



North Sea Hybrid Inverters

EL3000, EL3600, EL4000, EL5000, EL6000

Installation Manual

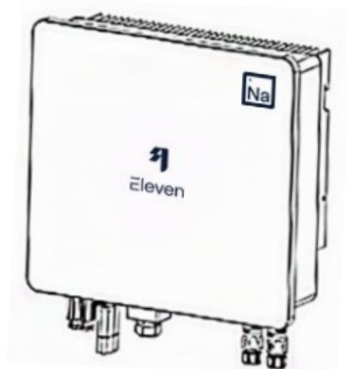
Optimised for Sodium-Ion Batteries

Eleven Energy's North Sea Hybrid Inverters are purpose-built to maximise the performance and lifespan of sodium-ion battery systems. Combining cutting-edge technology, intelligent functionality, and installer-friendly design, this inverter is a robust, future-ready solution for sustainable home energy management.

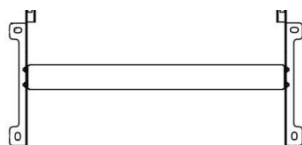
This manual provides detailed information about the hybrid inverters, including installation guidelines, electrical connections, configuration and commissioning procedures and technical specifications.

Before installing and operating the product, please read this manual carefully to ensure you are familiar with the safety instructions, features, and functions of the inverter.

Box Content



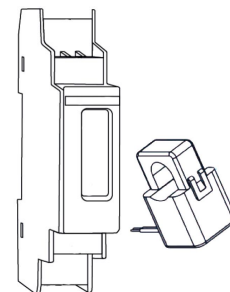
Inverter
Qty: 1



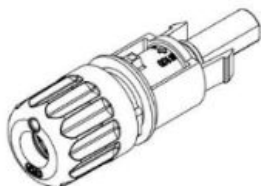
**Mounting
Bracket**
Qty: 1



**WIFI/
Bluetooth
Data Dongle**
Qty: 1



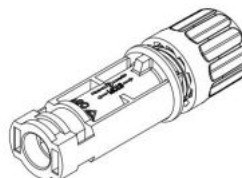
**ADL200n-CT
Digital Meter
with CT Clamp**
Qty: 1



**PV Positive
Input Terminal**
Qty: 2



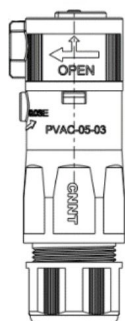
**PV Positive Input
Terminal crimp
contacts**
Qty: 2



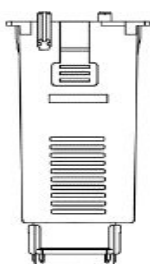
**PV Negative
Input Terminal**
Qty: 2



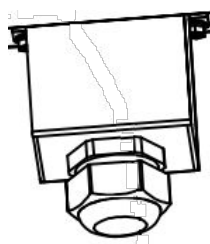
**PV Negative
Input Terminal
crimp contacts**
Qty: 2



**AC Terminal
Connector**
Qty: 2



**Battery
Terminal
Enclosure**
Qty: 1

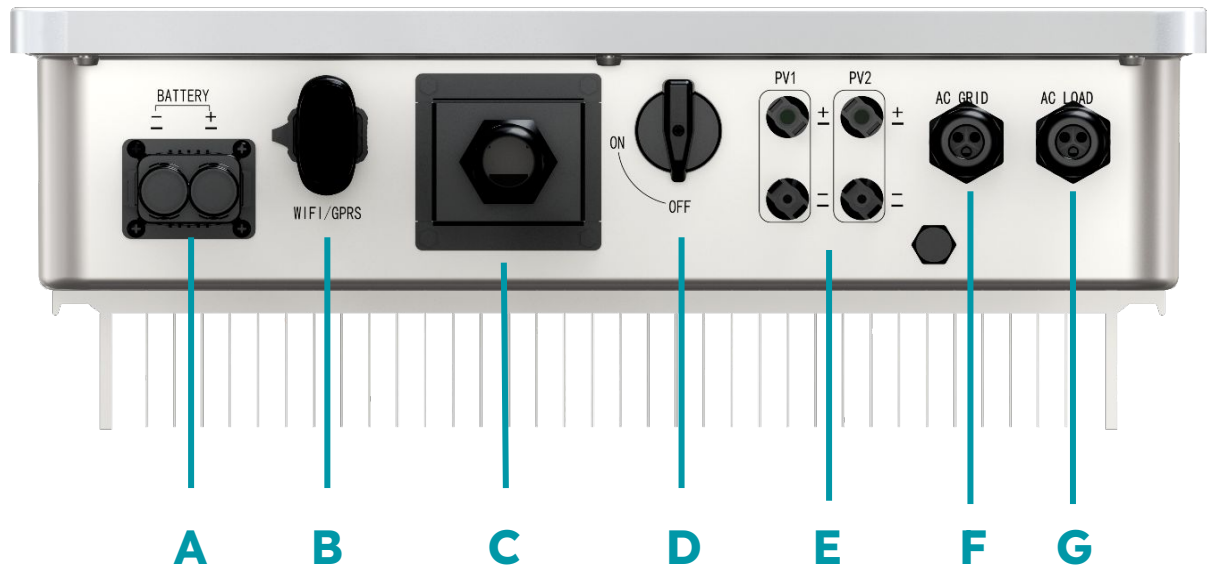


**Communication
Interface
housing**
Qty: 1



**Communication
Cable**
Qty: 2

If any damaged or missing parts are found, please contact us immediately.



A	Battery Connection Port
B	Data Dongle Connection Port
C	Communication Module Interface
D	PV Isolator (Standard: EN 60497-3)
E	PV Input Terminals
F	AC Supply Terminal for Grid Connection
G	EPS Terminal

Safety and Precautions

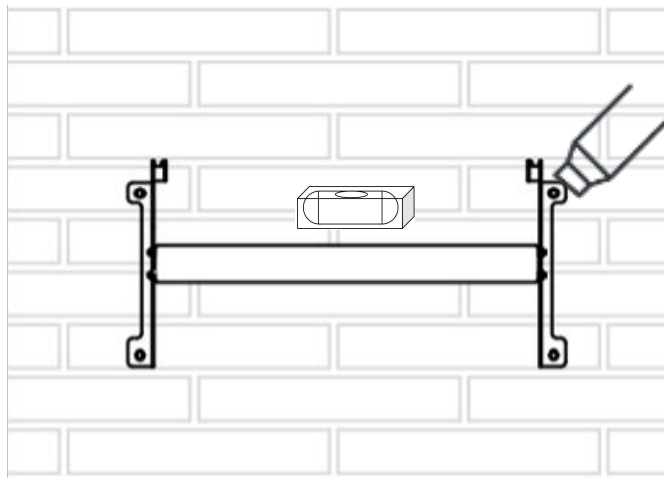
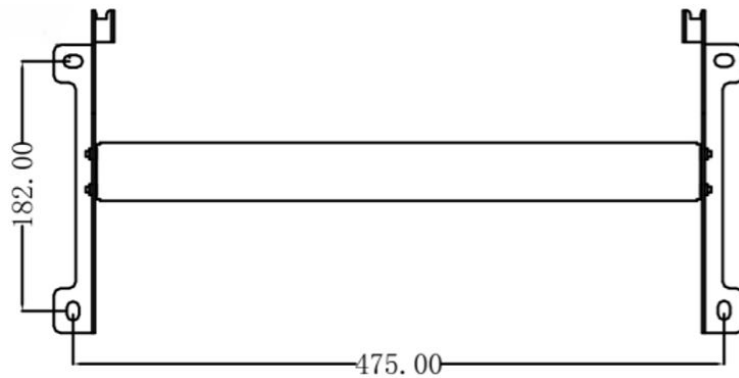
This document is intended exclusively for professional electricians accredited for the installation of battery storage systems and thoroughly familiar with UK electrical standards and regulations. **All electrical installations must be carried out by a qualified and UK registered electrician and in accordance with the IEE Wiring Regulations (BS 7671 - 18th Edition).**



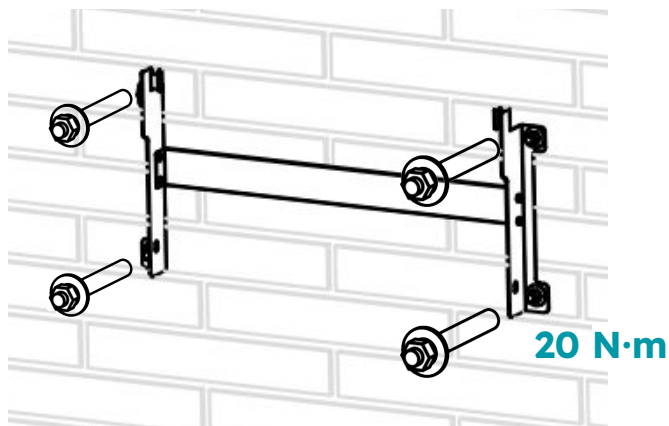
- The inverter must be installed in a **well-ventilated area** to ensure optimal performance. Avoid direct sunlight or near water sources.
- Ensure the mounting wall is fire-resistant and sturdy enough to support the inverter's weight, with a **minimum thickness of 100 mm**.
- Install the inverter vertically with all connections positioned at the bottom. Do not install the inverter horizontally or at an angle.
- Mount the inverter at least 3 feet (approximately 1 metre) above ground level.
- For external installations, the inverter must be mounted under a **protective canopy**.
- Only Eleven Energy sodium batteries are compatible with this inverter.
- During operation, the heat sink may become hot. Do not touch the heat sink of the inverter when in operation.
- If you suspect any issues with the inverter, please contact us.

Wall Mounting

1. Place wall mounting bracket horizontally onto the wall and mark the position of the bracket holes.



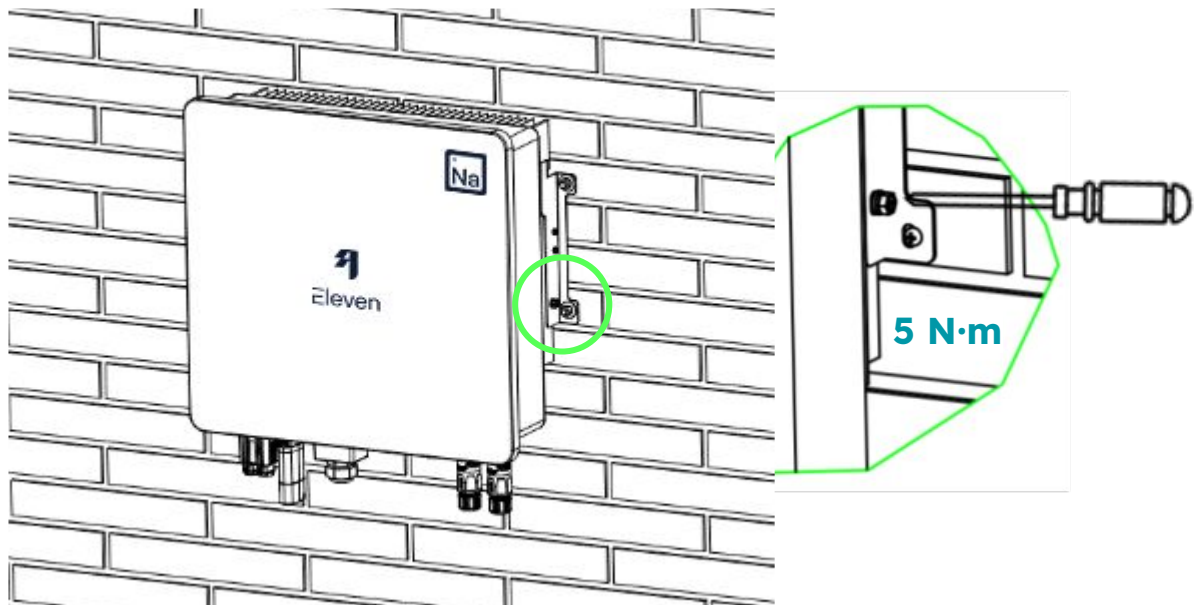
2. Drill 4 holes at the marked positions, at least 75 mm deep. Fix the mounting bracket to the wall using **4 x M8*80** expansion bolts.



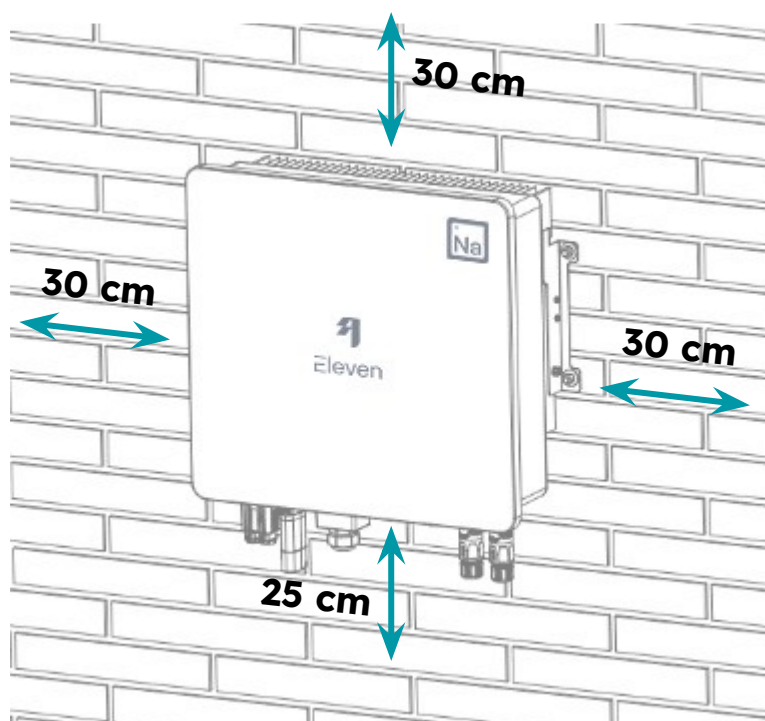
Different fixings should be used if fitting the inverter to a non-masonry wall.

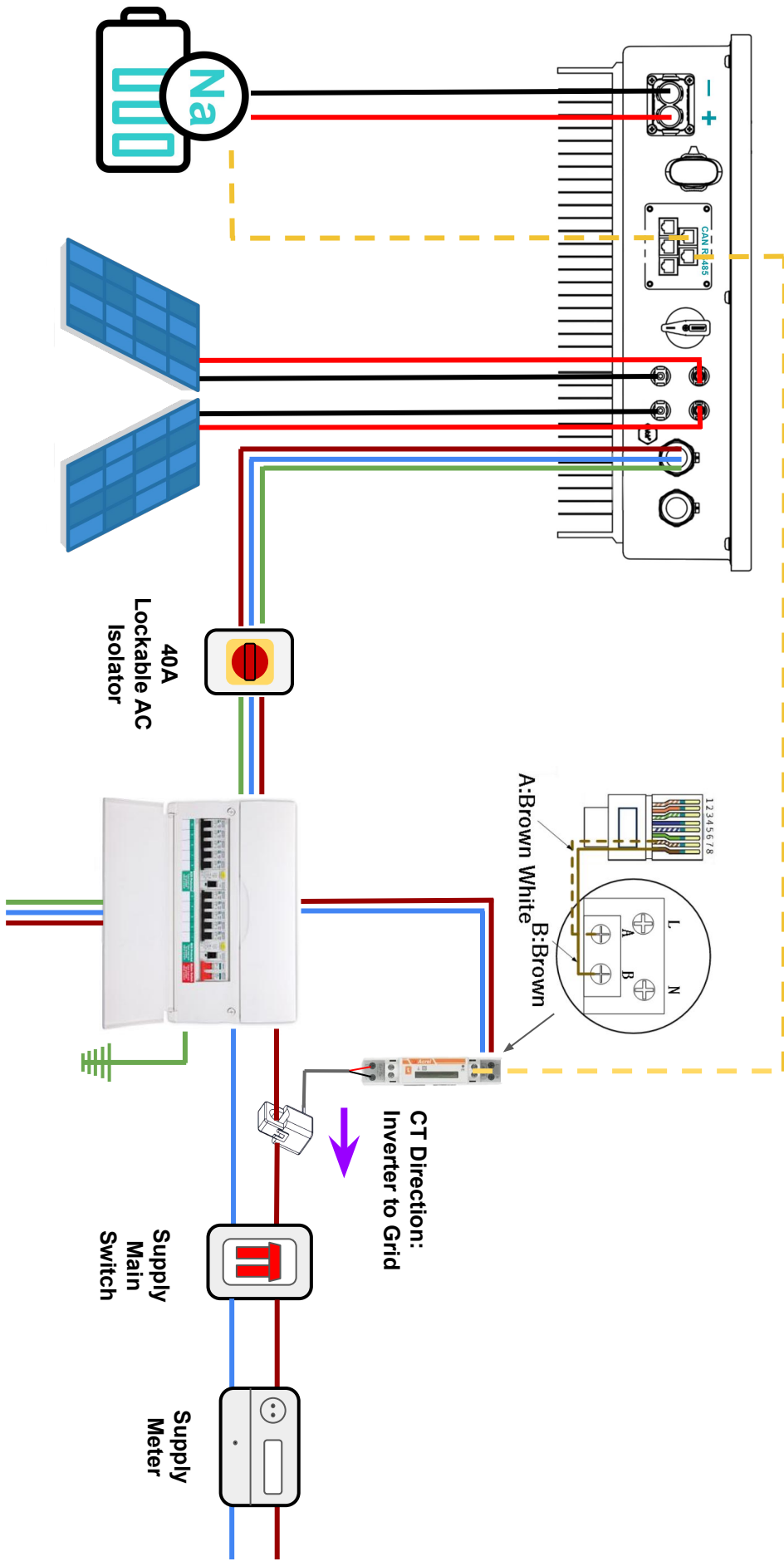
Wall Mounting

3. Mount the inverter onto the mounting bracket. Insert the 2 x M6 safety locking screws on the left and right side



Ensure there is sufficient clearance around the inverter to allow for proper heat dissipation. Refer to the diagram below for the recommended spacing around the inverter.

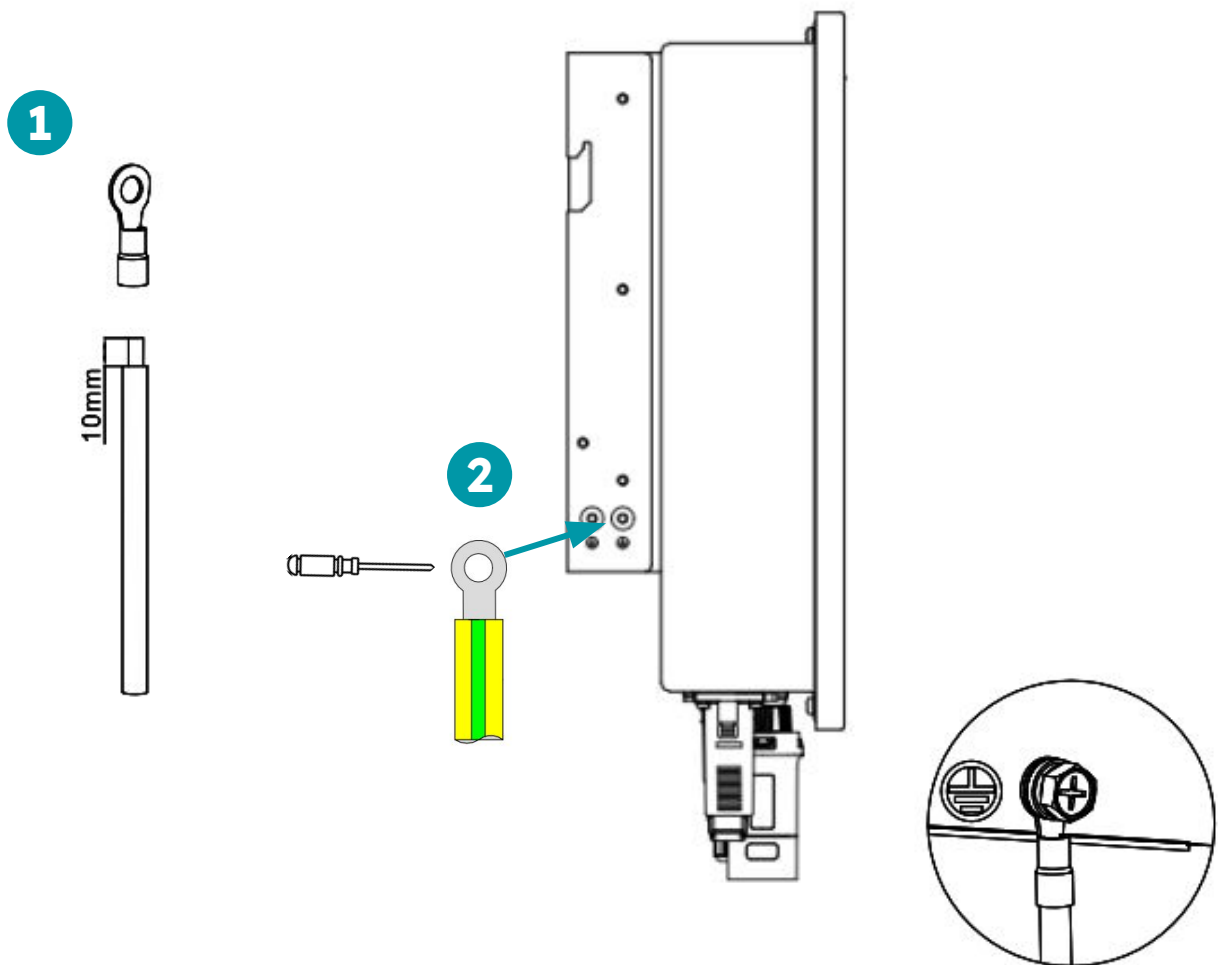




PE Connection

Non-current-carrying metal parts of the PV-battery system must be properly grounded.

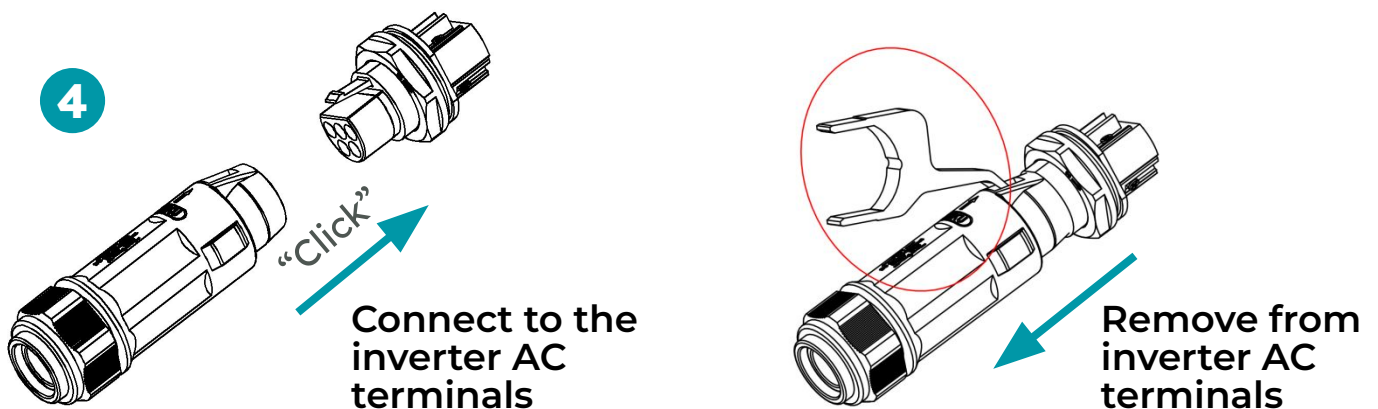
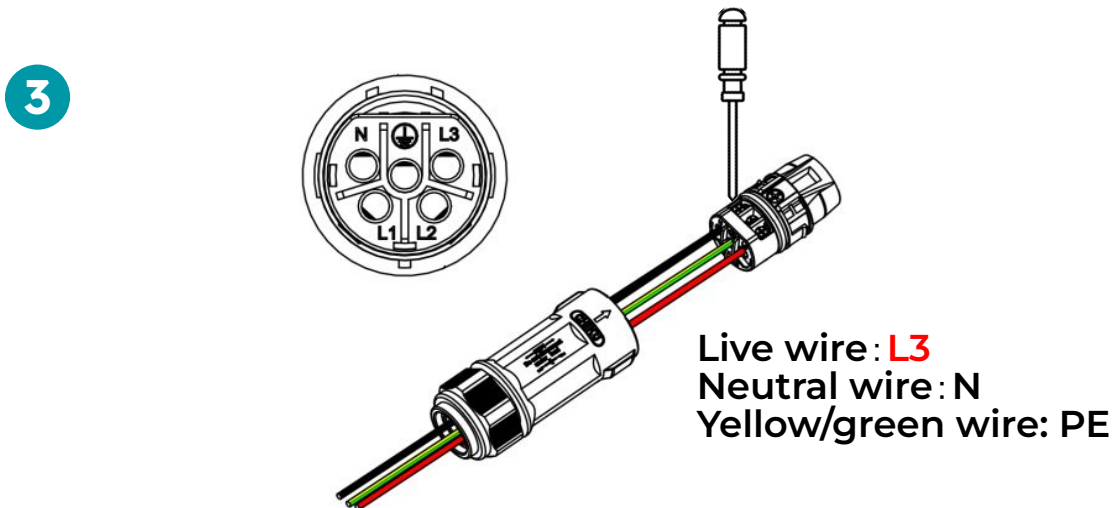
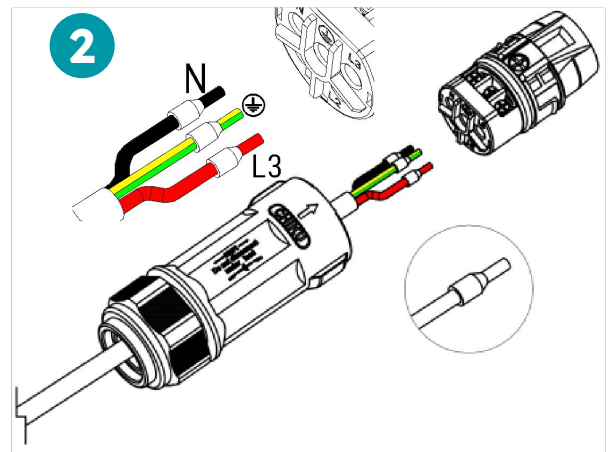
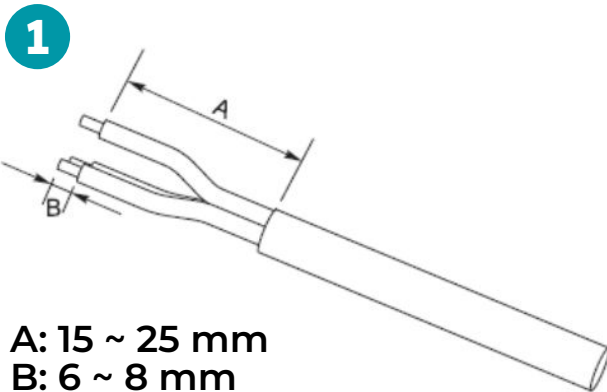
1. Use a yellow-green outdoor grounding cable with a cross-sectional area of at least 4 mm².
2. Strip the insulation layer of the grounding cable to the appropriate length using a wire stripper.
3. Insert the stripped wire core into the conductor crimping area of the OT terminal and securely crimp it using crimping pliers.
4. Attach the OT terminal using an M6 hex screw, ensuring a tightening torque of **5 N·m**.



AC Connection

AC cable size requirements: 6 ~ 10 mm²

The recommended maximum cable length should not exceed 50 metres, as excessive cable resistance can lead to power loss and reduce the inverter's efficiency.



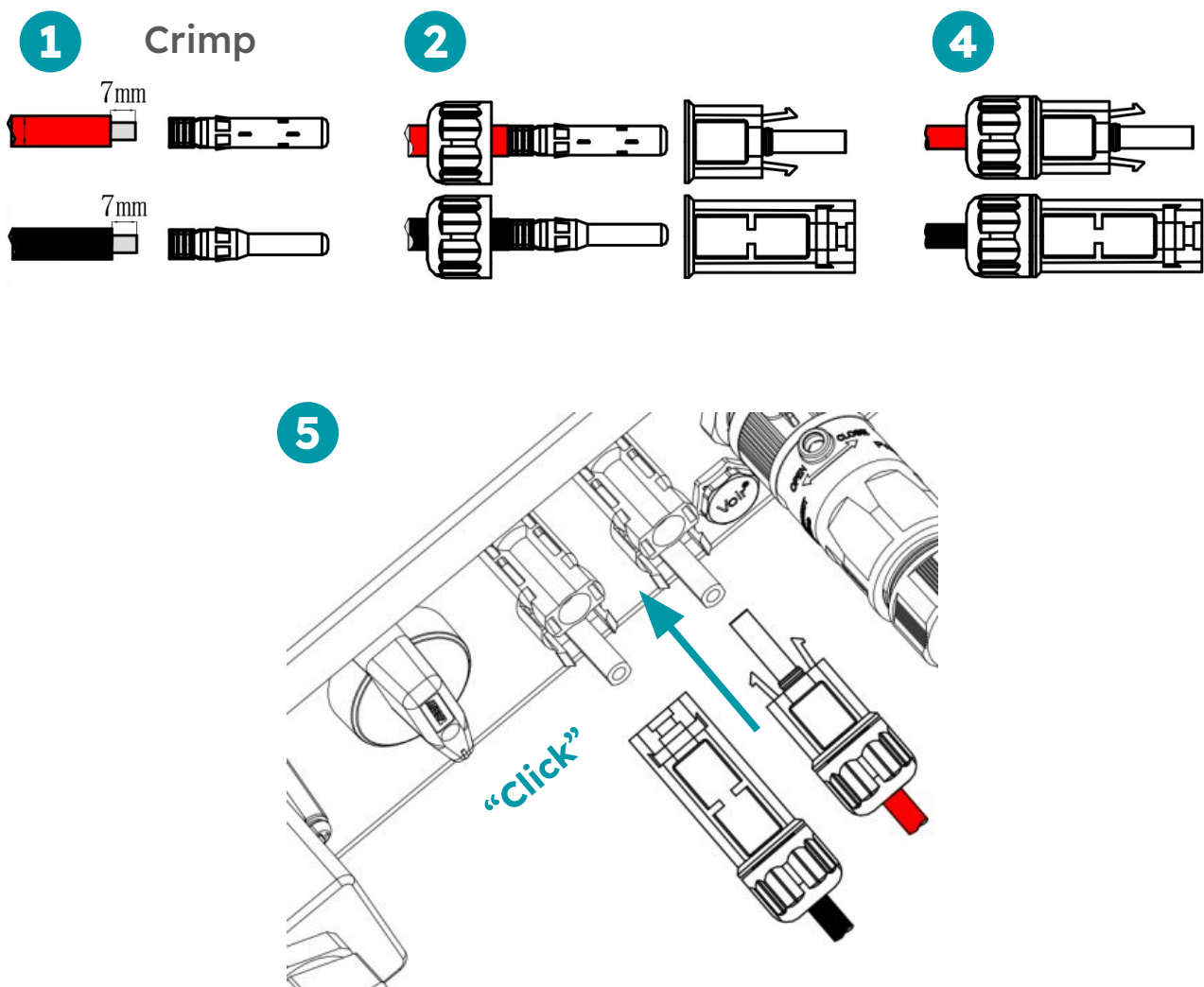
PV Connection

Ensure the PV Switch is on the “OFF” position before connecting PV strings to the inverter.

Ensure that the maximum short-circuit current and maximum input voltage of each PV module remain within the allowable range specified for the inverter.

Verify that the positive pole of the PV string is correctly connected to the PV+ terminal of the inverter, and the negative pole of the PV string is connected to the PV- terminal of the inverter. Always double check with a multimeter before connection.

DC cable size requirements: 4 ~ 6 mm²



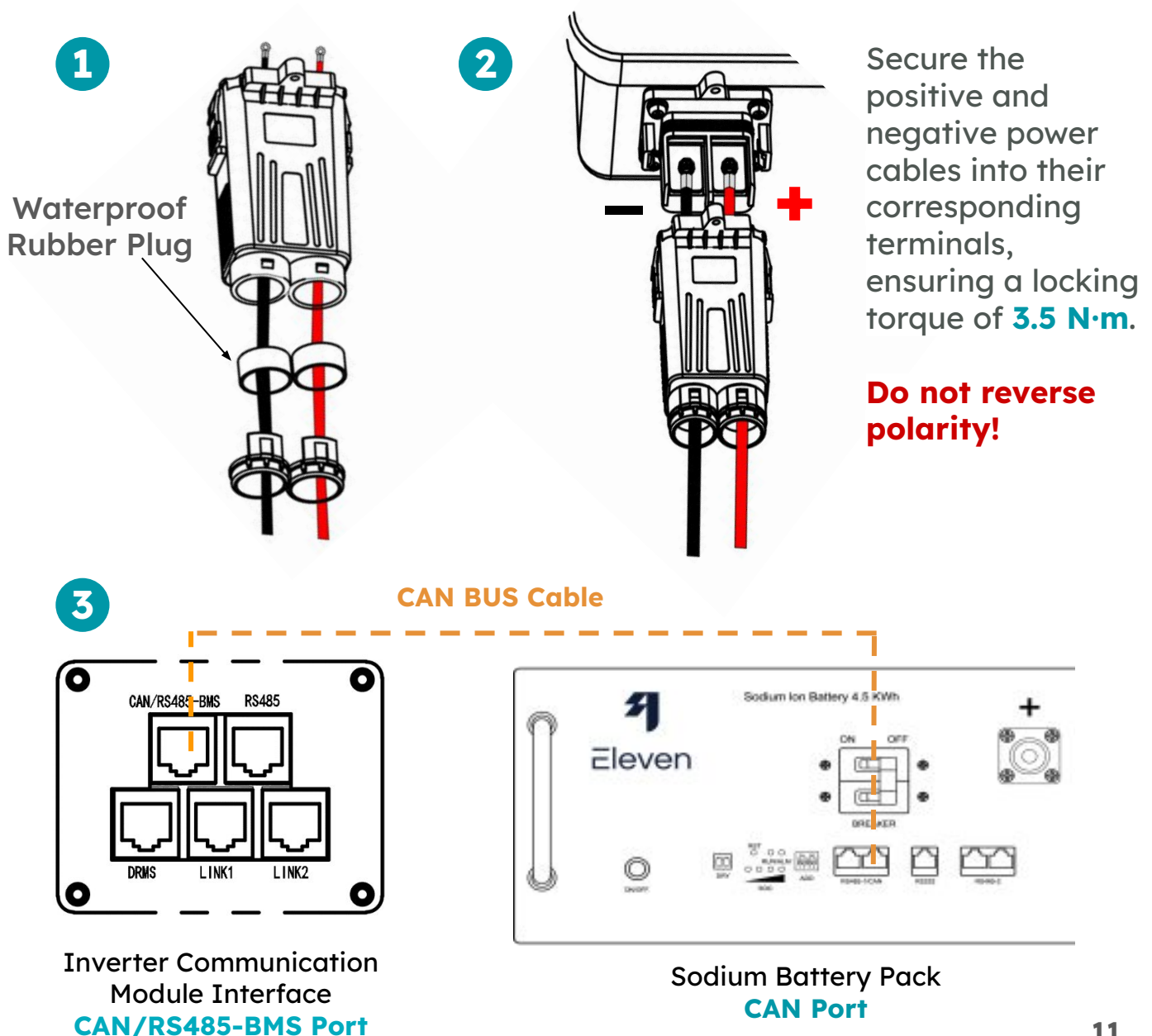
Battery Connection

Before connecting the battery cable, ensure that both the inverter and battery are powered off.

Do not connect or disconnect the battery cable while the inverter is operating, as this could result in electric shock and damage both the inverter and battery.

Avoid connecting the same battery pack to multiple inverters, as this would cause damage to the inverter.

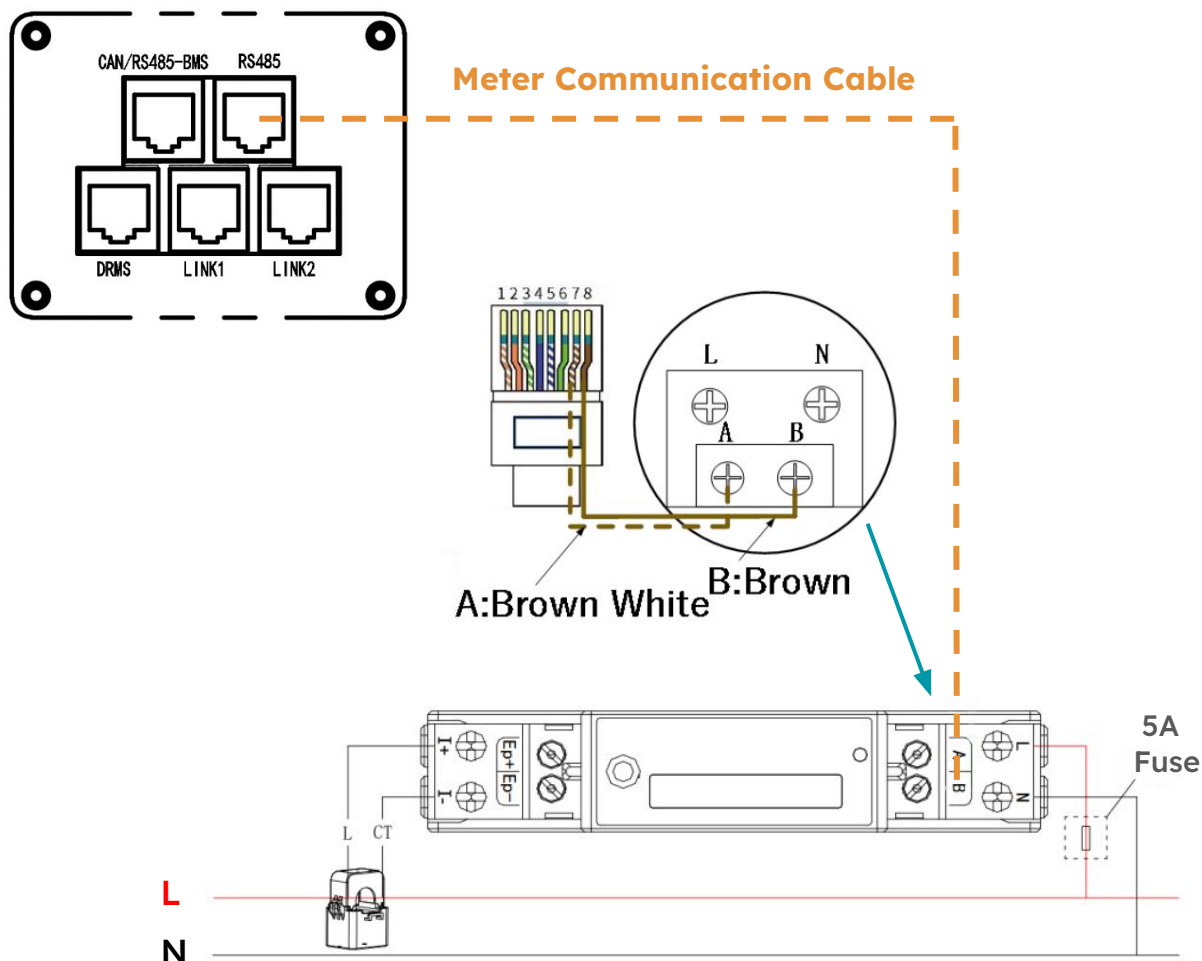
Only use the provided inverter-to-battery power and data cables.



Digital Meter & CT Clamp

Inverter Communication
Module Interface

RS485 Port



The CT clamp connected to the digital meter must be installed around the live incoming supply to the property to monitor the total consumption of the building. Ensure the arrow on the clamp points in the direction of grid import.

WiFi & Bluetooth Data Dongle



Indicator Light Description

RUN	A flashing light every second indicates normal operation
COM	The COM light indicates that the equipment data can be collected. It remains on continuously but briefly turns off when data is being sent. It turns back on after receiving and verifying that the data
NET	<p>Network Status Indicator</p> <ul style="list-style-type: none">• Flashing quickly: The inverter is scanning for a WiFi network.• Flashing slowly: The cloud platform has been registered successfully.• Always on: The inverter is connected to a WiFi network.

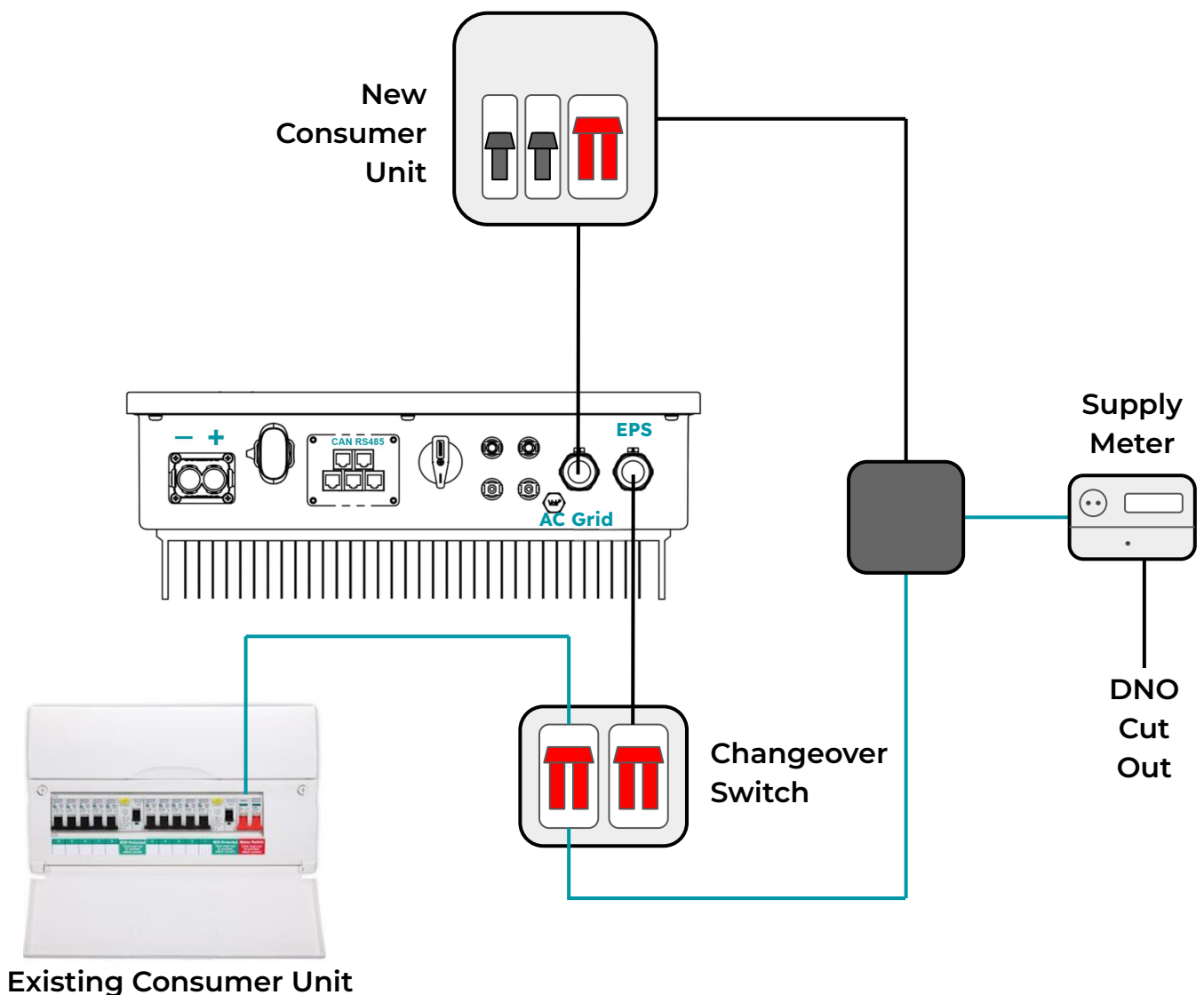
All three lights flashing simultaneously indicate that the dongle is currently upgrading.

EPS Connection

The Emergency Power Supply (EPS) can deliver a maximum output power of 6000 W during a grid failure. To ensure safety, this output must be protected as close to the inverter as possible using a double-pole 30 mA RCD rated for up to 30 A.

If the load exceeds 6000 W, the inverter will cease output and enter a fault state. The EPS output will only function when sufficient battery capacity is available.

An earth rod must be installed and connected to the main earthing terminal, positioned as close to the supply origin as possible. Adequate overload and short-circuit protection must also be installed in compliance with IEE Wiring Regulations.



Startup and Shutdown Procedure




Startup Procedure

1. Turn on the grid-side AC isolator
2. Turn on the PV Switch on the inverter
3. Press the ON/OFF switch on the battery pack(s). After hearing a "beeping" sound, set the battery's integrated circuit breaker to the ON position.
4. The inverter will start automatically after completing its self-test procedure.
5. Turn on the EPS AC isolar

Shutdown Procedure

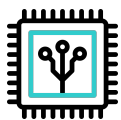
1. Turn off the PV Switch on the inverter
2. Turn off the EPS AC isolar
3. Turn off the grid-side AC isolator
4. Wait until the LED light on the inverter turns off completely.
5. Turn the battery's integrated circuit breaker to the OFF position, then press the battery ON/OFF switch.

Inverter Front Panel Indicator Light Description

	Flashing: Booting up / Standby mode Always on: Grid connected
	Flashing: Off-grid and standby mode Always on: Off-grid mode
	Flashing every 500 ms: Non-functional, waiting for recovery conditions to be met Flashing every 2 Sec: Reduced power mode Always on: Non-recoverable fault

System Commissioning

North Sea EL6000



Silicon Carbide Technology
Higher efficiency & Longer lifespan



High Charge / Discharge Rate
Up to 100 A, 6 kW



Backup Power Supply
<10ms On/Off-grid Switchover



Smart Tariff Compatible
Smart energy device integration & intelligent work modes



UK Cloud
Real time visibility
Monitor & configure from anywhere

Input Parameter (PV)

Max. DC Input Power	9 kWp
Starting Voltage	95 V
Max. Input Voltage	600 V
MPPT Voltage Range	80-550 V
Full Load MPPT Voltage Range	350-500 V
Number of MPPT	2
Input String Per MPPT	1
Nominal Input Voltage	360 V
MPPT Max. Input Current	18 A / 18 A
MPPT Max. Short Circuit Current	22 A / 22 A

On-grid Parameter (AC)

Nominal Output Power	6 kW
Max. Output Current	27.2 A
Nominal Grid Voltage	230 V
Max. Input Current from Grid	27.2 A
Grid Voltage Range	184 - 276 V
Frequency Range	45 - 65 Hz
Power factor	~1 (0.8 speed-up 0.8 lag)
THDi(@rated power)	<3%

Backup Terminal (AC)

Nominal Output Power	6 kW
Nominal Voltage	230 V
Nominal Frequency	50 Hz
Nominal Output Current	27.2 A
Output THDu (@Linear Load)	< 2%

General Data

AC Connection	Single Phase
PV Max. Efficiency	98%
Battery Charging / Discharging Efficiency	95.2%
Standby Power Loss	≤10W
Dimension (W x H x D)	500 x 470 x 180 mm
Weight	23 kg
Noise Emission	< 25 dB
Operating Temperature Range	-25 °C ~ 60 °C
Humidity Range	0 ~ 100%
Cooling Method	Natural Cooling
IP Rating	IP65
Monitoring	LED & APP
Communication	RS485 / CAN / Parallel ports

Battery

Battery Type	Sodium-ion
Nominal Battery Voltage	45 V
Battery Voltage Range	33 - 59.5 V
Max. Charging Voltage	60 V
Max. Continuous Charging / Discharging Current	100 A

Certificates & Approvals

CE-LVD	IEC 62109-1, IEC 62109-2, EN 62109-1, EN 62109-2 , IEC 62477-1
CE-EMC	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN 62920
Grid	G99, G100

Protection Mechanisms

- ✓ DC Switch
- ✓ PV Insulation Resistance Detection
- ✓ Residual Current Monitoring
- ✓ Anti-islanding Protection
- ✓ AC Short Circuit Protection
- ✓ Overvoltage and Overload Protection
- ✓ AC Overvoltage Protection: Level 3
- ✓ Battery and PV Overvoltage: Level 2
- ✓ Surge Protection
- ✓ Lightning Protection
- ✓ Reverse Polarity Protection (PV & Battery)

