

# **USER MANUAL**

## **MAX III 12KW PV Inverter**

**Version: 1.0**

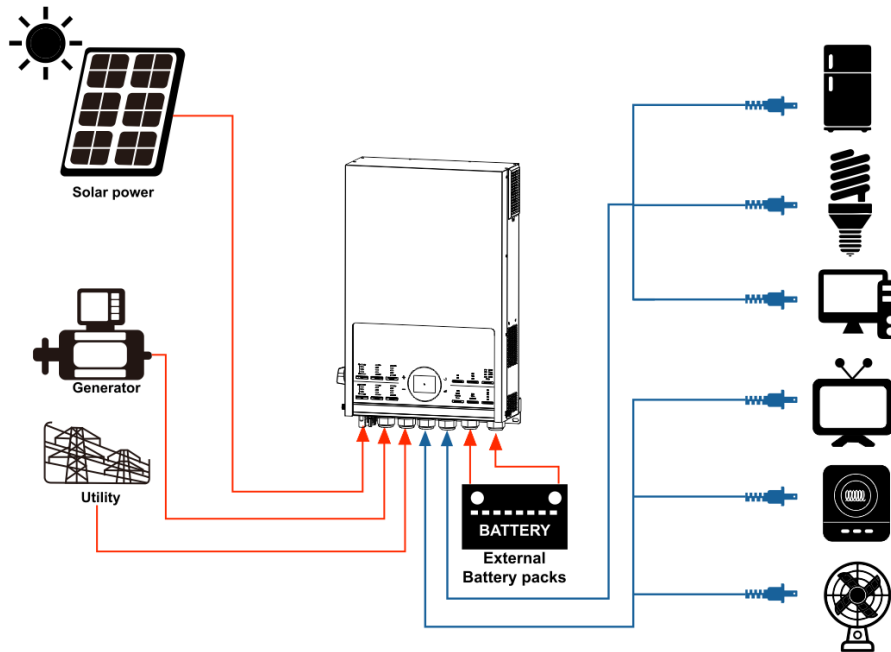
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# 1. Introduction

## 1-1. System Overview

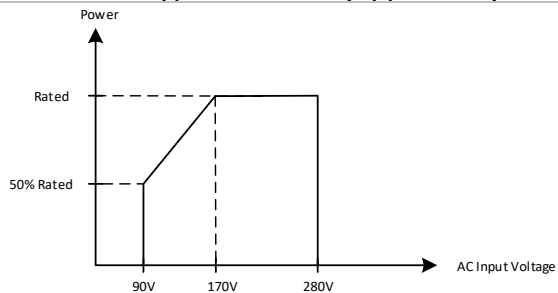
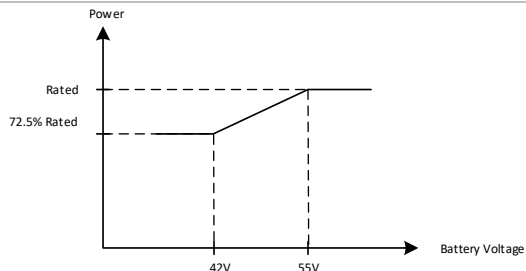
This solar inverter can provide power to connected loads by utilizing PV power, utility power and battery power.



*Figure 1 Basic PV System Overview*

Depending on different power situations, this solar inverter is designed to generate continuous power from PV solar modules (solar panels), battery, and the utility. When MPP input voltage of PV modules is within acceptable range (see specification for the details), this inverter is able to generate power to feed the grid (utility) and charge battery. This inverter is only compatible with PV module types of single crystalline and poly crystalline. Do not connect any PV array types other than these two types of PV modules to the inverter. Do not connect the positive or negative terminal of the solar panel to the ground.

## 1-2. Production Specifications

|                                   |                                                                                      |
|-----------------------------------|--------------------------------------------------------------------------------------|
| Model                             | 12KW                                                                                 |
| RATED POWER                       | 12000 W                                                                              |
| <b>PV INPUT (DC)</b>              |                                                                                      |
| Maximum DC Power                  | 18000 W(12000W max. per tracker)                                                     |
| Nominal DC Voltage                | 300 VDC                                                                              |
| Maximum DC Voltage                | 500 VDC                                                                              |
| MPP Voltage Range                 | 90 VDC ~ 450 VDC                                                                     |
| Number of MPP Trackers            | 2                                                                                    |
| Number of Strings Per MPP Tracker | PV1: 1, PV2: 2                                                                       |
| Maximum Input Current             | 27A/40A (MAX 60 A)                                                                   |
| Isc PV (absolute maximum)         | 27A/40A (MAX 60 A)                                                                   |
| <b>AC INPUT</b>                   |                                                                                      |
| AC Start-up Voltage               | 180VAC±7V(UPS); 100VAC±7V (Appliances)                                               |
| Acceptable Input Voltage Range    | 90 - 280 VAC                                                                         |
| Nominal Frequency                 | 50 Hz / 60 Hz                                                                        |
| Low Loss / Loss Return Frequency  | 40±1Hz / 42±1Hz                                                                      |
| High Loss / Loss Return Frequency | 65±1Hz / 63±1Hz                                                                      |
| AC Input Power                    | 12000VA/12000W                                                                       |
| Maximum AC Input Current          | 60 A                                                                                 |
| Short Circuit Protection          | Circuit Breaker                                                                      |
| Transfer Time                     | 10ms typical @50Hz (UPS)<br>20ms typical @50Hz (Appliances)                          |
| Power Limitation                  |   |
| <b>BATTERY MODE OUTPUT (AC)</b>   |                                                                                      |
| Nominal Output Voltage            | 230VAC±5%                                                                            |
| Output Frequency                  | 50 Hz / 60 Hz (auto sensing)                                                         |
| Output Waveform                   | Pure sine wave                                                                       |
| Output Power                      | 12000VA/12000W                                                                       |
| Efficiency (DC to AC)             | 93%                                                                                  |
| Overload Protection               | 10s @105%~120% load; 5s @≥120% load;<br>100ms @≥180% load                            |
| THDV                              | <5% for linear load, <10% for non-linear load @ nominal voltage                      |
| No Load Power Consumption         | 70W                                                                                  |
| Power Limitation                  |  |

|                                                 |                                        |
|-------------------------------------------------|----------------------------------------|
|                                                 |                                        |
| <b>BATTERY &amp; CHARGER (Lead-acid/Li-ion)</b> |                                        |
| DC Voltage Range                                | 40 – 63 VDC                            |
| Nominal DC Voltage                              | 48 VDC                                 |
| Maximum Battery Discharging Current             | 242 A                                  |
| Maximum Charging Current                        | 200 A                                  |
| Overcharge Protection                           | 63 VDC                                 |
| Charger power de-rating                         |                                        |
| <b>GENERAL</b>                                  |                                        |
| <b>PHYSICAL</b>                                 |                                        |
| Dimension, D X W X H (mm)                       | 687 x 432.4 x 176.3                    |
| Net Weight (kgs)                                | 27.3Kg                                 |
| <b>INTERFACE</b>                                |                                        |
| Communication Port                              | RS-232/USB/RS485/CAN/Wi-Fi/Dry-Contact |
| <b>ENVIRONMENT</b>                              |                                        |
| Ingress Protection Rating                       | IP21                                   |
| Humidity                                        | 0 ~ 90% RH (No condensing)             |
| Operating Temperature                           | -10 to 50°C                            |
| Altitude                                        | 0 ~ 1500m                              |
| Audible Noise                                   | <60dB                                  |
| Self-usage management                           | Built-in Current Transformer sensor    |
| Dust-proof function                             | Anti-dust kit                          |
| OTA supported                                   | Yes                                    |
| <b>PARALLEL</b>                                 |                                        |
| Max parallel numbers                            | 6                                      |
| Power Unbalance Ratio                           | <5% @ 100% Load                        |
| Parallel communication                          | CAN                                    |
| Parallel Kit                                    | YES                                    |

## 2. Important Safety Warnings

Before using the inverter, please read all instructions and cautionary markings on the unit and this manual. Store the manual where it can be accessed easily. This manual is for qualified personnel. The tasks described in this manual can only be performed by qualified personnel.

### Symbols used in Equipment Markings

|                                                                                   |                                                                                |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
|  | Refer to the operating instructions                                            |
|  | Caution! Risk of danger                                                        |
|  | Caution! Risk of electric shock                                                |
|  | Caution! Risk of electric shock. Energy storage timed discharge for 5 minutes. |
|  | Caution! Hot surface                                                           |

### Conventions used in this Document

|                 |                                                                                                                  |
|-----------------|------------------------------------------------------------------------------------------------------------------|
| <b>WARNING!</b> | Warnings identify conditions or practices that could result in personal injury;                                  |
| <b>CAUTION!</b> | Cautions identify conditions or practices that could result in damaged to the unit or other equipment connected. |

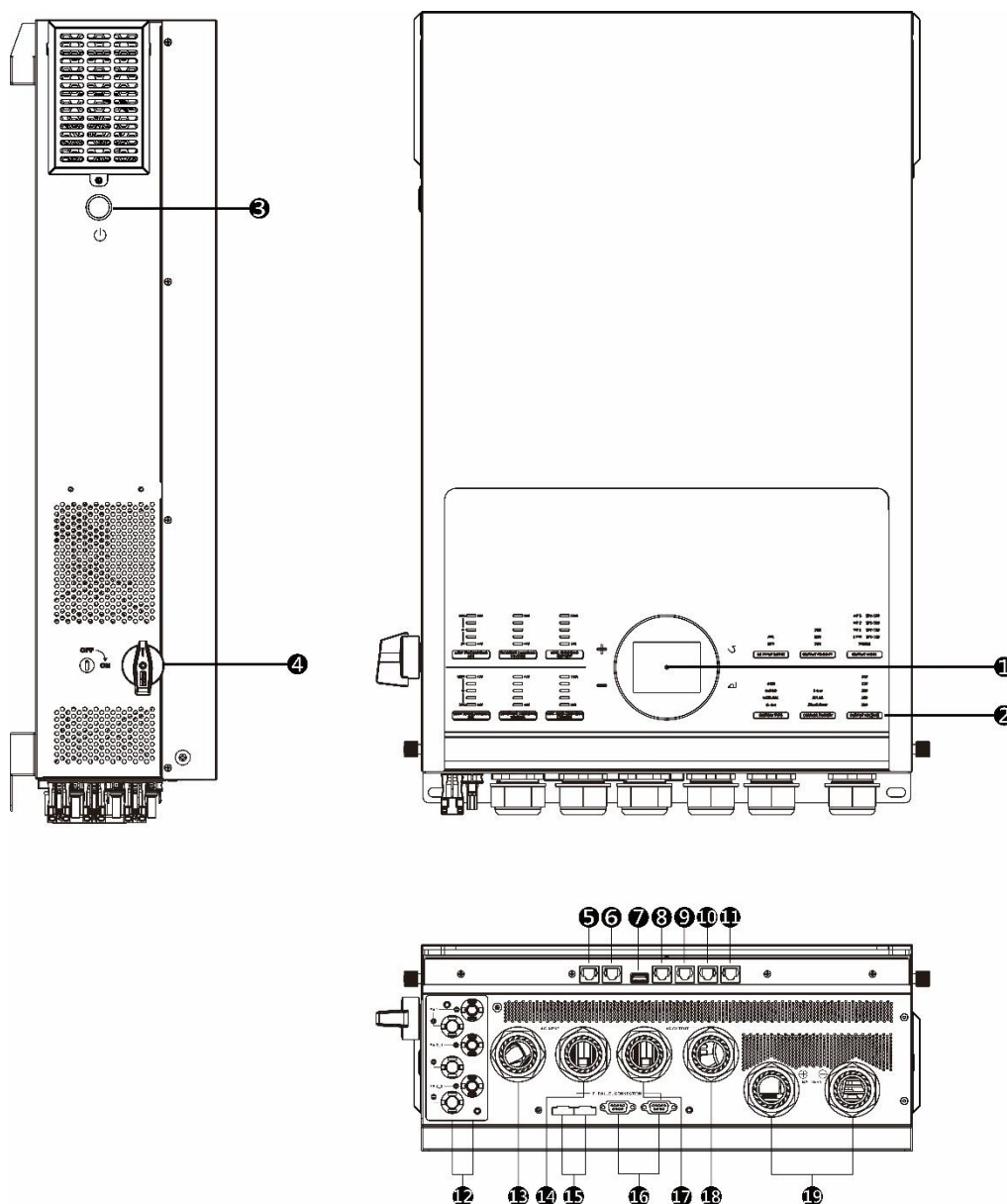
### General Precautions

|                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>WARNING!</b> Before installing and using this inverter, read all instructions and cautionary markings on the inverter and all appropriate sections of this guide.                                                                                                                                                                                                                                 |
|  | <b>WARNING!</b> Normally grounded conductors may be ungrounded and energized when a ground fault is indicated.                                                                                                                                                                                                                                                                                       |
|  | <b>WARNING!</b> This inverter is heavy. It should be lifted by at least two people.                                                                                                                                                                                                                                                                                                                  |
|  | <b>CAUTION!</b> Authorized service personnel should reduce the risk of electrical shock by disconnecting AC, DC and battery power from the inverter before attempting any maintenance, cleaning or working on any circuits connected to the inverter. Turning off controls will not reduce this risk. Internal capacitors can remain charged for 5 minutes after disconnecting all sources of power. |

|                                                                                     |                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p><b>CAUTION!</b> Do not disassemble this inverter yourself. It contains no user-serviceable parts. Attempt to service this inverter yourself may cause a risk of electrical shock or fire and will void the warranty from the manufacturer.</p> |
|    | <p><b>CAUTION!</b> To avoid a risk of fire and electric shock, make sure that existing wiring is in good condition and that the wire is not undersized. Do not operate the Inverter with damaged or substandard wiring.</p>                       |
|    | <p><b>CAUTION!</b> Under high temperature environment, the cover of this inverter could be hot enough to cause skin burns if accidentally touched. Ensure that this inverter is away from normal traffic areas.</p>                               |
|    | <p><b>CAUTION!</b> Use only recommended accessories from installer. Otherwise, not-qualified tools may cause a risk of fire, electric shock, or injury to persons.</p>                                                                            |
|    | <p><b>CAUTION!</b> To reduce risk of fire hazard, do not cover or obstruct the cooling fan.</p>                                                                                                                                                   |
|    | <p><b>CAUTION!</b> Do not operate the Inverter if it has received a sharp blow, been dropped, or otherwise damaged in any way. If the Inverter is damaged, please call for an RMA (Return Material Authorization).</p>                            |
|  | <p><b>CAUTION!</b> AC breaker, DC switch and Battery circuit breaker are used as disconnect devices and these disconnect devices shall be easily accessible.</p>                                                                                  |
|  | <p><b>WARNING!</b> Risk of Voltage Backfeed. Before working on this circuit, isolate inverter/Uninterruptible Power System (UPS); then check for Hazardous Voltage between all terminals including the protective earth.</p>                      |

## 3. Unpacking & Overview

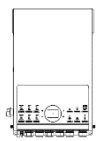
### 3-1. Product Overview



- ① LCD display panel
- ② Operation buttons
- ③ Power on/off switch
- ④ PV switch
- ⑤ COM1: Dry contact port
- ⑥ COM2: Reserved rapid shutdown control port
- ⑦ Type A USB disk port
- ⑧ COM3: External BTS port
- ⑨ COM4: BMS port
- ⑩ COM5: RS232 port
- ⑪ COM6: Reserved GFCI, AFCI detection port
- ⑫ PV input 1 & 2-1 & 2-2
- ⑬ Generator input
- ⑭ Grid input
- ⑮ Parallel current sharing port
- ⑯ Parallel communication port
- ⑰ AC output 1
- ⑱ AC output 2
- ⑲ Battery input

## 3-2. Packing List

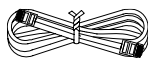
Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:



Inverter unit



RS-232 cable



Parallel cable



Share current wires



CT



PV connectors  
x 3 sets



Manual



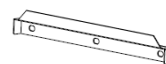
Software CD



Fixing screws



Cable gland  
x 6 pcs



Mounting bracket

## 4. Installation

### 4-1. Precautions

This solar inverter is designed for indoor use (IP21), please make sure the installation site meets the following conditions:

- Not in direct sunlight
- Not exposed during rain or snow
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television antenna or antenna cable.
- Not higher than altitude of about 2000 meters above sea level.
- Not in environment of precipitation or humidity (>95%).

### 4-2. Selecting the Mounting Location

- Please select a vertical wall with load-bearing capacity for installation and install on a concrete or other non-flammable surface.
- The ambient temperature should be between -25~60°C to ensure optimal operation.
- Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and enough space for removing wires.
- For proper air ventilation to dissipate heat, allow a clearance of approx. 50cm to the sides, approx. 50cm above and below the unit, and 100cm toward the front.



**WARNING! FIRE HAZARD. ONLY SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE.**

### 4-3. Mounting Unit

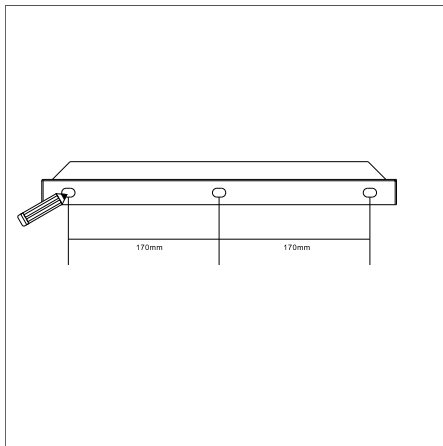


**WARNING!** Remember that this inverter is heavy! Please be careful when lifting it out from the package.

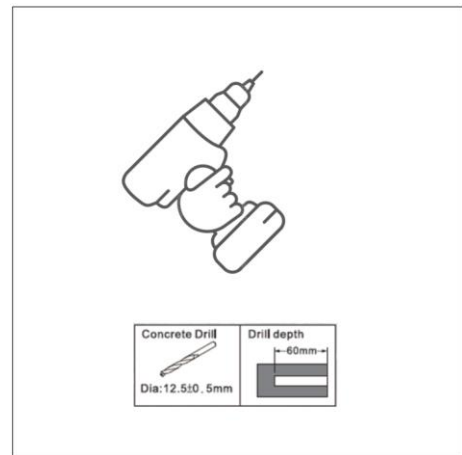
Installation to the wall should be implemented with the proper screws. After that, the device should be bolted on securely.

The inverter only can be used in a **CLOSED ELECTRICAL OPERATING AREA**. Only service people can enter into this area.

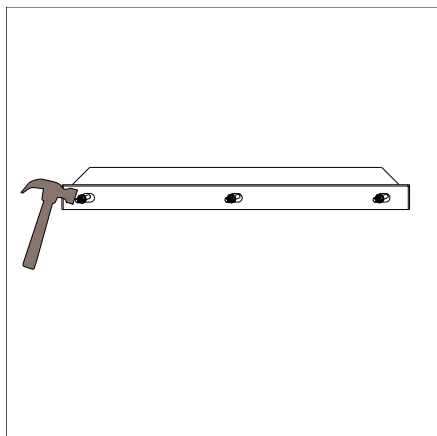
1.



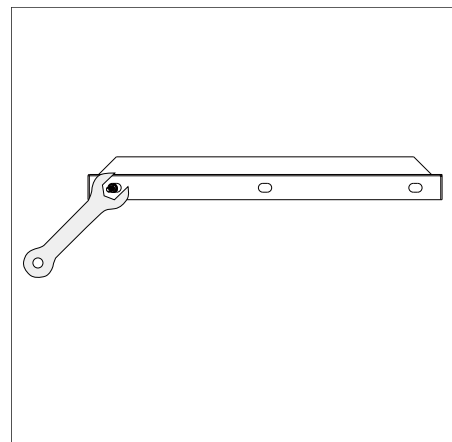
2.



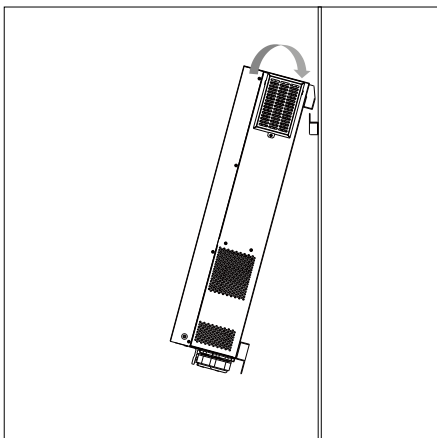
3.



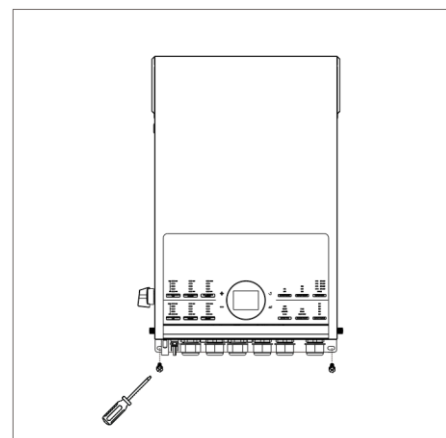
4.



5.

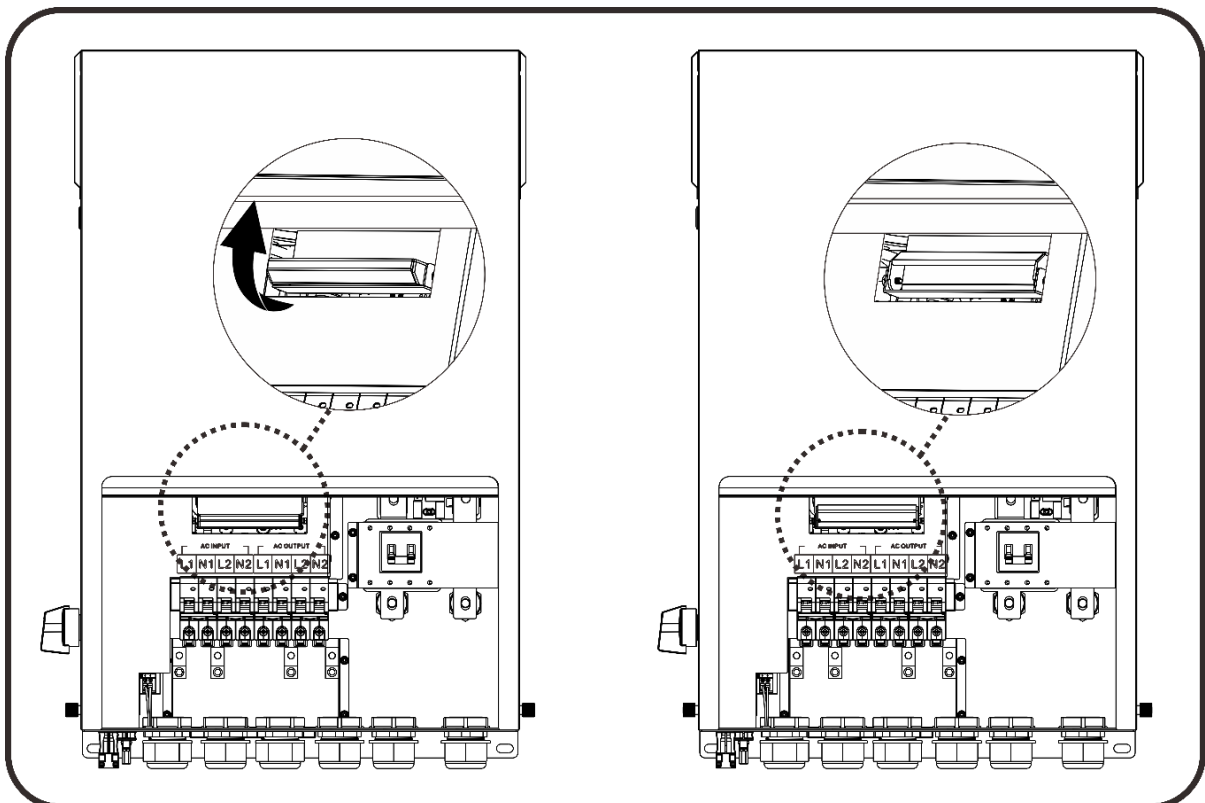
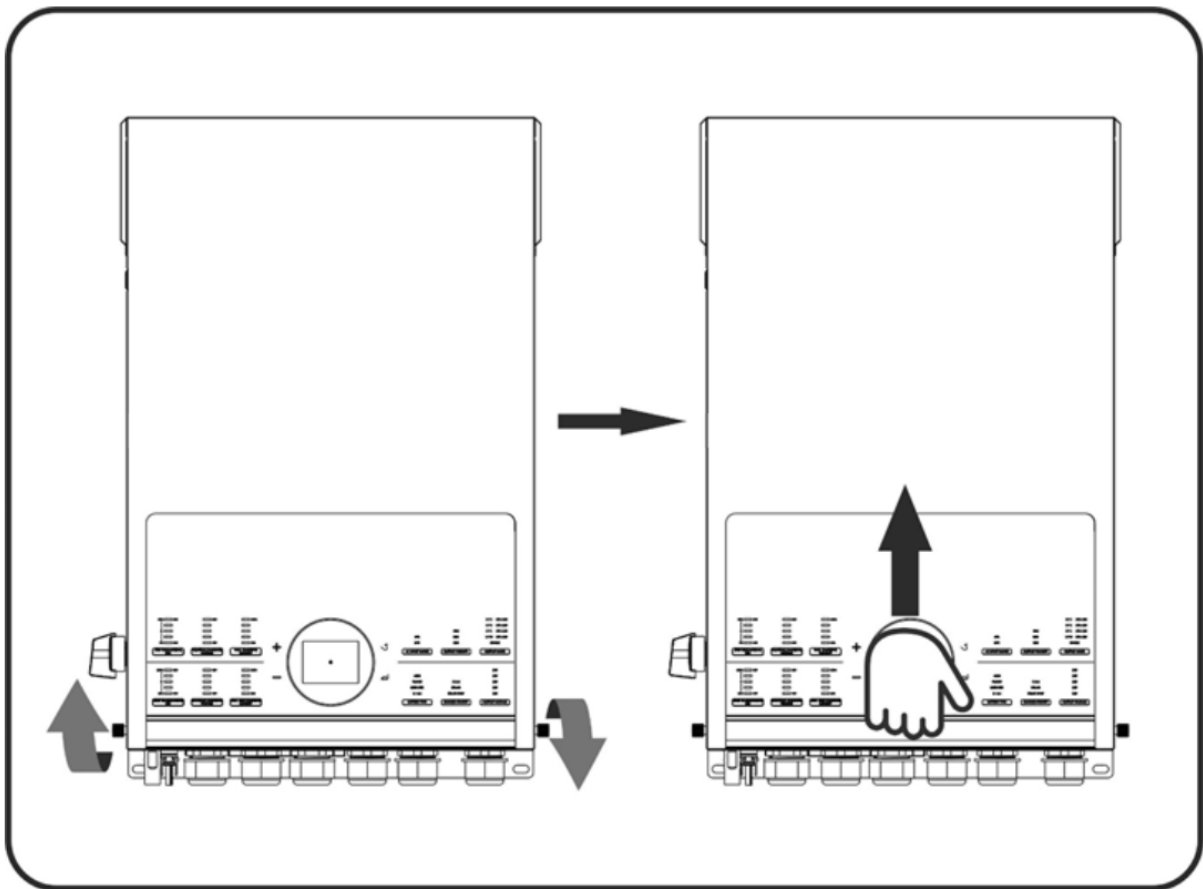


6.

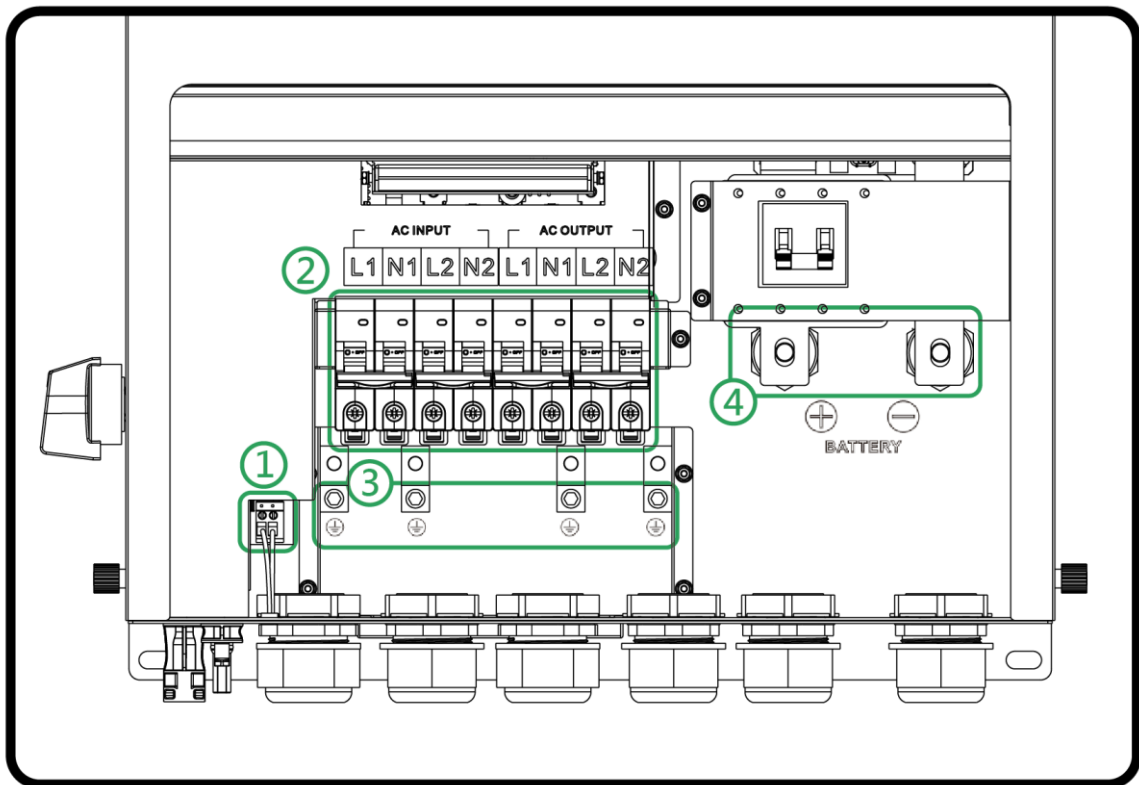


#### 4-4. Preparation

Before connecting all wires, be sure to open sliding cover by releasing the two captive screws on two sides. Refer to chart below for the details.



## Overview of the cable box



- ① External CT Connection
- ② AC Terminal and Breaker
- ③ Ground Studs
- ④ Battery Terminal

## 5. AC Input 1 (Generator) Connection

### 5-1. Preparation

**NOTE 1:** The overvoltage category of the AC input is III. It should be connected to the power distribution.

**NOTE 2:** Before connecting to grid, please install a separate AC breaker between inverter and grid. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current. The **recommended AC breaker is 63A/300V**.



**WARNING!** It's very important for system safety and efficient operation to use appropriate cable for grid (utility) connection. To reduce the risk of injury, please use the recommended cable size.

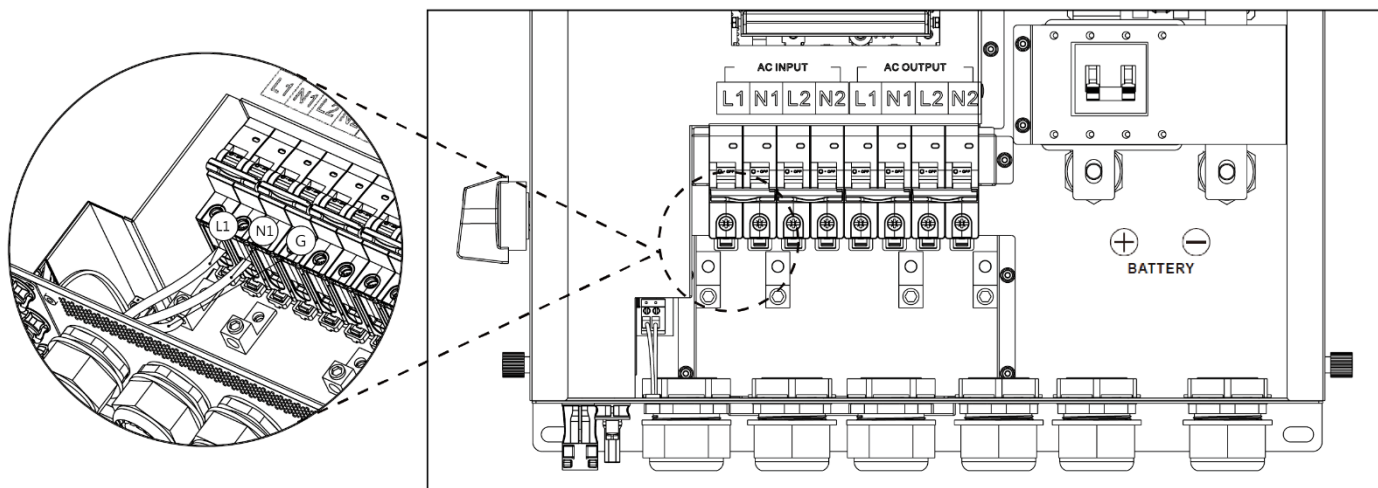
#### Recommended Cable for AC Wire

|                                            |        |
|--------------------------------------------|--------|
| Nominal Grid Voltage                       | 230VAC |
| Conductor cross-section (mm <sup>2</sup> ) | 10-16  |
| AWG no.                                    | 6-8    |

### 5-2. Connecting to the AC Input 1

Please follow below steps to implement AC input 1 (recommend connect to Generator):

1. Before making AC input connection, be sure to first open the DC protector or disconnecter.
2. Remove 7mm of the insulation sleeve.
3. Insert AC wires according to the polarities indicated on the terminal block and tighten the terminal screws. Be sure to connect the PE protective conductor (⊕) first.



**WARNING!** Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

## 6. AC Input 2 (Utility) Connection

### 6-1. Preparation

**NOTE 1:** The overvoltage category of the AC input is III. It should be connected to the power distribution.

**NOTE 2:** Before connecting to grid, please install a separate AC breaker between inverter and grid. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current. The **recommended AC breaker is 63A/300V**.



**WARNING!** It's very important for system safety and efficient operation to use the appropriate cable for generator connection. To reduce the risk of injury, please use the recommended cable size.

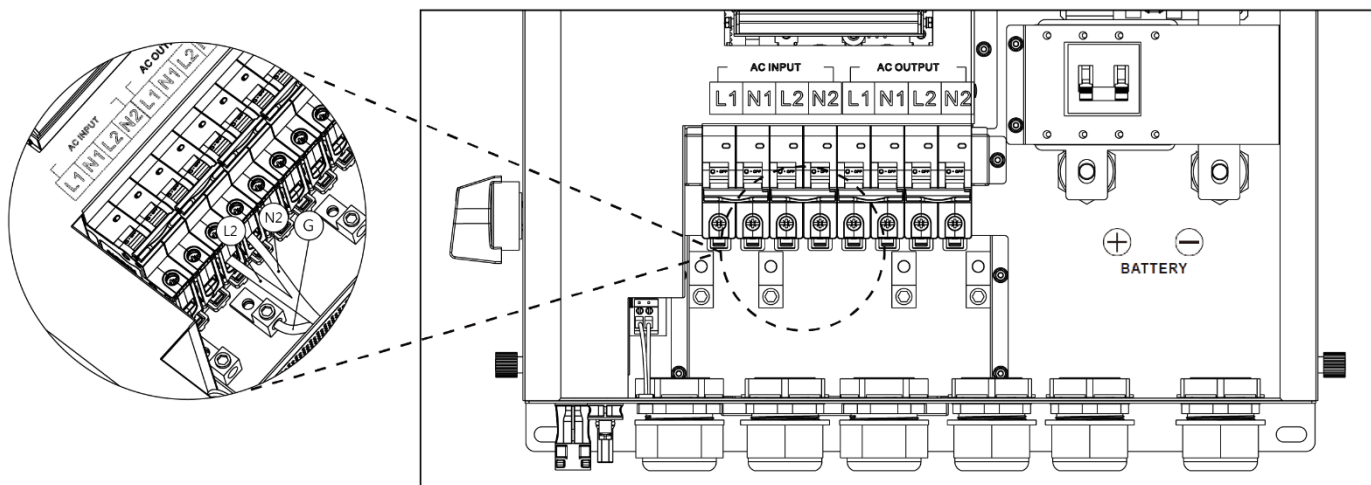
#### Recommended cable size

|                                            |        |
|--------------------------------------------|--------|
| Nominal Grid Voltage                       | 230VAC |
| Conductor cross-section (mm <sup>2</sup> ) | 10-16  |
| AWG no.                                    | 6-8    |

### 6-2. Connecting to the AC Input 2

Please follow the steps below to implement the AC input 2 (recommend connect to Utility):

1. Before making AC input 2 connection, be sure to first open the DC protector or disconnecter.
2. Remove 7mm of the insulation sleeve. 
3. Insert the AC wires according to the polarities indicated on terminal block and tighten the terminal screws. Be sure to connect the PE protective conductor (⊕) first.



**WARNING!** Be sure that the generator power source is disconnected before attempting to hardwire it to the unit.

## 7. PV Module (DC) Connection

### 7-1. Preparation

**NOTE1:** Before connecting to the PV modules, please **separately** install DC circuit breaker between the inverter and the PV modules. The recommended rating is **600VDC/50A** on each string.

**NOTE2:** The overvoltage category of the PV input is II.



**WARNING!** Because this inverter is non-isolated, only two types of PV modules are acceptable: single crystalline and poly crystalline with class A-rated. To avoid any malfunction, do not connect any PV modules with the possibility of leakage current to the inverter. For example, grounded PV modules will cause leakage current to the inverter.



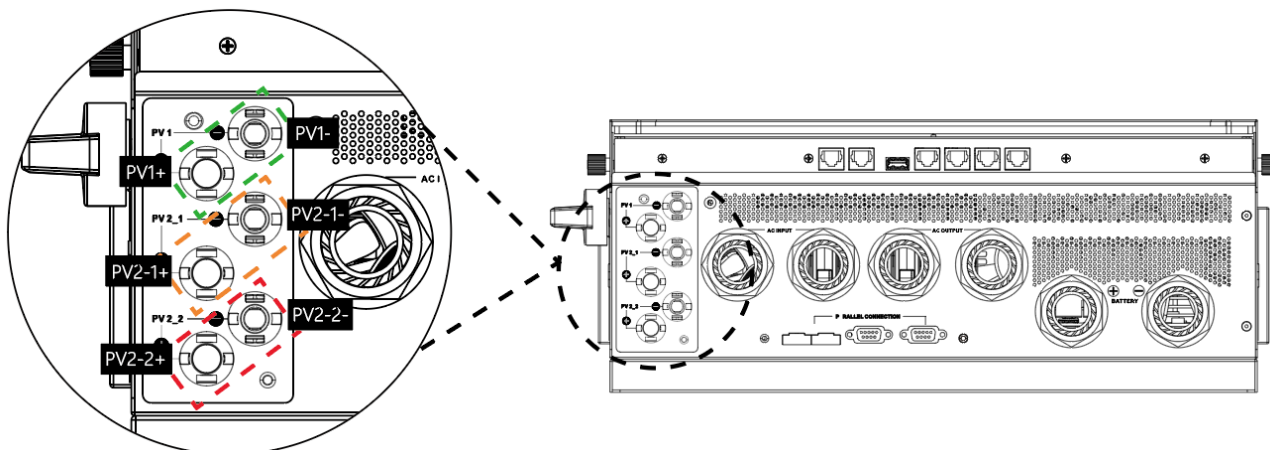
**CAUTION:** It's requested to have PV junction box with surge protection. Otherwise, it will cause inverter damage when lightning occurs on the PV modules.



**WARNING!** It's very important for system safety and efficient operation to use the appropriate cable for PV module connection. To reduce the risk of injury, please use the recommended cable size.

#### Recommended cable size

| Conductor cross-section (mm <sup>2</sup> ) | AWG no. |
|--------------------------------------------|---------|
| 4~6                                        | 10~12   |



Please follow below steps to implement PV module connection:

1. Open circuit Voltage (Voc) of PV modules not to exceed maximum PV array open circuit voltage of the inverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than the start-up voltage.
3. Disconnect the circuit breaker and switch off the PV switch located on the side of the inverter.
4. Check correct polarity of connection cable from PV modules and PV input connectors.



**CAUTION:** Exceeding the maximum input voltage can destroy the unit!! Check the system before wire connection.

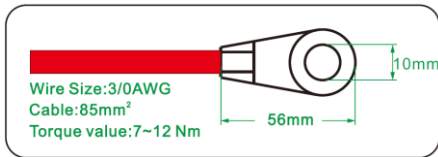
## 7-2. Recommended Panel Configuration

| Note                                   |               |       |       |       |
|----------------------------------------|---------------|-------|-------|-------|
| Max. PV Array Open Circuit Voltage     | 500Vdc        |       |       |       |
| Max. Array Current of PV1              | 27A           |       |       |       |
| Max. Array Current of PV2-1, PV2-2     | 27A, 27A      |       |       |       |
| Max. Total Array Current (PV2-1+PV2-2) | 40A           |       |       |       |
| Max. Total Array Current (PV1+PV2)     | (20A+40A) 60A |       |       |       |
|                                        |               |       |       |       |
| Specifications                         | Solar panel   |       |       |       |
| Nominal Max. Power (Pmax) (W)          | 615           | 620   | 630   | 640   |
| Opt. Operating Voltage (Vmp) (V)       | 35.5          | 35.7  | 35.9  | 36.1  |
| Opt. Operating Current (Imp) (A)       | 17.33         | 17.37 | 17.41 | 17.46 |
| Open Circuit Voltage (Voc) (V)         | 42.7          | 42.9  | 43.1  | 43.3  |
| Short Circuit Current (Isc) (A)        | 18.26         | 18.31 | 18.36 | 18.41 |
| For 18KW input recommendation          |               |       |       |       |
| Numbers in series of MPPT1             | 10            | 10    | 10    | 10    |
| Numbers of strings in MPPT1            | 1             | 1     | 1     | 1     |
| Maximum input voltage of MPPT1 (V)     | 427           | 429   | 431   | 433   |
| Input power of MPPT1 (W)               | 6150          | 6200  | 6300  | 6400  |
| Numbers in series of MPPT2             | 10            | 10    | 10    | 10    |
| Numbers of strings in MPPT2            | 2             | 2     | 2     | 2     |
| Maximum input voltage of MPPT2 (V)     | 427           | 429   | 431   | 433   |
| Input power of MPPT2 (W)               | 12300         | 12400 | 12600 | 12800 |
| Total input power (W)                  | 18450         | 18600 | 18900 | 19200 |
| Minimum input recommendation           |               |       |       |       |
| Numbers in series of MPPT1             | 3             | 3     | 3     | 3     |
| Numbers of strings in MPPT1            | 1             | 1     | 1     | 1     |
| Maximum input voltage of MPPT1 (V)     | 128.1         | 128.7 | 129.3 | 129.9 |
| Input power of MPPT1 (W)               | 1845          | 1860  | 1890  | 1920  |
| Numbers in series of MPPT2             | 3             | 3     | 3     | 3     |
| Numbers of strings in MPPT2            | 1             | 1     | 1     | 1     |
| Maximum input voltage of MPPT2 (V)     | 128.1         | 128.7 | 129.3 | 129.9 |
| Input power of MPPT2 (W)               | 1845          | 1860  | 1890  | 1920  |
| Total input power (W)                  | 3690          | 3720  | 3780  | 3840  |

## 8. Battery Connection

**NOTE1:** The overvoltage category of the battery input is II.

### Recommended battery cable and terminal size for each inverter



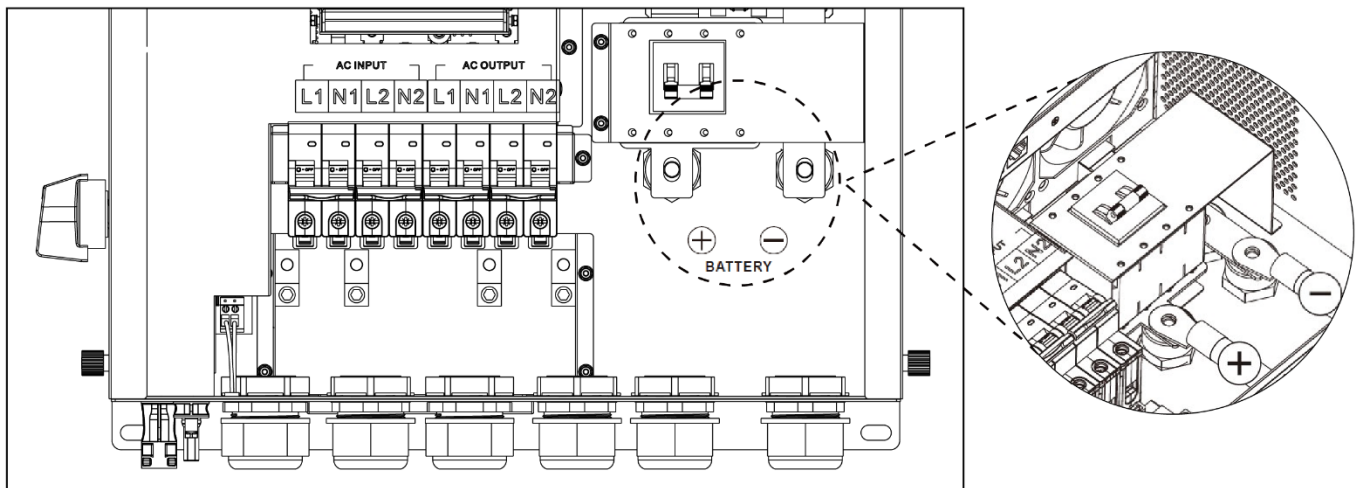
Please follow below steps to implement battery connection:

1. Check the nominal voltage 48VDC of batteries.



**WARNING!** Be sure the length of all battery cables are the same. Otherwise, there will be a voltage difference between inverter and battery and cause parallel inverters to not work.

2. Insert battery wires according to polarities indicated on the terminal block and tighten the terminal screws.



**WARNING!** Wrong connections will damage the internal fuse.

## 9. Load (AC Output) Connection

### 9-1. Preparation

**NOTE1:** To prevent further supply to the load via the inverter during any mode of operation, an additional disconnection device should be placed on in the building wiring installation.



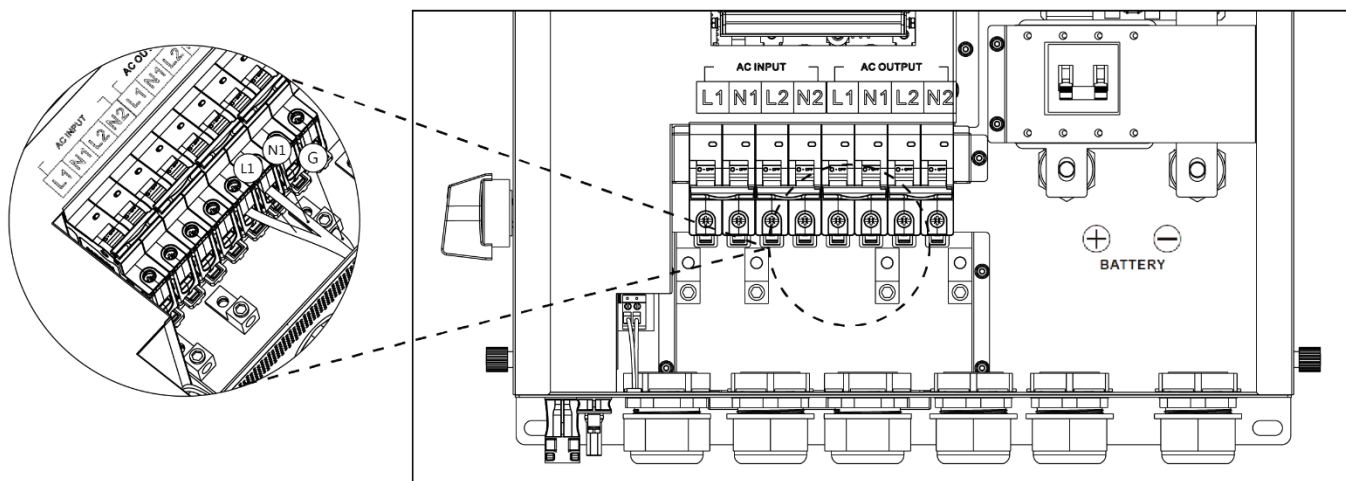
**WARNING!** It's very important for system safety and efficient operation to use the appropriate cable for AC connection. To reduce the risk of injury, please use the recommended cable size.

#### Recommended Cable Size

|                                            |         |
|--------------------------------------------|---------|
| Nominal Grid Voltage                       | 230 VAC |
| Conductor cross-section (mm <sup>2</sup> ) | 10-16   |
| AWG no.                                    | 8-6     |

### 9-2. Connecting to the AC output 1

1. Before making output 1 connection, be sure to first open the DC protector or disconnecter.
2. Remove 7mm of the insulation sleeve. 
3. Insert AC wires according to the polarities indicated on terminal block and tighten the terminal screws. Be sure to connect the PE protective conductor (⊕) first.



**CAUTION:** Do NOT connect the utility to "AC Output Connector (Load connector)". Be sure to connect the L terminal of load to the L terminal of "AC Output Connector (Load connector)" and the N terminal of load to the N terminal of "AC Output Connector (Load connector)". The G terminal of "AC Output Connector" is connected to grounding of the load.

### 9-3. Connecting to the AC Output 2

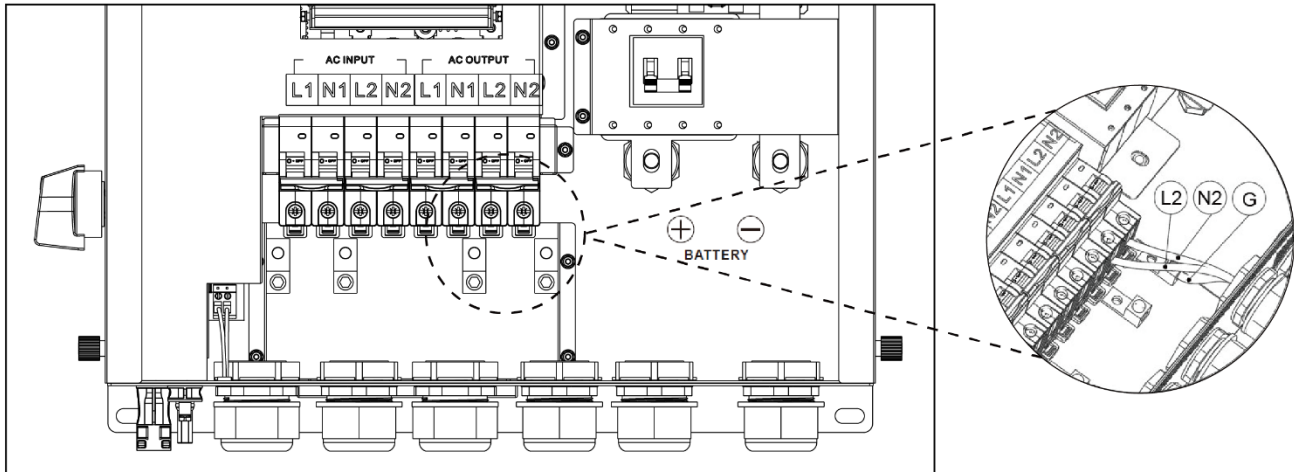
Please follow the steps below to implement the AC output 2 connection:

4. Before making output 2 connection, be sure to first open the DC protector or disconnector.

5. Remove 7mm of the insulation sleeve.



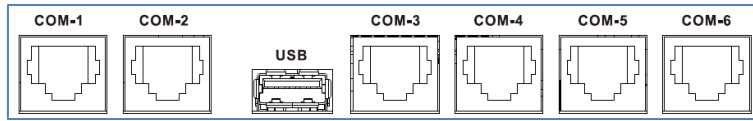
6. Insert the AC wires according to the polarities indicated on terminal block and tighten the terminal screws. Be sure to connect the PE protective conductor (⊕) first.



**CAUTION:** Appliances such as air conditioner require at least 2~3 minutes to restart because it's needs enough time to balance the refrigerant gas inside its circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check with the manufacturer of air conditioner to see if it's equipped with time-delay function before installation. Otherwise, this inverter/charger will trigger an overload fault and cut off the output to protect your appliance, but sometimes it may still cause internal damage to the air conditioner.

## 10. Communication

The inverter is equipped with several communication ports to communicate with a PC with the corresponding software. Follow the below procedure to connect the communication wiring and install the software.



Please install monitoring software in your computer. Detailed information is listed in the next chapter. After software is installed, you may initial the monitoring software and extract data through communication port.

### 10-1. Wi-Fi Connection

This unit is equipped with a Wi-Fi transmitter. The Wi-Fi transmitter can enable wireless communication between the off-grid inverters and the monitoring platform. Users can access and control the monitored inverter with downloaded APP. You may find "Energy-Mate" app from the Apple® Store and Google® Play Store. All data loggers and parameters are saved in iCloud. For quick installation and operation, please refer to The Wi-Fi Operation Guide for details.

### 10-2. Pin Assignment of COM-1 Port (Dry Contact)

| PIN # | Definition | PIN # | Definition |
|-------|------------|-------|------------|
| PIN 1 | NC         | PIN 5 | COM        |
| PIN 2 | NC         | PIN 6 | NO         |
| PIN 3 | NC         | PIN 7 | NO         |
| PIN 4 | COM        | PIN 8 | NO         |

There is one dry contact (3A/250VAC) signal available on the port. It could be used to deliver signal to external device when battery voltage reaches warning level.

| Unit Status | Condition                                             |                                                                        |                                                                                                                | NC & COM | NO & COM |
|-------------|-------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------|----------|
| Power Off   | Unit is off and no output is powered.                 |                                                                        |                                                                                                                | Close    | Open     |
| Power On    | Output is powered from Battery power or Solar energy. | Output source priority set as USB (utility first) or SUB (solar first) | Battery voltage /SOC < Low DC voltage / SOC warning                                                            | Open     | Close    |
|             |                                                       |                                                                        | Battery voltage/SOC > Setting value in restart charging voltage/SOC or battery charging reaches floating stage | Close    | Open     |
|             |                                                       | Output source priority is set as SBU (SBU priority)                    | Battery voltage/SOC < Setting value in stop discharging voltage/SOC or BMS sends disable discharging status    | Open     | Close    |
|             |                                                       |                                                                        | Battery voltage/SOC > Setting value in restart charging voltage/SOC or battery charging reaches floating stage | Close    | Open     |

### 10-3. Pin Assignment of COM-2 Port

| PIN # | Definition | PIN # | Definition |
|-------|------------|-------|------------|
| PIN 1 | X          | PIN 5 | GND        |
| PIN 2 | X          | PIN 6 | GND        |
| PIN 3 | X          | PIN 7 | GND        |
| PIN 4 | X          | PIN 8 | GND        |

### 10-4. Pin Assignment of USB Port

| PIN # | Definition |
|-------|------------|
| PIN 1 | VCC        |
| PIN 2 | D-         |
| PIN 3 | D+         |
| PIN 4 | GND        |

This port is used to export internal log or communicate with PC.

### 10-5. Pin Assignment of COM-3 Port (Battery temperature sensor)

| PIN # | Definition | PIN # | Definition       |
|-------|------------|-------|------------------|
| PIN 1 | X          | PIN 5 | Ext. Bat.Temp    |
| PIN 2 | X          | PIN 6 | Ext.Bat.Temp.SCL |
| PIN 3 | X          | PIN 7 | Ext.Bat.Temp.SDA |
| PIN 4 | +3.3V      | PIN 8 | GND              |

This port is reserved to accept external BTS signal for compensating charging parameters.

### 10-6. Pin Assignment of COM-4 Port (BMS communication)

| PIN # | Definition | PIN # | Definition |
|-------|------------|-------|------------|
| PIN 1 | X          | PIN 5 | RS485P     |
| PIN 2 | X          | PIN 6 | CANH       |
| PIN 3 | RS485N     | PIN 7 | CANL       |
| PIN 4 | X          | PIN 8 | GND        |

This port is used to communicate with the BMS of Lithium batteries.

### 10-7. Pin Assignment of COM-5 Port (RS232 communication)

| PIN # | Definition | PIN # | Definition |
|-------|------------|-------|------------|
| PIN 1 | RS232TX    | PIN 5 | X          |
| PIN 2 | RS232RX    | PIN 6 | X          |
| PIN 3 | X          | PIN 7 | X          |
| PIN 4 | X          | PIN 8 | GND        |

This port is used to communicate with PC.

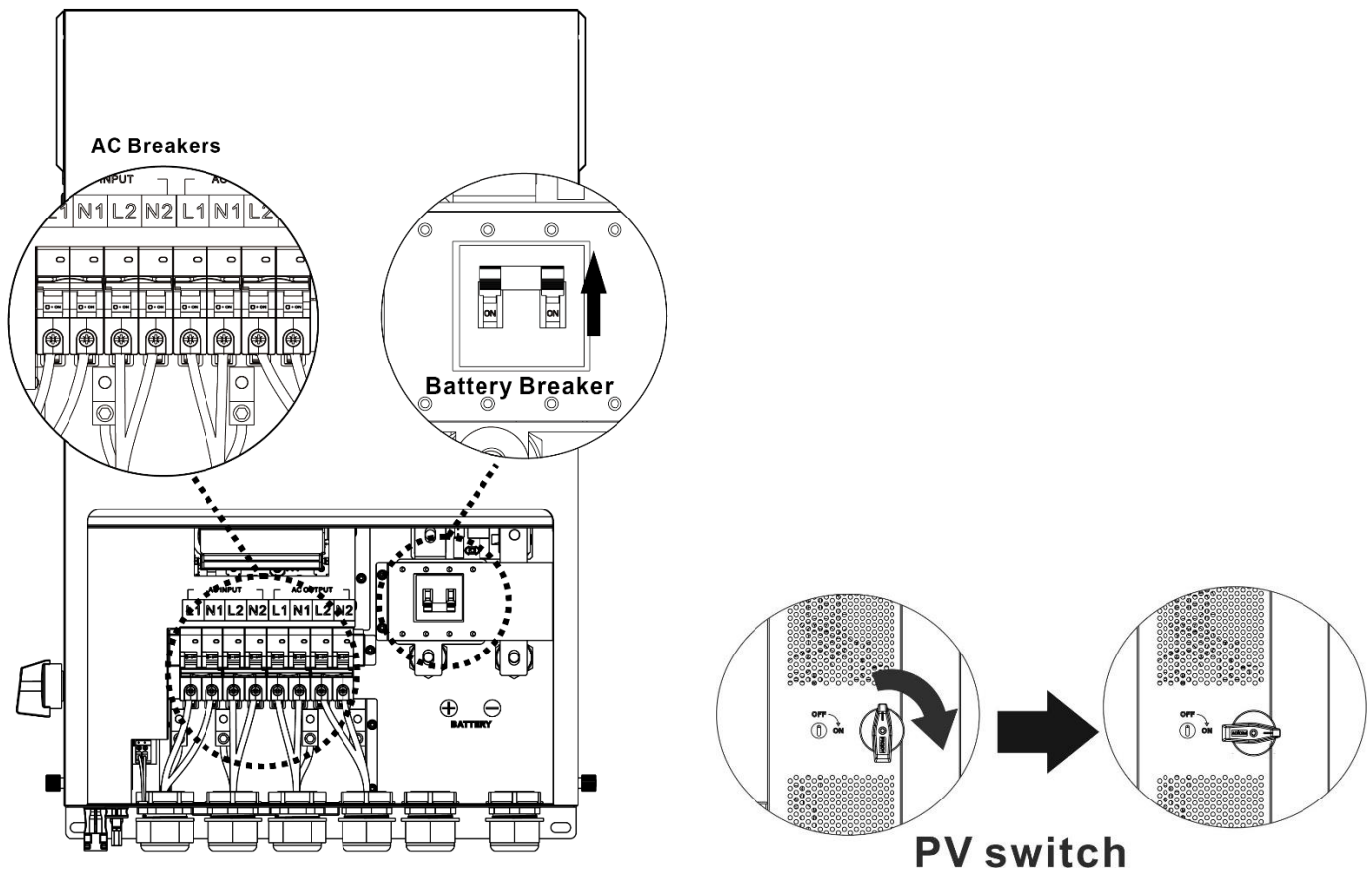
### 10-8. Pin Assignment of COM-6 Port (AFCI, GFCI, E-STOP Detections)

| PIN # | Definition   | PIN # | Definition   |
|-------|--------------|-------|--------------|
| PIN 1 | +12V         | PIN 5 | AFCI_AFD.ALM |
| PIN 2 | E-STOP Input | PIN 6 | X            |
| PIN 3 | AFCI_FRB     | PIN 7 | X            |
| PIN 4 | +5V          | PIN 8 | GND          |

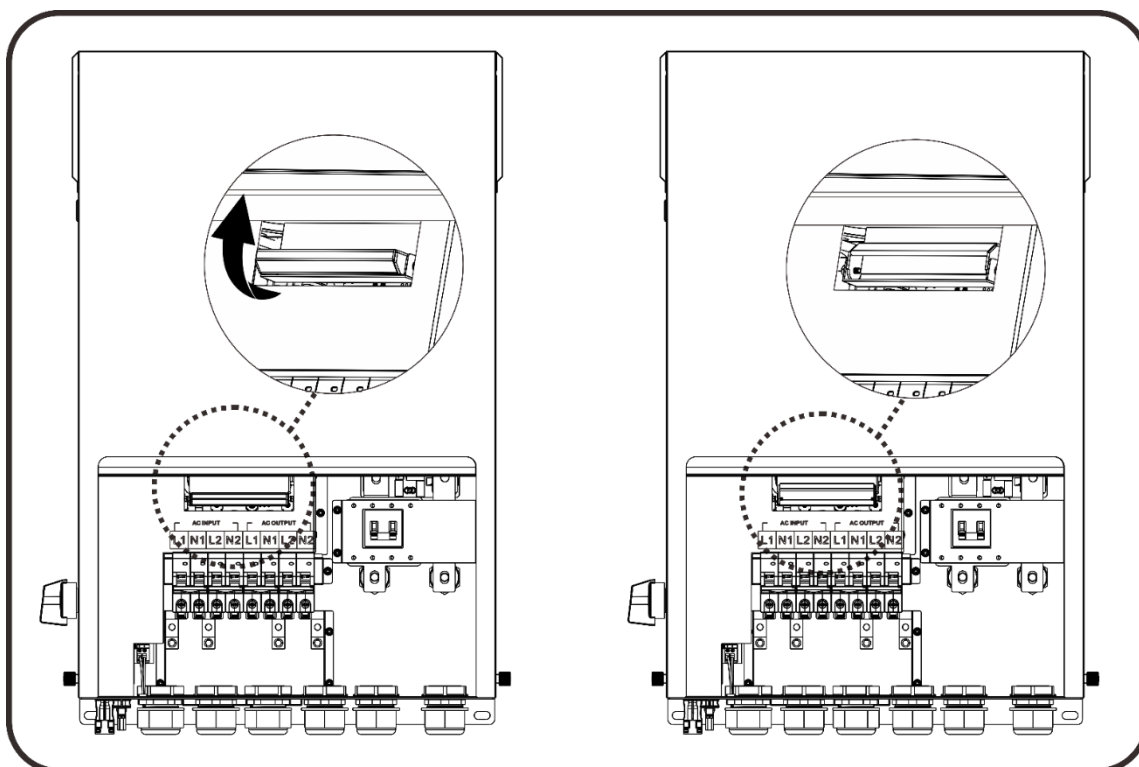
This port is reserved to integrate with external AFCI, GFCI or E-STOP device.

## 11. Commissioning

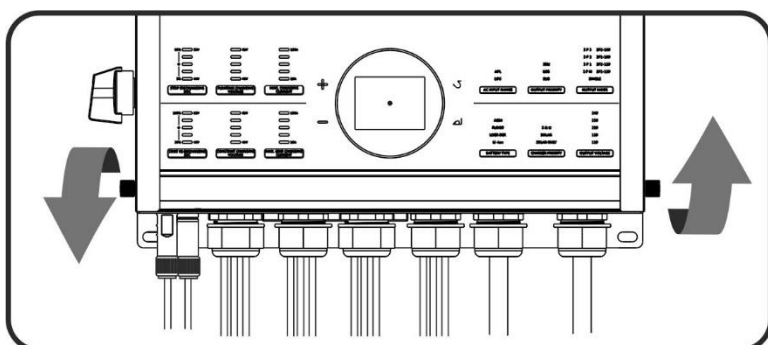
1. Check the following requirements before commissioning:
  - Ensure that the inverter is firmly secured
  - Check if the open circuit DC voltage of the PV module meets the requirements (see Section 7)
  - Check if the open circuit utility voltage of the utility is approximately the same as the nominal expected value from local utility company.
  - Check if the connection of AC cable to grid (utility) is correct, if the utility is required.
  - Full connection to PV modules.
2. Switch on the battery breaker and then switch on the PV switch. After that, if there is utility connection, please switch on the AC breakers.



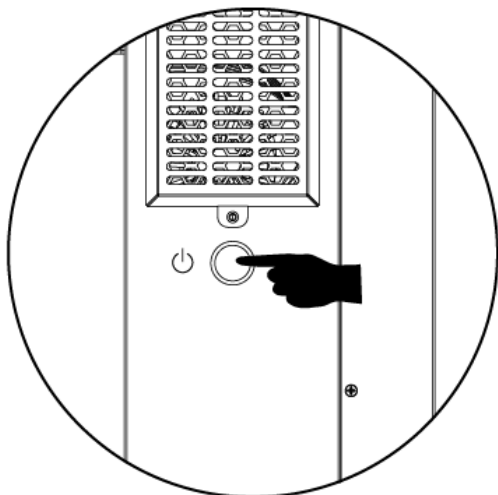
3. Return cover holder to original position and close sliding cover.



4. Lock two screws tightly on the two sides.



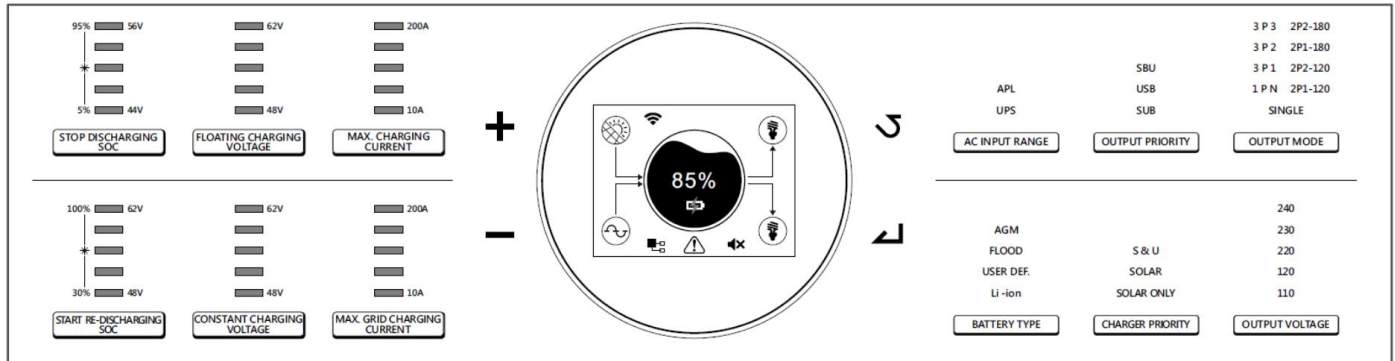
5. Press power on/off switch for 3~5 seconds to turn on the inverter.



## 12. Operation

### 12-1. Interface

The operation panel, shown in the chart below, includes four touchable function keys, twelve setting indicators and a colorful LCD display to indicate the operating status, configured critical parameters and all power information.

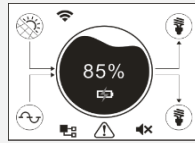


### 12-2. LCD Information

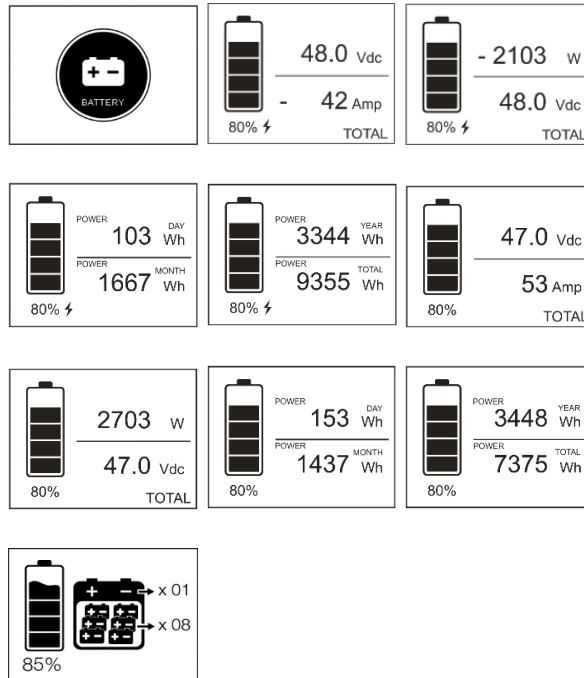
| Program List                  | Functions                                                              |
|-------------------------------|------------------------------------------------------------------------|
| <b>Basic</b>                  |                                                                        |
| <b>01</b>                     | HOME page selection                                                    |
| <b>02</b>                     | Mute function                                                          |
| <b>03, 04</b>                 | Date & Time                                                            |
| <b>05</b>                     | Data Log period                                                        |
| <b>06</b>                     | Screen off time                                                        |
| <b>Advanced</b>               |                                                                        |
| <b>01, 02</b>                 | Output frequency and voltage                                           |
| <b>03</b>                     | Output source priority                                                 |
| <b>04</b>                     | Charger source priority                                                |
| <b>05</b>                     | Battery type                                                           |
| <b>06, 07</b>                 | Stop/Re-start discharging battery voltage or SOC                       |
| <b>08, 09</b>                 | Bulk and floating charging voltage                                     |
| <b>10</b>                     | Battery minimum voltage or SOC                                         |
| <b>11</b>                     | Maximum charging current                                               |
| <b>12, 13</b>                 | Maximum utility and generator charging current                         |
| <b>14</b>                     | Maximum battery discharging current                                    |
| <b>15</b>                     | AC input voltage range                                                 |
| <b>16</b>                     | Auto restart when overload or over-temperature                         |
| <b>17</b>                     | Overload bypass                                                        |
| <b>18</b>                     | AC output mode                                                         |
| <b>19, 20</b>                 | External CT function                                                   |
| <b>21, 22, 23, 24, 25, 26</b> | Battery equalization, voltage, timer, activate                         |
| <b>27, 28, 29, 30, 31</b>     | Battery voltage, SOC, discharge time or interval on/off the 2nd output |
| <b>32, 33</b>                 | Calibrate meter earth, reverse LED                                     |
| <b>36</b>                     | Erase all data log                                                     |
| <b>37</b>                     | Reset to default                                                       |
| <b>38</b>                     | Firmware upgrade                                                       |
| <b>39</b>                     | Export Logs                                                            |

## Display

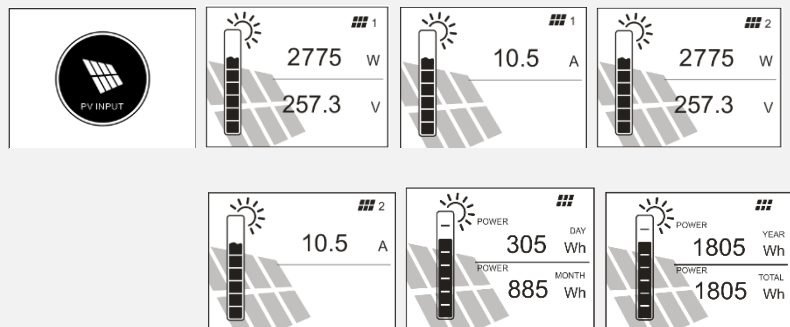
Home page:  
indicates the summarized power  
flow and energy information.



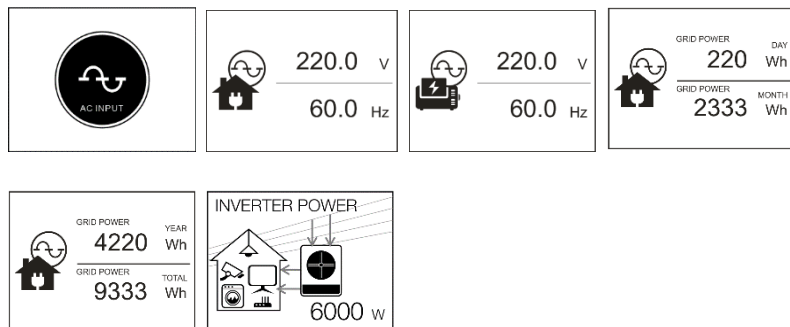
Battery page:  
Indicates the battery information.



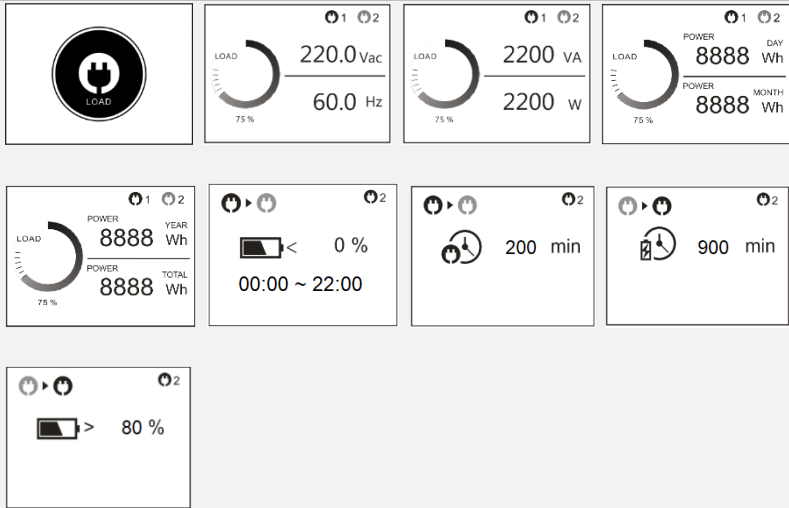
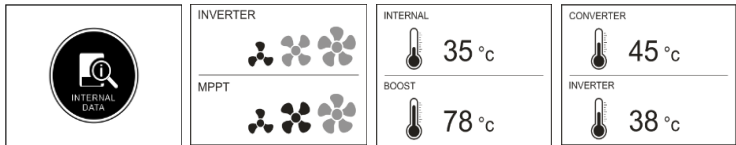
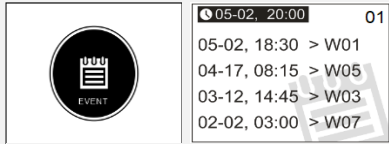
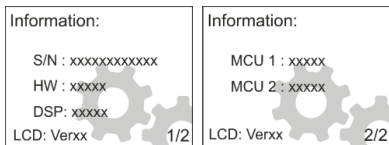
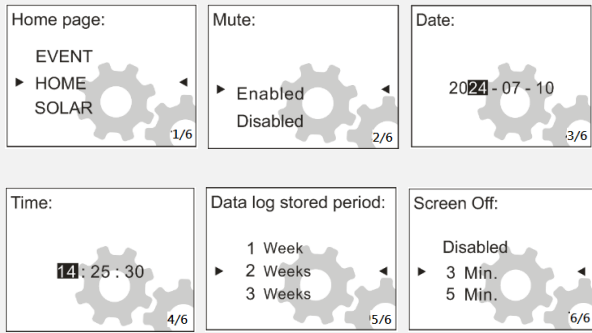
PV page:  
Indicates the dual PV information.



AC input page:  
Indicates the dual AC input  
information.



AC output page:  
Indicates the dual AC output  
information.

|                                                                                                                                                                                                                                                                                                                                               |                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                               |     |
| Internal data page:<br>Indicates fan speed and temperature information.                                                                                                                                                                                                                                                                       |    |
| Logs page:<br>Indicates all event, warning, and fault messages.                                                                                                                                                                                                                                                                               |   |
| <b>Configuration</b>                                                                                                                                                                                                                                                                                                                          |                                                                                      |
| Press  icon for 3s to enter the setting menu.<br>There are three sub-menus:<br>Information, Basic and Advanced.<br>Click  icon to exit setting and return to Home page. |  |
| <b>Information:</b><br>Serial number, Hardware and Firmware versions                                                                                                                                                                                                                                                                          |  |
| <b>Basic:</b><br>HOME page selection, Mute function, Date & Time & Log period adjustment                                                                                                                                                                                                                                                      |  |
| <b>Advanced</b>                                                                                                                                                                                                                                                                                                                               |                                                                                      |

|                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The nominal voltage and frequency</p> <p>Default: 230Vac, 50Hz</p>                                                                                                                                                                                                                                                                                                                     | <div> <div> Inverter Volt:<br/> 220Vac<br/> ▶ 230Vac<br/> 240Vac<br/> 1/39 </div> <div> Inverter Frequency:<br/> ▶ 60 Hz<br/> 50 Hz<br/> 2/39 </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>The output and charger source priority</p> <p>Regular: Priority arranged every day<br/> Schedule: Priority arranged during setting hours<br/> If setting 00hr – 00hr, the setting will not be activated.</p> <p>Default: Regular</p>                                                                                                                                                   | <div> <div> Output Source Priority:<br/> ▶ Schedule<br/> Regular<br/> 3/39 </div> <div> Charger Source Priority:<br/> ▶ Schedule<br/> Regular<br/> 4/39 </div> </div> <div> <div> Output Source Priority: [Regular]<br/> USB<br/> ▶ SUB<br/> SBU </div> <div> Output Source Priority: [Schedule]<br/> USB<br/> ▶ SUB<br/> SBU </div> <div> Charger Source Priority: [Regular]<br/> Solar<br/> ▶ Utility+Solar<br/> Solar only </div> <div> Charger Source Priority: [Schedule]<br/> Solar<br/> ▶ Utility+Solar<br/> Solar only </div> </div> <div> <div> Output Source Priority: [SUB]<br/> 09hr ~ 18hr </div> <div> Output Source Priority: [Utility+Solar]<br/> 09hr ~ 18hr </div> </div>                                                                                                                                            |
| <p>Battery Type Selection</p> <p>If “User-Defined” is selected, battery charge voltage and minimum voltage can be set up.</p> <p>Any type of lithium battery selected, maximum charging current and voltage will be managed by BMS automatically.</p> <p>Default: AGM</p>                                                                                                                 | <div> <div>Battery type:<br/>LIC<br/>▶ AGM<br/>Flooded<br/>5/39</div> <div>Battery type:<br/>AGM<br/>▶ Flooded<br/>User-Defined<br/>5/39</div> <div>Battery type:<br/>Flooded<br/>▶ User-Defined<br/>Pylontech battery<br/>5/39</div> <div>Battery type:<br/>User-Defined<br/>▶ Pylontech battery<br/>BYD battery<br/>5/39</div> </div> <div> <div>Battery type:<br/>Pylontech battery<br/>▶ BYD battery<br/>WECO battery<br/>5/39</div> <div>Battery type:<br/>BYD battery<br/>▶ WECO battery<br/>Soltaro battery<br/>5/39</div> <div>Battery type:<br/>WECO battery<br/>▶ Soltaro battery<br/>LIA<br/>5/39</div> <div>Battery type:<br/>Soltaro battery<br/>▶ LIA<br/>LIB<br/>5/39</div> </div> <div> <div>Battery type:<br/>LIA<br/>▶ LIB<br/>LIC<br/>5/39</div> <div>Battery type:<br/>LIB<br/>▶ LIC<br/>AGM<br/>5/39</div> </div> |
| <p>The stop and restart discharging voltage/SOC and minimum voltage/SOC</p> <p>Any type of lithium battery selected, setting value will be managed by BMS automatically.</p> <p>Default: 46V (Stop discharging Volt), 54V (Start re-discharging Volt), 44V (Minimum Vol Level).</p> <p>Default: 10% (Stop discharging Volt), 80% (Start re-discharging Volt), 10% (Minimum Vol Level)</p> | <div> <div>Stop Discharging Volt:<br/>45.9 V<br/>▶ 46.0 V<br/>46.1 V<br/>6/39</div> <div>Start Re-Discharging Volt:<br/>53.9 V<br/>▶ 54.0 V<br/>54.1 V<br/>7/39</div> <div>Minimum Vol Level:<br/>43.9 V<br/>▶ 44.0 V<br/>44.1 V<br/>10/39</div> </div> <div> <div>Stop Discharging SOC:<br/>5 %<br/>▶ 10 %<br/>15 %<br/>6/39</div> <div>Start Re-Discharging SOC:<br/>70 %<br/>▶ 80 %<br/>90 %<br/>7/39</div> <div>Minimum SOC Level:<br/>0 %<br/>▶ 10 %<br/>20 %<br/>10/39</div> </div>                                                                                                                                                                                                                                                                                                                                              |
| <p>The CV and floating voltage</p>                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Default: 56.4V (Charging CV Volt), 54V (Charging Floating Volt)</p>                                                                                                                               | <div>Charging CV Volt:</div> <div>56.3 V<br/>▶ 56.4 V<br/>56.5 V<br/>8/39</div> <div>Charging Floating Volt:</div> <div>53.9 V<br/>▶ 54.0 V<br/>54.1 V<br/>9/39</div>                                                                                                                                                                                                                                                                                                                           |
| <p>The maximum charging current and limitation while charging from Utility and Generator</p> <p>Default: 60A (Max charging current), 30A (Generator charging current), 30A (AC charging current)</p> | <div>Max. Charging Current:</div> <div>50 A<br/>▶ 60 A<br/>70 A<br/>11/39</div> <div>Generator Charging Current:</div> <div>20 A<br/>▶ 30 A<br/>40 A<br/>12/39</div> <div>Utility Charging Current:</div> <div>2 A<br/>▶ 10 A<br/>20 A<br/>13/39</div>                                                                                                                                                                                                                                          |
| <p>The max. discharging current</p> <p>Default: Disabled (no limitation)</p>                                                                                                                         | <div>Max. Discharge Current:</div> <div>Disable<br/>▶ 30 A<br/>40 A<br/>14/39</div>                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>The compatibility of AC input source</p> <p>Default: Generator</p>                                                                                                                                | <div>AC Input Volt Range:</div> <div>Generator-Sensitive<br/>▶ Generator<br/>Utility<br/>15/37</div>                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>Configure fault or overload behaviors</p> <p>Default: Disabled</p>                                                                                                                                | <div>Fault Auto-restart:</div> <div>▶ Disabled<br/>Enabled<br/>16/39</div> <div>Overload Bypass:</div> <div>▶ Disabled<br/>Enabled<br/>17/39</div>                                                                                                                                                                                                                                                                                                                                              |
| <p>The operation of AC output mode</p> <p>Default: Single</p>                                                                                                                                        | <div>AC Output Mode:</div> <div>L3 phase<br/>▶ Single<br/>Parallel<br/>18/39</div>                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p>The external CT function and CT direction</p> <p>Default: Disabled (external CT function), Normal (external CT direction)</p>                                                                     | <div>External CT function:</div> <div>200 A<br/>▶ Disabled<br/>50 A<br/>19/39</div> <div>External CT direction:</div> <div>▶ Normal<br/>Reversed<br/>20/39</div>                                                                                                                                                                                                                                                                                                                                |
| <p>The battery equalization function</p> <p>Voltage, time, timeout and interval setting</p> <p>Default: Disabled<br/>58.4V, 60 min, 120 min, 30 days</p>                                             | <div>Battery EQ Function:</div> <div>▶ Disabled<br/>Enabled<br/>21/39</div> <div>Battery EQ Volt:</div> <div>58.3 V<br/>▶ 58.4 V<br/>58.5 V<br/>22/39</div> <div>Battery EQ time:</div> <div>55 min<br/>▶ 60 min<br/>65 min<br/>23/39</div> <div>Battery EQ timeout:</div> <div>115 min<br/>▶ 120 min<br/>125 min<br/>24/39</div> <div>Battery EQ interval:</div> <div>29 days<br/>▶ 30 days<br/>31 days<br/>25/39</div> <div>EQ Immediately:</div> <div>▶ Disabled<br/>Enabled<br/>26/39</div> |

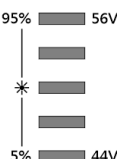
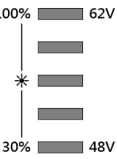
|                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The second output control according to the battery cut-off/restart voltage point or SOC</p> <p>Any type of lithium battery selected, the setting value will be managed by BMS automatically.</p> <p>Default: 42V, 46V, 0%, 20%</p>                                                                                   | <div> <div> Discharge Volt O/P-2:<br/> 60.0 V<br/> ▶ 42.0 V<br/> 42.1 V<br/> 27/39 </div> <div> Re-Discharge Volt O/P-2<br/> 45.9 V<br/> ▶ 46.0 V<br/> 46.1 V<br/> 30/39 </div> </div> <div> <div> Discharge SOC O/P-2:<br/> 95 %<br/> ▶ 0 %<br/> 5 %<br/> 27/39 </div> <div> Re-Discharge SOC O/P-2<br/> 15 %<br/> ▶ 20 %<br/> 25 %<br/> 30/39 </div> </div>                                                                                                                                                                                             |
| <p>The second output control according to the battery discharge timer or discharge/charging time</p> <p>Default: 00hr~23hr, Disabled, 0 min</p>                                                                                                                                                                         | <div> <div> Discharge Time O/P-2:<br/> 990 min<br/> ▶ Disable<br/> 0 min<br/> 28/39 </div> <div> Discharge Interval O/P-2<br/> 00hr ~ 23hr<br/> 29/39 </div> <div> Re-Discharge Time O/P-2<br/> Disable<br/> ▶ 0 min<br/> 5 min<br/> 31/39 </div> </div>                                                                                                                                                                                                                                                                                                  |
| <p>Calibration with external meter</p> <p>Default: 0, 200W</p>                                                                                                                                                                                                                                                          | <div> <div> Earth LED Calibration:<br/> Condition: 10<br/> - 1<br/> ▶ + 0<br/> + 1<br/> 32/39 </div> <div> Reverse LED Calibration:<br/> 190 W<br/> ▶ 200 W<br/> 210 W<br/> 33/39 </div> </div>                                                                                                                                                                                                                                                                                                                                                           |
| <p>Specific critical operations activate (It's necessary to enter Password 4743 to access)</p> <ul style="list-style-type: none"> <li>- Reset to factory setting</li> <li>- Erase all logs</li> <li>- Export all logs</li> <li>- Firmware upgrade via OTG (Please contact your installer to obtain firmware)</li> </ul> | <div> <div> Erase all data log:<br/> Password<br/> 0000<br/> 36/39 </div> <div> Erase all data log:<br/> ▶ Not reset<br/> Reset </div> </div> <div> <div> Reset to default:<br/> Password<br/> 0000<br/> 37/39 </div> <div> Reset to default:<br/> ▶ Enabled<br/> Disabled </div> </div> <div> <div> Firmware Upgrade:<br/> Password<br/> 0000<br/> 38/39 </div> <div> Firmware Upgrade:<br/> MCU<br/> ▶ NO<br/> DSP </div> </div> <div> <div> Export Logs:<br/> Password<br/> 0000<br/> 39/39 </div> <div> Export Logs:<br/> ▶ NO<br/> YES </div> </div> |

### 12-3. Touchable function keys

| Key                                                                               | Operation                 | Function                                      |
|-----------------------------------------------------------------------------------|---------------------------|-----------------------------------------------|
|  | Quick touch<br>Long Press | Confirm selection<br>Enter configuration mode |
|  | Quick touch.              | Exit the setting                              |
|  | Quick touch.              | Select next selection or scroll to next page  |
|  | Quick touch.              | Select next selection or scroll to up page    |

**NOTE:** If backlight of LCD module shuts off, you may activate it by touching any key

### 12-4. Setting LED Information

|                                                                                                                 |                                                                                                                  |                                                                                                                   |                                                         |                                                      |                                                                                               |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <br>STOP DISCHARGING SOC       | <br>FLOATING CHARGING VOLTAGE   | <br>MAX. CHARGING CURRENT        | APL<br>UPS<br><br>AC INPUT RANGE                        | SBU<br>USB<br>SUB<br><br>OUTPUT PRIORITY             | 3 P 3 2P2-180<br>3 P 2 2P1-180<br>3 P 1 2P2-120<br>1 P N 2P1-120<br>SINGLE<br><br>OUTPUT MODE |
| <br>START RE-DISCHARGING SOC | <br>CONSTANT CHARGING VOLTAGE | <br>MAX. GRID CHARGING CURRENT | AGM<br>FLOOD<br>USER DEF.<br>Li-ion<br><br>BATTERY TYPE | S & U<br>SOLAR<br>SOLAR ONLY<br><br>CHARGER PRIORITY | 240<br>230<br>220<br>120<br>110<br><br>OUTPUT VOLTAGE                                         |

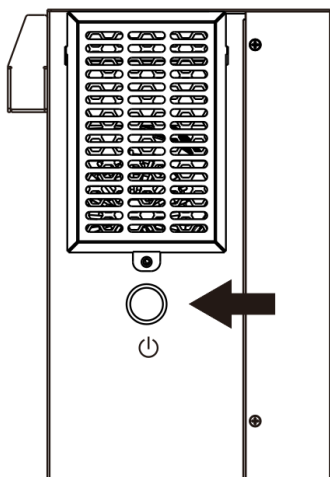
#### Critical Parameter Indications:

- Start Discharging / Stop Discharging SOC
- Floating / Constant Charging Voltage
- Max. Charging / AC Charging Current
- Output / Charger Priority
- Output Mode / Output Voltage
- AC Input Range
- Battery Type

|                          |                           |                            |                |                  |                |
|--------------------------|---------------------------|----------------------------|----------------|------------------|----------------|
| STOP DISCHARGING SOC     | FLOATING CHARGING VOLTAGE | MAX. CHARGING CURRENT      | AC INPUT RANGE | OUTPUT PRIORITY  | OUTPUT MODE    |
| START RE-DISCHARGING SOC | CONSTANT CHARGING VOLTAGE | MAX. GRID CHARGING CURRENT | BATTERY TYPE   | CHARGER PRIORITY | OUTPUT VOLTAGE |

12 shortcut indicators are used to enter configuration easily when the LCD in the setting page.

## 12-5. On/Off Operation (located on the side of the inverter)



Quick press to wake up inverter when the input power is supplied from battery only.

Press and hold the button for 3 seconds to turn on/off the AC output of the inverter.

## 13. Maintenance & Cleaning

Check the following points to ensure proper operation of whole solar system at regular intervals.

- Ensure all connectors of this inverter are cleaned all the time.
- Before cleaning the solar panels, be sure to turn off PV switch first.
- Clean the solar panels, during the cool time of the day, whenever it is visibly dirty.
- Periodically inspect the system to make sure that all wires and supports are securely fastened in place.



**WARNING!** There are no user-replaceable parts inside of the inverter. Do not attempt to service the unit yourself.

### Battery Maintenance

- Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
- When replacing batteries, replace with the same type and number of batteries or battery packs.
- The following precautions should be observed when working on batteries:
  - a) Remove watches, rings, or other metal objects.
  - b) Use tools with insulated handles.
  - c) Wear rubber gloves and boots.
  - d) Do not lay tools or metal parts on top of batteries.
  - e) Disconnect the charging source prior to connecting or disconnecting battery terminals.
  - f) Determine if battery is inadvertently grounded. If it is inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).



**CAUTION:**

A battery can present a risk of electrical shock and high short-circuit current.

Do not dispose of batteries in a fire. The batteries may explode.

Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

## 14. Trouble Shooting

When there is no information displayed in the LCD, please check if PV module/battery/grid connection is correctly connected.

**NOTE:** The warning and fault information can be recorded by a remote monitoring software.

### 18-1. Warning List

When a warning situation occurs,  icon will flash. Touch “” or “” to select displaying warning code. If there are several codes, it will display in a sequence. Please contact your installer when you can't handle the warning situations.

| Code # | Event                                                     | Code # | Event                                                                        |
|--------|-----------------------------------------------------------|--------|------------------------------------------------------------------------------|
| W01    | AC input source not presented or out of acceptable range. | W10    | Communication lost between inverter and BMS of lithium battery.              |
| W02    | PV source not presented or out of acceptable range.       | W11    | Communication lost between internal controllers.                             |
| W03    | Lithium battery pack is not detected.                     | W13    | AC input circuit breaker is tripped.                                         |
| W04    | Weak SoC of the connected battery                         | W14    | Battery is in equalization process.                                          |
| W05    | Weak voltage of the connected PV power.                   | W15    | MCU communication lost.                                                      |
| W06    | Power de-rating due to environmental restrictions.        | W16    | Charging and discharging are forbidden sent from the BMS of lithium battery. |
| W07    | Heavy load connected.                                     | W17    | Charging is forbidden sent from the BMS of lithium battery.                  |
| W08    | Over temperature.                                         | W18    | Discharging is forbidden sent from the BMS of lithium battery.               |
| W09    | Fan is not functioning properly.                          | W19    | Force charging from the BMS of lithium battery.                              |

### 18-2. Fault Reference Codes

When a fault occurs,  icon will solid on as a reminder. See below for fault codes for reference.

| Code # | Event                                               | Code # | Event                                                 |
|--------|-----------------------------------------------------|--------|-------------------------------------------------------|
| F01    | Fan not working.                                    | F17    | DC offset of AC output exceeds the max. level.        |
| F02    | PV voltage exceeds the max. level.                  | F18    | Overload on the AC output.                            |
| F03    | Battery voltage exceeds the max. level.             | F19    | Fault on the current sensor of AC output.             |
| F04    | Battery voltage is lower than alarm level.          | F20    | Backfeed fault.                                       |
| F05    | Short circuit on the AC output.                     | F21    | Firmware fault.                                       |
| F06    | Output voltage exceeds the max. level.              | F22    | CAN bus communication error in parallel operation.    |
| F07    | Output voltage exceeds the min. level.              | F23    | Host circuit on the parallel function doesn't work.   |
| F08    | Internal DC bus voltage exceeds the max. level.     | F24    | Sync circuit on the parallel function doesn't work.   |
| F09    | Internal DC bus voltage exceeds the min. level.     | F25    | Battery quantity doesn't match in parallel operation. |
| F10    | PV current exceeds the max. level.                  | F26    | AC input condition doesn't match while paralleling    |
| F11    | Over-temperature on the Inverter related components | F27    | Amperfier on the parallel function doesn't work       |
| F12    | Internal DC bus current exceeds the max. level.     | F28    | Parallel related setting doesn't match.               |
| F13    | Discharging current exceeds the max. level.         | F29    | Output short circuited.                               |
| F14    | Over temperature.                                   | F30    | GFCI fault detected on the AC input side.             |
| F15    | DC bus start fault.                                 | F31    | Low isolation resistance detected on the PV side.     |
| F16    | Inverter soft start fault.                          | F32    | Arc fault detected on the PV side.                    |

## Appendix I: Parallel Installation Guide

### Introduction

This inverter can be used in parallel with maximum 6 units. The supported maximum output power is 72KW/72KVA.

### Parallel cable

You will find the following items in the package:

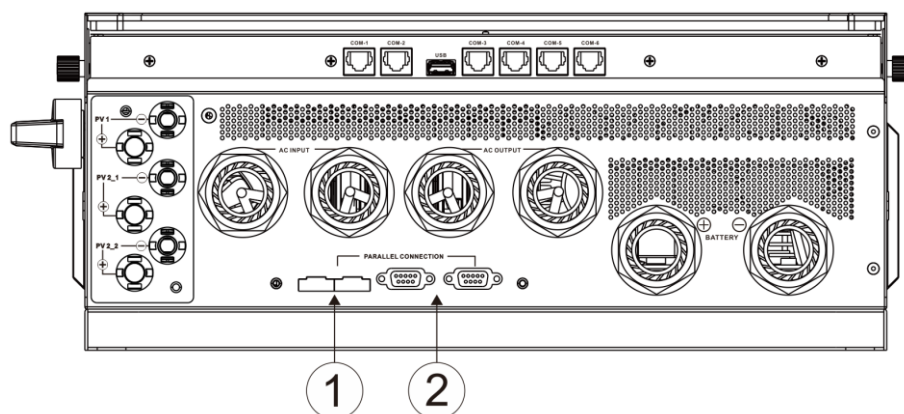


Parallel communication cable



Current sharing wires

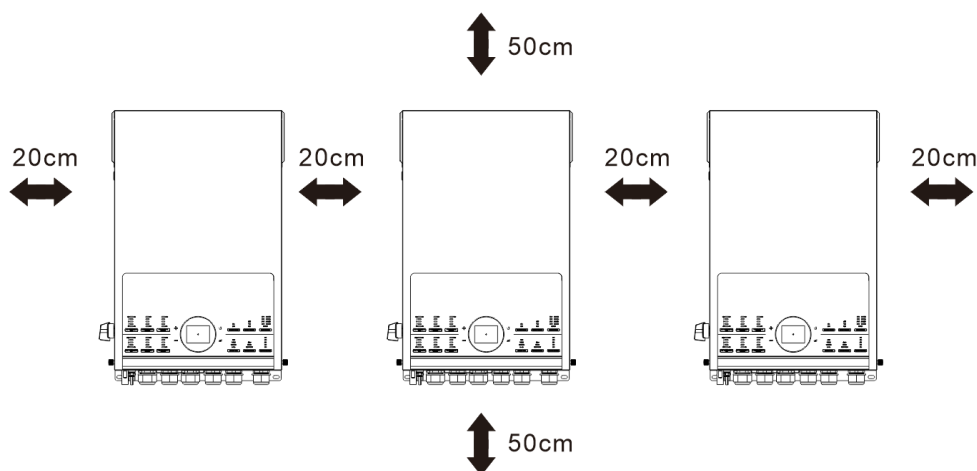
### Overview



1. Current sharing port
2. Parallel communication port

### Mounting the Unit

When installing multiple units, please follow below chart.



**NOTE:** For proper air circulation to dissipate heat, it's necessary to allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit. Be sure to install each unit in the same level.

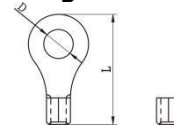
## Wiring Connection

The cable size of each inverter is shown as below:

Recommended battery cable and terminal size for each inverter:

| Wire Size | Ring Terminal         |            |        | Torque value |
|-----------|-----------------------|------------|--------|--------------|
|           | Cable mm <sup>2</sup> | Dimensions |        |              |
|           |                       | D (mm)     | L (mm) |              |
| 3/0AWG    | 85                    | 8.4        | 56     | 7~12 Nm      |

Ring terminal:



**WARNING!** Be sure the length of all battery cables is the same. Otherwise, there will be voltage difference between inverter and battery to cause parallel inverters to not work.

Recommended AC input and output cable size for each inverter:

| AWG no. | Conductor cross-section | Torque    |
|---------|-------------------------|-----------|
| 8-6 AWG | 10~16 mm <sup>2</sup>   | 1.4~1.6Nm |

You need to connect the cables of each inverter together. Take the battery cables for example. You need to use a connector or bus-bar as a joint to connect the battery cables together, and then connect to the battery terminal. The cable size used from joint to battery should be X times cable size in the tables above. "X" indicates the number of inverters connected in parallel.

Regarding cable size of AC input and output, please also follow the same principle.



**CAUTION:** Please install a breaker at the battery side. This will ensure the inverter can be securely disconnected during maintenance and fully protected from overcurrent of battery.

## Recommended battery capacity

| Inverter parallel numbers | 2     | 3     | 4     | 5      | 6      |
|---------------------------|-------|-------|-------|--------|--------|
| Battery Capacity          | 400AH | 600AH | 800AH | 1000AH | 1200AH |



**CAUTION:** Please follow the battery charging current and voltage from battery spec to choose the suitable battery. The wrong charging parameters will reduce the battery lifecycle sharply.

## Recommended PV connection

Please refer to user manual of single unit for PV Connection.

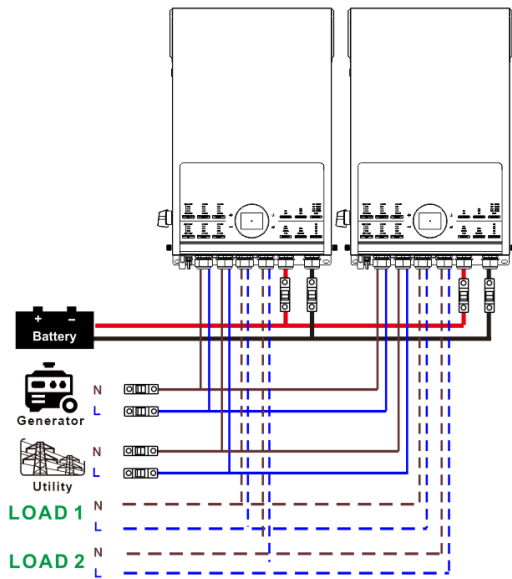


**CAUTION:** Each inverter should connect to PV modules separately.

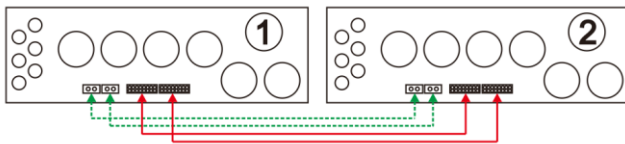
## Inverters Configuration

### Two inverters in parallel:

#### Power Connection

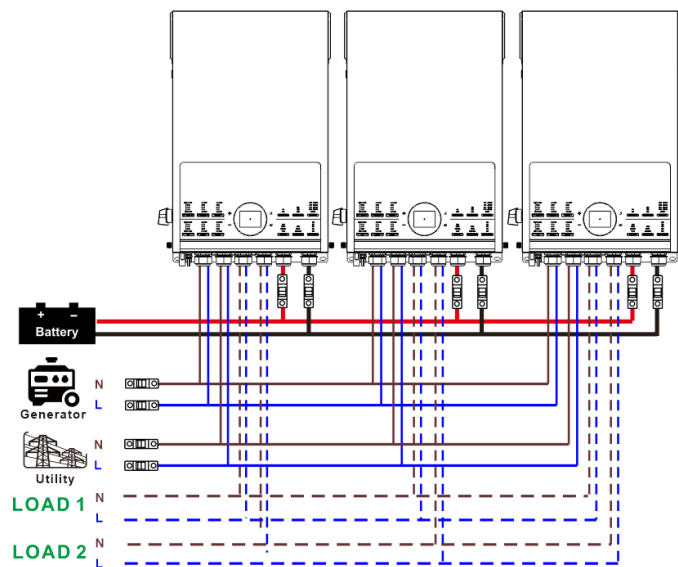


#### Communication Connection

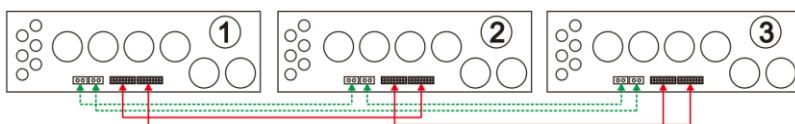


### Three inverters in parallel:

#### Power Connection

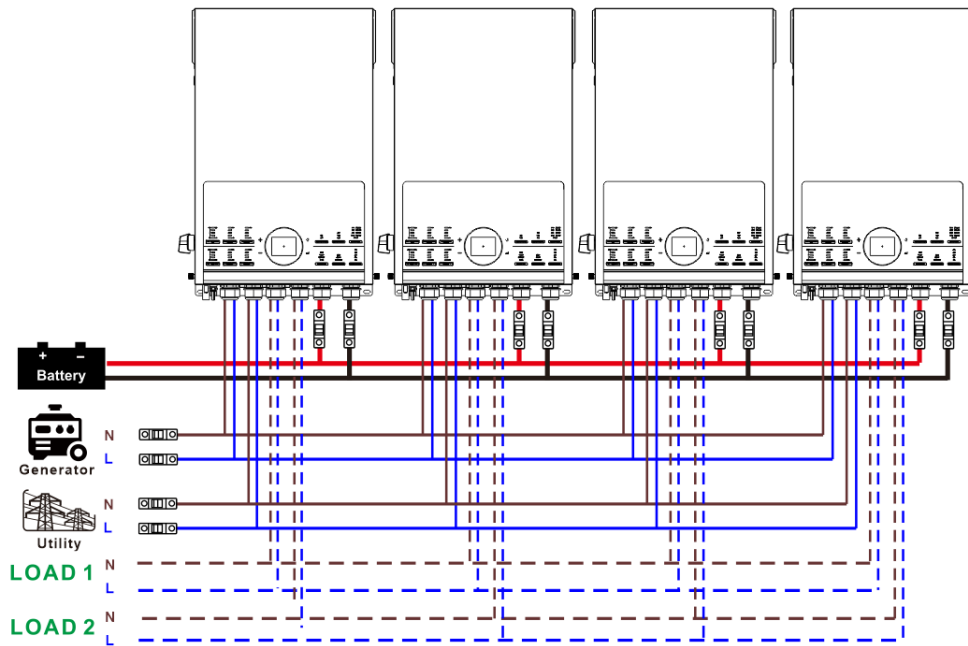


#### Communication Connection

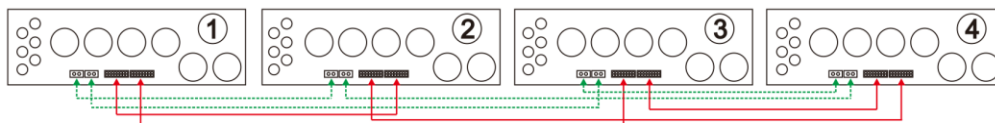


## Four inverters in parallel:

### Power Connection

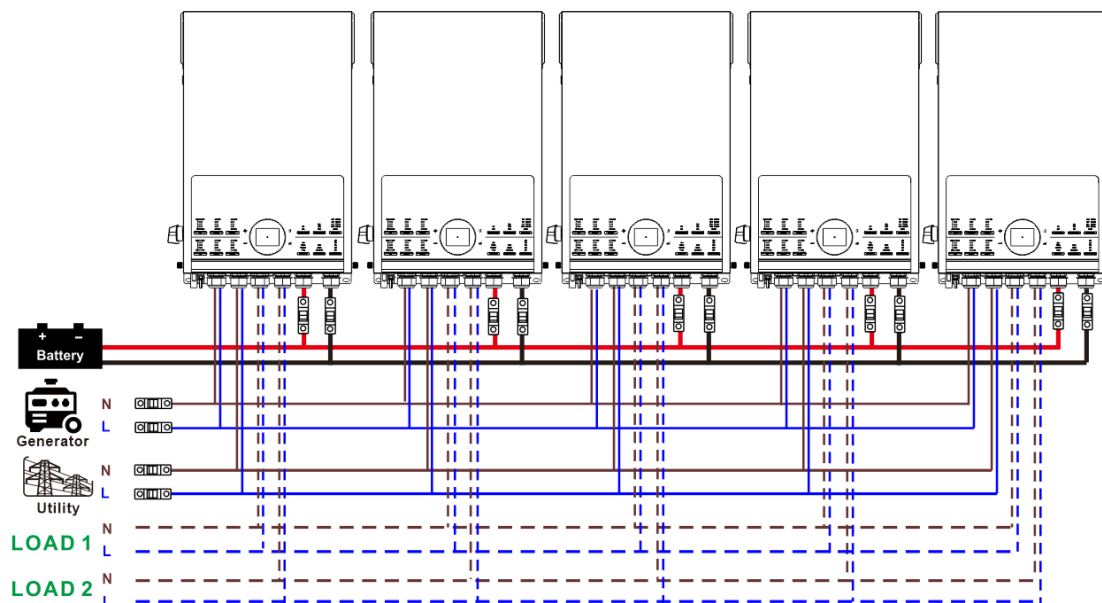


### Communication Connection

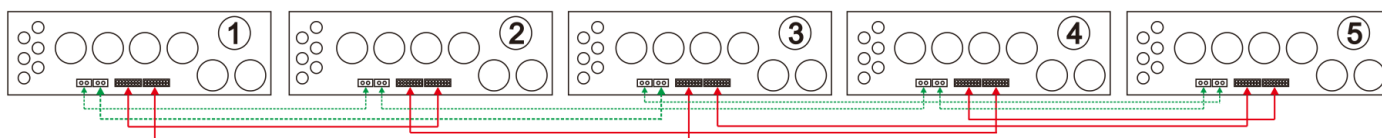


## Five inverters in parallel:

### Power Connection

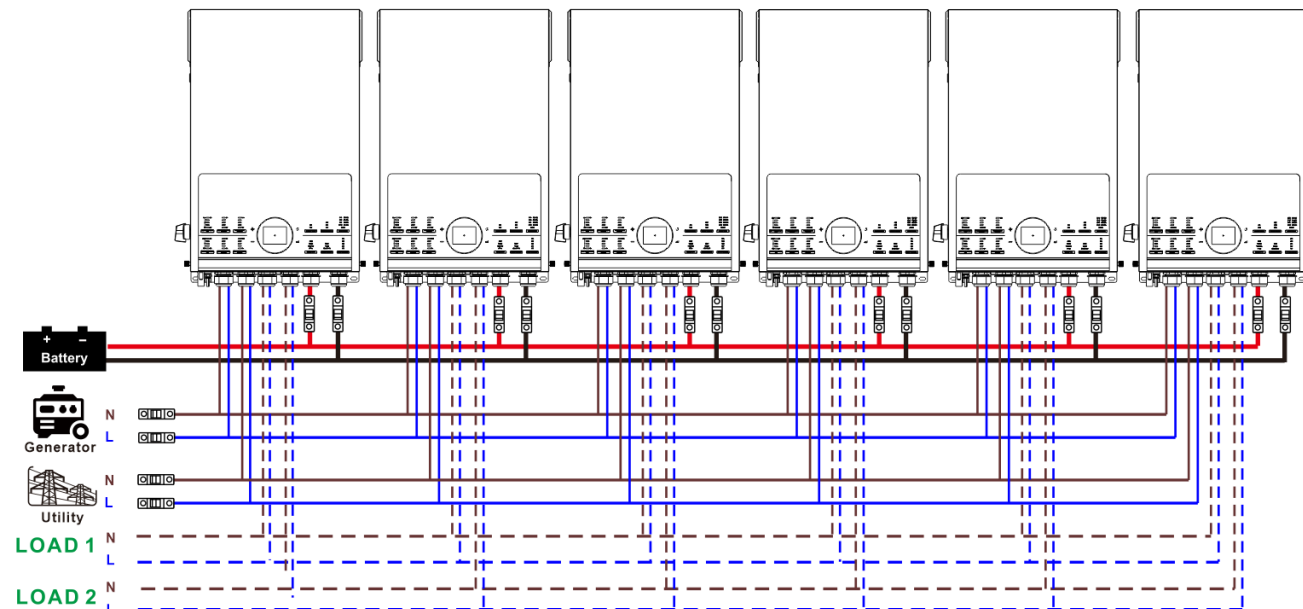


### Communication Connection

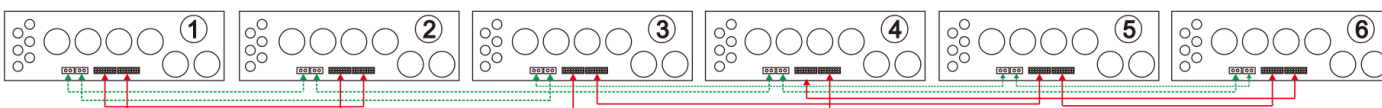


## Six inverters in parallel:

### Power Connection



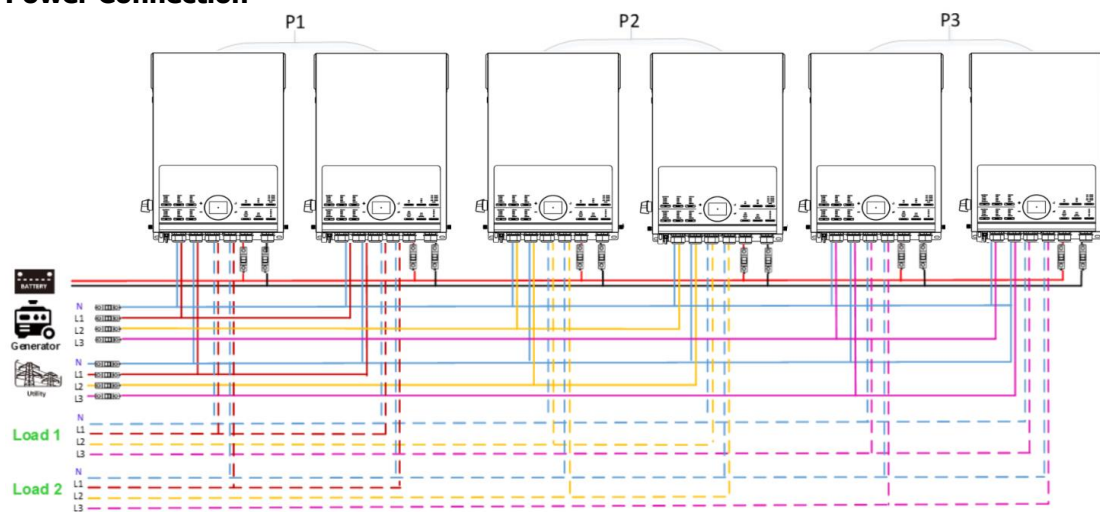
### Communication Connection



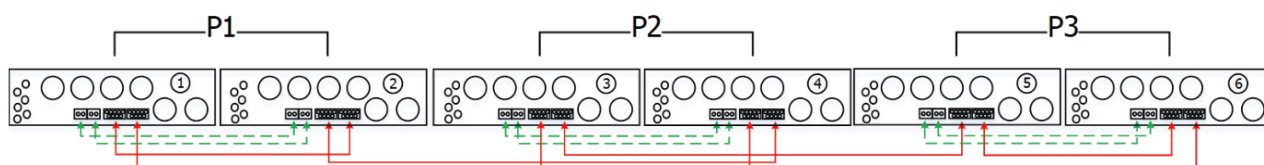
## Support 3-phase equipment

### Six inverters in parallel:

#### Power Connection

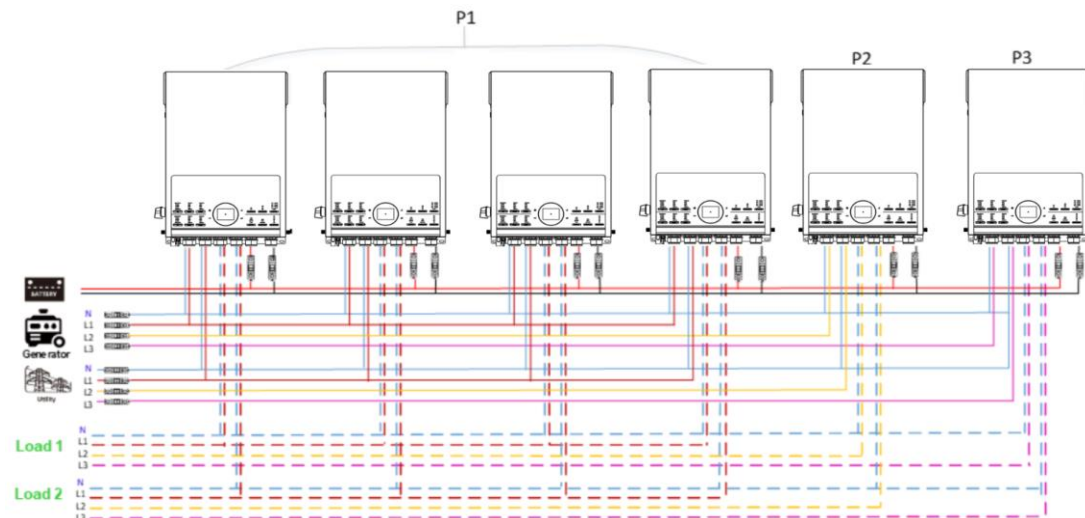


#### Communication Connection

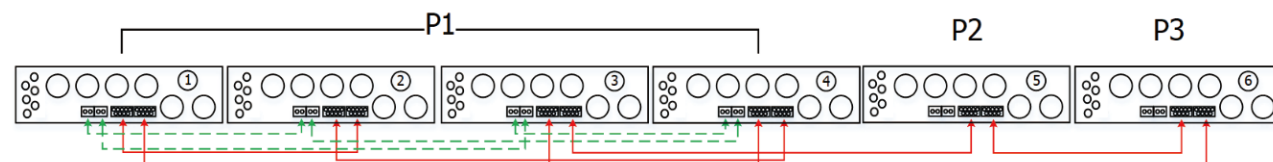


### Four inverters in one phase and one inverter for the other two phases:

#### Power Connection

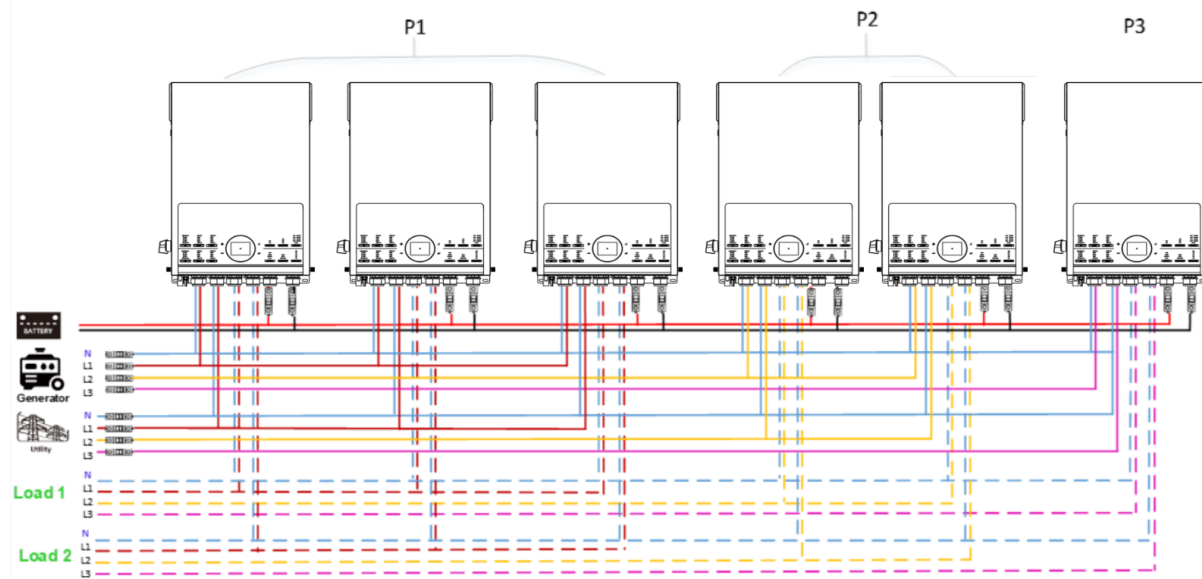


#### Communication Connection

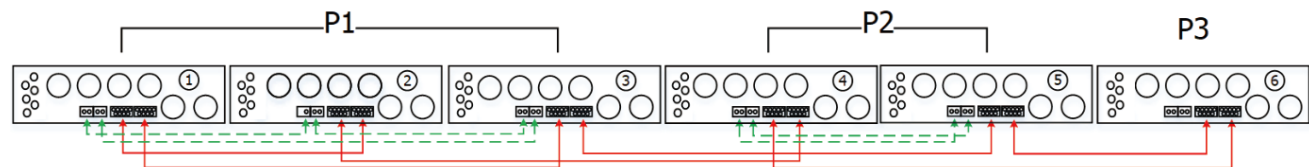


## Three inverters in one phase, two inverters in second phase and one inverter for the third phase:

### Power Connection

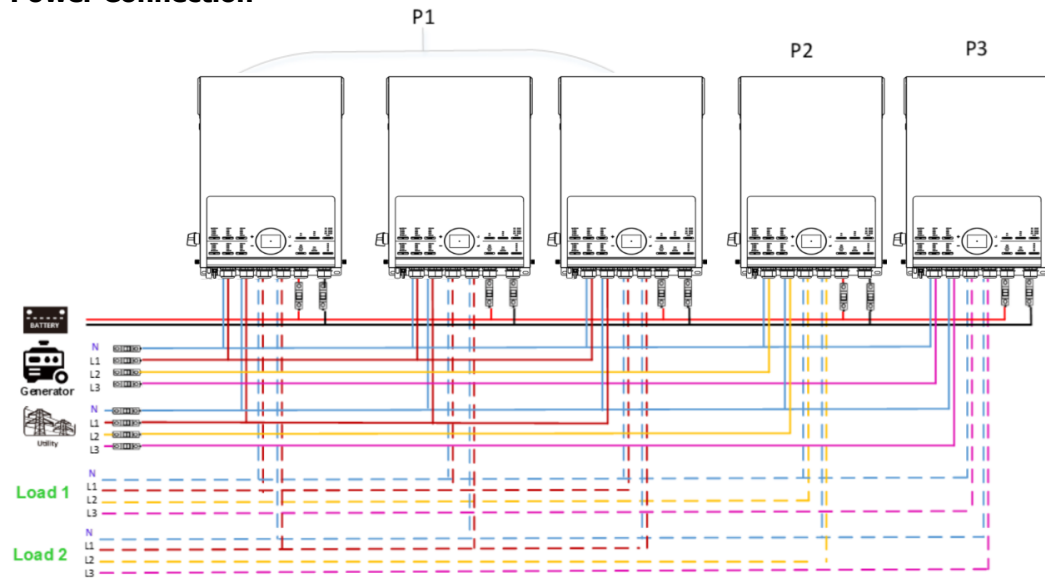


### Communication Connection

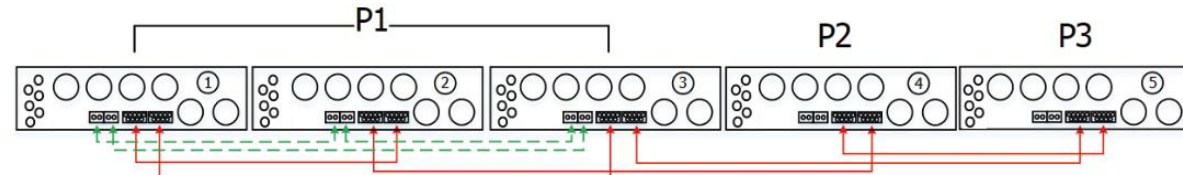


## Three inverters in one phase and only one inverter for the remaining two phases:

### Power Connection

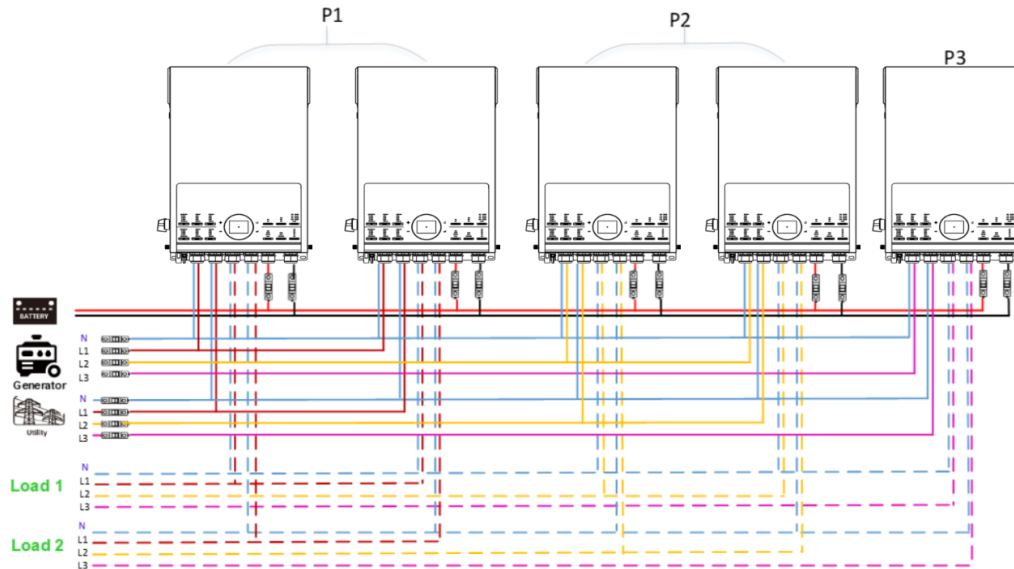


### Communication Connection

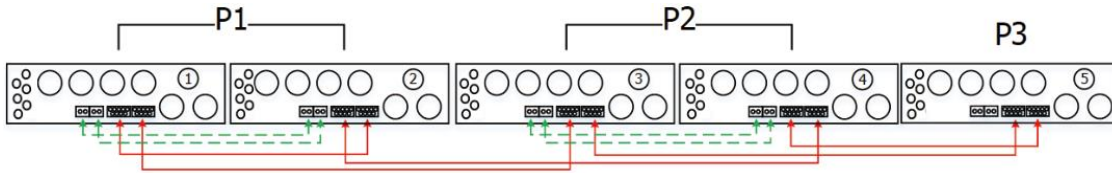


## Two inverters in two phases and only one inverter for the remaining phase:

### Power Connection

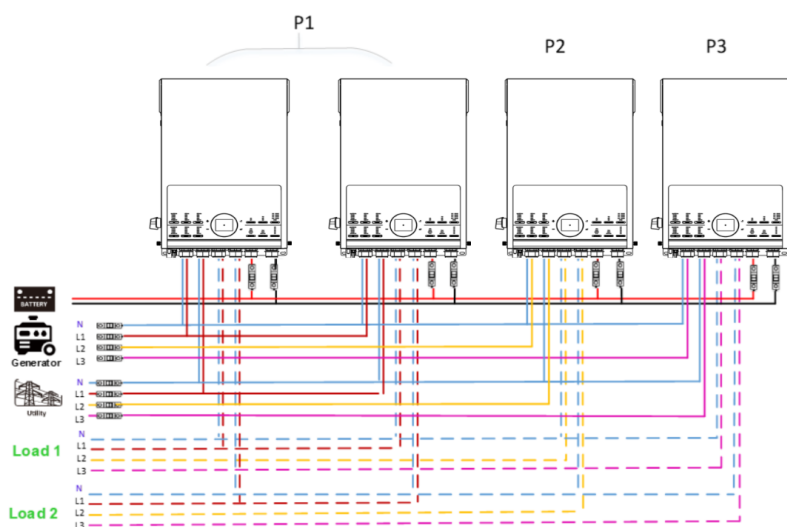


### Communication Connection

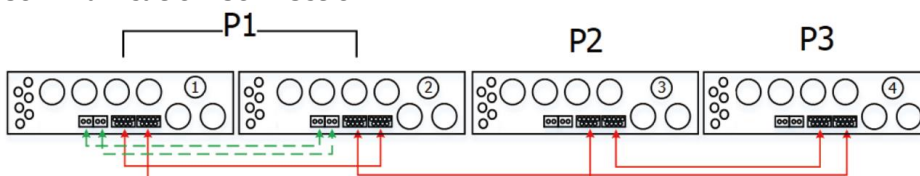


## Two inverters in one phase and only one inverter for the remaining phases:

### Power Connection

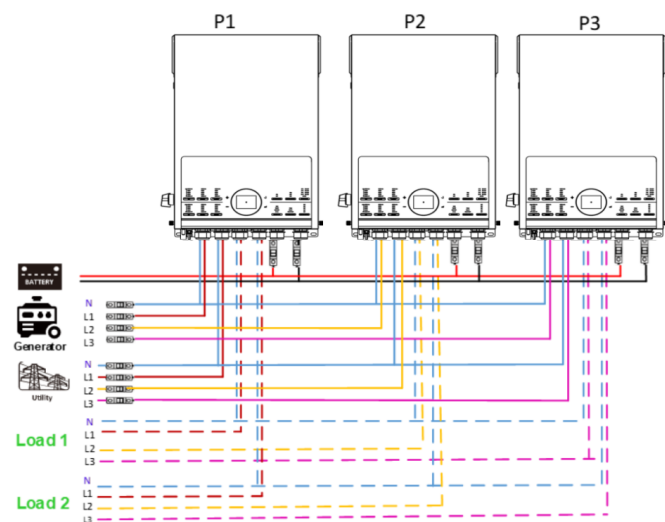


### Communication Connection

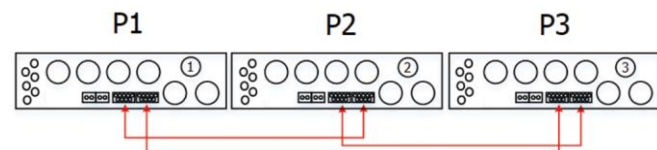


## One inverter in each phase:

### Power Connection



### Communication Connection



**WARNING:** Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.

## LCD Setting and Display

### Setting Program:

| Description                                                                                                                                 | Selectable option                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC output mode<br>*This setting is able to set up only when the inverter is in standby mode. Be sure that on/off switch is in "OFF" status. | Single<br>AC Output Mode:<br>L3 phase<br>► Single<br>Parallel      | When the unit is operated alone, please select "Single"                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                             | Parallel<br>AC Output Mode:<br>Single<br>► Parallel<br>L1 phase    | When the units are used in parallel for single phase application, please select "Parallel". Please refer to 4-1 for detailed information.                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                             | L1 phase:<br>AC Output Mode:<br>Parallel<br>► L1 phase<br>L2 phase | When the units are operated in 3-phase application, please choose phase to define each inverter. It is required to have at least 3 inverters or maximum 6 inverters to support three-phase equipment. It's required to have at least one inverter in each phase or it's up to four inverters in one phase. Please refers to 4-2 for detailed information. Please select "L1 phase" for the inverters connected to L1 phase, "L2 phase" for the inverters connected to L2 phase and |
|                                                                                                                                             | L2 phase:<br>AC Output Mode:<br>L1 phase<br>► L2 phase<br>L3 phase |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|  |                                                                                                                                                                 |                                                                                                                                                                                                                  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>L3 phase:</b><br>AC Output Mode:<br>L2 phase<br>▶ L3 phase<br>Single  18/39 | “L3 phase” for the inverters connected to L3 phase.<br><br>Be sure to connect share current cable to units which are on the same phase.<br>Do NOT connect share current cable between units on different phases. |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### Code Reference:

| Code | Description                       | Icon on                                                                           |
|------|-----------------------------------|-----------------------------------------------------------------------------------|
| NE   | Unidentified unit master or slave | No master and slave icon show on LCD                                              |
| HS   | Master unit                       |  |
| SL   | Slave unit                        |  |

## Commissioning

### Parallel in single phase

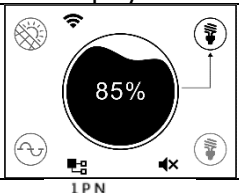
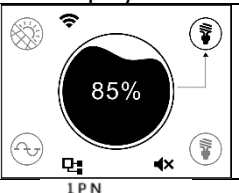
Step 1: Check the following requirements before commissioning:

- Correct wire connection
- Ensure all breakers in Line wires of load side are open and each Neutral wires of each unit are connected together.

Step 2: Turn on each unit and set “Parallel” in LCD setting of each unit. And then shut down all units.

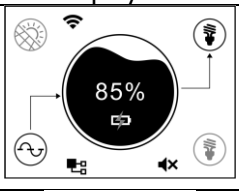
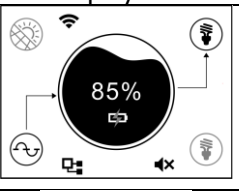
**NOET:** It’s necessary to turn off switch when setting LCD program. Otherwise, the setting cannot be programmed.

Step 3: Turn on each unit.

| LCD & LED display in Master unit                                                    | LCD & LED display in Slave unit                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |

**NOTE:** Master and slave units are randomly defined.

Step 4: Switch on all AC breakers of Line wires in AC input. It’s better to have all inverters connect to utility at the same time. If not, it will display fault 26 in following-order inverters. However, these inverters will automatically restart. If detecting AC connection, they will work normally.

| LCD & LED display in Master unit                                                    | LCD & LED display in Slave unit                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |

Step 5: If there is no more fault alarm, the parallel system is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

## Support three-phase equipment

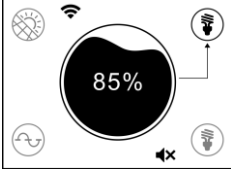
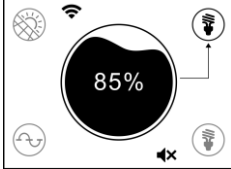
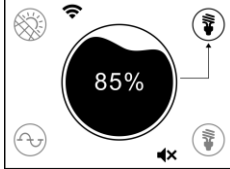
Step 1: Check the following requirements before commissioning:

- Correct wire connection
- Ensure all breakers in Line wires of load side are open and each Neutral wires of each unit are connected together.

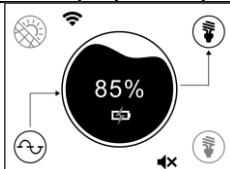
Step 2: Turn on all units and configure AC output mode as L1, L2 and L3 sequentially. And then shut down all units.

**NOET:** It's necessary to turn off switch when setting LCD program. Otherwise, the setting cannot be programmed.

Step 3: Turn on all units sequentially.

| LCD & LED display in L1-phase unit                                                | LCD & LED display in L2-phase unit                                                | LCD & LED display in L3-phase unit                                                  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| 3 P 1                                                                             | 3 P 2                                                                             | 3 P 3                                                                               |
| OUTPUT MODE                                                                       | OUTPUT MODE                                                                       | OUTPUT MODE                                                                         |

Step 4: Switch on all AC breakers of Line wires in AC input. If AC connection is detected and three phases are matched with unit setting, they will work normally. Otherwise, the AC icon  will off and they will not work in line mode.

| LCD & LED display in L1-phase unit                                                 | LCD & LED display in L2-phase unit                                                 | LCD & LED display in L3-phase unit                                                   |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |  |
| 3 P 1                                                                              | 3 P 2                                                                              | 3 P 3                                                                                |
| OUTPUT MODE                                                                        | OUTPUT MODE                                                                        | OUTPUT MODE                                                                          |

Step 5: If there is no more fault alarm, the system to support 3-phase equipment is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

Note 1: To avoid overload occurring, before turning on breakers in load side, it's better to have whole system in operation first.

Note 2: Transfer time for this operation exists. Power interruption may happen to critical devices, which cannot bear transfer time.

## Appendix II: The Wi-Fi Operation Guide

### 1. Introduction

Wi-Fi module can enable wireless communication between solar inverters and the monitoring platform. Users can remotely monitor and control their inverters when they combine the Wi-Fi module with Energy-Mate APP. The App uses the Wi-Fi chip to provide remote monitoring data services, which is beneficial for the daily data monitoring of the inverter, querying the real-time data in the device, sending commands from the device, and operating the device remotely. The app is available for both iOS and Android.

### 2. Energy-Mate App

#### 2-1. Download and install APP

Please find "Energy-Mate" app from Apple® store or Google® Play Store. Install this app in your mobile phone.



Or scan the following QR code with your smart phone and download Energy-Mate App.



(Android system)



(iOS system)

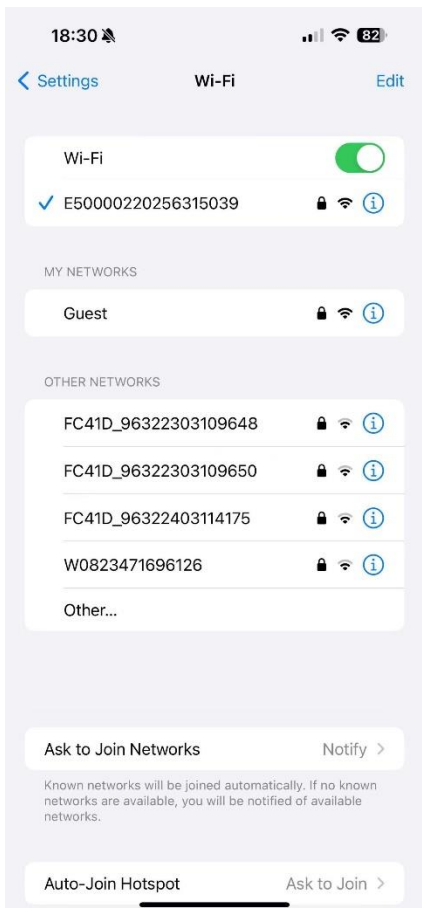
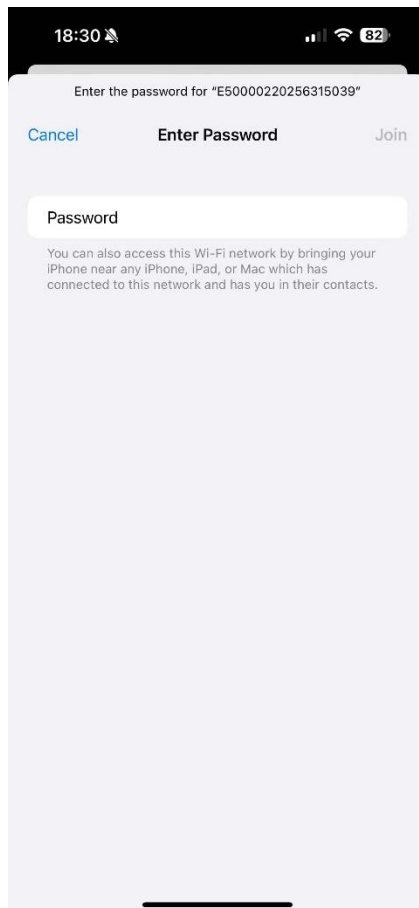
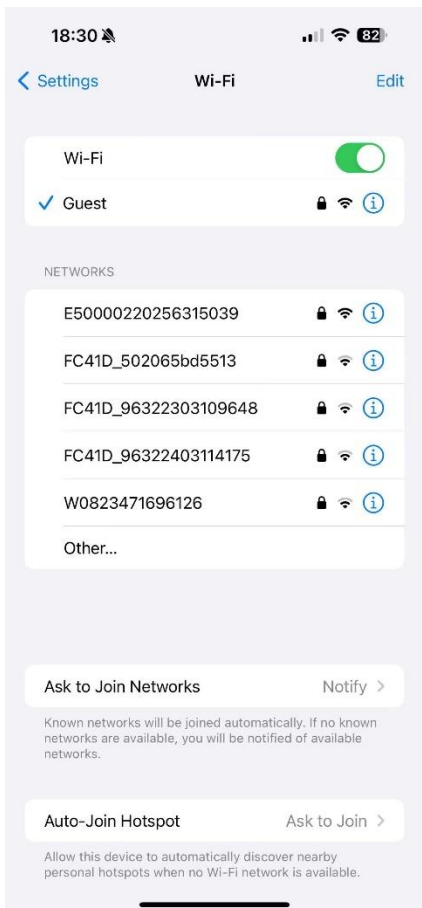
#### 2-2. Initial Setup

You can choose local Wi-Fi or Bluetooth to configure the Wi-Fi module network through Energy-mate APP.

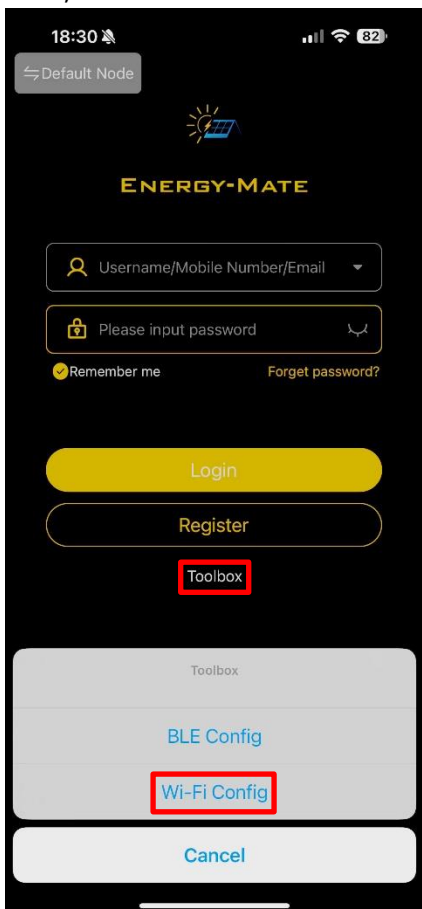
##### Local Wi-Fi Configuration

If you have configured the network through Bluetooth, please skip this section.

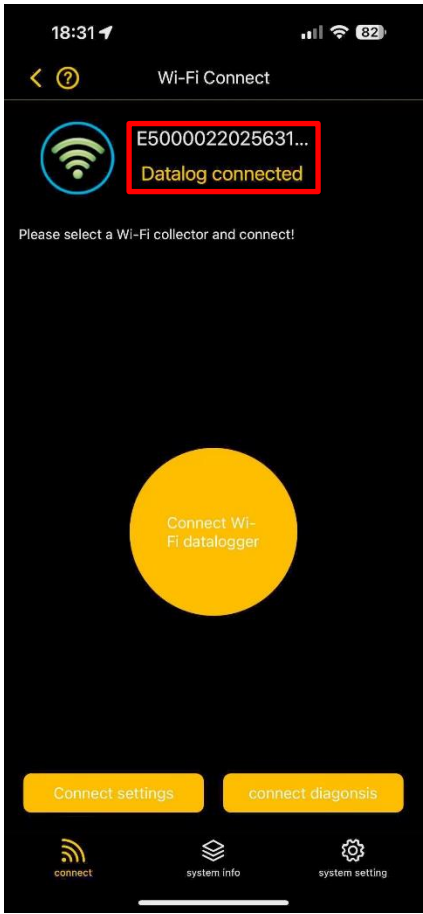
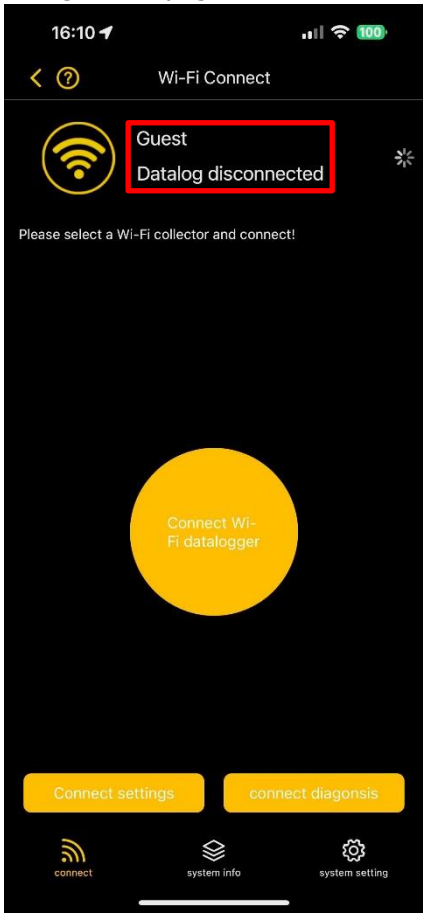
- Turn on the unit.
- Open the Wi-Fi settings from your smart phone.
- Connect your smart phone to the Wi-Fi module. The Wi-Fi module PN number is 18 digits.
- Default password for the Wi-Fi module is: 12345678.



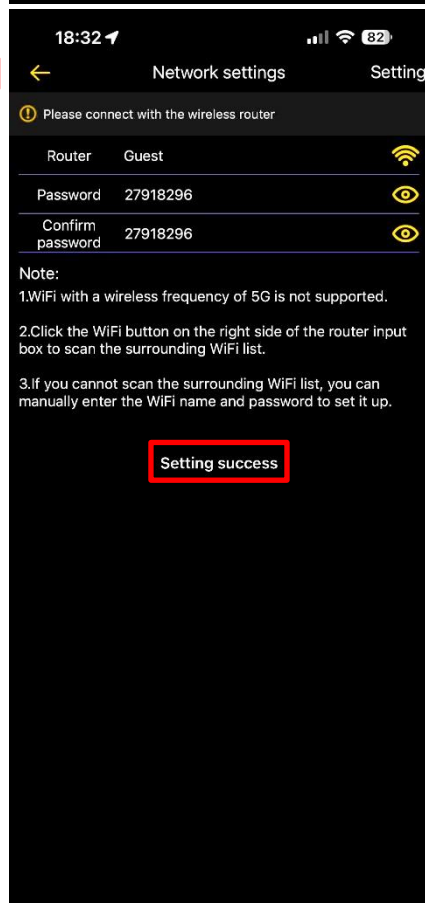
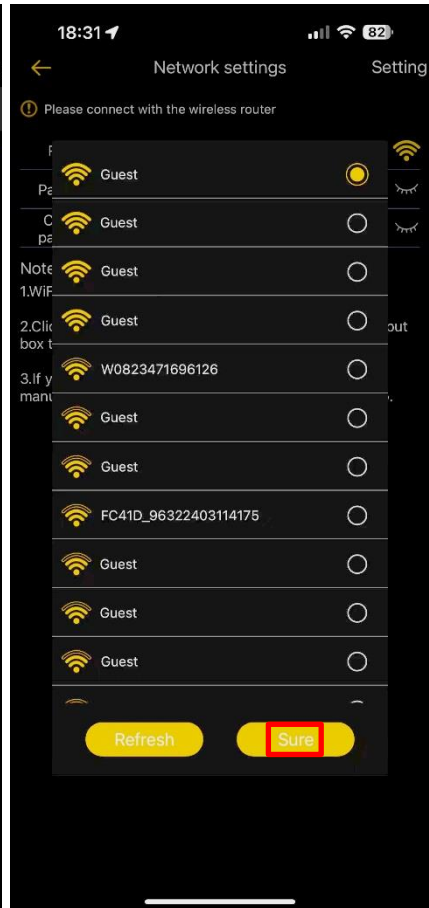
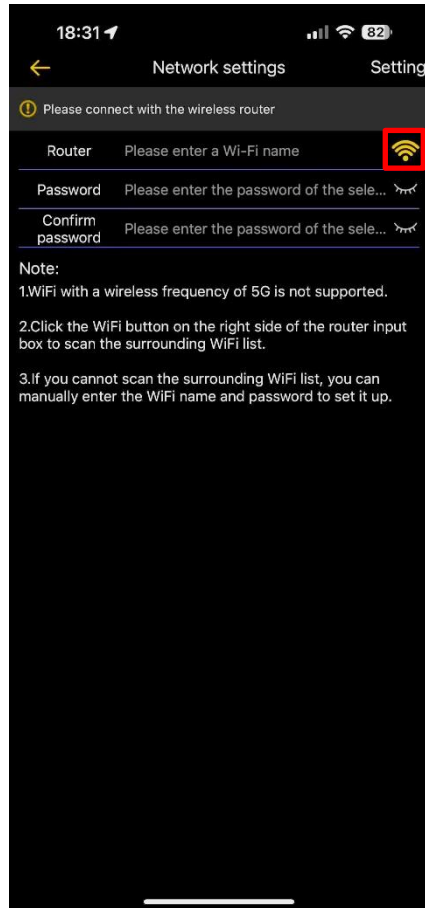
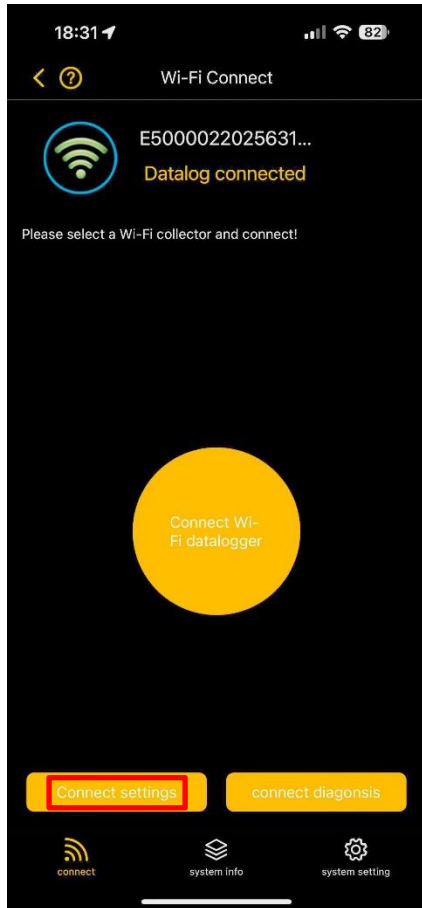
- Once the Wi-Fi connection is successful, click the Energy-Mate APP installed in the phone to enter the login page. Then, click the "Toolbox" and choose "Wi-Fi Config" to enter the Wi-Fi configuration page.



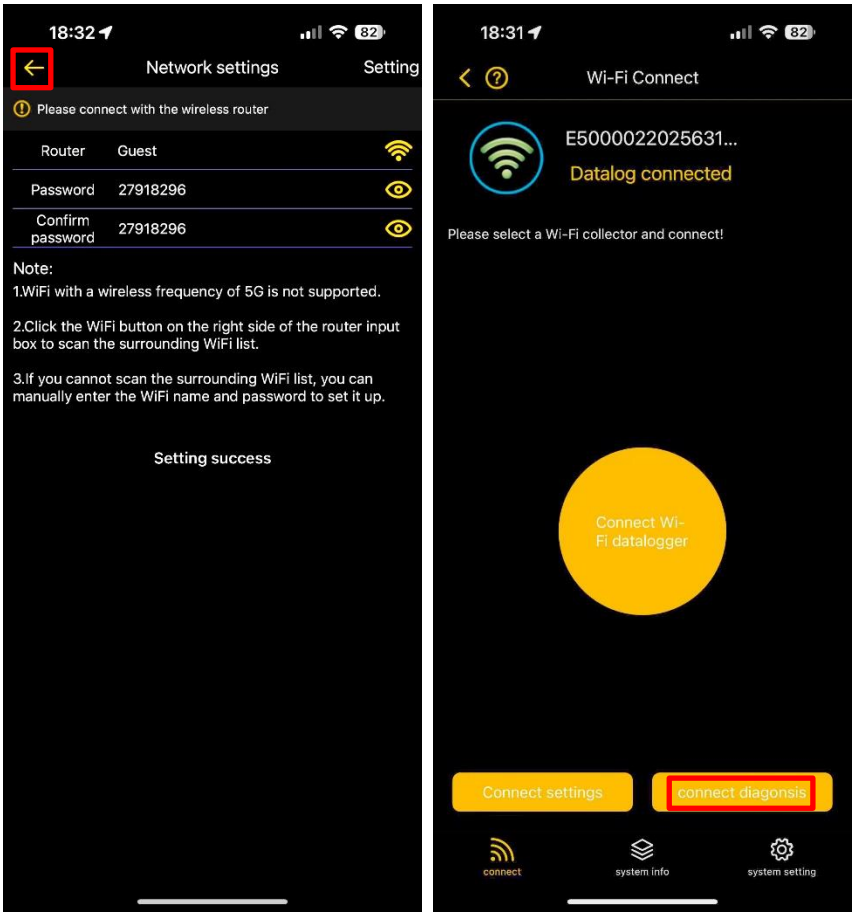
- After entering the Wi-Fi configuration page, please note that the connected Wi-Fi name **must** be the **same as your Wi-Fi module PN number**, and the status **must** be **connected**. If not, please return to the login page, connect your smart phone to the Wi-Fi module, and re-enter the Wi-Fi configuration page.

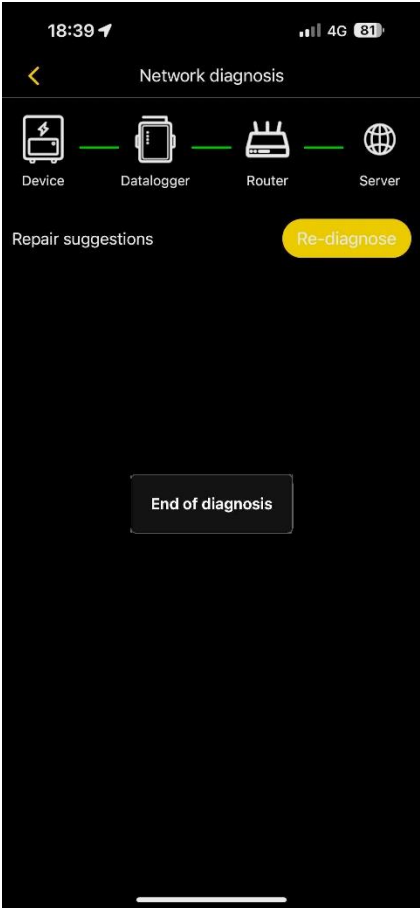
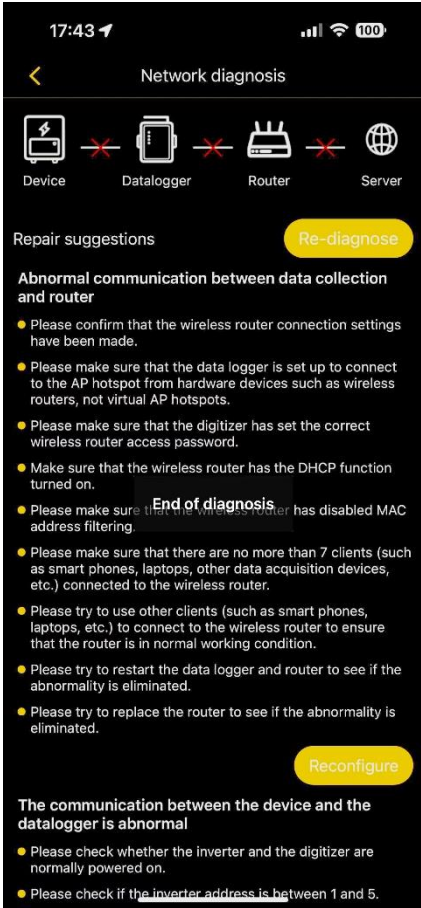
| The Wi-Fi module connection is <b>successfully</b>                                                                                                   | The Wi-Fi module connection <b>failed</b>                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>You can proceed to the next step to configure the network.</p>  | <p>Please return to the login page, connect your smart phone to the Wi-Fi module, and re-enter the Wi-Fi configuration page.</p>  |

- Click "Connect settings" to manually enter the router name or click  to choose the router name. Then, enter the router password and click the "Setting" to complete the setting.  
The Wi-Fi module only could connect the router at **2.4GHz**.

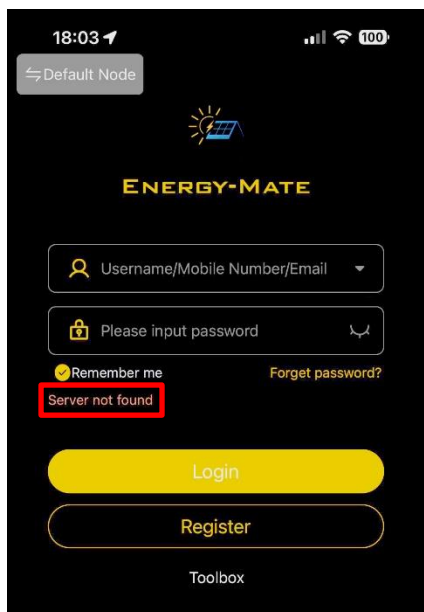


- Click  to return to the Wi-Fi configuration page. Click "Connect diagnosis" to check the connection status.



| The configuration is <b>successfully</b>                                                                                                               | The configuration <b>failed</b>                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Green lines between device, datalogger, router, and server.</p>  | <p>Red crosses between device, datalogger, router, and server. Please refer to APP instructions to re-configure.</p>  |

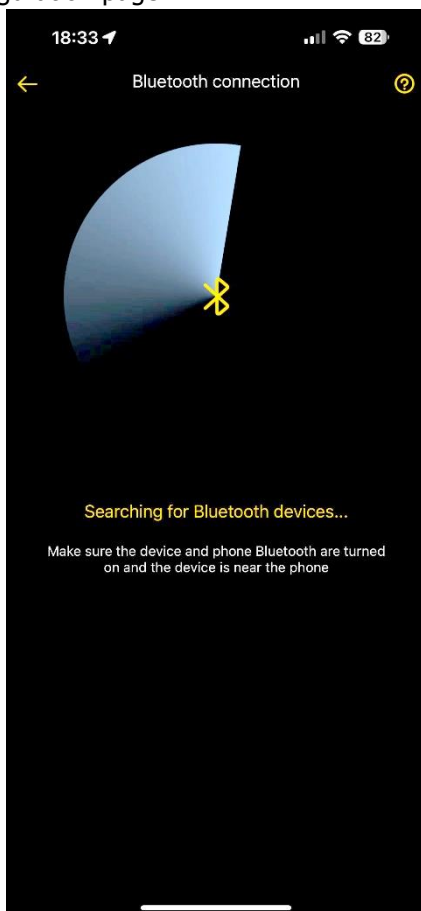
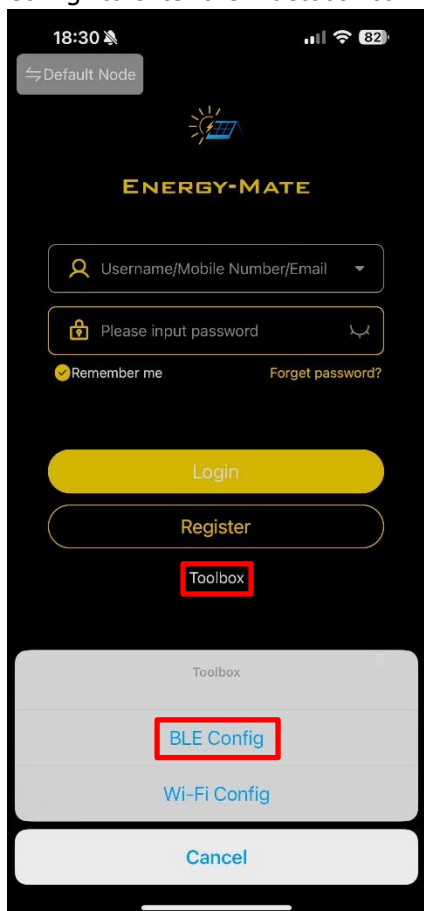
- After Wi-Fi configuration, please **forget** the Wi-Fi module of the Wi-Fi connection on the smartphone to avoid automatic connection and unable to access the network. The login page will prompt "Server not found".



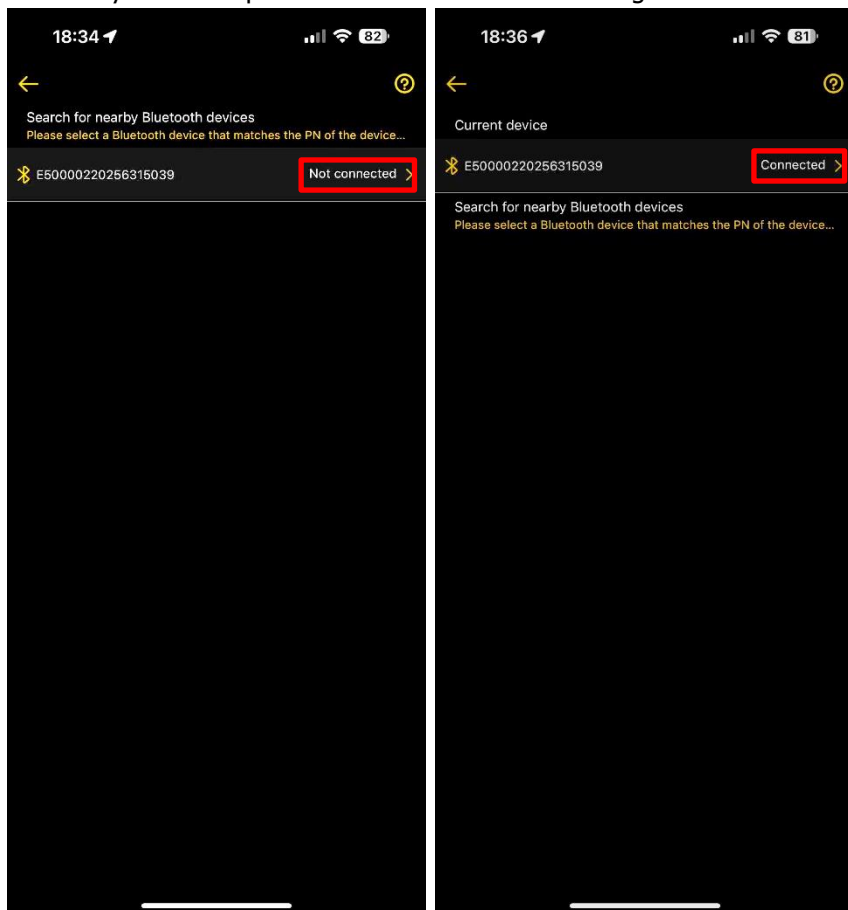
## Bluetooth Configuration

If you have configured the network through Wi-Fi, please skip this section.

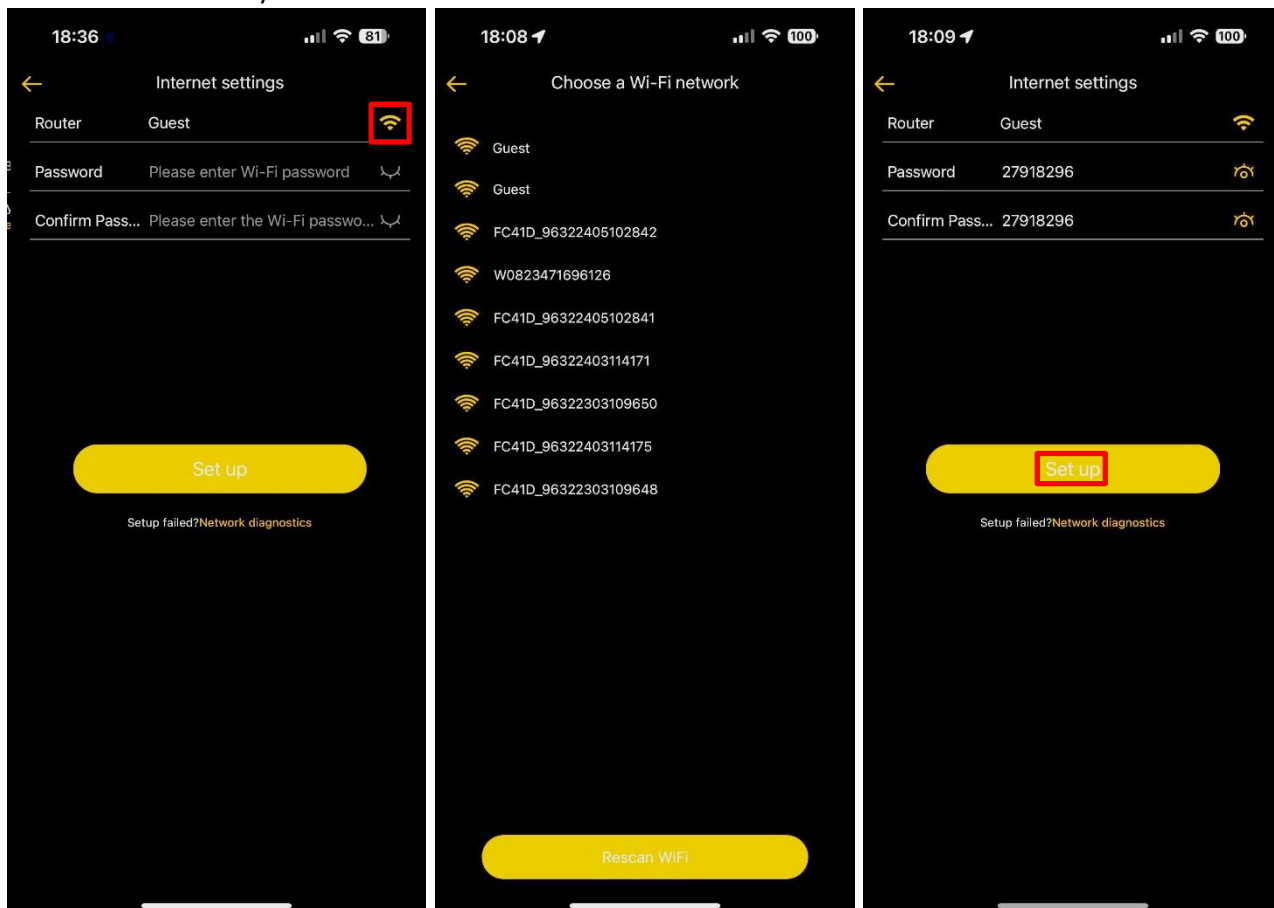
- Turn on the unit.
- Open the Bluetooth from your smart phone.
- Click the Energy-Mate APP installed in the phone to enter the login page. Then, click the "Toolbox" and choose "BLE Config" to enter the Bluetooth configuration page.



- Connect your smart phone to the Wi-Fi module through Bluetooth.

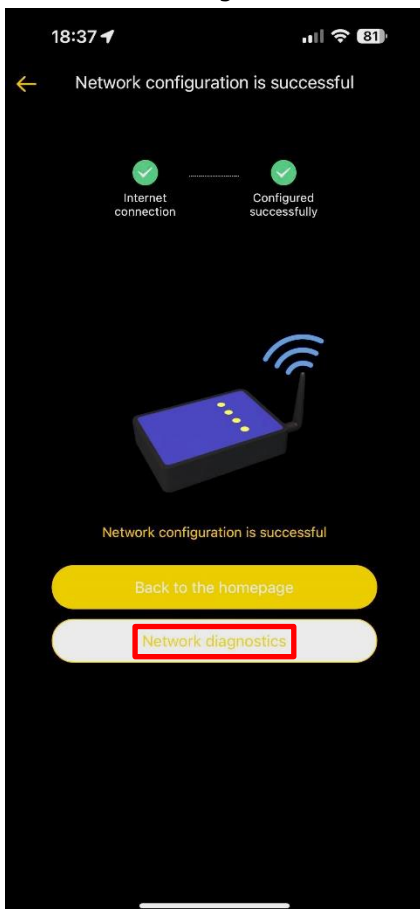


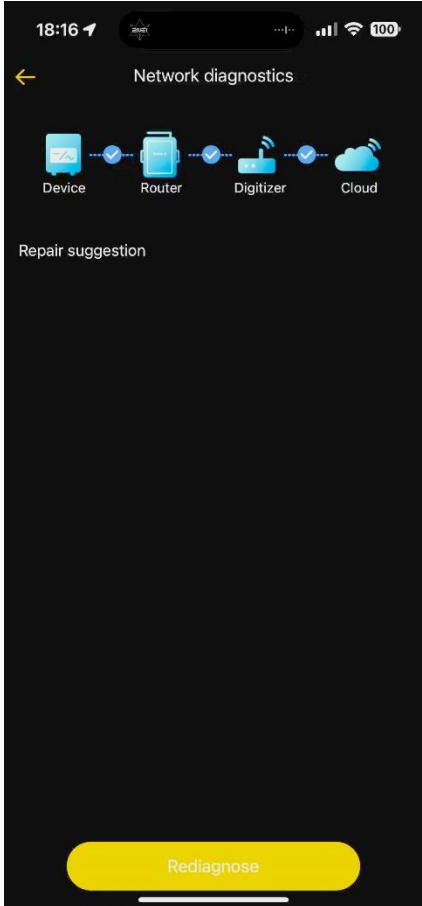
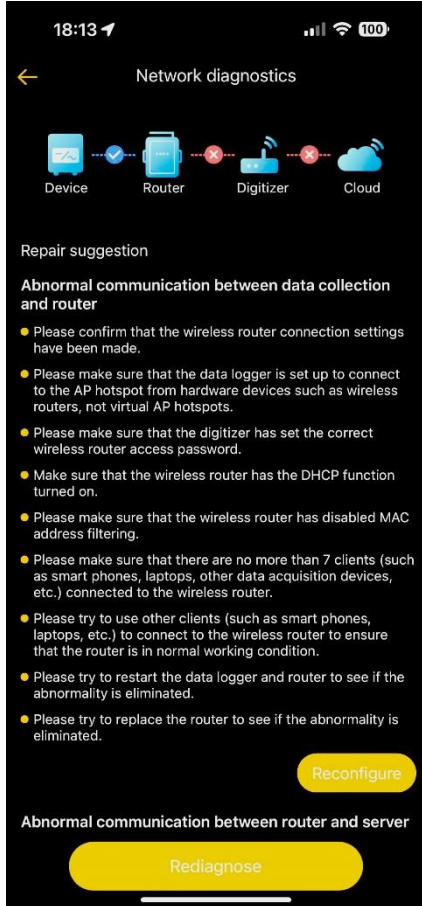
- Manually enter the router name or click  to choose the router name, enter the router password, and then click the "Setting" to complete the setting.  
The Wi-Fi module only could connect the router at **2.4GHz**.



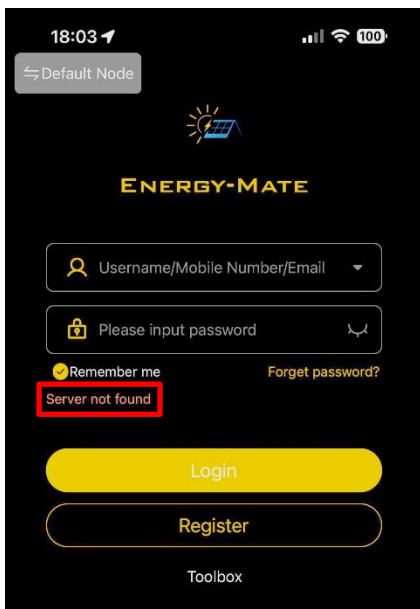


- Click "Network diagnosis" to check the connection status.



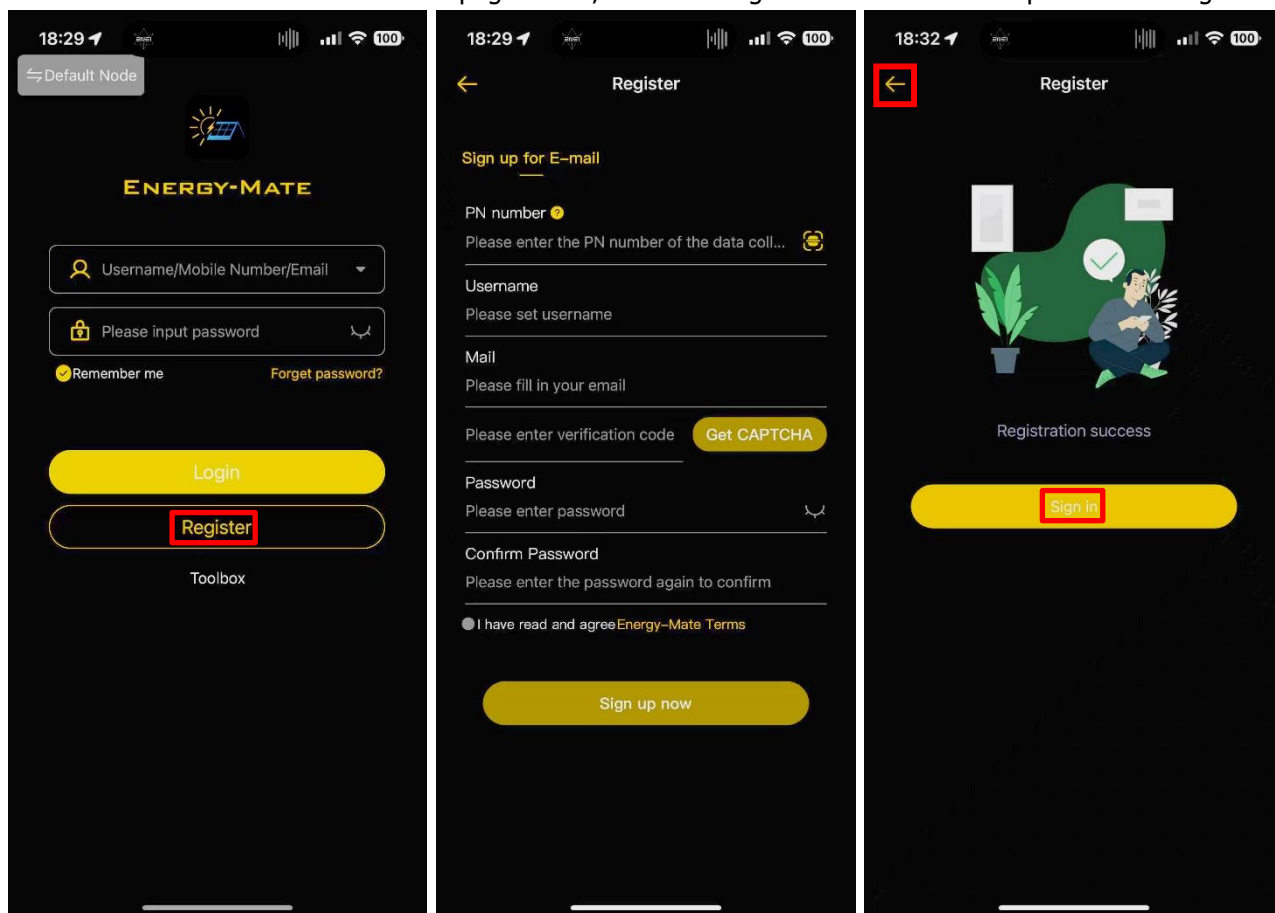
| The configuration is <b>successfully</b>                                           | The configuration <b>failed</b>                                                                              |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Green lines between device, datalogger, router, and server.                        | Red crosses between device, datalogger, router, and server. Please refer to APP instructions to reconfigure. |
|  |                           |

- After Bluetooth configuration, please **disconnect** the Wi-Fi module of the Bluetooth connection on the smartphone to avoid automatic connection and unable to access the network. The login page will prompt "Server not found".



## 2-3 Registration and login

- Connect your smart phone to the router.
- Registration at first time.
- Click the "Register" to enter registration page and fill in the information. Once registration is complete, click "Sign in" or click  to return to the home page. Then, enter the registered username and password to log in.

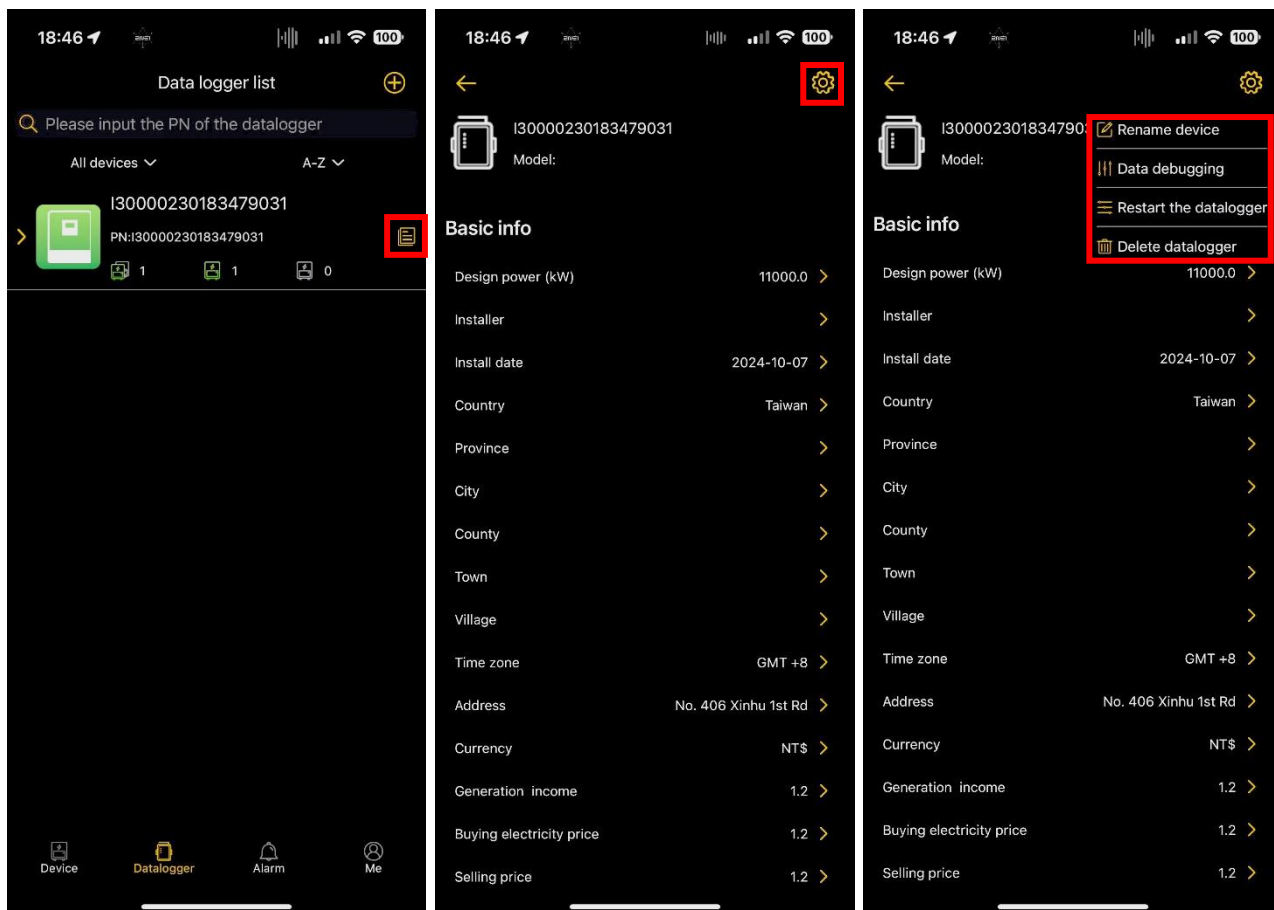


## 2-4 Datalogger

- After login, the default Home page will appear.
- Choose Datalogger page to see the Wi-Fi module list.
  - ◆ Gray icon means Wi-Fi module is offline. Please refer to 2-2 Initial Setup to choose local Wi-Fi or Bluetooth configure Wi-Fi module network.
  - ◆ Green icon means Wi-Fi module is online.

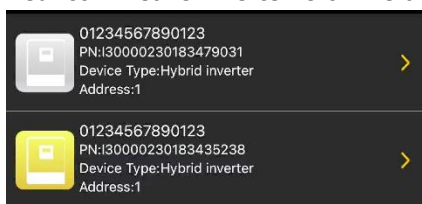


- Click  to see the Wi-Fi module information.
- Click  to rename device, data debugging, restart the datalogger, and delete datalogger.
  - ◆ Rename device: rename the Wi-Fi module name.
  - ◆ Data debugging: send RS232 commands to the inverter in hexadecimal format.
  - ◆ Restart the datalogger: restart the Wi-Fi module.
  - ◆ Delete datalogger: delete the Wi-Fi module. The inverter information in the device page will **also be deleted**. Once deleted, you **can** add datalogger under another account.

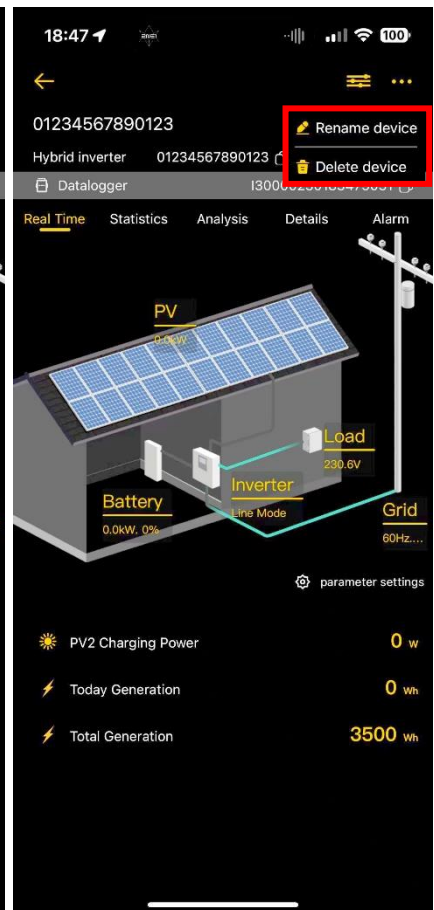
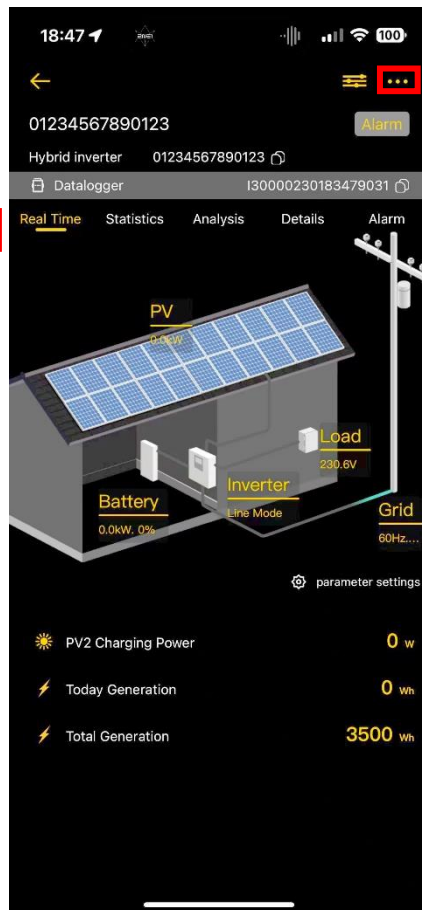
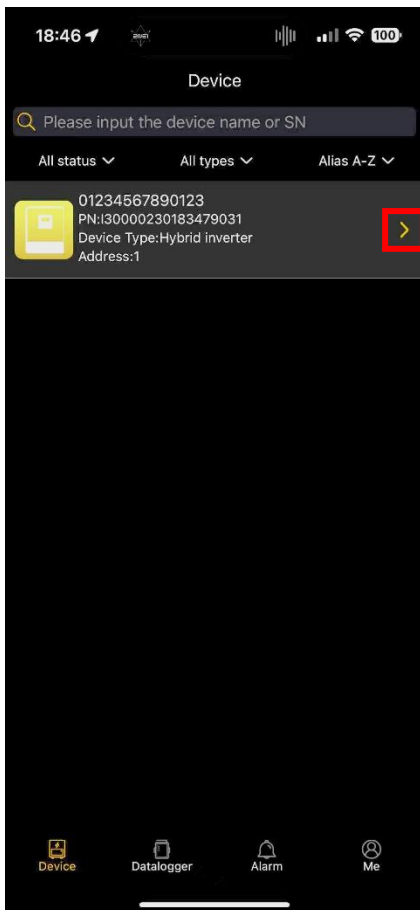


## 2-5 Device

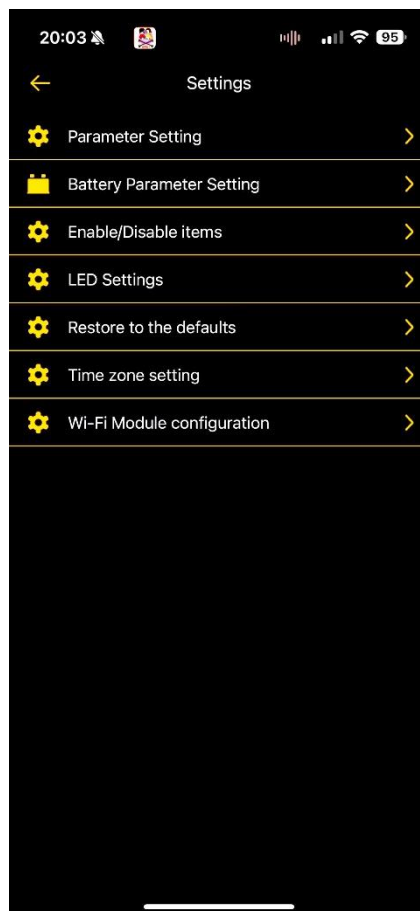
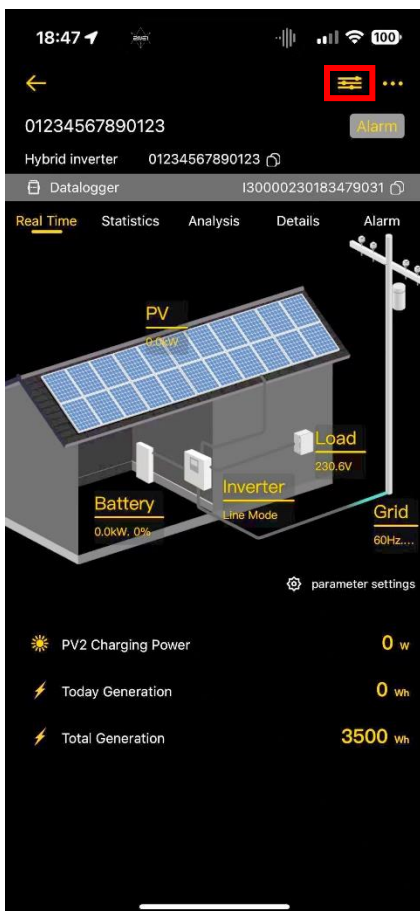
- Choose Device page to see the inverter list.
  - ◆ Gray icon means inverter is offline.
  - ◆ Green icon means inverter is online and no warnings and faults.
  - ◆ Yellow icon means inverter is online and has a warning.
  - ◆ Red icon means inverter is online and has a fault.



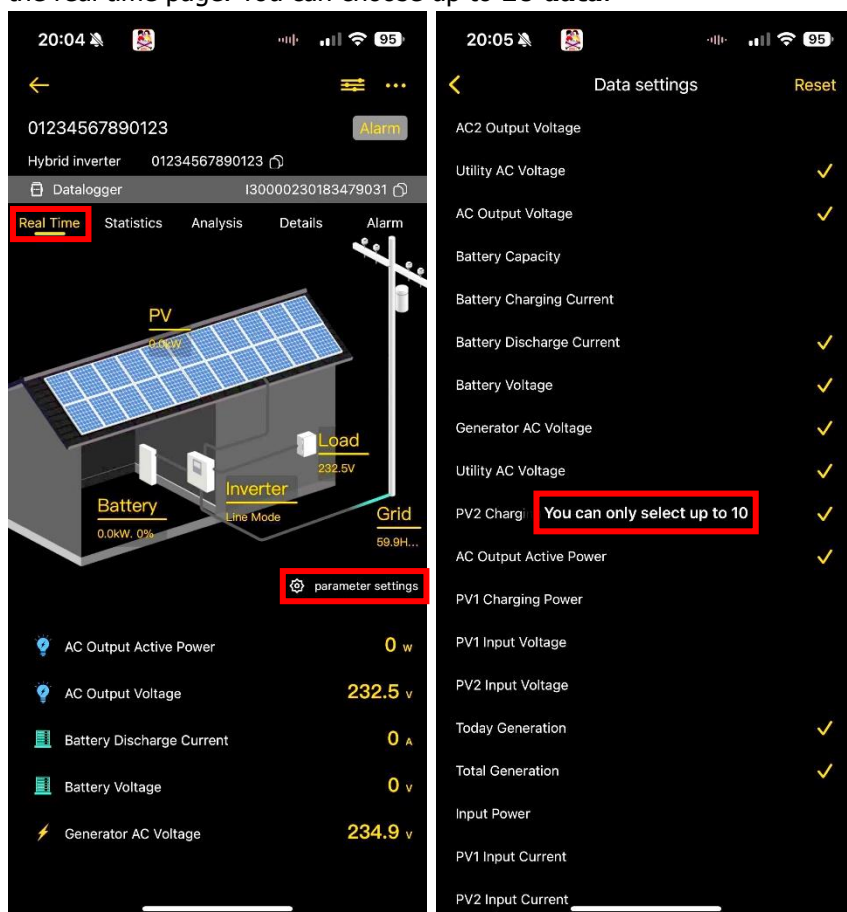
- Click > to see the inverter information.
- Click ⋮ to rename device and delete device.
  - ◆ Rename device: rename the inverter name.
  - ◆ Delete device: delete the inverter. The Wi-Fi module information in the datalogger page will **not be deleted**. Even if deleted, you **cannot** add Wi-Fi module under another account.



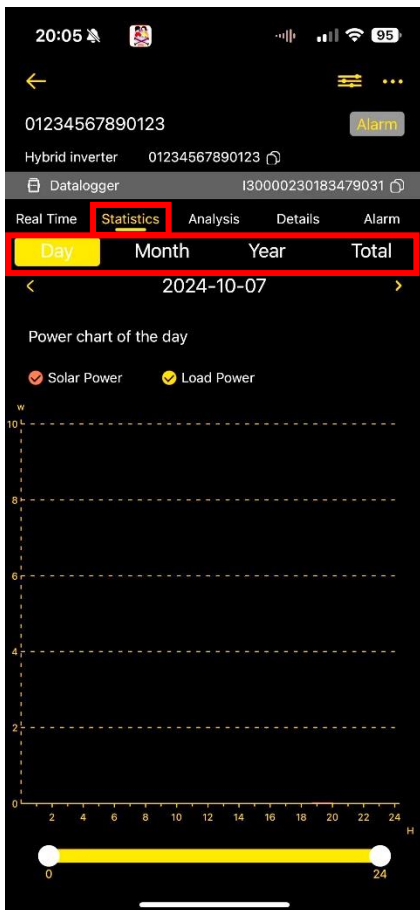
- Click  to enter setting parameters page. The setting items on the parameter page will be different based on different models.



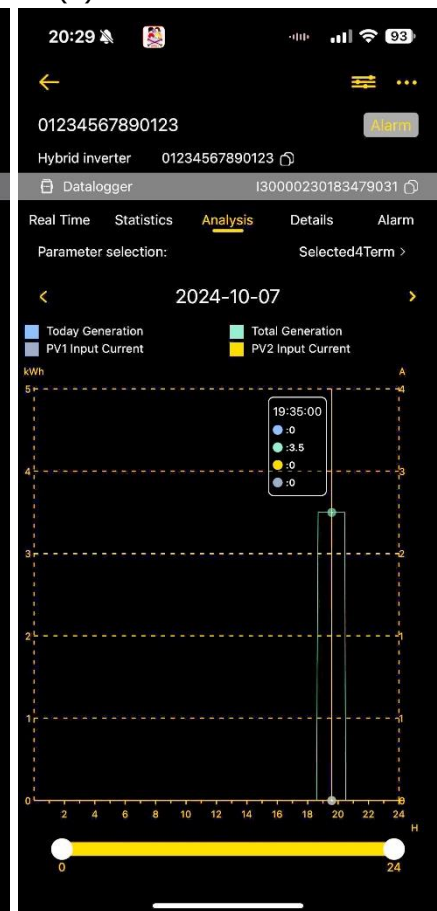
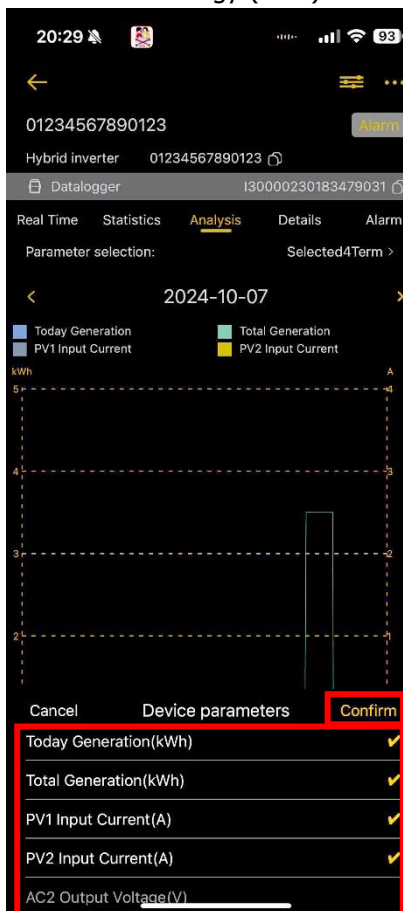
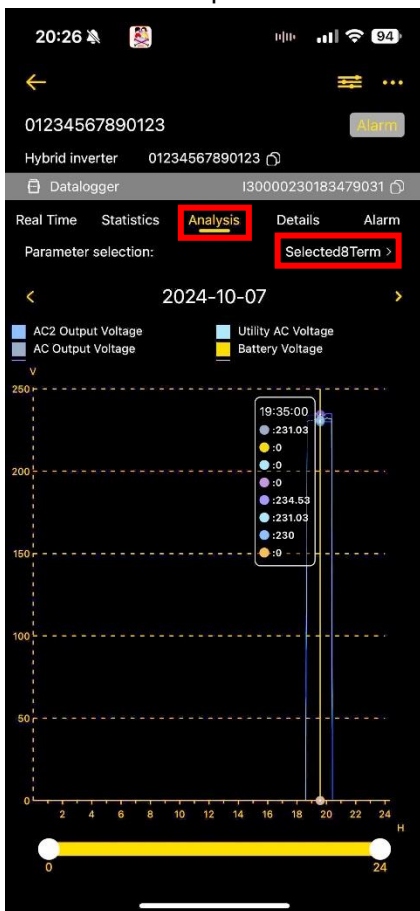
- Click "Real Time" to see the inverter real-time data. Click "parameter settings" to choose data you want to see on the real time page. You can choose up to **10 data**.



- Click "Statistics" to see the inverter solar power per hour, day, month and year.
  - Day: Click the button to query the hourly power generation data of the current day.
  - Month: Click the button to query the daily power generation data of the current month.
  - Year: Click the button to query the monthly power generation data of the current year.
  - Total: Click the button to query the annual power generation data.



- Click "Analysis" to see the inverter data per hour. Click "SelectedXTerm" to choose the data you want to compare. You can choose up to **2 different units** such as energy (kWh) and current (A).



- Click "Details" to see the inverter history.

20:06

01234567890123

Hybrid inverter 01234567890123

Datalogger I30000230183479031

Real Time Statistics Analysis **Details** Alarm

2024-10-07

| Timestamp | Data name                      | Data           |
|-----------|--------------------------------|----------------|
| 20:02:03  | SN                             | 01234567890123 |
| 19:57:14  | Main CPU Firmware Version      | 00001.91       |
| 19:52:24  | Secondary CPU Firmware Version | 00097.03       |
| 19:47:34  | Input Relay CPU Version        | 64.01          |
| 19:42:44  | Utility AC Voltage             | 0.0V           |
| 19:25:33  | Utility AC Frequency           | 0.0Hz          |
| 19:20:43  | Generator AC Voltage           | 234.9V         |
| 19:15:53  | Generator AC Frequency         | 59.9Hz         |
| 19:11:03  | PV1 Input Voltage              | 0.0V           |
| 19:06:13  | PV2 Input Voltage              | 0.0V           |
| 19:01:23  | PV1 Charging Power             | 0W             |
| 18:56:34  | PV2 Charging Power             | 0W             |
| 18:51:44  | Battery Voltage                | 0.0V           |
| 18:46:54  | Battery Capacity               | 0%             |
| 18:45:55  | Battery Charging Current       | 0A             |
|           | Battery Discharge Current      | 0A             |
|           | AC Output Voltage              | 232.5V         |
|           | AC Output Frequency            | 59.9Hz         |
|           | AC Output Apparent Power       | 0VA            |
|           | AC Output Active Power         | 0W             |
|           | Output Load Percent            | 0%             |
|           | Grid Rating Voltage            | 230.0V         |

- Click "Alarm" to see the inverter warning and fault.

19:38

01234567890123

Hybrid inverter 01234567890123

Datalogger I30000230183435238

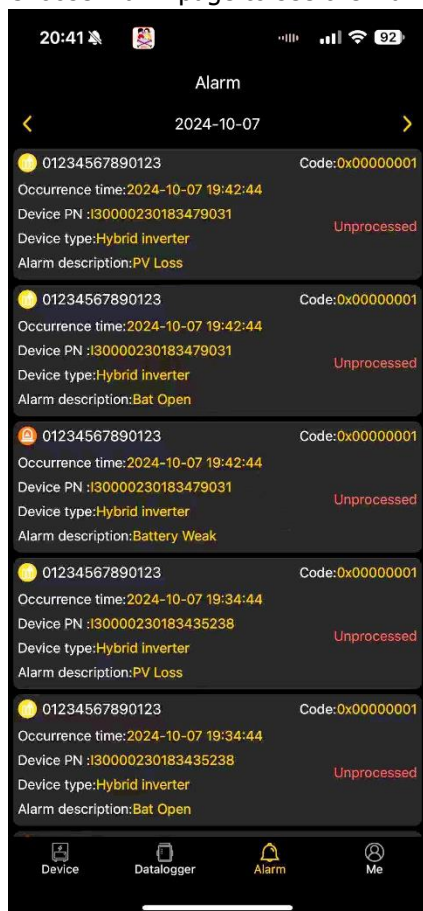
Real Time Statistics Analysis Details **Alarm**

All type All Status

|                           |
|---------------------------|
| <b>Alarm</b> PV Loss      |
| Alarm code:0x00000001     |
| 2024-10-07 19:34:44 ~ --  |
| <b>Alarm</b> Bat Open     |
| Alarm code:0x00000001     |
| 2024-10-07 19:34:44 ~ --  |
| <b>Fault</b> Battery Weak |
| Alarm code:0x00000001     |
| 2024-10-07 19:34:44 ~ --  |

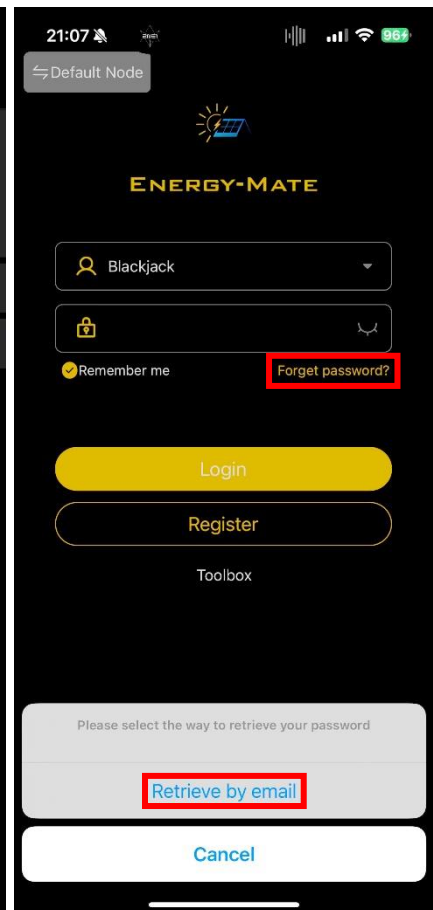
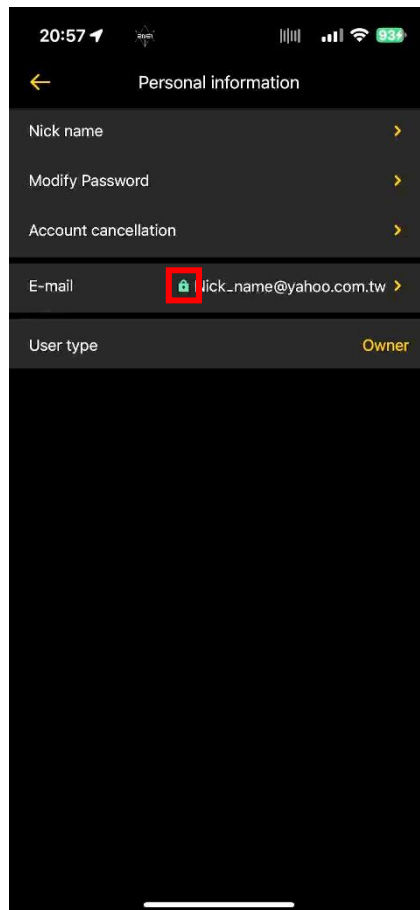
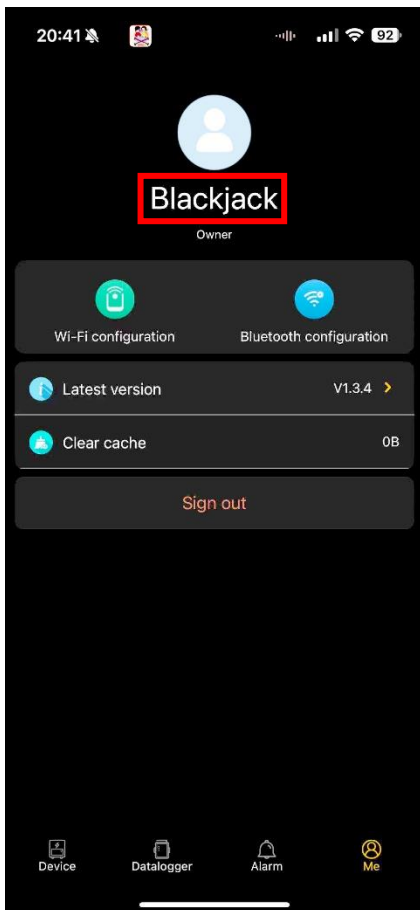
## 2-6 Alarm

- Choose Alarm page to see the warning and fault list of all inverters.

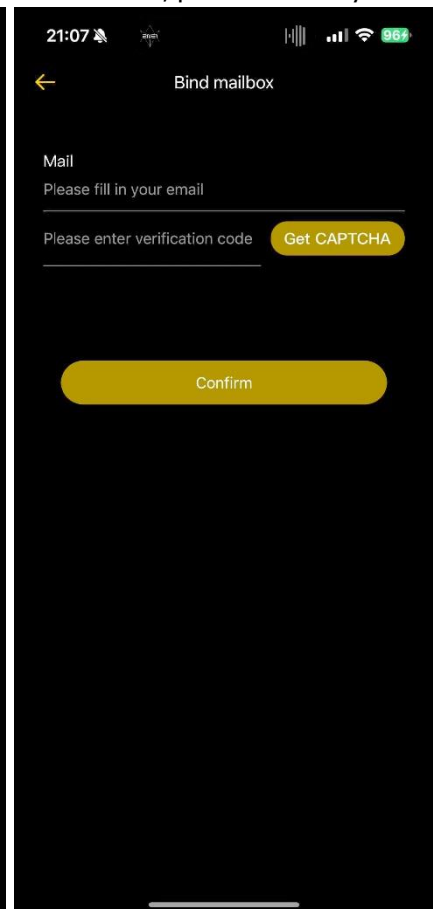
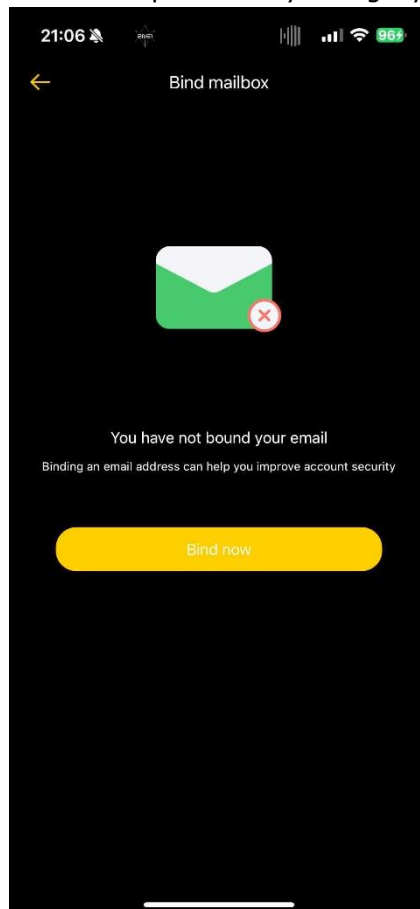
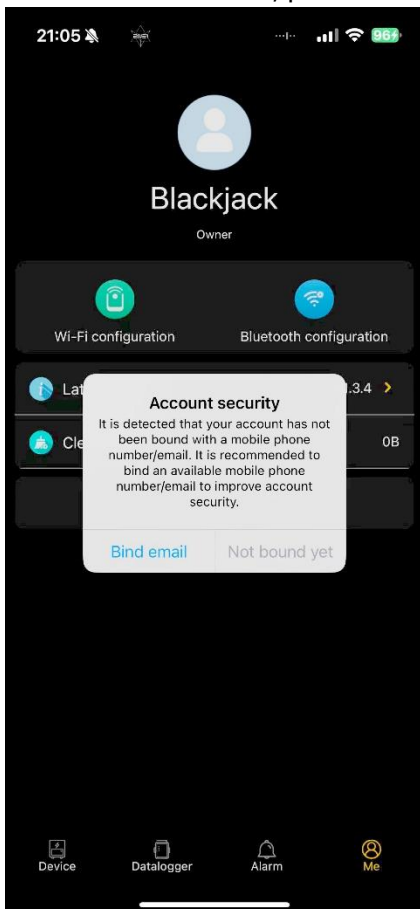


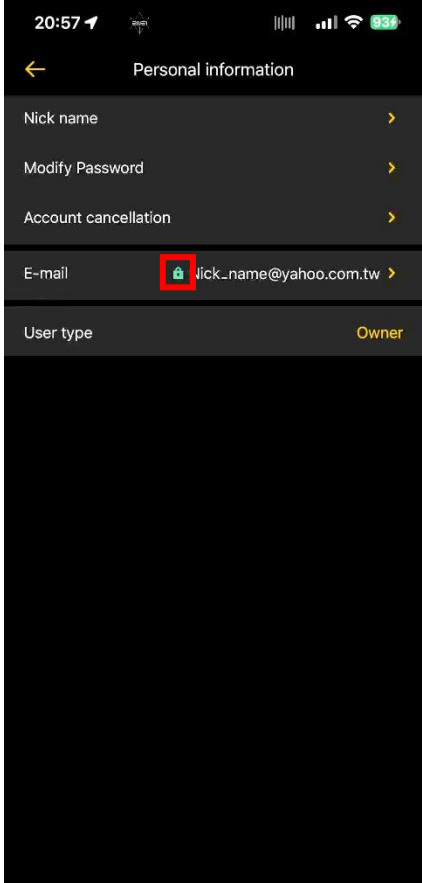
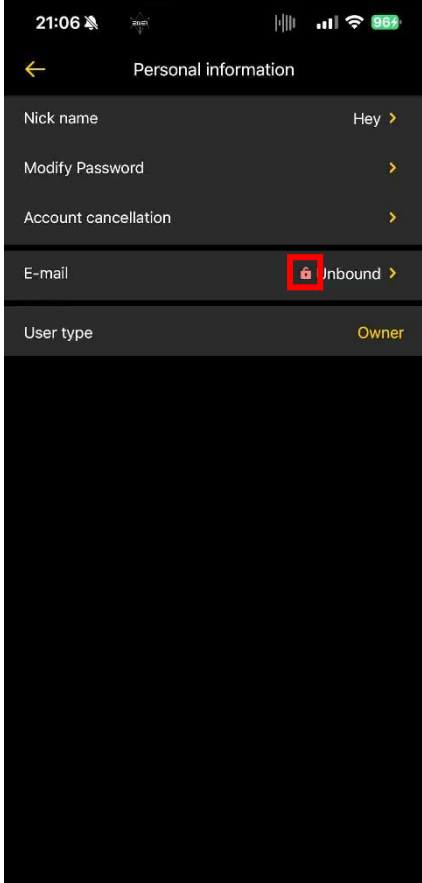
## 2-7 Me

- Choose Me page to see account information and app version.
- Click "Username" to modify nick name and password, and check if the mail has been bound. If the mail is bound, you can retrieve password through mail.

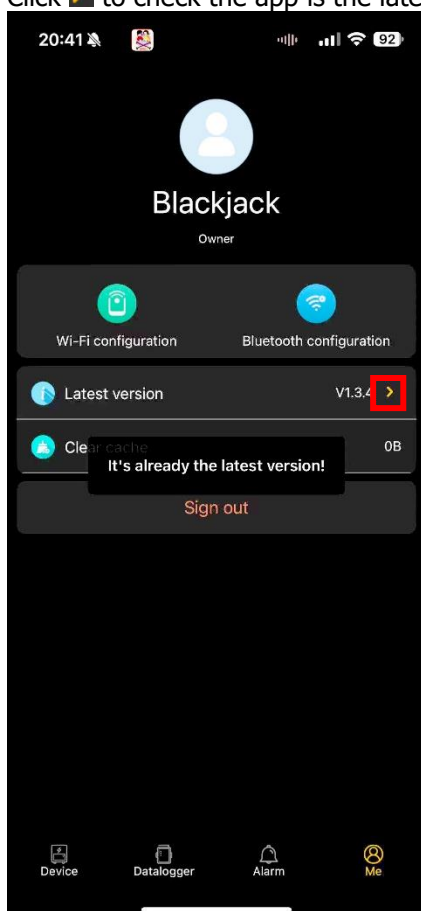


- If the mail is not bound, please bind it as soon as possible. If you forget your username, please contact your installer.



| Mail is bound.                                                                     | Mail is not bound.                                                                  |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |

- Click  to check the app is the latest version.

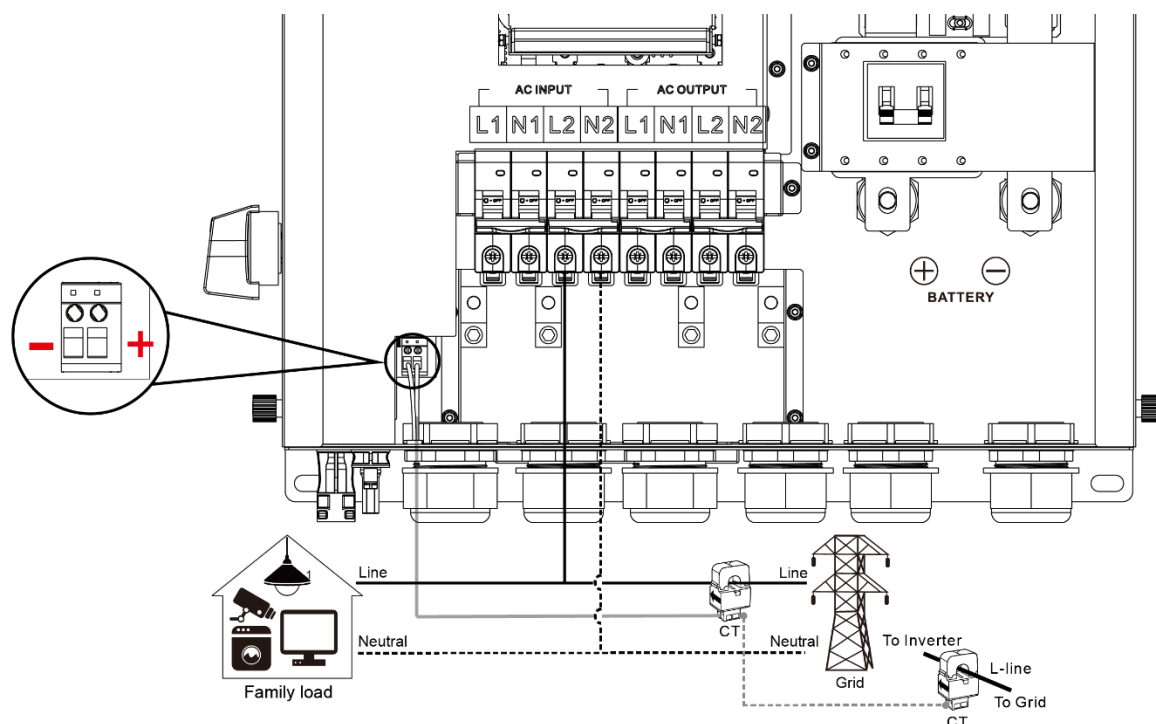


## Appendix III: The CT Operation Guide

With the CT connected, the solar inverter can be easily integrated into the existing household system. The CT can be used to control power generation and the battery charging of the inverter.

### Single commissioning

**Step 1.** Power off the inverter and connect the external CT to install on the spring terminal block. Be noted the mark of current flow direction on the CT should point to the inverter and the polarity on connecting CT wires on the terminal block should be followed as "L+" vs red wire and "L-" vs white wire.



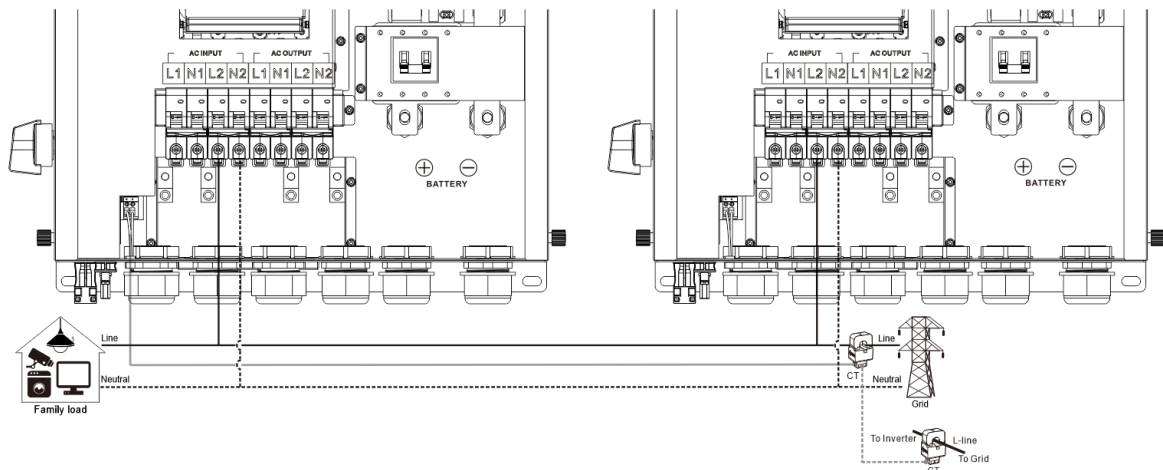
**Step 2:** Turn on the inverter

**Step 3:** Enter LCD setting on the inverter with CT sensor connected and set CT function to "enabled".

| External CT function | Disable (default)                                                          |
|----------------------|----------------------------------------------------------------------------|
|                      | External CT function:<br>200 A<br>► Disabled<br>50 A<br>19/39              |
|                      | Normal(default)<br>External CT direction:<br>► Normal<br>Reversed<br>20/39 |

### Parallel commissioning

**Step 1.** Power off the inverters and connect the CT sensor according to the wiring diagram below. For other parallel circuits, please follow Appendix I.

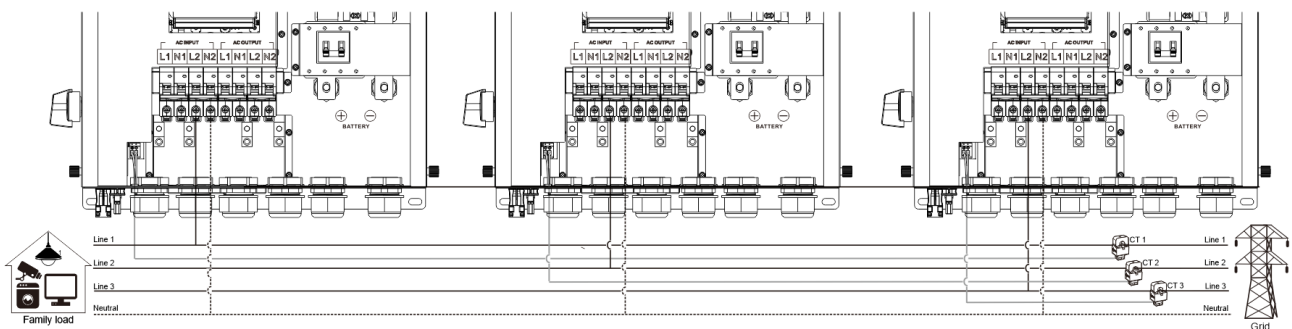


**Step 2:** Turn on each inverter.

**Step 3:** Enter LCD setting on the inverter with CT sensor connected and set CT function to "enabled".

### Three-phase commissioning

**Step 1.** Power off the inverters and connect the CT sensor according to the wiring diagram below. For other parallel circuits, please follow Appendix I.



**Step 2:** Turn on each inverter.

**Step 3:** Enter LCD setting on the inverter with CT sensor connected and set CT function to "enabled".

### IMPORTANT ATTENTION:

If applying CT function during parallel operation, it only needs one inverter from the parallel system connected to CT sensor. Be sure to enable LCD external CT function on the one inverter with CT connected and set up 'Disable' on the remaining inverters. Otherwise, it will cause CT function not working during parallel operation.