Safety instructions | **English**
Revision 2.00

E-GEN range

CLAYTON POWER

SAFETY INSTRUCTIONS – UN3480

The E-GEN is classified as Class 9 dangerous goods according to UN3480, a power source with high energy density and hazardous materials in a sealed metal cabinet.

Installation must follow national safety regulations in accordance with the requirements for enclosure, installation, creepage, clearance, marking and segregation requirements for the end-use application. We recommend that installations are performed by authorised professionals. Switch off the system and check for hazardous voltages before changing any connections!
The E-GEN must only be serviced by trained personnel.

The lowest ingress protection rating for specific E-GEN parts is IP20. Ensure that the installation of the E-GEN complies with IP20 requirements.

This is a Class I product. Connect only 230 VAC from a source connected to protective electrical earth, including all extension cords between source and the device.

Observe the following:
When connected to 230 V input, voltage is present at 230 V output, even when the device is switched off.
Do not open the E-GEN.
Do not discharge a new E-GEN until it has been fully charged.
Charge only within the specified limits.
Make sure the E-GEN is switched off when it is moved and during installing.
Do not mount the E-GEN upside down or on its side.
Check if the E-GEN has been damaged during transport.
Do not series- or parallel-connect AC outputs of the E-GEN.
Do not leave outside exposed to the elements.
Do not use at altitudes above 2000 metres (6562 feet)
Do not cover or block the fan or air intake to ensure that the battery does not overheat.
Do not allow children or animals to come in contact with the device or connected power supplies.
230V input must be protected by a 10 A or higher rated fuse and an RCD.

Solar Connection
Solar connection must not exceed the maximum voltage of 50 V.

Danger in case of fire:
Danger of explosion with dust particles.
Decomposition due to fire or heat development emits toxic and corrosive gases.
Combustion gases which strongly irritate the eyes and respiratory organs.

General precautions the driver should observe if these hazards occur:
Switch off the motor.
Place a warning sign on the road to warn others.
Inform others of the dangers and advise them to stay away from the wind direction.
Contact the police and fire brigade immediately and inform them that there are lithium batteries (UN3480) onboard.

Instruction for fire extinguishing:
Extinguish fire with water. If possible, submerge the E-GEN completely in water.
Extinguishing with water produces fluoride, phosphate, fluoride-oxide and carbon monoxide.
Alternatively, extinguish with a CO2 fire extinguisher.

NON-SPILL
LI-ION BATTERY

CONTENT

UNIT MUST BE CHARGED EVERY 6 MONTHS IF NOT USED

1. PRODUCT USAGE

All installations must be carried out by trained and qualified installers.
This document is intended as a general guide for installations and not as a comprehensive, step-by-step manual.
Local rules and regulations must always be followed and take precedence over any instructions provided in this guide.

Warning: Connecting the device with incorrect voltage or battery polarity will damage the device and is not covered by the warranty.

Warning: Do not connect the AC outputs in parallel or serial. It will damage the device and is not covered by the warranty.

Warning: Do not connect the output of a generator or AC mains to the output. It will damage the device and is not covered by the warranty.

It is recommended to perform a full battery cycle prior to the initial use.
To do this charge the E-GEN fully, then do a full discharge and then charging it overnight using the 230 V input.

The E-GEN is a compact power supply designed to provide power for a variety of 400 VAC, 230 VAC and 12 VDC applications. It comes with built-in:

- LiFePO4 battery.
- 230 VAC Output – For supplying 230 VAC single phase applications.
- 400 VAC Output – For supplying 400 VAC three phase applications.
- 230 VAC Input – For charging from mains.
- 12 VDC Output – High power DC output for supplying 12 VDC applications.
- 12 V/24 V Input – Bidirectional DC-DC converter for 12 V/24 V applications like:
    - Vehicle jumpstart
    - Charging from alternator.
- Solar Charging – Integrated MPPT for charging from solar panel.
- CANbus communication and I/O interface for interaction with auxiliary equipment and remote control.

2. SPECIFICATIONS

PARAMETER	E-GEN 6 kWh - V3	E-GEN 12 kWh - V3	E-GEN 18 kWh - V3	E-GEN 24 kWh - V3
General				
Model no.	CE2411	CE2412	CE2413	CE2414
Cooling	Forced air			
Ambient temperature range discharge	-20 - 50 °C (load dependent)			
Ambient temperature range charge	0-50 °C			
IP classification	20			
Protection class	I			
Maximum altitude	2000m			
Product weight	145 kg	215 kg	280 kg	350 kg
Product size (H x W x L)	675 mm x 680 mm x 480 mm	940 mm x 680 mm x 480 mm	1205 mm x 680 mm x 480 mm	1470 mm x 680 mm x 480 mm
Battery				
Type	Rechargeable Lion battery system			
Chemistry	LiFePO4			
Capacity	560 Ah	1120 Ah	1680 Ah	2240 Ah
Available capacity	470 Ah	940 Ah	1410 Ah	1880 Ah
Cycles	3500			
Operating mode consumption	< 90 mA			
Sleep mode consumption	< 50 mA			
Marking (IEC 61960)	4IFpP73/175/208-2			
Marking (IEC 62620)	IFpP/73/175/208/[2P4S]M/-30+60/90			
AC Input				
Voltage	207-253 V			
Frequency	45-65 Hz			
Charge Power (maximum)	1725 W			
Power with load (maximum)	3000 W			
Connector type	NAC3 FCA			
AC Output (System)				
Total power - continuous @ 40 °C	2900 W	6000 W	8300 W	9000 W
Total power - continuous @ 50 °C	2500 W	5300 W	7700 W	8300 W
Total power - 10 minutes	4500 W	9000 W	12000 W	
Frequency	50 Hz			
Efficiency	94 %			
Power factor	0.77			
Idle consumption	80 W			
Fault current (rms)	30 mA			
AC Output (3 phase)				
Voltage (+/- 10 %)	400 V pure sine wave			
Total power - continuous @ 25 °C	3600 W	7000 W	9000 W	

Total power - peak	12000 W	18000 W
Connector type	CEE 16A 3P+N+E	
AC Output (1 phase)		
Voltage (+/- 10 %)	230 V pure sine wave	
Total power - continuous @ 25 °C	3000 W	
Total power - peak	6000 W	
Connector type	NAC3 FECB	
DC Input		
Voltage	11.5-32 V	
Current	100A	
Connector type	Terminal – M8	
DC Output		
Voltage	10-14.4 V	
Discharge current - continuous	180 A	
Discharge current - 1 min.	270 A	
Idle consumption	< 5 W	
Charging current – continuous	180A	
Connector type	Terminal – M8	
Solar (Input)		
Voltage	15-50 V	
Charging power (max.)	1200 W (3x400 W)	
Charging current (max.)	45 A (3x15 A)	
Short circuit current (Isc)	30 A	
Connector type	Terminal – M4	
I/O		
Input port	C1	
Input (Voltage)	0-50 V	
Input (Current)	< 50 mA	
Output ports	3 x M12	
Output (Voltage)	10-14.4 V	
Output (Current)	1.5 A (total) (Overcurrent protected)	
Connector type (M12)	Type A – 5-way	
Connector type (C1)	Terminal – M4	

3. CERTIFICATIONS AND COMPLIANCE

Low Voltage Directive 2014/35/EU
EN62368-1, EN62133

RoHS Directive 2011/65/EU
EN 63000

EMC 2014/30/EU
EN61000-6-2, EN61000-6-3

E-Marking
UN-ECE Regulation 10, E5 10R – 06 0488

4. SAFETY AND FUSES

The following measures ensure the safe and secure operation of the electrical system.
Not following these measures can result in dangerous situations causing harm to the user and the equipment.

4.1 Internal Measures

- 230 VAC input protected with 16 A fuse.
- 230 VAC and 400 VAC output protected by a Residual Current Circuit Breaker with Overload protection (RCBO) 30 mA/13 A.
- L/N relay hardware protection against hazards.
- PE/N relay hardware protection against hazards.
- Solar panels 16 A fuse.
- 200 A fuse on DC output.

Fuses cannot be replaced by the user and require service.

ATTENTION: The MPPT/Solar may be permanently damaged if the input voltage exceeds 50 V.

ATTENTION: The device is equipped with a Residual Current Circuit Breaker with Overload protection (RCBO). To ensure its proper operation, it is important to regularly test the RCBO.

Procedure:

- Ensure that 230 VAC and 400 VAC respectively is present.
- Locate the button marked 'T' on the RCBO.
- Press the 'T' button.
- Observe the RCBO to ensure that it trips during the test.

If the RCBO becomes disabled, all 230 AC and/or 400 VAC output ports will be disconnected. This is a safety feature to protect the device and those using it. Regular testing of the RCBO ensures that it is functioning properly.

ATTENTION: Protective Earth - The device must have protective earth connected.

It is mandatory to install a Protective Earth (PE) connection in accordance with the requirements specified in IEC 62109-1. The PE connection provides a safe route for electrical fault current to flow, reducing the risk of electric shock and fire. Proper installation of the PE connection is essential for ensuring the safety of users and the equipment. Make sure that the PE connection is installed using appropriate materials and methods, in accordance with the relevant national and local regulations.

ATTENTION: Do not connect the CAN Bus to the vehicle's CAN communication system.

4.2 External Fuses

- All fuses must be installed as close to the power source as possible.
- Measures must be taken to ensure the cable located between the fuse and the power source is laid out in a short-circuit-proof manner.
- Fuses should be clearly marked with their name and size.
- It is important to use fuses rated for DC voltages.
- MEGA fuses (recommended fuse type) should be mounted in holders.

4.3 Cables

- Cables need to be flexible.
    - Cables are rated in different classes related to flexibility.
    - Cables with classification 5 or 6 needs to be used (This cable type is also referred to as HIGH-FLEX)
- Cables are dimensioned according to the fuse size.
- Always use the designated connection points in the vehicle for chassis and DC connections (if available/indicated).
- Always route cables the shortest way possible (except for cables between Battery Modules and E-GEN Module).
- Cables should always be secured along the routing to ensure that it does not move unintentionally.
- Cable must be kept away from moving parts.
- When passing through bulkheads or other surfaces the cable needs to be guarded against chamfering.
    - This can be done by grinding the hole to eliminate sharp edges, using a rubber grommet within the hole and using conduit or tubing to shield the cable.
- Cable terminals should be used for the right cable cross section as they are made for.
- It is important to choose cable terminals for the right cable classification.
    - This means that classification 5 cables need a classification 5 terminal.
- When connecting the cable remember to use the right torque.
    - M8 bolts must be torqued to 12 Nm
    - M4 bolts must be torqued to 2.5 Nm

5. STORAGE

The battery can be stored at temperatures between -20 ºC and 50 ºC. For long term storage (>1 month), the battery should be fully charged and stored at temperatures between 0 ºC and 35 ºC. Do not store the battery upside down.

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6. TRANSPORTATION

Lithium batteries are classified as Class 9 hazardous materials (UN3480) and must always be transported in compliance with all applicable local, national, and international regulations. Proper packaging is required during transportation, and packaging instructions (PI965) must be respected. The batteries should not be turned upside down during transportation.

7. DISPOSAL

To ensure proper disposal and reduce potential hazards, discharge the battery completely before placing it in a designated battery recycling bin. Improper disposal, such as throwing it in regular rubbish bins, is strictly prohibited as the product contains batteries with potentially harmful chemicals. Adhere to local laws and regulations for battery recycling and disposal.

8. WARRANTY

IMPORTANT AND WARNING:
DO NOT USE OR ATTEMPT TO USE THIS PRODUCT UNTIL YOU HAVE READ THE USER MANUAL IN ITS ENTIRETY. IMPROPER INSTALLATION OR USE OF THIS DEVICE MAY BE DANGEROUS AND MAY CAUSE DAMAGE TO OTHER ELECTRICAL EQUIPMENT AND WILL VOID THE WARRANTY.

Warranty. The company guarantees that products and associated services are free of significant defects in design, material and execution for 24 months after delivery.

Exceptions. The company's warranty does not include defects caused by: (i) ordinary wear and tear, (ii) storage, installation, use or maintenance against the company's instructions or ordinary practice, (iii) repair or change carried out by others than the company, and (iv) other conditions for which the company has no responsibility.

Examination. Within a reasonable period of time after receiving a complaint from the client about defects and examining the claim, the company will inform the client about whether or not the defects are covered by the warranty. After the request, the client must ship defective parts to the company.
The client covers the expenses and risks of the parts during transport to the company. The company covers the expenses and risks for return of parts during transport, only if the defects are covered by the warranty.

Register a complaint. If the client discovers defects within the period of warranty, which the client wishes to invoke, it must be communicated immediately in writing. If defects, which the client discovers or should have discovered, are not immediately communicated to the company in writing, it cannot be effectuated at a later time. The client must provide the company with the requested information about the defects registered.

Instructions for Obtaining Warranty Service for Clayton Power Devices
To obtain warranty service, contact the store where you have bought the product and provide the following:

- Sales receipt
- Device model number
- Device serial number
- Brief description of the application and problem, including any error codes displayed on the device.
- Obtain an authorisation number from the Clayton Power dealer before shipping the device. Carefully pack the device and ship it (freight paid) to the Clayton Power dealer. Note that the device contains lithium batteries and must be shipped as dangerous goods according to UN3480 lithium-ion batteries' regulations.

Sales: sales@claytonpower.com

Service: service@claytonpower.com

Phone: +45 4698 5760

Address: Pakhusgaarden 42-48
DK-5000 Odense C

CLAYTON POWER