# Inverter User Manual

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# 1.Information on this Manual

## 1.1 Validity

This manual is valid for the following devices:

- Solar inverter

## 1.2 Scope

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

## 1.3 Target Group

This document is intended for qualified persons and end users. Tasks that do not require any particular qualification can also be performed by 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

## 1.4 Label Description

In order to ensure the user's personal safety when using this product, the inverter and manual provides relevant identification information and uses appropriate symbols to alert the user, who should carefully read the following list of symbols used in this manual.

Labels on Inverter

| | |
|---|---|
|  | CAUTION<br>Do not disconnect under load! |
|  | Danger: High Voltage!<br>Danger: Electrical Hazard! |
|   | Start maintaining the INVERTER at least 5 minutes after the INVERTER disconnected from all external power supplies. |
|  | Read instructions carefully before performing any operation on the INVERTER. |
|  | Grounding: The system must be firmly grounded for operator safety. |

Labels in the documentation

| | |
|---|---|
| ⚠ WARNING! | A high level of potential danger, which, if not avoided, could result in death or serious injury to personnel. |
| ⚠ CAUTION! | A moderate or low level of potential danger, which, if not avoided, could result in moderate or minor injuries to personnel. In some bad situation, it could result in death or serious injury to personnel. |

## 1.5 Safety Instructions



**WARNING!**

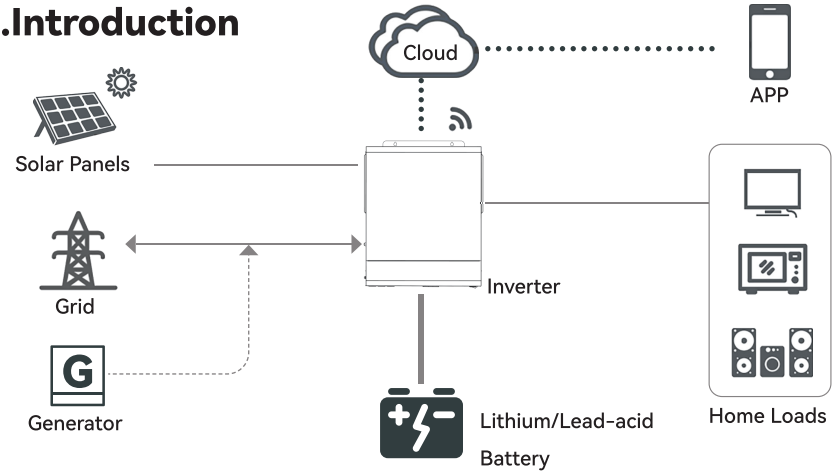
**This chapter contains important safety and operating instructions.**

**Read and keep this manual for future reference.**

01. 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't work normally.
02. Before using the unit, read all instructions and cautionary marking on the unit, the batteries 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.
03. All the operation and connection please professional electrical or mechanical engineer.
04. All the electrical installation must comply with the local electrical safety standards.
05. 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.
06. CAUTION – 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.
07. Do not disassemble the unit. 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.
08. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning.Turning off the unit will not reduce this risk.
09. NEVER charge a frozen battery.
10. For optimum operation of this inverter, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter.

11. 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.
12. 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.
13. 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.
14. NEVER cause AC output and DC input short circuited. Do NOT connect to the grid when DC input short circuits.
15. Make sure the inverter is completely assembled, before the operation.

# 2.Introduction




**Solar Energy Storage System**

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

The whole system also need other devices to achieve complete running such as PV modules, generator, or utility grid. Please consult with your system integrator for other possible system architectures depending on your requirements. The WiFi module is built-in or plug-and-play monitoring device to be installed on the inverter. With this device, users can monitor the status of the PV system from the mobile phone or from the website anytime anywhere.

# 3. Installation

## 3.1 Unpacking and Inspection

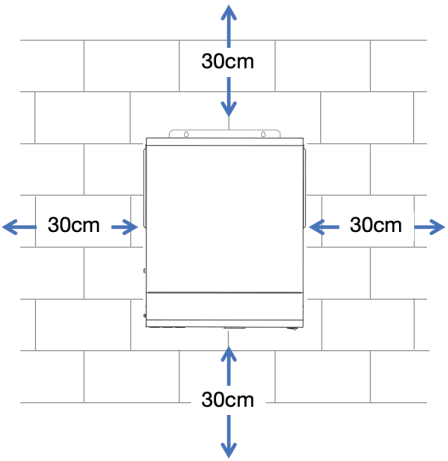
### 3.1.1 Open-box Inspection

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.

### 3.1.2 Installation Tools

| | | | |
|---|---|---|---|
| Installation Tools | Multi-meter  | Protective gloves  | Insulated anti-smashing shoes  |
| | Safety glasses  | ESD wrist strap  | Hammer drill  |
| | Electric screwdriver  | Cross screwdriver  | Rubber mallet  |
| | Spirit level  | Wire cutter / stripper  | Terminal crimping tool  |

## 3.2 Mounting Unit



Consider the following points before selecting where to install:

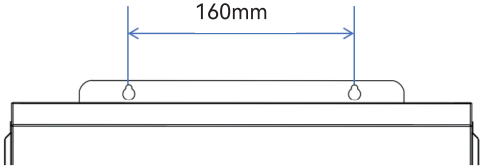
- Do not mount the inverter on flammable construction materials.
- Mount on a solid surface.
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- The ambient temperature should be between -10°C and 60°C to ensure optimal operation.
- The recommended installation 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 heat dissipation and to have enough space for removing wires.

**WARNING!**

**Inverter is suitable for mounting on concrete or other non-combustible surface only.**

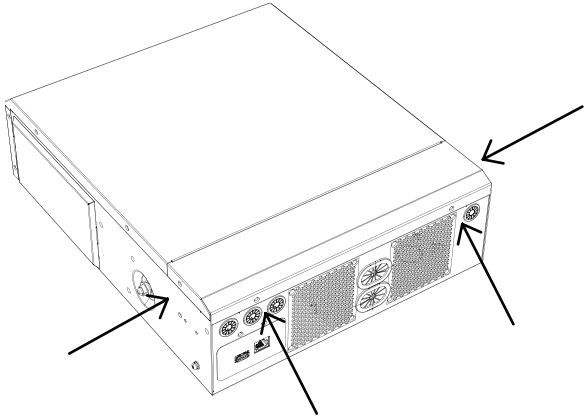
Follow the installation steps:

1. Use ϕ8 drilling bit drill holes on the mounting surface. The distance between 2 holes is 160mm. Then insert the expansion screw tube. M6 expansion screw is suggested.




2. Pick up the inverter vertically and align the screws' holes at the top of the inverter with the expansion screw tube already installed on the wall. Fix the inverter on the mounting surface by screws.

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



## 3.3 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. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input. The recommended spec of AC breaker is 40A.



CAUTION!

There are three terminal blocks with 'AC IN', 'AC OUT1', 'AC OUT2'(optional) markings. Please do NOT mis-connect input and output connectors.



CAUTION!

Be sure to connect AC cables with correct polarity. If L and N wires are connected reversely, it may cause damage to the inverter.
The N wires of input and output must not be connected together, as this may cause damage to the inverter in some condition.



WARNING!

All wiring must be performed by a qualified personnel.



WARNING!

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

Suggestion for AC input wires

| Gauge | Cable ($mm^2$) |
|---|---|
| 10 AWG | 5.26 |



WARNING!

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

Suggestion for AC output wires

| Gauge | Cable (mm²) |
|---|---|
| 12 AWG | 4 |

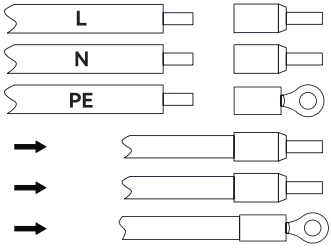
**WARNING!**

Make sure AC power is disconnected before attempting to connect AC power to the unit.

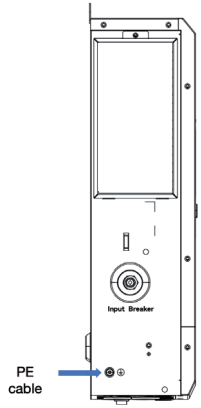
All operations during the electrical connection process, as well as the specifications of cables and components used, must comply with local laws and regulations. The cable color mentioned below is for typical reference.

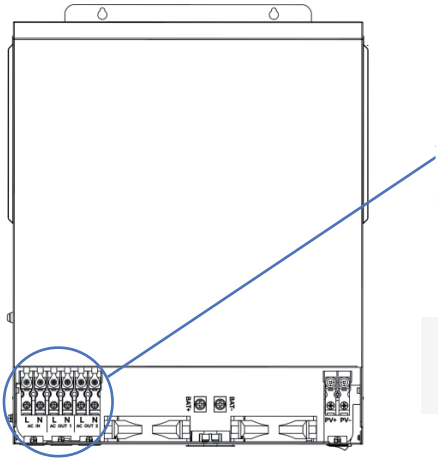
Please follow below steps to implement AC input (AC IN) connection:

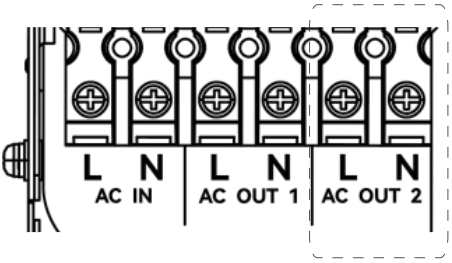
1. Before making AC connection, be sure to switch off AC circuit breaker first.
2. Remove insulation sleeve 12mm from the head of cables, shorten the conductor part to 10mm. Insert the cable into the tubular terminal. Then use terminal crimping tool make the terminal and cable connected tightly.




3. Insert AC input cables according to polarities indicated on terminal blocks and tighten the terminal screws. Be sure to connect PE protective cable on the inverter side first.
   PE → Protective Earth (yellow-green)
   L → LINE (brown or black)
   N → Neutral (blue)





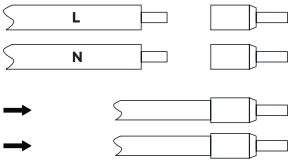



Some model don't have AC OUT 2 output, please refer to the datasheet for specification.

4. Make sure the cables are securely connected.

To implement AC output connection:

Follow the steps as AC input connection of L (LINE) and N (Neutral) cables.




**CAUTION!**

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 with manufacturer of air conditioner that if it's equipped with time-delay function before installation. Otherwise, this solar inverter will trig overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

## 3.4 PV Connection

**CAUTION!**
Before connecting to PV modules, please install a separate DC circuit breaker between inverter and PV modules.

**WARNING!**
Do not ground the positive or negative terminals of the PV modules, as this can severely damage the inverter.

**WARNING!**
Exposure to sunlight can generate lethal high voltages in photovoltaic strings, so strictly adhere to the safety precautions listed in the photovoltaic string and related documents.

**WARNING!**
Make sure to connect the PV terminals to the corresponding ports on the inverter, as reversing the polarity can damage the inverter.

**WARNING!**
All wiring must be performed by a qualified personnel.

**WARNING!**
It's very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size as below. The cable color mentioned below is for typical reference.

| Gauge | Cable ($mm^2$) |
|---|---|
| 10AWG | 5.26 |

PV Module Selection:

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

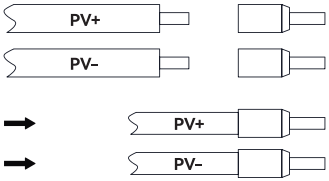
1. Open circuit Voltage (Voc) of PV modules not exceeds max. PV array open circuit voltage of inverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than start-up voltage.

| | |
|---|---|
| Max. PV Array Open Circuit Voltage | 500Vdc |
| Start-up Voltage | 80Vdc |
| PV Array MPPT Voltage Range | 60Vdc~450Vdc |

WARNING!
Please do not connect any DC switches or AC/DC circuit breakers before completing the electrical connections.

Please follow below steps to implement PV module connection:

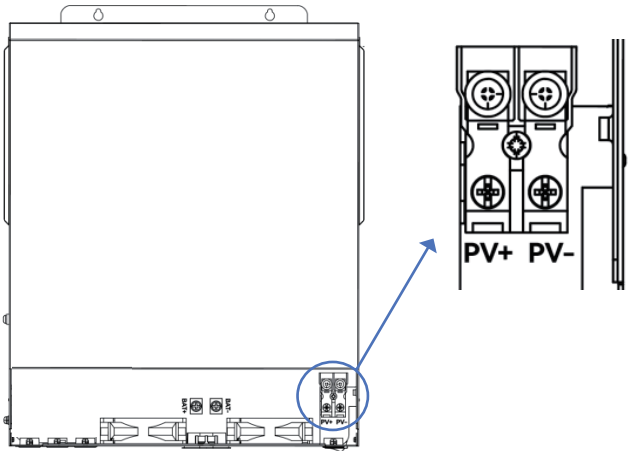
1. Before making PV connection, be sure to switch off DC circuit breaker first.
2. Remove insulation sleeve 12mm from the head of cables, shorten the conductor part to 10 mm. Insert the cable into the tubular terminal. Then use terminal crimping tool make the terminal and cable connected tightly




3. Use multi-meter check to ensure the polarities are correct.
4. Insert PV cables according to polarities indicated on terminal block and tighten the terminal screws.

+ → PV+ (red)

- → PV- (black)




5. Make sure the cables are securely connected.

## 3.5 Battery Connection

### 3.5.1 Lead-acid Battery Connection

User can choose proper capacity lead acid battery with a nominal voltage at 24V. Also you need to choose battery type as 'AGM or FLD(flooded)'.



CAUTION!

For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnect device between battery and inverter. It may not be requested to have a disconnect device in some applications, however, it's still requested to have over-current protection installed. The recommended size of protector or disconnect is 250A.



WARNING!

All wiring must be performed by a qualified person.



WARNING!

It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable and terminal size as below. The cable color mentioned below is for typical reference.



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.The cable color mentioned below is for typical reference.

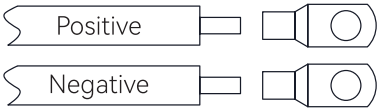
Recommended battery cable and terminal size:

| Gauge | Cable ($mm^2$) |
|---|---|
| 1 AWG | 42 |

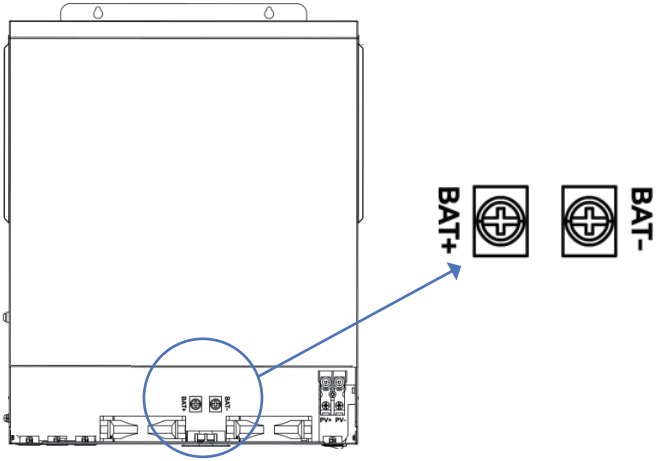
Note: For lead acid battery, the recommended charge current is 0.3C (C≤battery capacity)

Please follow below steps to implement battery connection:

1. Unscrew the pre-fixed screws on battery poles. Prepare 2 DT terminals (It should fit for AWG1 cables).
2. Remove insulation sleeve 12mm from the head of cables, shorten the conductor part to 10 mm. Insert the cable into the DT terminal. Then use terminal crimping tool make the terminal and cable connected tightly.




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




4. Connect all battery packs as units requires. It's suggested to connect at least 200Ah capacity battery.

**WARNING! Shock Hazard**
Installation must be performed with care due to high battery voltage in series.

CAUTION!

Do not place anything between the flat part of the inverter terminal and the DT terminal. Otherwise, overheating may occur.

CAUTION!

Do not apply anti-oxidant substance on the terminals before terminals are connected tightly.

CAUTION!

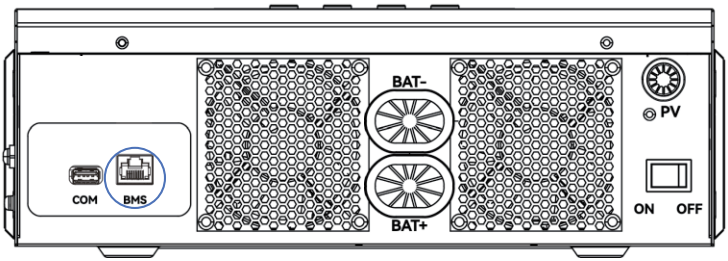
Before making the final DC connection or closing DC breaker/disconnector, be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).

### 3.5.2 Lithium Battery Connection

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

Please follow below steps to implement lithium battery connection:

1. Follow section 3.5.1 to implement the power cable connection.
2. Connect RJ45 terminal of battery communication cable to BMS communication port of inverter. The communication protocol should be RS485 or CAN.




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

Note: If choosing lithium battery, make sure to connect the BMS communication cable between the battery and the inverter.

Lithium battery communication and setting:

In order to communicate with battery BMS, you should set the battery type to 'LIT' or 'FEL' in Section 4.2.2 Program 17.

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

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

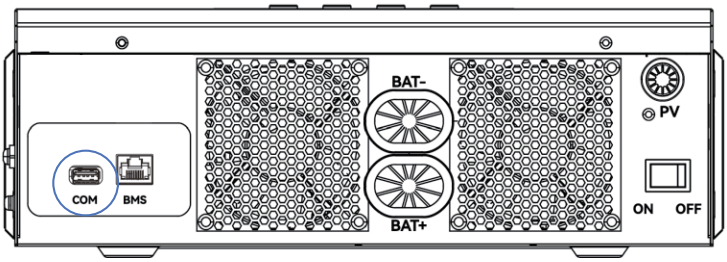
## 3.6 Final Assembly

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

## 3.7 Smart Communication Stick Connection(Optional)

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

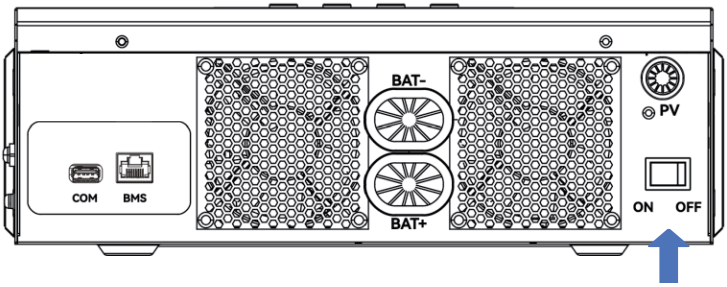
Some models support built-in WIFI monitoring function, please check the solar APP quick configuration guide.




# 4. Operation

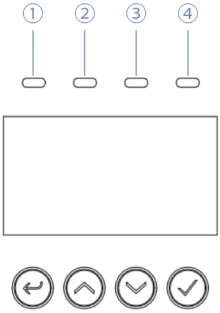
## 4.1 Power ON/OFF

Once the unit has been properly installed and the batteries are connected well, simply press ON/OFF switch (located on the button of the case) to turn on the unit.

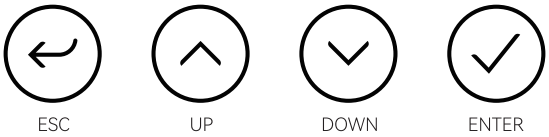



## 4.2 Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes four indicators, four function keys and a LCD display, indicating the operating status and input/output power information.



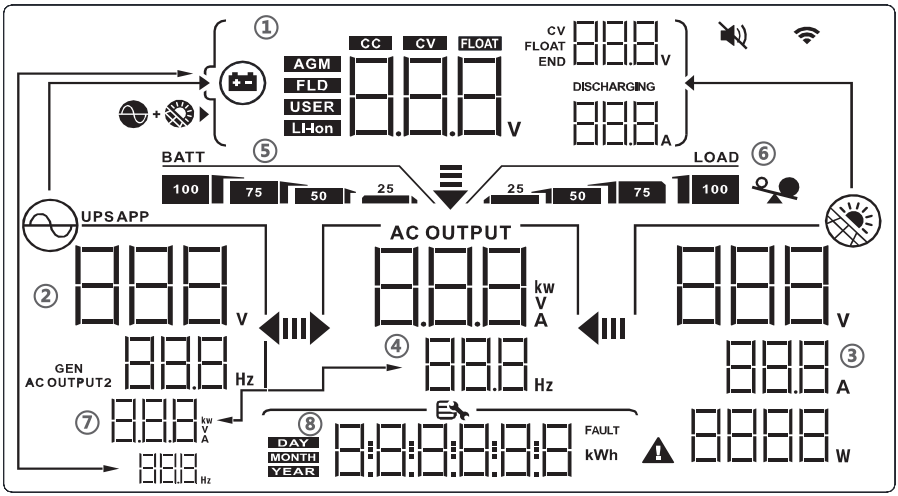
| LED Indicator | | | Messages |
|---|---|---|---|
| ① AC | Status indicator (Green) | Solid On | The grid power is normal and enters the grid power operation. |
| | | Flashing | The grid power is normal, but it has not entered grid power operation. |
| | | Off | The grid power is abnormal. |
| ② Inverter | Invert indicator (Yellow) | Solid On | Output is powered by battery or PV in battery mode. |
| | | Off | Other states. |
| ③ Charging | Charging indicator (Yellow) | Solid On | The battery is in float charging. |
| | | Flashing | The battery is in constant voltage/constant current charging. |
| | | Off | Other states. |
| ④ Fault | Fault indicator (Red) | Solid On | Fault occurs in the inverter. |
| | | Flashing | Warning condition occurs in the inverter. |
| | | Off | The inverter is working properly. |

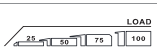



Function Buttons

| Button | Description |
|---|---|
| ESC | To exit setting mode |
| UP | To go to previous selection |
| DOWN | To go to next selection |
| ENTER | To confirm the selection in setting mode or enter setting mode |

### 4.2.1 LCD Display Icons



| Display area | Icon | Description |
|---|---|---|
| ①Battery 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 FLOAT icon is illuminated.<br>During the discharge state, the end discharge voltage is displayed and the END icon is illuminated. |
| |  | Battery charging/discharging current |
| ②AC Input Information |  | AC input icon |
| |  | UPS or APP input mode<br>When set to GEN input, it displays as APP |
| |  | AC input voltage and frequency |
| ③PV Input Information |  | PV input icon |
| |  | Indicate PV power, PV voltage, PV current, etc. |
| ④Output Information |  | Indicate output voltage(V), apparent power (VA or kVA), output active power (W or kW) alternately, switching every five seconds<br>Indicate output frequency |
| ⑤Battery Capacity |  | Indicate battery capacity |
| ⑥Load Capacity |  | Indicate load capacity |
| |  | Over load icon |
| ⑦AC OUTPUT2 information |  | Second AC output icon |
| |  | Indicate AC output 2 voltage(V) |
| ⑧Parameter Query, Function Setting or Fault/Alarm Information |  | Indicate system infomation; Function setting; Indicate Fault/Alarm |

| | | |
|---|---|---|
| Other Information |  | Mute |
| |  | Wifi connected |
| |  | If PV + Grid, the left and right icon light at same time; if only PV, the right icon is only light |
| |  | If PV first, the left and right icon light at same time. |

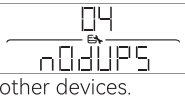
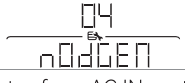
For Lead-acid battery, detailed description of battery icon as following:

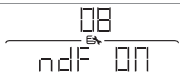
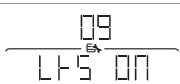
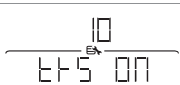
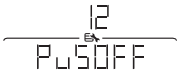
| In battery mode, battery icon will present Battery Capacity | | |
|---|---|---|
| Load Percentage | Battery Voltage | Display |
| Load >50% | < 22.292V |  |
| | 22.292 ~ 23.37V |  |
| | 23.37 ~ 24.448V |  |
| | > 24.448V |  |
| 50%> Load > 20% | < 23.59V |  |
| | 23.59 ~ 24.668V |  |
| | 24.668 ~ 25.746V |  |
| | > 25.746V |  |
| Load < 20% | < 24.24V |  |
| | 24.24 ~ 25.318V |  |
| | 25.318 ~ 26.395V |  |
| | > 26.395V |  |

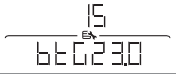
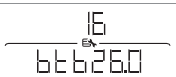
### 4.2.2 LCD Setting

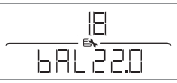
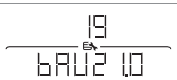
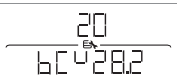
After pressing and holding ENTER button for 2 seconds, the unit will enter setting mode. Press 'UP' or 'DOWN' button to select setting programs. Then press 'ENTER' button to confirm the selection or ESC button to exit.

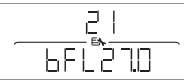
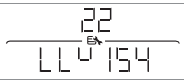
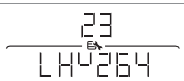
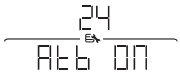
<table>
<tr><th>Program</th><th>Description</th><th colspan="2">Setting Option</th></tr>
<tr><td rowspan="2">01</td><td rowspan="2">Output voltage</td><td colspan="2"></td></tr>
<tr><td colspan="2">230V (default)<br>Adjustable/settable value: 208V, 220V, 230V, 240V</td></tr>
<tr><td rowspan="2">02</td><td rowspan="2">Output frequency</td><td colspan="2"></td></tr>
<tr><td colspan="2">50Hz(default)<br>Adjustable/settable frequency: 50Hz, 60Hz</td></tr>
<tr><td rowspan="5">03</td><td rowspan="5">Output source priority</td><td>Grid first (default)</td><td></td></tr>
<tr><td colspan="2">Grid provides power to the loads as first priority.<br>Solar power will charge the battery.<br>If solar is not sufficient to charge battery, grid will charge the battery at the same time.<br>If grid is absent and solar is sufficient, solar will power the loads.<br>If grid is absent and solar is not sufficient, solar and battery will power the loads.<br>If grid is absent, solar and battery are not sufficient to power loads at the same time, inverter will go to standby and charge battery.</td></tr>
<tr><td>Solar first</td><td></td></tr>
<tr><td colspan="2">Solar energy provides power to the loads as first priority.<br>If solar energy is sufficient, battery will be charged with solar energy.<br>If solar energy is not sufficient to power all connected loads, Grid will supply power to the loads at the same time.<br>If grid is absent and solar is not sufficient, solar and battery will power the loads.<br>If grid is absent, solar and battery are not sufficient to power loads at the same time, inverter will go to standby and charge battery.</td></tr>
</table>

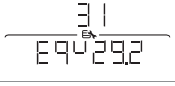
| | | | |
|---|---|---|---|
| 03 | Output source priority | PBG priority |  |
| | | Solar energy provides power to the loads as first priority.<br>If solar energy is sufficient, solar will charge the battery.<br>If solar energy is not sufficient, battery will also supply power.<br>If solar and battery energy are not sufficient, grid will supply power to the loads and solar charges the battery.<br>If battery is charged to be sufficient, solar and battery will power the loads instead of grid.<br>If grid is absent, solar and battery are not sufficient to power loads at the same time, inverter will go to standby and charge battery. | |
| | | MKS |  |
| | | Generator provides power to loads as first priority. When generator, PV, battery all exist, the work mode is as PBG. When generator and battery exist (no PV), the work mode is as GPB. When generator and PV exist (no battery), the work mode is as GPB. | |
| 04 | Input mode | APP: Appliance (default) |  |
| | | Applied to household appliances<br>Typical switching time is 10ms. | |
| | | UPS |  |
| | | Applied to computer and other devices.<br>Typical switching time is 10ms. | |
| | | GEN |  |
| | | Applied to connect generator from AC IN port. Typically switching time is 20ms. | |
| 05 | Charger source priority | PNG: PV and Grid (default) |  |
| | | PV and Grid are charged at the same time. | |
| | | OPV: Only PV |  |
| | | Only PV charge. | |
| | | PVF: PV first |  |
| | | If both gird and PV are available, PV charge. If only PV is available, PV charge. If only grid is available, grid charge. | |

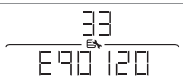
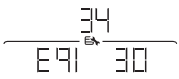
| | | | |
|---|---|---|---|
| 06 | Grid charging current |  | |
| | | The default setting is 80A. Available options are: 2/10/20/30/40/50/60/70/80/90/100/110/120/130/140/150/160A | |
| 07 | Maximum charging current |  | |
| | | Set total charging current for solar and grid chargers.<br>The default setting is 120A. Available options are: 2/10/20/30/40/50/60/70/80/90/100/110/120/130/140/150/160A | |
| 08 | Menu default |  | |
| | | Set to ON. If the current page is not on the first page and no operation with 1 minute, the system will return to display the first page.<br>Set to OFF. If the current page is not on the first page and no operation with 1 minute, the system will stay on the current page. | |
| 09 | Auto restart when overload occurs | ON(default) |  |
| 10 | Auto restart when over temperature occurs | ON(default) |  |
| 11 | Main input cut warning |  | |
| | | Enable/Disable Grid or PV loss alarm.<br>The default setting is ON. If the grid input detected lost, the buzzer will sound for 5 seconds. when set to OFF, after the grid input is lost, the buzzer will not sound. | |
| 12 | Energy-saving mode |  | |
| | | The default setting is OFF. When set to ON, in battery mode, if the load is lower than 25W, the system will stop output for a period then resume. If the load is still lower than 25W, the system will do the loop stop then resume. If the load is higher than 35W, the system will resume continuous normal output. | |
| 13 | Overload transfer to bypass |  | |
| | | The default setting is OFF. When set to ON, in the case of PBG (PV priority) or MKS (generator priority) mode, if there is an overload, the system will immediately transfer to bypass mode (grid power output, also known as bypass mode). | |

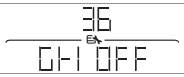
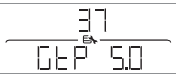
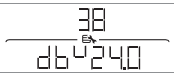
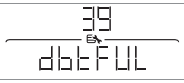
| | | | |
|---|---|---|---|
| 14 | Silent mode setting |  | |
| | | Enable/disable buzzer sound. The default setting is OFF.<br>When set to ON, in any situation such as alarms or faults, the buzzer will not sound. This setting can be applied to all modes. Button sound is not effected. | |
| 15 | Battery return to grid voltage point |  | |
| | | When the battery is set to the AGM (Lead Acid Battery Type) or FLD (Flooded Battery Type) mode. The default setting is 23V, and it can be adjusted within a range of [22, 26V]. | |
| | | When the battery is set to LIT (Ternary lithium battery) or CUS (Customer Setting Type). The default setting is 23.8V. It can be adjusted within a range of [20, 25V].<br>When the battery is set to FEL (Lithium iron battery), the default setting is 24.8V. It can be adjusted within a range of [20, 25V]. | |
| 16 | Switching back to battery mode voltage points |  | |
| | | After the battery shuts down due to low voltage, it needs to reach a certain voltage level to restart in battery mode. The value can be set to FUL or batery voltage. If set to FUL, the battery will only recharge to full capacity before it can restart in battery mode. | |
| | | When the battery is set to AGM (Absorbent Glass Mat) or FLD (Flooded) mode, The default setting is 26V. It can be adjusted within a range of [24, 29V]. | |
| | | When the battery is set to LIT (Ternary lithium battery) or CUS (Customer Set Type) mode. The default setting is 27.2V. It can be adjusted within a range of [23, 29V].<br>When the battery is set to FEL (Lithium iron battery), the default setting is 26.2V. It can be adjusted within a range of [23, 29V]. | |
| 17 | Battery type | AGM(default) |  |
| | | Flooded |  |
| | | Lithium (Ternary Lithium Battery) |  |
| | | FEL (Lithium iron) |  |
| | | User-Defined |  |

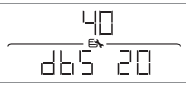
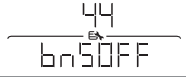
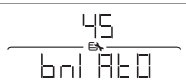
| | | |
|---|---|---|
| 18 | Battery low voltage point |  |
| | | Battery low voltage alarm setting.<br>When the battery type is set to LIT, the default setting is 23.8V. The adjustable range for the voltage is [20.6, 25V]. Initial settings for CUS are the same as for LIT.<br>When the battery type is set to FEL, the default setting is 24V. The adjustable range for the voltage is [20.6, 25V]. |
| | | It is not possible to set the battery definition mode to AGM or FLD mode. The initial default setting is 22V. |
| 19 | Battery shutdown voltage point |  |
| | | The battery low voltage shutdown point setting function cannot be adjusted when the battery is defined as AGM or FLD mode. The default setting is 21V. |
| | | When the battery type is set to LIT , the battery shutdown point can be modified. The default setting is 23V, and the adjustable range is [20, 24V]. Initial settings for CUS are the same as for LIT.<br>When the battery type is set to FEL , the battery shutdown point can be modified. The default setting is 21V, and the adjustable range is [20, 24V]. |
| 20 | Constant voltage mode voltage point setting |  |
| | | When the battery is defined in AGM or FLD mode, the voltage set point cannot be configured. The default setting for AGM mode is 28.2V, for FLD mode is 29V.<br>When the battery type is CUS, It can be set within the range of [24, 30V] for the constant voltage charging set point. The default setting is 28.2V. It is important to note that the constant voltage set point voltage needs to be higher than the float charge set point voltage. |
| | | If the battery type is set to LIT, the default setting is 28.2V, and it can be adjusted within the range of [24, 30V].<br>If the battery type is set to FEL, the default setting is 27.6V, and it can be adjusted within the range of [24, 30V].<br>It is important to ensure that the constant voltage set point voltage is higher than the float charge set point voltage. |

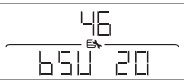
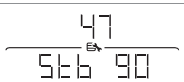
| | | |
|---|---|---|
| 21 | Floating charge mode voltage point setting |  |
| | | If battery type is AGM or FLD mode, the voltage set point cannot be configured. The default setting is 27V.<br>If the battery type is CUS, the default setting is 27.6V. The setting range is [24, 30V].<br>If the battery type is LIT, the default setting is 27.6V. The setting range is [25, 29V].<br>If the battery type is FEL, the default setting is 27.2V. The setting range is [25, 29V].<br>It is important to note that the constant voltage point voltage should always be set higher than the floating charge point voltage. |
| 22 | Grid low voltage point setting |  |
| | | If intput mode is APP/GEN, Grid low voltage point can be set within a range of 90V to 154V. The default setting is 154V.<br>If intput mode is UPS, Grid low voltage point can be set within a range of 170V to 200V. The default setting is 185V. |
| 23 | Grid high voltage point setting |  |
| | | If input mode is APP/GEN, Grid high voltage point can be set within a range of 264V to 280V. The default setting is 264V.<br>If input mode is UPS, Grid high voltage point is set as 264V. |
| 24 | Automatic turn off backlight |  |
| | | The default setting is ON.<br>If ON, the backlight will turn off after 1minutes of no button operation. |
| 25 | Inverter soft start setting |  |
| | | The default setting is OFF.<br>If ON, the inverter output gradually increases from 0 to the target voltage value.<br>If OFF, the inverter output directly increases from 0 to the target voltage value. |

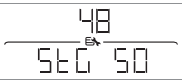
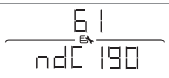
| | | |
|---|---|---|
| 26 | Reset factory setting |  |
| | | Restore all settings to factory default values.<br>Before the setting, this interface is displayed as OFF. When set to ON, the system will restore to default settings. After the setting is completed, this interface will display OFF again.<br>The setting can be applied immediately in grid and standby modes, but cannot be set in battery mode. |
| 29 | Battery disconnection alarm |  |
| | | Enable/Disable battery disconnection alarm.<br>The default setting is OFF. When set to OFF, there will be no battery disconnection alarm when the battery is disconnected. |
| 31 | Equalization voltage point setting |  |
| | | The default setting is 29.2V, with a configurable range of [24, 30V]. |
| 32 | Equalization charging time setting |  |
| | | The function can be set as 'OFF' or active. The default setting is OFF and won't start equalization.<br>During the equalization stage, the controller will charge the battery as much as possible until the battery voltage rises to the battery equalization voltage. Then, it will adopt constant voltage regulation to maintain the battery voltage. The battery will remain in the equalization stage until the set battery equalization time is reached.<br>The setting range is [5, 900] with 5 minutes for every step. |

| | | |
|---|---|---|
| 33 | Equalization delay time setting |  |
| | | The function can be set as 'OFF' or active.<br>During the equalization stage, if the battery equalization time expires and the battery voltage has not risen to the battery equalization voltage point, the charging controller will extend the battery equalization time until the battery voltage reaches the battery equalization voltage. When the battery equalization delay setting is completed and the battery voltage is still below the battery equalization voltage, the charging controller will stop equalization and return to the floating stage.<br>The default setting is 120 minutes, with a configurable range of [5, 900], and an increment of 5 minutes for each setting.<br>When set to OFF, no equalization delay is performed. |
| 34 | Equalization interval time setting |  |
| | | When the battery connection is detected during the float phase with the equalization mode turned on, the controller will start to enter the equalization phase when the set equalization interval (cell equalization period)is reached.<br>The default setting is 30 days, the settable range is[1, 90], and the increment of each setting is 1 day. |
| 35 | Enable equalization immediately |  |
| | | The default setting is OFF,  and the function is not turned on.<br>If it is set to ON, in the float charging stage when the equalization mode is turned on and the battery connection is detected. The equalization charging is activated immediately, and the controller will start to enter the equalization stage. |

| | | |
|---|---|---|
| 36 | Grid-tie inverter function |  |
| | | Set whether the inverter is grid fed or not. If the value is 'INT', the inverter can feed to grid according to different output source priority.<br>In PGB mode when battery level is sufficient, as long as grid is connected, PV can feed energy to grid as much as possible and surplus energy of PV charges the battery.<br>In PGB mode when battery level is NOT sufficient, PV charges battery as much as possible and surplus energy of PV feeds to grid.<br>In GPB mode and PBG mode, as long as grid is connected, PV charges battery as much as possible and surplus energy of PV feeds to grid.<br>In MKS mode, inverter does not feed to grid. |
| 37 | Max Grid Tie Power |  |
| | | Setting the output power value to grid. The default setting is 5.0kW. The setting range is [0, 5.0]kW. Every setting step is 0.5kW. |
| 38 | Battery dual output low voltage shutdown point |  |
| | | When enabled, the secondary output of the inverter is enabled by default. In battery mode, when the battery voltage drops below the set point, the secondary output is turned off. When the battery voltage rises above the set value plus 1V per additional battery cell, the secondary output is turned on.<br>The default setting is 24V, with a configurable range of [22, 30]V. When the set point is higher than the constant voltage charging (CV) point - 1V per cell, the recovery voltage is set to the constant voltage charging point.<br>Note: This setting has no effect on models without second output. |
| 39 | Battery dual output duration |  |
| | | When enabled, the secondary output of the inverter is enabled by default. In battery mode, when the battery discharge time reaches the set point, the secondary output is turned off.<br>Default setting is OFF, the function is not enabled. The configurable range is [5, 900] in minutes.<br>When set to FUL, the secondary output has unlimited output time.<br>Note: This setting has no effect on models without second output. |

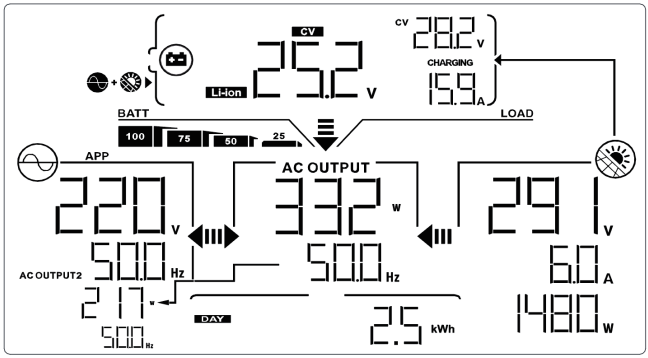
| | | |
|---|---|---|
| 40 | Dual output battery mode cut-off SOC |  |
| | | When enabled, the secondary output of the inverter is enabled by default. In battery mode, when the battery SOC is lower than the set value, the secondary output is turned off. After the battery voltage is 5% higher than set value, the secondary output will turn on.<br>The default setting is 20. The setting range is [5, 90] and OFF.<br>Note: This setting has no effect on models without second output. |
| 44 | BMS communication function |  |
| | | The default setting is OFF, and the function is not enabled. When set to a specific BMS protocol, the inverter communicates with the lithium battery BMS through the centralized control board and obtains battery information.<br>If the communication is abnormal after the function is enabled, alarm 56 is generated, and the inverter does not determine the running logic based on the BMS information.<br>CVT: CVTE protocol (485)<br>PYL: PYLON protocol (485 and CAN)<br>GRO: GROWATT protocol (485 and CAN)<br>VOL: VOLTRONIC protocol (485)<br>IRO: China Tower protocol (485)<br>PAR: PACE RTU protocol (485) |
| 45 | BMS ID |  |
| | | Setting BMS ID number to communication with. The setting value is AtO or numerical value [0, 15]. Among them, A-F represents 10-15 respectively.<br>The default setting is auto (AtO). When set to auto (AtO), system will automatically poll the BMS ID from small to large. When system poll for the first ID with a correct response, it locks the ID and only asks the BMS with that ID. |

| | | |
|---|---|---|
| 46 | Low SOC shutdown | <br>Set the inverter to shut down when the State of Charge (SOC) of the battery is low.<br>Default setting is 20, with a configurable range of [5, 50]. When the lithium battery SOC reaches the set value in battery mode, the inverter shuts down and generates alarm 68. The alarm 68 is cleared when the SOC returns to the set value + 5%. In standby mode, the inverter can switch to battery mode only when the SOC reaches the set value + 10%. If it does not reach this threshold, alarm 69 is generated. Once the function is enabled, alarm 69 is triggered when the lithium battery SOC reaches the set value + 5%, and it is cleared when it returns to the set value + 10%.<br>It can be set to OFF, in which case the inverter no longer performs shutdown, startup, or alarm operations based on the SOC condition.<br>Once the function is enabled, if a communication abnormality occurs, the inverter no longer operates based on the SOC information and clears the related alarms. |
| 47 | High SOC to battery | <br>Set the SOC value for the inverter to switch to battery mode.<br>The default setting is 90, with a configurable range of [10, 100]. In PBG priority mode, when the lithium battery SOC reaches the set value in normal grid mode, the inverter switches to battery mode. Once enabled, the inverter will only switch to battery mode when the SOC is above the set point and the battery voltage is higher than the voltage point to switch back to battery mode.<br>It can be set to OFF, in which case the inverter no longer switches from grid mode to battery mode based on the SOC condition.<br>Once the function is enabled, if a communication abnormality occurs, the inverter no longer operates based on the SOC information and clears the related alarms. |

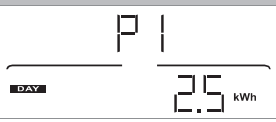
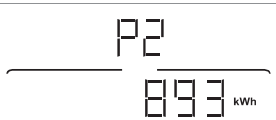
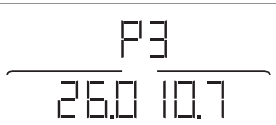
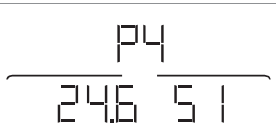
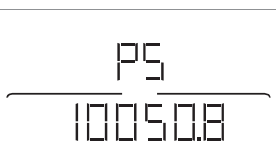
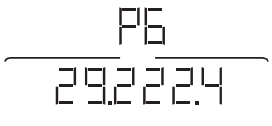
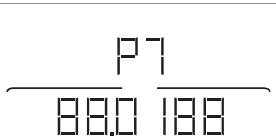
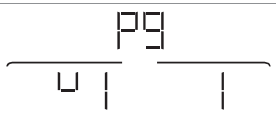
| | | |
|---|---|---|
| 48 | Low SOC to grid |  |
| | | Set the SOC value for the inverter to switch to grid mode.<br>The default setting is 50, with a configurable range of [10, 90].<br>In PBG priority mode, when the lithium battery SOC reaches the set value in battery mode, the inverter switches to grid mode. Once enabled, the inverter will switch to grid mode when the SOC is below the set point or the battery voltage is lower than the voltage point to switch back to grid mode<br>It can be set to OFF, in which case the inverter no longer switches from battery mode to grid mode based on the SOC condition.<br>Once the function is enabled, if a communication abnormality occurs, the inverter no longer operates based on the SOC information and clears the related alarms.<br>When this setting is higher than the STB point, STB and STG will no longer take effect after the next activation. |
| 61 | Battery Max. discharge current |  |
| | | The default setting is 190A. The inverter will not limit the battery discharging current when setting to OFF.<br>When set to a numerical value, it indicates the limitation current value. The setting range is [10, 190A] with a setting step of 5A. If the discharging current is over the limitation, alarm 60 will occur. If the continuous over-current time reaches 5 seconds, fault 14 will occur and inverter goes into fault mode.<br>If the value set to OFF, there are risks of overheating if the current exceeds 190A for a long time. |

## 4.3 Display Information

The LCD display information will be switched in turns by pressing 'UP' or 'DOWN' key.
If there is no operation for a long time, the daily PV power generation will be displayed at the bottom of the screen. For example the following screen displays 2.5kWh.



The selectable information is switched as below.

| LCD display | Informatiopn |
|---|---|
|  | Display the daily power generation from solar. |
|  | Display total power generation from solar. |
|  | Display lithium battery voltage and current.<br>Display ERR when BMS communication fails.<br>If BMS function is disabled, the page will not display. |
|  | Display lithium battery temperature and SOC.<br>Display ERR when BMS communication fails.<br>If BMS function is disabled, the page will not display. |
|  | Display lithium battery rated capacity and remaining capacity.<br>Display ERR when BMS communication fails.<br>If BMS function is disabled, the page will not display. |
|  | Display lithium battery maximum charging voltage and minimum discharging voltage.<br>Display ERR when BMS communication fails.<br>If BMS function is disabled, the page will not display. |
|  | Display lithium battery maximum charging current and maximum discharging current.<br>Display ERR when BMS communication fails.<br>If BMS function is disabled, the page will not display. |
|  | Display lithium battery alarm and fault information.<br>Display ERR when BMS communication fails.<br>If BMS function is disabled, the page will not display. |
|  | Display inverter firmware version. |

# 5. Fault Reference Code




Fault display:

**Function description:** If an alarm occurs, the indicator flashes and the buzzer sounds once every second for 1 minute before stopping. If a fault occurs, the fault indicator stays on, the buzzer sounds for 10 seconds and then stops, and the system will attempt an automatic restart. If the device still fails to work normally after accumulating 6 restarts within 15 minutes, the device and LCD screen will remain in a fault state. You need to completely power off the device (turn off the screen) or wait for 15 minutes before restarting it.

The LCD display interface in the fault state is shown in the figure above. In fault mode, the fault icon stays on; in alarm state, the alarm icon flashes. Please contact the manufacturer to troubleshoot the abnormal condition based on the fault information.

**Fault:** The inverter enters fault mode, with a constant red LED light and LCD displaying a fault code.

Fault code sheet

| Fault code | Meaning | Relevant action | Trigger conditions | Resume conditions |
|---|---|---|---|---|
| 1 | Grid soft start fail | Turn fault mode | Grid soft start process starts but bus voltage does not reach set value | Restore after reaching the set voltage for 15 seconds |
| 2 | Bus over voltage | Turn fault mode | Bus voltage is higher than set value | Restore after reaching the set voltage for 15 seconds |
| 3 | Bus below voltage | Turn fault mode | Bus voltage is lower than set value | Cannot restore |

| Fault code | Meaning | Relevant action | Trigger conditions | Resume conditions |
|---|---|---|---|---|
| 4 | Battery over current | Turn fault mode | Battery current is higher than set value | Cannot restore |
| 5 | System over temperature | Turn fault mode | PFC temperature is higher than set value or fan is not connected | Restore after temperature lower than set value and fan connected for 15 minutes |
| 6 | Battery over voltage | Turn fault mode | Battery voltage is higher than set value | Restore after reaching the set voltage for 15 seconds |
| 7 | Bus soft start failed | Turn fault mode | Battery soft start process starts but the bus voltage has not reached set value | Restore after reaching the set voltage for 15 seconds |
| 8 | Bus short circuit | Turn fault mode | Bus voltage is lower than set value | Cannot restore |
| 9 | Inverter soft start failed | Turn fault mode | Inverter soft start process starts but the inverter voltage has not reached set value | Restore after reaching the set voltage for 15 seconds |
| 11 | Inverter under voltage | Turn fault mode | The inverter voltage is lower than the set value in battery mode | Restore after reaching the set voltage for 15 seconds |

| Fault code | Meaning | Relevant action | Trigger conditions | Resume conditions |
|---|---|---|---|---|
| 12 | Inverter short circuit | Turn fault mode | Inverter voltage is less than the set value and current is higher than the set value | Restore after reaching the set value for 15 seconds |
| 13 | Inverter negative power | Turn fault mode | The inverter power is negative and exceeds the set value for a period of time | Restore after reaching the set value for 15 seconds |
| 14 | Over load | Turn fault mode | The load current, load power, battery current, or grid current exceeds the set value. | Restore after reaching the set value for 15 seconds |
| 17 | Program updating | Turn fault mode | Inverter updating or OTA | Restore after updating |
| 18 | PV reverse connection | Turn fault mode | PV reverse connection | Restore after connecting correctly for 5 seconds |
| 26 | BMS fault | Turn fault mode | Error code in BMS message. | Restore after BMS fault resolved |
| 29 | Inverter load abnormal | Turn fault mode | Abnormal inverter load leads to abnormal voltage | Restore after voltage returning normal for 15 seconds |
| 30 | PV over voltage | Turn fault mode | PV voltage exceeds the maximum supported voltage | Restore after voltage returning lower than maximum supported voltage |

# 6. Alarm Reference Code

Alarm: the inverter does not enter the fault mode, LED red light flashing, LCD displays the Alarm code.




Alarm code sheet

| Alarm code | Meaning | Relevant action | Trigger conditions | Resume conditions |
|---|---|---|---|---|
| 50 | Battery open | Alarm | Battery disconnected for no more than 10 minutes | Restore after battery connected and charging for 2 minutes |
| 51 | Battery under voltage | Alarm, battery low voltage shutdown or cannot power on | Battery voltage is lower than BAU set value | When the battery voltage is higher than 26V, or higher than BAU + 2V, and the grid power is connected, or the on/off switch is turned off, or a remote shutdown command is received. |
| 52 | Battery low voltage | Alarm | Battery voltage is lower than BAL set value | Restore after the battery voltage exceeding the BAL set value by 2V |
| 53 | Battery charge short circuit | Alarm, battery does not charge | Battery voltage is less than 12V and the charging current exists. | Restore after a maximum of 1 minute when the short circuit is eliminated. |
| 56 | BMS loss | Alarm | Communication failure after BMS communication function is enabled | Restore after communication function disabled or communication success |
| 58 | Fan error | Alarm, fan operation in full speed | No fan speed signal detected | Restore after fan speed signal detected |

| Alarm code | Meaning | Relevant action | Trigger conditions | Resume conditions |
|---|---|---|---|---|
| 59 | EEPROM error | Alarm | EEPROM read/write exception | Can not restore |
| 60 | Overload | Alarm | The grid current/battery discharge current/ load power is higher than the rated value. | Restore after the grid current/battery discharge current/load power is less than the rated value. |
| 62 | PV energy weak | Alarm, Turn off the PV output to the load, but keep the PV charging the battery | When the battery is not connected, the bus voltage is lower than the set value | Restore after battery connected or grid connected, or 10 minutes later. |
| 68 | Battery under SOC shutdown | Alarm, turn to standby mode | BMS reports SOC lower than BSU set value | Restore after meeting one of the following three conditions:<br>1. Disable low SOC shutdown function<br>2. Disable BMS communication function<br>3. SOC is higher than the set value by 5% |
| 69 | Battery below SOC warning | 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) | Restore after meeting one of the following three conditions:<br>1. Disable low SOC shutdown function<br>2. Disable BMS communication function<br>3. SOC is higher than the set value by 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 | Grid power is unstable | 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.

Note:*Don't activate this mode when using lithium batteries.

- How to Apply Equalization Function

  You can enable battery equalization function in monitoring LCD setting Program 32 by setting time, or you can choose immediate equalization on Program 35. Then, you may apply this function in device by either one of following methods:

  1.Set equalization voltage point on Program 31.

  2.Set equalization charging time on Program 32.

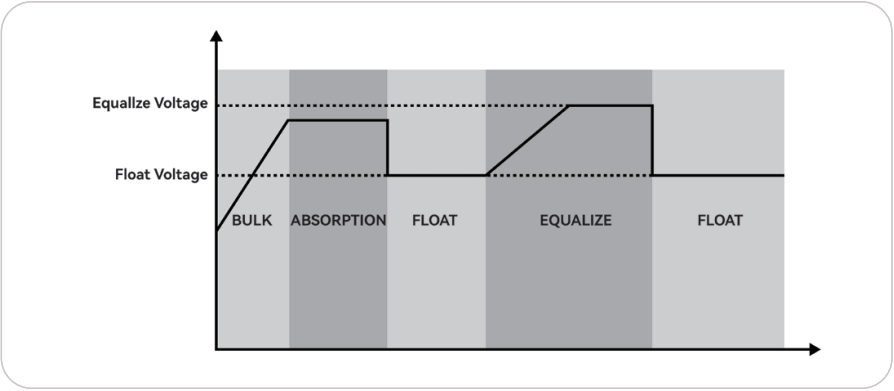
  3.Set equalization delay time on Program 33.

  4.Set equalization interval time on Program 34.

  5.Set immediate equalization mode activation on Program 35.

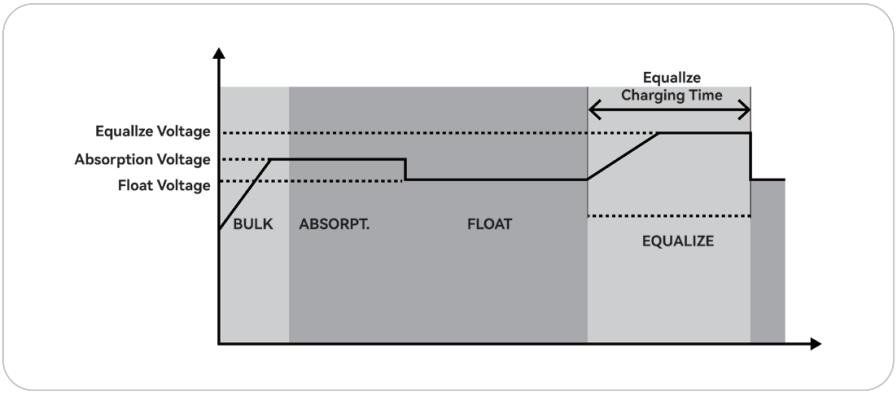
- When to Equalize

  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.

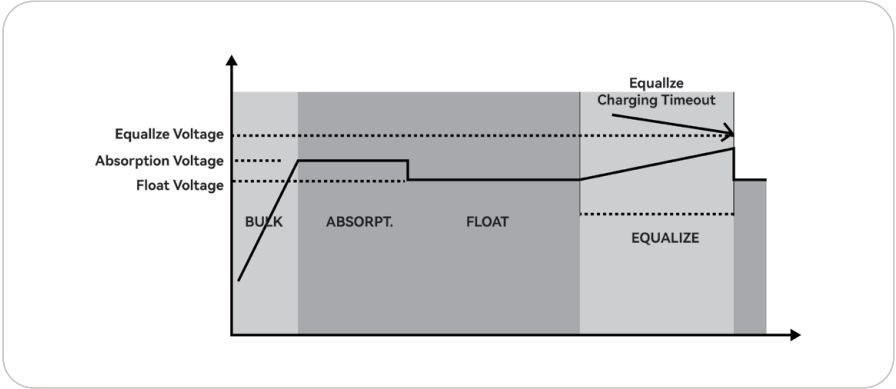


- Equalize charging time and timeout

  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 will remain in the Equalize stage until setting battery equalized time is arrived.




However, in Equalize stage, when battery equalized time is expired and battery voltage doesn't 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. Trouble Shooting

| Problem | Fault Event | Trigger conditions | What to do |
|---|---|---|---|
| LED screen display fault code 2 | Bus voltage high | 1. Check whether the total rated voltage of PV string exceeds the Max. PV open circuit voltage of inverter. | If it exceeds, reduce the PV module number. |
| | | 2. In case of parallel operation, check whether the output voltage settings of the two inverters are consistent. | If inconsistent, reset. |
| LED screen display fault code 3 | Bus voltage low | 1. Disconnect the load from inverter and restart again to observe if it recovers. | If it recovers, it indicates that there are too many impact loads and part of them should be removed from inverter. |
| LED screen display fault code 5 | Over temperature | 1. After the temperature is low, start the inverter output and check whether the fan rotates. | If the fan is not rotating, there may be a fault with the fan or its wiring. |
| | | 2. Check if the dust filter is too dirty. | If there is excessive dust accumulation, it needs to be cleaned. |
| | | 3. Check if there is a clearance space of more than 30cm around the machine. | If there is insufficient space, please refer to the user manual for reinstalling. |
| | | 4. Check if the ambient temperature is too high (above 45℃). | For example, avoid direct sunlight. |
| | | 5. Check if the air duct paper is loose. | Install the plastic nail provided by the manufacturer at the loose position |
| LED screen display fault code 26 | BMS fault | 1. Check the BMS fault information through the battery background controller. | Handle battery problems according to fault information. |

| | | | |
|---|---|---|---|
| LED screen display fault code 56 | BMS loss | 1. Check whether the communication cable is plugged into the correct port of the lithium battery. | The lithium battery may have multiple communication interfaces, which need to be plugged into the correct position. |
| | | 2. Check whether the battery dial switch setting is consistent with the protocol used. | The battery supports a variety of BMS protocols, and different protocols can be selected through the dial switch on the battery. |
| | | 3. Confirm whether the definition of battery port pin of BMS communication cable is consistent with that of inverter. | If not, replace the correct cable. |
| | | 4. Confirm whether the BMS protocol matches the inverter. | If it is not within the matching range of inverter, the Protocol shall be replaced. |
| | | 5. Replace the battery or inverter for test. | If it is normal after replacement, the communication hardware fails. |
| LED screen display fault code 58 | Fan abnormal alarm | 1. Confirm if the fan rotation is abnormal and if there is any foreign object causing obstruction. | Remove any foreign objects. |
| | | 2. Check if the fan is not connected or if the wiring is loose. | Ensure proper connection of the fan. |
| | | 3. Replace the fan to check if the fan is damaged. | Confirm damage and replace the fan. |
| LED screen display fault code 62 | PV Energy Weak | 1. Check if PV power is normal. | If abnormal, repair PV. |
| | | 2. Check if PV power is lower than load demand. | Remove part of the load. |

Notes:

1. Updates to the content and version of this manual will not be notified separately.
2. The product images displayed in this manual are for visual illustration purposes only and do not represent the actual dimensional ratios of the equipment. The actual appearance of the product shall be subject to the datasheet or the physical product.