook	Barrette de raccordement
X2	Terminal strip	Klemmenstrook	Barrette de raccordement
X3	Terminal strip	Klemmenstrook	Barrette de raccordement
X25	Terminal strip	Klemmenstrook	Barrette de raccordement

	DEUTSCH	ESPAÑOL	SVENSKA
F1-2	Sicherung (6A or 10A)	Fusible (6A or 10A)	Säkring (6A or 10A)
F3-4	Sicherung (0,25 A)	Fusible (0,25 A)	Säkring (0,25 A)
MC	Schütz Netzanschlub	Suministro principal del contactor	Nätströmsanslutning
PC	Schütz Generator	Dínamo del contactor	Generatoranslutning
X1	Klemmenleiste	Bloque de terminales	Anslutningslist
X2	Klemmenleiste	Bloque de terminales	Anslutningslist
X3	Klemmenleiste	Bloque de terminales	Anslutningslist
X25	Klemmenleiste	Bloque de terminales	Anslutningslist

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	ITALIANO	NORSK	DANSK
F1-2	Fusibile (6A or 10A)	Sikring (6A or 10A)	Sikring (6A or 10A)
F3-4	Fusibile (0,25 A)	Sikring (0,25 A)	Sikring (0,25 A)
MC	Alimentazione contattore	Kontaktorstrømforsyning	Kontaktor til strømforsyning
PC	Generatore del contattore	Kontaktorgenerator	Kontaktor til generator
X1	Morsettiera	Koplingssplint	Klemliste
X2	Morsettiera	Koplingssplint	Klemliste
X3	Morsettiera	Koplingssplint	Klemliste
X25	Morsettiera	Koplingssplint	Klemliste

	ΕΛΛΗΝΙΚΑ	PORTUGUÊS	SUOMI
F1-2	Ασφάλεια (6A or 10A)	Fusível (6A or 10A)	Varoke (6A or 10A)
F3-4	Ασφάλεια (0,25 A)	Fusível (0,25 A)	Varoke (0,25 A)
MC	Παροχή ηλεκτρικών αγωγών επαφέα	Contactor de corrente principal	Verkkosyötön liitin
PC	Γεννήτρια επαφέα	Contactor do gerador	Generaattorin liitin
X1	Λωρίδα ακροδέκτη	Cablagem de terminais	Liitäntärima
X2	Λωρίδα ακροδέκτη	Cablagem de terminais	Liitäntärima
X3	Λωρίδα ακροδέκτη	Cablagem de terminais	Liitäntärima
X25	Λωρίδα ακροδέκτη	Cablagem de terminais	Liitäntärima

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Instruction Manual
for AC Generators

QIX44 Dd