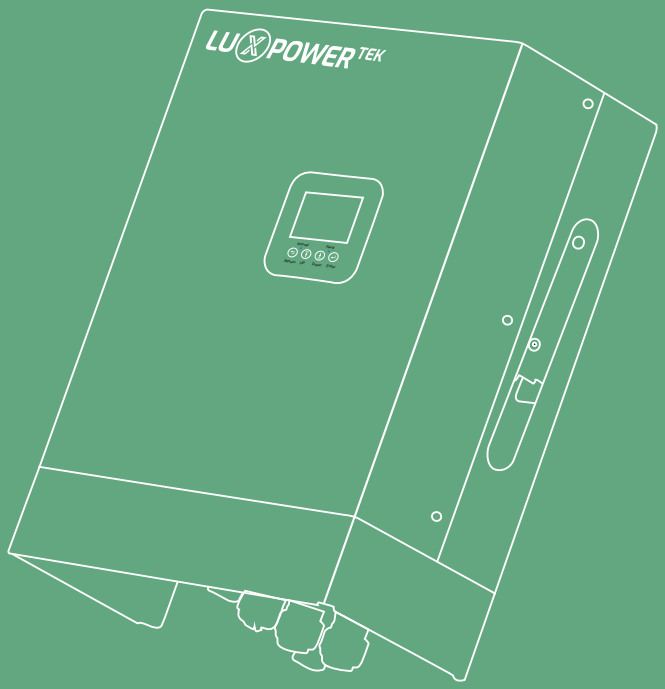
Hybrid Inverter User Manual

GEN-LB-EU 3-6K



LUXPOWER TEK

Version: UM-GEN01001

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Revision History

Version	Date	Description
UM-GEN01001	2024.06.07	First official release.

1. Safety

1.1 Safety Instruction

General Safety Instructions

The inverter has been designed and tested strictly according to international safety regulations. Read all safety instructions carefully prior to any work and observe them at all times when working on or with the inverter. The operator must be qualified personnel and the installation must be capable with relevant national or international standards or regulations.

Incorrect operation or work may cause:

- injury or death to the operator or at third party
- damage to the inverter and other properties belonging to the operator or a third party.

Important Safety Notifications

There are many safety issues need to be carefully notified before, during and after the installation, and also in future operation and maintenance, following is important safety notifications to operator, owner and user of this product in appropriate usage

DANGER

Dangers of High Voltages and Large Current

- Beware of high PV voltage. Please turn-off the DC switch of PV Panel output before and during the installation to avoid electric shock.
- Beware of high grid voltage. Please turn-off the AC switch of grid connection before and during the installation to avoid electric shock.
- Beware of large current of the battery output. Please turn-off the battery module before and during the installation to avoid electric shock.
- Do not open the inverter when it's working to avoid electric shock and damages from live voltage and current from the system.
- Do not operate the inverter when it's working, only the LCD and buttons can be touched in limited cases by qualified personnel, other parts of the inverter can be touched when the inverter is under a safe state(e.g. fully shut-down).
- Do not connect or disconnect any connections (PV, battery, grid, communication etc.) of the inverter when it's working.
- Make sure the inverter is well grounding, an operator should make sure himself is good protected by reasonable and professional insulation measurements (e.g. personal protective equipment (PPE)).
- Inspect relevant existed wiring on-site of the installation is under good condition before installation, operation or maintenance.
- Inspect the connections are good between inverter and PV, battery and grid during installation to prevent damages or injuries caused by bad connections.

⚠ WARNING

Avoid Misoperation and Inappropriate Usage

- All the work of this product (system design, installation, operation, setting, configuration and maintenance must be carried out by qualified personnel as required.
- All connections must be in accordance with local and national regulations and standards.
- The inverter and system can inter-connected with the utility grid only if the utility grid permits it.
- All the warning labels or nameplates on the inverter must be clearly visible and must not be removed, covered or pasted.
- The installation should consider the safety of future users when choosing the right position and location as specified in this manual.
- Please keep the children away from touching or misusing the inverter and relevant systems.
- Beware of burning hurt, the inverter and some parts of the system could be hot when working, please do not touch the inverter surface or most of the parts when they are working. During inverter working states, only the LCD and buttons could be touched.

● NOTICE

Avoid Misoperation and Inappropriate Usage

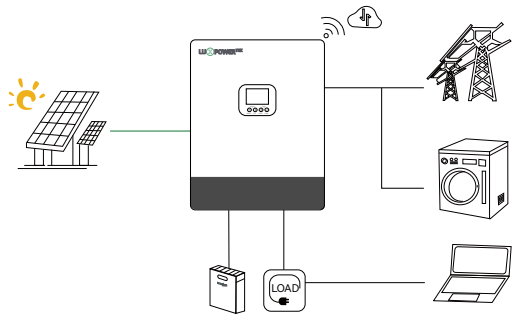
- Please carefully read this manual before any work is carried out on this inverter, the installation, please keep this manual carefully stored and easy to access at any time.
- The qualified personnel should have had training in the installation and commissioning of the electrical system as well as dealing with hazards, also they should have the knowledge of the manual and other related documents. As the installer or operator they are required to be familiar with local regulations and directives.

2. Brief Introduction

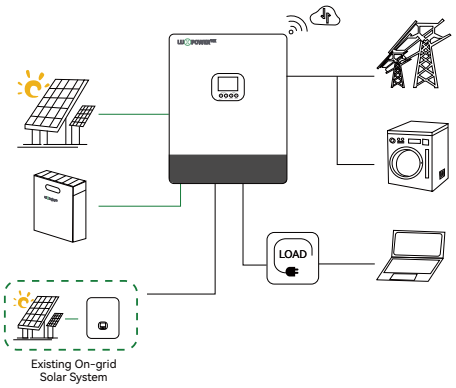
2.1 Brief Introduction

This product and relevant system is suitable for following system applications (system diagram):

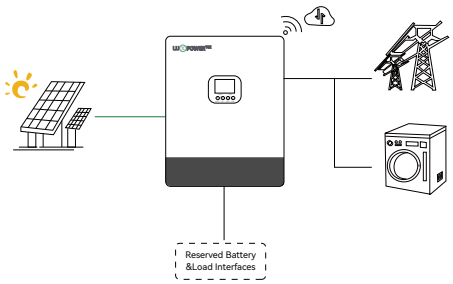
A. Solar and battery storage system



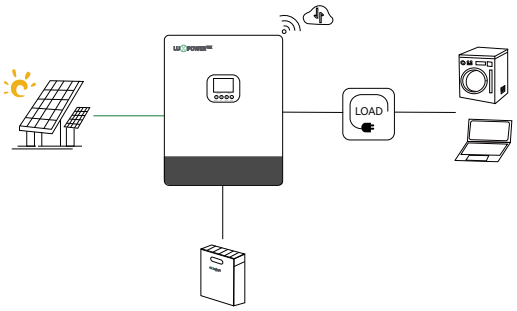
B. AC Coupling with existed solar system



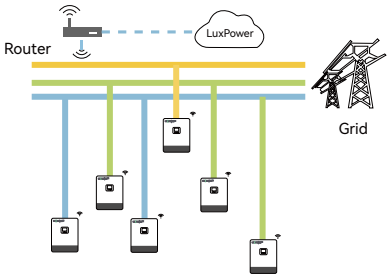
C. On-grid solar system without battery
(Support load even without battery)



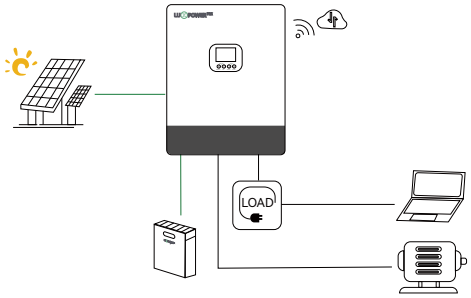
D. Off-grid and back-up applications



E. Single and three phase paralleling system



F. Off-grid and generator applications



3. Installation

3.1 Packaging List & Storage Instructions

Packaging List

When the packaging is unpacked, the inner components should be the same as described in below packaging list.

Hybrid Inverter X1

User Manual X1

Wi-Fi Module X1

Grid Connector

Load Connector

Rj45 Terminal X4

Cross Head Screw X13

Expansion Screw and Tube X4

Security Screw X1

GEN Connector

Communication Port Cover X1

CT X1

4mm Allen Key

PV Connector X4

Battery Communication cable L= 2m X 1(Orange)

Parallel Communication cable L=2m X 1(grey)

Guardrail barrier

Wall-mounted Bracket X1

Connector for BAT+

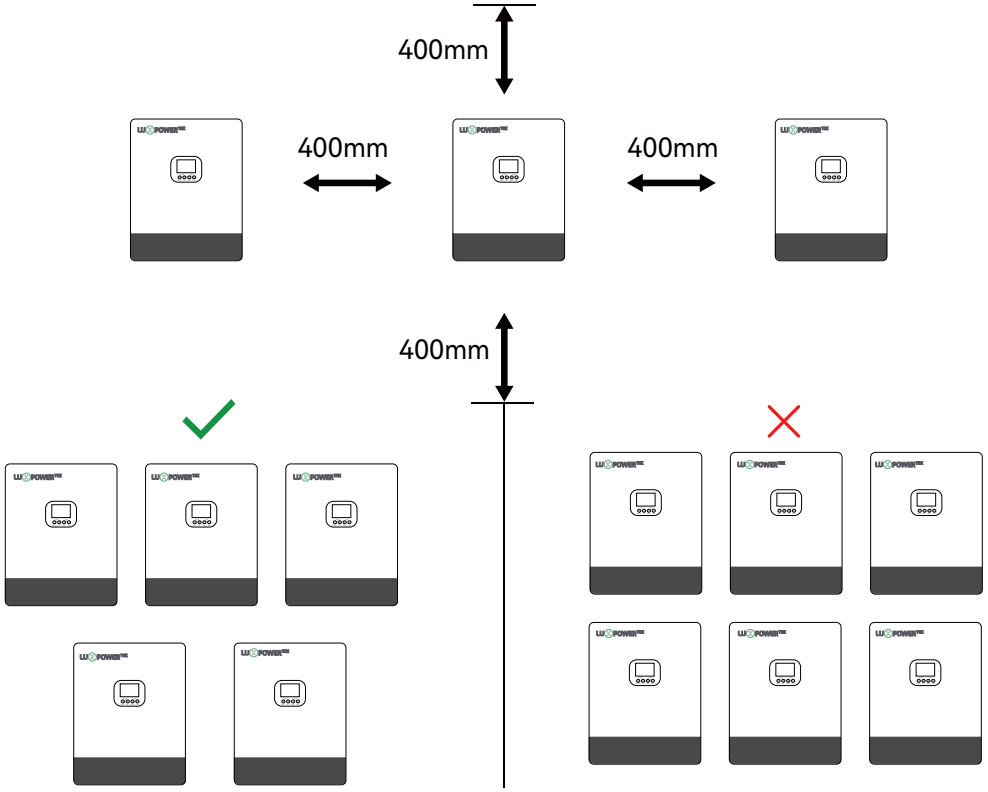
Connector for BAT-

3.2 Location Selection and Installation

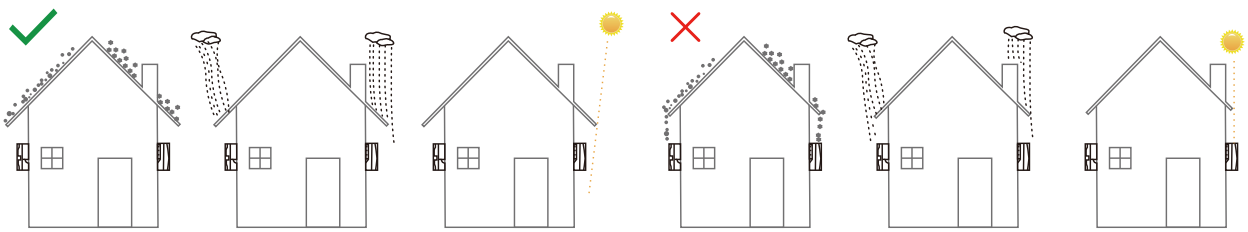
3.2.1 Requirements for installation location

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

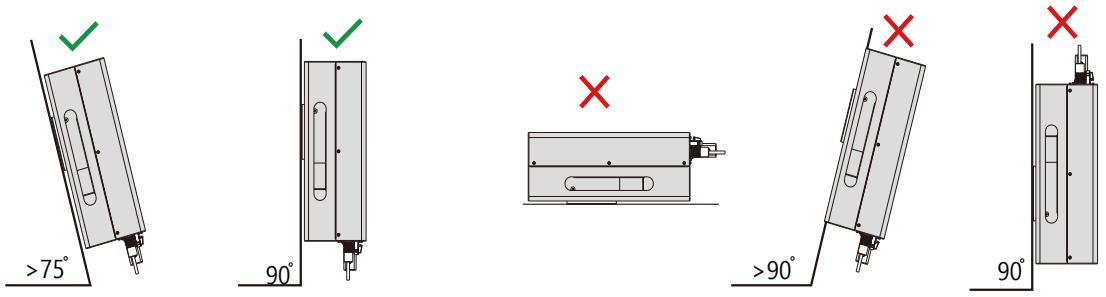
b). Please maintain the minimum clearances below for adequate heat dissipation.



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 fro direct sunlight, rain and snow etc. PROTECT the LCD screen from excessive UV exposure.

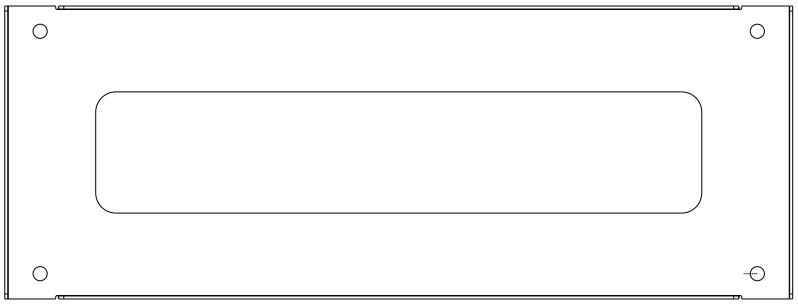


d). The inverter should be installed upright on a vertical surface.



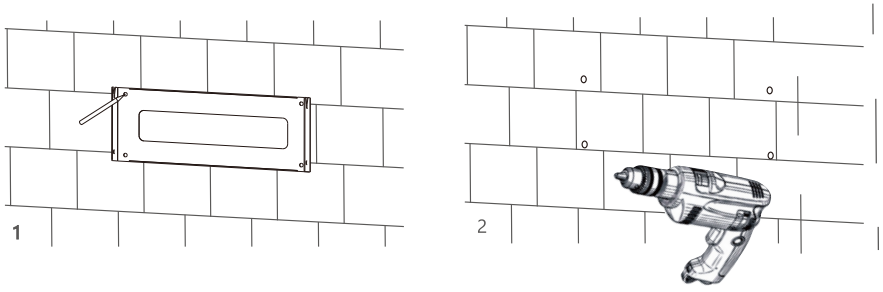
3.2.2 Installing the inverter

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.

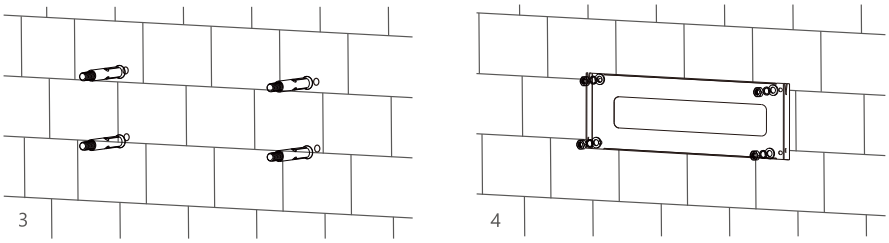


The mounting steps are as below: (Use brick wall as example)

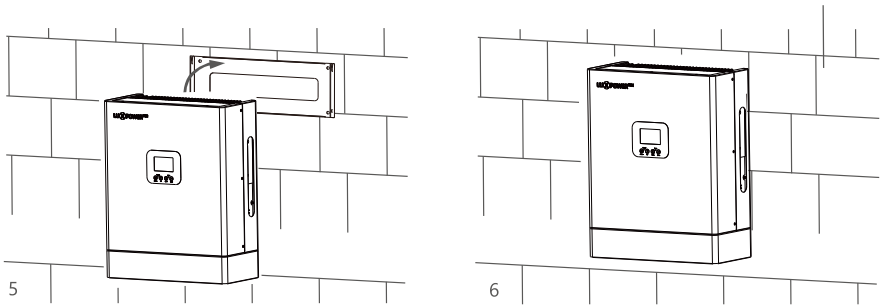
Step 1. Mark the positions of drill holes with the mounting bracket, then drill 4 holes of 8mm (5/16inch) diameter and make sure the depth of the holes is deeper than 50mm(2inch).



Step 2. Install and tighten the expansion bolts into the holes.Then use the corresponding nuts and washers (packaged together with the expansion bolts) to install and fix the wall-mounting bracket on the wall.



Step 3. Hang the inverter onto the wall-mounting bracket and lock the inverter on the wall using one Hex socket countersunk screw screw onto the right side of the heatsink.

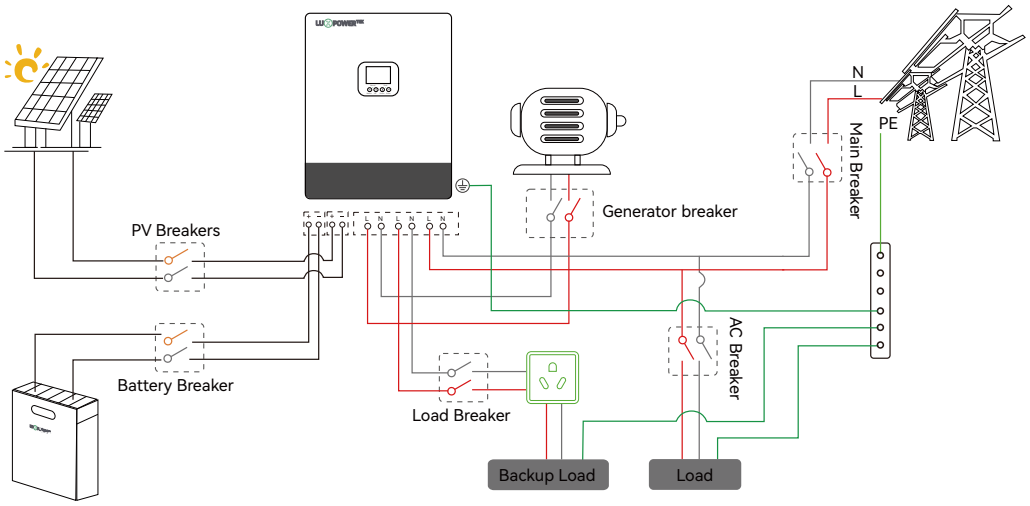


For installation on wood studs

Fasten the mounting bracket on the studs with 4 wood screws, then hang the inverter onto the bracket and lock the inverter on the wall with 2 self-tapping screws. Please note that the wood screws and self-tapping screws are not provided with the inverter. Installers need to prepare the screws before installation.

3.3 Connection Overview

3.3.1 System Connection



* Note:

1, Max. AC input is 52.7A

2, About the "Load" terminal on the Inverter

In our inverter system, there is a port labeled "Load," which is specifically used to connect essential loads. On the inverter's LCD screen, this terminal is labeled as "EPS," indicating Emergency Power Supply.

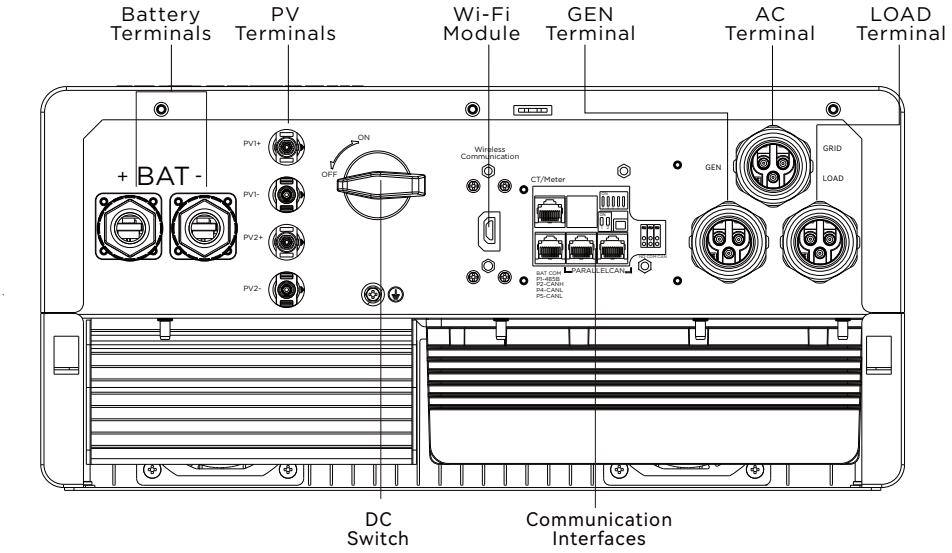
In some sections of our manual, this terminal is also referred to as "Backup Load."

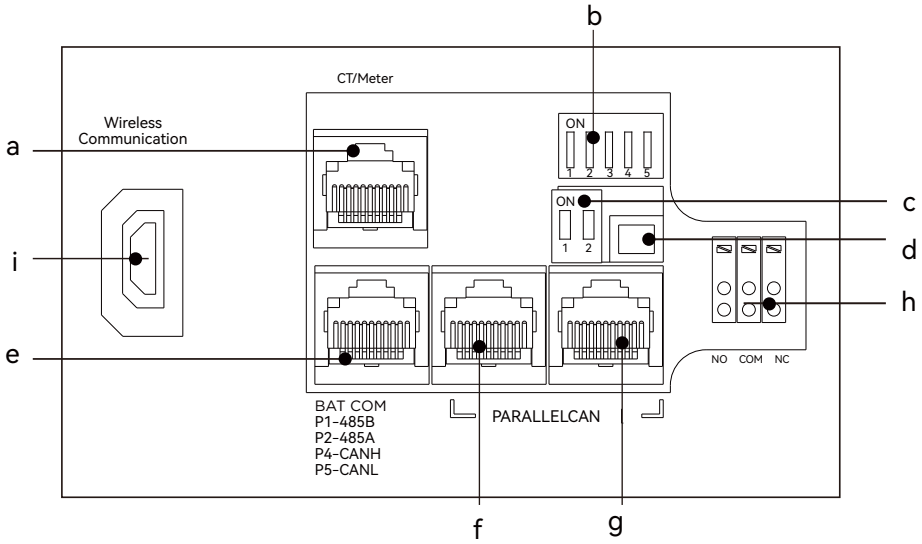
Regardless of the term used, these all refer to the same port, which functions to ensure that, in the event of a power outage, the connected critical loads can continue to be powered by solar panels or the storage battery, thereby maintaining the operation of essential devices.

Please prepare the breakers before connection, breakers selection recommendation for both DC and AC

Inverter model	GEN-LB-EU 3-6K
PV Breakers (2Px2)	600V/20A
Battery Breaker (2P)	100V/250A
Main Breaker (2P)	63A/230Vac
Load Breaker (2P)	40A/230Vac
Geneartor breaker	40A/230V

Connection Terminals and Interfaces Overview





a	For detailed interface definitions of CT&METER 485 and INV 485, please refer to section 3.6.3.
b	Safety code dip switch: set different safety codes by adjusting the dip switches. For corresponding safety codes, please refer to section 3.6.5.
c	CAN Matching resistance: Set DIP switch when use inverters in parallel
d	Connection for temperature sensor of lead-acid battery
e	Battery communication port (CAN&RS485) please check Chapter 3.5.2 for Pin definition
f	Parallel communication port
g	Please check Chapter 3.9 for Parallel connection
h	GEN (NO, NC) : Connection forgenerator auto-start function
i	Wifi/GPRS/4G/WLAN dongle connection

3.4 PV Connection

The PV connection of GEN hybrid inverter is the same to traditional on-grid solar inverter (string inverter).

NOTICE

- Before connection the PV, please use the multi-meter to measure the PV array voltage to verify if PV array is working normally, if not, please fix the PV array to normally working states before connection
- When your PV panel ambient temperature could possibly be lower than 0℃, then please check the PV array voltage up ceiling and if you are not sure please ask your system or panel provider for further assistance. As when temperature is extremely low the PV panel voltage will increase by a certain percentage.

Cable Requirement:

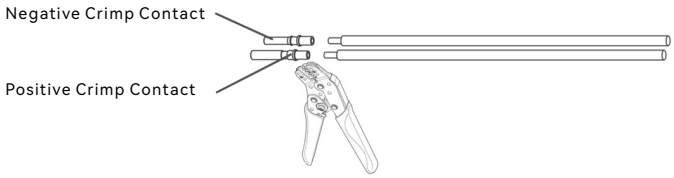
Cross-section	Cable Diameter	Minimum Voltage
3 - 6 mm^2	2-2.6mm	600V

Step 1: Turn off or disconnect the PV switch (DC switch). Then keep this switch always open during the connection.

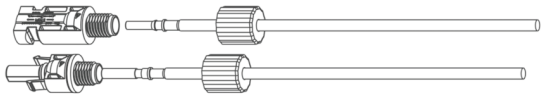
Step 2: Assemble the PV connector

a). Strip 6~8mm insulation from the cable end.

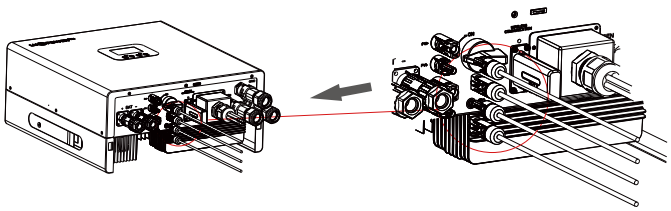
b). Assemble the cable ends to crimp contacts.



c). Lead the cable through the cable gland, then insert into the corresponding insulator until it snaps into place, then tighten the cable gland.



When verified the PV connector is tightly, align the 2 half connector and mate them together by hands until 'click' is felt or heard.



3.5 Battery Connection

3.5.1 Battery power cable connection

Cable Requirement:

Model	Cable Size	Minimum Voltage	Torque for cable connection	OT ring
5K/6K	1-2AWG(35-50 mm^2)	600V	20(N·m)	RNB35-6

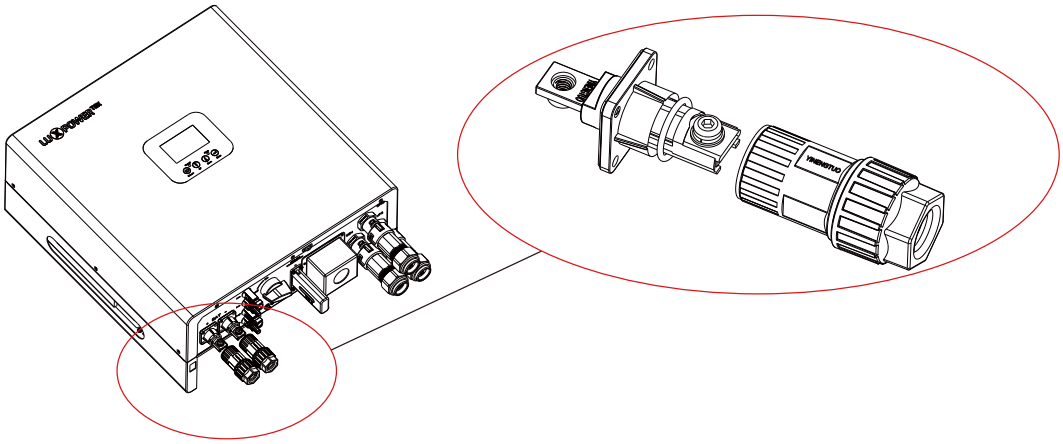
Step 1: Strip 1/4-5/16inch(6-8mm) insulation from the cable end and crimp Cable lugs for the cable ends.

Step 2: Route the battery power cable through the cable gland, connect positive to BAT+,negative to BAT-.

Step 3: Secure the conduit fitting to the enclosure using the counter nut.

Step 4: Fasten the OT rings of battery positive and negative cables to the lugs according to the marking.

Step 5: Fix the cable gland in place.

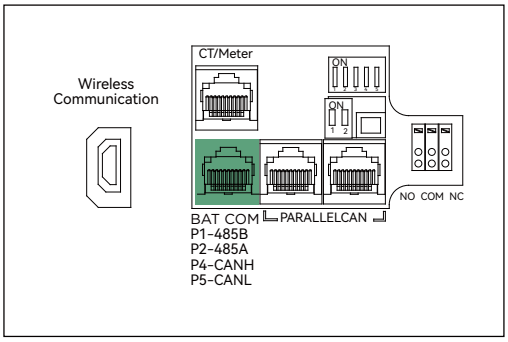


3.5.2 Battery communication cable connection

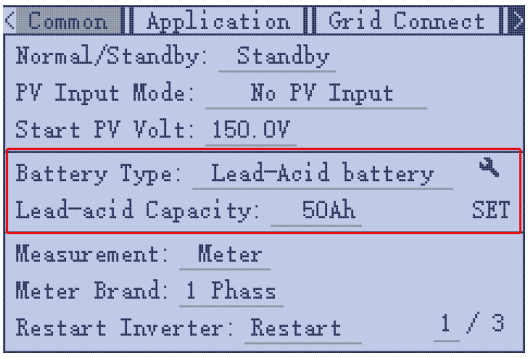
A correct battery communication cable must be used to connect the battery to the inverter when users choose lithium-ion battery type. Please select 'Lead-acid ' type if the lithium battery can not communicate with inverter. The battery communication port on inverter is a RJ45 socket, Pin for the RJ45 plug of the communication cable is as below. Make the communication cable according to the below inverter Pin and the correct pinout of communication port on battery. The inverter supports both CAN and RS485 communication.

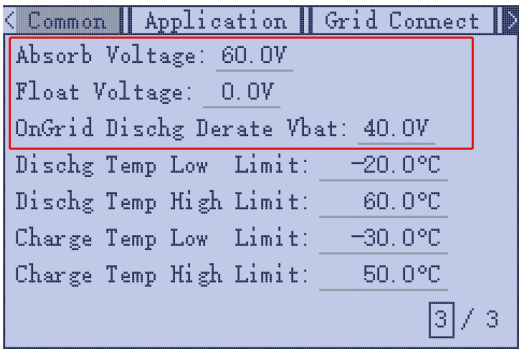
If using a Luxpower battery, select lithium type for option 6: Luxpower; for Hina battery, select lithium type option 1: Hina Battery.

Pin	Description
1	BAT RS485 B
2	BAT RS485 A
3	
4	BAT CAN H
5	BAT CAN L
6	
7	
8	



After battery power cable and communication cable connection, users need to enter Advanced setting and choose Battery type and brand on the inverter LCD





NOTICE

For Li-ion battery

1. Please make sure the lithium-ion battery to be used is compatible with our inverters. Please contact your distributor for updated battery compatible list.
2. If you are using multiple battery modules with the inverter, the inverter communication cable must be connected to the master battery. Please check with your battery supplier for battery master and slave settings.

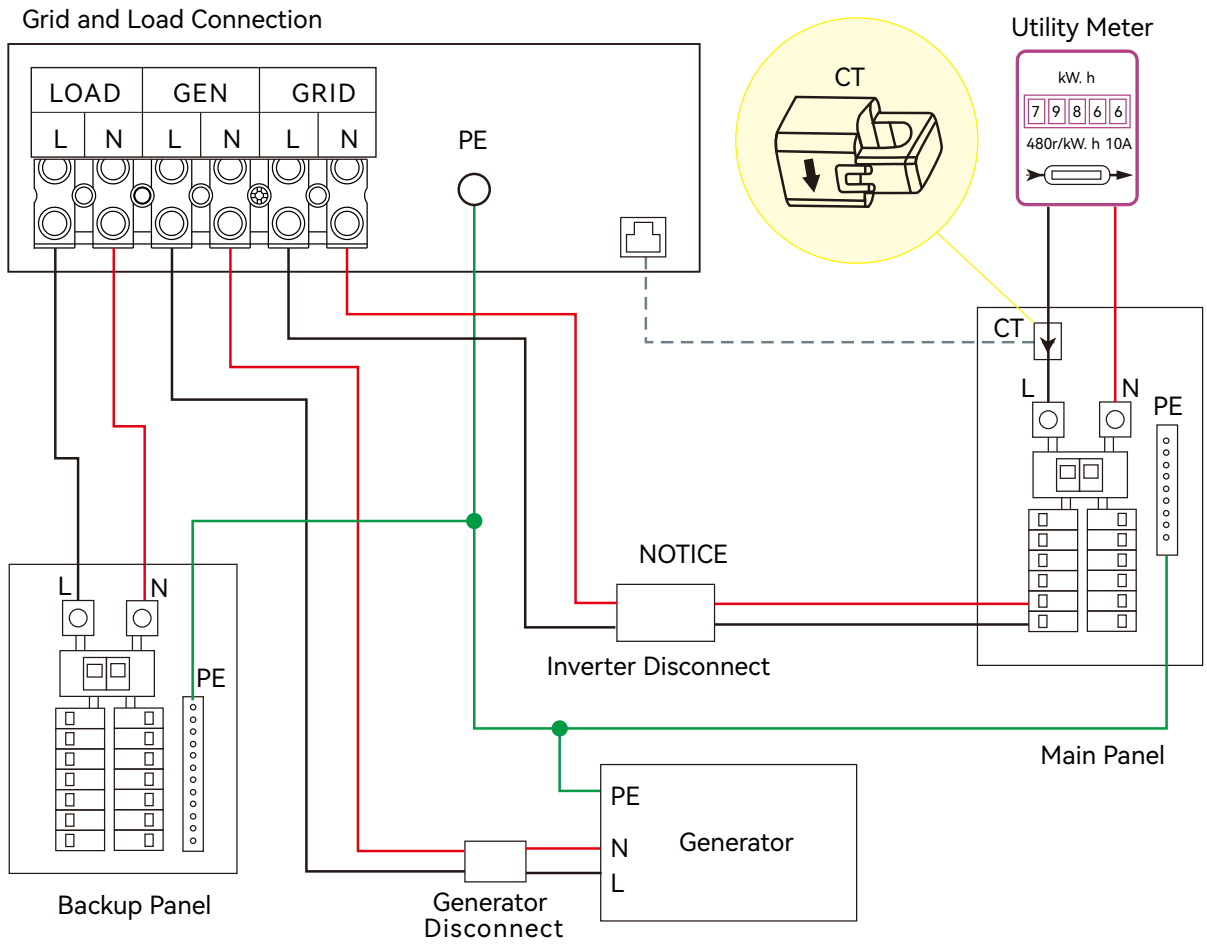
For Lead-acid battery

1. The temperature sensor for lead-acid battery is optional. If you need it, please contact distributor for purchasing.
2. There are three stages for lead-acid battery charging.
For charging/discharge related parameters, "Setting->Common Page 3" Modify the "Page 3" settings (this page will appear only when set to lead-acid battery).

3.6 Grid & LOAD Connection

3.6.1 Grid and load connection

The inverter can be connected to the load side of the service disconnecting means if the busbar rating in the main panel can meet the NEC705.12(B)(3) requirements. Otherwise, a Line side connection can be made to avoid an expensive main panel upgrade.



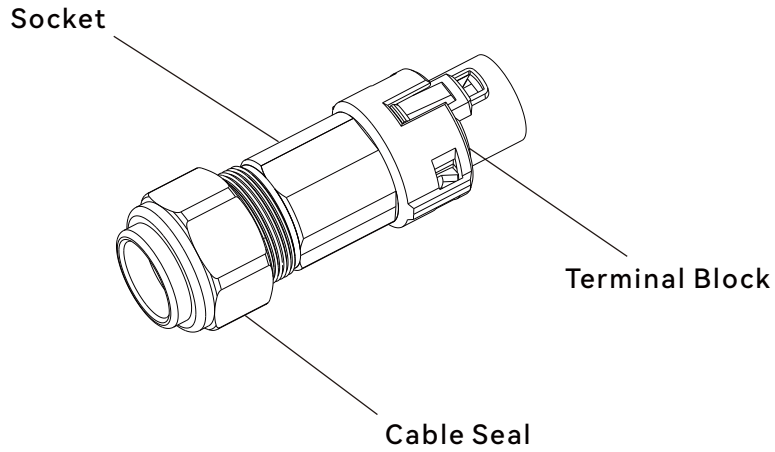
3.6.2 AC cable connection

Cable Requirement:

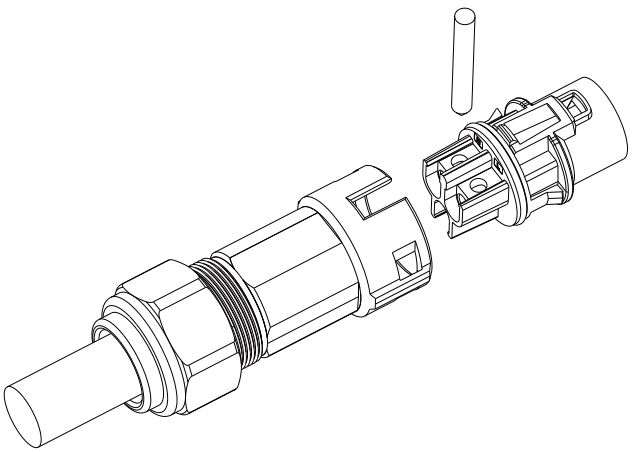
	Cable Size	Minimum Voltage
Grid terminal	8-6 AWG(9-14mm²)	600V
Load/Gen terminal	10AWG(4-6mm²)	600V

Step 1: Installation of Grid Connector

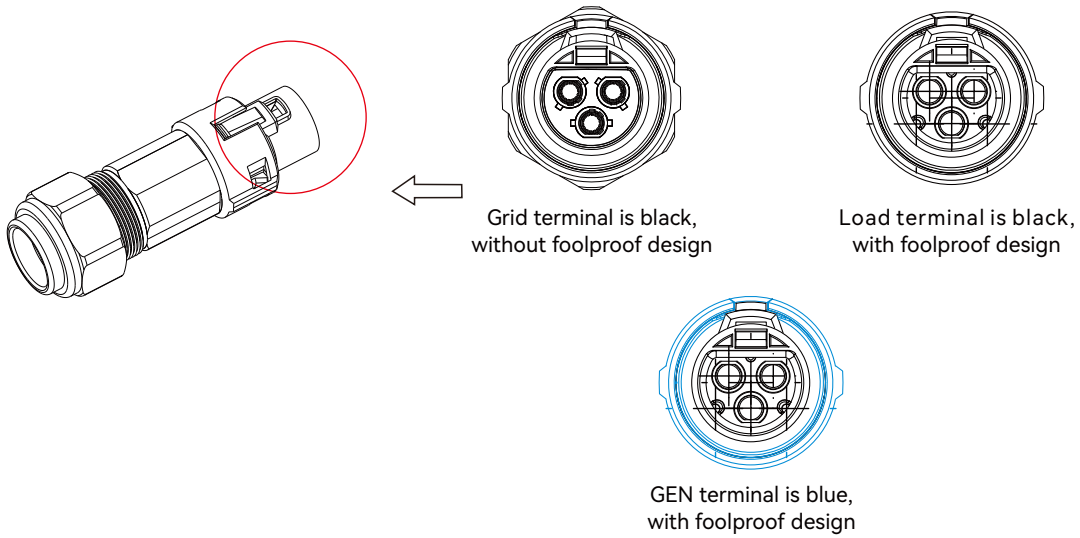
Component Overview



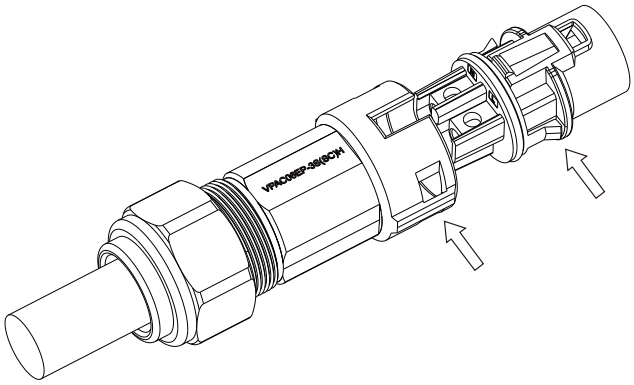
a). Thread the AC cable through the cable seal and socket. Insert the conductors fully into the corresponding terminals of the terminal block and tighten the screws.



b). Refer to the image to ensure correct AC cable connection.



c). Assemble the Grid connector,ensuring that the ribs of the terminal block and the grooves on the housing are fully engaged until you feel or hera a distinct “click”.



Step 2: Installation of Load Connector

a). Align the Load connector with the AC terminals, and manually engage them until you hear or feel a distinct “click”.

b). Install an AC circuit breaker (AC switch) between the inverter and the grid. Before connecting the AC cable from the inverter to the AC circuit breaker, ensure the AC circuit breaker is functioning properly. Close the AC circuit breaker and leave it in the open position.

c). Connect the PE conductor to the grounding pole, and connect the N and L conductors to the AC circuit breaker.

d). Connect the AC circuit breaker to the AC grid.

e). Install a separate single-phase circuit breaker or other load disconnection device for each inverter to ensure safe disconnection under load.

NOTICE

The inverter features residual current detection and protection functions. If the inverter must be equippedwith an AC circuit breaker with residual current detection capability. An AC circuit breaker with a rated residual current greater than 300mA must be selected.

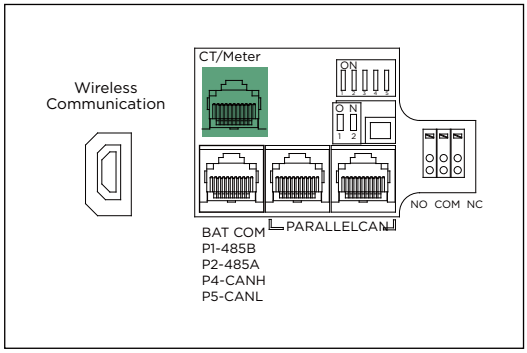
3.6.3 CT/Meter connection

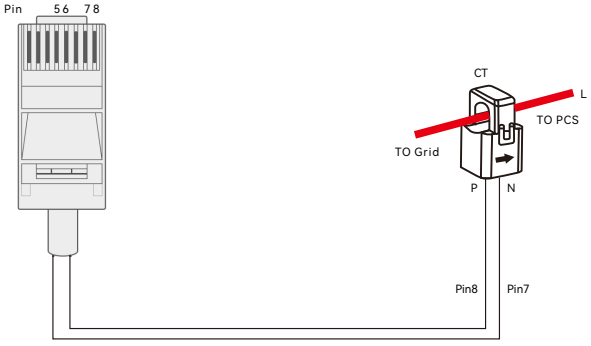
To measure the power import from and export to the grid, a CT or one meter must be installed at the service entry point in or near the main service panel. We standard supply 1 CT for one inverter.

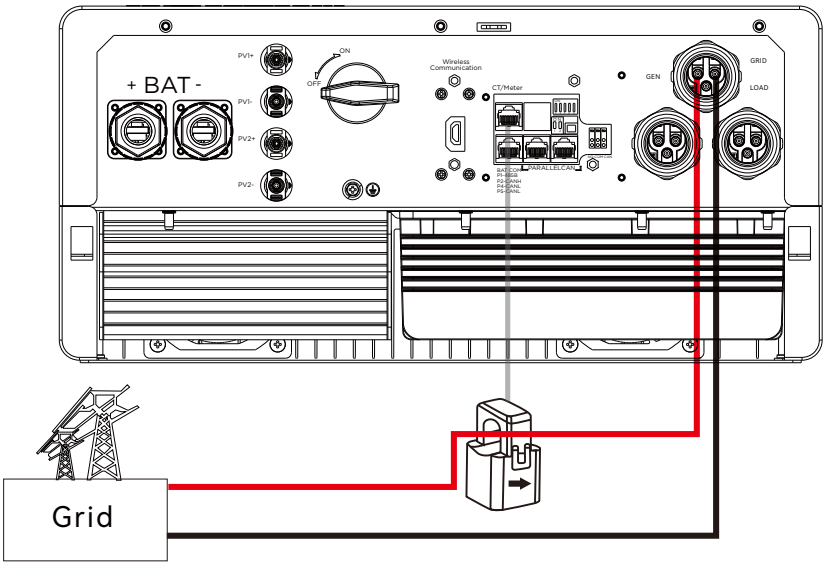
Extend CT clamp cable

The CT interface for 1 CT connection is a RJ45 port, we have made a RJ45 plug on tose 1 CT in advance, so you can connect it to port directly.

Pin	Description
1	Meter RS485 B
2	Meter RS485 A
3	INV RS485 B
4	INV RS485 A
5	
6	
7	CT N
8	CT P







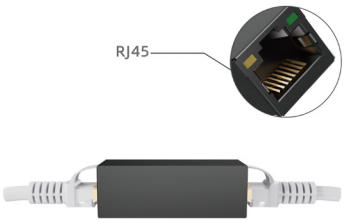
Please refer to the above connection diagram for the correct positions of CTs. The arrows on the CTs must point to inverter side.

CT Clamp Ratio

The inverter support 3 ratios of CT clamp-1000:1, 2000:1 and 3000:1. The CT ratio in the accessory bag is 1000:1. 1f 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.

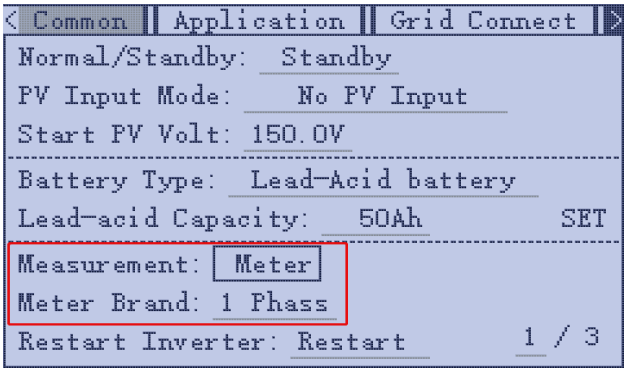
Extend CT clamp cable

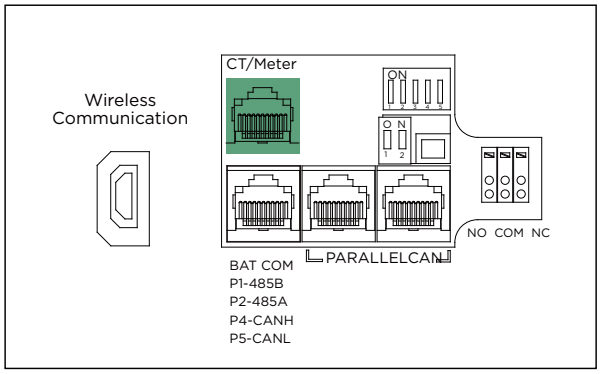
The CT wires can be extended with a common ethernet cable if the length is not enough. An RJ45 adapter is needed for the extension. The CT wires can be extended up to 300ft(around 100m).



Meter Connection

Currently only EASTRON Modbus version meters can be used. If you need to use meter for import/export detection instead of CT, you need to connect it to the Meter 485A and 485B terminals on the inverter, please contact Luxpower for detailed guideline.



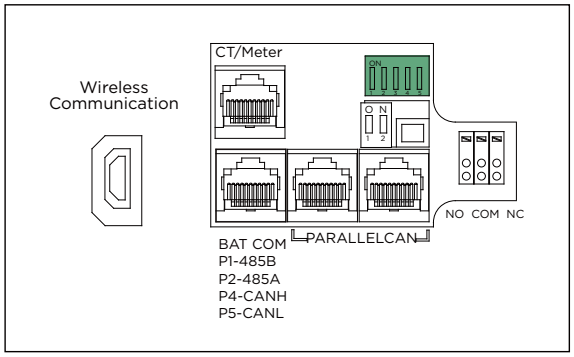


3.6.4 Safety Standard Configuration - Sw2

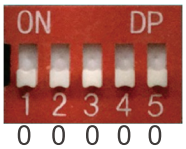
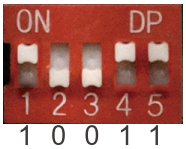
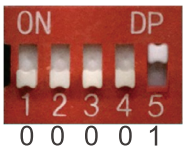
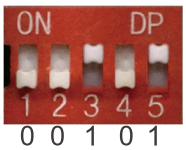
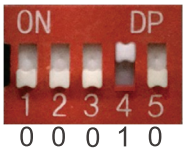
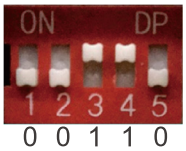
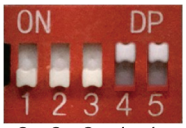
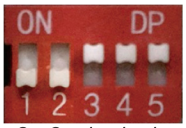
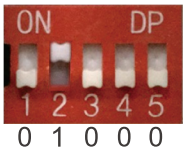
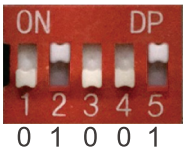
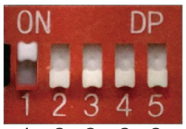
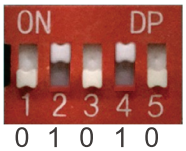
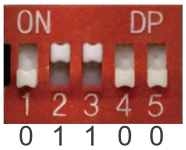
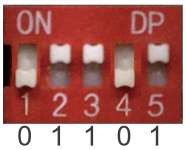
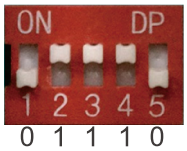
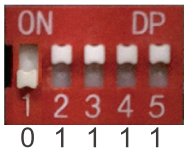
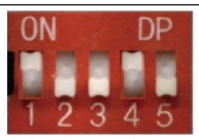
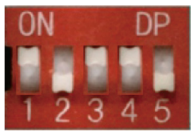
By configuring the DIP switch the inverter could comply with different safety requirements of various areas.

Sw2 Safety Standard Configuration Switch Overview

Note: The DIP switch is composed of five-digit binary number PINs. Each PIN has two status, when set upward to“ON”, its value turns to“1”, when set downward, its value turns to “0”.



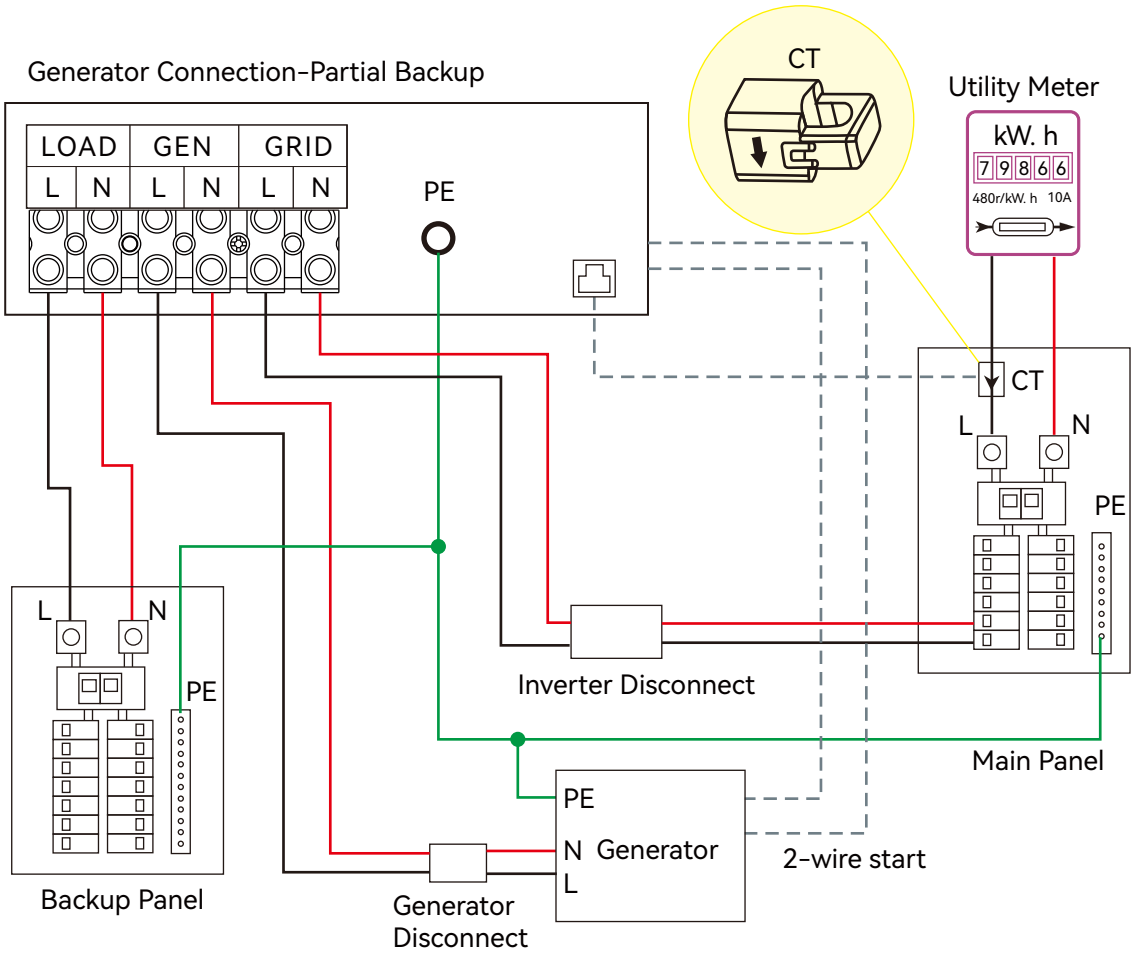
Safety Standard Configuration Guidance

Country Standard	SW2 Configuration	Country Standard	SW2 Configuration
Default VDE0126		En50549	
Germany VDE0126		United Kingdom G99	
Australia AS4777		United Kingdom G98	
New Zealand NZS		Germany N4105	
Italy CEI0-21		Europe EN50438	
South Africa NRS 097-2-1		Finland EN 50438	
Thailand PEA		Thailand MEA	
Ireland EN 50438		Czech EN 50438	
CEIO-21 ARET		Spain RD 1699, RD 413, RD 647, UNE 217001, NTS TYPE A	
Belgium C10/C11			

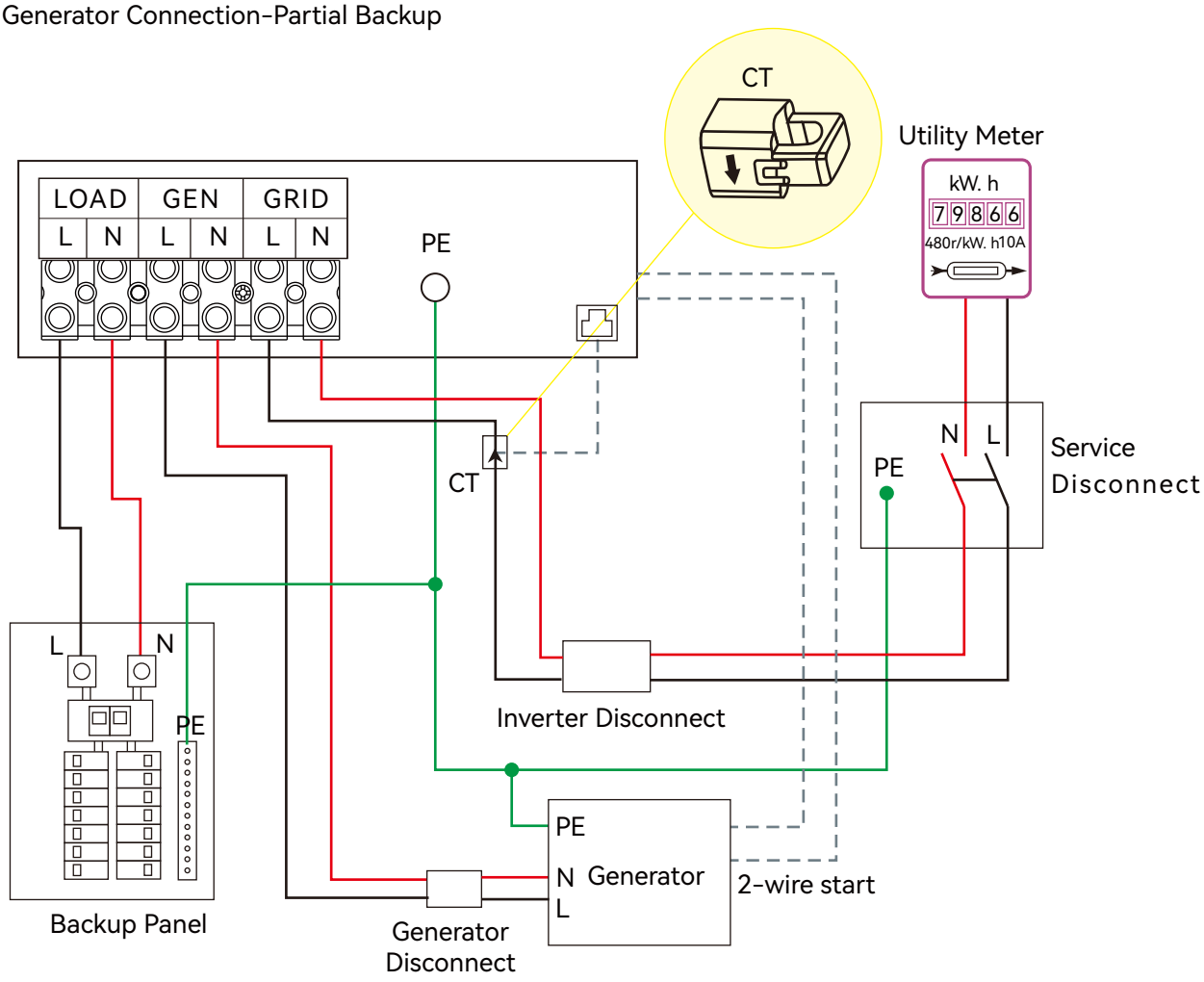
3.7 Working with Generator

3.7.1 Generator system connection

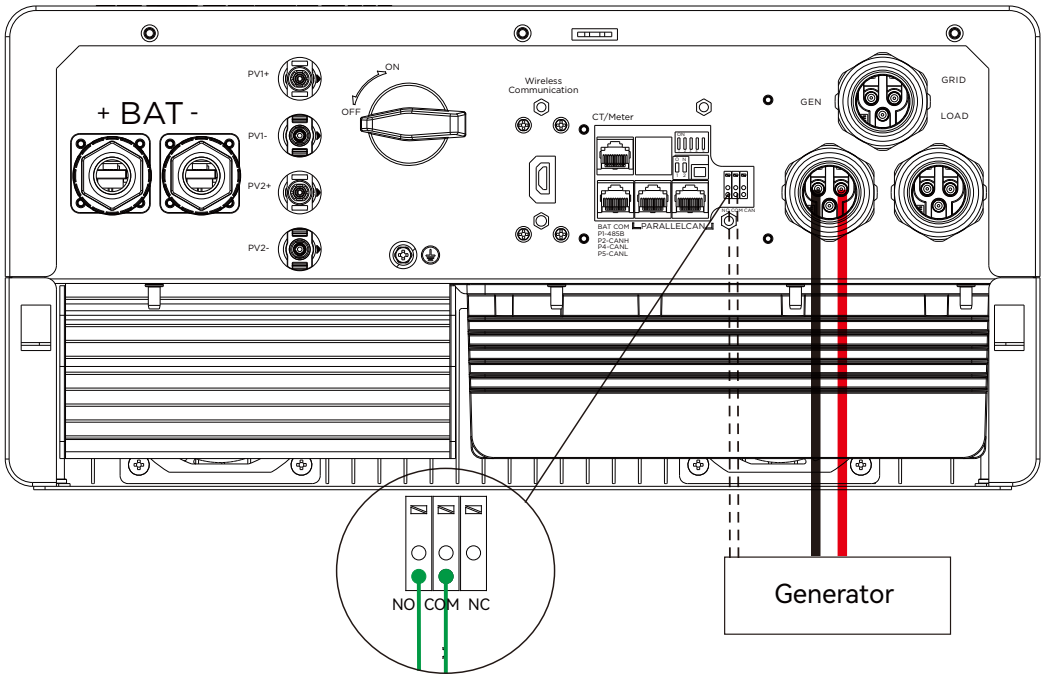
This hybrid inverter can work with generator. There are Gen ports on the inverter for generator connection



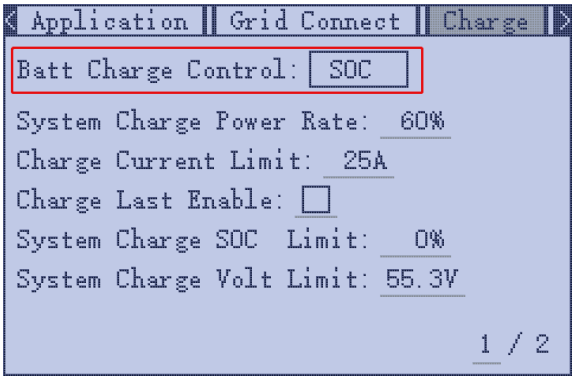
Generator Connection-Partial Backup

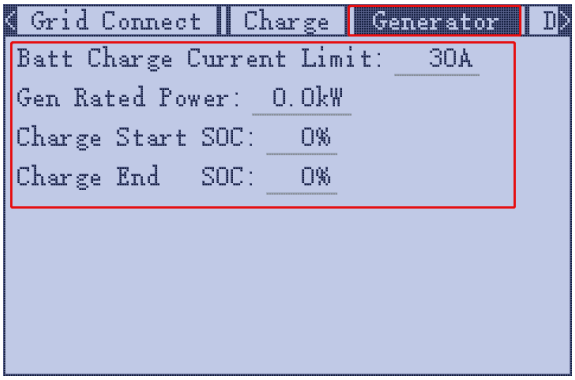


When the generator is started, all loads connected to the LOAD interface will be supplied by the generator.
The maximum current for the generator port connector is 35A. Please ensure that the total load does not exceed 35A when starting the generator.



3.7.2 Generator Startup and Stop settings





It depends on the Bat operating mode setting, The system will use either battery SOC or battery voltage to determine whether the system needs to start or stop the generator.

Generator Start Conditions

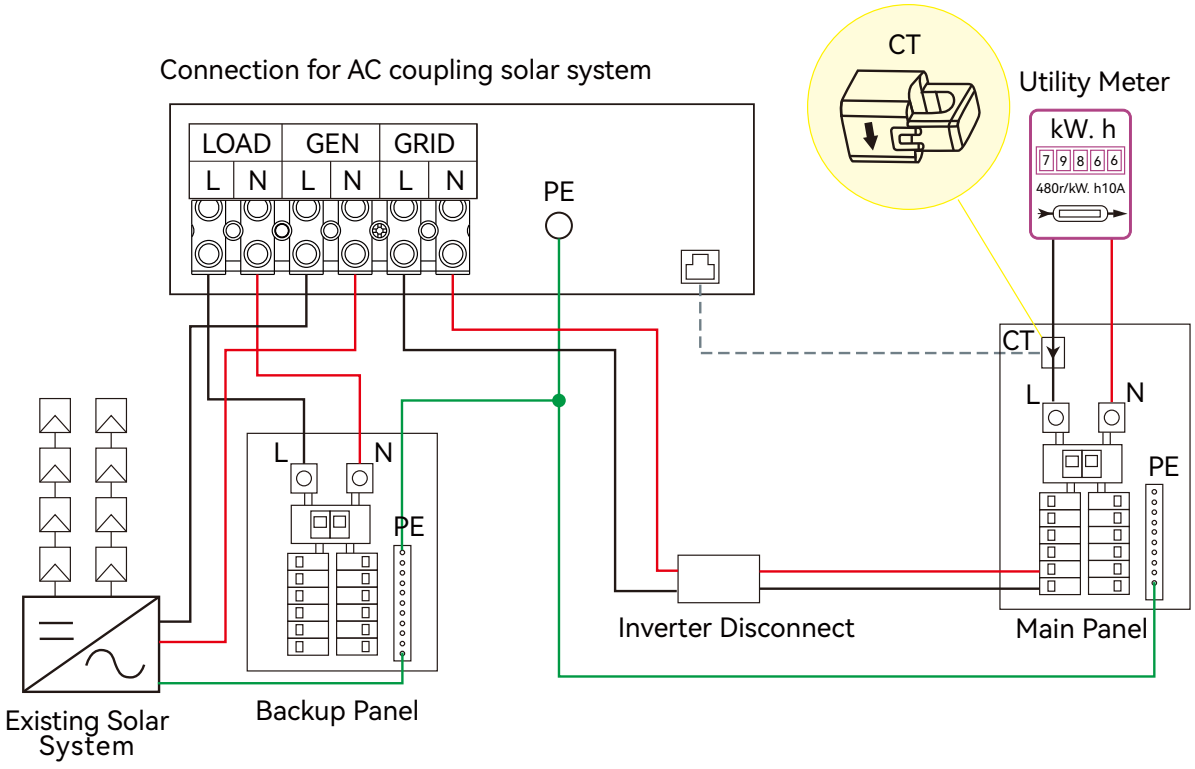
When utility fails and
-When battery is discharged to cut-off settings
or there is force charge request from battery.
or when the battery voltage or SOC is lower than the Generator Charge start Volt/SOC setting value.

Generator Stop Conditions

when battery voltage or SOC is higher than Charge end Volt/SOC setting value.

3.8 AC Coupling Installation Connection

The inverter supports AC coupling connection with the existing on-grid solar system. The existing solar system is connected to the inverter's GEN port.



After AC couple function enabled:
When the Grid is on, the GEN terminal is connected to the grid terminal inside the inverter. In this case the hybrid inverter will bypass the interactive inverter AC to the grid and Load.

When grid is off, The GEN terminal is connected to the LOAD terminal inside the inverter. In this case, the loads will be first supplied by solar power. If solar panels are generating more power than load consumption, the excess solar power will be stored to the battery. When solar power exceeds the sum of load power and max battery charging power, e.g. when battery is nearly full. The inverter will signal the grid interactive inverter to reduce power via the frequency shifting power reduction mechanism, thus to maintain the balance of generation and consumption of the micro grid system.

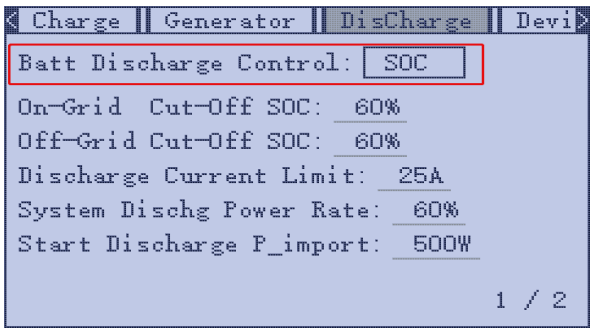
AC Coupling Settings

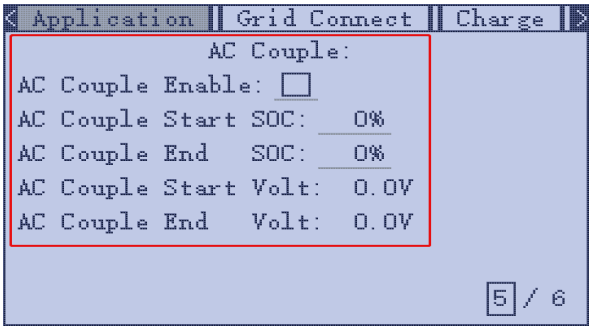
Users need to enable AC coupling function when they connect existing on grid system to GEN terminal

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

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

When On-Grid and Grid Sell Back enabled, the AC coupling inverter will always be on, and it will sell any extra power back to the grid. Ensure you are allowed to sell power to your utility provider.
When Grid Sell Back is disabled, the AC-coupled inverter will stay at off mode and could not work at on-grid mode to sell power to utility grid.



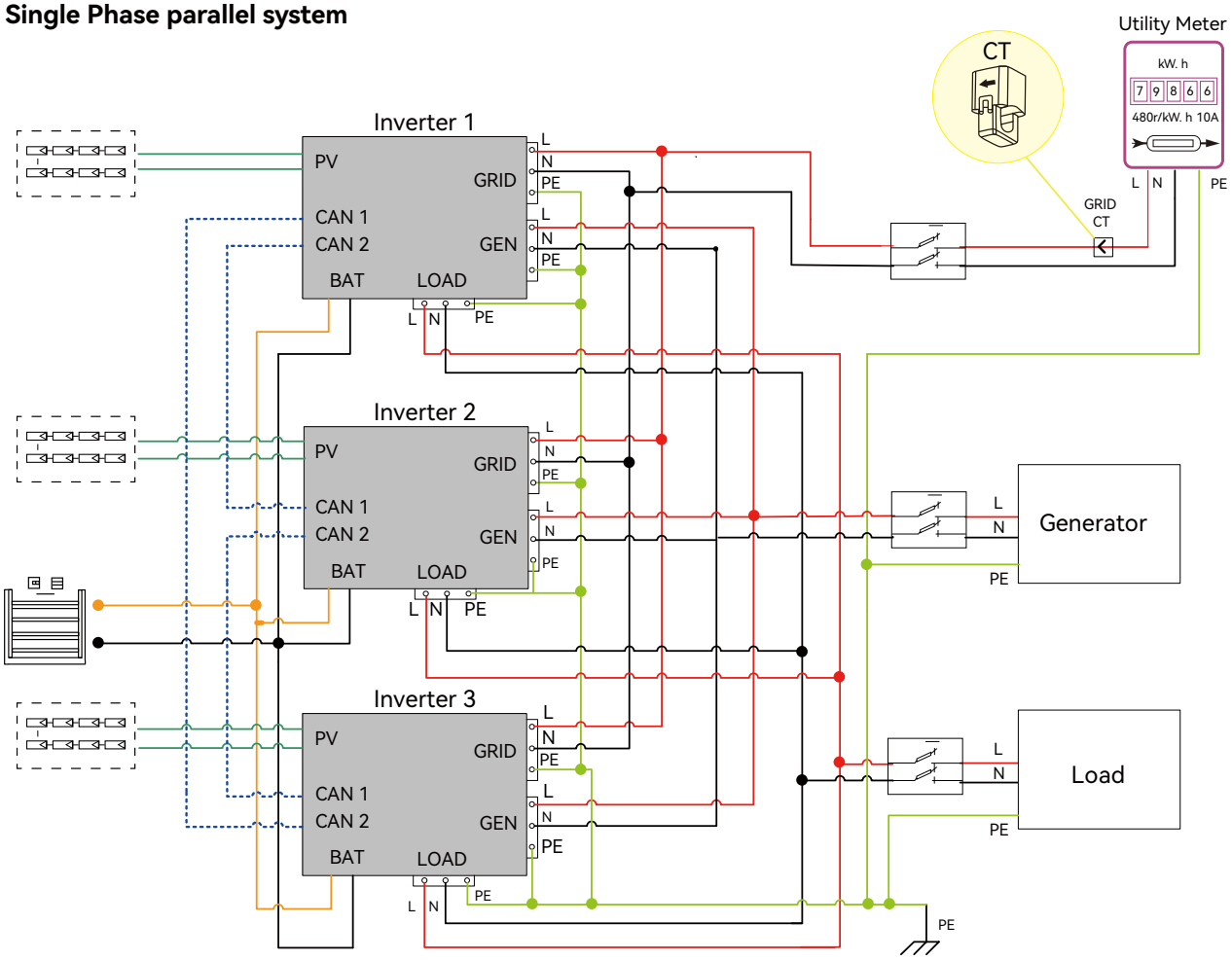


3.9 Parallel System Connection

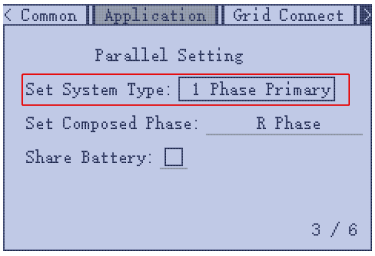
3.9.1 Connection for paralleling system

The hybrid inverter supports parallel connection to expand power and energy capacity to suit different using scenarios. Up to 6 units can be paralleled to reach a capacity of 36kW. Wiring diagram is as below, The manual bypass switch connect essential loads to LOAD panel for default. When inverters fail, users can switch the loads to utility.

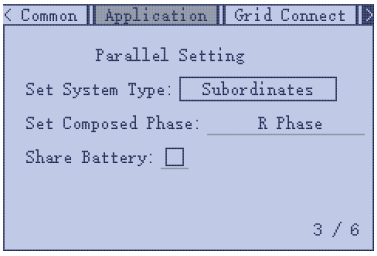
Single Phase parallel system



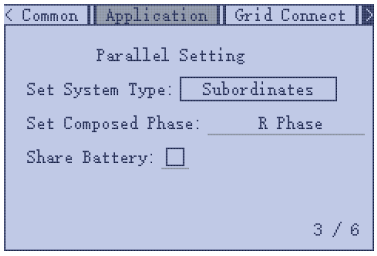
Inv1 setting



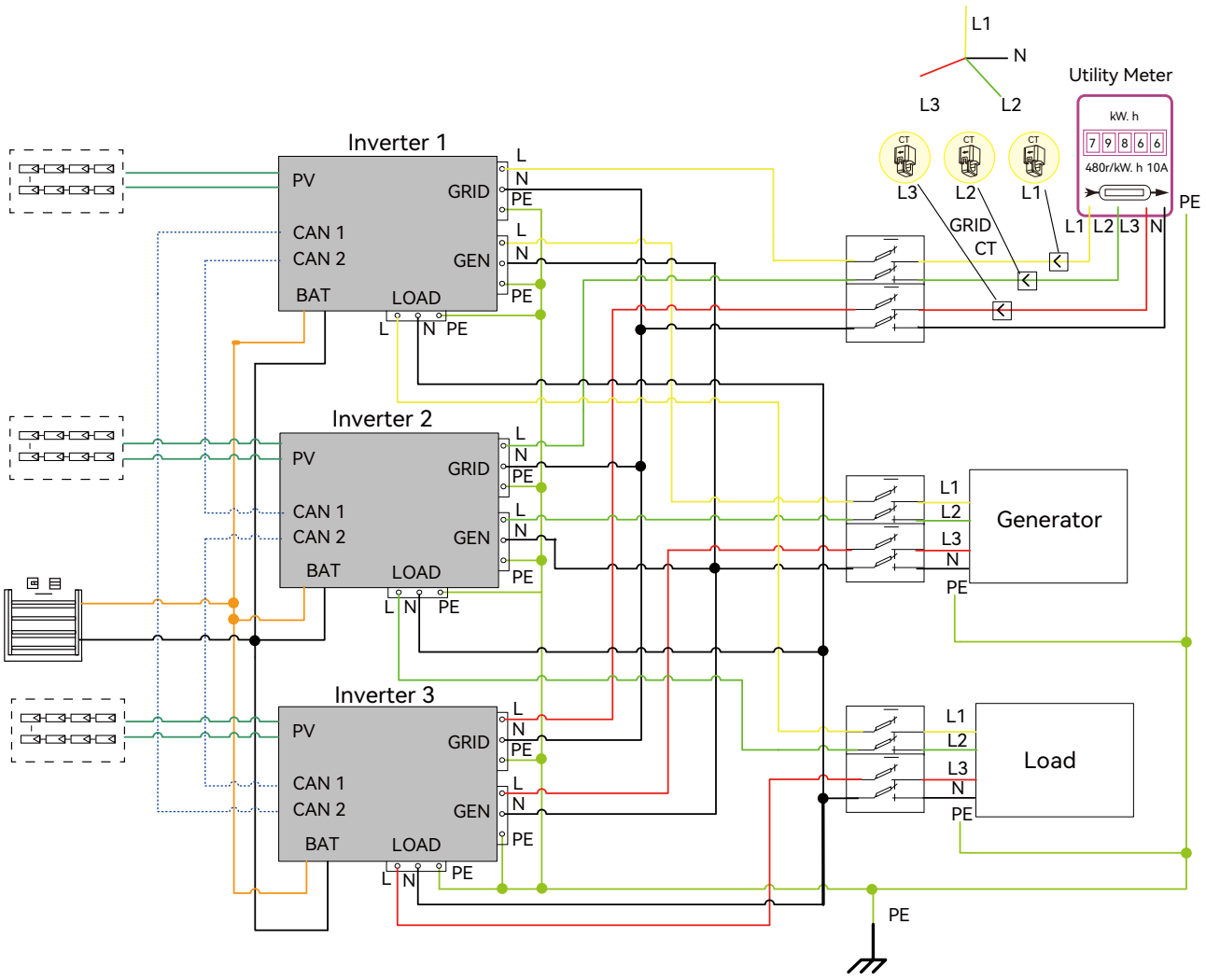
Inv2 setting



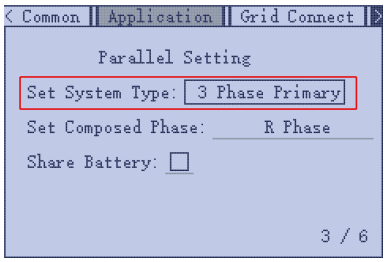
Inv3 setting



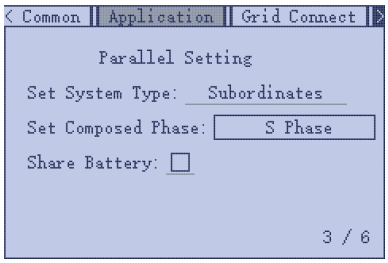
Three Phase parallel system



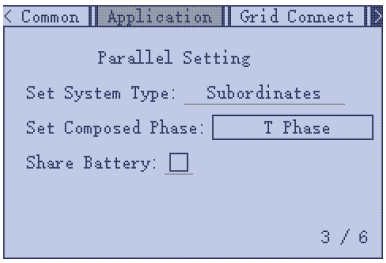
Inv1 setting



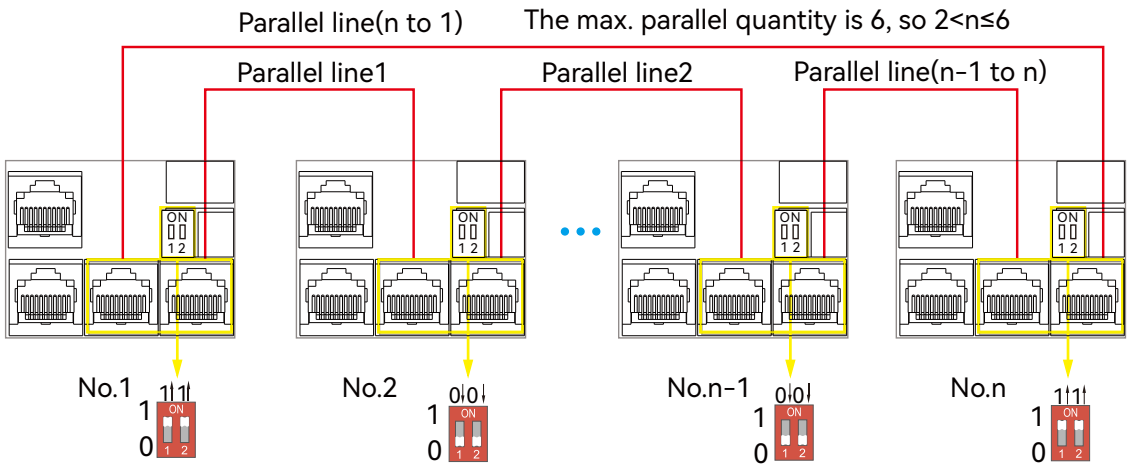
Inv2 setting



Inv3 setting



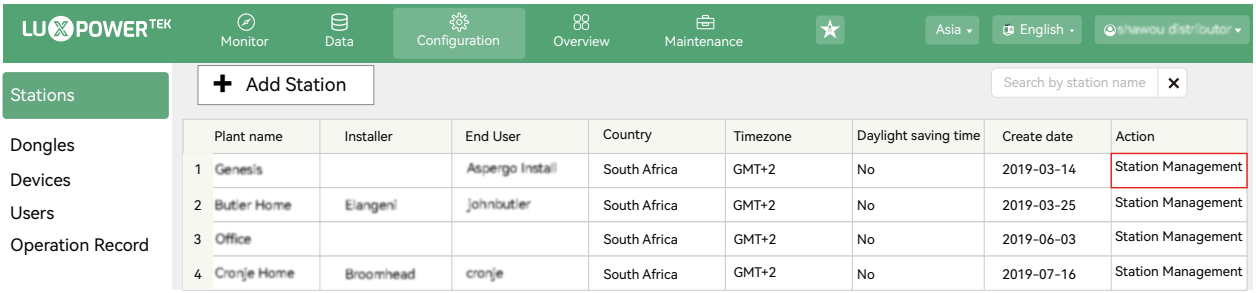
Please put the CAN communication PIN to on status for the first and the end inverter



If the parallel cable is not enough or long enough, please make a straight pin to pin cable.

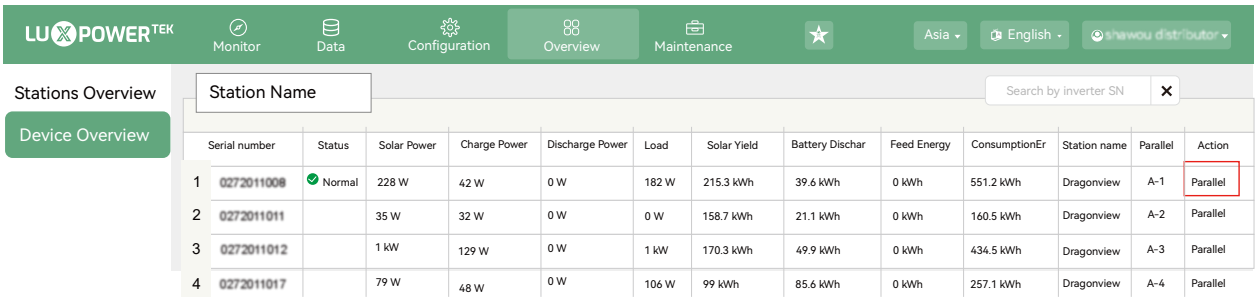
Settings for paralleling function in monitor system

1. Set up monitoring for the system, add all dongles to one station. Users can login to visit the monitoring system, Configuration-> Station-> Station Management-> Add dongle.



2. If the system shares a single battery bank,enable the shared battery function otherwise disable the shared battery function.

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



Please contact your inverter supplier for more detailed guidance for paralleling system

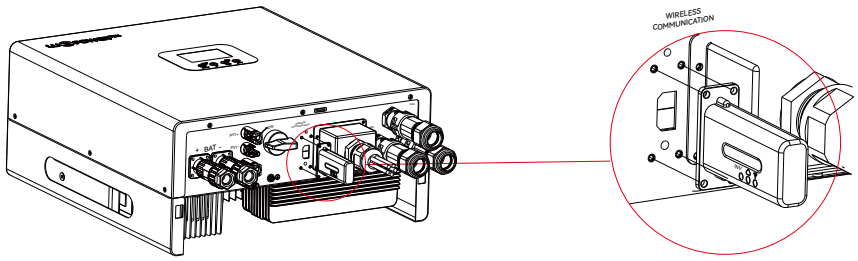
Parallel System Notice

Notices for parallel system:
A. Ensure the Generator is connected to all systems in parallel (if application).
B. If you cannot divide the number of PV panels connected to each inverter, it is recommended to have more PV panels in the primary inverter.
C. The values shown on the LCD of each inverter represent the inverter's contribution, not the total contribution of thr system.

3.10 Monitor System Setup

3.10.1 Wifi/GPRS/4G/WLAN dongle connection

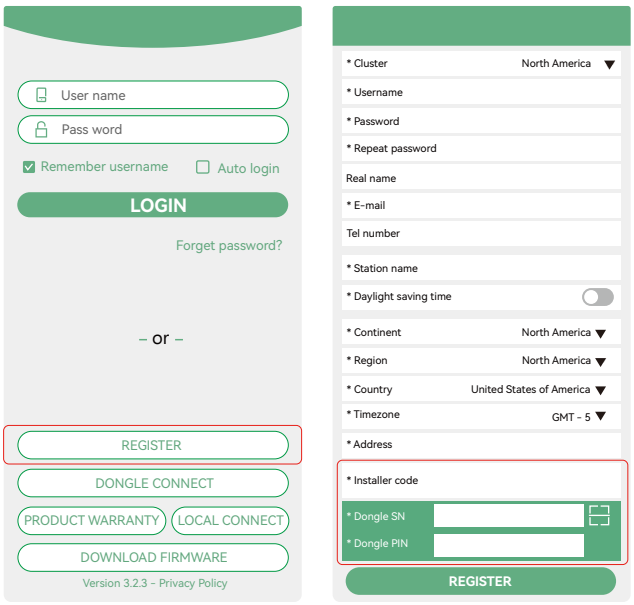
Users can use a WiFi/ WLAN /4G /2G dongle to monitor their inverter, and view the monitoring data on a computer or smart phone remotely.
To view data on smart phone, please download APP from the Google Play or Apple APP store, then login with the user acconunt.



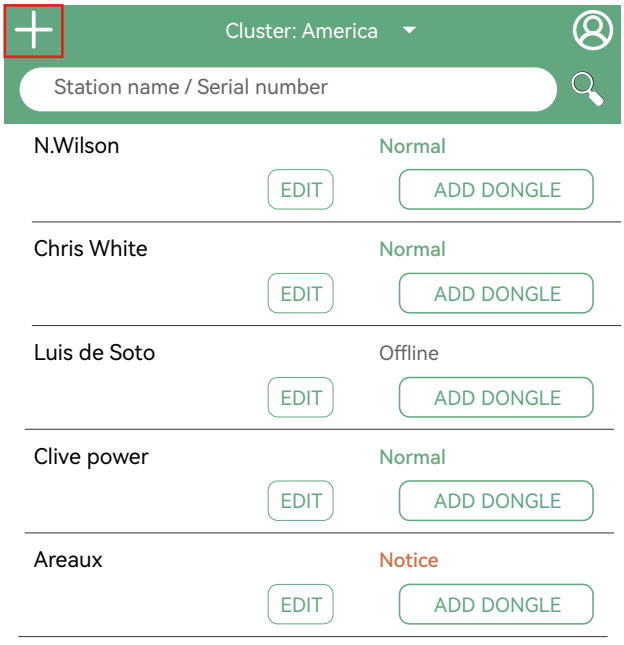
3.10.2 Setup the monitor system

1. Sign up an account on the mobile phone APP or Website

The "customer code" is a code we assign to your distributor or installer. You can contact your supplier for their code.

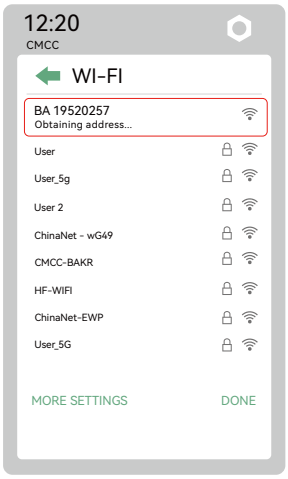


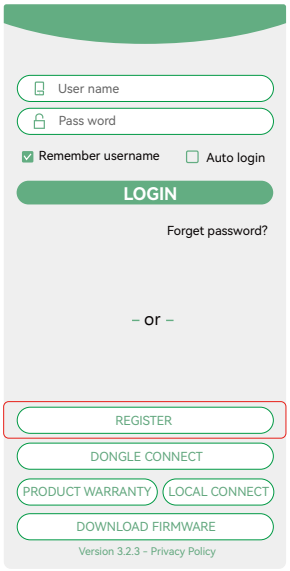
2. The station and wifi dongle will be created auto when you register, if you want have more stations need to be created, you can create as below.

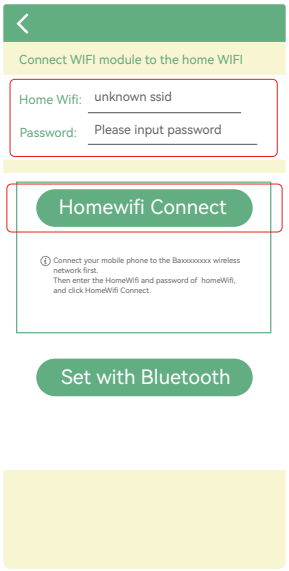


3.10.3 Set homewifi password to dongle

1. Connect your mobile phone to the “BAxxxxxxxx” wireless network where “BAxxxxxxxx” is the serial number of the WiFi dongle.
2. Click the "WiFi MODULE CONNECT" button on the APP
3. Select the home WiFi that the WiFi dongle is to be connected to, and enter the WiFi's password. And then click "HomeWifi Connect". The WiFi dongle will restart and try to connect to our server automatically.
4. Check the LEDs' status on the WiFi dongle. The middle light should be solidly lit when the WiFi dongle connects to our server successfully.







5. Now you can disconnect your mobile phone from the “BAxxxxxxxx” wireless network. Login on the APP with your account, you'll find the inverter information already appears. Now you'll be able to monitor and control the inverter remotely on any smart phone or computer that has an Internet connection.

Please download the following guides for setting up WiFi dongle and monitoring account at Document Reference:

1. Wifi Quick Guidance
- Quick guidance for setting connection of WiFi module to home WiFi, you can also find a printed version in the packaging of the WiFi module.
2. Monitor system setup for Distributors and Monitor system setup for endusers Account registration, the description of each items and parameters, setting parameters
3. Monitor_UI_Introduction
   Introduction of monitor interface

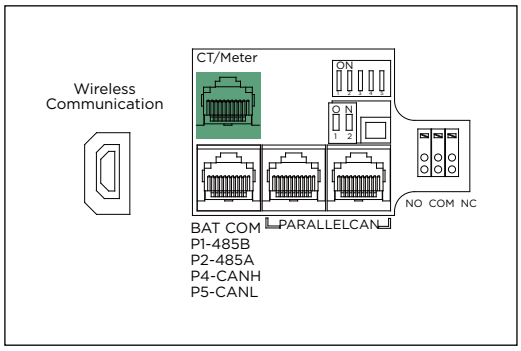
3.10.4 4G dongle monitoring setup

Customer should register the account as 3.10.2 first. Make sure you have put SIM card inside 4G dongle. Plug 4G dongle in, and 5 minutes later, you will be able to see your inverter online.

3.10.5 Third party RS485 communication

INV485: this interface is shared with WIFI module. If WIFI module is not in use, users can use this interface to communicate with inverter. Please contact your distributor to get the protocol for third party APP development.

Pin	Description
1	Meter RS485 B
2	Meter RS485 A
3	INV RS485 B
4	INV RS485 A
5	
6	
7	CT N
8	CT P



4. Operation Guide

4.1. Operation Mode and Function

The inverter has different working modes and functions to meet customers' various demands. The working modes and functions are as below.

4.1.1 Self-usage Mode (Default)

In this mode, the priority order of load supply source is Solar > Battery > Grid. The priority order of solar power usage is Load > Battery > Grid.

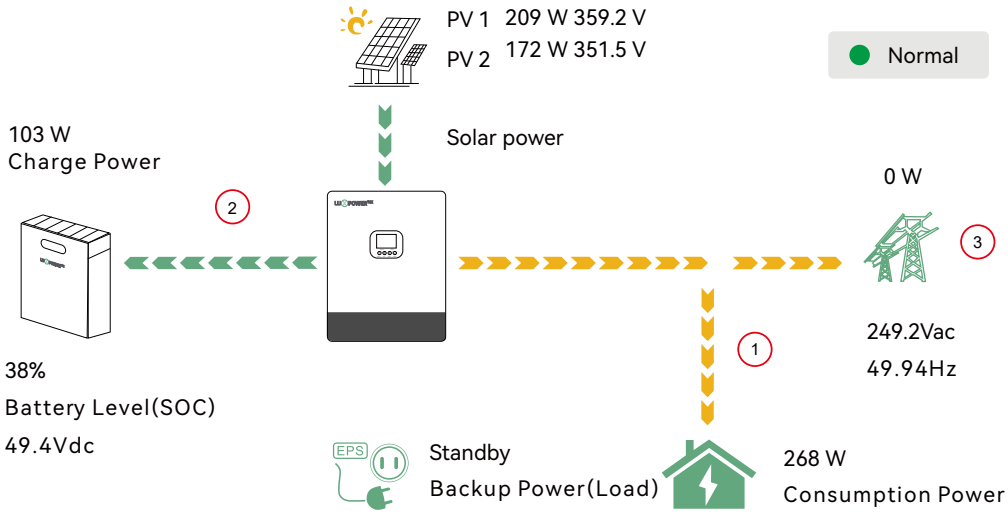
- **Application Scenarios**

  Self consumption mode will increase self consumption rate of solar power and reduce the energy bill significantly

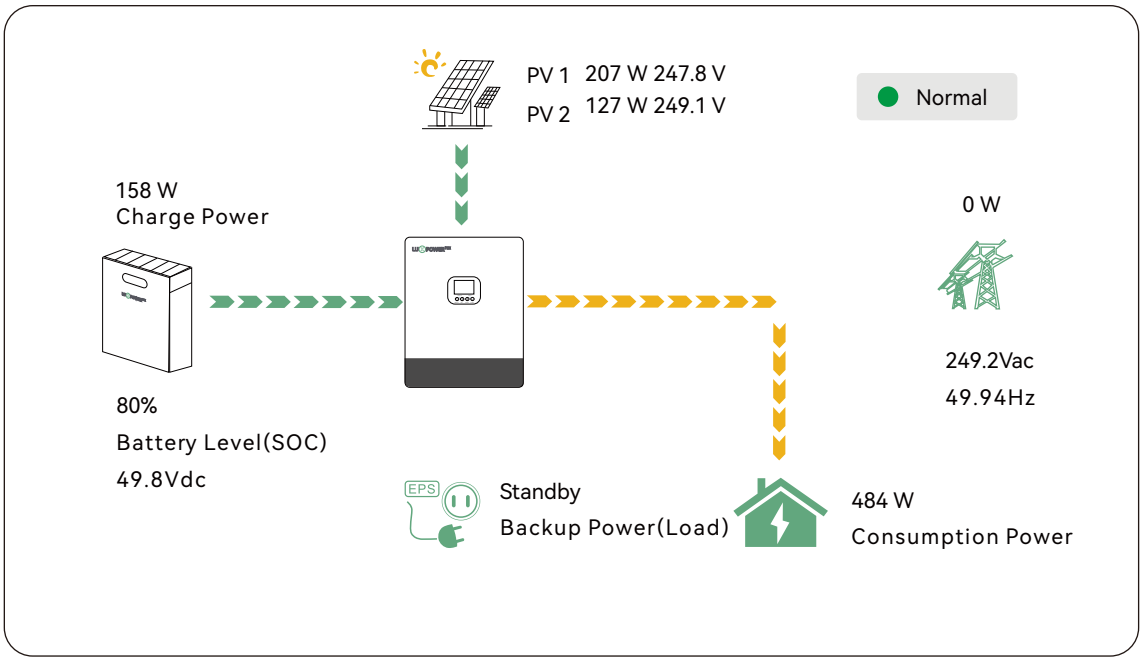
- **Related Settings**

  Effective when Charge Priority, AC Charge, and Forced discharge are disabled

- **Example**



When solar power is enough, solar power will take load, then charge battery, and at last feedback into grid (when feedback function is enabled).



When solar is not enough to take load, the solar and battery will take load together. If battery is empty, grid will used to take load.

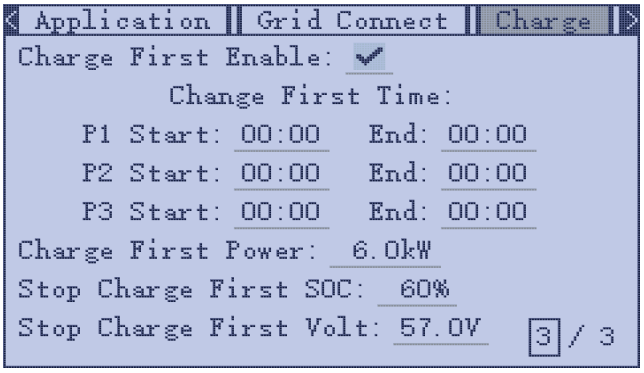
4.1.2 Charge First Mode

The priority order of solar power usage will be Battery > Load > Grid. During Charge Priority time period, load is first supplied with grid power. If there is excess solar power after battery charging, the excess solar power will take load together with grid power.

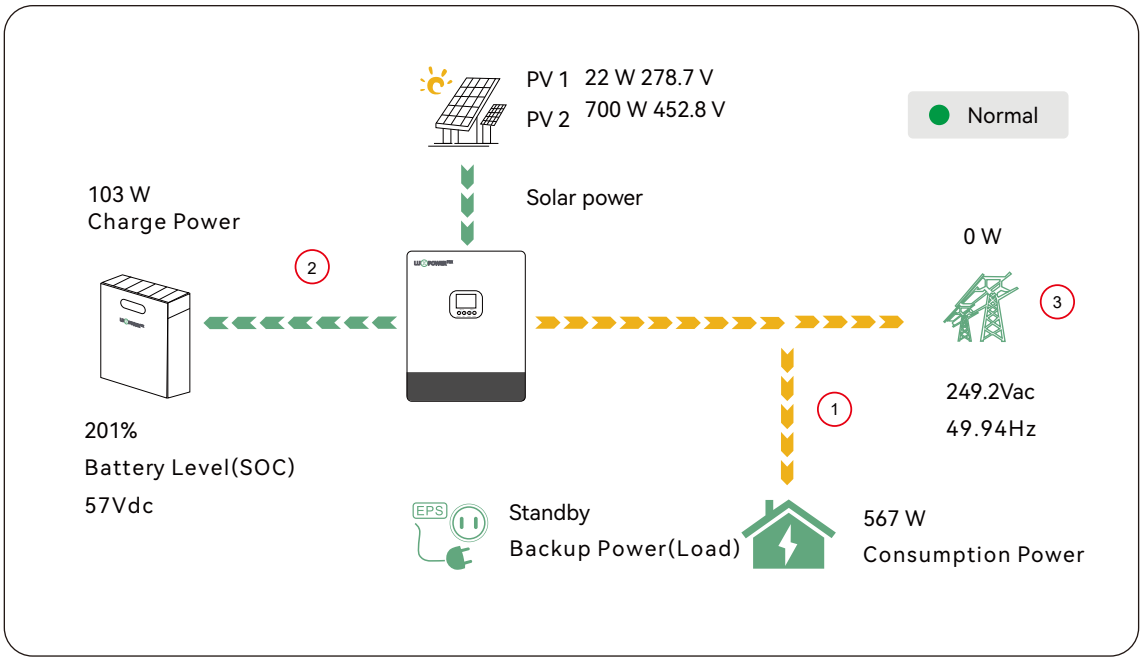
- **Application Scenarios**

  When users want to use solar power to charge battery, grid power to supply load.

- **Related Settings**



- **Example**



Solar power will used to charge battery first, if there is extra power, it will be used to take load.

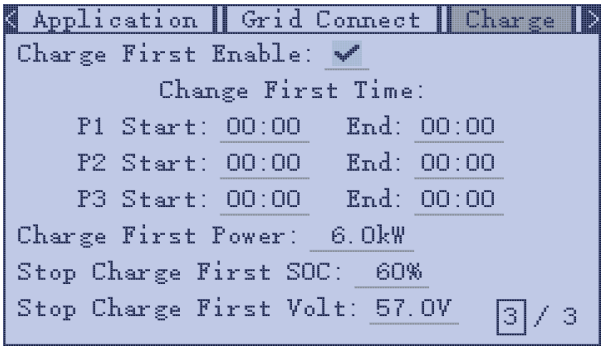
4.1.3 AC Charge Mode

Users can charge batteries with grid power when electricity prices are cheap, and discharge battery power to supply load or export to the grid when electricity prices are high.

- Application Scenarios

  When users have a Time of Use(TOU) rate plan.

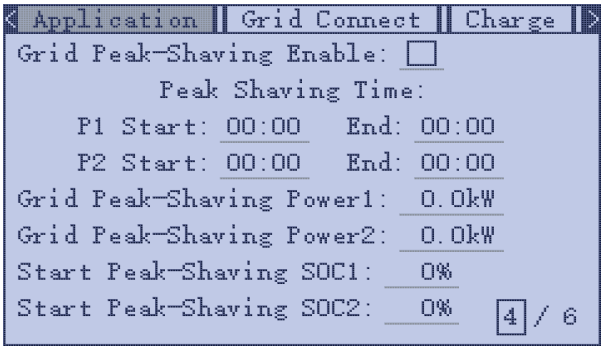
- Related Settings



4.1.4 Grid peak-shaving Function

Grid peak-shaving & Grid peak-shaving power(kW):

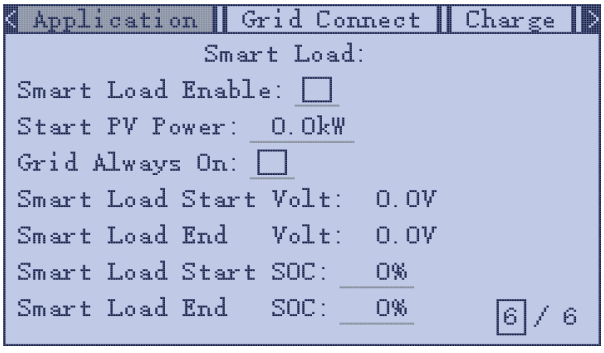
Is used to set the maximum power that the inverter will draw from its grid power. And the Peak-shaving power needs to be set to more than 0.2(KW).



4.1.5 Smart Load Function

Smart Load: This function is to make the Gen input

connection point as an load connection point, if you enable it,inverter will supply power to this load when the battery SOC and PV power is above a user setup value.e.g. Smart load start SOC=90%, Smart load end SOC=85%,Start PV power=300W, it means: When the PV power exceeds 300w, and the battery system SOC gets to 90%, the Smart Load Port will switch on automatically to supply the load which is connected on this side. When the battery reaches SOC<85% or PV power<300w, the Smart Load Port switch off automatically.



Note:

If you enable the Smart load function, it's forbidden to connect the generator at the same time, otherwise the device will be damaged!

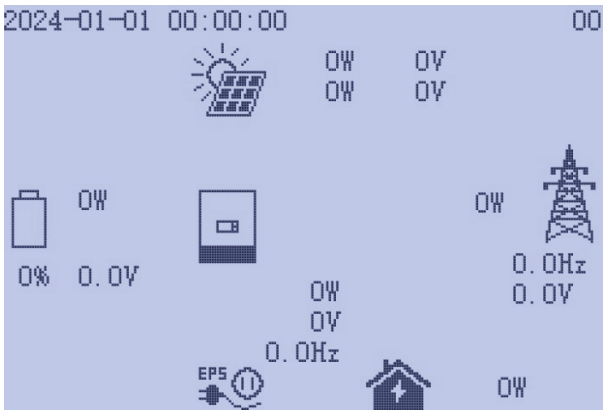
4.2 LCD Display

Users can view inverter running status, real time power, daily and accumulated energy information conveniently on inverter LCD. In addition to the above information, users can also check alarm and fault record on the display for troubleshooting.

4.2.1 Viewing information and alarm/fault record

Home Page

Users will see a system overview diagram and real-time information for each component, such as battery SOC, battery charging/discharging power, grid input/output power, load power, PV voltage, and power.

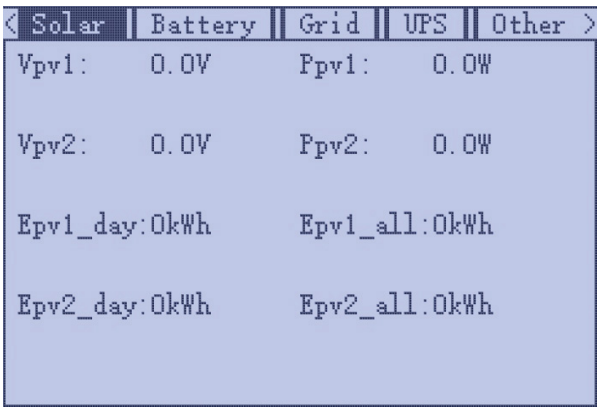


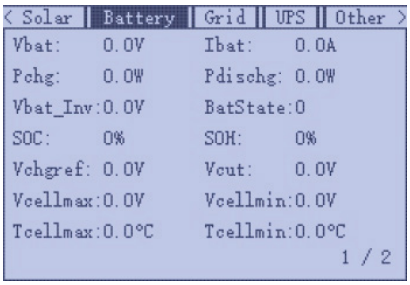
Content

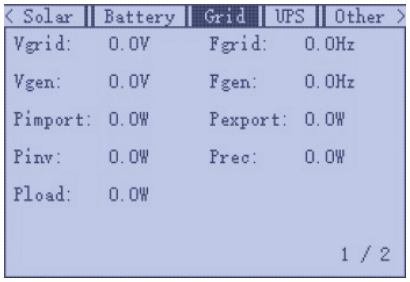
Press the Enter key to enter the directory page.

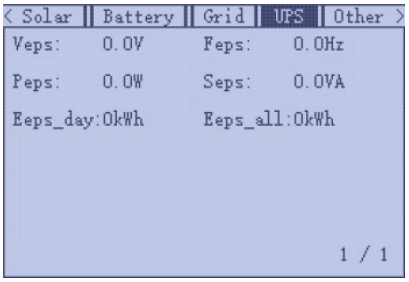
Detailed System Information

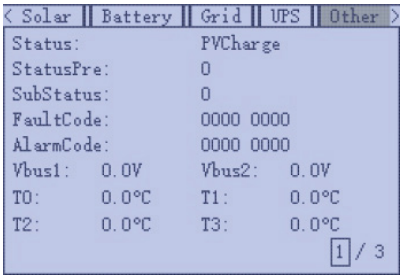
Select the Data function in the directory, and you'll be able to view detailed real-time solar information, battery information, grid information, and Load output information.

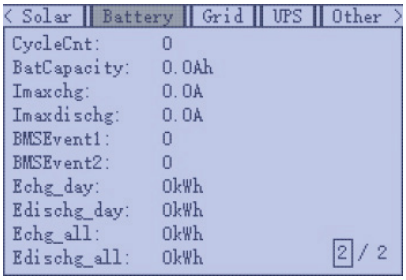


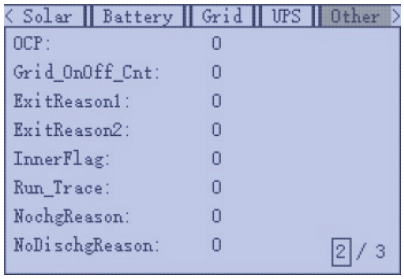


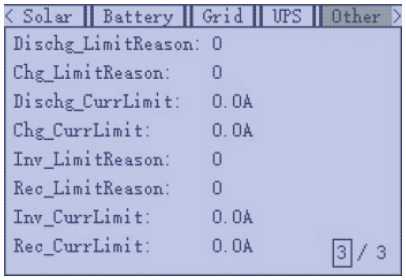






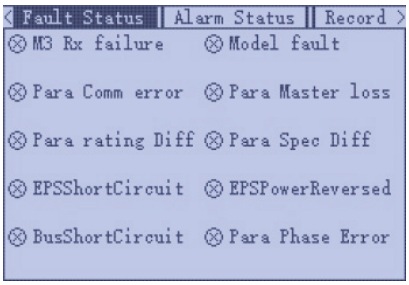


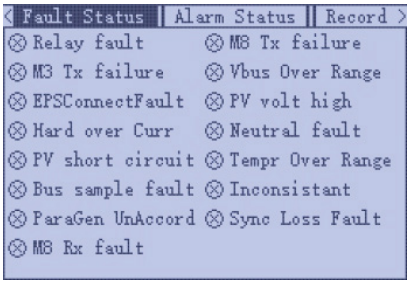


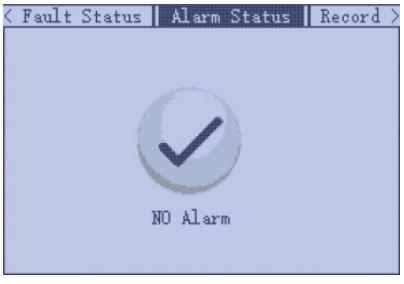


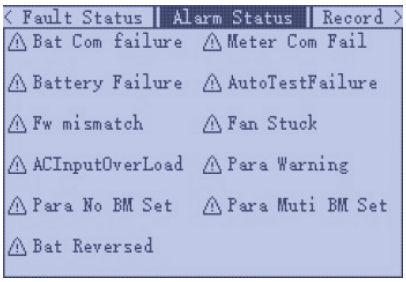
Fault/Alarm Information

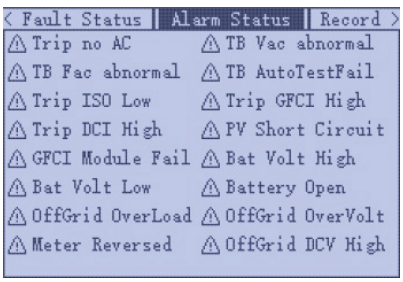
Select the Notice function in the menu, and you'll see all the current and historical fault and warning information on this page.





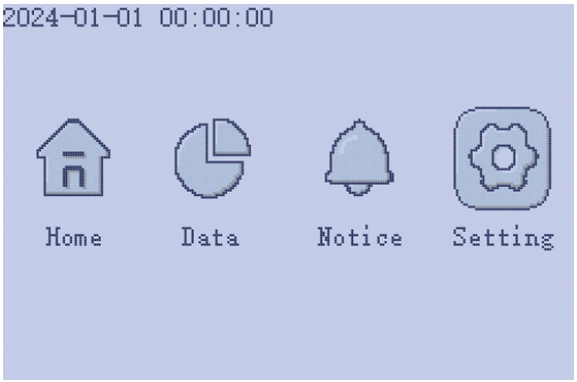




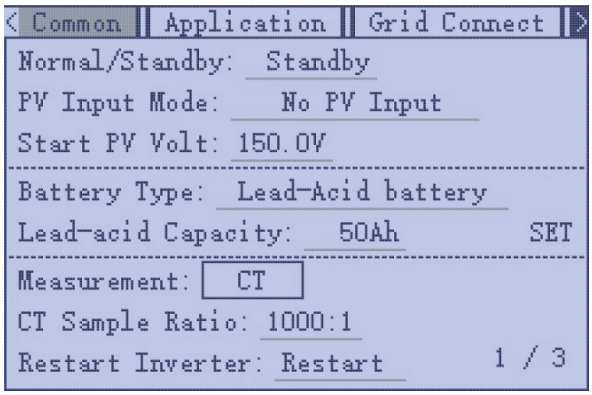


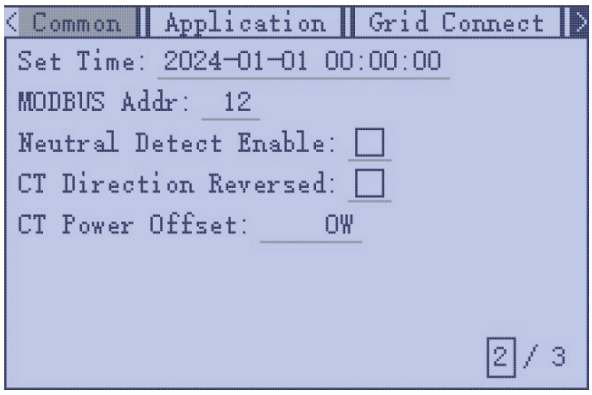
4.2.2 Setting Parameters

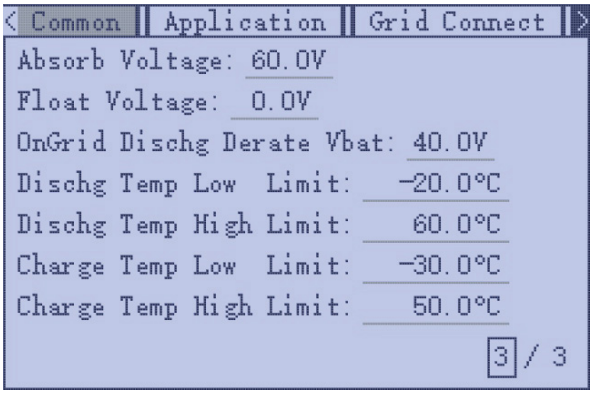
Select the Setting function in the menu, and you'll get into the parameter setting page of the inverter.



a). Common settings



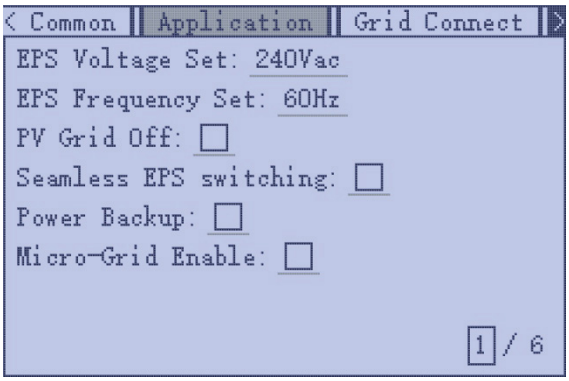


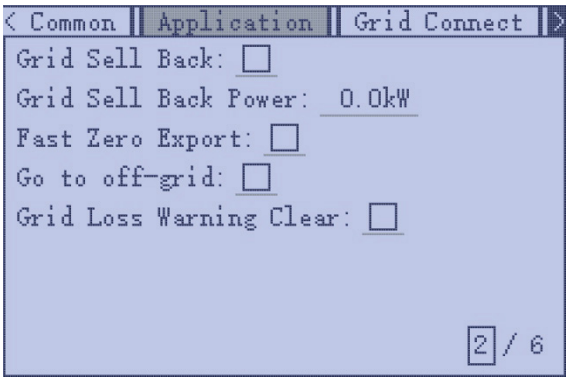


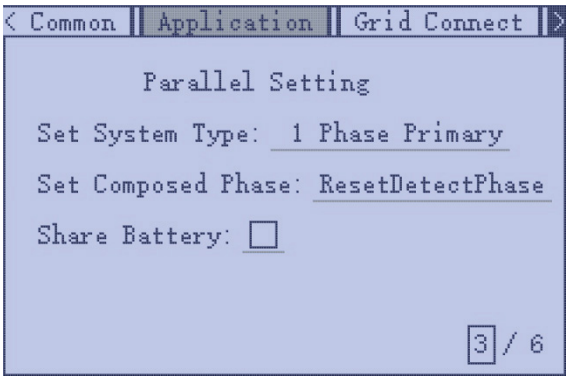
- **Normal/Standby**: Is for users to set the inverter to normal status or to standby status. In standby status, the inverter will stop any charging or discharging operations, as well as solar-feed-in.
- **Restart Inverter**: Restart the system, please note the power maybe interrupted when restarted. you'll get into the parameter setting page of the inverter.
- **Battery Type**: No battery, lead-acid or lithium-ion. If lead-acid battery is selected, please input correct battery capacity. If lithium-ion battery is selected, please choose the batterybrand in the lithium brand drop down list.
- **Measurement**: CT or Meter, default CT.
- **CT Sample Ratio**: The supported CT ratio is 1000:1, 2000:1, 3000:1. Default CT ratio is 1000:1. If 3rd party CT is to be used, please ensure its CT ratio is one of them, and set it accordingly.
- **CT direction reversed**: If the CT are in a wrong direction which will cause the display to show incorrect information and features of the inverter will not function correctly, the installer can modify it by selecting it (only for direction not CT placement), there is no need to reconnect the CT and no need to go change it physically, in the order of loads-grid export--battery charging.

- **Lead Acid**: When using Lead-acid battery, you need to set parameters in these programs, Follow the battery manufacturer's recommendation

b). Application setting

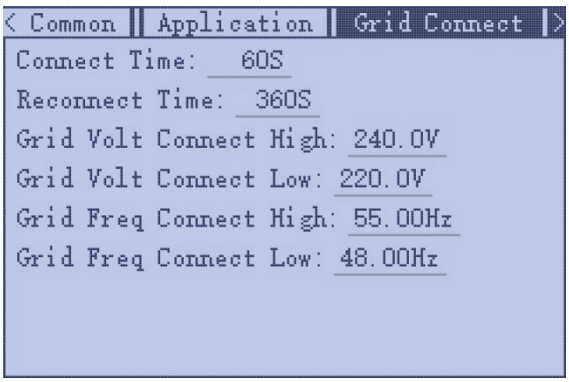






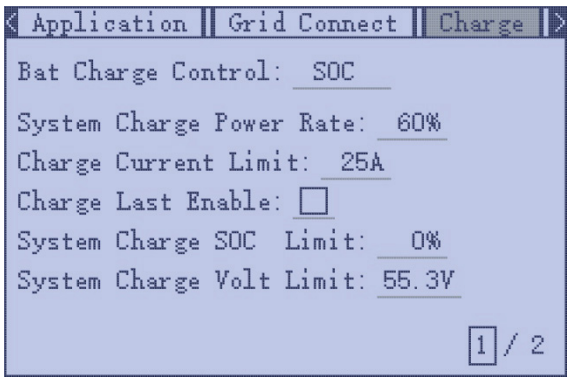
- **Power Backup**: It is for users to set if the inverter provides backup power or not when the grid is lost. If users want the load to be seamlessly transferred to the inverter backup power, "Seamless EPS switching" must be enabled. If customers don't have a battery installed yet, but still wish to have inverter backup power with only solar panels connected, “PV Grid Off” can be enabled to use solar power to supply load when the grid fails or load-shedding happens.
- **Micro-Grid**: only needs to be set when the generator is connected to the inverter's grid port. With this option enabled, the inverter will use AC power to charge the battery and won't export any power through the grid port if AC power is present at the inverter's grid port.
- **Grid Sell Back**: Is for users to set a zero export function. If exporting solar power is not allowed, users need to disable the “Grid Sell Back” option. If users' utility meter is tripped with even a little solar export,”Zero export”can be enabled Thus the export detection and adjustment will take place every 20mS, which will effectively avoid any solar power being exported. If export is allowed, users can enable “Grid Sell Back” and set a maximum allowable export limit in “Grid Sell Back Power”.
- **Set Composed Phase**: This is the phase code setting of the Load output. The system will automatically detect the phase sequence of the inverter (consistent with the phase sequence of the connected Grid mains) and display on the inverter after it is connected to the grid.
- **Set System Type**: The Role setting of the parallel system. It is set to 1 phase primary by default. In a parallel system, only one inverter is allowed to be set as Primary, and the others are all Subordinate.
- **Share Battery**: When the inverter is connected as a parallel system, all inverters need to share the battery, and set the “Share Battery” to “Enable” at the same time.

c). Grid Connect Setting

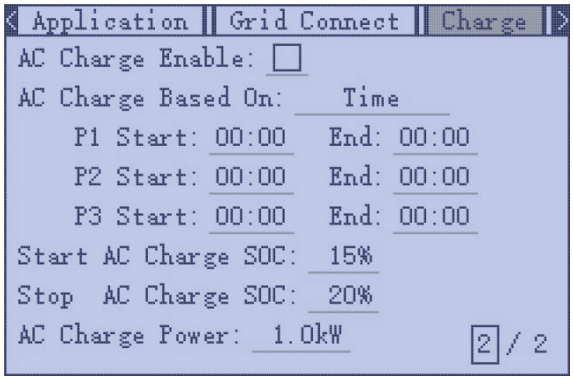


- **Connect Time**: Set the countdown timer for on-grid.

d). Charge Setting

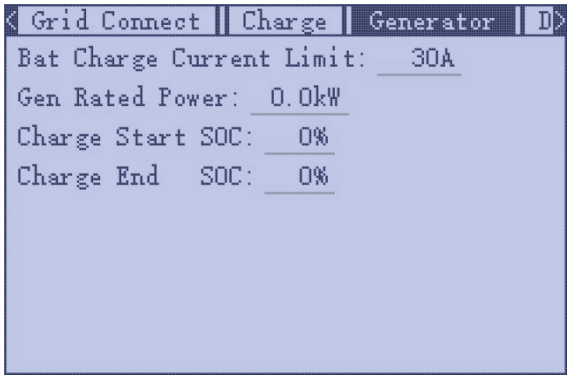


- **Bat Charge Control**: Users can decide to use SOC or BatV to control charge and discharge logic depending on battery type. Charge Current Limit: Users can set the maximumcharge current (machine supports a maximum of 125A).
  Charge last: When users want to use solar power in the order of loads - grid export - battery charging.



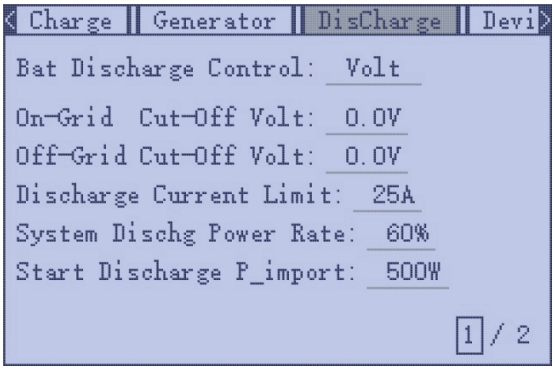
- **AC Charge**: Utility charge configuration If users want to usegrid power to charge their battery, then they can enable “AC Charge”, set time periods when AC charging can happen, AC Charge power (KW) to limit utility charging power, and “Stop AC Charge SOC(%)” as the target SOC for utilitycharging. “Stop AC Volt(V)” as the target battery voltage for utility charging.

e). Generator Setting

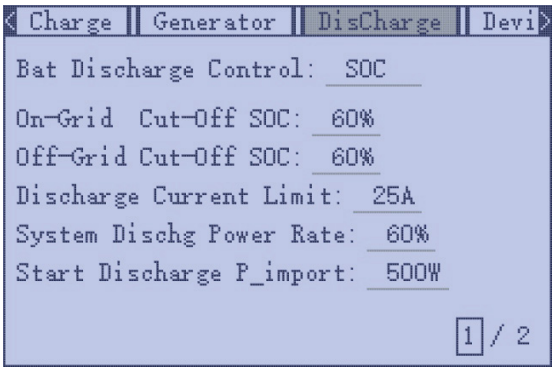


- **Bat charge current limit(A)**: Set the Max. battery charge current from the Generator. The Generator will start charging according to the charge start Volt/SOC, and stop charging when the battery voltage or SOC reaches the Charge end Volt/SOC value.
- **Gen rated power**: Inverter has the peak-shaving function, when you need you can enable it and setup the Gen peak shaving power(W).

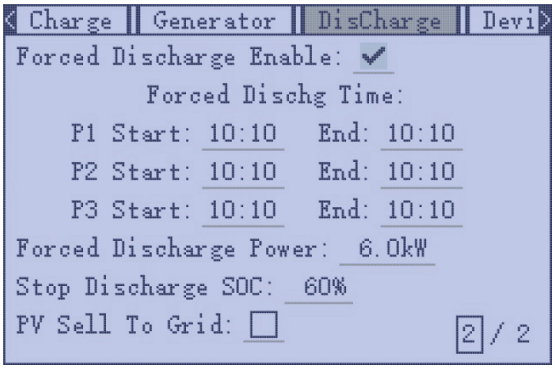
f). Discharge Setting



- **Bat Discharge Control**: You can choose “SOC”or “Volt” to control the battery discharge state.
- **Start Discharge P_import**: When the inverter detects the import power is higher than this value, battery start discharging, otherwise battery will keep standby.

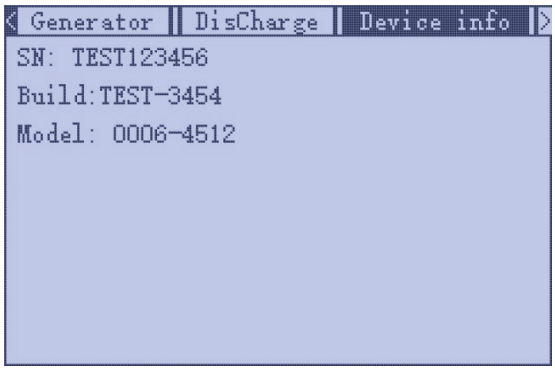


- **On-grid Cut-off(%) and Off-grid Cut-off(%)/On-grid Cut-off(V) and Off-grid Cut-off(V):**
  End of discharge SOC/Cut off voltage in on-grid and off grid condition respectively.



- **Forced discharge:** Settings for battery forced discharge with in certain time period. In the preset time period, the inverter will discharge battery at the power set by “discharge power”, until battery SOC or voltage reaches “Stop discharge” value.

g). Device info



- Device information will display the serial number, firmware version, and current model information.

4.3 LCD Screen Settings

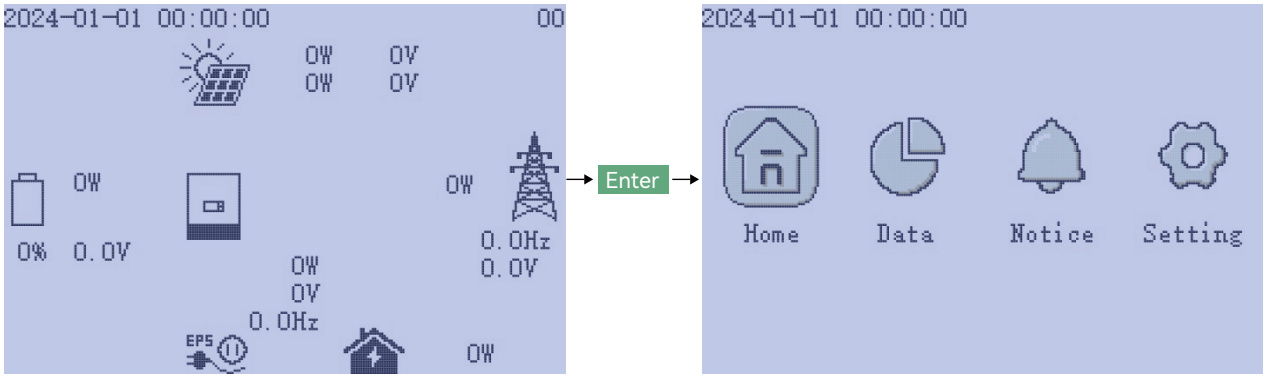
4.3.1 Button Operation

Button	Function
ESC	Exit
ENTER	Confirm, Enter menu
UP	Previous level, Increase
DOWN	Next level, Decrease

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

4.3.2 General Operations

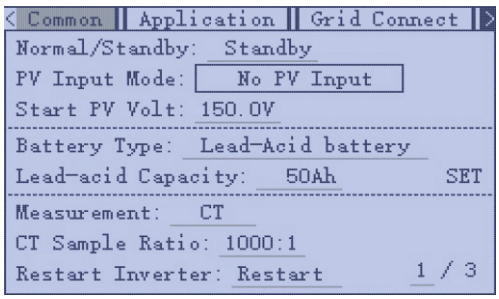
Through button control, press ENTER on the home screen to access the menu options.

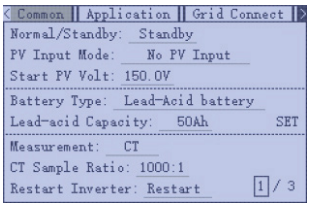
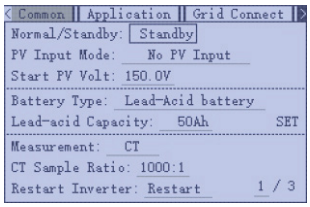
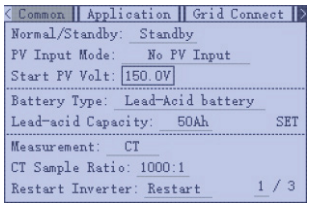
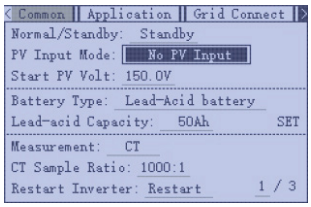


Using the UP and DOWN buttons, select the desired function, then press ENTER to enter. Press ESC to return to the previous level. The options include Home for the main page, Data for operational data, Notice for fault and warning information, and Setting for configuration settings.

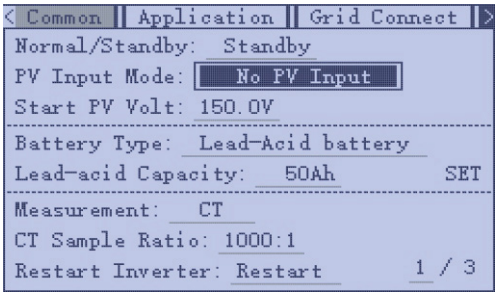
4.3.3 Setting Operation

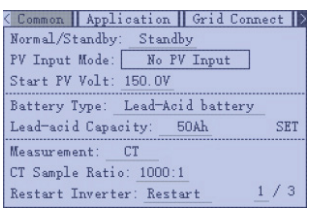
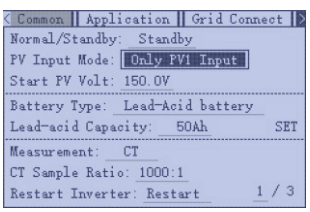
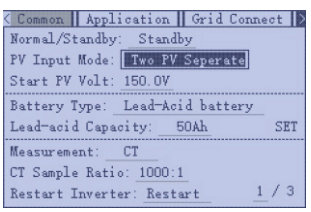
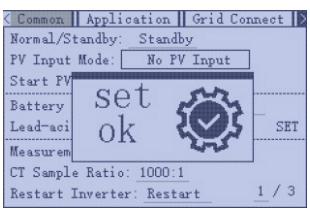
Once in the settings interface, you can use the buttons to navigate through various configuration options.



Esc	Up	Down	Enter
			
Exit to the previous level	Previous option	Next option	Set the selected option

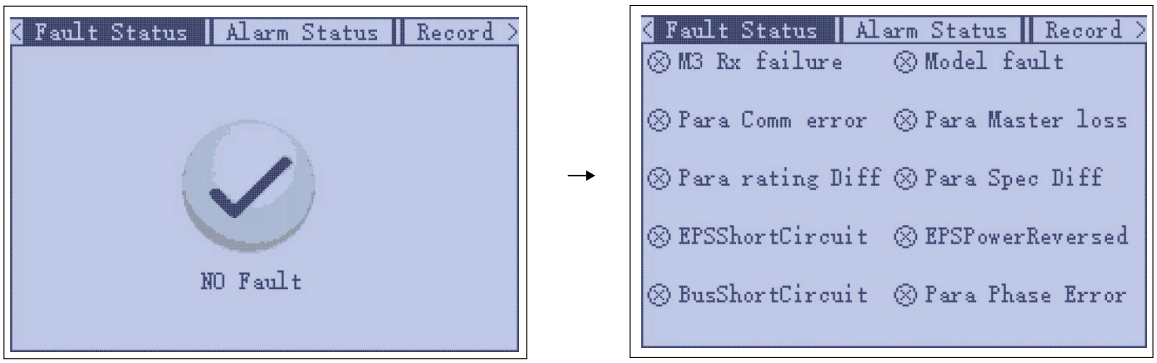
In the settings menu, press Enter to select the setting item. The selected setting will be highlighted. Use the UP and DOWN buttons to navigate and select the desired content. Press Enter again to confirm the setting (an "OK" animation will be displayed)



Esc	Up	Down	Enter
			
Exit to the previous level	Previous option	Next option	Confirm the setting and play the animation

4.3.4 Faults & Warnings Function

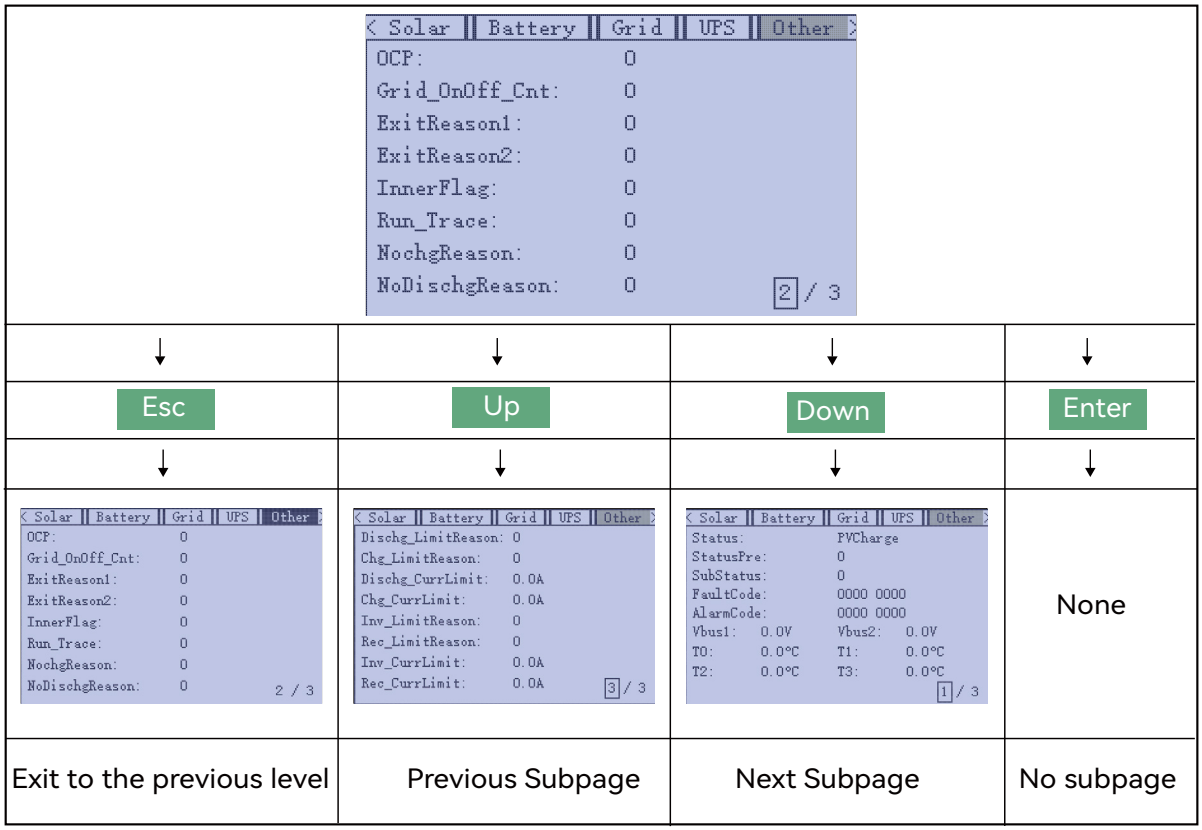
Under the Faults & Warnings Function, in the Fault Status menu, you can view real-time fault information. When fault information is refreshed, the page will update accordingly.



The warning information works similarly. In the Record page, you can view historical fault and warning information.

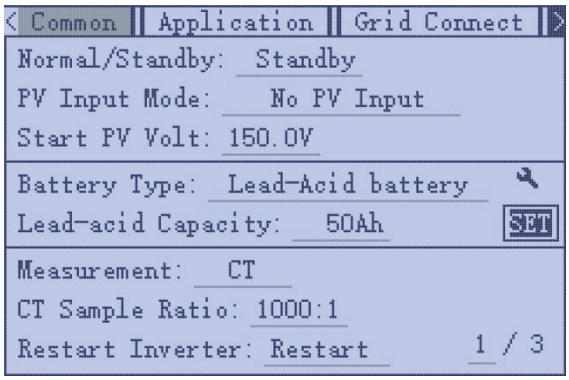
4.3.5 Subpage Selection

For menus with subpages, indicated by a display in the bottom right corner, you can use the Enter button to navigate to the menu's subpages.



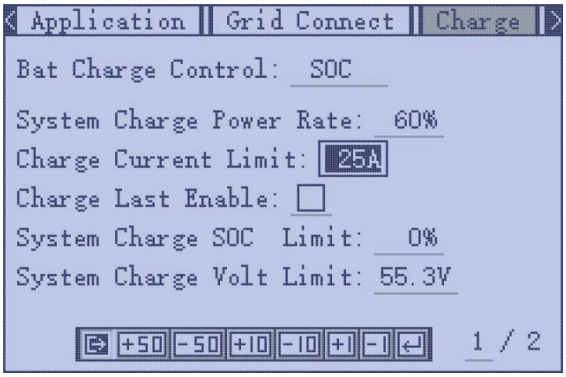
4.3.6 Special Operation

For certain special settings, such as configuring the battery, you need to press Enter on "SET" to confirm the settings.

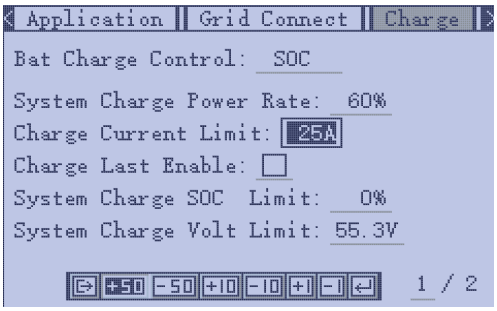


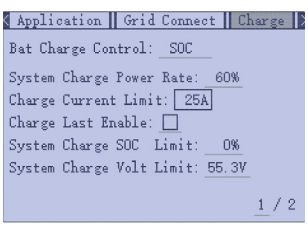
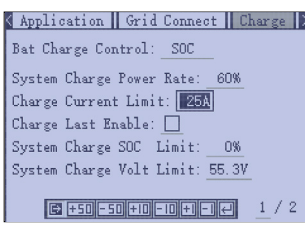
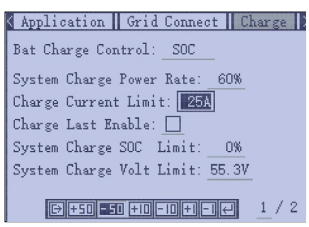
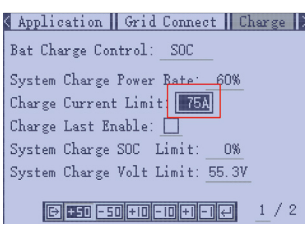
Keypad Operation

In certain settings, a keypad will pop up for input, as shown below.

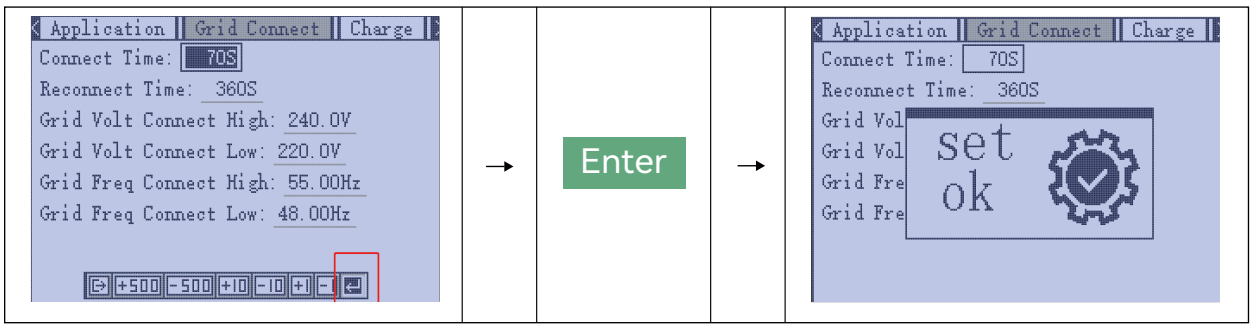


Now, you can use the buttons to navigate the numeric keypad:



Esc	Up	Down	Enter
			
Go back to the previous level	Scroll to the previous value on the keypad	Scroll to the next value on the keypad	Confirm. In this case, the keypad shows "+50". Pressing confirm will increase the charge current limit by 50A.

When you select the "Enter" key on the keypad, press "Enter" again to confirm the setting.



Long Press Operation: The UP and DOWN keys support long-press functionality. After holding down for a certain period, the key will continue to execute (i.e., repeatedly pressing the key).

5. Troubleshooting & Maintenance

5.1 Regular Maintenance

Inverter Maintenance

a. Check the inverter every 6 months or 1 year to verify if there are damages on cables, accessories, terminals and the inverter itself.
b. Check the inverter every 6 months to verify if the operating parameter is normal and there is no abnormal heating or noise from the inverter.
c. Check the inverter every 6 months to confirm there is nothing that covers the inverter heat sink, if there is, shut-down the inverter and clear the heat sink.

Battery Maintenance

Follow the manufacturer's requirements on maintenance. When you carry out these works on batteries, please make sure to fully shut-down the inverter for safety consideration.

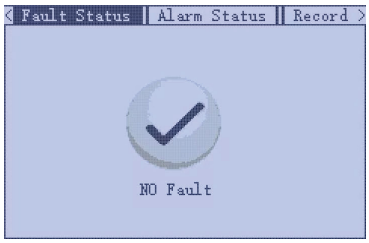
5.2 LED Displays

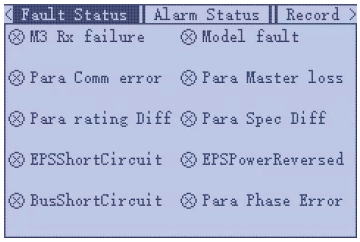
LED	Display	Description	Suggestion
Green LED	Solid light	Working normally	
	Flashing	Firmware upgrading	Wait till upgrading complete
Red LED	Solid light	Fault, inverter stop work	Need troubleshooting

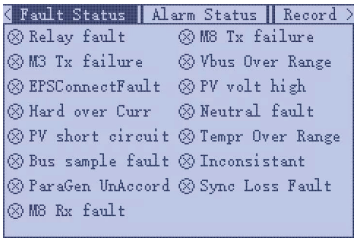
5.3 Troubleshooting Based on LCD Displays

1. Fault on the LCD

Once there is any warning or fault occurring, users can troubleshoot according to the LED status and the warning/fault information on the LCD.





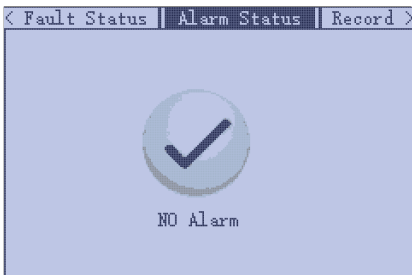


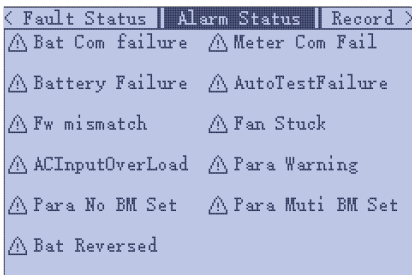
Fault	Meaning	Troubleshooting
M3 Rx failure	M3 microprocessor fails to receive data from DSP	Restart inverter, if the error still exists, contact your supplier.
Model fault	Incorrect model value	
Load short circuit	Inverter detected short-circuit on Load output terminals	1. Check if the L and N wires are connected correctly at inverter Load output port; 2. Disconnect the Load breaker to see if fault remains. If fault persists, contact your supplier.
Para rating Diff	Rated power of parallel inverters are inconsistent	Please confirm that the rated power of all inverters are the same, or you can contact Luxpower service to confirm
Para Phase set error	Incorrect setting of phase in parallel	Please confirm that the wiring of the parallel system is correct first. In this case, then connect each inverter to the grid, the system will automatically detect the phase sequence, and the fault will be automatically resolved after the phase sequence is detected.
Para Gen un Accord	Inconsistent generator connect in paralle	Some inverters are connected to generators, some are not. please confirm that all inverters in parallel are connected to generators together or none of them are connected to generators
Para sync loss	Parallel inverter fault	Restart inverters, if the error still exists, contact Luxpower service or your inverter supplier
Load power reversed	Inverter detected power flowing into Load terminal	Restart inverter, if the error still exists, contact your supplier
Bus short circuit	DC Bus is short circuited	
Relay fault	Relay abnormal	
M8 Tx failure	DSP fails to receive data from M8 microprocessor	
M3 Tx failure	DSP fails to receive data from M3 microprocessor	
Vbus over range	DC Bus voltage too high	Please check if the PV string voltage is within the inverter specification. If string voltage is within range, and this fault still appears, contact your supplier.
Load connect fault	Load port and grid port are connected mixed up	Check if the wires on Load terminal and grid terminal are connected correctly. If the error exists, contact your supplier.
PV volt high	PV voltage is too high	Please check if the PV string voltage is within the inverter specification. If string voltage is within range, and this fault still appears, contact your supplier

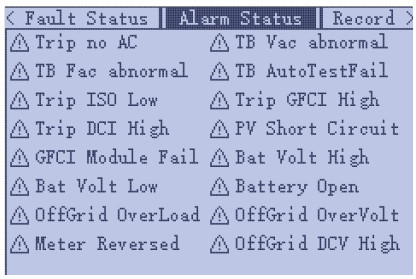
Hard over curr	Hardware level over current protection triggered	Restart inverter, if the error still exists, contact your supplier
Neutral fault	Voltage between N and PE is greater than 30V	Check if the neutral wire is connected correctly
PV short circuit	Short circuit detected on PV input	Disconnect all PV strings from the inverter. If the error persists, contact your supplier.
Temperature fault	Heat sink temperature too high	Install the inverter in a place with good ventilation and having no direct sunlight. If the installation site is okay, please check if the NTC connector inside the inverter is loose.
Bus sample fault	Inverter detected DC bus voltage lower than PV input voltage	Restart inverter, if the error still exists, contact your supplier.
Inconsistant	Sampled grid voltage values of DSP and M8 microprocessor are inconsistent	
M8 Rx fault	M8 microprocessor fails to receive data from DSP	Please confirm that the rated power of all inverters are the same, or you can contact Luxpower service to confirm
Para Comm error	Parallel communication abnormal	1. Please check whether the connection of the parallel cable is loose, please connect the parallel cable correctly 2. Please check and make sure the PIN status of CAN communication cable from the first to the end inverter rightly.
Para primary loss	No primary in the Parallel system	1. If a primary has been configured in the system, the fault will be automatically removed after the primary works. If so, you can ignore it. 2. If a primary has not been configured in the system, and there are only subordinate in the system, please set the primary first. Note: For single unit running system, the role of the inverter should be set as “1 phase primary”

2. Alarm on the LCD

When there are errors, they will be displayed in real-time on the "Notice -> Alarm Status" page.





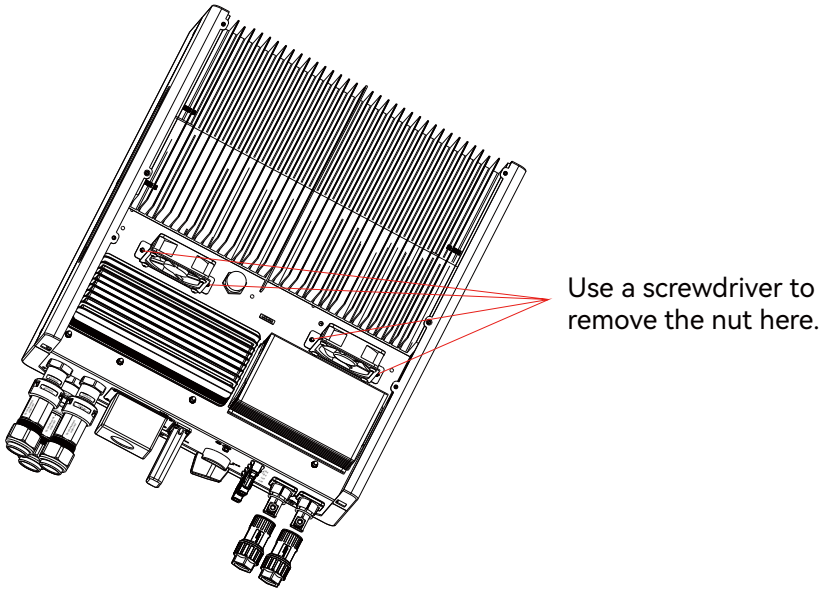


Alarm	Meaning	Troubleshooting
Bat com failure	Inverter fails to communicate with battery	Check if communication cable is correct, and if you have chosen the correct battery brand on inverter LCD. If all is correct but this error persists, please contact your supplier.
Meter Com Fail/CT Disconnected	Inverter fails to communicate with the meter	1. Check if the L and N wires are connected correctly at inverter Load output terminal; 2. Disconnect the Load breaker to see if fault remains. If fault persists, contact your supplier.
Bat Fault	Battery cannot charge or discharge	1. Check the battery communication cable for correct pinout on both inverter and battery end; 2. Check if you have chosen an incorrect battery brand; 3. Check if there is fault on battery's indicator. If there is fault, please contact your battery supplier.
Auto test failure	Auto test failed	Only applied to Italy model
Lcd com failure	LCD fails to communicate with M3 microprocessor	Restart inverter. If fault still exists, contact your supplier.
Fwm mismatch	Firmware version mismatch between the microprocessors	
Fan stuck	Cooling fans are stuck	
Trip by gfci high	Inverter detected leakage current on AC side	1. Check if there is ground fault on grid and load side; 2. Restart inverter. If the fault remains, contact your supplier
Trip by dci high	Inverter detected high DC injection current on grid port	Restart inverter. If the fault remains, contact your supplier.
PV short circuit	Inverter detected short circuit PV input	1. Check if each PV string is connected correctly; 2. Restart inverter. If the fault remains, contact your supplier.

GFCI module fault	GFCI module is abnormal	Restart inverter. If fault still exists, contact your supplier
Bat volt high	Battery voltage too high	Check if battery voltage exceeds 59.9V, battery voltage should be within inverter specification.
Bat volt low	Battery voltage too low	Check if battery voltage is under 40V, battery voltage should be within inverter specification.
Bat open	Battery is disconnected from inverter	Check battery breaker or battery fuse
Offgrid overload	Load voltage is too high	Restart inverter. If fault still exists, contact your upplier.
Meter reversed	Meter is connected reversely	Check if meter communication cable is connected
Offgrid dcv high	High DC voltage component on Load output when running off-grid	Restart inverter. If fault still exists, contact your supplier.
Para phase loss	Phase losing in parallel system	Please confirm that the wiring of the inverter is correct. If the primary is set to 3 Phase primary, contact your supplier. the number of parallel inverters needs to be ≥3. (And the grid input of each inverter should be connect with Grid L rightly).
Para no BM set	Primary isn't set in the parallel system	Please set one of the inverters in the parallel system as the primary
Para multi BM set	Multiple Primary have been set in the parallel system	There are at least two inverters set as Primary in the parallel system, please keep one Primary and the other set as Sunordinate

5.4 Fan replacement

Please check and clean the fans regularly. The recommended period is 6 months. Please replace the fan following up the below diagram if there is problem with the fans. Turn off the system and wait for more than 5 minutes before disassembling the machine.



PV Input data	3K	3.6K
Max. usable input current(A)	18/18	18/18
Max. short circuit input current(A)	32/32	32/32
Start input voltage(V)	100	100
Startup voltage(V)	140	140
Power MPPT voltage range(V)	150-425	150-425
DC nominal voltage(V) MPPT tracker	360	360
DC voltage range(V)	100-530	100-530
Max. power(W)	6600	6600
Number of MPPT	2	2
AC output data(On-Grid)		
Nominal Output Current(A)	13	15.7
Rated voltage(V)	230	230
Operating voltage range(V)	180-270	180-270
Nominal power output(W)	3000	3600
Operating frequency(Hz)	50/60	50/60
Operating frequency range(Hz)	45-55/55-65	45-55/55-65
Phase shift	0.99@full load	0.99@full load
Reactive power adjust range	-0.8~+0.8 leading Adjustable	-0.8~+0.8 leading Adjustable
THDI	<3%	<3%
Sync inrush curent(A)	35	35
AC output data(Backup)		
Nominal output current(A)	13	15.7
Nominal output voltage(V)	230	230
Rated output power(VA)	3000	3600
Operating frequency(Hz)	50	50
Peak power(VA)	2xPn, 0.5s	2xPn, 0.5s
THDV	<3%	<3%
Switching Time	<20	<20
Efficiency		
Europe Efficiency	96%	96%
Max. Efficiency @ PV to grid	97.5%	97.5%
Max.Efficiency @ battery to grid	94%	94%
MPPT Efficiency	99.9%	99.9%
Battery data		
Type	Lead-acid battery/Lithium battery	
Max. charge current(A)	80	80
Max. discharge current(A)	80	80
Nominal voltage(V)	48	48
Voltage range(V)	40-60	40-60
Max. voltage(V)	60	60
General Data		
Integrated disconnect	DC switch	DC switch
Reverse polarity protection	Yes	Yes
DC switch rating for each MPPT	Yes	Yes
Output over-voltage protection varistor	Yes	Yes
Output over current protection	Yes	Yes
Ground fault monitoring	Yes	Yes
Grid monitoring	Yes	Yes
Pole sensitive leakage current	Yes	Yes
Dimensions(mm)	487*455*211.7mm(19.2*17.9*8.3inch)	487*455*211.7mm(19.2*17.9*8.3inch)
Weight(kg)	29kg(63.9 lbs)	29kg(63.9 lbs)
Degree of protection	NEMA4X / IP 65	NEMA4X / IP 65
Cooling concept	FAN	FAN
Topology	Transformer-less	Transformer-less
Relative humidity	0-100%	0-100%
Altitude(m)	<2000m	<2000m
Noise emission(dB)	50dB	50dB
Internal consumption(W)	<15W	<15W
Display	LCD	LCD
Communication interface	RS485/ Wi-Fi/ CAN	RS485/ Wi-Fi/ CAN
Standard warranty	5years	5years

PV Input data	4K	4.6K
Max. usable input current(A)	18/18	18/18
Max. short circuit input current(A)	32/32	32/32
Start input voltage(V)	100	100
Startup voltage(V)	140	140
Power MPPT voltage range(V)	150-425	150-425
DC nominal voltage(V) MPPT tracker	360	360
DC voltage range(V)	100-530	100-530
Max. power(W)	7000	9000
Number of MPPT	2	2
AC output data(On-Grid)		
Nominal Output Current(A)	17.4	20
Rated voltage(V)	230	230
Operating voltage range(V)	180-270	180-270
Nominal power output(W)	4000	4600
Operating frequency(Hz)	50/60	50/60
Operating frequency range(Hz)	45-55/55-65	45-55/55-65
Phase shift	0.99@full load	0.99@full load
Reactive power adjust range	-0.8~+0.8 leading Adjustable	-0.8~+0.8 leading Adjustable
THDI	<3%	<3%
Sync inrush curent(A)	35	35
AC output data(Backup)		
Nominal output current(A)	17.4	20
Nominal output voltage(V)	230	230
Rated output power(VA)	4000	4600
Operating frequency(Hz)	50	50
Peak power(VA)	2xPn, 0.5s	2xPn, 0.5s
THDV	<3%	<3%
Switching Time	<20	<20
Efficiency		
Europe Efficiency	96%	96%
Max. Efficiency @ PV to grid	97.5%	97.5%
Max.Efficiency @ battery to grid	94%	94%
MPPT Efficiency	99.9%	99.9%
Battery data		
Type	Lead-acid battery/Lithium battery	
Max. charge current(A)	80	96
Max. discharge current(A)	80	96
Nominal voltage(V)	48	48
Voltage range(V)	40-60	40-60
Max. voltage(V)	60	60
General Data		
Integrated disconnect	DC switch	DC switch
Reverse polarity protection	Yes	Yes
DC switch rating for each MPPT	Yes	Yes
Output over-voltage protection varistor	Yes	Yes
Output over current protection	Yes	Yes
Ground fault monitoring	Yes	Yes
Grid monitoring	Yes	Yes
Pole sensitive leakage current	Yes	Yes
Dimensions(mm)	487*455*211.7mm(19.2*17.9*8.3inch)	487*455*211.7mm(19.2*17.9*8.3inch)
Weight(kg)	29kg(63.9 lbs)	29kg(63.9 lbs)
Degree of protection	NEMA4X / IP 65	NEMA4X / IP 65
Cooling concept	FAN	FAN
Topology	Transformer-less	Transformer-less
Relative humidity	0-100%	0-100%
Altitude(m)	<2000m	<2000m
Noise emission(dB)	50dB	50dB
Internal consumption(W)	<15W	<15W
Display	LCD	LCD
Communication interface	RS485/ Wi-Fi/ CAN	RS485/ Wi-Fi/ CAN
Standard warranty	5years	5years

PV Input data	5K	6K
Max. usable input current(A)	18/18	18/18
Max. short circuit input current(A)	32/32	32/32
Start input voltage(V)	100	100
Startup voltage(V)	140	140
Power MPPT voltage range(V)	150-425	150-425
DC nominal voltage(V) MPPT tracker	360	360
DC voltage range(V)	100-530	100-530
Max. power(W)	9000	9000
Number of MPPT	2	2
AC output data(On-Grid)		
Nominal Output Current(A)	21.7	26
Rated voltage(V)	230	230
Operating voltage range(V)	180-270	180-270
Nominal power output(W)	5000	6000
Operating frequency(Hz)	50/60	50/60
Operating frequency range(Hz)	45-55/55-65	45-55/55-65
Phase shift	0.99@full load	0.99@full load
Reactive power adjust range	-0.8~+0.8 leading Adjustable	-0.8~+0.8 leading Adjustable
THDI	<3%	<3%
Sync inrush curent(A)	35	35
AC output data(Backup)		
Nominal output current(A)	21.7	26
Nominal output voltage(V)	230	230
Rated output power(VA)	5000	6000
Operating frequency(Hz)	50	50
Peak power(VA)	2xPn, 0.5s	2xPn, 0.5s
THDV	<3%	<3%
Switching Time	<20	<20
Efficiency		
Europe Efficiency	96%	96%
Max. Efficiency @ PV to grid	97.5%	97.5%
Max.Efficiency @ battery to grid	94%	94%
MPPT Efficiency	99.9%	99.9%
Battery data		
Type	Lead-acid battery/Lithium battery	
Max. charge current(A)	105	125
Max. discharge current(A)	120	140
Nominal voltage(V)	48	48
Voltage range(V)	40-60	40-60
Max. voltage(V)	60	60
General Data		
Integrated disconnect	DC switch	DC switch
Reverse polarity protection	Yes	Yes
DC switch rating for each MPPT	Yes	Yes
Output over-voltage protection varistor	Yes	Yes
Output over current protection	Yes	Yes
Ground fault monitoring	Yes	Yes
Grid monitoring	Yes	Yes
Pole sensitive leakage current	Yes	Yes
Dimensions(mm)	487*455*211.7mm(19.2*17.9*8.3inch)	487*455*211.7mm(19.2*17.9*8.3inch)
Weight(kg)	29kg(63.9 lbs)	29kg(63.9 lbs)
Degree of protection	NEMA4X / IP 65	NEMA4X / IP 65
Cooling concept	FAN	FAN
Topology	Transformer-less	Transformer-less
Relative humidity	0-100%	0-100%
Altitude(m)	<2000m	<2000m
Noise emission(dB)	50dB	50dB
Internal consumption(W)	<15W	<15W
Display	LCD	LCD
Communication interface	RS485/ Wi-Fi/ CAN	RS485/ Wi-Fi/ CAN
Standard warranty	5years	5years

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