

# **Off-Grid Solar Inverter 5kW-48V&6.5kW-48V IP21**

## **User Manual**

Version 2.0



# About This Manual

## Scope of Validity

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations.

## Target Group

This document is intended for qualified persons and end users. Tasks that do not require any particular qualification can also be performed end users. Qualified persons must have the following skills:

- Knowledge of how an inverter works and is operated
- Training in how to deal with the dangers and risks associated with installing and using electrical devices and installations
- Training in the installation and commissioning of electrical devices and installations
- Knowledge of the applicable standards and directives
- Knowledge of the compliance with this document and all safety information

## Symbol Description

Different levels of warning messages in this manual are defined as follows:



### **DANGER!**

- Indicates a high-level hazard that, if not avoided, will result in death or serious injury.



### **WARNING!**

- Indicates a medium-level hazard that, if not avoided, could result in death or serious injury.



### **CAUTION!**

- Indicates a low-level hazard that, if not avoided, could result in minor or moderate injury.



### **NOTICE**

- Provide important operation information and techniques for high efficient, proper using and maintenance.

## Change History

### **Version 2.0 (05/20/2026)**

Modified the LCD Display and LCD settings to match the actual device.

### **Version 1.0 (01/30/2026)**

Initial release

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## 1.1 Symbols on the Label and Inverter

Table 1-1 Symbols

| Symbol                                                                            | Description                                                                  |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------|
|  | Do not disconnect under load!                                                |
|  | Danger: High Voltage!                                                        |
|   | Danger: Electrical Hazard!                                                   |
|   | Delayed discharge. Wait 5 minutes after power completely discharged.         |
|  | Read instructions carefully before performing any operation on the INVERTER. |
|  | Grounding: The system must be firmly grounded for operator safety.           |

## 1.2 Safety Instructions

This chapter contains important safety and operating instructions. Read and keep this manual for future reference.



### **DANGER!**

- To reduce risk of injury, charge only deep-cycle lead-acid type rechargeable batteries and lithium batteries. Other types of batteries may burst, causing personal injury and damage.
- To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
- Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this manual for the details.



## WARNING!

- Do not disassemble the upper cover. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
- Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
- NEVER cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
- Make sure the inverter is completely assembled, before the operation.



## CAUTION!

- NEVER charge a frozen battery.
- For optimum operation of this inverter, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter.
- GROUNDING INSTRUCTIONS - This inverter should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.



## NOTICE

- Provide important operation information and techniques for high efficient, proper using and maintenance.
- Please be clear which kind of battery system you want, lithium battery system or lead-acid battery system, if you choose the wrong system, energy storage system can not work normally.
- Before using the device, read all instructions and cautionary making on the devices and all appropriate sections of this manual. The company has the right not to quality assurance, if not according to the instructions of this manual for installation and cause equipment damage.
- All the operation and connection please professional electrical or mechanical engineer.
- All the electrical installation must comply with the local electrical safety standards.
- When install PV modules in the daytime, installer should cover the PV modules by opaque materials, otherwise it will be dangerous as high terminal voltage of modules in the sunshine.
- After a factory reset, reconfigure using only the values in this manual; operation outside these limits may cause malfunction, and any risk or damage is borne solely by the user.

### 1.3 Inverter Load Management Instruction

This product features excellent overload handling capability, allowing it to operate continuously for short periods under various overload conditions. When the load exceeds the allowable limit, the protection mechanism is promptly activated to ensure equipment safety. The specific overload capabilities are as follows:

For 5kW model:

- Capable of withstanding a load between 102% and 110% for up to 1 minutes;
- Capable of withstanding a load between 110% and 130% for up to 10 seconds;
- Capable of withstanding a load between 130% and 150% for up to 3 seconds;
- Capable of withstanding a load exceeding 150% for up to 200 milliseconds.

For 6.5kW model:

- Capable of withstanding a load between 102% and 120% for up to 10 minutes;
- Capable of withstanding a load between 120% and 150% for up to 1 minute;
- Capable of withstanding a load between 150% and 200% for up to 10 seconds;
- Capable of withstanding a load exceeding 200% for up to 5 seconds.

The system will automatically trigger the protection mechanism when the above time or load limits are exceeded, preventing damage to the equipment.

Table 1-2 Load Type and Power Requirements

| Type of load       | Equipment              | Power(W)  | Start power       |
|--------------------|------------------------|-----------|-------------------|
| Resistive Load(R)  | Lamp                   | 40~100    | 1.5 x             |
|                    | Hair dryer             | 1200~1800 | 1.5 x             |
|                    | Iron                   | 1000~2200 | 1.2 x             |
|                    | Heater                 | 1000~3000 | 1.2 x             |
| Inductive Load(L)  | Refrigerator           | 100~200   | 5~8 x             |
|                    | Air conditioner        | 800~3500  | 4~7 x             |
|                    | Washing machine        | 400~800   | 4~7 x             |
|                    | Fan                    | 30~100    | 3~5 x             |
|                    | Vacuum cleaner         | 800~2000  | 3~6 x             |
|                    | Induction Cooker       | 1200~2200 | 3~5 x             |
|                    | Microwave oven         | 700~1200  | 2~3 x             |
| Capacitive Load(C) | Laser Printer / Copier | 300~1500  | 5~30 x            |
|                    | Phone charger          | 5~30      | 10~100 x (< 1 ms) |

| Type of load        | Equipment                                                               | Power(W) | Start power |
|---------------------|-------------------------------------------------------------------------|----------|-------------|
| Half-wave Load (HW) | Old radio,record player DC supply, Cheap half-wave rectified appliances | 5-30     | 20 x        |

**\*Inductive load and Capacitive load** can referred to as **Shock load**.

Shock loads may experience shock currents or surges during startup, which can cause voltage fluctuations, current inrushes, motor vibrations, and voltage surges. These anomalies may exceed the load-bearing capacity of the inverter, resulting in damage or even failure.

Therefore, it is necessary to control the total amount of inductive and capacitive loads connected to the inverter to ensure safe and stable operation.

- When selecting an inverter, the loading capacity should be taken into consideration to ensure that the total amount of connected inductive and capacitive loads fall within its rated capacity.
- When connecting Shock loads to the off-grid inverter, it is necessary to limit the total load capacity to ensure safe and reliable operation of the inverter.

| Continuous Output | Surge Power (< 200 ms) | Maximum individual Shock load power, Maximum total load power                                                                                                            |
|-------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5000 W            | 15000 VA               | R: Lamp < 500W<br>L: Refrigerator + Fan + Washing machine < 2000W or Air conditioner / Induction Cooker < 2200W<br>C: Phone charger + Old radio < 100W<br>R: Lamp < 500W |
| 6500 W            | 16000 VA               | L: Refrigerator + Fan + Washing machine < 2000W or Air conditioner/ Induction Cooker < 2500W<br>C: Phone charger + Old radio < 100W                                      |



### WARNING!

- Earth connection essential before connecting supply.
- Be sure that AC power source is disconnected before attempting to hardwire it to the unit.
- Be sure to connect AC wires with correct polarity. If L and N wires are connected reversely, it may cause utility short-circuited when these inverters are worked in parallel operation.



## NOTICE

- It is important to make sure that the combined power required for all devices connected to this EPS output does not exceed the power rating of the inverter.
- Appliances such as air conditioner are required at least 2~3 minutes to restart because it's required to have enough time to balance refrigerant gas inside of 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 manufacturer of air conditioner if it is equipped with time-delay function before installation. Otherwise, this inverter will trig overload fault and cutoff output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

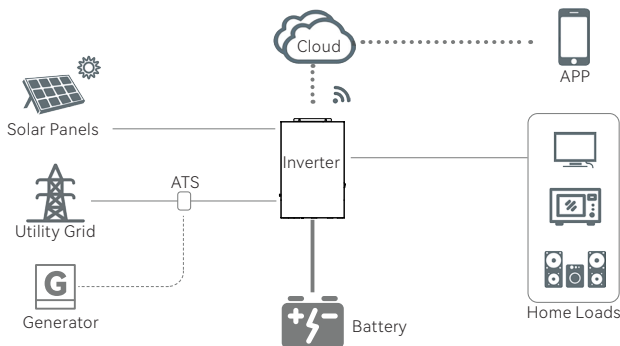


Figure 2-1 System Overview

This is a multifunctional solar inverter, integrated with an MPPT solar charge controller, a high-frequency pure-sine-wave inverter, and a UPS function module in one machine—perfect for off-grid backup power and self-consumption applications. The inverter can operate with or without batteries.

To run the whole system, you will also need PV modules, generators or the utility. Please consult your system integrator for other possible architectures tailored to your needs.

The WiFi / GPRS module is a plug-and-play monitoring device that plugs into the inverter. With this module, you can monitor your PV system status anytime, anywhere from a mobile phone or the website.

### 2.1 Features

- Pure sine wave AC output
- High frequency inverter with small size and light weight
- Solar and utility can power loads at the same time
- With RS485 or CAN for BMS communication
- With the ability to work without battery
- Dual AC output
- (Optional) WiFi/GPRS remote monitoring

## 2.2 Product Overview

### Terminal Description

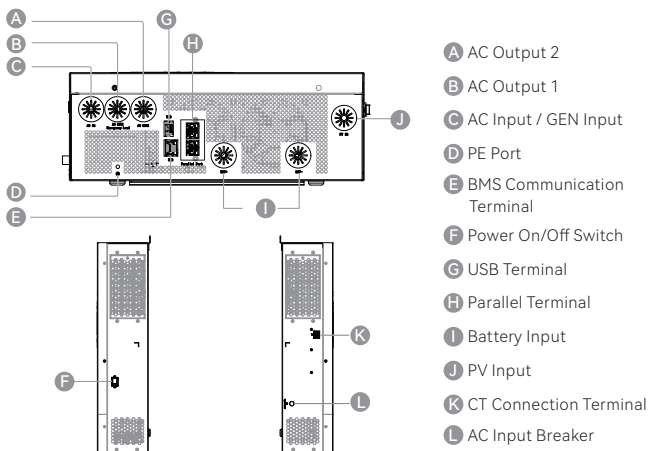


Figure 2-2 Terminal

### NOTICE

- Diagrams are for reference only; refer to the actual product. Specifications are subject to change without notice.

## 3 Installation

### 3.1 Unpacking and Inspection

Products have been strictly tested before leaving the factory. Please sign for them after inspection. If the product is damaged, please contact the local distributor. Please open the box to check whether the outer packaging is intact or damaged, whether the internal equipment is damaged.

#### 3.1.1 Installation Tools



Goggles



Safety shoes



Safety gloves



Dust mask



RJ45 crimping tool



Diagonal pliers



Wire stripper



Hammer drill



Heat gun



Vacuum cleaner



Marker



Level



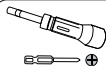
Heat shrink tube



Cable tie



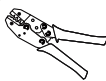
Rubber hammer



Torque wrench



Multimeter



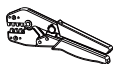
PV crimping tool



Tube type terminal crimping tool



Measuring tape



Crimping tool



Hex socket

### 3.1.2 Packing List

| Description      | Quantity |
|------------------|----------|
| Inverter         | 1 pc     |
| Document         | -        |
| Expansion Screw  | 2 pcs    |
| M3*8 Screw       | 4 pcs    |
| Tubular Terminal | 9 pcs    |

## 3.2 Mounting Unit

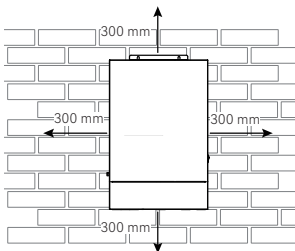


Figure 3-1 Installation distance recommendation

Consider the following points before selecting where to install:

- Mount on a solid surface and non-combustible surfaces like concrete.
- Place at eye level for LCD visibility.
- The recommended installation position is to be adhered to the wall vertically.
- Be sure to keep other objects and surfaces as shown in the diagram above to guarantee sufficient and to have enough space for removing wires.

### Installation steps:

**Step 1:** Mark two drilling positions.

**Step 2:** Drill holes and knock the expansion bolts into the holes.

**Step 3:** Secure the device to the wall with screws by torque wrench.

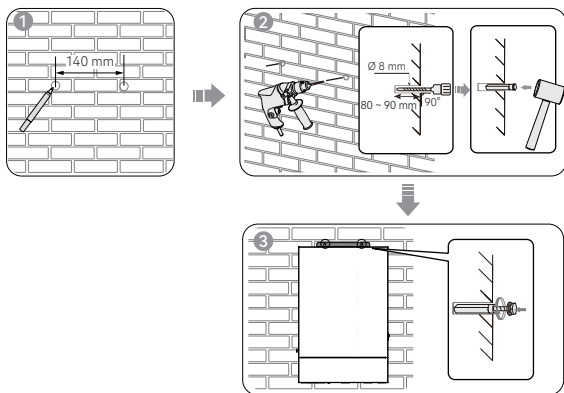


Figure 3-2 Installing the inverter

Before connecting all wiring, please take off bottom cover by removing four screws as shown below:

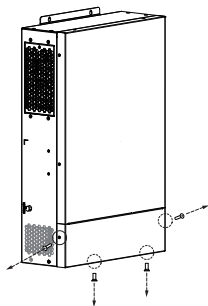


Figure 3-3 Removing screws

## 4 Electrical Connection



### WARNING!

- Make sure AC power is disconnected before attempting to connect AC power to the unit.
- All operations during the electrical connection process, as well as the specifications of cables and components used, must comply with local laws and regulations.
- All wiring must be performed by a qualified personnel.
- To ensure safe and efficient operation of the system and reduce the risk of injury, please use the recommended cable specifications.

### 4.1 PE Connection

Be sure to connect PE protective cable on the inverter side first.

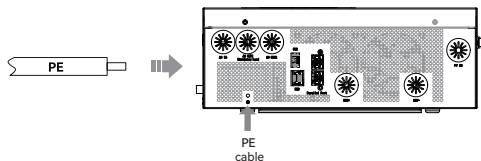


Figure 4-1 PE Connection

### 4.2 AC Input / Output Connection



### CAUTION!

- Before connecting to AC input power source, please install a separate AC breaker between inverter and AC input power source. The recommended of AC breaker is 40 A.
- There are three terminal blocks with 'AC IN', 'AC OUT 2', 'AC OUT 1' markings. Do not mis-connect input and output connectors.

Table 4-1 Suggestion for AC input/output wires

| Wire Size | Cable             |
|-----------|-------------------|
| 12 AWG    | 4 mm <sup>2</sup> |

#### AC input/output connection steps:

**Step 1:** Before connecting to AC power, make sure that the AC circuit breaker is

disconnected.

**Step 2:** Remove 12 mm insulation. Insert the cable into the tubular terminal. Then use terminal crimping tool make the terminal and cable connected tightly.

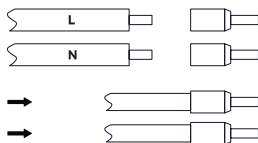


Figure 4-2 AC cable connection

**Step 3:** Insert AC input cables according to polarities indicated on terminal blocks and tighten the terminal screws.

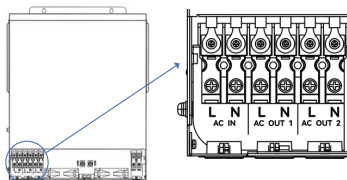


Figure 4-3 AC side connection

## **i** NOTICE

- Output 1 is for connecting general loads, while Output 2 is designated for heavy loads. Please ensure this distinction is maintained to guarantee the safe and effective operation of the equipment.

## 4.3 GEN Input Connection

Table 4-2 Suggestion for GEN Input wires

| Wire Size | Cable             |
|-----------|-------------------|
| 12 AWG    | 4 mm <sup>2</sup> |

### Connection steps:

**Step 1:** Before connecting GEN, make sure that the AC circuit breaker between inverter and generator is disconnected.

**Step 2:** Remove 12 mm insulation. Insert the cable into the tubular terminal. Then use terminal crimping tool make the terminal and cable connected tightly.

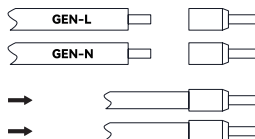


Figure 4-4 Generator cable connection

**Step 3:** Insert cables according to polarities indicated on terminal blocks and tighten the terminal screws.

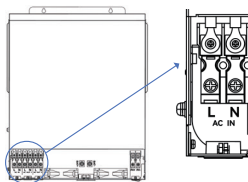


Figure 4-5 Generator connection

## 4.4 PV Connection



### DANGER!

- Direct sunlight can cause dangerous high voltages in solar panels. Therefore, be sure to follow the safety guidance in the solar panel manual plus related documents.



### WARNING!

- Make sure to connect the PV terminals to the corresponding ports inverter, as reversing the polarity can damage the inverter.



### CAUTION!

- Before connecting to PV modules, install a separate DC circuit breaker between inverter and PV modules. Do not connect any DC switches or AC/DC circuit breakers before completing the electrical connections.

Table 4-3 Suggestion for PV wires

| Wire Size | Cable             |
|-----------|-------------------|
| 12 AWG    | 4 mm <sup>2</sup> |

## PV Module Selection:

When selecting proper PV modules, please be sure to consider below parameters.

- 1 Open circuit Voltage (Voc) of PV modules not exceeds max. PV array open circuit voltage of inverter.
- 2 Open circuit Voltage (Voc) of PV modules should be higher than start-up voltage.

|                                          |          |
|------------------------------------------|----------|
| Max. PV Array Open Circuit Voltage [Vdc] | 500      |
| PV Array MPPT Voltage Range [Vdc]        | 60 ~ 450 |

## PV module connection step:

**Step 1:** Before connecting the PV module, make sure that the DC circuit breaker is disconnected.

**Step 2:** Remove 12mm insulation. Insert the cable into the tubular terminal. Then use terminal crimping tool make the terminal and cable connected tightly.

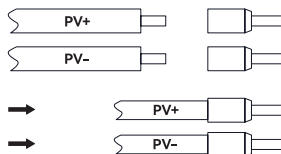


Figure 4-6 PV cable connection

**Step 3:** Use multi-meter check to ensure the polarities are correct.

**Step 4:** Insert PV cables according to polarities indicated on terminal block and tighten the terminal screws.

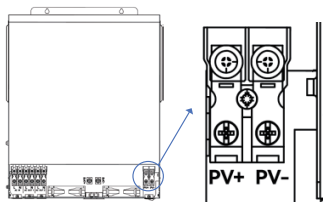


Figure 4-7 PV side connection

## 4.5 Battery Connection

### 4.5.1 Lead-acid Battery Connection

User can choose proper capacity with a nominal voltage at 48V. Also, you need to choose battery type as AGM or FLD, for specific settings, refer to “5.4.1 LCD Setting”.



#### CAUTION!

- Avoid placing anything between the inverter terminal's flat part and the DT terminal to prevent overheating.
- For safety, install a separate DC over-current protector or disconnect device between the battery and inverter. It's recommended to have a 175 A protector or disconnect.

Table 4-4 Suggestion for battery cable and terminal

| Wire Size | Cable              |
|-----------|--------------------|
| 1 AWG     | 45 mm <sup>2</sup> |



#### NOTICE

- The recommended charge current is 0.3C (C > battery capacity).

#### Battery connection step:

**Step 1:** Unscrew the pre-fixed screws on battery poles. Prepare 2 DT terminals.

**Step 2:** Remove 12mm insulation. Insert the cable into the DT terminal. Then use terminal crimping tool make the terminal and cable connected tightly.

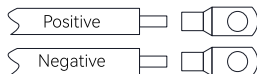


Figure 4-8 Battery cable connection

**Step 3:** Pass the battery cable through the battery installation hole on bottom, and tighten the terminal screws. Make sure polarity at both the battery and inverter are correctly connected and DT terminals are tightly screwed to the battery terminals.

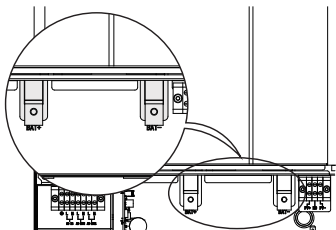


Figure 4-9 Battery side connection



### CAUTION!

- Do not apply anti-oxidant substance on the terminals before terminals are connected tightly.
- Before making the final DC connection or closing DC breaker / disconnecter, be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).

## 4.5.2 Lithium Battery Connection

If choosing lithium battery for inverter, please check the compatibility of the protocol first. There are two connectors on the lithium battery, RJ45 port of BMS and power cable.

### Lithium battery connection step:

**Step 1:** Follow [“4.4.1 Lead-acid Battery Connection”](#) to connect the power cable.

**Step 2:** Connect RJ45 terminal of battery communication cable to BMS communication port of inverter. The communication protocol should be RS485.

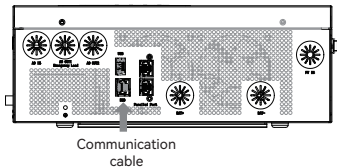


Figure 4-10 Lithium battery connection

**Step 3:** Insert the other end of RJ45 (battery communication cable) to battery communication port of lithium battery.

## Lithium battery communication and setting:

In order to communicate with battery BMS, you should set the battery type to “Lib” in “5.4.1 LCD Setting” Program 5.

Make sure the lithium battery BMS port connects to the inverter is Pin to Pin, the inverter BMS port Pin assignment shown as below:

Table 4-5 BMS port Pin assignment

| Pin | BMS Port | Pin | BMS Port |
|-----|----------|-----|----------|
| 1   | RS485B   | 5   | CANL     |
| 2   | RS485A   | 6   | -        |
| 3   | -        | 7   | -        |
| 4   | CANH     | 8   | -        |

## 4.6 Final Assembly

After connecting all wiring, please put bottom cover back by screwing four screws mentioned in Section 3.2.

## 4.7 Smart Communication Stick Connection (Optional)

The smart communication stick is used to connect to cloud platform. Please insert the stick into COM port directly.

## 4.8 Meter Connection (Optional)

Insert the RJ45 connector (communication cable) from meter.

Make sure that the meter port connected to the inverter is Pin to Pin, and the inverter meter port pin assignment is as shown below:

Table 4-6 Meter port pin assignment

| Pin | Meter Port   | Pin | Meter Port |
|-----|--------------|-----|------------|
| 1   | Meter RS485B | 5   | -          |
| 2   | Meter RS485A | 6   | -          |
| 3   | -            | 7   | -          |
| 4   | -            | 8   | -          |

### 5.1 Power ON

**Step 1:** Turn on the battery breaker to connect the battery to the inverter.

**Step 2:** Turn on the switch on the inverter to start the inverter.

**Step 3:** Turn on the PV breaker.

**Step 4:** Turn on the AC breaker between the inverter and the power grid.

**Step 5:** Turn on the load breaker to supply power to the connected loads.



#### **WARNING!**

- After AC mains power is connected, the product must remain undisturbed for 30 seconds; during this period, disconnecting PV or battery connections is prohibited.

### 5.2 Power OFF

**Step 1:** Turn off the load switch to ensure that all connected loads are disconnected.

**Step 2:** Turn off the PV breaker to disconnect the PV from the inverter.

**Step 3:** Turn off the AC switch between the inverter and the power grid.

**Step 4:** Turn off the switch on the inverter.

**Step 5:** Turn off the battery switch to disconnect the battery from the inverter.



#### **CAUTION!**

- After the inverter system is powered down, there is still residual electricity and heat, which may cause electric shock or burns. Therefore, wear protective gloves to operate the inverter after the inverter system has been powered down for 5 minutes.

## 5.3 Operation and Display Panel

The panel indicates the operating status and input/output power information.

### NOTICE

- The illustrations and specifications in this section are for reference only. Please refer to the actual product.

### 5.3.1 Introduction of Control Panel

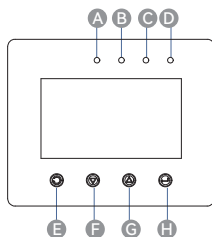


Figure 5-1 LED Panel

Table 5-1 LED indicator

| LED Indicator                                                                                                         |          | Description                                                              |
|-----------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------|
| <br>AC Status indicator<br>(Green)   | Solid On | The mains power is normal and enters the mains power operation.          |
|                                                                                                                       | Flashing | The mains power is normal, but it has not entered mains power operation. |
|                                                                                                                       | Off      | The mains power is abnormal.                                             |
| <br>Invert indicator<br>(Yellow)     | Solid On | Output is powered by battery or PV in battery mode.                      |
|                                                                                                                       | Off      | Other states.                                                            |
| <br>Charging indicator<br>(Yellow) | Solid On | The battery is in float charging.                                        |
|                                                                                                                       | Flashing | The battery is in constant voltage charging.                             |
|                                                                                                                       | Off      | Other states.                                                            |
| <br>Fault indicator<br>(Red)       | Solid On | Fault occurs in the inverter.                                            |
|                                                                                                                       | Flashing | Warning condition occurs in the inverter.                                |
|                                                                                                                       | Off      | The inverter is working properly.                                        |

Table 5-2 Function Buttons

| Button                                                                              | Description           |
|-------------------------------------------------------------------------------------|-----------------------|
|  | To exit setting mode. |

|          |                                                                 |
|----------|-----------------------------------------------------------------|
| <b>F</b> | To decrease the page number or the parameter value.             |
| <b>G</b> | To increase the page number or the parameter value.             |
| <b>H</b> | To confirm the selection in setting mode or enter setting mode. |

### 5.3.2 LCD Display Icons

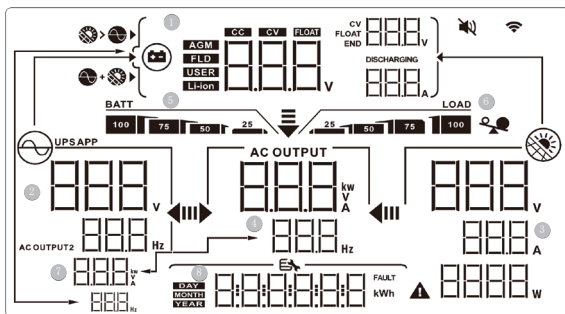


Figure 5-2 LCD Display

Table 5-3 LCD Icons

| Display area              | Icon | Description                                                                                                                                                                                                                             |
|---------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1<br>Battery Information  |      | Battery icon                                                                                                                                                                                                                            |
|                           |      | Battery type                                                                                                                                                                                                                            |
|                           |      | Three charging period. The CC icon is illuminated during the constant current charging stage, the CV icon is illuminated during the constant voltage charging stage, and the FLOAT icon is illuminated during the float charging stage. |
|                           |      | Indicate battery voltage                                                                                                                                                                                                                |
|                           |      | During the constant voltage charging stage, the CV voltage is displayed and the CV icon is illuminated.<br>During the float charging stage, the float voltage is displayed and the END icon is illuminated.                             |
|                           |      | Battery charging/discharging current                                                                                                                                                                                                    |
| 2<br>AC Input Information |      | AC input icon                                                                                                                                                                                                                           |
|                           |      | Input mode<br>When set to GEN/APL input, it display as APP                                                                                                                                                                              |
| 3<br>PV Input Information |      | PV input icon                                                                                                                                                                                                                           |
|                           |      | Indicate PV power, PV voltage, PV current, etc.                                                                                                                                                                                         |
| 4<br>Output Information   |      | Indicate output voltage (V), apparent power (VA or kVA), output active power (W or kW) alternately, switching every five seconds indicate output frequency.                                                                             |
| 5<br>Battery Capacity     |      | Indicate battery capacity                                                                                                                                                                                                               |
| 6<br>Load Capacity        |      | Indicate load capacity                                                                                                                                                                                                                  |
|                           |      | Over load icon                                                                                                                                                                                                                          |

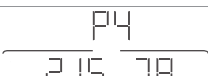
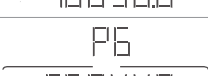
| Display area                                                                         | Icon                                                                                                                                                                   | Description                                                                                                                                                  |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>7</b><br>AC OUTPUT2<br>Information                                                | <b>AC OUTPUT2</b><br>                                                                 | Second AC output icon<br>Indicate AC output 2 voltage (V)                                                                                                    |
| <b>8</b><br>Parameter<br>Query, Function<br>Setting or<br>Fault/Alarm<br>Information |                                                                                       | Indicate system information; Function setting<br>indicate Fault/Alarm                                                                                        |
| Other<br>Information                                                                 |                                                                                       | Mute                                                                                                                                                         |
|                                                                                      |                                                                                       | WiFi connected                                                                                                                                               |
|                                                                                      | <br> | If PV+Utility, the left and right icon light at same<br>time; if only PV, the right icon is light<br>If PV first, the left and right icon light at same time |

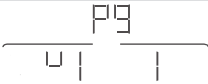
## 5.4 Display Information

### 5.4.1 LCD Display

The selectable information is switched as below.

Table 5-4 LCD Display Information

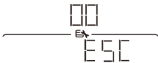
| LCD display                                                                                                     | Information                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br>P1<br>DAY MONTH 0.9 0.9 kWh | Display the monthly and daily power generation from solar.<br>The left value shows the monthly generation, and the right shows the daily.                                              |
| <br>P2<br>YEAR 0.9 0.9 kWh      | Display the annual and total power generation from solar.<br>The left value shows the annual generation, and the right shows the total.                                                |
| <br>P3<br>53.2 0.0              | Display lithium battery voltage and current. Display ERR when BMS communication fails. If BMS function is disabled, the page will not display.                                         |
| <br>P4<br>21.5 78               | Display lithium battery temperature and SOC. Display ERR when BMS communication fails. If BMS function is disabled, the page will not display.                                         |
| <br>P5<br>100 50.8              | Display lithium battery rated capacity and remaining capacity.<br>Display ERR when BMS communication fails. If BMS function is disabled, the page will not display.                    |
| <br>P6<br>56.0 44.8             | Display lithium battery maximum charging voltage and minimum discharging voltage.<br>Display ERR when BMS communication fails. If BMS function is disabled, the page will not display. |
| <br>P7<br>95.0 105             | Display lithium battery maximum charging current and maximum discharging current.<br>Display ERR when BMS communication fails. If BMS function is disabled, the page will not display. |
| <br>P8<br>NUL NUL             | Display lithium battery alarm and fault information.<br>Display ERR when BMS communication fails. If BMS function is disabled, the page will not display.                              |

| LCD display                                                                     | Information                        |
|---------------------------------------------------------------------------------|------------------------------------|
|  | Display inverter firmware version. |

## 5.4.2 LCD Setting

After pressing and holding ENTER button for 2 seconds, the unit will enter setting mode. Press “UP” or “DOWN” button to select setting programs. Then press “ENTER” button to confirm the selection or ESC button to exit.

Table 5-5 LCD Setting

| No. | Description              |                                                                                     |                                                                                                                                                                                                 |
|-----|--------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00  | Exit setting mode        |    | <ul style="list-style-type: none"> <li>Return to main page</li> </ul>                                                                                                                           |
| 01  | Output source priority   |    | <ul style="list-style-type: none"> <li>Solar powers loads first</li> </ul>                                                                                                                      |
|     |                          |    | <ul style="list-style-type: none"> <li>Default setting</li> <li>Solar and battery powers loads first</li> </ul>                                                                                 |
|     |                          |    | <ul style="list-style-type: none"> <li>Generator powers loads first</li> </ul>                                                                                                                  |
| 02  | Maximum charging current |    | <ul style="list-style-type: none"> <li>Maximum charging current for PV and mains power</li> <li>Default: 100 A</li> <li>Available options: 2/10/20/30/40/50/60/70/80/90/100/110/120A</li> </ul> |
| 03  | Input mode               |   | <ul style="list-style-type: none"> <li>Default mode</li> <li>Applied to household appliance</li> <li>Typical switching time is 10 ms</li> </ul>                                                 |
|     |                          |  | <ul style="list-style-type: none"> <li>Applied to computer and other devices.</li> <li>Typical switching time is 10 ms</li> </ul>                                                               |
|     |                          |  | <ul style="list-style-type: none"> <li>Applied to connect generator from AC IN port</li> <li>Typically switching time is 20 ms</li> </ul>                                                       |

## No. Description

|    |                                           |                                                                                     |                                                                                                                                                                                                                                                                                                                                                    |
|----|-------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 04 | Energy-saving mode                        |    | <ul style="list-style-type: none"> <li>• Default OFF</li> <li>• ON: When the load is below 25W and below 100VA, the system will briefly halt output before resuming. If the load exceeds 35W or exceeds 120VA, the system will resume continuous normal output.</li> </ul>                                                                         |
| 05 | Battery type                              |    | • Default: AGM (Lead-Acid Battery)                                                                                                                                                                                                                                                                                                                 |
|    |                                           |    | • FLD (Flooded Battery)                                                                                                                                                                                                                                                                                                                            |
|    |                                           |    | • LIB (Lithium Battery)                                                                                                                                                                                                                                                                                                                            |
|    |                                           |    | • FEL (Lithium iron)                                                                                                                                                                                                                                                                                                                               |
| 06 | Auto restart when overload occurs         |    | • USE (User-Defined)                                                                                                                                                                                                                                                                                                                               |
|    |                                           |                                                                                     |                                                                                                                                                                                                                                                                                                                                                    |
| 06 | Auto restart when overload occurs         |    | • Default ON                                                                                                                                                                                                                                                                                                                                       |
| 07 | Auto restart when over temperature occurs |    | • Default ON                                                                                                                                                                                                                                                                                                                                       |
| 08 | Reset factory setting                     |   | • Default OFF                                                                                                                                                                                                                                                                                                                                      |
|    |                                           |  | <ul style="list-style-type: none"> <li>• ON: Resets all settings to factory defaults. Automatically returns to OFF after reset</li> <li>• The setting can be applied immediately in mains and standby modes, but can not be set in battery mode.</li> <li>• In parallel mode, settings can be adjusted when all rocker switches are OFF</li> </ul> |

## No. Description

|    |                                                |                                                                                    |                                                                                                                                                                                                                                                                                                                                           |
|----|------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 09 | Output frequency                               |   | <ul style="list-style-type: none"> <li>• Default: 50 Hz</li> <li>• Options: 50 Hz, 60 Hz</li> <li>• Configurable in standby or mains modes. When switching from mains to battery mode, the frequency changes gradually.</li> </ul>                                                                                                        |
| 10 | Output voltage                                 |   | <ul style="list-style-type: none"> <li>• Default: 230 V</li> <li>• Options: 208 V, 220 V, 230 V, 240 V</li> <li>• The setting can be applied immediately in mains and standby modes. When switching back to battery mode, the frequency changes gradually.</li> </ul>                                                                     |
| 11 | Utility charging current                       |   | <ul style="list-style-type: none"> <li>• Default: 60 A</li> <li>• Options: 2/10/20/30/40/50/60/70/80/90/100/110/120A</li> </ul>                                                                                                                                                                                                           |
| 12 | Battery return to Grid voltage setting         |   | <p>AGM/FLD Type</p> <ul style="list-style-type: none"> <li>• Range: 44–52V</li> <li>• Default: 46V</li> </ul> <p>LIB/USE Type</p> <ul style="list-style-type: none"> <li>• Range: 40–50V</li> <li>• Default: 47.6V</li> </ul> <p>FEL Type</p> <ul style="list-style-type: none"> <li>• Range: 40–50V</li> <li>• Default: 49.6V</li> </ul> |
| 13 | Switching back to battery mode voltage setting |  | <p>AGM/FLD Type</p> <ul style="list-style-type: none"> <li>• Range: 48–58V</li> <li>• Default: 52V</li> </ul> <p>LIB/USE Type</p> <ul style="list-style-type: none"> <li>• Range: 46–58V</li> <li>• Default: 54.4V</li> </ul> <p>FEL Type</p> <ul style="list-style-type: none"> <li>• Range: 46–58V</li> <li>• Default: 53.2V</li> </ul> |

## No. Description

|    |                              |                                                                                     |                                                                                                                                                                                           |
|----|------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14 | Utility low voltage setting  |    | APL/GEN Mode                                                                                                                                                                              |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Range: 90-154V</li> <li>• Default: 154V</li> </ul>                                                                                               |
| 15 | Utility high voltage setting |    | UPS Mode                                                                                                                                                                                  |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Range: 170-200V</li> <li>• Default: 185V</li> </ul>                                                                                              |
| 16 | Charge source priority       |    | APL/GEN Mode                                                                                                                                                                              |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Range: 264-280V</li> <li>• Default: 264V</li> </ul>                                                                                              |
| 16 | Charge source priority       |    | UPS Mode                                                                                                                                                                                  |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Fixed at 264V</li> </ul>                                                                                                                         |
| 16 | Charge source priority       |    | <ul style="list-style-type: none"> <li>• Solar and Utility are charged at the same time</li> </ul>                                                                                        |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Default: Only Solar charge</li> </ul>                                                                                                            |
| 17 | PV charging current          |    | <ul style="list-style-type: none"> <li>• Default: 100 A</li> <li>• Options: 2/10/20/30/40/50/60/70/80/90/100/110/120 A</li> </ul>                                                         |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Solar first; if both available, solar charge</li> </ul>                                                                                          |
| 18 | Silent mode setting          |    | <ul style="list-style-type: none"> <li>• Default: 100 A</li> <li>• Options: 2/10/20/30/40/50/60/70/80/90/100/110/120 A</li> </ul>                                                         |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Default ON: Buzzer silent in all modes.</li> <li>• OFF: Buzzer sounds for alarms or faults</li> </ul>                                            |
| 19 | Menu default                 |    | <ul style="list-style-type: none"> <li>• Default ON: Returns to the first page if no operation for 1 minute (when not on the first page)</li> <li>• OFF: Stays on current page</li> </ul> |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Default ON: Buzzer silent in all modes.</li> <li>• OFF: Buzzer sounds for alarms or faults</li> </ul>                                            |
| 20 | Automatic turn off backlight |  | <ul style="list-style-type: none"> <li>• Default ON: Returns to the first page if no operation for 1 minute (when not on the first page)</li> <li>• OFF: Stays on current page</li> </ul> |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Default ON: Backlight off after 1 min of inactivity</li> </ul>                                                                                   |
| 21 | Battery disconnection alarm  |  | <ul style="list-style-type: none"> <li>• Default ON: Returns to the first page if no operation for 1 minute (when not on the first page)</li> <li>• OFF: Stays on current page</li> </ul> |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Default OFF: No alarm</li> <li>• ON: Alarms when battery disconnected</li> </ul>                                                                 |
| 22 | Main input cut warning       |  | <ul style="list-style-type: none"> <li>• Default OFF: No alarm</li> <li>• ON: Alarms when grid or PV are connected or lost</li> </ul>                                                     |
|    |                              |                                                                                     | <ul style="list-style-type: none"> <li>• Default OFF: No alarm</li> <li>• ON: Alarms when grid or PV are connected or lost</li> </ul>                                                     |

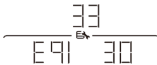
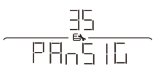
## No. Description

|    |                                       |  |                                                                                                                                                             |
|----|---------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 23 | Overload transfer to bypass           |  | <ul style="list-style-type: none"> <li>• Default OFF</li> <li>• ON: Transfers to bypass mode on overload</li> </ul>                                         |
| 24 | Alarm setting                         |  | <ul style="list-style-type: none"> <li>• Default OFF: All the alarm have no sound or light display</li> <li>• ON: Alarms active</li> </ul>                  |
| 25 | Inverter soft start setting           |  | <ul style="list-style-type: none"> <li>• Default OFF: Output jumps to target voltage</li> <li>• ON: Output gradually increases to target voltage</li> </ul> |
| 26 | Constant voltage mode voltage setting |  | AGM/FLD Type                                                                                                                                                |
|    |                                       |  | <ul style="list-style-type: none"> <li>• AGM Default: 56.4V</li> <li>• FLD Default: 58V</li> </ul>                                                          |
|    |                                       |  | Notice: Unable to adjust                                                                                                                                    |
|    |                                       |  | LIB/USE Type                                                                                                                                                |
| 27 | Floating charge mode voltage setting  |  | <ul style="list-style-type: none"> <li>• Range: 48-60V</li> <li>• Default: 56.4V</li> </ul>                                                                 |
|    |                                       |  | Notice: Must > Float Charge Voltage                                                                                                                         |
|    |                                       |  | FEL Type                                                                                                                                                    |
|    |                                       |  | <ul style="list-style-type: none"> <li>• Range: 48-60V</li> <li>• Default: 55.2V</li> </ul>                                                                 |
| 27 | Floating charge mode voltage setting  |  | Notice: Must > Float Charge Voltage                                                                                                                         |
|    |                                       |  | AGM/FLD Type                                                                                                                                                |
|    |                                       |  | <ul style="list-style-type: none"> <li>• Default: 54V</li> </ul>                                                                                            |
|    |                                       |  | Notice: Unable to adjust                                                                                                                                    |
| 27 | Floating charge mode voltage setting  |  | LIB Type                                                                                                                                                    |
|    |                                       |  | <ul style="list-style-type: none"> <li>• Range: 50-58V</li> <li>• Default: 55.2V</li> </ul>                                                                 |
|    |                                       |  | Notice: Must < Constant Voltage                                                                                                                             |
|    |                                       |  | USE Type                                                                                                                                                    |
| 27 | Floating charge mode voltage setting  |  | <ul style="list-style-type: none"> <li>• Range: 48-60V</li> <li>• Default: 55.2V</li> </ul>                                                                 |
|    |                                       |  | Notice: Must < Constant Voltage                                                                                                                             |
|    |                                       |  | FEL Type                                                                                                                                                    |
|    |                                       |  | <ul style="list-style-type: none"> <li>• Range: 50-58V</li> <li>• Default: 54.4V</li> </ul>                                                                 |
| 27 | Floating charge mode voltage setting  |  | Notice: Must < Constant Voltage                                                                                                                             |
|    |                                       |  |                                                                                                                                                             |

## No. Description

|    |                                    |                                                                                     |                                                                                                                                                                                                                                                 |
|----|------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 28 | Battery low voltage setting        |    | AGM/FLD Type<br>• Default: 44V<br>Notice: Unable to adjust<br>LIB/USE Type                                                                                                                                                                      |
|    |                                    |                                                                                     | • Range: 41.2-50V<br>• Default: 47.6V<br>FEL Type<br>• Range: 41.2-50V<br>• Default: 48V                                                                                                                                                        |
| 29 | Battery shutdown voltage point     |    | AGM/FLD Type<br>• Default: 42V<br>Notice: Unable to adjust<br>LIB/USE Type                                                                                                                                                                      |
|    |                                    |                                                                                     | • Range: 40-48V<br>• Default: 46V<br>FEL Type<br>• Range: 40-48V<br>• Default: 42V                                                                                                                                                              |
| 30 | Equalization voltage setting       |    | FEL Type<br>• Default: 58.4V<br>• Range 48-60V<br>AGM/FLD/LIB/USE Type                                                                                                                                                                          |
|    |                                    |                                                                                     | • Default: 58.4V<br>• Range 48-60V                                                                                                                                                                                                              |
| 31 | Equalization charging time setting |    | • Default: OFF<br>• Range: 5-900 min (adjust in 5-min steps)<br>• Controller charges at max current until equalization voltage, then switches to constant voltage mode for set duration.                                                        |
| 32 | Equalization delay time setting    |  | • Default: 120 minutes<br>• Range: 5-900 min (adjust in 5-min steps)<br>• Extends equalization if voltage not reached; returns to float charging if voltage is still below equalization voltage after delay<br>• The function can be set as OFF |

## No. Description

|    |                                    |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----|------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 33 | Equalization interval time setting |    | <ul style="list-style-type: none"> <li>• Default: 30 days</li> <li>• Range: 1-90 days (increment of 1 day)</li> <li>• Enters equalization phase when interval is reached</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                             |
| 34 | Enable equalization immediately    |    | <ul style="list-style-type: none"> <li>• Default: OFF</li> <li>• Activates equalization immediately when ON and battery connection is detected</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 35 | Parallel operation mode            |    | <ul style="list-style-type: none"> <li>• Default: SIG (single mode).</li> <li>• Selectable: PAR (parallel mode), 3P1 (R-phase), 3P2 (S-phase), 3P3 (T-phase).</li> <li>• For parallel operation: connect all units correctly first, then set each unit's mode. If any unit remains in SIG mode, Fault 24 triggers. If any unit is set to 3P1/3P2/3P3, all units must use one of these three modes with at least one of each present; otherwise Fault 24 triggers on all 3P-mode units.</li> <li>• Settings apply immediately in grid and standby modes; unavailable in battery mode.</li> </ul> |
| 36 | Parallel identity code             |    | <ul style="list-style-type: none"> <li>• Default: ATO (Auto).</li> <li>• Selectable: ATO, 1-9.</li> <li>• Each unit in a parallel system requires a unique ID. Set this item to assign the unit's ID. Fault 19 triggers if duplicate IDs exist in the system.</li> </ul>                                                                                                                                                                                                                                                                                                                        |
| 37 | Parallel PV only operating mode    |   | <ul style="list-style-type: none"> <li>• Default: OFF.</li> <li>• Selectable: ON/OFF.</li> <li>• When set to OFF in a parallel system without battery, PV/battery operation is disabled; grid-connected operation remains available.</li> </ul>                                                                                                                                                                                                                                                                                                                                                 |
| 40 | Photovoltaic Charging Priority     |  | <ul style="list-style-type: none"> <li>• Default: BLU (PV Priority Charging)</li> <li>• LBU (PV Priority for Load)</li> <li>• LUB (PV + Grid for Load)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                               |

## No. Description

|    |                            |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----|----------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 44 | BMS communication function |  | <ul style="list-style-type: none"> <li>Manages communication with BMS protocols</li> <li>Default OFF</li> </ul> <hr/> <p>CVT: CVTE protocol<br/>           PYL: PYLON protocol<br/>           GRO: GROWATT protocol<br/>           VOL: VOLTRONIC protocol<br/>           IRF: IRON Tower protocol<br/>           PAC: PACE protocol</p>                                                                                                                                                                                                                                                                                                                                                                                                  |
| 45 | BMS ID                     |  | <ul style="list-style-type: none"> <li>Sets ID for BMS communication.</li> <li>Default: ATO (Auto)</li> <li>Range: [0-9]/A/B/C/D/E/F/ATO/OVE.</li> <li>When system poll for the first ID with a correct response, it locks the ID and only asks the BMS with that ID</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 46 | Low SOC shutdown           |  | <ul style="list-style-type: none"> <li>Inverter shutdown when SOC falls below the set value</li> <li>Default: 20%</li> <li>Range: 5-50%</li> <li>In battery mode, if SOC reaches the set value, the inverter shuts down and triggers alarm 68, which clears when SOC returns to set value + 5%</li> <li>In standby mode, inverter switches to battery mode only when SOC reaches set value + 10%; otherwise, it triggers alarm 69</li> <li>Alarm 69 is triggered when <math>SOC \leq +5\%</math> of set value and cleared at +10% of set value</li> <li>If off, inverter ignores SOC status for shutdown/startup/alarm operations.</li> <li>Communication errors cause SOC data to be ignored and related alarms to be cleared</li> </ul> |

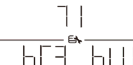
## No. Description

|    |                                |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----|--------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 47 | High SOC to Battery            |  | <ul style="list-style-type: none"> <li>Set the SOC value for the inverter to switch to battery mode</li> <li>Default: 90%</li> <li>Range 10–100%</li> <li>In SBU mode, if <math>SOC \geq</math> set value and battery voltage &gt; grid voltage, switch to battery</li> <li>Can be set to OFF to disable switching based on SOC</li> <li>If communication fails, inverter stops using SOC and clears alarms</li> </ul>                                                                                                                                                                      |
| 48 | Low SOC to Grid                |  | <ul style="list-style-type: none"> <li>Set SOC for inverter to switch to grid mode</li> <li>Default: 25%</li> <li>Range: 10–90%</li> <li>In SBU mode, if <math>SOC \leq</math> set value and battery voltage &lt; grid voltage, switch to grid mode</li> <li>Can be set to OFF to disable switching based on SOC</li> <li>If communication fails, inverter stops using SOC and clears alarms</li> </ul>                                                                                                                                                                                     |
| 49 | Battery Max. discharge current |  | <ul style="list-style-type: none"> <li>Default OFF</li> <li>Range: [10–140]/OFF</li> <li>Set the step size to 5 A. If off, the inverter limits the discharge current to 130 A for 1 min; after 1 min, an overload fault (Fault Code 14) is triggered.</li> <li>If not off, an overload warning 60 is triggered when current exceeds the limit. If it persists for 5s, the inverter enters Fault Mode (Code 14).</li> <li>When the BMS is connected and communicating successfully, if MDC is not off, the maximum discharge current is updated to the value uploaded by the BMS.</li> </ul> |

## No. Description

|    |                                                |                                                                                     |                                                                                                                                                                                                                                                                                                                                        |
|----|------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 60 | Battery dual output duration                   |    | <ul style="list-style-type: none"> <li>• Default FUL</li> <li>• Range: [5,900min]/OFF/FUL</li> <li>• When enabled, the secondary output of the inverter is enabled by default</li> <li>• In battery mode, it turns off when the discharge time reaches the set point</li> <li>• Setting to FUL allows unlimited output time</li> </ul> |
| 61 | Battery dual output low voltage shutdown point |    | <ul style="list-style-type: none"> <li>• After entering battery mode, when the battery voltage falls below the set point, the secondary output is turned off.</li> <li>• Default: 48V</li> <li>• Range: 44-60V</li> </ul>                                                                                                              |
| 62 | Dual output battery mode cut-off SOC           |    | <ul style="list-style-type: none"> <li>• After entering battery mode, when the battery voltage falls below the set point, the secondary output is turned off</li> <li>• Default: 30</li> <li>• Range: [5-90]/OFF</li> </ul>                                                                                                            |
| 63 | Battery dual output restart setting            |    | <ul style="list-style-type: none"> <li>• After entering battery mode, when the battery voltage higher than the set point, the secondary output is turned on</li> <li>• Default: 52V</li> <li>• Range: 44-60V</li> </ul>                                                                                                                |
| 64 | Dual output battery mode restart SOC           |    | <ul style="list-style-type: none"> <li>• Default: 90</li> <li>• Range: [30-100]/OFF</li> </ul>                                                                                                                                                                                                                                         |
| 65 | RGB backlight enable                           |    | <ul style="list-style-type: none"> <li>• Set to ON to enable RGB lights; set to OFF to disable.</li> <li>• Default: ON</li> </ul>                                                                                                                                                                                                      |
| 66 | RGB backlight brightness                       |   | <ul style="list-style-type: none"> <li>• Default: MI(Medium)</li> <li>• Options: LO(Low)/MI(Medium)/HI(High)</li> </ul>                                                                                                                                                                                                                |
| 67 | RGB backlight mode                             |  | <ul style="list-style-type: none"> <li>• Default: SOL(Solid)</li> <li>• Options: SOL(Solid)/PCY(Cycle)</li> </ul>                                                                                                                                                                                                                      |
| 68 | RGB backlight linked data                      |  | <ul style="list-style-type: none"> <li>• Default: BBS</li> <li>• Options: BTP (Battery Capacity) / PVW (Photovoltaic Power) / LDP (Load Power) / EGS (Energy Source) / BBS (Charge/Discharge Status)</li> </ul>                                                                                                                        |

## No. Description

|    |                       |                                                                                   |                                                                                                                                                                                    |
|----|-----------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 69 | RGB backlight color 1 |  | <ul style="list-style-type: none"> <li>• Default: WHI(White)</li> <li>• Options: WHI(White)/RED(Red)/GRE(Green)/BLU(Blue)/LBL(Light Blue)/PUR(Purple)/YEL(Yellow)</li> </ul>       |
| 70 | RGB backlight color 2 |  | <ul style="list-style-type: none"> <li>• Default: GRE(Green)</li> <li>• Options: WHI(White)/RED(Red)/GRE(Green)/BLU(Blue)/LBL(Light Blue)/PUR(Purple)/YEL(Yellow)</li> </ul>       |
| 71 | RGB backlight color 3 |  | <ul style="list-style-type: none"> <li>• Default: BLU(Blue)</li> <li>• Options: WHI(White)/RED(Red)/GRE(Green)/BLU(Blue)/LBL(Light Blue)/PUR(Purple)/YEL(Yellow)</li> </ul>        |
| 85 | Timing setting-Minute |  | <ul style="list-style-type: none"> <li>• Default: Current minutes</li> <li>• Range: 0-60 minutes</li> <li>• During first setup, it should be set according to real time</li> </ul> |
| 86 | Timing setting-Hour   |  | <ul style="list-style-type: none"> <li>• Default: Current hour</li> <li>• Range: 0-24 hour</li> <li>• During first setup, it should be set according to real time</li> </ul>       |
| 87 | Timing setting-Day    |  | <ul style="list-style-type: none"> <li>• Default: Current day</li> <li>• Range: 1-31 day</li> <li>• During first setup, it should be set according to real time</li> </ul>         |
| 88 | Timing setting-Month  |  | <ul style="list-style-type: none"> <li>• Default: Current month</li> <li>• Range: 1-12 month</li> <li>• During first setup, it should be set according to real time</li> </ul>     |
| 89 | Timing setting-Year   |  | <ul style="list-style-type: none"> <li>• Default: Current year</li> <li>• Range: 0-99</li> <li>• During first setup, it should be set according to real time</li> </ul>            |

## 6 Troubleshooting Guide

Contact the Customer Service for further assistance.

### 6.1 Fault Code

When a fault occurs, the inverter enters fault mode, with a constant red LED light and LCD displaying a fault code.

Table 6-1 Fault code sheet

| No. | Meaning                 | Trigger conditions                                                              | Resume conditions                                                               |
|-----|-------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| 1   | Bus Boost Fail          | Grid soft start process starts but bus voltage does not reach set value         | Restore after reaching the set voltage for 15 seconds                           |
| 2   | System Over Temperature | Temperature is higher than set value or fan is not connected                    | Restore after temperature lower than set value and fan connected for 15 minutes |
| 3   | Bus Short Circuit       | Bus voltage is lower than set value                                             | Cannot restore                                                                  |
| 4   | Battery Over Current    | Battery current is higher than set value                                        | Cannot restore                                                                  |
| 7   | Over Load               | The load current is higher than the set value                                   | Restore after reaching the set value for 15 seconds                             |
| 8   | Bus Over Voltage        | Bus voltage is higher than set value                                            | Restore after reaching the set voltage for 15 seconds                           |
| 9   | Bus Soft Start Fault    | Battery soft start process starts but the bus voltage has not reached set value | Restore after reaching the set voltage for 15 seconds                           |
| 10  | Battery Over Voltage    | Battery voltage is higher than set value                                        | Restore after reaching the set voltage for 15 seconds                           |
| 12  | Invert Short            | The inverter voltage is lower than the set value in battery mode                | Restore after reaching the set voltage for 15 minutes                           |
| 13  | Invert Negative Power   | Inverter power negative and exceeds set value for a period of time              | 15-second recovery                                                              |
| 17  | Program updating        | Inverter updating or OTA                                                        | Restore after updating                                                          |
| 18  | Panel Reverse           | PV reverse connection                                                           | Restore after connecting correctly for 15 seconds                               |
| 19  | Parallel Same ID        | Same parallel ID in system                                                      | Restore when there is no identical ID.                                          |

| No. | Meaning                        | Trigger conditions                                                                                                                                                                              | Resume conditions                                                                                                             |
|-----|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 20  | Parallel Communication Fault   | When communication abnormalities occur, the number of parallel devices decrease to 1                                                                                                            | Restore after re-establishing parallel mode or adjusting to single machine mode                                               |
| 21  | Parallel Battery Differ        | In parallel mode, the battery voltage difference between different machines is too large                                                                                                        | Restore after the battery voltage of each inverter under parallel operation is consistent                                     |
| 22  | Parallel Grid Voltage Differ   | In parallel mode, the input voltage difference between different machines is too large                                                                                                          | Restore after the grid voltage of each inverter under parallel operation is consistent                                        |
| 23  | Parallel Grid Frequency Differ | In parallel mode, the input frequency difference between different machines is too large                                                                                                        | Restore after the grid frequency of each inverter under parallel operation is consistent                                      |
| 24  | Parallel Configuration Differ  | In three-phase parallel mode, different machine parallel mode settings may have phase loss, or both three-phase and single-phase parallel modes may exist, or there may be single machine mode. | Restore after set to single machine operation and disconnect parallel communication, or parallel operation condition recover. |
| 25  | Parallel Sync Loss             | In parallel mode, the output voltage detection loses synchronization.                                                                                                                           | Cannot restore in parallel mode or restore after change to single mode.                                                       |
| 26  | BMS Fault                      | Error code in BMS                                                                                                                                                                               | Restore after BMS fault resolved                                                                                              |
| 29  | Invert Load Abnormal           | Inverter load abnormal causing voltage abnormal                                                                                                                                                 | 15-second recovery                                                                                                            |
| 52  | Bus Below Voltage              | Bus voltage is lower than set value                                                                                                                                                             | Cannot restore                                                                                                                |
| 53  | Invert Softstart Fail          | Inverter soft start fails to reach rated output voltage after specified time                                                                                                                    | 15-second recovery                                                                                                            |
| 58  | Invert Under Voltage           | The inverter voltage is lower than the set value in battery mode                                                                                                                                | 15-second recovery                                                                                                            |

## 6.2 Alarm Reference Code

Inverter not in fault mode; red LED flashing, LCD displays alarm code

Table 6-2 Alarm code sheet

| No. | Meaning                       | Relevant action                                                                 | Trigger conditions                                                              | Resume conditions                                                      |
|-----|-------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------|
| 1   | Fan Lock                      | Alarm, fan operation in full speed                                              | No fan speed signal detected                                                    | Restore after fan speed signal detected                                |
| 4   | Battery Below Voltage         | Alarm                                                                           | Battery voltage is lower than BAL set value                                     | Restore after the battery voltage exceeding the BAL set value by 2V    |
| 50  | Battery open                  | Alarm                                                                           | Battery disconnected for no more than 10 minutes                                | Charging after connecting the battery 2 min                            |
| 51  | Battery Under Voltage         | Alarm, battery low voltage shutdown or cannot power on                          | Battery voltage is lower than BAU set value                                     | Restore after the battery voltage exceeding 52V                        |
| 53  | Battery Charge Short          | Alarm, battery does not charge/discharge                                        | Single battery cell voltage < 6 V with charging current present                 | Can not restore                                                        |
| 56  | BMS loss                      | Alarm                                                                           | Communication failure after BMS communication function is enable                | Restore after communication function disabled or communication success |
| 59  | EEPROM                        | Alarm                                                                           | EEPROM read/write exception                                                     | Cannot restore                                                         |
| 60  | Over load                     | Alarm                                                                           | The output current > 40A                                                        | Restore after output current < 38A                                     |
| 62  | PV energy weak                | Alarm, Turn off the PV output to the load, but keep the PV charging the battery | In only PV mode, PV power is less than load demand.                             | Restore after 10 minutes                                               |
| 64  | Parallel Configuration Differ | Alarm, turn to standby mode                                                     | In standby mode, there is an incompatible mode setting while parallel operation | Restore after setting the parallel operation mode correctly            |

| No. | Meaning                 | Relevant action                                                  | Trigger conditions                                                                                                  | Resume conditions                                                                                                                    |
|-----|-------------------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 68  | Battery under SOC       | Alarm, turn to standby mode                                      | BMS reports SOC lower than BSU set value                                                                            | 1. Turn off the low SOC shutdown function<br>2. Turn off the BMS communication function<br>3. Restore the SOC to the set value + 5%. |
| 69  | Battery below SOC       | Alarm, if it is in standby mode, it will remain in standby mode. | Lithium battery SOC is lower than set value+5% (grid mode or battery mode), lower than set value+10% (standby mode) | 1. Disable low SOC shutdown function<br>2. Disable BMS communication function<br>3. SOC restored to set value + 10%.                 |
| 72  | Battery can not startup | Alarm                                                            | During standby, battery voltage is lower than the allowed startup voltage                                           | Restore after the battery voltage is higher than the allowed startup voltage                                                         |
| 77  | Unstable Grid Power     | Alarm                                                            | Lost of grid power three times within 5 minutes                                                                     | Restore after 5 mins                                                                                                                 |

## 7 Battery Equalization

Equalization function is added into charge controller. It reverses the buildup of negative chemical effects like stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Equalization also helps to remove sulfate crystals that might have built up on the plates. If left unchecked, this condition, called sulfation, will reduce the overall capacity of the battery. Therefore, it's recommended to equalize battery periodically.



### NOTICE

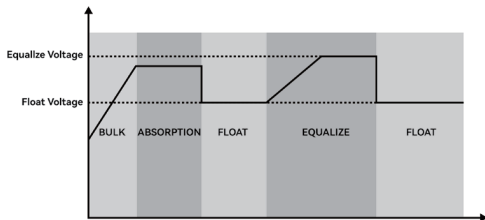
- Do not activate this mode when using lithium batteries.

### How to Apply Equalization Function

- 1 Set balance voltage point on “Program 30”.
- 2 Set balance charging time on “Program 31”.
- 3 Set balance delay time on “Program 32”.
- 4 Set balance interval time on “Program 33”.
- 5 Set immediate balance mode activation on “Program 34”.

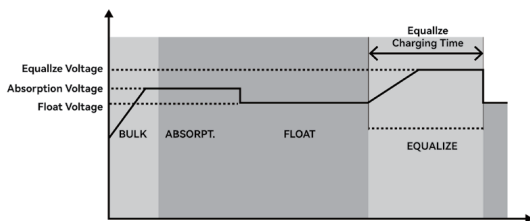
### When to Equalize

In float stage, when the setting equalization interval (battery equalization cycle) is arrived, or equalization is active immediately, the controller will start to enter Equalize stage.

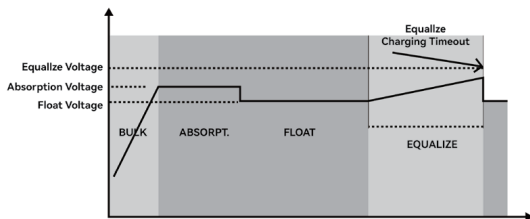


### Equalize charging time and timeout

In Equalize stage, the controller will supply power to charge battery as much as possible until battery voltage raises to battery equalization voltage. Then, constant-voltage regulation is applied to maintain battery voltage at the battery equalization voltage. The battery remain in the Equalize stage until setting battery zed time is arrived.



However, in Equalize stage, when battery equalized time is expired and battery voltage does not rise to battery equalization: voltage point, the charge controller will extend the battery equalized time until battery voltage achieves battery equalization voltage. If battery voltage is still lower than battery equalization voltage when battery equalized timeout setting is over, the charge controller will stop equalization and return to float stage.



## 8 Specifications

### • PV INPUT

| Model                              | 5kW Inverter | 6.5kW Inverter |
|------------------------------------|--------------|----------------|
| Max. PV Power                      | 9000 W       |                |
| Max. PV Array Open Circuit Voltage | 500 Vdc      |                |
| MPPT Range @ Operating Voltage     | 60–450 Vdc   |                |
| Number of MPP Tracker              | 1            |                |

### • AC OUTPUT

| Model                                 | 5kW Inverter                              | 6.5kW Inverter |
|---------------------------------------|-------------------------------------------|----------------|
| Nominal Output Voltage                | 230 Vac                                   |                |
| AC Voltage Range                      | 195–253 Vac                               |                |
| AC Frequency Range                    | 49–51 Hz $\pm$ 0.1% / 59–61 Hz $\pm$ 0.1% |                |
| Nominal Output Current                | 21.7 A                                    | 28.3 A         |
| Power Factor Range                    | > 0.99                                    |                |
| Maximum Conversion Efficiency (DC/AC) | 96.9%                                     |                |

### • GRID INPUT

| Model                          | 5kW Inverter                                   | 6.5kW Inverter |
|--------------------------------|------------------------------------------------|----------------|
| Acceptable Input Voltage Range | 170–280 (UPS mode):<br>90–280 (Appliance mode) |                |
| Frequency Range                | 50–60 Hz (auto sensing)                        |                |
| Rating of AC Transfer Relay    | 40 A                                           |                |

### • BATTERY MODE OUTPUT

| Model                                 | 5kW Inverter   | 6.5kW Inverter |
|---------------------------------------|----------------|----------------|
| Nominal Output Voltage                | 230 Vac        |                |
| Output Waveform                       | Pure Sine Wave |                |
| Maximum Conversion Efficiency (DC/AC) | 94.0%          |                |

### • BATTERY & CHARGER

| Model                                | 5kW Inverter | 6.5kW Inverter |
|--------------------------------------|--------------|----------------|
| Nominal DC Voltage                   | 48 Vdc       |                |
| Maximum Charging Current (from Grid) | 100 A        | 120 A          |
| Maximum Charging Current (from PV)   | 100 A        | 120 A          |
| Maximum Charging Current             | 100 A        | 120 A          |

### • GENERAL

| Model      | 5kW Inverter                                                       | 6.5kW Inverter |
|------------|--------------------------------------------------------------------|----------------|
| Dimension  | (338 mm $\times$ 124 mm $\times$ 513 mm) (W $\times$ D $\times$ H) |                |
| Net Weight | 12 kg                                                              |                |

- INTERFACE

| Model         | 5kW Inverter      | 6.5kW Inverter |
|---------------|-------------------|----------------|
| Communication | RS485 / USB / CAN |                |

- ENVIRONMENT

| Model                 | 5kW Inverter           | 6.5kW Inverter |
|-----------------------|------------------------|----------------|
| Humidity              | 5–95% (Non-condensing) |                |
| Operating Temperature | –10 °C to 60 °C        |                |

### 9.1 Filter Cotton Cleaning



#### CAUTION!

- Before cleaning the filter cotton, please refer to “5.2 Power OFF” to power off the inverter.

**Step 1:** Remove the screws from the vents and store them properly.

**Step 2:** Remove the filter cotton and clean it.

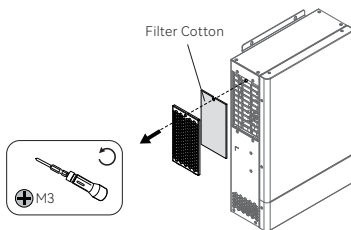


Figure 9-1 Remove the filter cotton

**Step 3:** Install the cleaned filter cotton and vent back onto the inverter, tighten the screw.

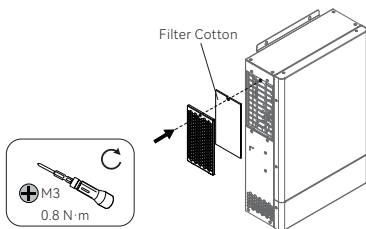


Figure 9-2 Install the cleaned filter cotton



#### NOTICE

- Make sure the filter cotton is dry when installing it. Otherwise, water may enter the inverter, which may damage the inverter.

## 9.2 Parallel Installation Guide (Only for parallel model)

The inverter can be used in parallel with two different operation modes.

1. Parallel operation in single phase with up to 9 units.
2. Maximum 9 units work together to support 3-phase operation, and up to 7 units can be configured for one phase of the three-phase system. In a 3-phase system, it is required that at least 1 inverter is working properly for each phase.

Check the installation instructions from above sections. Be sure to save enough clearance between every 2 inverters. For AC/DC breaker/disconnector, please check the recommended size from corresponding section and how many units of inverter mounted, then selected proper model of breaker/disconnector.



### WARNING!

- The grid cable of parallel inverters in same phase shall ensure that the material, cross-sectional area and length of conductor are consistent.
- The output cable of parallel inverters in same phase shall ensure that the material, cross-sectional area and length of conductor are consistent.



### WARNING!

- Parallel system can operate without battery and grid, but AC output will derate.
- If parallel system contains battery, all inverters must be connected to the same batteries.
- It is recommended to connect the battery interfaces of all inverters to the same copper bar, and then connect the batteries to the copper bar.
- If cable are used to connect the inverters to the battery, the cable shall be consistent in material, conductor cross-sectional area and conductor length.



### WARNING!

- Do not connect the same PV string to multiple inverters, as this may cause damage to the inverters. Each inverter is separately connected to PV.



### CAUTION!

- To avoid overload, it is best to run the whole system properly before closing the circuit breaker on the load side.
- When parallel function is enabled, system can not operate in Energy-saving mode / Inverter soft start function.
- In parallel system, the leakage current specification of the AC input breaker should be selected as 300mA.

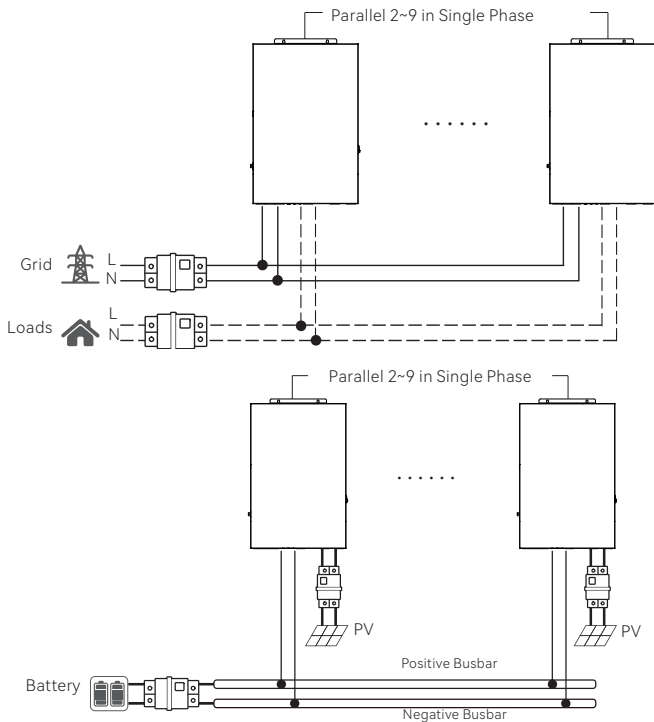


## CAUTION!

- If inverters' AC OUT2 are used during parallel operation, they will be connected independently from AC OUT1, but with the same wiring method, supplying power to different loads separately.

### 9.2.1 Parallel Cable Connection in Single Phase

2~9 inverters in parallel system connection:



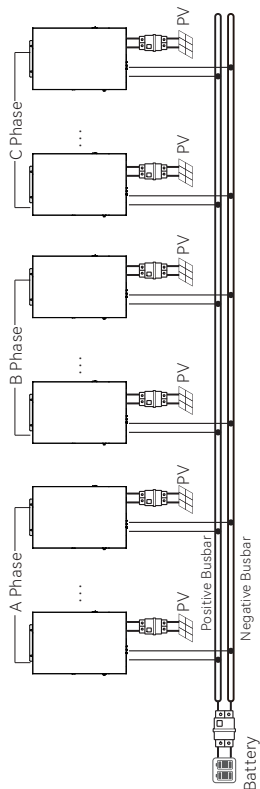
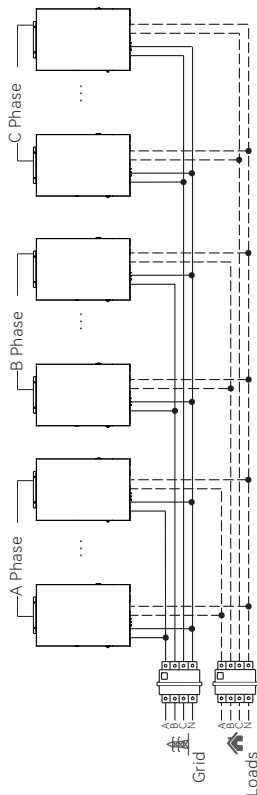
## 9.2.2 Parallel Cable Connection in Three Phase

In parallel system, at least 1 inverter that is working properly must be maintained for each phase.

Example 1: phase A-3 inverters, phase B-3 inverters, phase C-3 inverters.

Example 2: phase A-1 inverters, phase B-1 inverters, phase C-7 inverters.

**3~9 inverters in parallel system connection:**



### 9.2.3 Communication Cable for Parallel

The connection of parallel communication cables does not require consideration of which phase the inverter is in, nor does it differentiate in order.

The communication cable can be inserted into any parallel communication interface of the inverter.

It is necessary to ensure a circular connection of the communication cable.

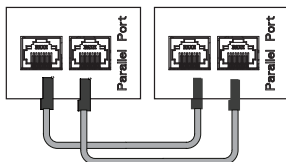


#### **WARNING!**

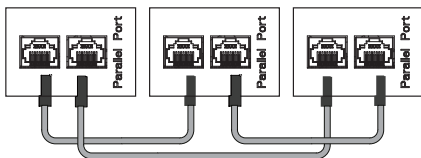
- The parallel communication cable needs to be arranged separately from the power line to avoid interference with communication. It is recommended to have a spacing of at least 5cm.

When there are a large number of inverters in parallel system, it is recommended to connect the inverter communication cable every other inverter, so as to use the standard cables in the accessories to complete it, without the need for a long cable from the end inverter to the beginning inverter.

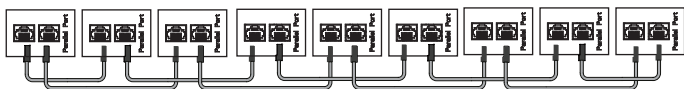
Communication connection for 2 inverters in parallel system:



Communication connection for 3 inverters in parallel system:



Communication connection for 9 inverters in parallel system:

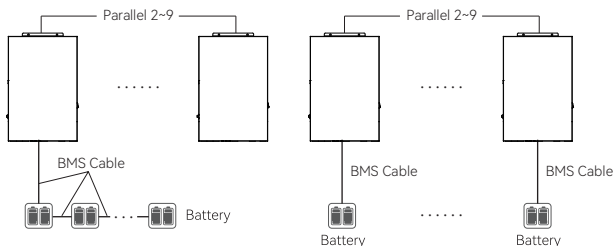


## 9.2.4 BMS Cable for Parallel

There are two ways to connect BMS and inverters:

1. All battery BMS are interconnected and then connected to only one inverter.
2. If the number of inverters is the same as the number of batteries, each BMS can be separately connected to one inverter.

Attention: All battery power cables must be connected in parallel. If the number of inverters does not match the number of batteries, connection (1) must be used.



## 9.2.5 System Setting for Parallel

To configure system settings, first set the Parallel mode in [“5.3.3 Advanced Function”](#).

### Single-phase setting

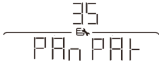
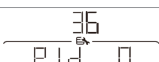
- Step 1:** Before setting, please check if the wiring is correct. Ensure that all circuit breakers (PV, AC input, AC output battery breaker) are disconnected and that each neutral line of the inverter is connected together.
- Step 2:** Switch "ON/OFF" switch to OFF and make sure all inverters switched to OFF. Connect battery breaker to power the inverters.
- Step 3:** If there is grid in parallel system, skip directly to step 4.  
If there is no grid in parallel system, switch 'ON/OFF' switch to ON on inverter, wait until the LCD display is on. Then switch 'ON/OFF' switch to OFF and LCD display will last for a while.
- Step 4:** Set "PAR" in program 35 on the LCD.
- Step 5:** Follow step 3&4 to set all the parallel inverter.
- Step 6:** Switch 'ON/OFF' switch to ON on inverter, then connect all the breakers.

Note:

1. When setting the LCD program, the ON/OFF switch must be OFF. Otherwise, it cannot be

set up.

- The primary and slave devices are generated by competition within the system.
- After parallel setting, when the parameters of one inverter (unrelated to parallel operation) are changed, other inverters will automatically synchronize the parameters.

|                                                                                   |                                                                                                                         |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|  | The default setting for the inverter is SIG: single machine mode.                                                       |
|  | The default setting for the inverter is PAR: single-phase parallel mode                                                 |
|  | PID: Parallel identity code.<br>The default setting is ATO (auto mode), system will automatically assign a parallel ID. |
|  | Parallel identity code can be set to 0-8, the same identical ID cannot be set for two inverters.                        |

### Three-phase setting

Follow the steps of Single phase setting. Most of the steps are the same except 2 points: The first difference is when set in Program 3, it should be **3P1** for first phase, **3P2** for second phase and **3P3** for third phase.

The second difference is to verify whether the three-phase input has the correct phase sequence.

The inverter needs to be set to UPS mode. If the screen displays that the power grid cannot be connected to the system, the AC phase sequence of the system input needs to be adjusted. After the power grid is connected normally, the APP or UPS mode can be set according to actual needs.

### 9.2.6 Wifi connection in parallel system

There are two ways to install WIFI:

- (1) Only install a WIFI stick on any one inverter, and the entire parallel system will upload data through this WIFI stick.
- (2) Install WIFI sticks on each inverter, and each inverter will upload its own data through its own WIFI stick.



#### CAUTION!

- When installing WIFI sticks on more than 1 inverters, other inverters without WIFI sticks cannot upload data.

