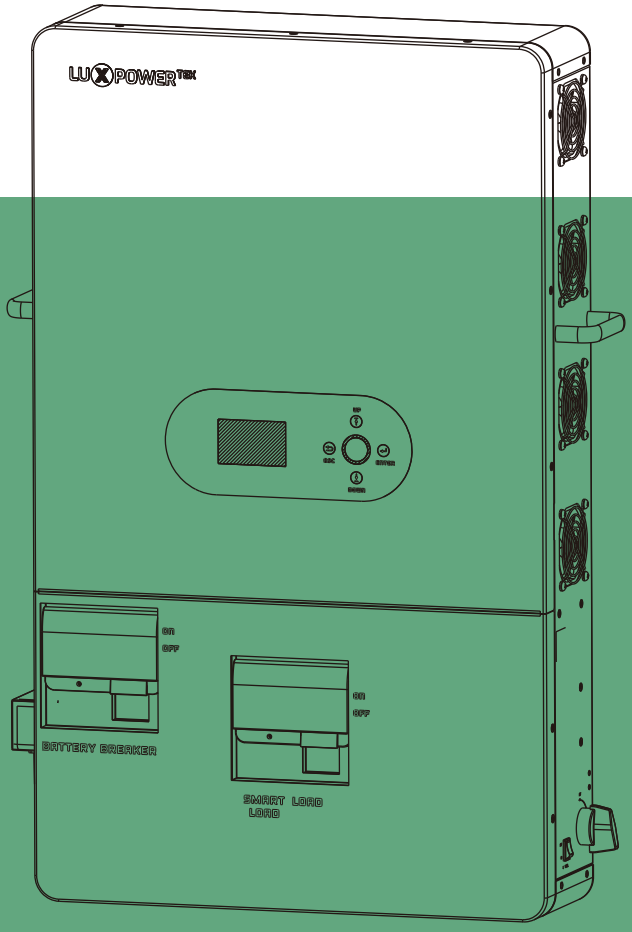
Energy Storage Inverter
User Manual

SNA-EU 12K
SNA-EU 14K



Version: UM-SNA04001E02

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Revision History

Version	Date	Description
UM-SNA04001	2024.07.15	First official release.
UM-SNA04001E02	2025.10.24	Added safety enhancements and resolved known issues.

Information on this Manual

Validity

This manual is valid for the following devices: SNA-EU 12K, SNA-EU 14K.

Scope

This manual provides installation, operation, and troubleshooting guidelines for the product. Please read carefully before performing any installation or operation.

Target Group

This manual is intended for both professionals and end users. Professionals and end users should possess the following knowledge and skills:

- Understanding of the operating principles of this device.
- Training in installation and electrical safety.
- Experience in installing and commissioning electrical equipment and systems.
- Familiarity with applicable local standards and regulations.

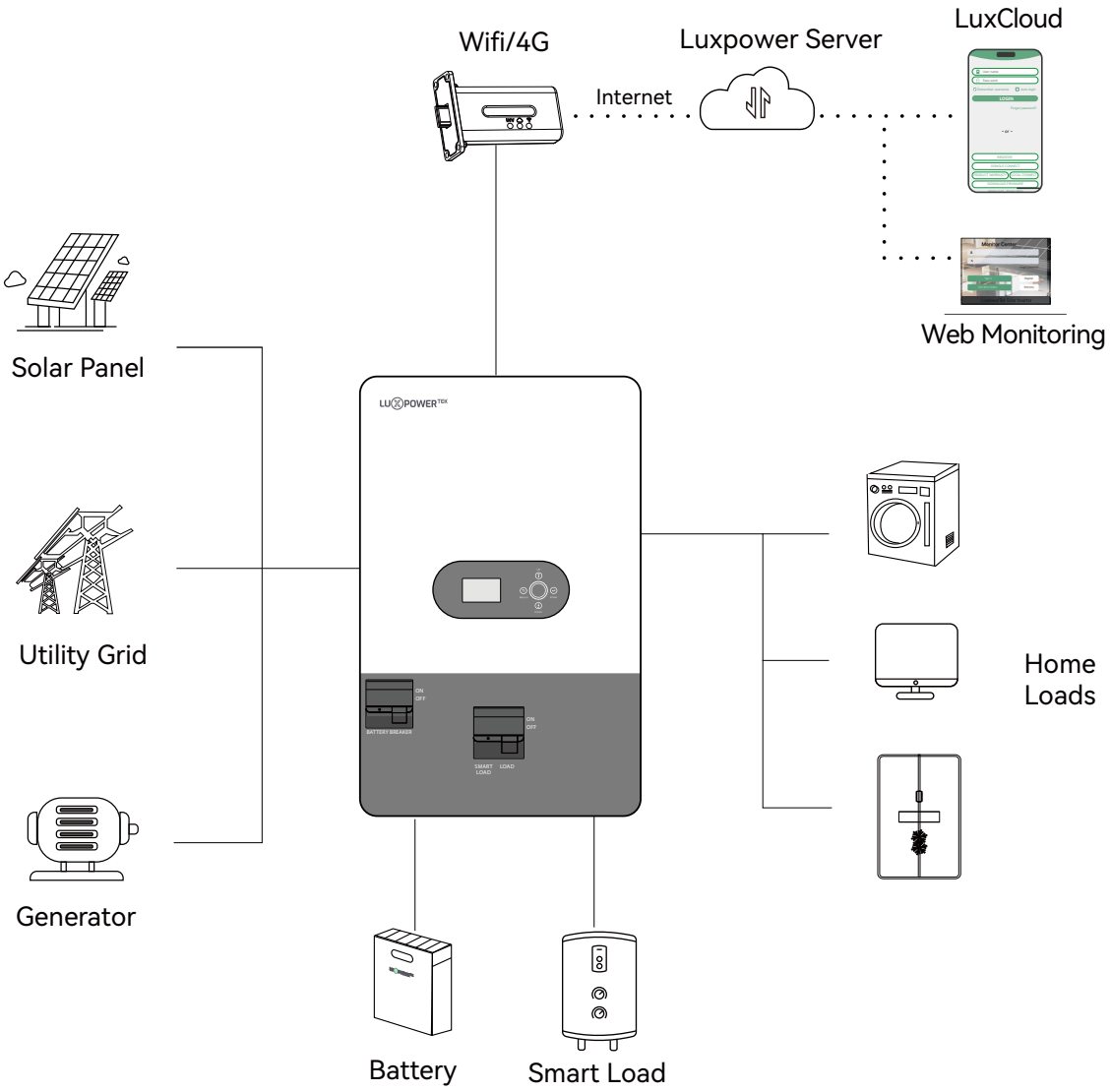
Safety Instructions

WARNING: This section contains important safety and operating instructions. Please read carefully and keep for future reference.

- All operations and wiring must be carried out by qualified professionals.
- Before using this equipment, carefully read all instructions and warning labels. Any damage caused by improper operation is not covered under LuxpowerTek's warranty.
- All electrical installations must comply with local electrical safety standards.
- Do not disassemble this equipment. For service, contact a qualified service center. Incorrect reassembly may result in electric shock or fire. Opening the inverter housing or replacing any components without Luxpower's authorization will void the warranty.
- To reduce the risk of electric shock, disconnect all wiring before performing any maintenance or cleaning. Simply switching off the device does not eliminate the risk.
- CAUTION: To avoid personal injury, charge only deep-cycle lead-acid or lithium batteries. Other types of batteries may explode, causing injury or equipment damage.
- Exercise extreme caution when working near batteries or using metal tools. Dropped tools may cause sparks or short circuits, leading to explosion.
- Do not attempt to charge frozen batteries.
- To ensure optimal performance, always use cables and circuit breakers that meet the recommended specifications.
- When connecting or disconnecting AC or DC terminals, strictly follow the installation instructions. Refer to the "Installation" section of this manual for detailed steps.
- GROUNDING INSTRUCTIONS: This equipment must be connected to a permanent grounding system. Installation must comply with all applicable local regulations and requirements.
- Never short-circuit the AC and DC terminals. Do not connect the inverter to the utility grid if the DC input side is short-circuited.

1. Product Overview

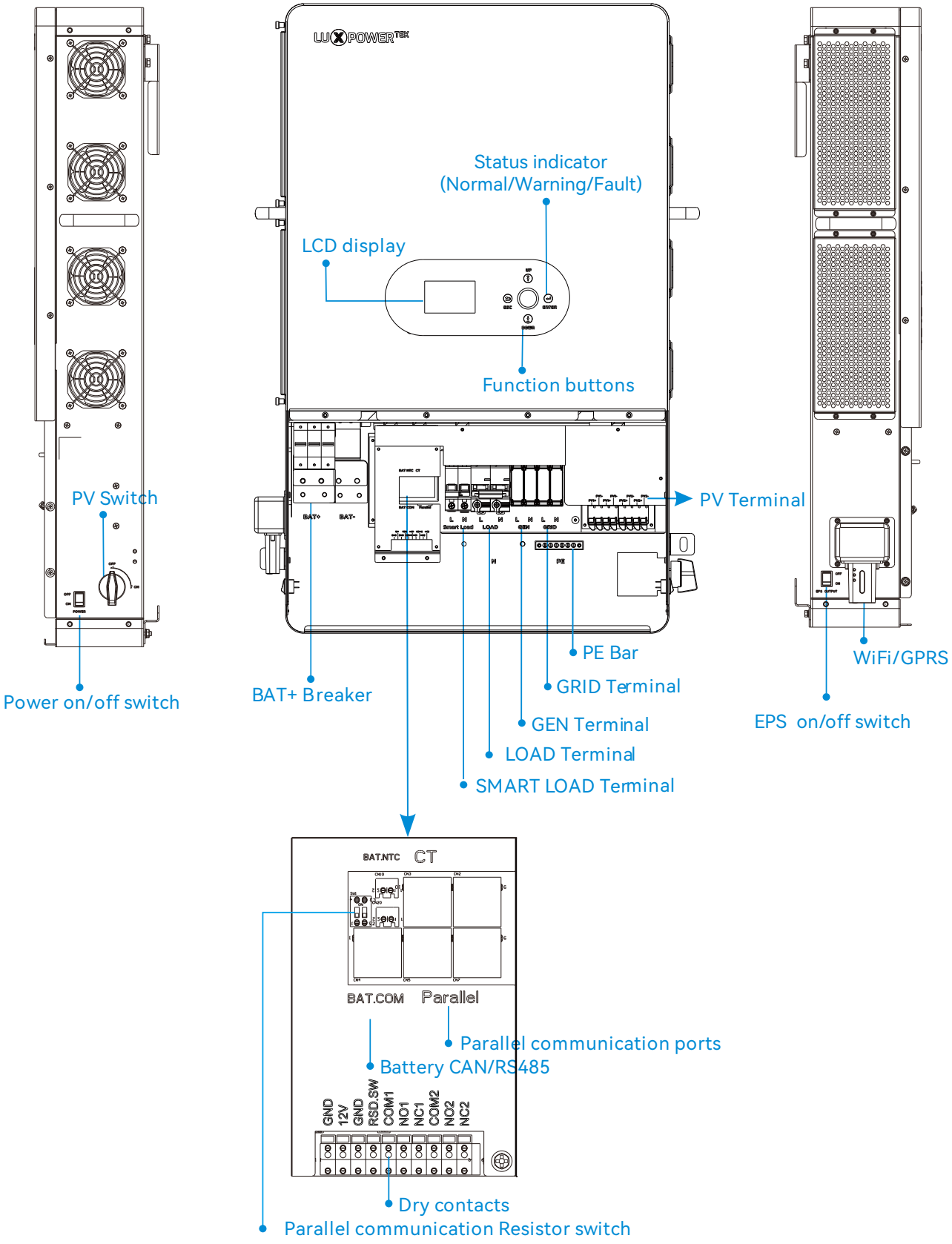
1.1 Features of the Inverter



SNA series is a multifunctional, high frequency pure sine wave Offgrid inverter solar inverter, features:

- Applicable for pure off grid inverter/backup power/self-consumption/ongrid situation.
- Integrated with 2MPPT solar charge controllers, MPPT ranges 120V~440V.
- Each PV input MPPT supports up to 12kW, with a total input power of 24kW when both PV inputs are used, and a power factor of 1.
- Be able to run with or without battery in ongrid and offgrid mode.
- With separated generator input interface, able to control generator remotely.
- Equipped with an independent Smart Load port, enabling connection to smart loads or the retrofit of existing on-grid systems into energy storage systems.
- With integrated advanced parallel function, up to 16 pcs max paralleling.
- Support CAN/RS485 for Li-ion battery BMS communication.
- WIFI/GPRS remote monitoring , setting and firmware update, support website, free IOS/Android APP.

1.2 Interface of the Inverter

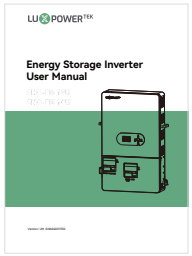


1.3 Packing List

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged.

You should have received the following items in the package:

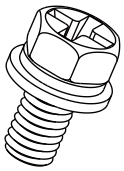
Offgrid inverter **×1**



User Manual **×1**

Expansion Screw and Tube **×6**

Wall-mounted **×2**



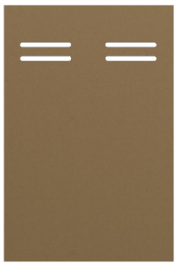
Cross Head Screw M5 **×4**

Bracket: wall-mounted **×1**

Cross Head Screw M8 **×6** / M3 **×8**

Wi-Fi Module **×1**

1000:1 CT **×1**



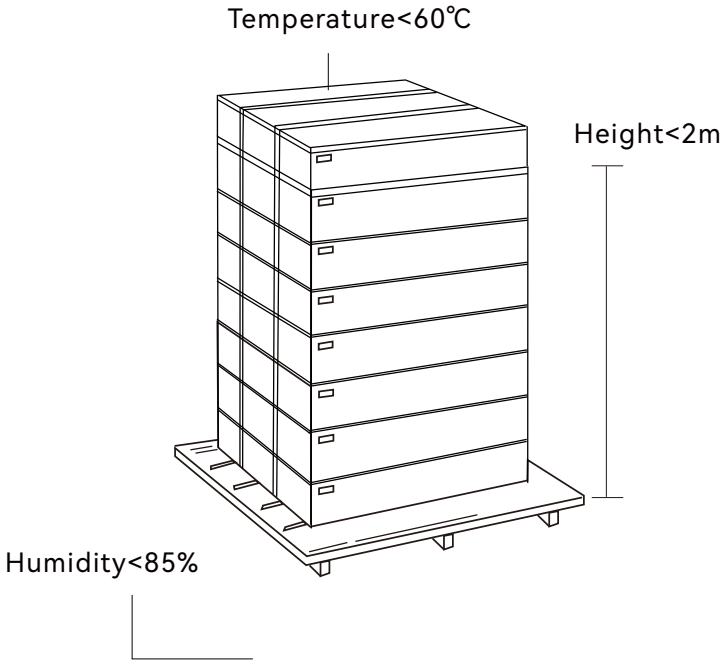
Mounting Template **×1**

Storage requirements

The inverter must be stored appropriately if not installed immediately, refer to below figure.

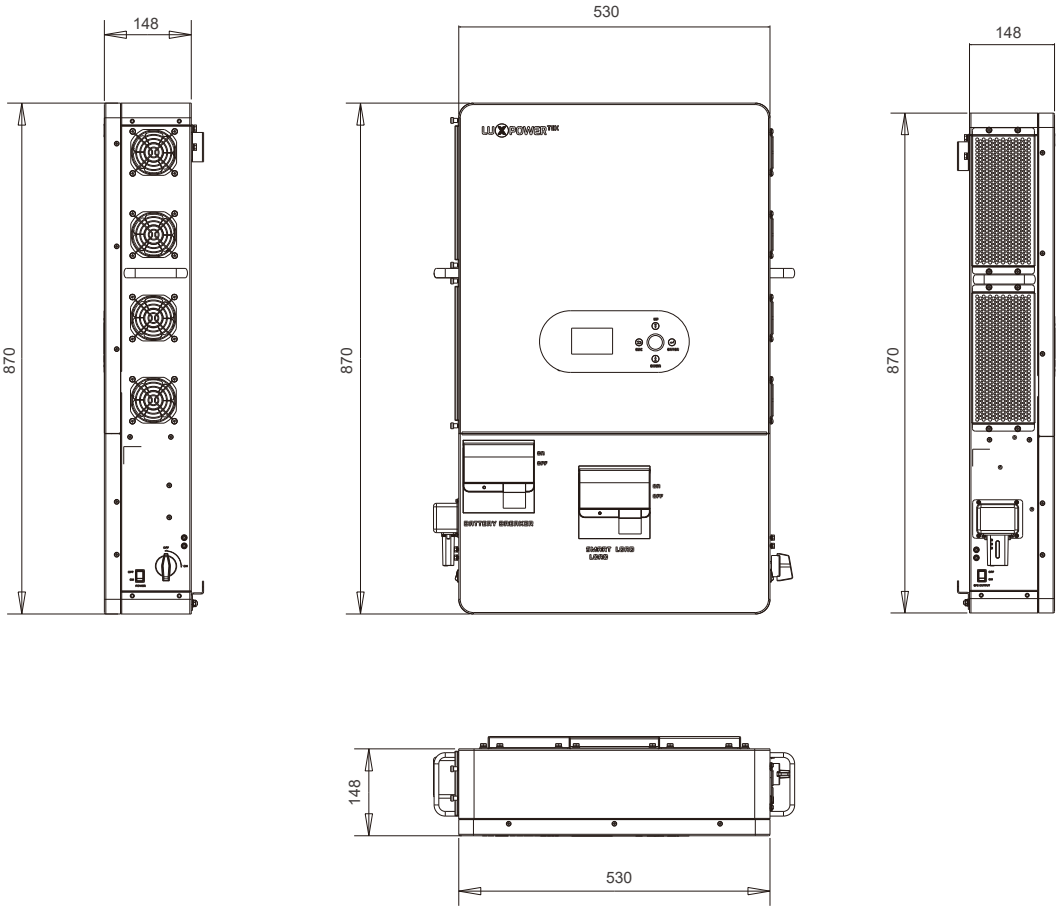
⚠ CAUTION

- Must be stored in the original packaging.
- Storage temperature: −15°C to 60°C; humidity: 0–85%.
- Packages must be stored upright, stacked no more than 8 layers, and height less than 2 m.
- Avoid direct sunlight, rain exposure, and corro issive environments.



1.4 Product Dimensions

The overall dimensions of the inverter are shown in the figure below (unit: mm):

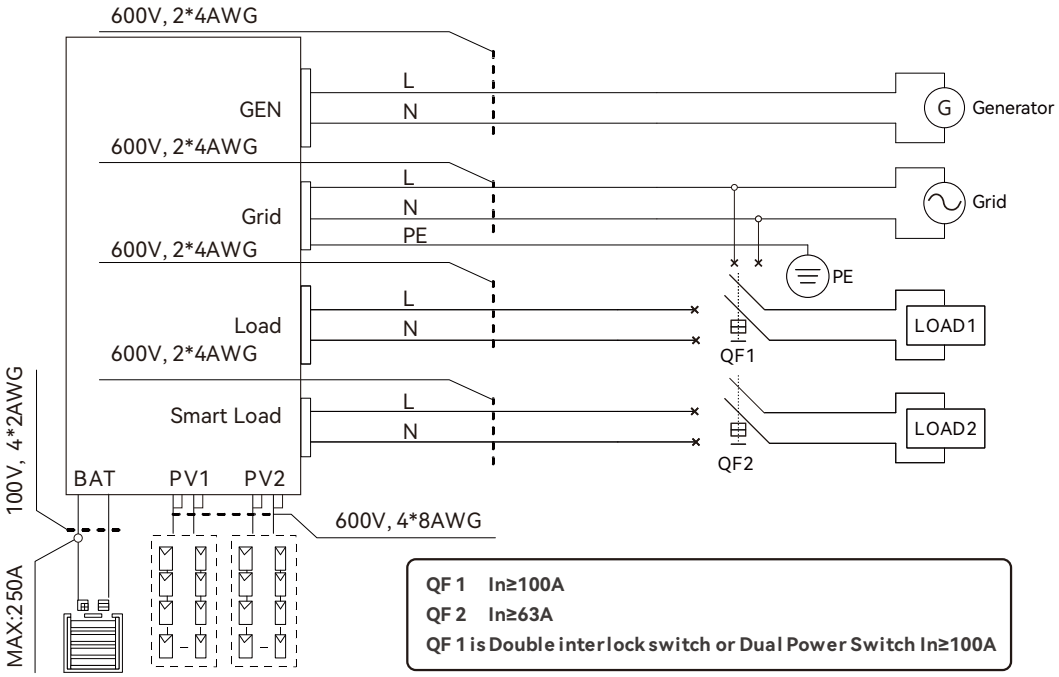


2. Installation

2.1 Preparation

Before installation, please ensure all breakers and cables are prepared in advance. For detailed requirements on cable specifications and circuit breaker parameters, please refer to the subsequent sections (Battery / AC / PV wiring).

System connection diagram:



2.2 Handling Requirements

- Handle with care during transportation to avoid impact or dropping.
- It is recommended that two people cooperate or use appropriate handling equipment.
- Do not place heavy objects on top of the inverter.
- Keep the inverter upright during transport and storage.

2.3 Installation Environment Requirements

During installation and operation, avoid direct sunlight, rain exposure, and snow accumulation on the inverter.

Do not install the inverter in the following environments:

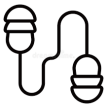
- Under direct sunlight.
- Areas where flammable or explosive materials are stored.
- Potentially explosive atmospheres.
- Locations directly exposed to cold air outlets.
- Near television antennas or antenna cables.
- At altitudes above 3000 m.
- Areas subject to rainfall or humidity greater than 95%.

2.4 Installation Tools

Recommended tools for installation:


Protective goggles

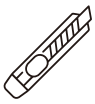

Anti-dust mask


Earplugs

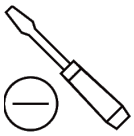

Work shoes


Work gloves


Percussion drill

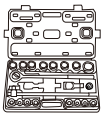

Utility knife


Marker


Slotted screwdriver


Cross screwdriver


Pliers


Socket wrenches set


Rubber hammer


Wire cutter

Level

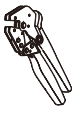

Anti-static wrist strap

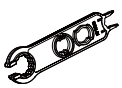

Wire stripper


Heat gun


Hydraulic pliers


Allen Key


Crimping tool 4–6 mm²


Solar connector wrench


Multimeter ≥1100 VDC


RJ45 crimping plier

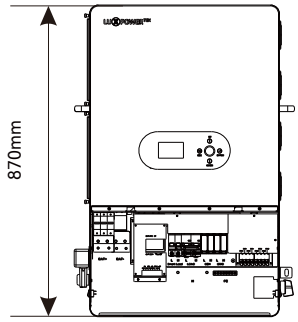

Cleaner

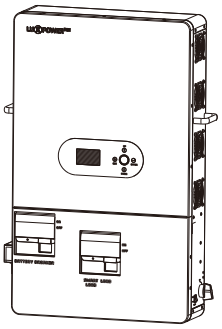
2.5 Inverter Installation

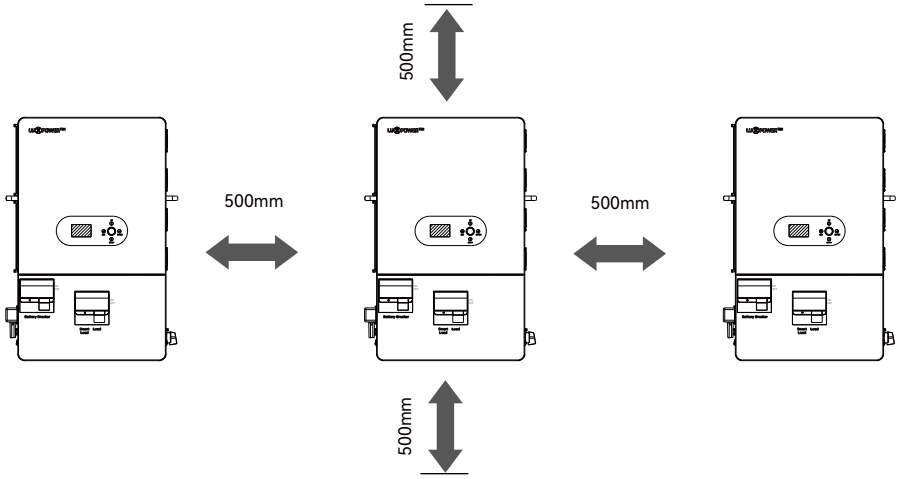
2.5.1 Requirements for Installation Location

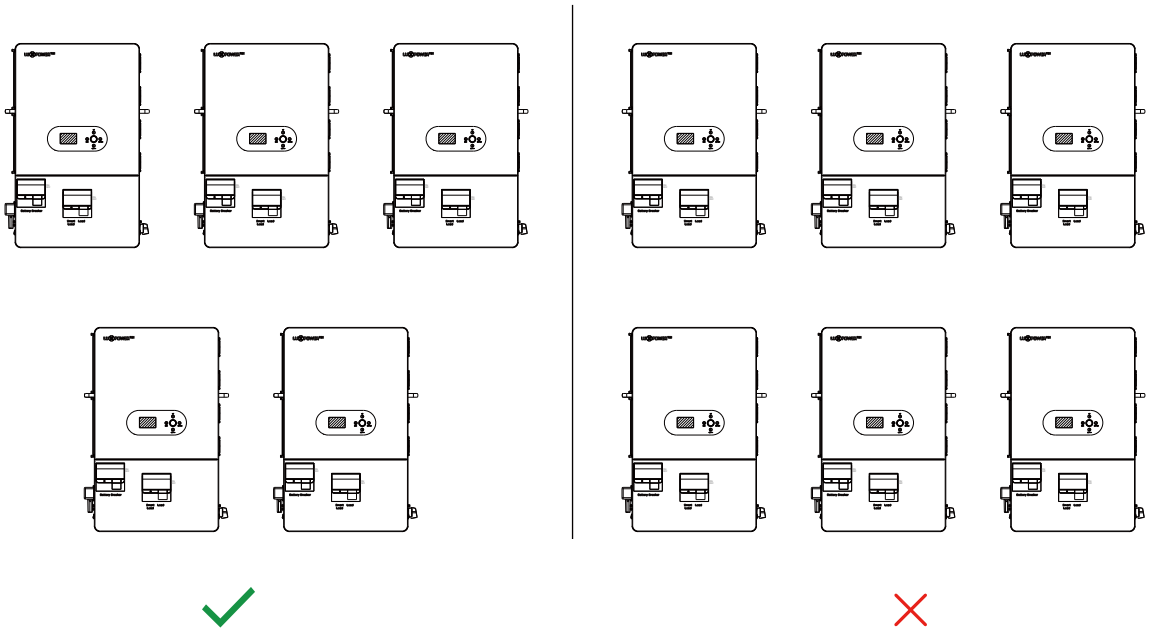
a. The wall for mounting should be strong enough to bear the weight of inverter.

b. Please maintain the minimum clearances below for adequate heat dissipation.

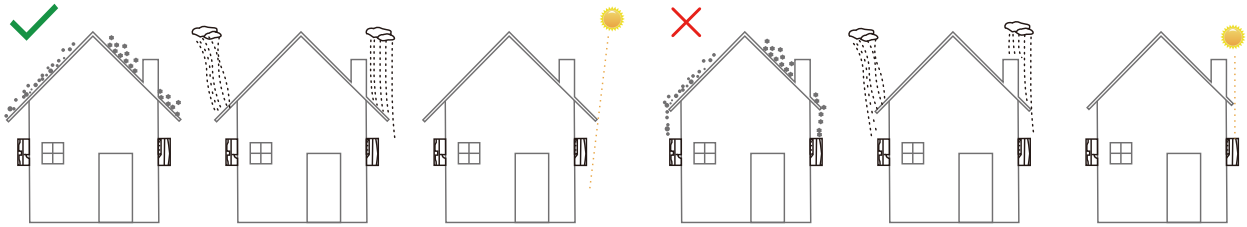




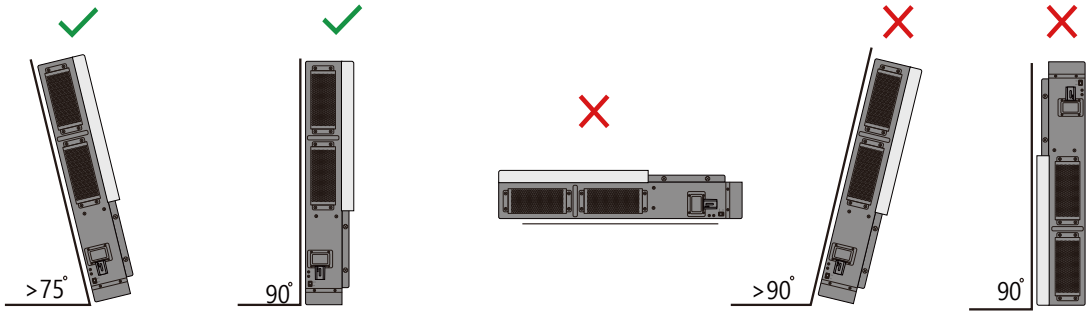




c. Never install the inverter in a place with direct sunlight, rain or snow. Please refer to below figure and select a well shaded place or install a shed to protect the inverter from direct sunlight, rain and snow etc. Protect the LCD screen from excessive UV exposure.

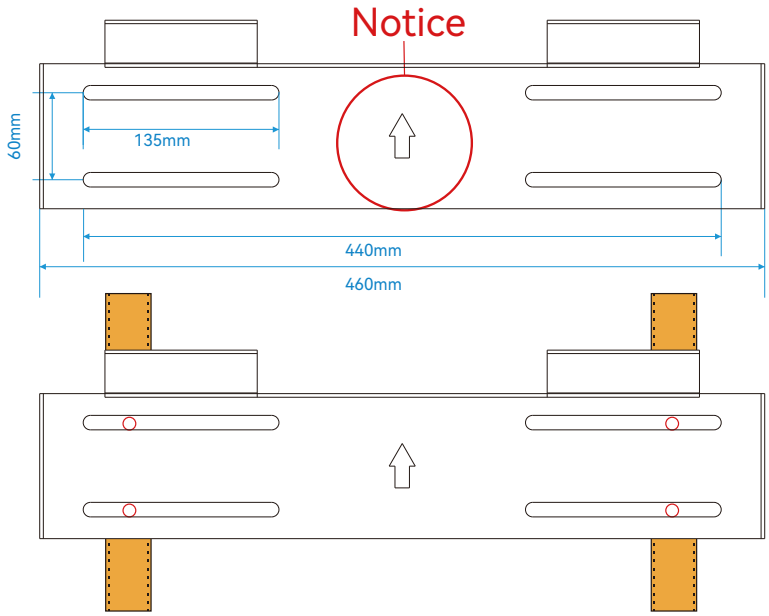


d. The inverter should be installed upright on a vertical surface.



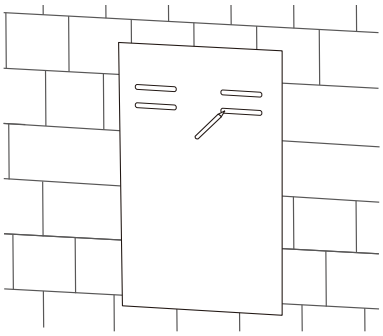
2.5.2 Inverter Mounting

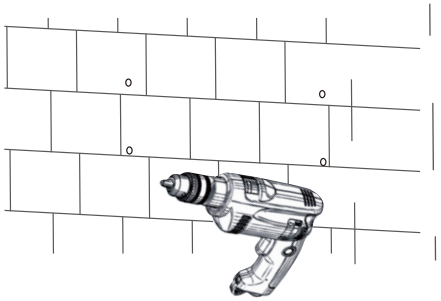
The inverter is wall-mounted type and, should be installed on a vertical, solid mounting surface, such as wood studs, brick or concrete wall. Two or more persons may be needed to install the inverter due to its weight. The slots on the mounting bracket can accommodate various stud spacings from 12 inches (305mm) to 16 inches (406mm).



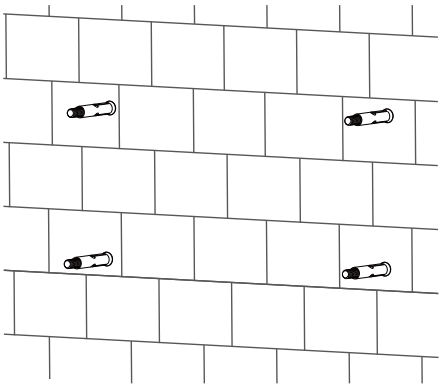
The mounting steps are as below: (Use brick wall as example)

Step 1: Use the positioning plate to mark the positions of the mounting holes on the selected spot and drill holes.

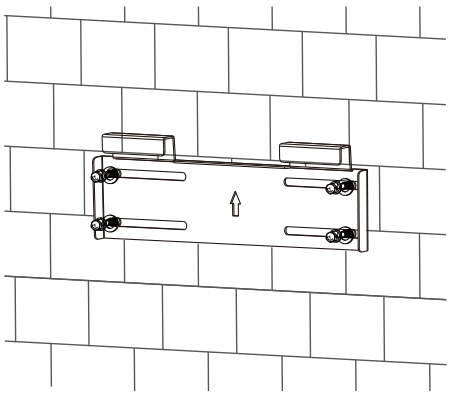




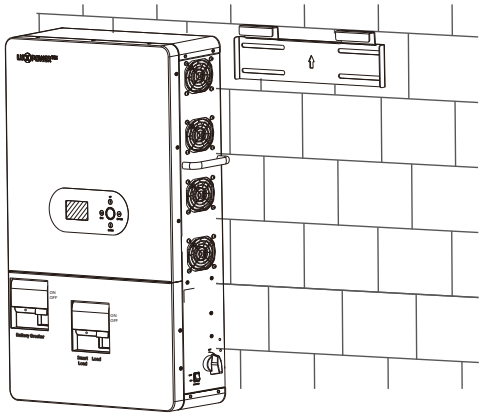
Step 2: Remove the positioning plate and insert M8 expansion screws into the holes.



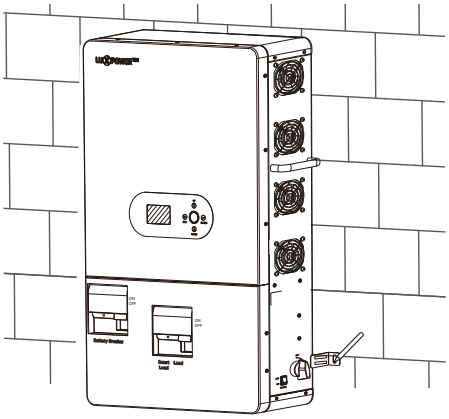
Step 3: Attach the wall mount to the expansion screws and secure it (pay attention to the direction of the arrows on the wall mount).

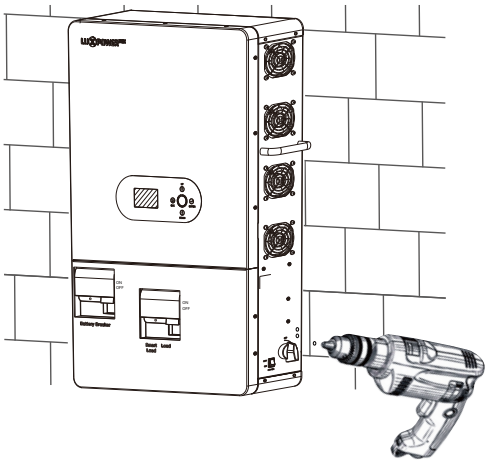


Step 4: Lift the inverter and secure it onto the wall mount.

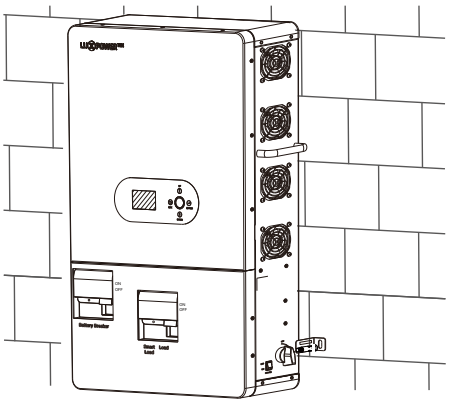


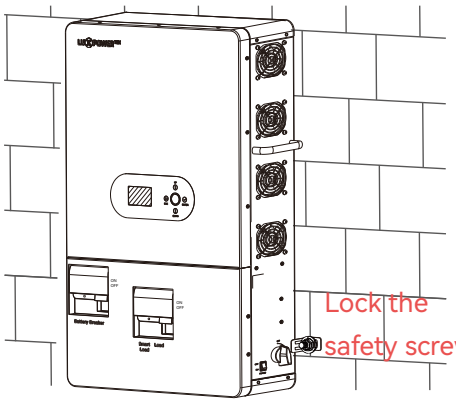
Step 5: Take out the right-angle fixing clip, find the holes on the inverter (located at the bottom, one on each side), and drill holes on the wall based on the positions of the right-angle clip holes.





Step 6: Insert the expansion screws through the right-angle bracket into the drilled holes and secure them with M5 screws.





Step 7: Complete the installation.

2.6 Battery Connection

Wiring instructions

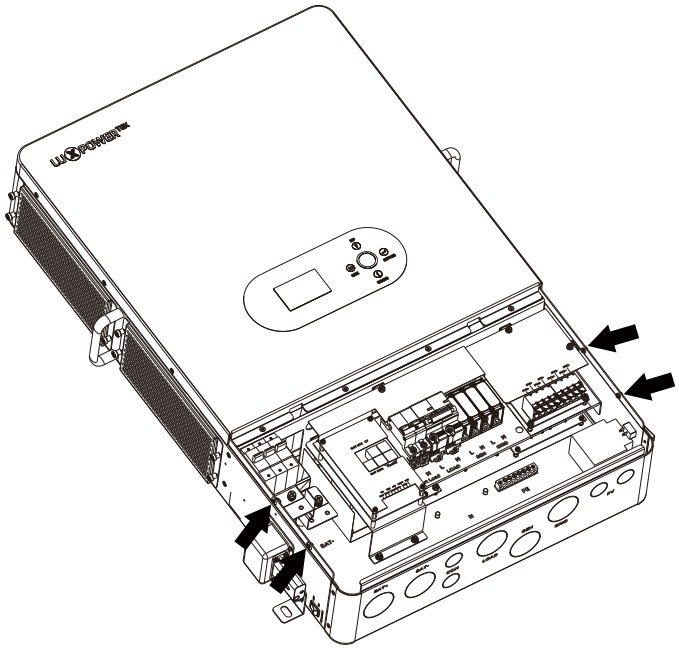
Note: For the final installation, circuit breakers complying with IEC 60947-1 and IEC 60947-2 standards must be equipped and installed together with the device.

• NOTICE

Before Wiring

- All wiring work must be carried out by qualified professionals to avoid the risk of electric shock.
- Using proper AC input cables is critical for system safety and efficient operation. To reduce the risk of injury, please use the cable specifications recommended in this manual.
- Before performing any wiring operations, remove the bottom cover of the inverter (by loosening the 4 screws shown in the diagram).

- Ensure the inverter is completely powered off before removing the cover.
- Double-check the polarity of all DC cables during wiring.
- Strictly follow the recommended cable sizes and specifications. Incorrect wiring may cause overheating or fire hazards.
- Ensure that all terminals are tightened according to the recommended torque. Loose connections may result in malfunction or damage.



NOTICE

- The cable insulation rating should not be lower than 90 °C.
- Keep the cable length as short as possible to reduce voltage drop.
- The wiring sequence should be: connect the positive (+) terminal first, then the negative (–) terminal.

2.6.1 Recommended battery cables and terminal specifications

Model	Max. Amperage	Battery Capacity	Cable Size	Ring Terminal Cable (mm^2)	Torque (N·m)	Compatible Cable Hole
SNA-EU 12K SNA-EU 14K	250A	400Ah	2/0 AWG	67.43 (mm^2)	11–12 N·m	M6/M8

Note:

Battery terminal screw: M6

2.6.2 General safety notes

- A proper DC circuit breaker or isolating switch must be installed between the inverter and the battery.
- Polarity must be strictly observed during wiring.
- All terminals must be tightened according to the recommended torque to avoid overheating caused by poor contact.
- Use extreme caution when working with metal tools around batteries. Dropped tools may cause sparks, short circuits, or even explosions.

2.6.3 Lead-Acid battery connection

When using lead-acid batteries, please follow the requirements below:

1. The recommended charging current is 0.1–0.25C (where C = battery capacity).

2. Assemble the battery ring terminals according to the recommended battery cable and terminal specifications.

3. Connect all battery packs as units requires. It's suggested to connect at least 400Ah capacity battery for SNA-EU 12K, SNA-EU 14K.

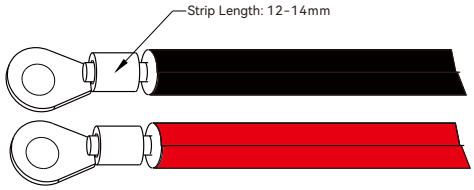
4. Insert the battery cables with pre-crimped ring terminals straight into the inverter's battery connection ports. Ensure that the bolts are tightened to a torque of 11–12 N·m. Make sure the battery polarity is correctly connected. Reversing the positive and negative terminals is strictly prohibited, as it may cause irreversible damage to the inverter. It is recommended to use four 2 AWG battery cables (two positive and two negative), secured with four M6 bolts. If using two 2/0 AWG battery cables (one positive and one negative), the larger ring terminals may not be compatible with M6 bolts, posing a significant installation risk.

2.6.4 Lithium Battery Connection

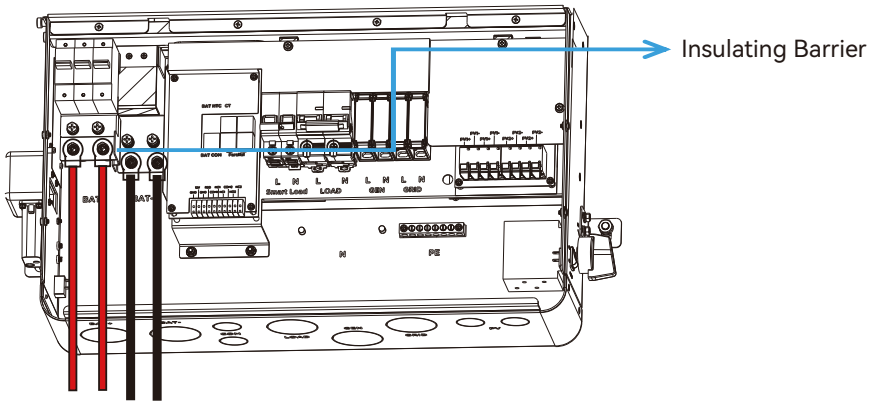
When using lithium batteries, ensure the battery BMS is compatible with Luxpower inverter (refer to the latest compatibility list on the Luxpower official website).

Operating Procedures:

Step 1: Assemble the battery ring terminals and connect the power cables between the inverter and the battery according to the recommended specifications (refer to the table above).



Step 2: Insert the battery cables with pre-crimped ring terminals straight into the inverter's battery connection ports. Ensure that the bolts are tightened to a torque of 11–12 N·m. Make sure the battery polarity is correctly connected.



Step 3: Connect the CAN or RS485 communication cable between the battery and the inverter.

a. If the manufacturer does not provide a dedicated communication cable, please crimp the connector according to the specified PIN definition.

Step 4: Configure the battery type on the LCD interface to enable communication between the inverter and the BMS:

a. Enter Program 03 → Select "Li-ion".

b. From the menu, select the correct battery brand/model (refer to the Luxpower Battery Compatibility List).

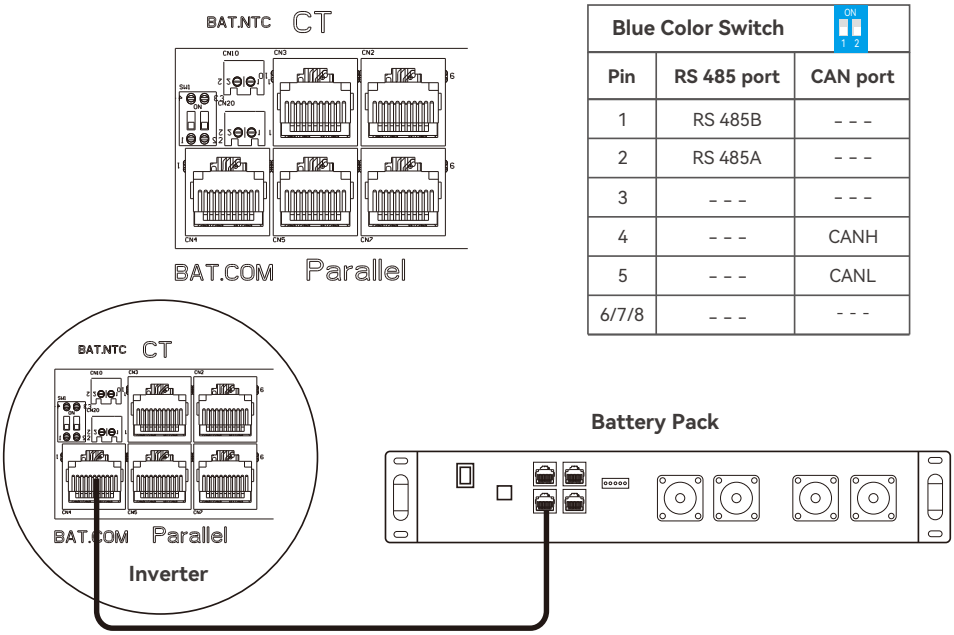
Notes for Third-Party Lithium Batteries:

a. Ensure that the communication protocol (CAN/RS485) is compatible.

b. Some batteries may require DIP switch or Brand ID configuration.

c. If communication fails, the system will revert to voltage control mode (SOC and temperature display will be unavailable).

d. Always refer to the battery manufacturer's manual during installation.



Blue Color Switch		
Pin	RS 485 port	CAN port
1	RS 485B	- - -
2	RS 485A	- - -
3	- - -	- - -
4	- - -	CANH
5	- - -	CANL
6/7/8	- - -	- - -

2.7 PE Wire Connection

To ensure electrical safety and reliable system grounding, the inverter chassis grounding must be completed before any other wiring operations.

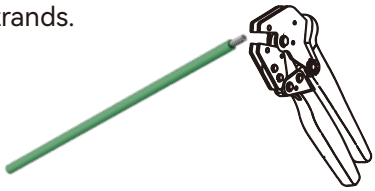
Wire Color: PE wire – yellow/green

Model	PE Gauge	Cable Size (mm^2)	Torque (N·m)
SNA-EU 12K SNA-EU 14K	10AWG	6 mm^2	2.0 N·m

Operating Procedures:

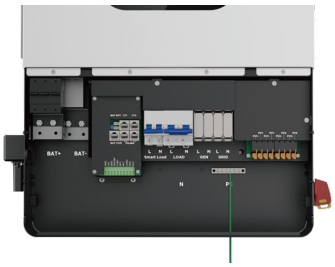
Step 1: Prepare the grounding wire:
Use a 10 AWG (4–6 mm^2) copper grounding wire and strip approximately 10 mm of insulation.

Step 2: Crimp the wire end:
Use a crimping tool to ensure the wire strands are tightly compacted — no loose or frayed strands.



Step 3: Connect to the grounding terminal:
Insert the crimped end into the PE aluminum grounding bar inside the inverter wiring box and fasten it securely with screws to ensure a solid, reliable connection.

Step 4: Verify grounding integrity:
Confirm that the grounding wire is firmly secured to the grounding bar and properly connected to the grounding network.



NOTICE

- When using multiple inverters in parallel, all chassis ground cables must be connected to the same grounding point to avoid potential voltage differences.
- Each AC interface (e.g., Grid, Load, Gen) must have an independent PE grounding wire connected to the grounding bar.
- Sharing a single PE wire among multiple AC interfaces is strictly prohibited, as it may cause fault current backflow or excessive grounding impedance.
- If local standards require equipotential bonding, use a dedicated grounding busbar to connect PV module frames, racks, and other components accordingly.

⚠ WARNING: Improper grounding may cause electric shock hazards or equipment malfunction. Always comply with local electrical codes and standards.

2.8 AC Input/Output Connection

⚠ CAUTION

- The AC terminals are divided into IN (input) and OUT (output). Do not connect them incorrectly. (**Input port**: Grid and GEN; **Output port**: Load and Smart Load)
- Ensure correct L (Live) and N (Neutral) polarity. Reversed polarity may cause short circuits, especially in parallel operation.
- Before performing AC input/output wiring, make sure the AC power is completely disconnected to avoid the risk of electric shock.

⚠ **The Backup Load Port must not be connected to any type of transformer:**

- Connecting a transformer may cause abnormal operation of the inverter's internal circuits, potentially leading to overload, damage, or safety hazards.
- Only connect household appliances or loads within the rated power.
- For extended applications, strictly follow the official installation guidelines and consult technical support.

• NOTICE

Please install a separate AC breaker between inverter and AC input power source, inverter and AC output load. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input.

Recommended cable size for AC input/output/GEN wiring are listed below.

Model	Gauge		Cable (mm^2)	Torque Value
SNA-EU 12K SNA-EU 14K	AC INPUT (GRID side)	4AWG	21	11-12 N·m
	GEN INPUT (GEN side)	4AWG	21	11-12 N·m
	AC OUTPUT (LOAD side)	4AWG	21	11-12 N·m

Wire Color:

L (Live): Red

N (Neutral): Black

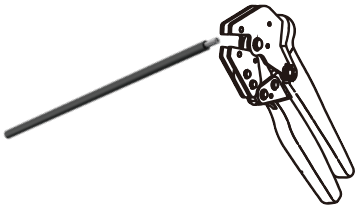
2.8.1 Grid Port Connection

Wiring Procedures

Step 1: Before wiring, ensure the DC protection switch is turned off.

Step 2: Strip approximately 10 mm of insulation from each conductor.

Step 3: Crimp the stripped ends firmly using an appropriate crimping tool.

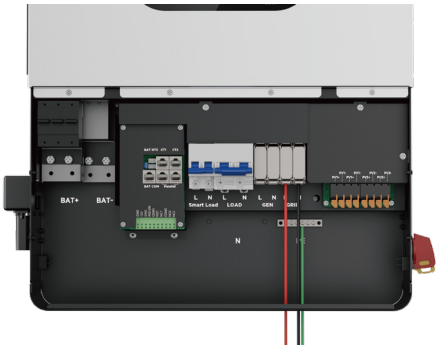


Step 4: Insert the crimped L (Live) and N (Neutral) wires into the corresponding Grid terminals, and secure them with a Allen key.

Step 5: Tighten the terminal screws to the recommended torque (12 N·m).

Step 6: Verify that all wires are securely fastened and cannot loosen.

Step 7: Ensure the L and N wires are properly positioned and securely fixed within the Grid ports.



NOTICE

Input Side (Grid): The AC input side must be connected to the utility grid through a circuit breaker.

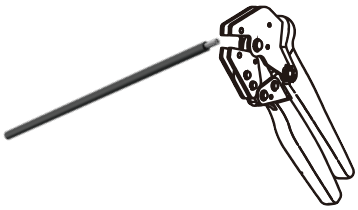
2.8.2 Load Port Connection

Wiring Procedures

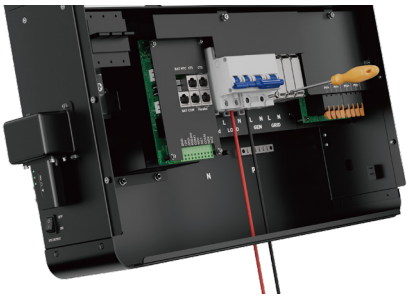
Step 1: Before wiring, ensure the DC protection switch is turned off.

Step 2: Strip approximately 10 mm of insulation from each conductor.

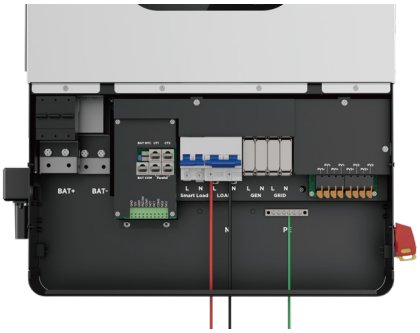
Step 3: Crimp the stripped ends using a wire crimping tool.



Step 4: Insert the crimped L (Live) and N (Neutral) wires into the corresponding Load terminals.



Step 5: Ensure all connections are firmly secured to prevent loosening.



NOTICE

The Load port (AC output) is designed for household loads (EPS/Backup output). Properly distribute load power to ensure grounding safety and system stability.

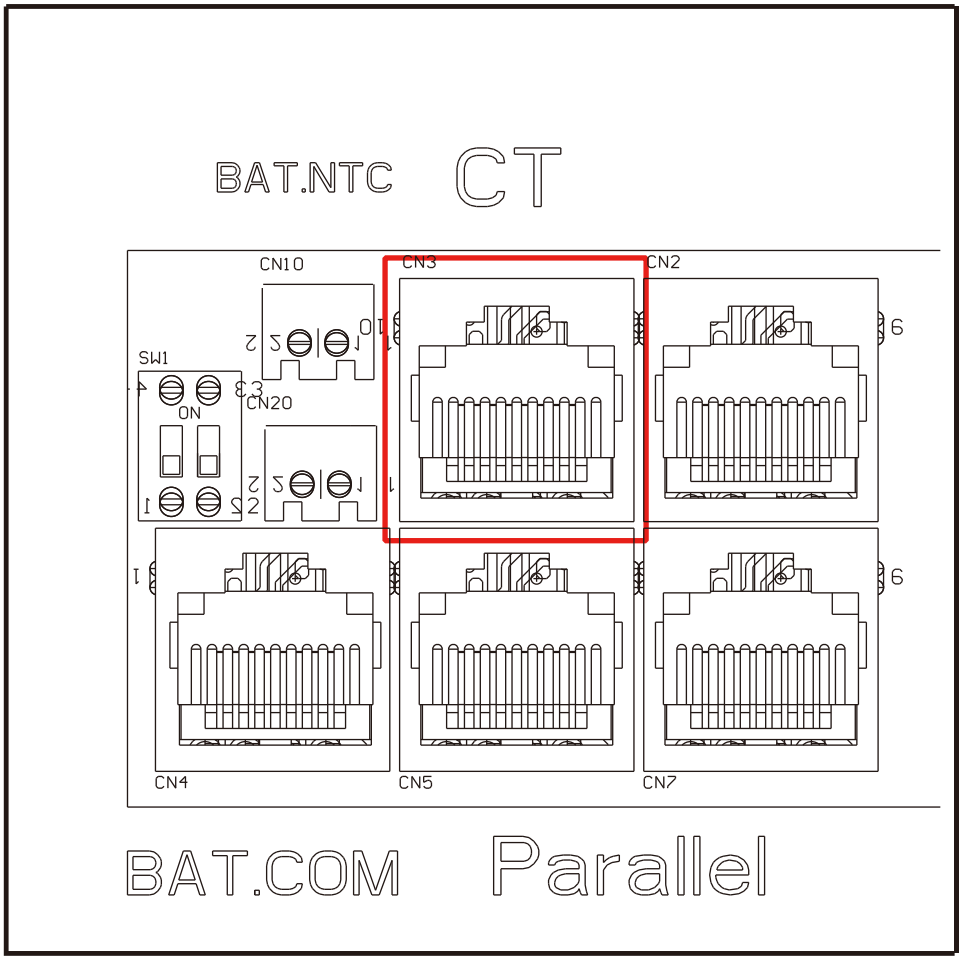
2.9 CT

To measure the power imported from and exported to the grid, the CT must be installed at the service entry point in or near the main service panel. "External Grid CT" function is off by default, and if you need inverter to export power to compensate the grid loads, you can set "External Grid CT" function to "Enable" state. Please refer to section 4.4 LCD Settings for detected setting info.

2.9.1 CT Port definition

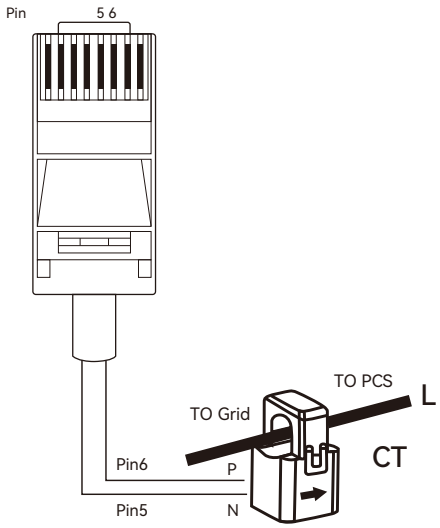
The CT interface for CT connection is a RJ45 port.

Pin	Description
	CT
1/3	B
2/4	A
5	**CTN**
6	**CTP**
7	B2
8	A2



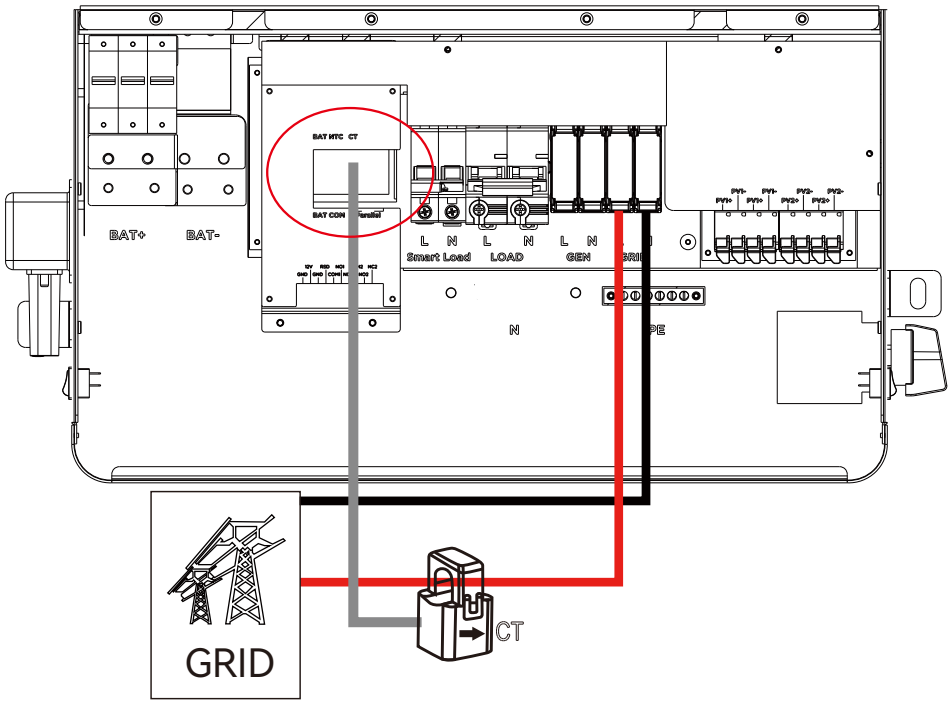
2.9.2 Installation precautions

Please refer to the connection diagram for the correct positions of Grid CT and clamp the CT on the wires at the service entry point in the main service panel. The arrow on the CT is pointing to the inverter.(*** Incorrectly install CT will cause the display to show incorrect information and features of the inverter will not function correctly) If the CT is in a wrong direction, there is an option you can change the direction of the CT on your inverter call: CT Direction Reversed in Advanced Tab. You would not need to go change it physically.



2.9.3 CT Clamp Ratio

The inverter support 3 ratios of CT clamp–**1000:1**, **2000:1** and **3000:1**. The CT ratio of the CT in the accessory bag is 1000:1. If you are using a 3rd party CT, please ensure the CT ratio is one of them, and select the correct CT ratio setting in the inverter monitor page or on the inverter LCD.



2.10 PV Connection

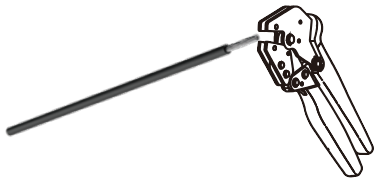
2.10.1 Recommended cables and breaker specifications

Model	Gauge	Cable Size (mm^2)
SNA-EU 12K SNA-EU 14K	8AWG	8 mm^2

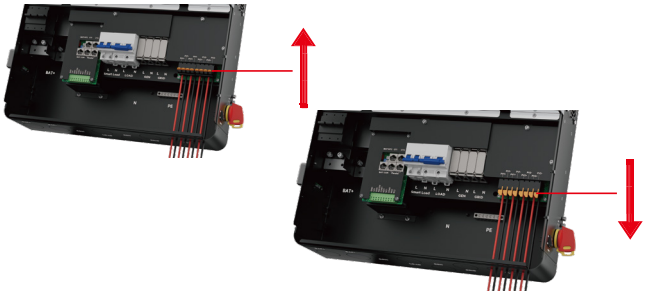
Wiring Procedures

Step 1: Strip approximately 20 mm of insulation from the positive and negative conductors.

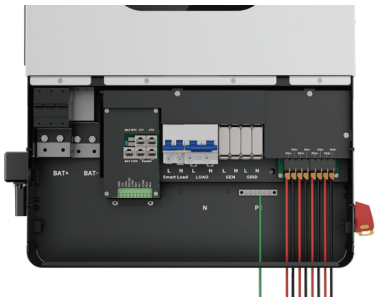
Step 2: Use a crimping tool to firmly crimp the wire ends, ensuring the strands are tightly compacted, with no loose or frayed wires.



Step 3: Connect the positive (+) cable of the PV module to the positive (+) terminal of the inverter's PV input, and the negative (−) cable to the negative (−) terminal of the inverter's PV input. Finally, close the orange switch.



Step 4: Verify that all connections are secure and cannot loosen.



NOTICE

- Do not connect PV modules that may pose a leakage risk to the inverter. For example, grounded PV modules can cause inverter leakage. Ensure that the PV+ and PV− terminals of the PV array are not connected to the system grounding bar.
- It is strongly recommended to use a PV combiner box with surge protection. Without it, lightning strikes may damage the inverter.
- A dedicated DC circuit breaker (1500 V / 50 A) must be installed between the PV modules and the inverter.
- Cables must be UV-resistant, double-insulated, and designed for outdoor PV applications.
- Ensure that cable voltage drop does not exceed 2%. If the cable length is too long, increase the conductor size accordingly.
- It is strongly recommended to install a DC isolator switch compliant with IEC 60947-3 or equivalent standards to enhance operational safety.

2.11 GEN Port Function

NOTICE

- The GEN port is strictly reserved for connection to a generator.
- The generator must be connected to the GEN port through a dedicated circuit breaker to ensure operational safety. It is recommended to use a breaker compliant with IEC 60947-1 / IEC 60947-2 standards, with a typical rating of 50A / 2P. The breaker rating may be adjusted based on the generator's rated output power.

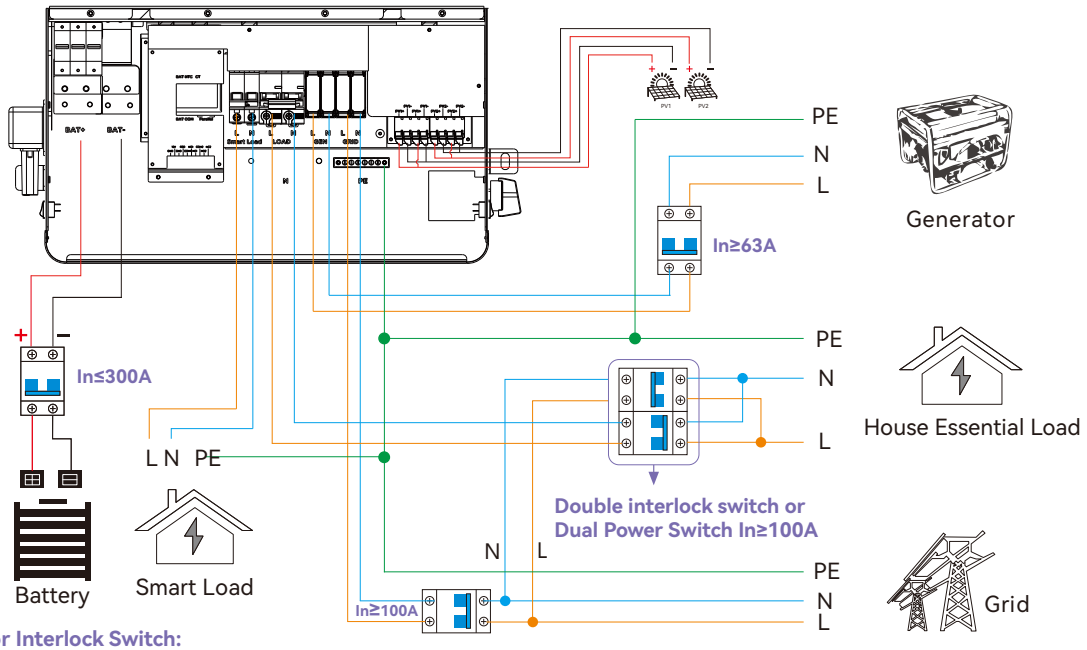
2.11.1 Generator system connection

This product supports generator connection through the GEN port for both battery charging and household load supply. In the event of a grid outage, the generator can serve as a backup power source to ensure continuous system operation.

- When selecting a generator, ensure sufficient capacity and stable frequency (Total Harmonic Distortion THD < 3%).
- It is recommended that the generator's rated output power be at least 1.5 times the inverter output power to meet both load supply and battery charging requirements.
- The table below lists the recommended generator capacities corresponding to the number of parallel inverters:

Number of inverters in parallel	Generator Capacity
1	≥18KW
2	≥36KW
3	≥54KW
4	≥72KW

This SNA-EU 12K and SNA-EU 14K product can work with a generator and includes a dedicated Gen port for generator connection.



Note for Interlock Switch:
Turn on both switches only when grid connection is confirmed. Incorrect use may cause grid power to flow directly to the load, damaging the device.

All LuxpowerTek inverters can work with generator:

- The user can connect the generator output to the inverter's GEN input terminals.
- The generator will be automatically started when battery voltage is lower than the cut-off value or there is charge request from BMS. When voltage is higher than AC charge setting value, it will stop the generator.
- Battery will get charged when the generator is turned on, and the generator is bypassed to AC output to take all loads.
- The system will use AC first if there is both utility input and generator input.

2.11.2 Connect Generator

Wiring Procedures

Step 1: Before performing any wiring, ensure that the inverter (and all parallel inverters, if applicable) is completely powered off, the generator supply is disconnected, and all circuit breakers are in the OFF position to prevent equipment damage.

Step 2: Prepare the generator cables according to Steps 1–3 in Section 2.8.1, then insert the crimped L (Live) and N (Neutral) wires into the corresponding GEN port terminals.

Step 3: Verify that the wires are securely connected and cannot loosen.

Generator Auto Start/Stop Logic

When wiring is completed and a generator with remote start capability is connected, the inverter can automatically start the generator under the following conditions:

- When battery voltage or SOC falls below the preset value;
- When a charging request is received from the BMS.

During generator operation:

- The battery will be charged;
- Excess power will automatically be routed to the AC output port (LOAD) to supply connected loads.

2.11.3 Integrated two-wire Start/Stop

The Dry port (NO2, COM2) could be used to deliver signal to external device when battery voltage reaches warning level. The GEN port (NO1, COM1 could be used to wake-up the Generator and then the generator can charge the battery.

● NOTICE

NO: Normal open

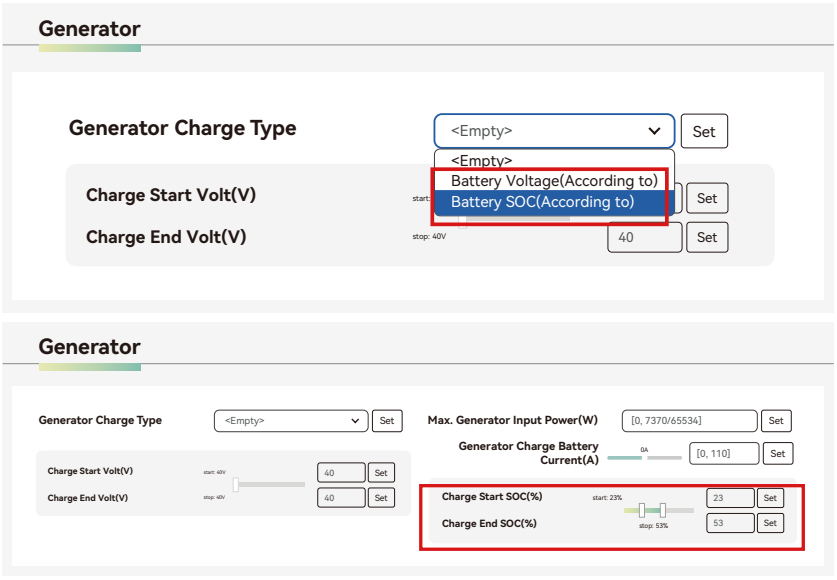
Dry Port Relay Maximum Specification: 250VAC 5A

Gen Port Relay Maximum Specification: 250VAC 5A

Unit Status	Condition		Dry port  NO2 & COM2	GEN  NO1 & COM1
Power Off	The inverter is off and no output is being powered.		Open	Open
Power On	Without Grid	Battery voltage/SOC<Generator Charge Start Voltage/S0C	Close	Close
		Battery voltage/SOC<Generator Charge EndVoltage/S0C	Open	Open
	With Grid	Battery voltage/SOC<Generator Charge Start Voltage/S0C	Close	Open
		Battery voltage/SOC<Generator Charge EndVoltage/S0C	Open	Open

2.11.4 Generator start and stop settings

Using the Luxpower Monitoring Software, navigate to the “Maintenance” page where “Remote Set” will be automatically selected. Scroll to the “Generator” section and select the “Generator Charge Type” (see screenshot below). Typically, lead-acid batteries are charged based on voltage, while lithium batteries are charged based on SOC (State of Charge).



Generator Start Conditions:

The generator will start when utility fails and one of the following conditions is met:

- The battery is discharged to the cut-off setting
- There is a force charge request from the battery
- The battery voltage or SOC is lower than the “Generator Charge Start Battery Volt / SOC” setting

Generator Stop Conditions:

The generator will stop when the battery voltage or SOC is higher than the “Generator Charge End Battery Volt / SOC” settings.

2.11.5 Generator Charging Mode settings

Users can select the generator charging logic via the monitoring platform or the LCD interface:

- By Voltage and Time: Recommended for lead-acid batteries.
- By SOC (State of Charge) and Time: Recommended for lithium batteries.

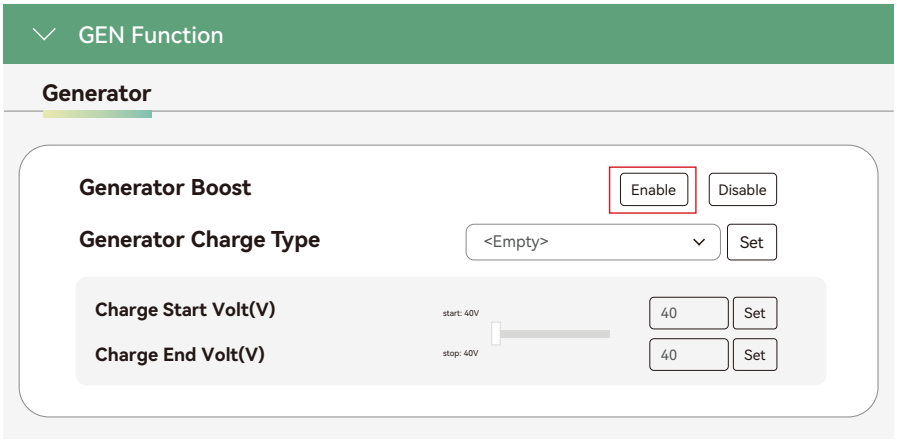
Configurable Parameters Include:

- Start/stop voltage or SOC.
- Generator charging time 1 and charging time 2.
- Maximum charging current.
- Maximum generator input power.

2.11.6 Gen Boost Function

In real applications, customer loads often fluctuate, making generators highly sensitive to frequent changes. Activating GEN Boost can allocate a margin for the generator's input power, preventing it from consistently operating near overload conditions.

Enable GEN boost



2.12 Smart Load Port

2.12.1 Function Overview

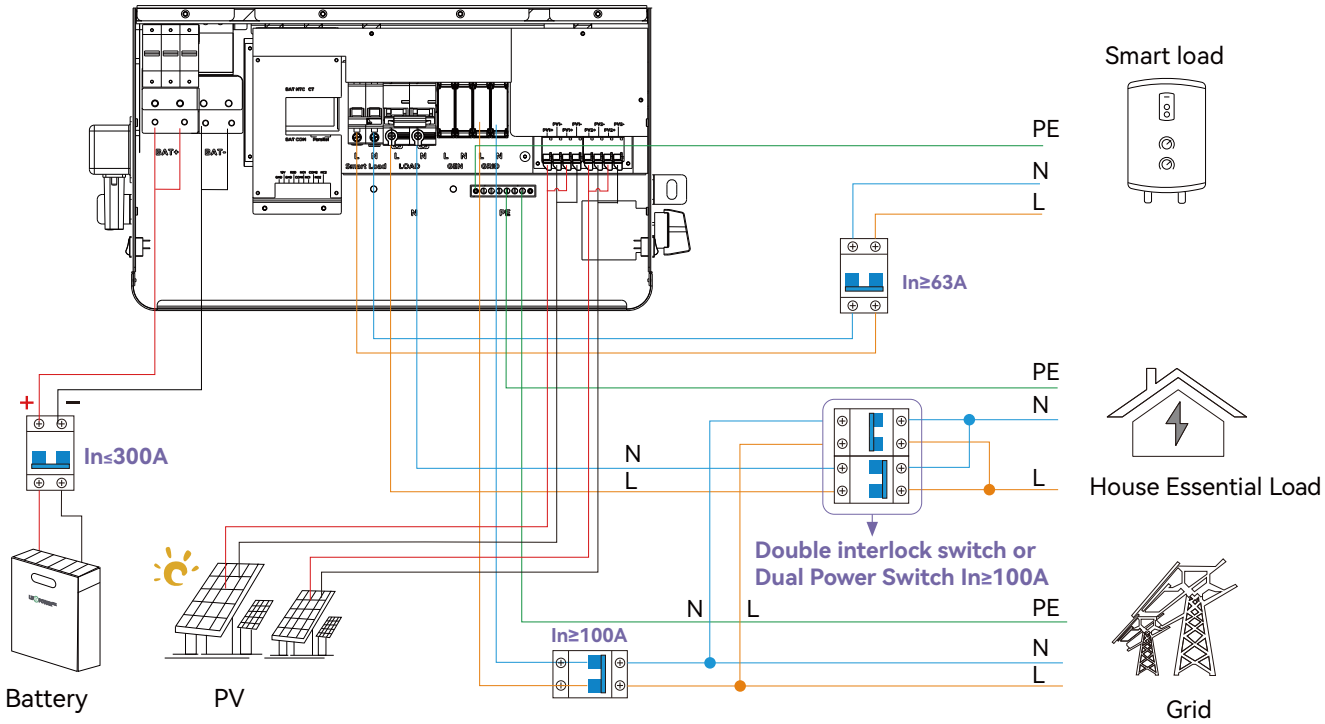
The Smart Load port can be used for either Smart Load (intelligent load) operation or AC Coupling connection. These two functions cannot be enabled simultaneously.

When the battery is sufficiently charged and solar generation is abundant, the system automatically activates designated loads (such as water heaters or EV chargers) to maximize clean energy utilization and reduce waste.

When the battery charge is low or PV power decreases, the system automatically disconnects the Smart Load to prioritize critical household loads (Essential Loads).

2.12.2 Smart load Connection

The SNA-EU 12K, SNA-EU 14K dedicated Smart Load port can also connect to various smart loads, such as water heaters.



NOTICE

1: Ensure that both the inverter and external loads are powered off, and all circuit breakers are in the OFF position.

2: Identify and connect the Smart Load wiring according to the standard wiring color code:

a.L (Live): Red

b.N (Neutral): Black

c.PE (Ground): Yellow/green

3: Connect the L and N wires of the Smart Load to the corresponding Smart Load terminals, and connect the PE (ground) wire to the inverter grounding terminal.

4: It is recommended to install a dedicated circuit breaker (e.g., 50 A / 2P or compliant with IEC 60947) on the Smart Load branch circuit to ensure operational safety.

Recommended cable size

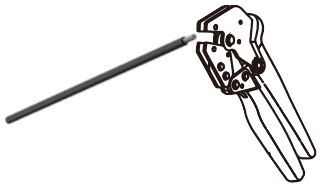
Model	Gauge		Cable (mm^2)	Torque Value
SNA-EU 12K SNA-EU 14K	AC OUTPUT (SMART LOAD side)	4AWG	21	11-12 N·m

Wiring Procedure

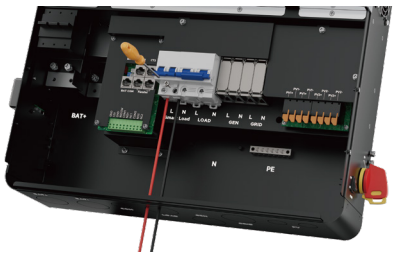
Step 1: Before wiring, ensure the DC protection switch is turned off.

Step 2: Strip approximately 10 mm of insulation from each conductor.

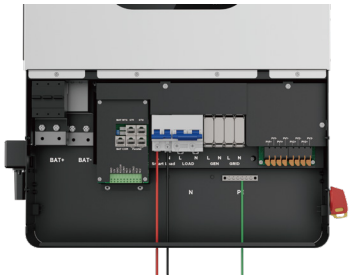
Step 3: Crimp the stripped ends using a wire crimping tool.



Step 4: Insert the crimped L (Live) and N (Neutral) wires into the corresponding Load terminals.

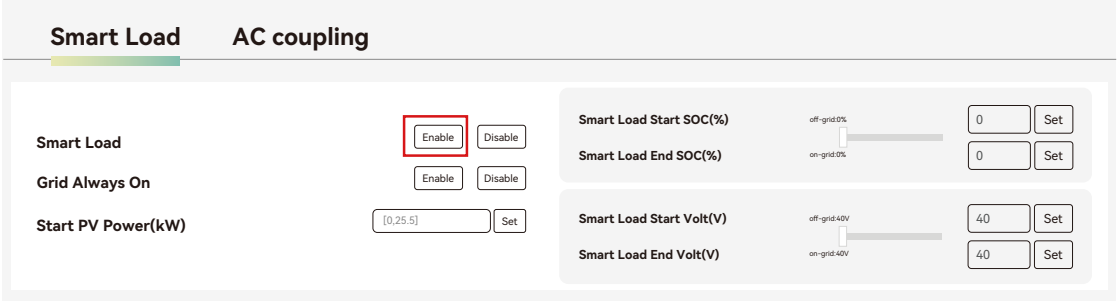


Step 5: Ensure all connections are firmly secured to prevent loosening.



2.12.2.1 Smart Load Settings

Enable smart load



Enable “Grid always on”: When connected to the grid, the smart load remains continuously connected. Start PV Power: Input the PV power threshold at which you want the smart load to start. You can also input the battery's SOC or voltage to select when to start and stop.

If your home already has an existing grid-tied system, you can connect it to our Smart Load port as an AC power input, transforming your grid-tied system into an energy storage system.

2.12.2.2 Example applications

- Automatically start a water heater when PV generation is sufficient.
- Enable EV charging after the battery is fully charged.
- Run high-power household appliances during off-peak periods using remaining energy.

2.12.3 AC Coupling

2.12.3.1 Function Overview

The AC Coupling function allows users to integrate an existing on-grid inverter system through the Smart Load interface, thereby upgrading the system into a hybrid energy storage system.

- When the utility grid is disconnected, this inverter automatically switches to off-grid mode, maintaining stable system voltage and frequency, and enables the on-grid inverter to continue generating power via the Smart Load interface.
  - When PV power is sufficient, the inverter prioritizes load supply and uses surplus energy to charge the battery.
  - Once the battery is fully charged, the inverter will limit the output power of the on-grid inverter.
  - When PV power is insufficient, both the battery and the on-grid inverter will supply power jointly to ensure uninterrupted operation of critical loads.
- When the utility grid is available, this inverter and the on-grid inverter operate in coordination. Solar energy can simultaneously power loads and charge the battery. When load demand is low or the battery is fully charged, excess energy can be exported to the grid, ensuring optimal energy utilization.

● NOTICE

When using AC Coupling, ensure that the system has grid-connection approval and complies with local grid regulations.

2.12.3.2 Wiring Instructions

Wiring Procedure

Step 1: Ensure that the inverter, on-grid inverter, and utility grid are all powered off, and all circuit breakers are in the OFF position.

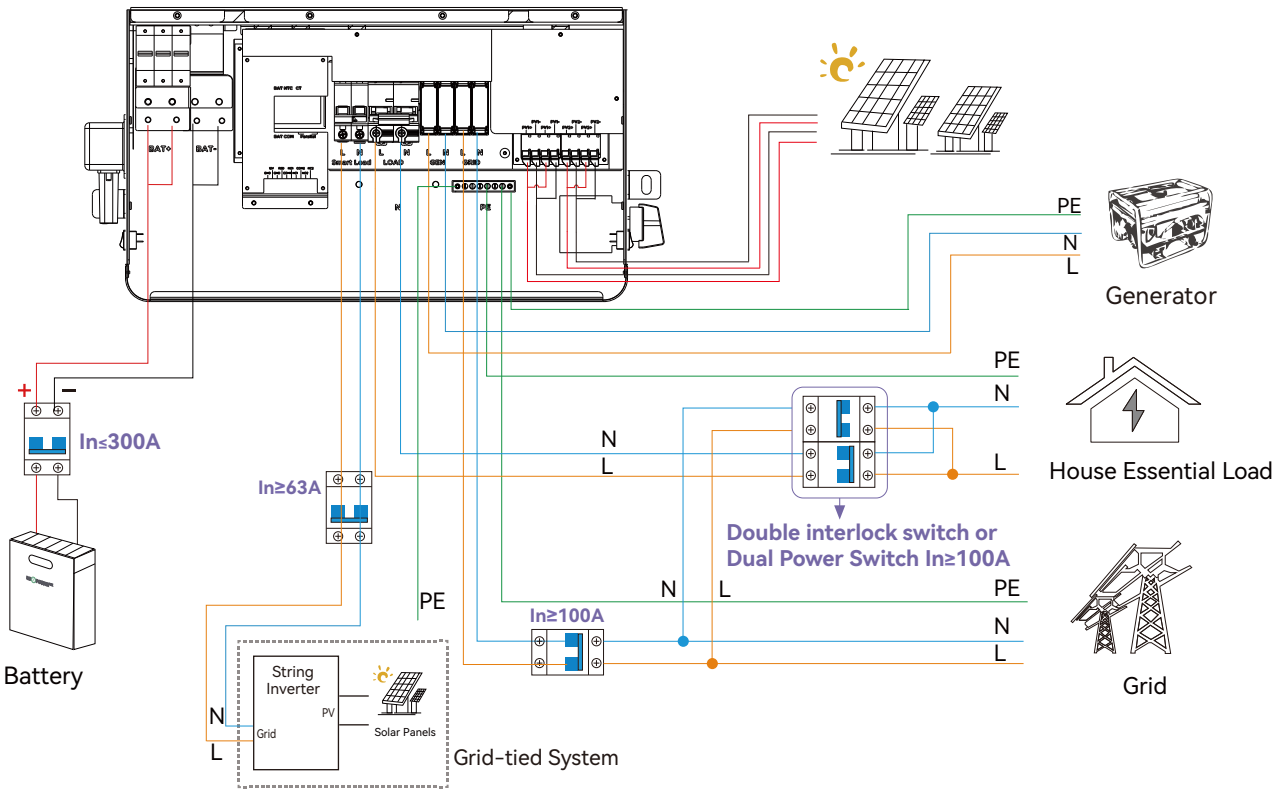
Step 2: Connect the output terminals of the on-grid inverter (L, N, PE) to the corresponding terminals of the Smart Load port:

a.L (Live) → Smart Load terminal L

b.N (Neutral) → Smart Load terminal N

c.PE (Ground) → Inverter grounding terminal

Step 3: It is recommended to install a dedicated circuit breaker in the AC coupling circuit to ensure safe operation.

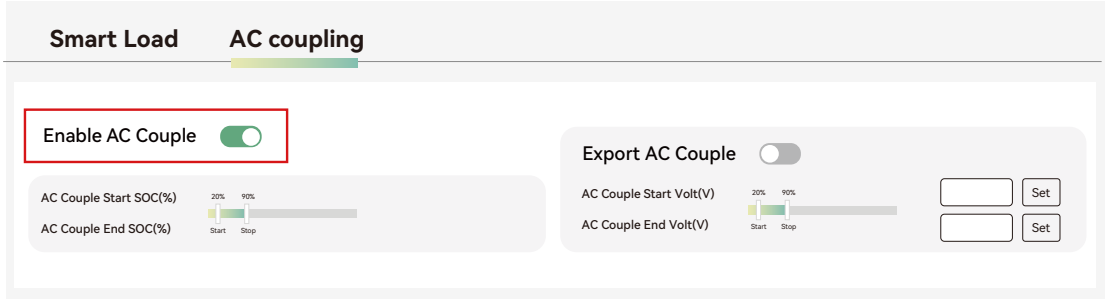


2.12.3.3 AC Coupling Settings

The AC Coupling setting must be enabled when connecting an existing on-grid system to the Smart Load port.

Start SOC(%): The SOC at which the AC-coupled inverters are turned on when in off-grid mode (50% to 70% recommended).

End SOC(%): The SOC at which the AC-coupled inverters are shut down when in off-grid mode (90% recommended).



2.12.3.4 System features

- **Grid-Tied Mode**: The grid-tied inverter continuously operates, feeding PV-generated electricity directly into the grid. Any excess energy can be sold back to the grid.
- **Off-Grid Mode**: The grid-tied inverter operates using a virtual grid signal provided by this inverter. The generated energy can be used to charge the battery or supply loads.
- **Energy Priority**: PV generation supplies the load first. Remaining energy is used to charge the battery. When battery energy is insufficient, the system automatically switches to grid power.

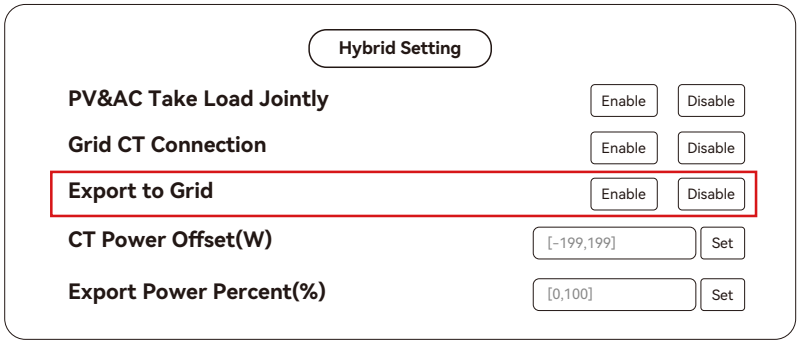
2.12.4 Export to Grid

When the grid is available, if the remaining energy from the AC-coupled system is required to be exported to the grid, the “Export to Grid” function must be enabled in the settings interface.

When enabled, the AC coupled inverter will feed unused energy back to the grid, maximizing energy utilization.

When disabled, surplus energy is only used for battery charging or local loads and cannot be exported to the grid.

Before enabling, confirm that the local utility allows surplus energy export and strictly comply with relevant grid-connection policies and standards.

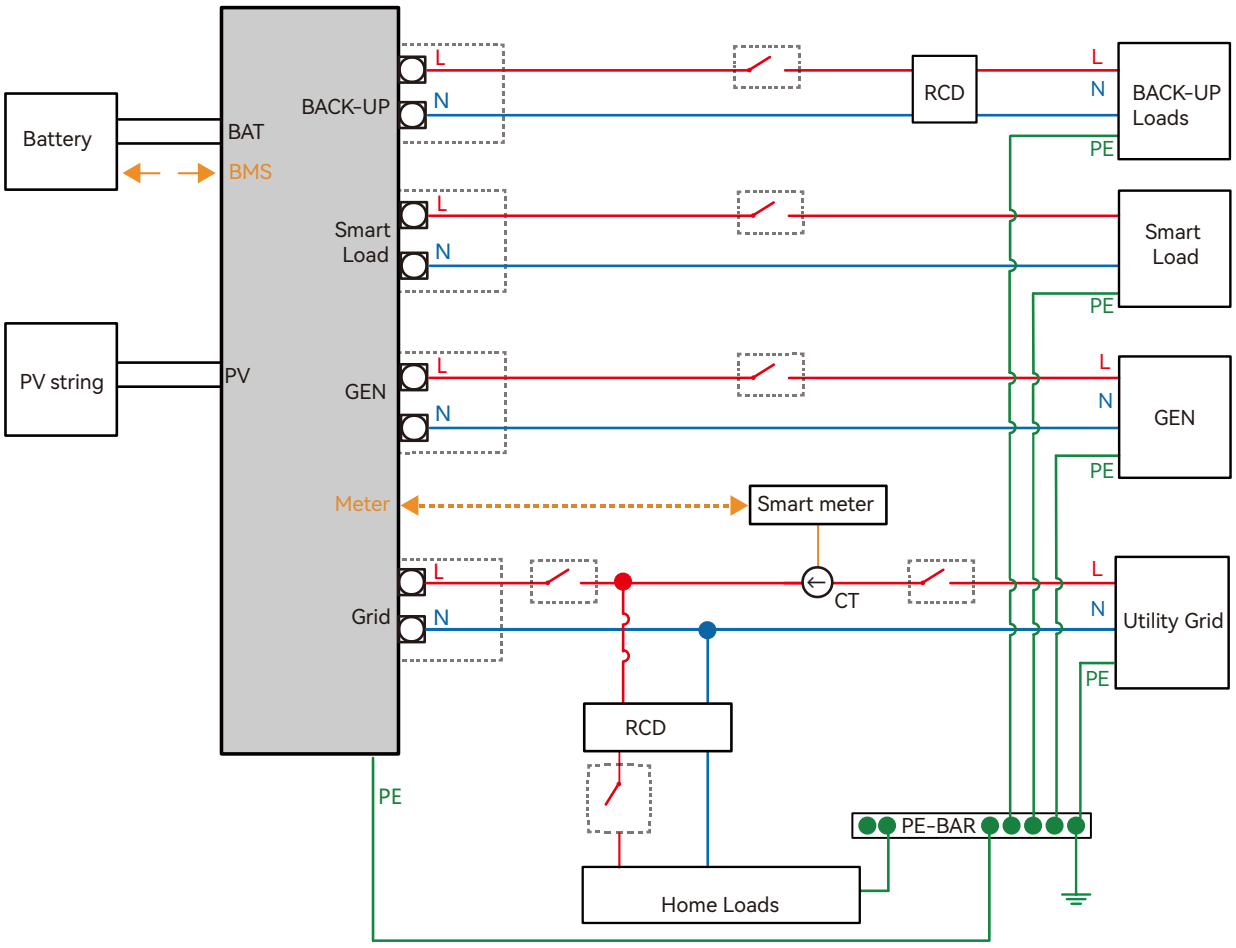


2.13 Parallel Function

SNA series inverter support up to 16 units to composed single phase parallel system or three phase parallel system, for parallel system setup.

NOTICE

- Each inverter must have its own dedicated PV input; PV inputs cannot be shared.
- All parallel cables must be connected according to the instructions to ensure signal transmission and system stability.
- Before parallel operation, ensure all inverters have the same firmware version and that parallel parameters are configured.



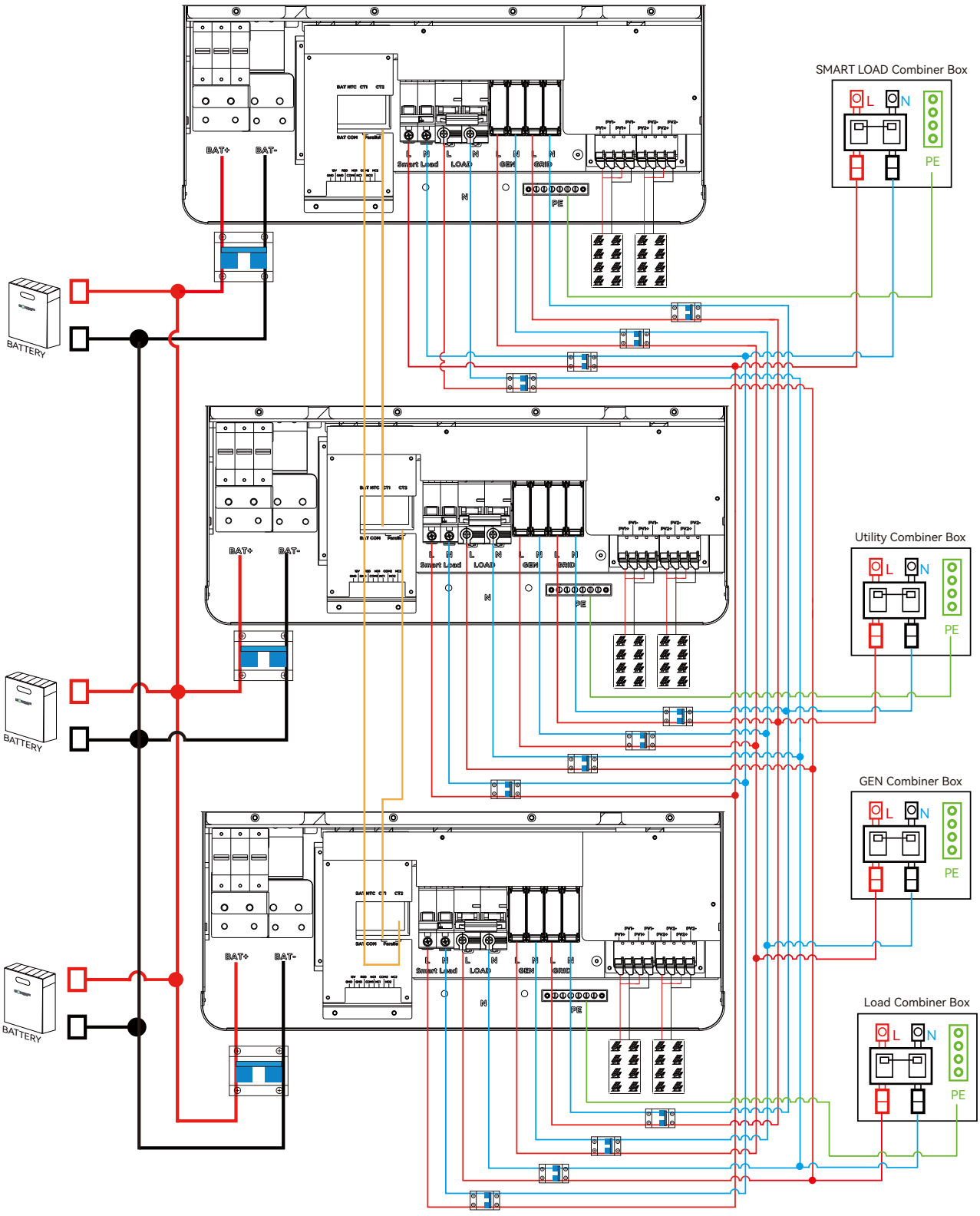
System Wiring Diagram:

NOTICE

The PE line of the load must be correctly and effectively grounded. Otherwise, backup functions may not operate properly during grid faults.

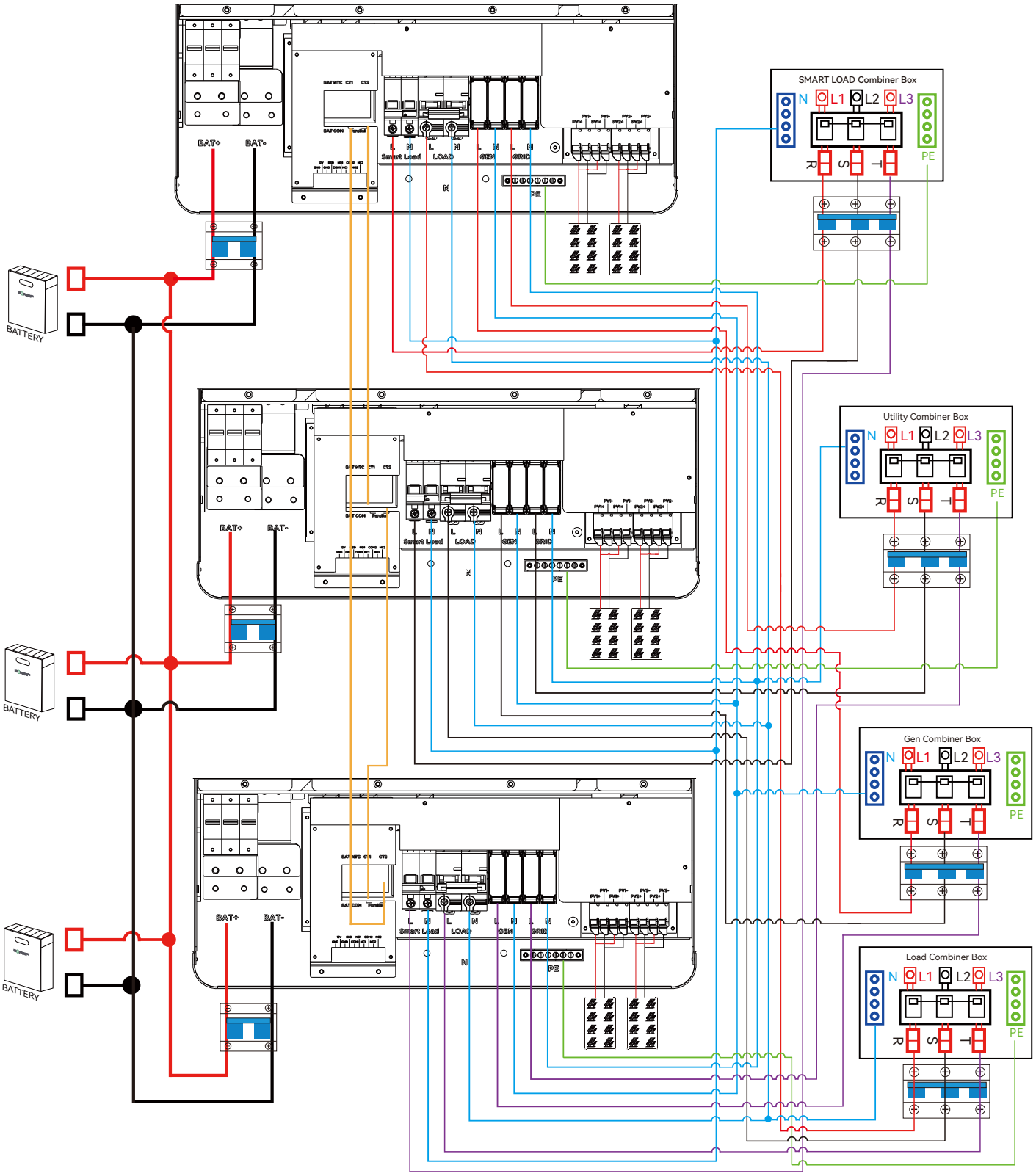
2.13.1 Single phase parallel conncetion diagram:

⚠ Cannot share PV input at any time!

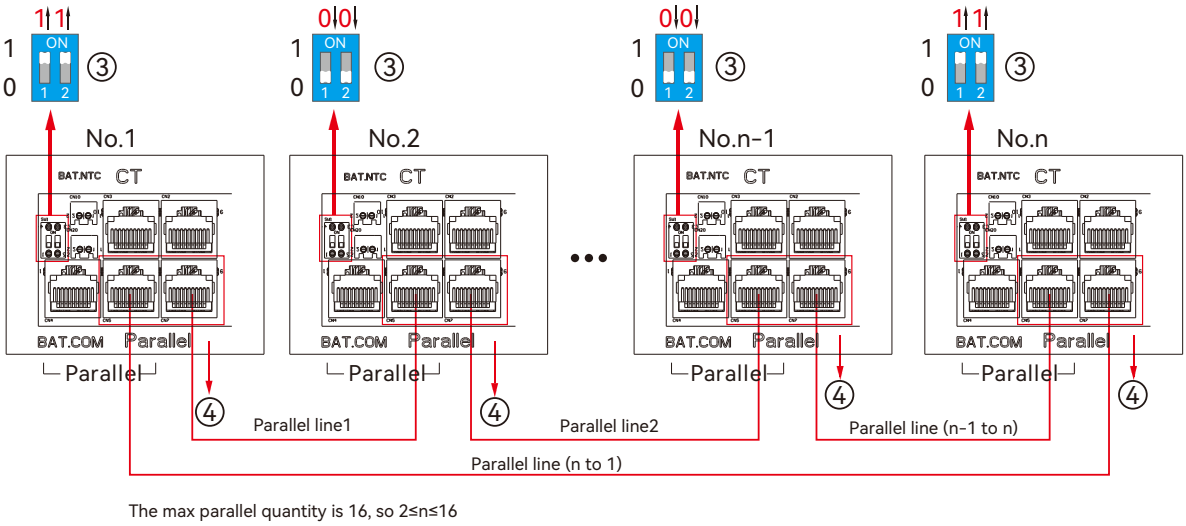


2.13.2 Three phase parallel conncetion diagram:

⚠ Cannot share PV input at any time!



2.13.3 DIP Switch

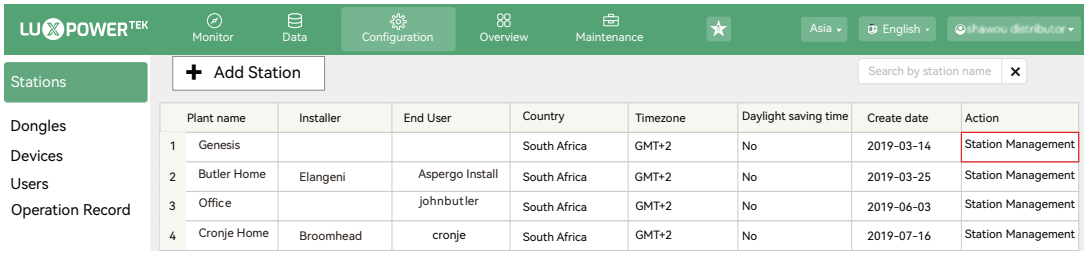


The max parallel quantity is 16, so 2≤n≤16

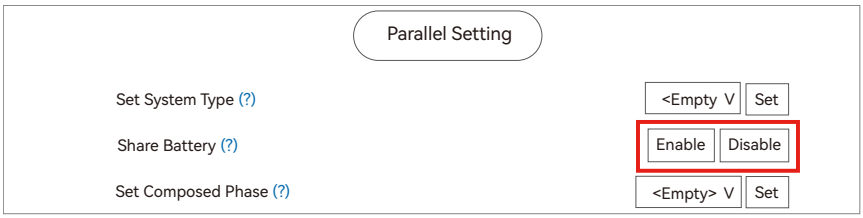
2.13.4 Monitoring settings

Operating Procedures

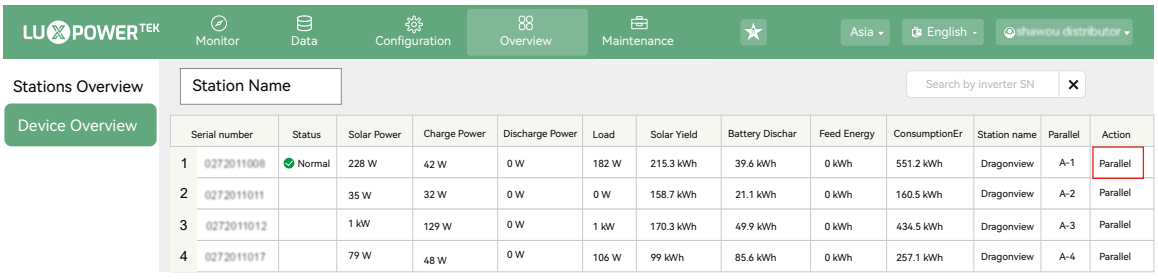
Step 1: Setup the monitor for the system, add all datalogs in one station. Users can login to the visit interface of monitor system, Configuration->Station->Station Management->add datalog to add the datalogs.



Step 2: Enable share battery for the system if the system share one battery bank, otherwise disable the shared battery function.

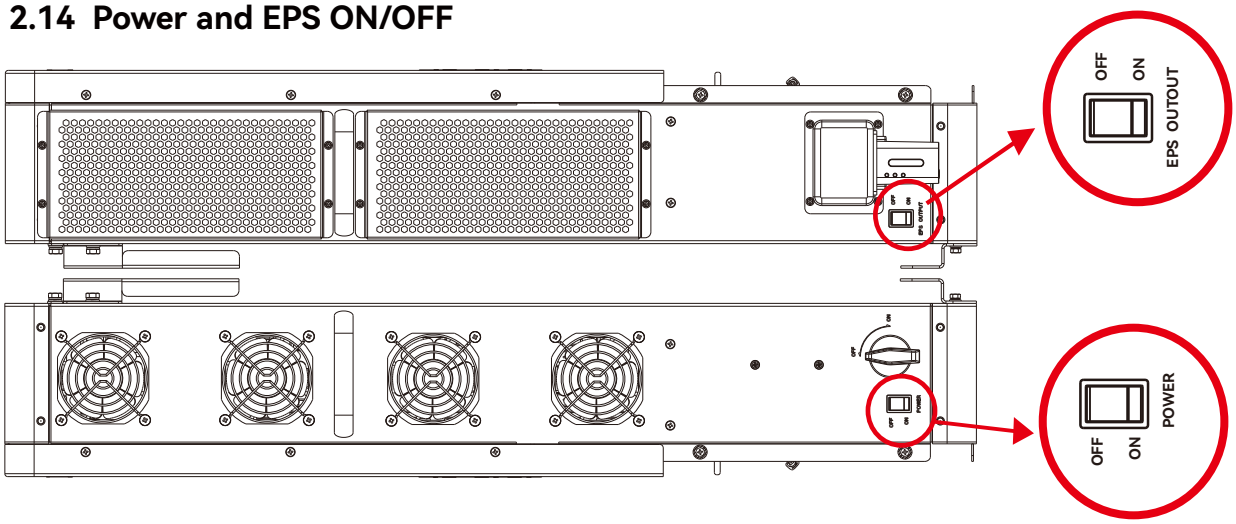


Step 3: Set the system as a parallel group in the monitor system.



For more detailed guidance for paralleling system, please visit https://www.luxpowertek.com/download/ And download the guidance.

2.14 Power and EPS ON/OFF



1. Power Switch: Control power supply for the unit
2. LOAD Output Switch: Use to control the AC output

After connection, please turn on both switch. Users can turn off the LOAD output switch to turn off power supply in some emergency case.

2.15 System Power-On

2.15.1 Pre-Power-On Inspection

No.	Inspection Item
1	The inverter is securely mounted, with adequate space for operation, maintenance, and ventilation. The installation environment should be clean and tidy.
2	Protective earth, DC cables, AC cables, communication cables, and terminal resistors are correctly and firmly connected.
3	All cables are properly tied, routed according to wiring requirements, evenly distributed, and free from damage.
4	All unused cable glands and ports are properly sealed.
5	All used cable glands are tightly sealed to prevent dust or moisture ingress.

2.15.2 Power-On Procedure

⚠ CAUTION

- Before powering on, ensure that all wiring connections are correct and securely fastened. The inverter, battery, PV, and load connections must comply with wiring specifications. Incorrect power-on sequences may result in equipment damage or safety hazards.
- In systems with multiple inverters, ensure that all slave inverters are powered on from the AC side within one minute after the master inverter AC side is powered on.

Operating Procedures

Step 1: Verify Environment and Connections

a. Ensure all AC, DC, and communication cables are properly connected, with no loose, shorted, or reverse-polarity connections.

b. Confirm that the battery voltage is within the normal range and that the battery has been activated.

For new or long-idle batteries, use an external charger to activate them before connection.

Step 2: Power-On Sequence

1. Turn off all circuit breakers (PV, BAT, LOAD, GRID).
2. Switch on the circuit breakers in the following order:
   a. Turn on the battery breaker (BAT) — the inverter enters standby mode.
   b. Turn on the PV input breaker (PV) — the system begins to detect PV voltage.
   c. Turn on the load breaker (LOAD) — power is supplied to the connected loads.

(For parallel systems) Ensure all inverters are powered on sequentially. The master inverter must be powered on first, and all slave inverters must be powered on within one minute.

Step 3: System Startup Confirmation

a. After startup, the inverter display or indicator light will turn on, and the system will perform a self-check.

b. If the check passes, the inverter will automatically enter normal operation.

If an alarm or communication error appears, immediately power off and check all wiring connections.

c. For parallel systems, verify that communication between all inverters is normal before enabling grid connection.

Notes:

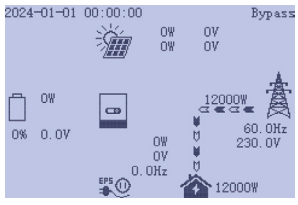
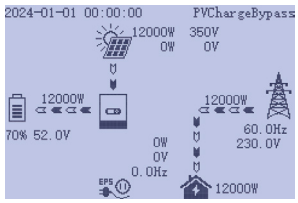
a. Ensure the PE (Protective Earth) connection is secure before powering on.

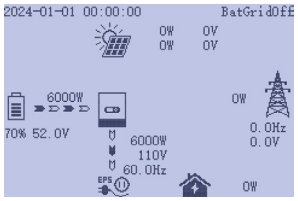
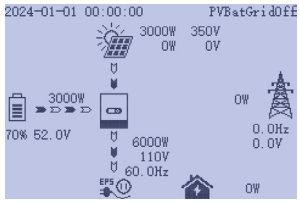
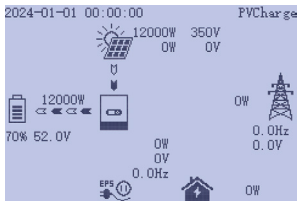
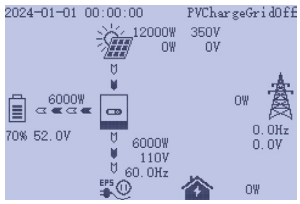
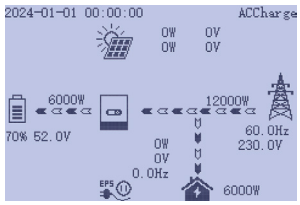
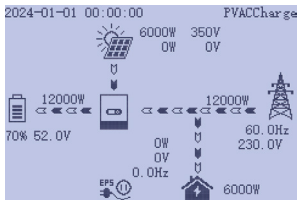
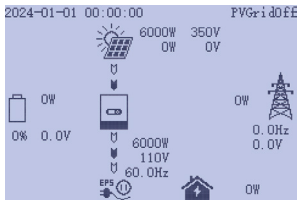
b. If the system needs to be powered on again, first power off all sources and wait for at least 15 minutes before re-energizing.

c. Do not connect or disconnect battery cables while live.

3. Working modes

3.1 SNA series inverter modes introduction:

Bypass Mode		AC is used to take the load.
PV Charge Bypass		PV charge the battery while the AC power the load.

BAT Grid off		Battery is used to take the load.
PV+BAT Grid off		PV+Battery power the load together.
PV Charge		1.When the LOAD key off, the inverter charge the battery only. 2.When the battery is power off, the PV can wake up the battery automatically.
PV Charge+Grid off		PV charge the battery and power the load.
AC Charge		1. AC charge the battery from AC Input or GEN Input. 2. When the battery is power off, the AC can wake up the battery automatically.
PV+AC charge		PV+AC charge the battery. AC is from AC Input or GEN Input.
PV Grid off		NOTE: The output power depends on the PV energy input, if the PV energy is unstable, witch will influence the output power. When setting without battery, the PV can power the load.

3.2 Working Modes related setting description

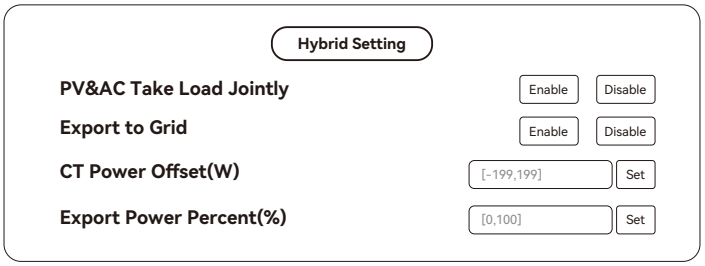
Situation	Setting 1	Setting 2	Setting 3	Working modes and Description
AC abnormal	NA	NA	NA	off grid inverter mode if P_Solar>=P_load, solar is used to take load and charge battery if P_Solar<P_load, solar and battery take the load together, system will discharge until battery lower than the Cut Off Voltage/SOC.
AC normal	PV&AC Take Load Jointly Enable	In the AC first time	NA	Hybrid Mode 1 (charge first) Solar power will used to charge battery first, 1. The solar power will be used to charge the battery first. AC will take load. 2. if solar power is higher than power need to charge the battery, the extra power will used to take load together with grid. 3. If there is still more energy after charge battery and take the load, it will feed energy into grid if export to grid function is enabled.
		Enable AC charge and in the AC charge time	AC charge accroding to Time	Hybrid Mode 1 (charge first)+AC charge battery if solar power is not enough to charge battery.
			AC charge accroding to battery voltage or SOC	Hybrid Mode 1 (charge first)+AC charge battery if solar power is not enough to charge battery and the battery voltage/SOC is lower than AC start charge voltage/SOC, the AC will stop charging when the battery Voltage/SOC is higher than AC end charge battery voltage/SOC.
		1. Not in the AC first time and 2. Disable AC charge or not in the AC charge time	NA	Hybrid Mode 2 (load first) Solar power will used to take load first, 1. if solar power is lower than load, battery will discharge together to take load until battery lower than EOD voltage/SOC. 2. if solar power is higher than load, the extra power will used to charge battery, if there is still more energy, it will feed into grid if enable export.
	PV&AC Take Load Jointly Disable	In the AC first time	NA	Bypass Mode AC will take the load and Solar is used to charge battery.
		Enable AC charge and in the AC charge time	AC charge accroding to Time	Bypass Mode+AC charge battery/Solar is used to charge battery. AC will take load and also charge battery during AC charge time if solar power is not enough.
			AC charge accroding to SOC/Battery voltage	Bypass Mode+AC charge battery Solar is used to charge battery. AC will take load and also charge battery when battery SOC/Volage is lower than start SOC/Voltage, and the AC will stop charging when the battery Voltage/SOC is higher than AC end charge battery voltage/SOC.
		1. Not in the AC first time and 2. Disable AC charge or not in the AC charge time	NA	off grid inverter mode if P_Solar>=P_load, solar is used to take load and charge battery if P_Solar<P_load, solar and battery take the load together, system will discharge until battery lower than EOD Voltage/SOC.

3.3 Hybrid Mode Function Overview

3.3.1 Function Description

The hybrid mode is an extended feature of the SNA off-grid inverter series, designed to provide more flexible power supply options for various application scenarios.

This function is mainly suitable for regions without mandatory grid-connection requirements, helping users maximize the synergistic advantages of solar power and battery storage.If your region has explicit or strict regulations regarding grid connection, do not enable this function to ensure that the system complies with local grid standards and safety requirements.



Related setting

PV & AC Take Load Jointly: Disabled by default. If there is no mandatory grid-connection requirement in your region, you can enable this feature to operate in hybrid mode.

Export to Grid: If there is no mandatory restriction on grid export in your area, you may enable this feature.

CT Power Offset: Allows you to enter a power calibration parameter to eliminate CT measurement errors, enabling more stable and accurate power control under anti-reflux or hybrid operation modes.

Default value: 0 W

Adjustment range: typically ±199 W

Recommended use cases:

If, under “Zero Export” mode, the monitoring system still displays slight “positive power (feedback),” set a negative offset (e.g., -50 W).

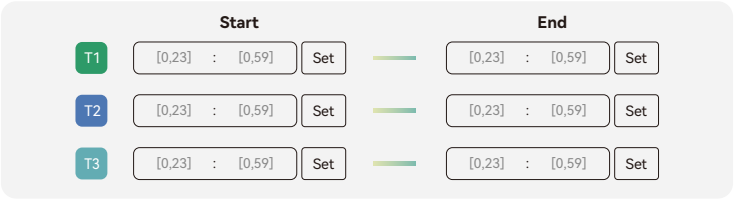
If the system continuously draws power from the grid, set a positive offset (e.g., +50 W) to help maintain a more accurate power balance point.

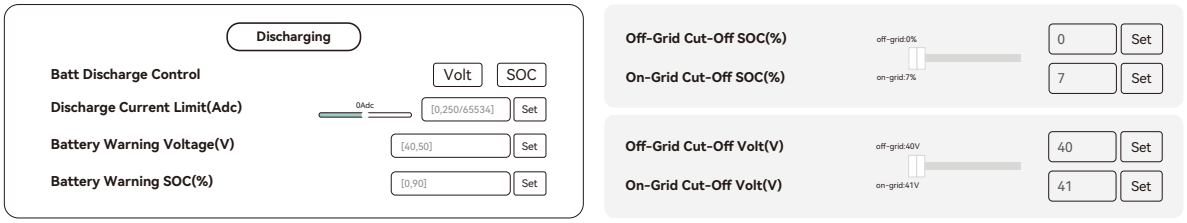
Export Power Percent: When “Export to Grid” is enabled in regions without mandatory grid restrictions, you can set an export power ratio.

3.4 Monitoring Operation Modes

3.4.1 AC First

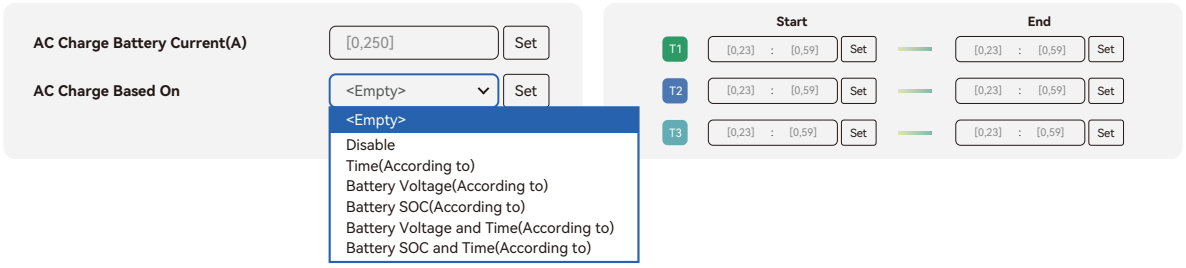
During the setting time, system will use AC to take load, use solar power to charge the battery first. If there is extra solar power, extra solar power will take the load. When out of the setting time, system will use solar and battery to take load first until battery voltage / SOC is lower than On Grid EOD settings, then it will use AC to take the load.





3.4.2 AC Charge

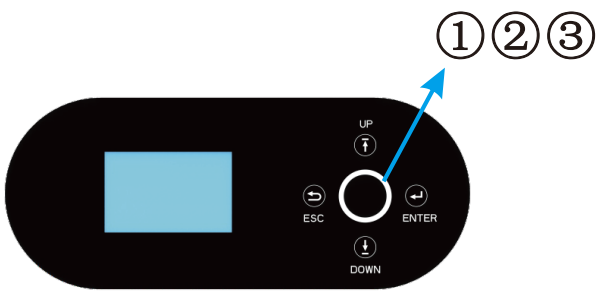
The system will not use AC to charge the battery (except when a forced charge command is issued by the lithium battery BMS).



- According to Time: During the setting time, system will use AC to charge the battery until battery full and battery will not discharge during the setting time.
- According to Battery Voltage: During the setting voltage, system will use AC to charge the battery if battery voltage is lower than AC Charge Start Battery Voltage and will stop when Voltage is higher than AC Charge End Battery Voltage.
- According to Battery SOC: During the setting SOC, system will use AC to charge the battery if battery SOC is lower than AC Charge Start Battery SOC and will stop when Voltage is higher than AC Charge End Battery SOC.
- According to Battery Voltage and Time: During the setting time, system will use AC to charge the battery if battery voltage is lower than AC Charge Start Battery Voltage and will stop when Voltage is higher than AC Charge End Battery Voltage. And battery will not discharge during the setting time.
- According to Battery SOC and Time: During the setting time, system will use AC to charge the battery if battery SOC is lower than AC Charge Start Battery SOC and will stop when Voltage is higher than AC Charge End Battery SOC. And battery will not discharge during the setting time.

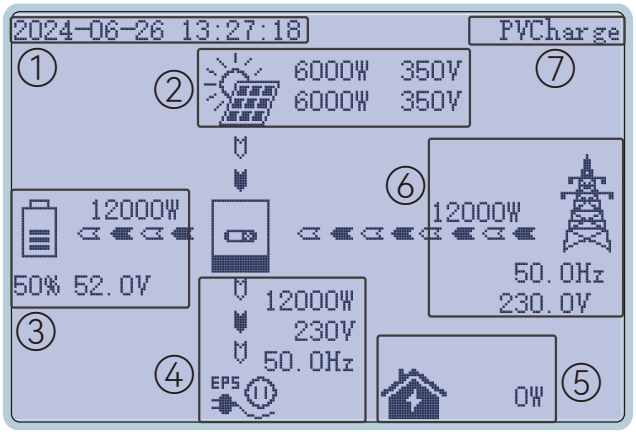
4. LCD display and settings

4.1 RGB Display



LED Indicator			Messages
1	Green	Rotate	Normal
2	Yellow	Rotate	Warning
3	Red	Rotate	Fault

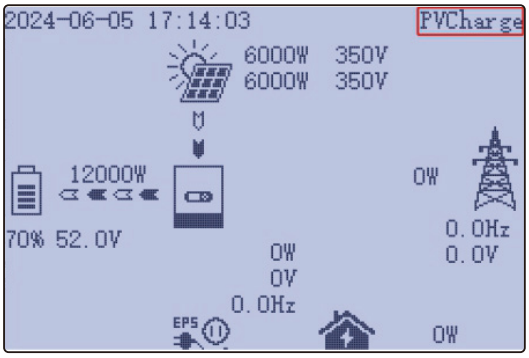
4.2 LCD Display



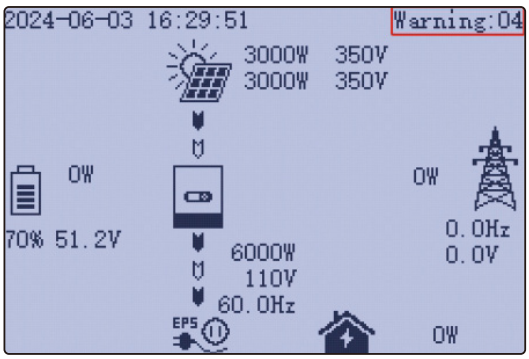
NO.	Description	Remarks
1	Generally Information Display Area	Display the currently time/date by default.
2	Solar inverter output power	This area shows the data of Two-chnnel PV voltage and power.
3	Battery information and data	This area shows the battery type, (lithium battery or lead Acid battery), display the voltage, SOC , input and output power.
4	LOAD output information and data	This area will display LOAD voltage, frequency, power.
5	Loads consumption	Display the power consumption by the loads in on grid model.
6	Grid information and Generator information	Display the grid (Power pylon) information of voltage, frequency, input or output power, the Generator (dynamo) information of voltage, frequency, input power.
7	Working status text display area	This area displays the status code of the SNA-EU 12K, SNA-EU 14K inverter, including rated running status text, the code for the alarm and the code error.

4.3 Inverter Status Display

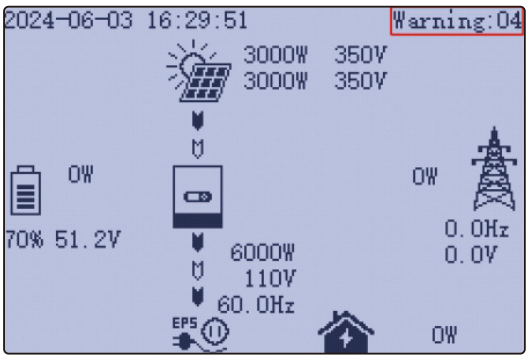
When the SNA-EU 12K, SNA-EU 14K inverteris running normally, the text information corresponding to the current working status is displayed in the red box, such as PVGridOn or PVCharge.



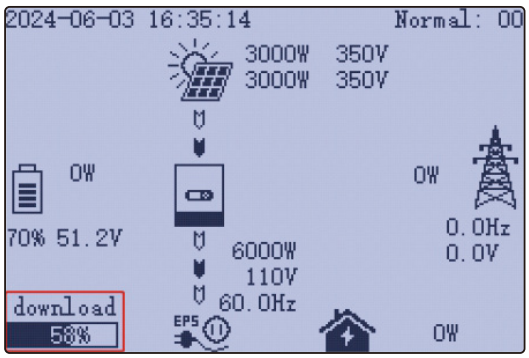
Warning Status, warning 04



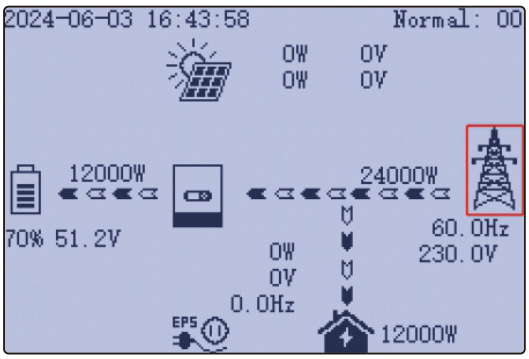
Fault status, fault 02



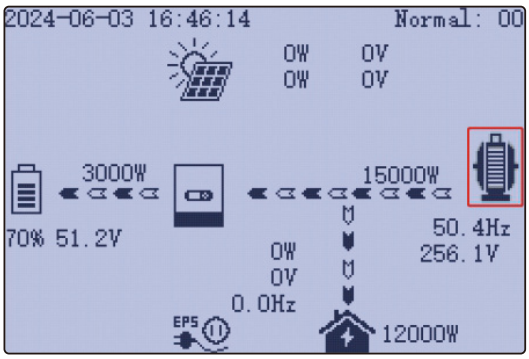
Flash status: download percent is 58%



If the system displays the icon in the red box. Indicates that the AC input port is connected to the power grid.

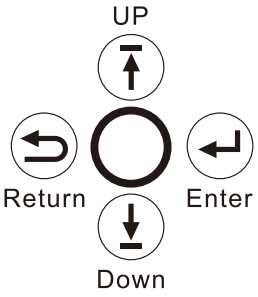


When the icon in the red box is displayed, it indicates that the AC input port is connected to a generator.



4.4 LCD Settings

Button Operations

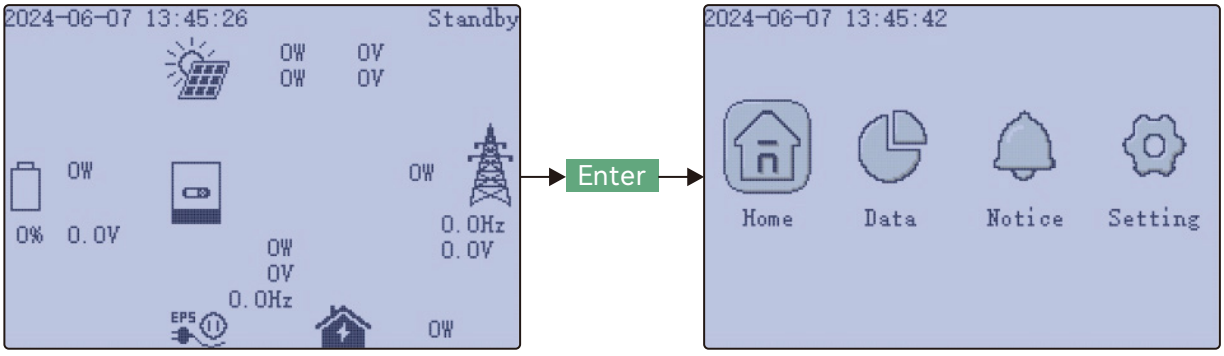


Button	Function
Return	Exit
Enter	Confirm, Enter menu
Up	Previous step or Slide right
Down	Next step or Slide left

Note: Long-pressing the UP and DOWN keys will continuously input the correspongding key signals.

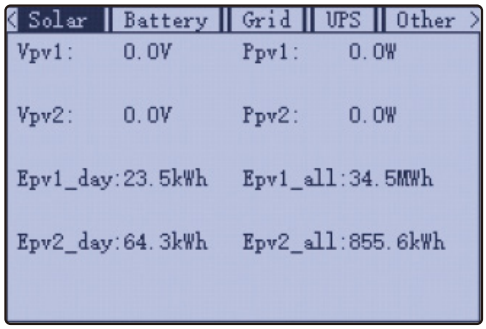
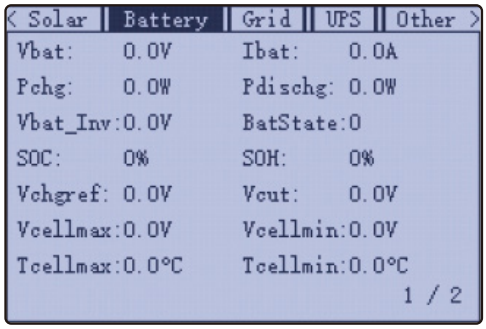
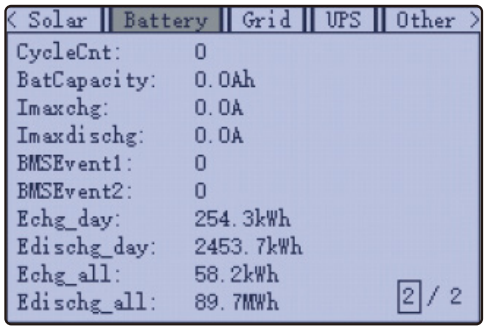
General Operations

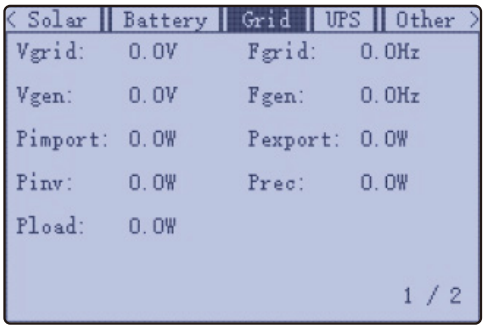
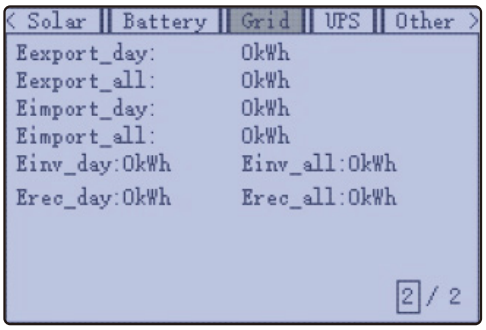
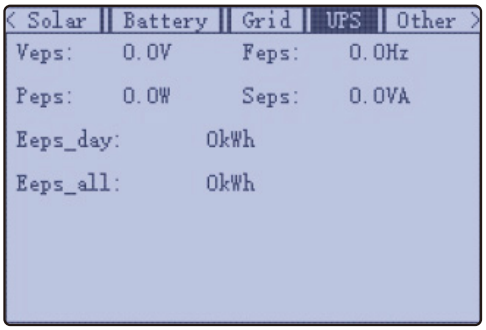
Through button control, press ENTER on the home screen to access the menu options

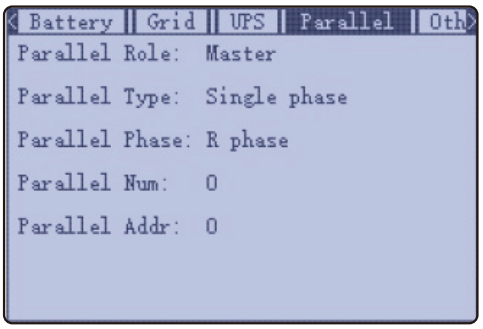
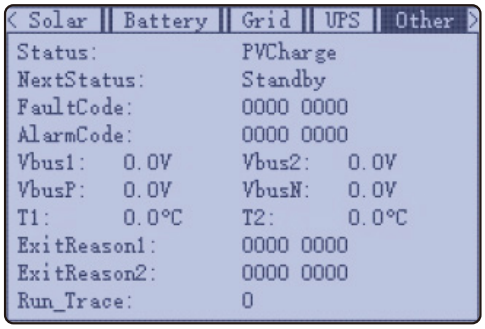


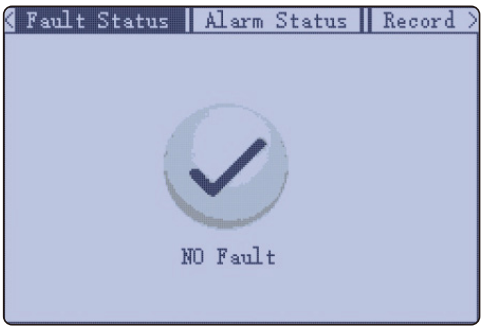
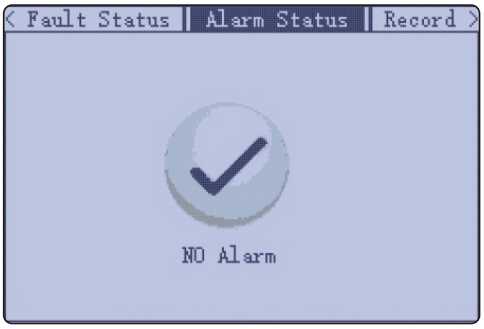
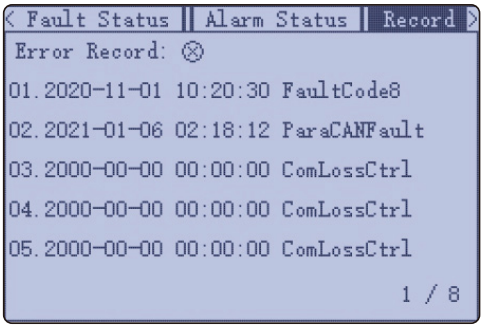
Using the UP and DOWN buttons, select the desired function, then press ENTER to enter. Press Return to return to the previous level. The options include Home for the main page, Data for operational data, Notice for fault and warning information, and Setting for configuration settings.

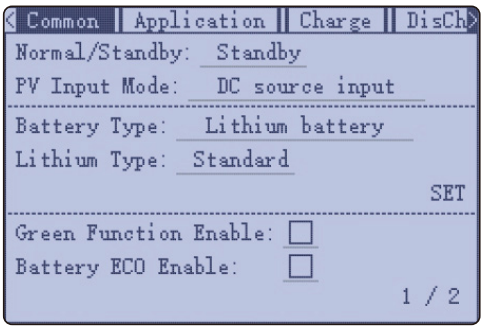
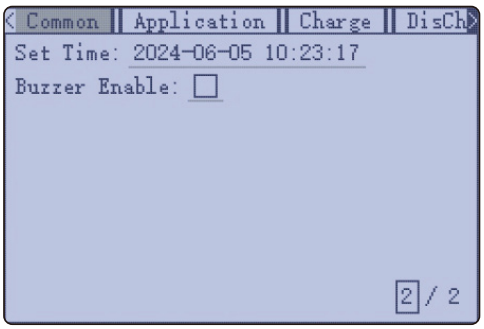
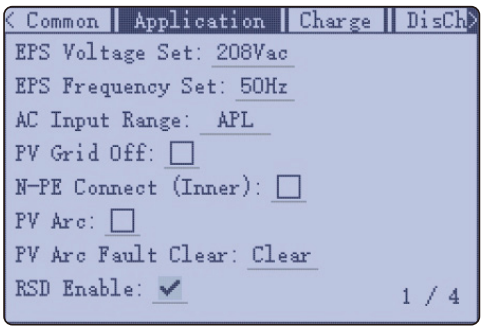
Note: Click the Down button again, then jump to Notifications, Settings, Home, and complete a loop.

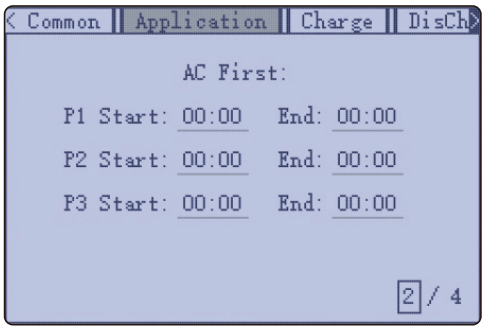
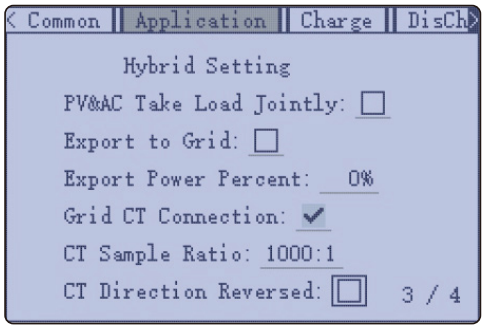
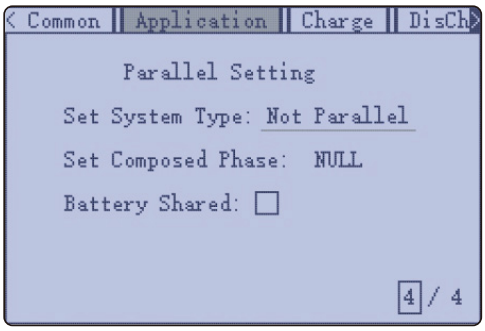
Index	Description	Data
1	Solar	 The figure shows the voltage and power of Pv1, the voltage and power of PV2, the power generation of PV1 in one day and the total power generation of PV1, the power generation of PV2 in one day and the total power generation of Pv2.
2	Battery (1)	 The first page contains the following information: battery voltage, battery charge and discharge current, battery charge power, battery discharge power, inverter sampling battery voltage, battery status, battery remaining power, battery health, battery charge cut-off voltage, battery discharge cut-off voltage. The highest cell voltage. Lowest cell voltage. Highest cell temperature, lowest cell temperature.
3	Battery (2)	 The second page contains the following information: the number of charge and discharge times of the battery, the capacity of the battery, the maximum charge current, the maximum discharge current, BMS event 1, BMS event 2, the charge power in a day, the discharge power in a day, the total charge power, the total discharge power.

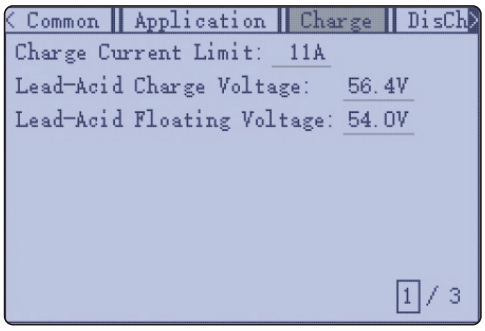
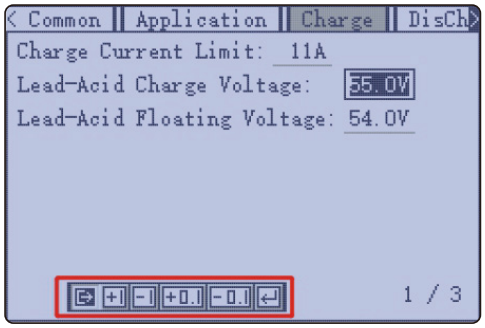
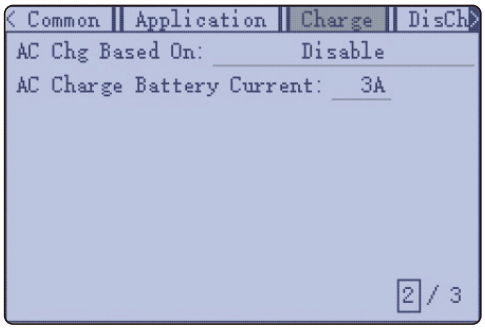
4	Grid (1)	 The first page contains the following information: grid voltage, grid frequency, generator voltage,generator frequency, power input from the grid to the inverter, power output from the inverter to the grid, inverter power, rectified power, load power.
5	Grid (2)	 The second page contains the following information: The power of the inverter exported to the grid during the day. The total power of the inverter exported to the grid. The power that the grid imports into the inverter during the day. The total power imported from the grid to the inverter. The power output of the inverter during the day. The power of inverter rectification in a day.
6	UPS (1)	 The first page contains the following information: load voltage, load frequency. Active power of LOAD, apparent power of LOAD. LOAD Power output in a day. LOAD Indicates the total power output.

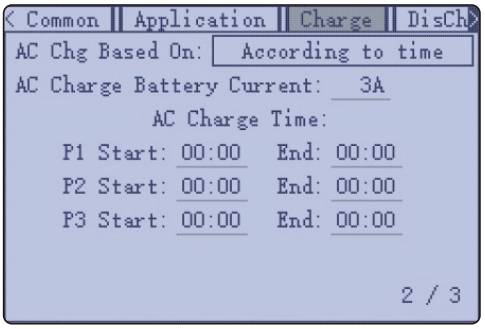
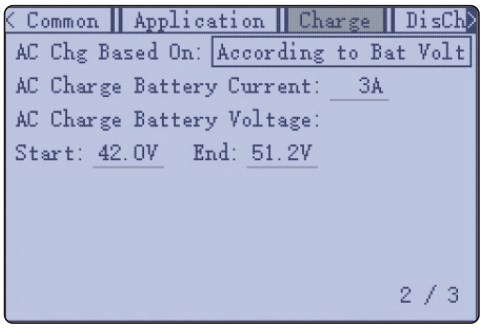
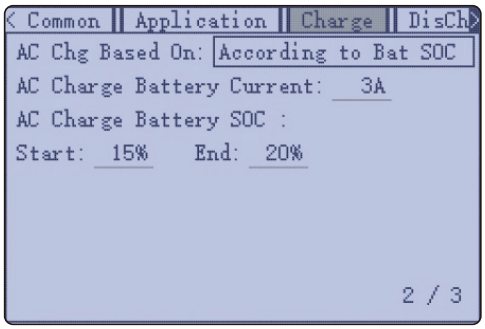
7	Parallel	 This page contains information about the role of the machine in the parallel state (host or slave). Parallel type (single phase or three phase). Parallel phase ® or S or T). Number of parallel machines. Parallel address.
8	Other	 This page contains text information about the current status of the inverter. Inverter error code. Inverter alarm code. Voltage of BUS1. Voltage of BUS2. Positive BUS voltage. Negative voltage of the BUS. The temperature of T1 is the temperature of the I/O board (the highest value). T2 is the temperature of the motherboard (take the highest value).

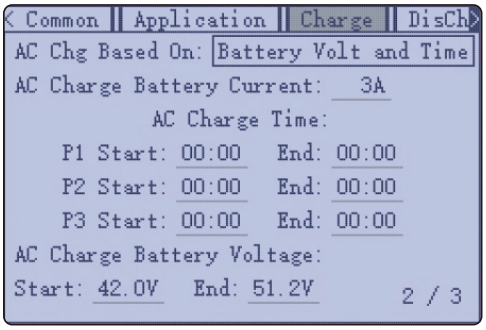
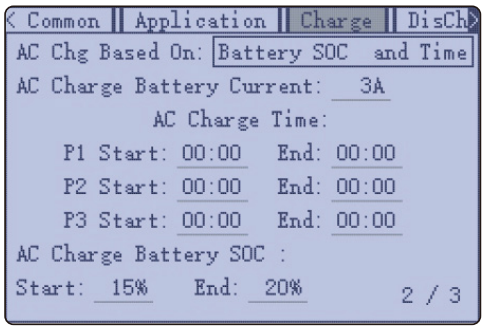
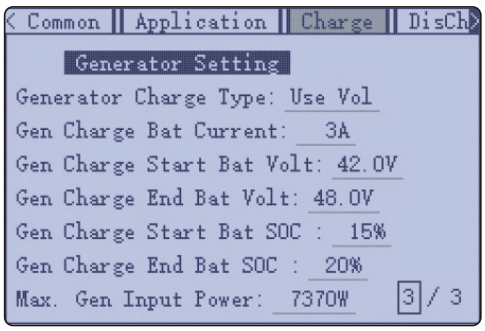
Index	Description	Notice
1	Fault Status	 Information on this page: When the inverter fails, this page displays the corresponding fault code. If there is NO Fault, no fault is displayed.
2	Alarm Status	 Information contained in this page: When the inverter alarm appears, this page will display the corresponding alarm code. If there is NO Alarm, no alarm is displayed.
3	Record	 This page contains information that lists the history of failures and alarms. Specific to the time and date of failure or alarm. The fault history is displayed on pages 1 to 4. Pages five through eight show the history of the call.

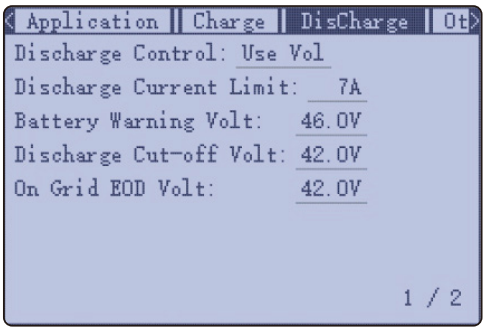
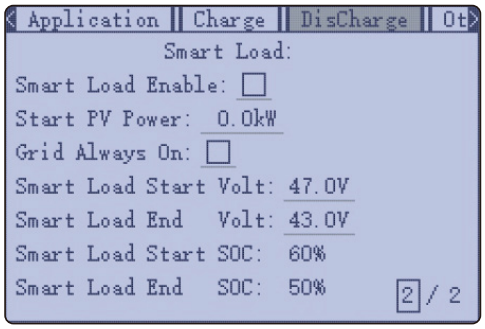
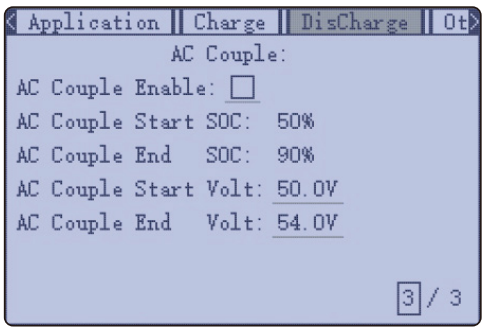
Index	Description	Setting
1	Common	 The first page contains the following information: Inverter status information (rated or standby). PV input mode (DC source or PV1 and PV2 independent or PV1 and PV2 parallel). Type of battery (lithium, lead-acid, or no battery). Lithium battery brands (containing 24 battery brands). Green energy saving enabled. Battery energy saving is enabled. **For a detailed list of compatible battery brands, please visit the LuxpowerTek official website for download or contact your device provider.**  The second page contains the following information: The Settings of the year, month and date. Enabling the buzzer.
2	Application (1)	 The first page contains information on LOAD output voltage Settings (240, 230, 220, 208, 200). LOAD output frequency setting (50Hz or 60Hz). AC input range (UPS: 170-280 or APL: 90-280). The PV off-network function was enabled. N-PE is enabled. AFCI enabled, AFCI clear, RSD enabled.

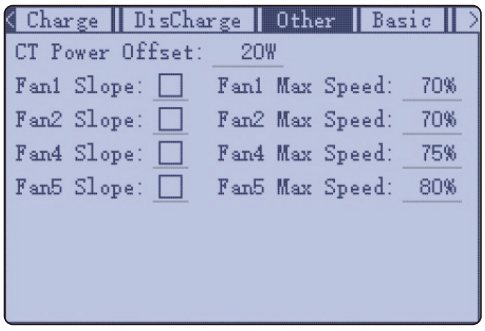
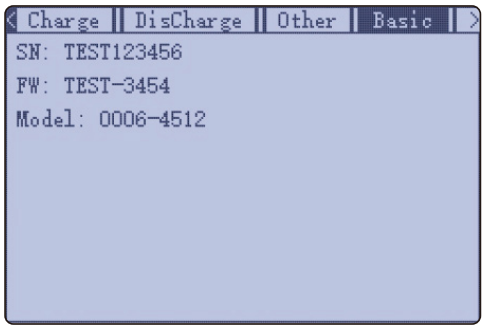
3	Application (2)	 The second page contains information: AC priority charging time, you can set three time periods.
4	Application (3)	 The third page contains the following information: Mixed mode Settings. PV and AC are loaded together. empowerExport to the grid. Percentage of electricity output to the grid.Enable the CT function on the inverter power grid side. The default CT ratio is 1000:1. It can also be set to 2000:1 and 3000:1.
5	Application (4)	 The fourth page contains information: Type of parallel machine (no parallel machine or single phase parallel machine or three phase parallel machine). Parallel phase (R, S, T) can be set. The battery sharing function was enabled.

6	Charge (1)	 The first page contains information: charging current Settings. CV voltage setting of lead-acid battery. Lead-acid battery floating charge voltage setting.
7	Charge (Numerical setting operation)	 This page contains: Setting values. After pressing Down, exit move to +1, +1 to -1, -1 to +0.1, +0.1 to -0.1, and -0.1 to Enter. Press UP to roll back. If you press Enter when the cursor moves to +1, 55 becomes 56. If you press Enter when the cursor moves to -1, 55 becomes 54. If you press Enter when the cursor moves to -0.1, 55 becomes 54.9. If you press Enter when the cursor moves to +0.1, 55 becomes 55.1.
8	Charge (2)	 The second page contains information: AC charging mode enable Settings. AC charging current setting.

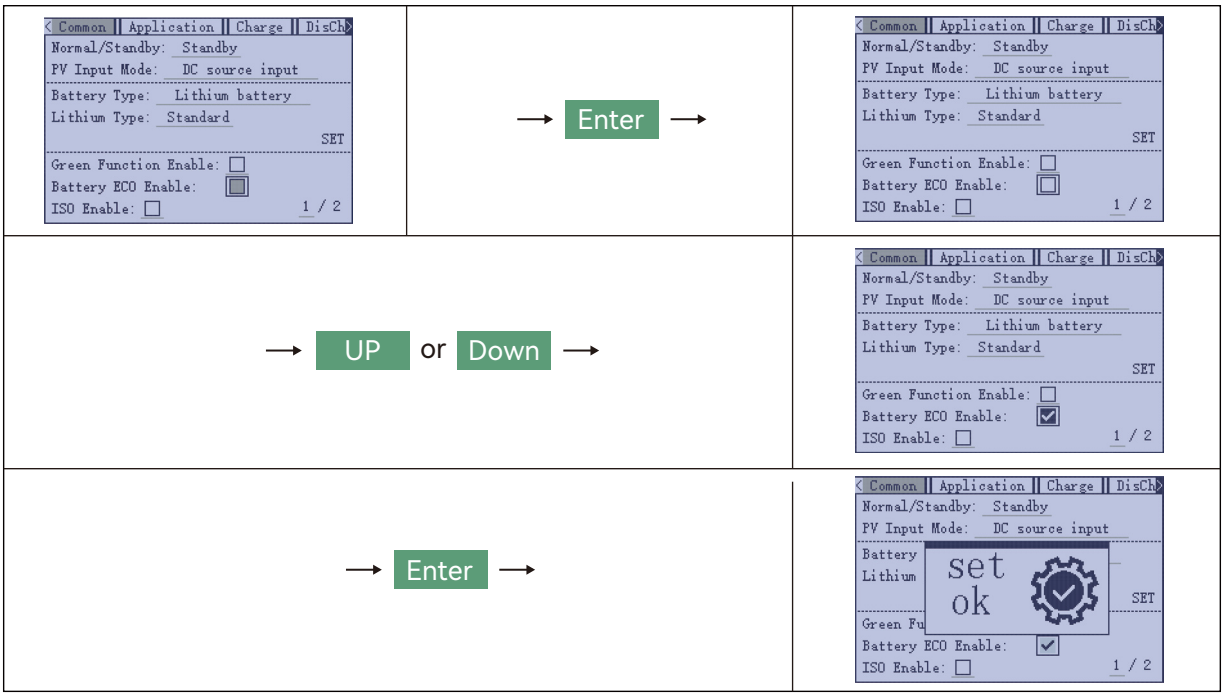
9	Charge (according to the time)	 The second page contains information: The AC is charged according to the time, and three time periods are provided.
10	Charge (according to the battery voltage)	 The second page contains information: The AC is charged according to the battery voltage. The starting charge voltage and cut-off charge voltage can be set.
11	Charge (according to the battery SOC)	 The second page contains information: The AC is charged according to the battery SOC. Start charge SOC and stop charge SOC can be set.

12	Charge (according to the battery voltage and time)	 The second page contains information: The AC is charged according to the battery voltage and time. Meet one of the three time periods and the battery voltage between the starting charge voltage and the cut-off charge voltage. The AC will be charged.
13	Charge (according to time and SOC)	 The second page contains information: The AC is charged according to time and SOC. Meet one of the three time periods and the battery SOC between the start charge SOC and the cut-off charge SOC. The AC will be charged.
14	Charge (3)	 The third page contains information about the Settings for charging the generator. The generator is charged according to the battery voltage or battery SOC. Battery charging current can be set. The battery voltage can be set to start charging. You can set the battery voltage at the end of charging. Battery SOC can be set to start charging. Battery SOC can be set to end charging. The maximum input power of the generator can be set.

15	DisCharge (1)	 The first page contains information: battery discharge can be based on voltage or SOC. Discharge current can be set. Battery alarm voltage can be set. Off-grid discharge cutoff voltage can be set. Grid-connected discharge cutoff voltage can be set. The alarm voltage is larger than the off-grid cut-off voltage. The off-grid cut-off voltage range is complementary to the grid-connected cut-off voltage range.
16	DisCharge (2)	 The second page contains the following information: Enable Smart Load. When the actual PV input power is greater than the value, the Smart Load function takes effect. Normally open when connected to the grid. Smart Load takes effect voltage point. Smart Load End voltage point. Smart Load takes effect on the SOC. Smart Load Ends the SOC.
17	DisCharge (3)	 Page 3 contains the following information: Enable the AC Couple function. Enable the start SOC of the AC Couple. End The cutoff SOC of the AC Couple. Turn on the start voltage of the AC Couple. End The cut-off voltage of the AC Couple.

18	Other	 Include information: CT power compensation setting. Set the maximum speed of five fans. Set five fan control slope curves.
19	Basic	 Contains information: SN Indicates the serial number of the inverter. FW Indicates the firmware version of the inverter (cEaa indicates the US version, cFaa indicates the European version).

5. About LCD Settings check the operation



6. SNA Series Inverter Monitoring System

- Users can monitor the system via WiFi Dongle / WLAN Dongle / 4G Dongle (Available in some countries since March 2021). Monitoring website: server.luxpowertek.com
- The monitoring APP can be downloaded from:
  - Google Play or Apple App Store (scan the QR code on the module or printed manual).
  - Or directly from our website: https://www.luxpowertek.com/download/

6.1 WiFi Quick Guide

A quick setup guide for WiFi connection and password configuration is included in the WiFi module package or the printed manual.

6.2 Monitoring System Setup

(For Installers and End Users)

Includes instructions for system monitoring setup, WiFi connection, inverter pairing, and APP configuration.

6.3 Lux_Monitor_UI Interface Overview

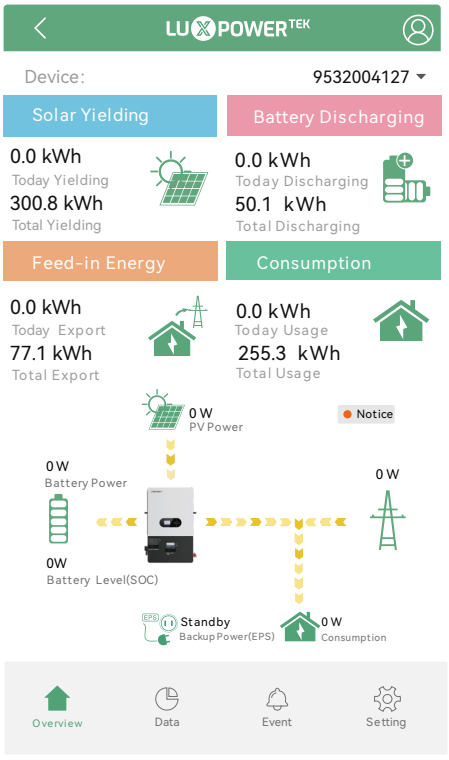
Introduces the main functions of the Luxpower monitoring interface, displaying solar generation, battery charging/discharging status, grid interaction, and real-time energy consumption.

6.4 Web Portal Settings Guide

Provides instructions for configuring inverter parameters and monitoring settings through the Luxpower web portal.

Note:

The setup and operation manuals for Sections 6.2, 6.3, and 6.4 can be obtained from your device supplier.



7. Specifications

Table 1 MPPT Mode Specifications		
INVERTER MODEL	SNA-EU 12K	SNA-EU 14K
Max. PV Array Power (W)	24000W (12000/12000)	
Rated PV Input Voltage (V)	320	
Number of Independent MPPT Inputs	2	
Number of string per MPPT	2	
PV Input Voltage Range (V)	100~480	
MPPT Voltage Range (V)	120~440	
Start-up Voltage (V)	100	
Max. PV Input Current per MPPT (A)	35/35	
Max. PV Short-circuit Current per MPPT (A)	44/44	
Max. PV Charging Current for Battery (A)	250	270
Table 2 Battery Mode Specifications		
INVERTER MODEL	SNA-EU 12K	SNA-EU 14K
Output Voltage Waveform	Pure Sine Wave	
Output Voltage Regulation	200Vac/208Vac/220Vac/230Vac/240Vac±5%	
Output Frequency	50/60Hz	
PV+Battery Output Power (W)	12000	14000
Rated Output Current (A)	53	61
Max. Charging/Discharging Current (A)	250	270
Max. Charging/Discharging Power (W)	12000	13000
Overload Protection	5s@≥150%*12K /10s@ 110%~150%*12K(Only Battery)	10s@≥118% *12K (With PV+ Battery)
Surge Capacity	2* rated power within 5 seconds	
Recommend Capacity of Battery per Inverter	>400AH	
Battery Voltage Range	46.4V-60V (Li)	38.4V-60V (Lead_Acid)
High DC Cut-off Voltage	59VDC (Li)	60VDC (Lead_Acid)
High DC Recovery Voltage	57.4VDC (Li)	58VDC (Lead_Acid)

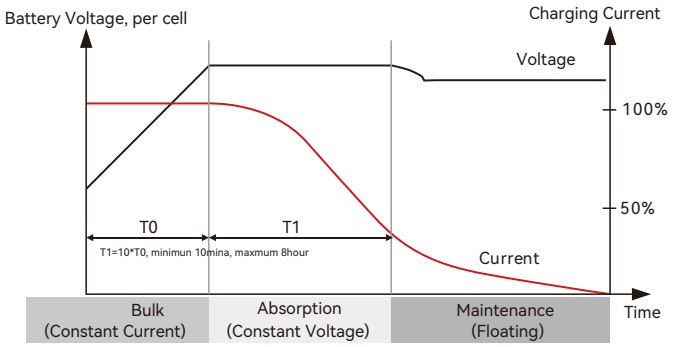
Low DC Warning Voltage (Lead Acid)	load < 20%	44.0Vdc (Settable)
	20% ≤ load < 50%	Warning Voltage@load < 20% -1.2V
	load ≥ 50%	Warning Voltage@load < 20% -3.6V
Low DC Warning Return Voltage(Lead Acid)		Low DC Warning Voltage@Different load+2V
Low DC Cut-off Voltage (Lead Acid)	load < 20%	42.0Vdc (Settable)
	20% ≤ load < 50%	Cut-off Voltage@load < 20% -1.2V
	load ≥ 50%	Cut-off Voltage@load < 20% -3.6V
Low DC Cut-off Return Voltage (Lead Acid)	Cut-off Voltage@ load<20%≥45V	Low DC Cut-off Voltage@load<20%+3V
	Cut-off Voltage@ load<20%<45V	48V
Low DC Warning SOC		20% SOC (Settable)
Low DC Warning Return SOC		Low DC Warning SOC +10%
Low DC Cut-off SOC		15% SOC (Grid on) (settable)
		15% SOC (Grid off) (settable)
Low DC Cut-off Return SOC		Low DC Cut-off SOC +10%
Charge Cut-off Voltage		58.4Vdc
No Load Power Consumption		<70W
Lead_Acid Battery Charging Algorithm		3-Step
Absorption Charging Voltage		Flooded Battery 58.4Vdc (Recommend)
		AGM/Gel Battery 56.4Vdc (Recommend)
Floating Charging Voltage		54Vdc
Charging Curve		

Table 3 Line Mode Specifications		
INVERTER MODEL	SNA-EU 12K	SNA-EU 14K
Input Voltage Wavefor	Sinusoidal (utility or generator)	
Nominal Input Voltage (V)	230Vac	
Low Loss Voltage	170Vac±7V (UPS); 90Vac±7V (Appliances)	
Low Loss Return Voltage	180Vac±7V (UPS); 100Vac±7V (Appliances)	
High Loss Voltage	280Vac±7V	
High Loss Return Voltage	270Vac±7V	
Max. AC Input Voltage	280Vac	
Nominal Input Frequency	50Hz/60Hz (Auto detection)	
Max. AC Input Current (A)	100	
Max. AC Input Power (W)	24000	
Rated AC Output Current (A)	53	61
Rated AC Output Power (W)	12000	14000
Output Short Circuit Protection	Software Protect when GridOff Discharge Circuit Breaker Protect when GridOn Bypass	
Transfer Time	<10ms	

Table 4 Generator Mode Specifications		
INVERTER MODEL	SNA-EU 12K	SNA-EU 14K
Rated GEN Voltage (V)	230	
Rated GEN Frequency (Hz)	50/60	
Rated GEN Input Current (A)	65	
Rated GEN Input Power (W)	15000	

Table 5 Protection/General Specifications		
INVERTER MODEL	SNA-EU 12K	SNA-EU 14K
Over Current/Voltage Protection	YES	
Grid Monitoring	YES	
AC Surge Protection Type III	YES	
Safety Certification	CE	
Ingress Protection Rating	IP 20	
Display&Communication Interface	RGB+LED, RS485/WIFI/CAN	
Warranty	2 Years	
Cooling Method	FAN	
Topology	Transformer-less	
Noise Emission (typical)	<55dB	
Operating Temperature Range	0℃ to 45℃ (full load)	
Storage temperature	-15℃ ~ 60℃	
Humidity	5% to 95% Relative Humidity (Non-condensing)	
Altitude	<2000m	
Dimension (W*H*D)	530*870*150mm (20.87*34.25*5.91inch)	
Net Weight	43.5kg	

8. Maintenance

This chapter describes the safety precautions and procedures for inverter maintenance, replacement, and routine inspection.

All operations must be carried out by qualified personnel, and only after the power has been completely disconnected.

8.1 Power OFF the Inverter

⚠ WARNING

Before performing any maintenance, cleaning, or removal work, the inverter must be powered off and all power sources disconnected to prevent electric shock or equipment damage.

Operating Procedures

Step 1: Turn off the PV input breaker.

Step 2: Turn off the battery breaker.

Step 3: Turn off the AC output breaker (load side) and AC input breaker (utility or generator side).

Step 4: Switch off the inverter main power switch.

Step 5: Wait until the inverter display is completely off.

Step 6: Confirm that no voltage is present before proceeding with any further operation.

8.2 Removing the Inverter

⚠ WARNING

Before removing the inverter, make sure all power sources are completely disconnected to avoid electric shock or short circuit.

This procedure must be performed by a qualified electrician.

Operating Procedures

Step 1: Power off the system

- Follow the steps described in 8.1 Power OFF the Inverter to ensure complete power disconnection.
- Verify that all indicator lights are off.

Step 2: Disconnect the cables

- Use a screwdriver to remove the PV connection cables.
- Carefully disconnect the battery and communication cables.
- Loosen and remove the AC input and output cables.
- Label each cable for easy reinstallation.

Step 3: Remove the inverter

- Hold the bottom of the inverter firmly with both hands, and use a Phillips screwdriver to remove the two mounting screws on the top and two on the bottom.
- Carefully lift and remove the inverter from the mounting bracket.

Step 4: Packaging and storage

- Repack the inverter using its original packaging materials if available.
- Store the device in a dry, ventilated, and dust-free environment.
- Do not place heavy objects on top of the inverter to prevent deformation or damage.

8.3 Disposing of the Inverter

When the inverter or any of its components reaches the end of its service life or cannot be repaired, it must be disposed of in accordance with local environmental regulations.

- Do not dispose of the inverter as household waste.
- The unit contains electronic and metal components that should be sent to a qualified recycling facility.
- Batteries, capacitors, and similar components must be handled as hazardous waste in accordance with local standards.
- If you have any questions, contact the manufacturer or an authorized local service center for recycling guidance.

8.4 Trouble Shooting & Error List

The failures mainly divided into 5 categories, for each category, the behavior is different:

Code	Description	Troubleshooting
E000	Internal communication fault1	Restart inverter, if the error still exist, contact us (DSP&M3)
E001	Model fault	Restart inverter, if the error still exist, contact us
E003	CT Fail	Restart inverter, if the error still exist, contact us
E008	CAN communication error in Parallel System	Check CAN cable connection is connected to the right COM port
E009	No master in parallel system	Check parallel setting for master/Slave part, there should be one master in the system
E012	Off-gird, short-circuit of the Load or Smart Load.	Check if the load is short circuit, try to turn off the load and restart inverter
E013	UPS reserve current	Restart inverter, if the error still exist, contact us
E015	Phase Error in three phase parallel system	Check if the AC connection is right for three phase system, there should one at least one inverter in each phase
E018	Internal communication fault3	Restart inverter, if the error still exist, contact us (DSP&M3)
E019	Bus voltage high	Check if PV input voltage is higher than 495V
E020	AC connection fault	Check if LOAD and AC connection is in wrong terminal
E021	PV voltage high	Check PV input connection and if PV input voltage is higher than 480V
E022	Hardware Over current	Restart inverter, if the error still exist, contact us
E024	PV overcurrent	Check PV connection
E025	Temperature over range	The internal temperature of inverter is too high, turn off the inverter for 10minutes, restart the inverter, if the error still exist, contact us
E028	Sync signal lost in parallel system	Check CAN cable connection is connected to the right COM port
E029	Sync triger signal lost in parallel system	Check CAN cable connection is connected to the right COM port

Code	Description	Trouble shooting
W000	Communication failure with battery	Check if you have choose the right battery brand and communication cable is right, if the warning still exist, contact us
W001	AFCI Com failure	Restart inverter, if the error persists, contact your supplier.
W002	AFCI High	Check each PV string for correct open circuit voltage and short circuit current. If the PV strings are in good condition, please clear the fault on inverter LCD.
W003	Communication failure with meter	Check communication cable, if the warning still exist, contact us
W004	Battery failure	Inverter get battery fault info from battery BMS, restart battery, if the warning still exist, contact us or battery manufacture
W006	RSD Active	Check if the RSD switch is pressed.
W008	Software mismatch	Please contact Luxpower for firmware update
W009	Fan Stuck	Check if the fan is OK
W013	Over temperature	The temperature is a little bit high inside inverter
W015	Bat Reverse	Check the battery connection with inverter is right, if the warning still exist, contact us
W017	AC Voltage out of range	Check AC voltage is in range
W018	AC Frequency out of range	Check AC frequency is in range
W019	AC inconsistent in parallel system	Reconnect the AC input or Restart inverter, if the error still exist, contact us
W020	PV Isolation low	Restart inverter, if the error still exist, contact us
W022	DC injection high	Restart inverter, if the error still exist, contact us
W025	Battery voltage high	Check if battery voltage is in normal range
W026	Battery voltage low	Check if battery voltage is in normal range, need to charge the battery if battery voltage is low
W027	Battery open	Check if there is output from the battery and battery connection with inverter is OK
W028	Over load	Check if load is too high
W029	The load output voltage is high	Restart inverter, if the error still exist, contact us
W031	Load DCV high	Restart inverter, if the error still exist, contact us

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luxpowertek

Lux Power Technology Co., Ltd
Headquarter: +86 755 8520 9056
www.luxpowertek.com
Contact us: info@luxpowertek.com

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