User Manual Of Portable All-in-one PV Energy Storage System

Model: 5kW/5kWh battery system

Customer Model: **SFEP230SK48-5001CT**

Contents

Chapter 1. Notes On This Manual

1.1 Clarification

This manual applies to the assembly, installation, commissioning and maintenance of the portable All-in-One ESS. It does not cover any details of peripheral equipment and accessories (e.g. PV modules) connected to this product. For details on this device, please refer to the respective manufacturer's manuals.

Target People:

	This manual is qualified for persons who have received electrical training, demonstrated knowledge and skills in operation this equipment. This person is able to deal with the dangers and hazards involved in installing electrical devices.

1.2 Additional Information

Contact us by email for more product information.

1.3 Storage of Instructions

Please keep this user manual in a safe place for future use. The manufacturer is not responsible for any damage or harm caused by failure to operate in the manner instructed in the manual.

1.4 Symbol Description

The icons in the following tables will appear in subsequent text and are annotated below.

	**MANUAL:** Please read this manual carefully before use.
	**DANGER:** This symbol indicates a dangerous situation that, if not avoided, could result in death or serious injury.
	**WARNING:** This symbol indicates a dangerous situation that, if not avoided, could result in death or serious injury.

	**CAUTION**: This symbol indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.
	**NOTE:** Failure to follow this warning could result in damage to the equipment.

1.5 Warning symbols

Symbol	Descriptions
	**Dangerous voltage warning!** This product works under high voltage. All operations on this product must be performed as described in the documents and by qualified professionals.
	**Be careful of Heat!** This product may becomes hot during operation. Do not touch the product while it is in operation.
	**Follow Operating Instructions!** Before using this product, please read the product manual carefully. Follow all safety precautions and instructions described in the documents.
	Grounding Protection Connection Point.
	Direct Current (DC)
	Alternating current (AC)
	**Dangerous Signal!** Risk of electric shock! The installation operation can only be performed after the inverter has been switched off and disconnected for at least 5 minutes.

Chapter 2. Safety and conformity

2.1 Safety instructions

DANGER

Danger To Life Due To Lethal Voltages!

High voltage exists inside this inverter and on the power cord. Therefore, only authorized electricians should install and operate this equipment. Even if the inverter is disconnected, there may still be a risk of electric shock from high voltage!

DANGER

Danger Of Burn Injuries Due To Hot Housing Parts!

During operation, the four sides of the housing cover and the heat sink may become hot. Only touch the front cover of the inverter during operation.

NOTE

PV Modules &Grounding Equipment

Comply with the local requirements for grounding the PV modules and generator. We recommend connecting the generator frame and other electrically conductive surfaces in a way that ensures continuous conduction with ground,to provide optimal protection for the system and people.

NOTE

Capacitive Discharge Currents

PV modules with a larger capacity than the ground, such as thin-film photovoltaic modules on metal substrates, can only be used if their coupling capacity does not exceed 470nF. During the charging and discharging operation,a leakage current will flow to the ground, and its magnitude depends on the installation of the PV modules such as aluminum foil on a metal roof) and the weather conditions (such as rain and snow). Generally, the leakage current does not exceed 30mA.If it exceeds this range, the inverter will trigger protection and automatically disconnect from the grid.

NOTE

Do not attempt to open the device during operation!

2.2 DC and AC circuit breakers

Disconnecting the unit securely from the grid, the PV generators, and batteries by using DC and AC breaker. The DC and AC breaker should be capable of disconnect all non-ground conductors after installation.

2.3 PV module grounding

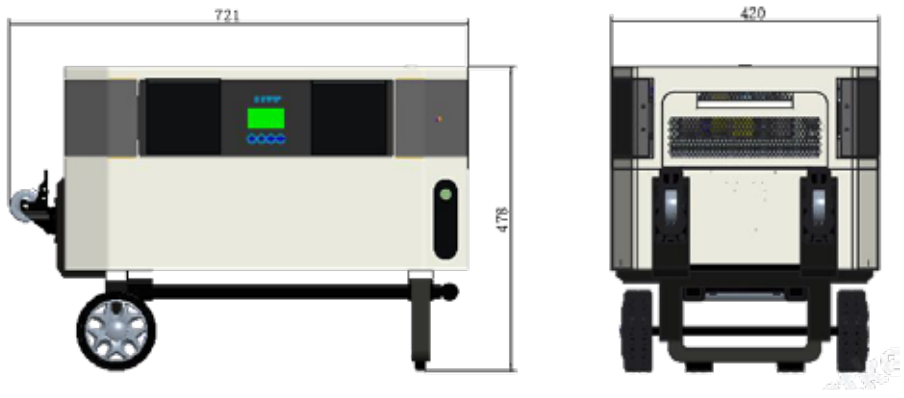
This unit has a built-in transformerless inverter between PV and the grid. It is strictly forbidden to ground the PV module directly. Only the mounting frame must be earthed. Otherwise, you will receive the error message "PV ISO Low".

2.4 Qualification of skilled technicians

- Understand how this product works and how to operate it.
- Know how to deal with the hazards and risks associated with the installation and use of electrical equipment and devices.
- Attended training in the installation and commissioning of electrical equipment and devices.
- Be familiar with all applicable standards and guidelines
- Know and follow this manual and all safety instructions.

Chapter 3. Product description

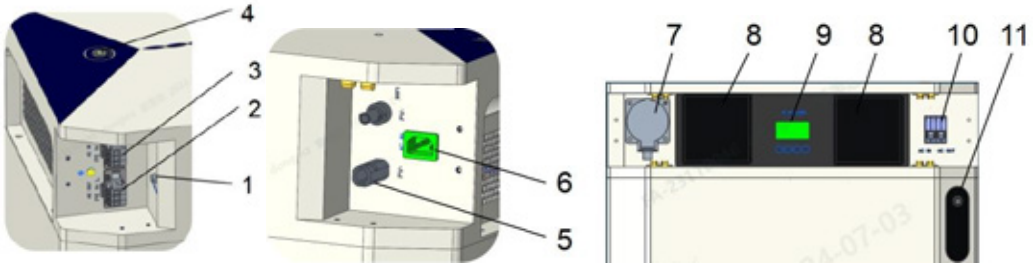
3.1 Dimensions of the portable all-in-one system（ Figure 1）



3.2 Equipment Information

The device is one-way power flowing and is suitable for PV systems with battery storage. The energy produced by the PV system is prioritised for load consumption, with excess energy used to charge the batteries. When the PV output is not sufficient to support the connected loads, the system automatically obtains energy from the batteries if they are sufficient. If the battery energy is not sufficient to meet its own consumption needs, energy is obtained from the public grid.

Product Interface Description (Figure 2)



No.	Silk-screen Sign	Remark
1	BREAKER	
2	AC OUT	Output voltage Control
3	AC IN	Input voltage
4	Inverter SWITCH	Inverter on and off
5	PV IN	
6	AC IN	Input voltage
7	AC OUT	Output voltage
8	AC OUT	Socket
9	LCD	
10	BAT SWITCH	Control battery output and input
11	SWITCH	Battery RUN switch

3.3 Product Storage Conditions

- Equipment must be stored in its original box
- The ambient storage temperature should be between -20°C and +55°C.
- The relative humidity of the storage environment should be maintained between 0-95% at all times.
- Bulk equipment storage, original cartons can be stacked up to 5 levels

3.4 Unpacking Inspection

Upon receipt of the product, please check the packaging first, if you find any damage to the packaging, or if you find damage to the unit after unpacking, please save the original packaging and contact your dealer immediately. If you

need to transport the unit, the original packaging is recommended!

Product Accessories (Figure 3)

A

B

NO	Components (These are optional depends on PO*)	Quantity (PCS)
A	Charging gun	1
B	2.5KW Charging cable	1

* The type of socket and plug should be determined according to the local electrical standards in the applications.

3.5 Installation and Electrical Connections

DANGER

Danger to life due to fire or explosion

Despite careful construction, electrical devices have the potential to cause fires. Do not install the inverter near flammable and explosive materials!

DANGER

Risk of burns due to hot housing cover**and radiator**

The device should be installed in an inaccessible place.

DANGER

- All electrical installations must adhere to the IEE wiring rules. It is important to avoid removing the case of the inverter, as it does not contain user-serviceable parts. Please seek assistance from qualified service personnel for any repair work.
- All wiring and electrical installations should only be performed by a qualified electrician.
- Carefully remove the unit from its packaging and inspect it for any external damage.If you find any issues, please contact your supplier.
- This inverter is designed to be used with PV generation, and cannot be connected to other renewable energy devices.
- Both AC and DC voltage sources are terminated inside the PV Inverter. All

AC and DC input and output must be disconnected before performing any maintenance.

- Do not connect it to a generator or any other external power generating device, as it may cause severe damage to your equipment.
- Although the product is designed to comply all safety regulations, some parts and surfaces of the inverter generate high heat during operation. To reduce the risk of injury, avoid touching the heat sink back of the unit while the inverter is in operation.

Basic Installation Requirements

This section of the guide is for the installer to select a suitable mounting position to avoid damage to the machine or injury to the operator.

- This product must not be installed in direct contact with water.
- In order to avoid over-temperature which may reduce the output power of the product, please do not expose the device to direct sunlight.
- Ambient humidity around the equipment should be 0 - 95 per cent, non-condensing.
- Installation location must be convenient for future maintenance.
- Do not install the product in buildings constructed of flammable or non-heat-resistant materials.
- Keep out of reach of children.
- Do not cover this product, do not put anything on the device.
- Do not install the product near strong magnetic signals such as TV aerials or other antennas or cables.
  The equipment requires adequate cooling space. Provide the unit with optimum ventilation to ensure adequate heat dissipation. The ambient temperature should be below 40°C for optimal operation.
- Although the Battery Pack part of this product is IP65 rated, it is recommended that it be installed in such a way as to avoid prolonged operation under sun, rain and snow pressure.

3.6 Equipment Installation Status Check

- Be sure to select a suitable mounting surface to ensure that the unit is stable and free of wobbles.

Electrical connection

WARNING

There is a risk of damage to electronic components from electrostatic

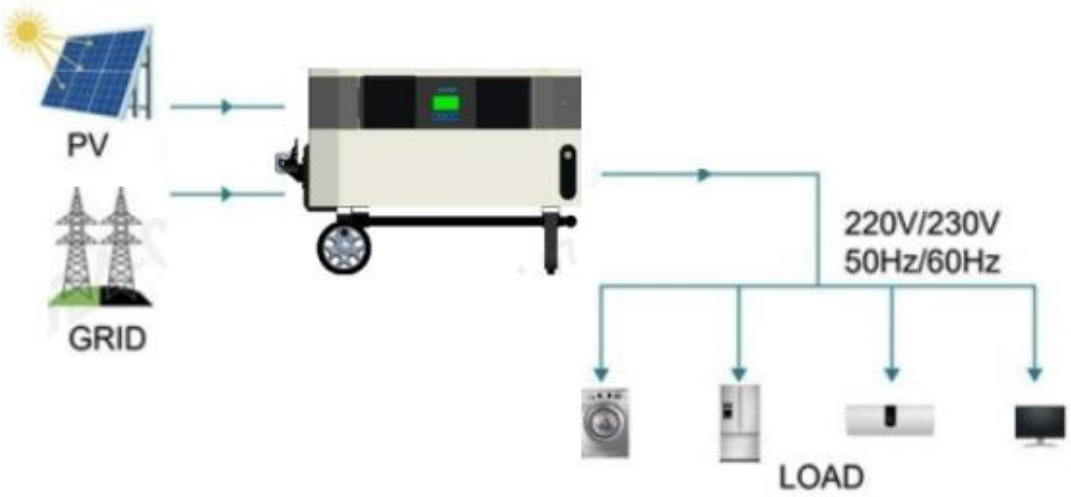
discharge and appropriate anti-static measures should be taken when replacing and installing equipment.

DANGER

Grounding: The AC power supply must be grounded before connecting the DC power cord.

3.7 System Diagram

See details (Figure 4)



NOTE

Ensure that all wiring is correctly selected and constructed to comply with wiring regulations.

3.7.1LoadConnection

Energy Storage System with All-in-one can provide a maximum output power of 5kW.

WARNING

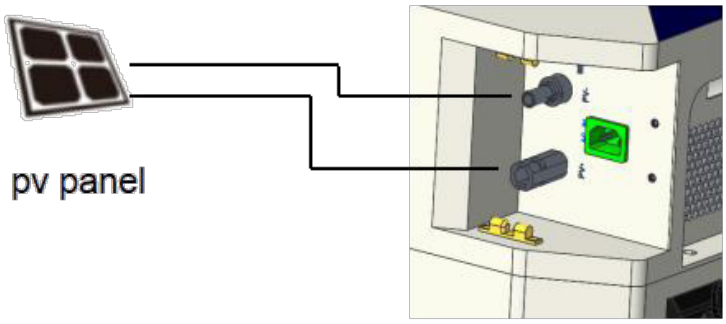
The maximum output power of the Load is 5kW. If the load is continuously greater than 5kW, Energy Storage System with All-in-one will stop outputting..

3.7.2Solar Panel Connections (Figures 5)

DANGER

1. Risk of electric shock and fire, with a maximum input voltage of 430V DC per string.
2. Transformerless design with no grounding at positive or negative ends.

This device supports one-way PV access, refer to Figure 5 .



(Figure 5)

- The maximum open-circuit voltage of each PV input must not be higher than 500V DC.
- Check the design of the PV plant. The maximum open-circuit voltage may occur at an ambient temperature of -10°C for the PV panels, where the input voltage must not exceed the maximum input voltage of the inverter (430 V).
- Before connecting the PV panels to the DC terminals, make sure that the positive and negative are correct. Incorrect polarity connections may damage the inverter.
- Check the short-circuit current of the PV bank. The total short-circuit current of the PV bank should be less than the maximum DC current of the inverter.
- 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 connection. To reduce risk of injury, please use the proper recommended cable size as belo

Wire Size	Cable (mm^2)	Torque value (max)
1 x 12AWG	6	1.2-1.6 Nm

Max. PV Array Open Circuit	500Vdc
Start-up Voltage	150Vdc
PV Array MPPT Voltage Range	120Vdc~430Vdc

Chapter 4. Inverter Function Introduction

4.1 Working modes

(Figure 6)(Figure 7)

Once the unit has been properly installed and the batteries are connected well, press On/Off switch(located on right side of the case) to turn on the unit(Figure 6).Then turn on the inverter switch(Figure 7).

4.2Instructions for operation panel

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

4.2.1 Four-button function

The keys	Functional specifications
Function Setting /	Function setting: Press ENTER key on the display page for more than 2 seconds to enter the

Identifying key	**function setting page. After entering the setting interface, press UP or DOWN key to turn the page up and down to select the interface to be set. OK: On the Function Settings page, press ESC key for 0.1 second to 2 seconds to determine the options for setting**
Page Turn/Query key	**Page turning: Press UP or DOWN key on any page for more than 0.1 second to turn the page left or rig**

4.2.2 LED Indicator Functions

LED Indication			Messages
AC	Green	Solid On	The utility grid is running properly
		Flashing	The utility grid is normal, but the utility grid supply is not working
		light off	The utility grid power is abnormal
INV	Yellow	Solid On	The machine is working in battery mod
		light off	indicates other status
CHG	Yellow	Solid On	The battery is floating and charging
		Flashing	The battery is being charged at constant voltage
		light off	indicates other status
FAULT	Red	Solid On	The inverter is faulty
		Flashing	An alarm is generated on the inverter
		light off	f The inverter is working properly

4.2.3Function Buttons

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

4.2.4LCD Function Displa

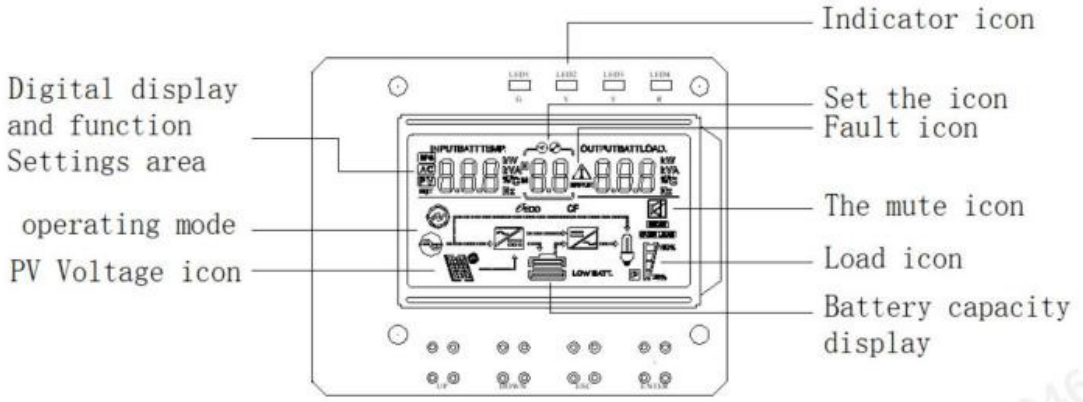


Figure 1-2 Four-button LCD screen

LCD display can be divided into: icon display, numerical display and function setting area, working mode display a

4.2.5 Icon display

(1) Load and battery graph indicates load and battery capacity. Each square represents 25% of the capacity. The load icon blinks when the inverter is overloaded, and the battery icon blinks when the battery capacity is too low or the battery is not connected.

(2) Buzzer icon Indicates whether the buzzer is silent. Normally, this icon is not displayed. In any mode, the backstage software sets MUTE ON, the inverter enters the MUTE state, and the buzzer disabled icon will be displayed.

(3) The Settings icon will be on when enter the Settings menu. Otherwise, the icon will not be displayed.

(4) The fault icon is displayed only in fault mode. In other cases, the fault icon is not displayed.

4.2.6 Value display and function setting area:

(1) In non-functional mode, the inverter information is displayed in this area.Output information is displayed in normal mode. Operation query key (UP or DOWN key) can display input voltage and output voltage, input frequency and output frequency, battery voltage and current, PV voltage and PV current, PV voltage and power, output power and output voltage, output apparent power and output voltage, load percentage and output voltage, software version and other related information. Fault mode displays

(2) On the Function Setting page, you can set the output voltage (OPU) and battery low-voltage shutdown point (EOd) by using the Operation function setting key and the UP and Down searching key

4.2.7 Working mode display area:

After starting for 4 seconds, this display area mainly displays the working mode of the inverter. For example, standby mode, utility grid mode, battery mode, , and Fault mode.

4.2.8Inverter working status table of the buzzer

A buzzer alarm is generated	describe
A long sound lasts ten seconds and then stops	Failure mode
The long sound stops after three seconds	The PV/input voltage is lost or recovered
	The main switch of startup is turned on or off
Sound one time per second, last for one minute, and then stop	All other alarms (it will beep for low battery voltage only in battery mode

4.3 Daily Power on

Please refer to this manual for switching on and off the machine.

4.3.1 Startup Procedure

(1) utility grid switch on

Connect to utility grid, press the Inverter switch， The system starts. utility grid output is preferred, wait for a while until the utility grid mode is displayed ON the rear panel.

(2) The battery switch on

Connect to the normal battery,press the Battery switch and Inverter switch, the inverter to establish working power supply. The system automatically starts. After a while, the system enter the battery mode if the battery mode is displayed on the rear panel,.

4.3.2 Shutdown Procedure

press the Battery switch and Inverter switch when the system is in battery mode or utility grid mode, and the system will shut down.

4.3.3 Mute operations

Can set MUTE ON or OFF to MUTE or unmute the inverter when the inverter is in any mode.

4.3.4Operations performed in the Alarm State

It indicates that the inverter is in the alarm state if the inverter has an alarm sound and the LED fault indicator blinks.You can locate the cause of the alarm or contact the supplier based on the alarm information.

4.3.5 Operations in Fault Mode

It indicates that the inverter is working in fault mode when the inverter buzzer is always ringing and the LED fault indicator is always on. Contact the supplier or maintenance personnel to provide information about the fault alarm and help to troubleshoot the fault.

4.4 Parameter Query operations

Under normal circumstances, it has a total of ten pages for the display. Press the query key UP or DOWN 0.2 to 1 second to turn the display page, display input and output voltage, input and output frequency, battery, PV voltage and current, load, software version, and other information. A page of alarm information is added if an alarm is generated. The fault code page is displayed by default If the inverter is faulty. The fault or alarm information is displayed on the main page by default. The output voltage and frequency information are displayed on the main page by default when the inverter has no fault or alarm.

Display page 1 (main display page): Displays the inverter input and output voltages, as shown in Figure 1-3

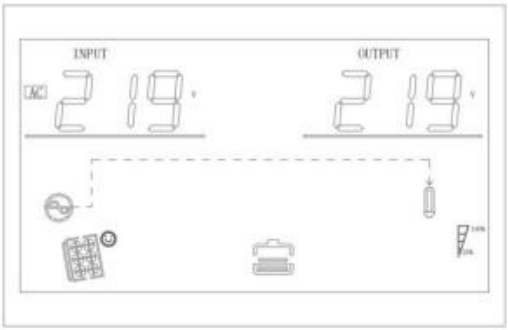


Figure 1-3 shows page 1

Page 2: Displays the inverter input and output frequency, as shown in Figure 1-4

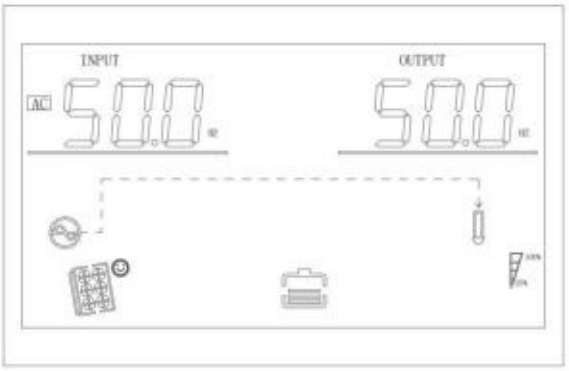


Figure 1-4 Showing page 2

Page 3: Battery information is displayed, showing the battery voltage and charging current, as shown in Figure1-5

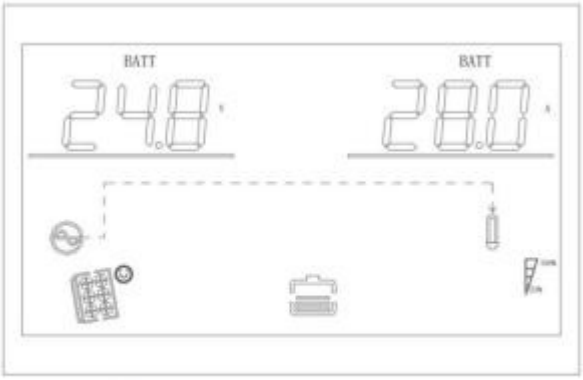


Figure 1-5 shows page 3

Page 4 :PV information is displayed, showing the PV voltage and PV charging current, as shown in Figure1-6

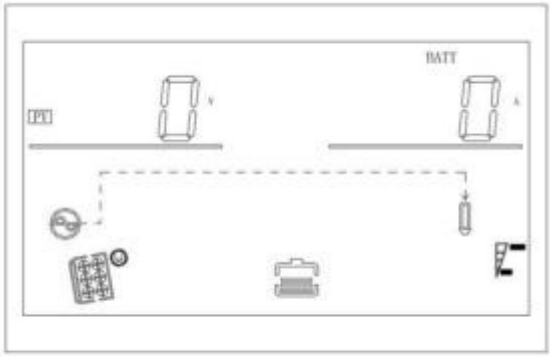


Figure 1-6 shows page 4

Page 5:PV Information is displayed, showing the PV voltage and PV

charging power, as shown in Figure1-7

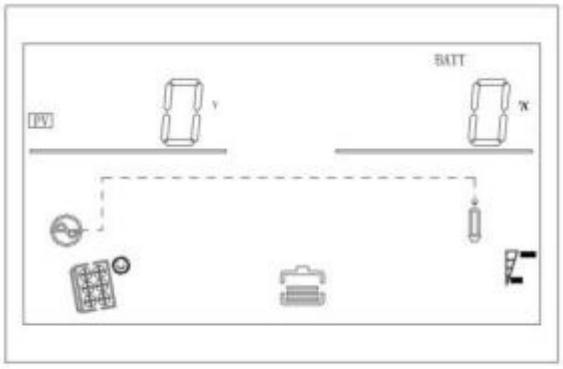


Figure 1-7 Display page 5

Display page 6: Output Information is displayed, showing the output voltage and active power, as shown in Figure1-8

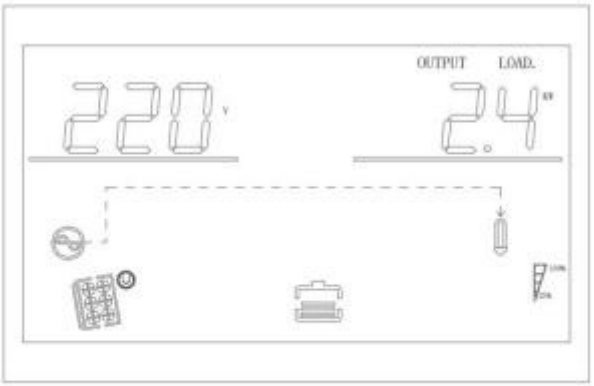


Figure 1-8 Display page 6

Display page 7: Output Information is displayed, showing the output voltage and output complex power, as shown in Figure 1-9

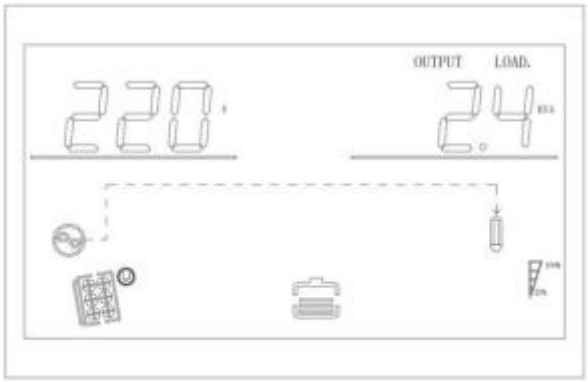


Figure 1-9 shows page 7

Display page 8: Output information is displayed, showing the voltage and load percentage, as shown in Figure1-10

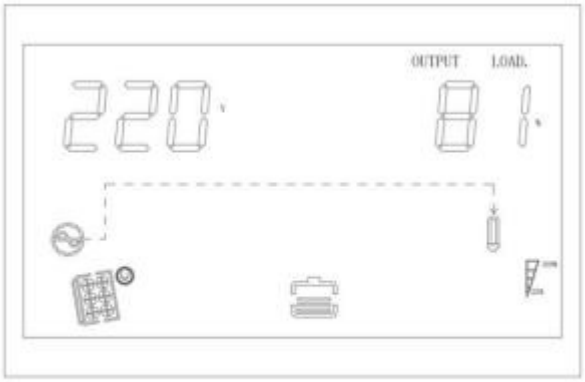


Figure 1-10 Display page 8

Display page 9: The software version of the inverter is displayed, as shown in Figure1-11

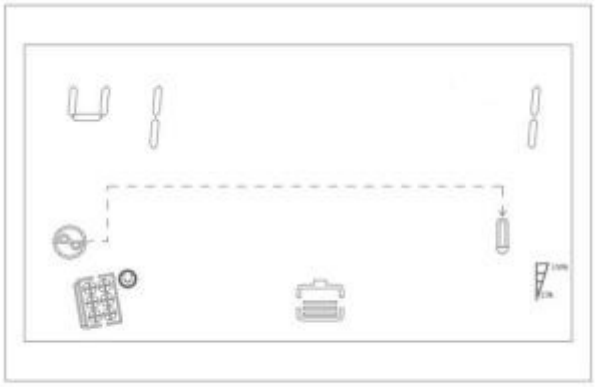


Figure 1-11 Display page 9

Display page 10: Displays the MPPT software version, as shown in Figure 1-12

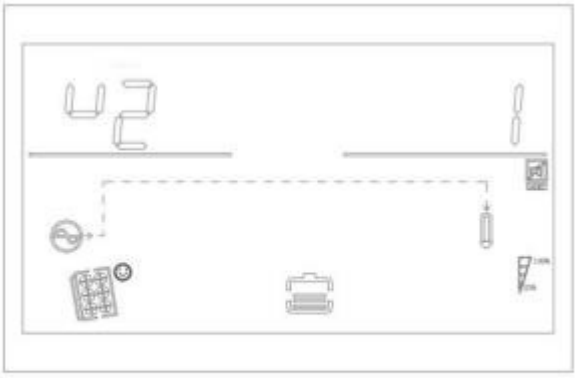


Figure 1-12 shows page 10

Display Page 11: Shows the photovoltaic power generation, as shown in Figure 1-13

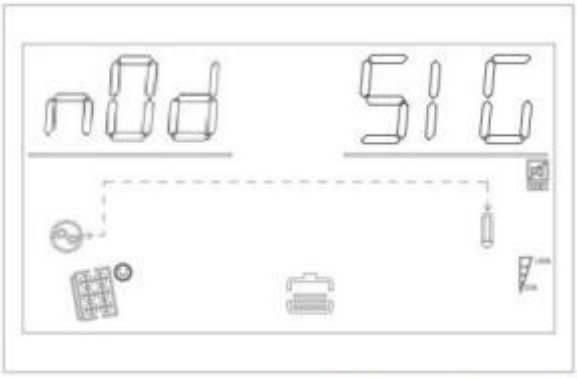


Figure 1-13 Display Page 11 (parallel status)

Display page 12: Lithium battery networking status; For SIG constant, the battery pack is in single group operation; For PAR constant, the battery pack is in parallel operation; The battery pack is in parallel operation when PAR is flashing.

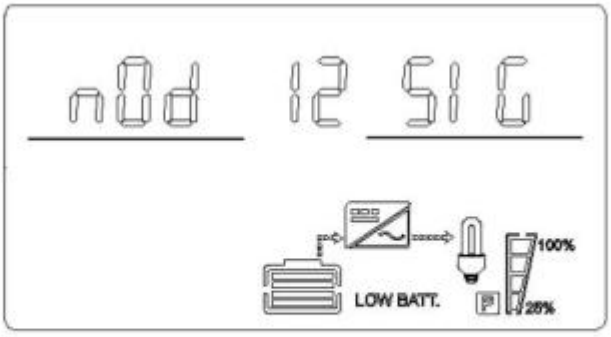


Figure 1-14 Display page 12 (lithium battery networking status)

Display page 13: Lithium battery battery voltage and current

information; BMS voltage information is displayed on the upper left; and BMS current information is displayed on the upper right. The upper left and right shows the flashing ERR when BMS communication fails.

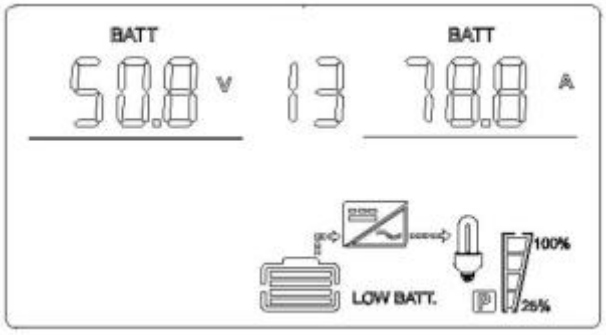


Figure 1-15 Display Page 13 (lithium battery voltage and current information)

Display page 14: Lithium battery temperature and SOC. BMS temperature is displayed on the upper left and BMS SOC is displayed on the upper right. It flashes ERR when BMS communication fails

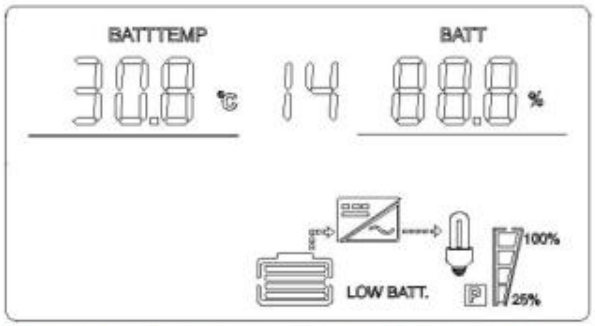


Figure 1-16 Display Page 14 (lithium battery temperature & SOC information)

Display page 15: Lithium battery capacity; The rated capacity is displayed on the upper left and the current capacity displayed on the upper right. The upper left and right show the flashing ERR when BMS communication fails.

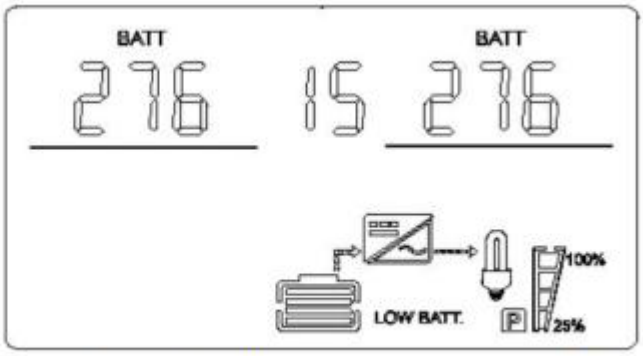


Figure 1-17 Display Page 15 (lithium battery capacity information)

Display page 16: Constant voltage point of lithium battery; Fixed letter CV is displayed on upper left and BMS constant voltage charging point is displayed on the upper right. The upper left and right show the flashing ERR when the BMS communication fails.

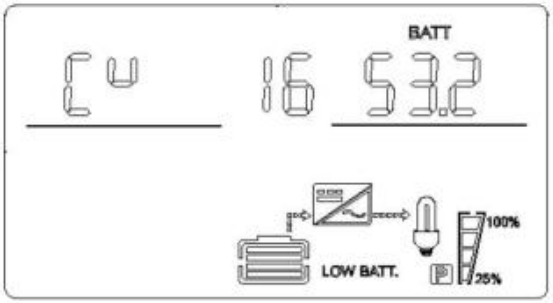


Figure 1-18 Display page 16 (lithium battery battery constant voltage information)

Display page 17: Lithium battery fault alarm information; BMS alarm information on the upper left; BMS fault information on the upper right. It flashes ERR on upper left and upper right when BMS communication fails.

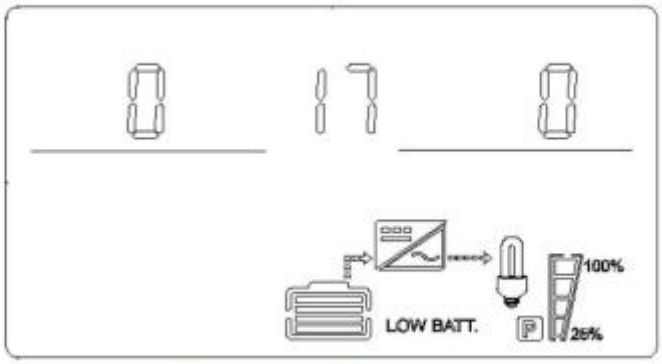


Figure 1-19 Display page 17 (lithium battery fault alarm information)

4.5 Function Setting Operations

Function setting operation of inverter:
Enter the exit function setting page and the operations details are as below:

(1)Press the function setting key ENTER for more than 2 seconds to enter the function setting page. Press the query key UP or DOWN for 0.1 to 2 seconds to select the function. The corresponding function will blink after turning the page to the required function setting page.

(2) Press the key ENTER for 0.1 to 2 seconds to enter the setting page of the selected function. At this time, the words of the selected function will be steady bright, and the value will blink on the left of the words of the selected function. Press QUERY KEY UP or DOWN for 0.1 to 2 seconds and select the value of the desired function parameter

(3) Press the key ENTER for 0.1 to 2 seconds after turning the page to the desired function parameters. The function setting is completed. At this time, the value of the function parameters will be steady bright and no longer blink.

Press ESC key for more than 0.1 to 2 seconds to set the function successfully. At the same time, exit the function setting page and return to the main display page (you can also do nothing, and it will automatically turn back to the main display page after waiting for 30 seconds at most).

4.5.1 Output Voltage (OPU)

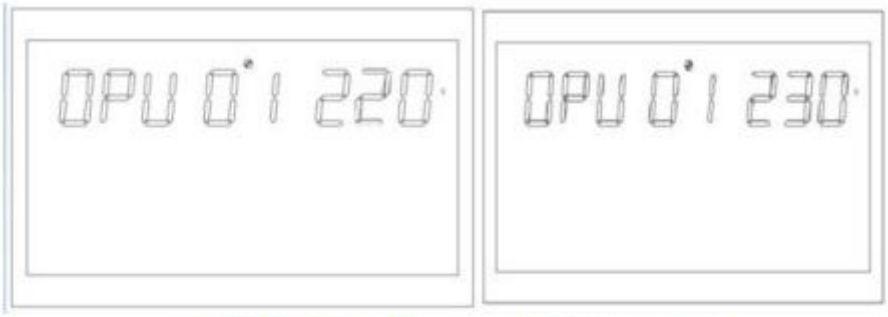


Figure 1-12 Setting the output voltage

(1) The default output voltage is 230V, 208V, 220V, 230V and 240V, which can be set for all working conditions and take effect immediately.

(2) Press the function setting key ENTER for more than 2 seconds to enter the function setting page. Press the query key UP or DOWN for 0.1 to 2 seconds to select the function. The word OPU flashes when turn the page to the setting page of output voltage OPU.

(2)Press the key ENTER for 0.1 to 2 seconds to enter the setting page of output voltage OPU. At this time, the word OPU will be steady bright and the value of OPU will blink on the right of the word OPU.Press the query

key UP or DOWN for 0.1 to 2 seconds, and select different output voltage values. The available voltage values are 208V, 220V, 230V, and 240V. The output voltage is 230V by default. The Settings are saved in real time.
(4) Press the key ENTER for 0.1 to 2 seconds after turning the page to the desired output voltage value. The output voltage OPU is set. At this time, the value on the right side of OPU will be steady bright and no longer flicker.
(3)The function is set successfully after press ESC key for more than 0.1 to 2 seconds, then exit the function setting page, return to the main display page (If not operate, wait for maximum 30 seconds to automatically turn back to the main display page)
Note:
(4)The output voltage must be derated to 90% if the output voltage is set to 208V.

4.5.2Setting Other Functions

4.5.2.1Output Frequency (OPF)

The output frequency is set. The default value is 50Hz

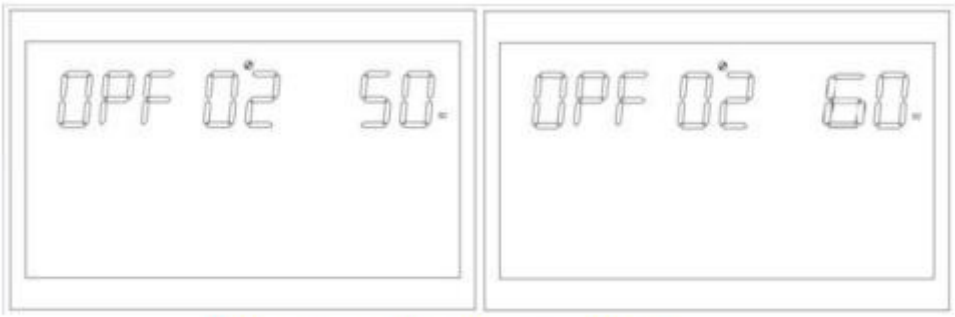


Figure 1-13 Setting the output frequency

Function description: Set the inverter output frequency. 50Hz and 60Hz can be set. The default value is 50Hz.
Setting conditions: All status can be set. In battery mode, the setting will take effect when the machine is restarted next time. The utility grid mode takes effect immediately. The frequency changes slowly after you switch it to battery mode.

4.5.2.2 Setting Output Priority (OPP)

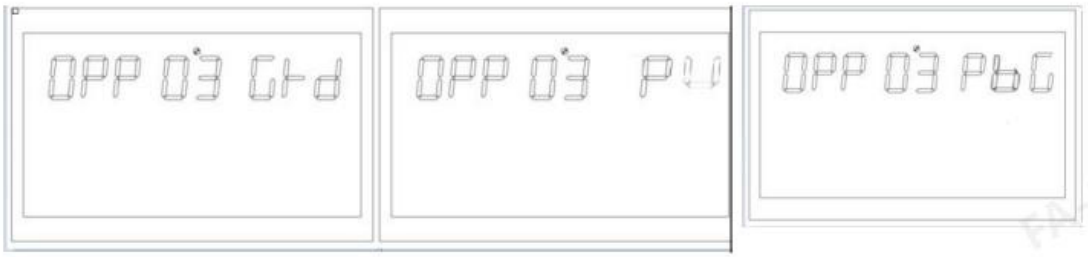


Figure 1-14 Setting the output priority page

Function description: Set the inverter output priority.
Setting conditions: All status can be set, and the setting takes effect immediately.
Note:
There are three options for the inverter output priority. The default output priority is GRD: The utility 31 grid output is preferred. The second is PU(PV): photovoltaic output is preferred; The third is PBG: photovoltaic >battery >utility grid output

4.5.2.3Output Mode (MOD)

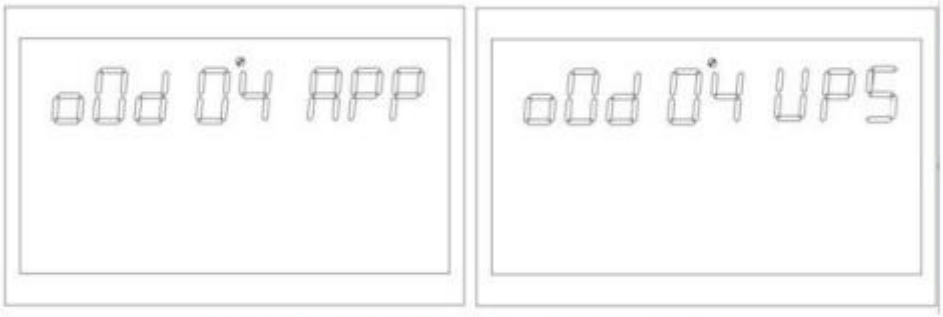


Figure 1-15 Setting the output mode

Function description: Set the inverter output mode.
Setting conditions: All status can be set and take effect immediately.
Description:
There are two options for AC output mode, the default mode is APP: Appliance, which is used for household appliances; The second is UPS mode, which is used for equipment such as computers. The typical switchover time is 10ms.

4.5.2.4 Charging Priority (CHP)

Figure 1-16 Setting the charging priority page

Function description: Set the charging priority of the inverter.
Setting conditions: All status can be set, and the Settings take effect immediately.

Description:

There are four charging priorities, the default priority is PNG (PV and Grid):PV charging and Grid charging are at the same time; The second is OPV(Only PV): Only PV charging; The third 32 is GRD(Grid): the charging priority is utility grid; The fourth is PV: the charging priority is PV charging.

4.5.2.5 Grid Charging Current (RCC)

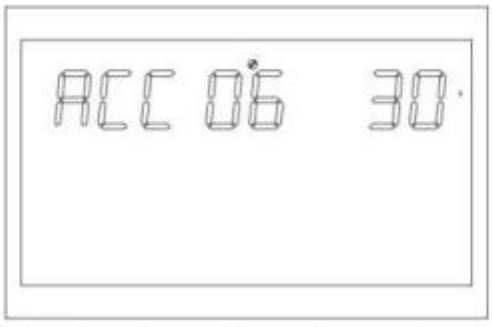


Figure 1-17 Setting the grid maximum charging current

Function description: Set the grid maximum rechargeable current of the inverter. Setting conditions: All status can be set.

Description:

RCC:The maximum charging current of grid is set to 30A by default,

and the setting range is [1,80A].

4.5.2.6 Maximum Charging Current (MCC)

Figure 1-18 Setting the maximum charging current

Function description: Set the maximum charging current of the inverter.
Setting conditions: All status can be set.

Description:
MCC:Maximum Charge Current refers to the Maximum value of PV and grid charging current. It is optional (2/10/20/30/40/50).

4.5.2.7 Menu Default (MDF)

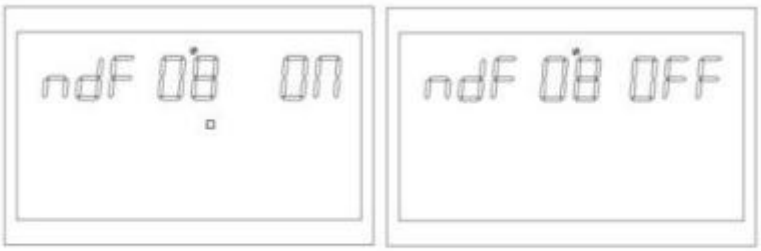


Figure 1-19 Returning to the Settings page

Function Description: Return to the main screen.
Setting conditions: All status can be set.
Description:
The default setting is ON. In the function setting operation, if it is set to ON, the page is not in the first interface (P1) at this time, and will return to the first interface after 1min; If this parameter is set to OFF, the LCD remains on this screen if the page is not in the first screen (P1).

4.5.2.8 Overload Restarting (LrS)

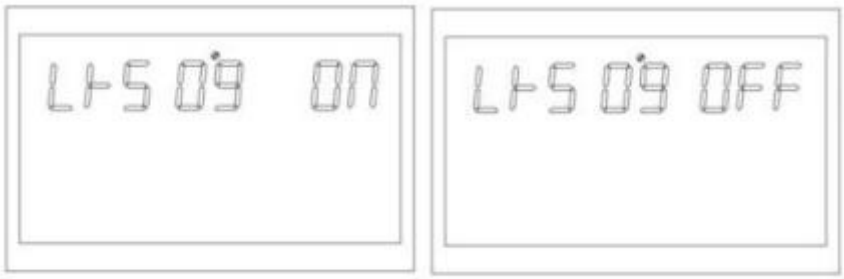


Figure 1-20 Setting the overload restart page

Function description: Set overload restart.
Setting conditions: All status can be set
Description:
The default setting of overload restart is ON.

4.5.2.9 Over-temperature Restart (TrS)

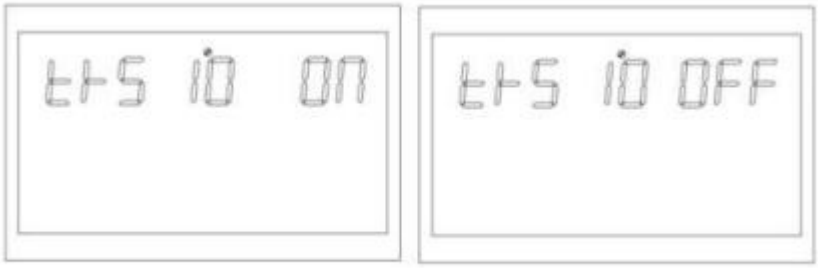


Figure 1-21 Setting the over-temperature restart page

Function description: Restart the system from over-temperature.
Setting conditions: All status can be set.
Description:
The default setting of over-temperature is ON.

4.5.2.10 Main Input Power Failure (MIP)

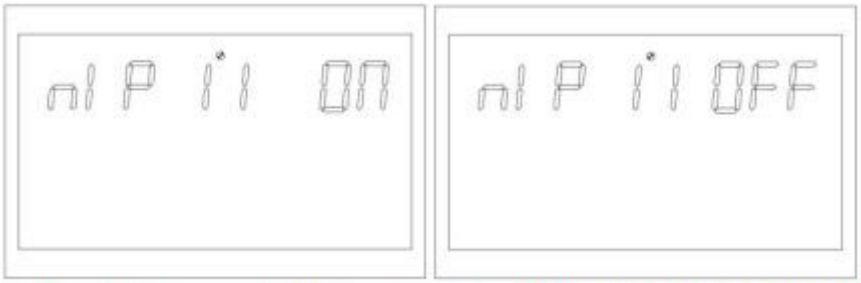


Figure 1-22 Setting the alarm page of main input power failure

Function description: Set the constant alarm for grid or PVloss.
Setting condition: All status can be set. The default status is ON. The grid or PV loss alarm keeps ringing for a period of time. You can set itto OFF.

(All modes can be set)
Description:
MIP:Main Input cut warning
The default value is ON. The buzzer will ring for 3 seconds if the primary input detection is lost. The buzzer does not sound frequently after the main input is lost when the parameter is set to OFF.

4.5.2.11 Energy Saving Mode

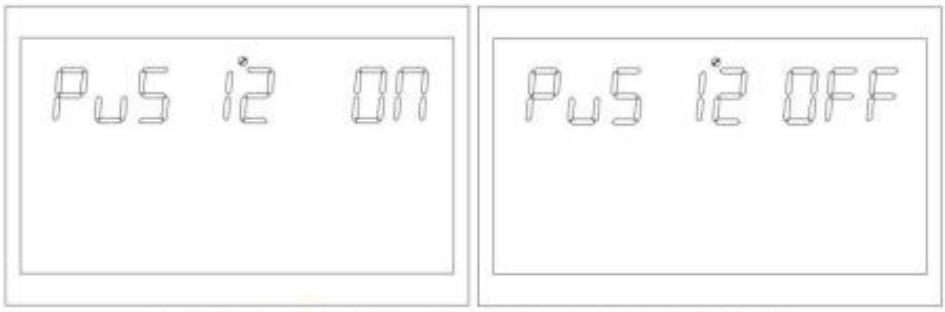


Figure 1-23 Setting the energy saving mode

Function description: Set whether to enable the low-power mode (energy saving mode) for the inverter.
Setting conditions: All status can be set.
Description:
PWS:Power Saving
The default value is OFF, and the function is disabled. In battery mode, the output of system will temporarily stop if the load is lower than 25W when this parameter is set to ON; The output will continue if the load is higher than 35W, and the output of system will resume normal.

4.5.2.12 Transition from Overload to Bypass Mode (OLG)

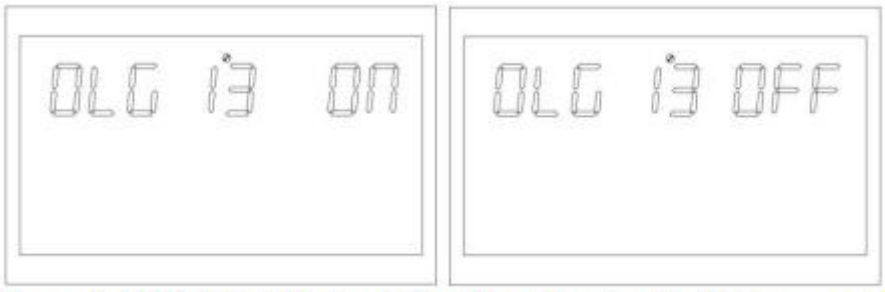


Figure 1-24 Setting the transition from overload to bypass mode

Function description: Set whether to switch to grid mode immediately (also known as bypass mode) when it is overloaded in battery mode.
Setting conditions: All status can beset.
Description:
OLG:Overload to Bypass
The default value is OFF, and the function is disabled. The system will

immediately switch to bypass mode (grid output, that is, bypass mode) if the PV output is overloaded when the value is set to ON, .

4.5.2.13 Setting Mute (MUE)

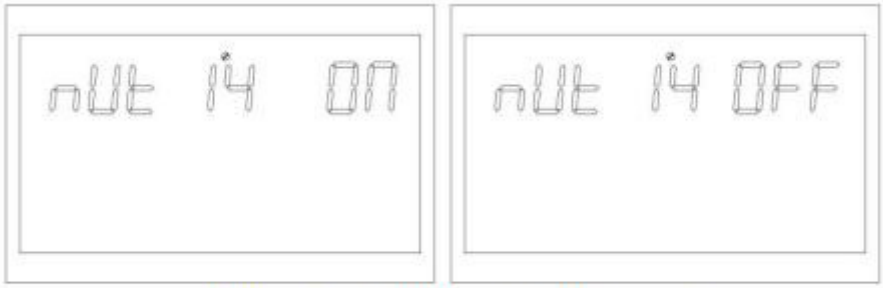


Figure 1-25 Setting the mute page

Function description: Sets whether the buzzer beeps.
Setting conditions: All status can be set.
Description:
MUE:Mute
The default value is OFF, and the Mute function is disabled. The buzzer does not sound in any state, such as alarm or fault when the parameter is set to ON.
It can be set in any modes , and the function is normal, but the picture can not be displayed.

4.5.2.14 Battery Return to Grid Voltage Point (BTG)

Figure 1-26 Switching the battery back to the grid voltage point

Function Description: It transfers to grid power supply only to ensure that the battery will not be empty when the battery and grid power supply at the same time and the battery discharging reaches a certain voltage.
Setting conditions: All status can be set, and the output priority must be set in PV and PBG mode.
Description:
BTG:Back To Grid
The default value is 46V

When the definition mode of battery is CUS(Customer Set Type) mode: The range can be [44,52]
When the battery is AGM(lead-acid battery type) or FLD (water-injection battery type) : The default value is 46V. The range can be [44,52].
When the battery is LIB (lithium battery type) : The default value is 47.6V. The range can be [40,50].

4.5.2.15 Switching Back to Battery Mode Voltage Point (BTB)

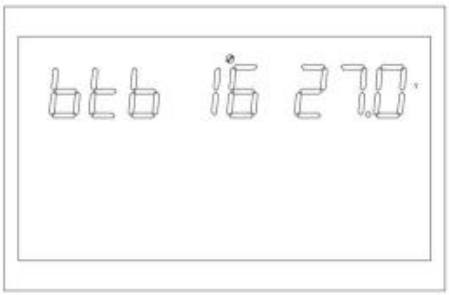


Figure 1-27 Setting the battery voltage point that let Grid mode switch back to battery mode

Function Description: It needs to reach a certain battery voltage value to restart the battery mode after shutdown for a low battery voltage.
Setting conditions: All status can be set.
Description:
BTB:Back To Battery
The default value is 52V
When it is set to FUL, the battery will be charged until it is fully charged before restarting in battery mode.
When the definition mode of battery is CUS(Customer Set Type) mode: It can be set in the range of[48,58]
When the definition mode of battery is AGM(lead-acid battery type) or FLD (water-injection battery type)
The default value is 52V. The range can be[48,58]
When the definition mode of battery is LIB (lithium battery type) : The default setting is 54.4v, and the range can be set to [46,58]

4.5.2.16 Battery Type (BAT)

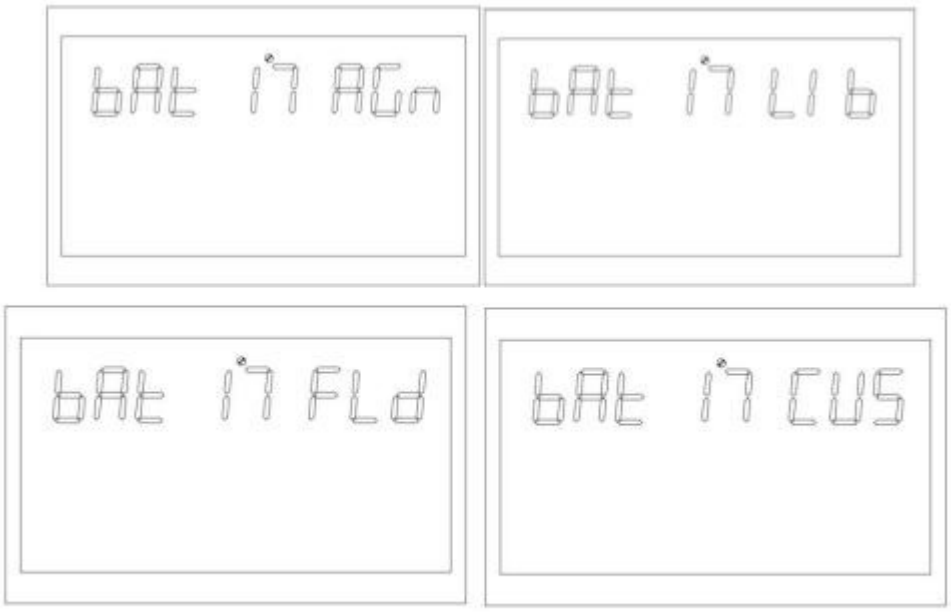


Figure 1-28 Battery type setting page

Function Description:Set the battery type.
Setting conditions: All status can beset.
Description:
BAT:Battery Type
Four battery types are set: AGM(lead-acid battery) is set as the default; The second is FLD(water injection battery); The third type is LIB (lithium battery); The fourth is CUS(Customer setting type)

4.5.2.17 Battery Low Voltage Point (bAL)

Figure 1-29 Setting the battery low voltage point

Function Description: Sets the low alarm point.
Setting conditions: All status can be set.
Description:

bAL:battery Low
This parameter cannot be set when the definition mode of battery is

AGM(lead-acid battery type) 39 or FLD (water-injection battery type).
The default value is 44V
The battery low voltage point can be modified when the battery type is set to CUS(Customer set type).
The value range is [42,54].
If the battery type is set to LIB(lithium battery type), you can change the battery low voltage point.
The default value is 47.6V, and the range is [41.2,50.0].

4.5.2.18 Battery Shutdown Point (bAU)

Figure 1-29 Setting the battery shutdown point

Function Description: Battery low voltage shutdown point setting
Setting conditions: All status can beset.
Description:
bAU:battery Under
This parameter cannot be set when the battery definition mode is AGM(lead-acid battery type) or FLD (water-injection battery type).
The default value is 42V
The battery shutdown point can be modified when the battery type is set to CUS(Customer Setting type)
The value range is [40,48]
When the battery type is set to LIB(lithium battery type), you can change the battery shutdown point.
The default value is 46V. The value range is [40,4].

4.5.2.19 Setting Voltage Points in Constant Voltage Mode (bCV)

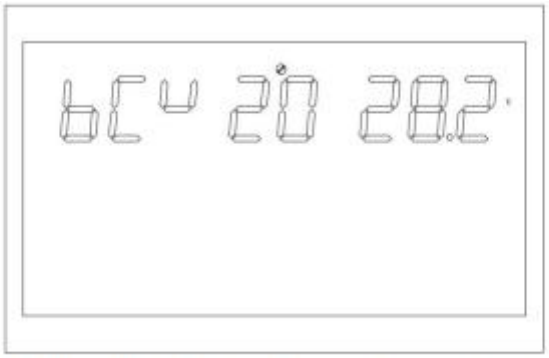


Figure 1-30 Setting the voltage point in constant voltage mode

Function Description: Constant voltage point setting.
Setting conditions: All status can beset.
Description:
bCV:battery Constant Volt
This parameter cannot be set when the definition mode of battery is AGM(lead-acid battery type) or FLD (water-injection battery type).
Initial default Settings: 56.4V (AGM), 58V (FLD)
The constant voltage charging point can be modified when the battery type is set to CUS(Customer Setting type).
The value ranges from 48 to 60. The constant point voltage needs to be greater than the floating point voltage.
If the battery type is set to LIB(lithium battery type), the constant voltage charging point can be changed.
The default value is 56.4V and the value range is [48,60]. The constant point voltage needs to be greater than the floating point voltage.

4.5.2.20 Voltage Point Setting in Floating Charge Mode (bFL)

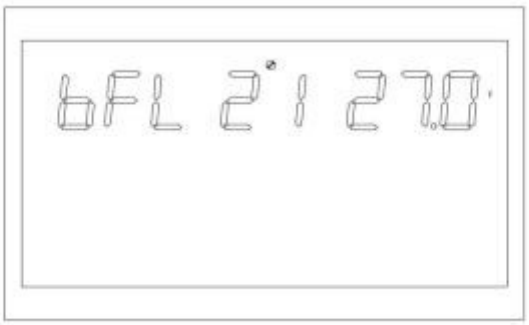


Figure 1-31 Setting voltage point in floating charge mode

Function Description: Float charging voltage point setting.
Setting conditions: All status can be set.
Description:

bFL:battery Float
This parameter can not be set when the definition mode of battery is

AGM(lead-acid battery type) or FLD (water-injection battery type)
The default value is 54V
The battery type is set to CUS(Customer Setting Type) to modify the floating battery charge point.
The value ranges from 48 to 60V. The constant point voltage needs to be greater than the floating point voltage.
If the battery type is set to LIB(lithium battery type), the constant voltage charging point can be changed.
The default value is 55.2V. The value range is [50,58]. The constant point voltage needs to be greater than the floating point voltage.

4.5.2.21 Low Voltage Point Setting of Grid (LLV)

Figure 1-32 Setting the low-voltage point of grid in inverter mode

Function Description: Set the low voltage protection point of grid.
Setting conditions: The inverter is in APP and UPS mode, and all status can be set.
Description:
LLV:Line Low Voltage

Output mode: MOD needs to be set to APP, the default value of low voltage point of grid is 154V, and the range of setting is [90,154]; Output mode: MOD needs to be set to UPS, the default value is 185V, and the range is [170,200].

4.5.2.22 Setting High Voltage Point of Grid (LHV)

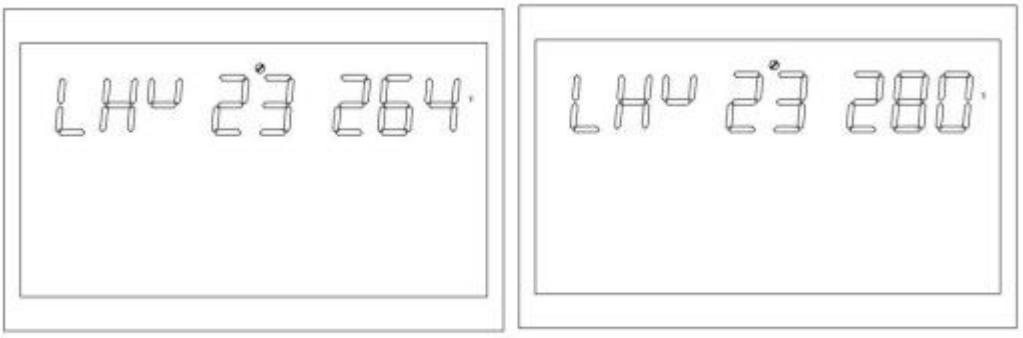


Figure 1-33 Setting high voltage point of grid

Function Description: Set the high voltage protection point of grid.
Setting conditions: The inverter is in APP mode, and all status can be set.
Description:
LHV:Line High Voltage
Output mode: MOD needs to be set to APP, the default value of high voltage point of grid is 264V, and the range is [264,280].

4.5.2.23 Setting Low Power Discharging Time (LWD)

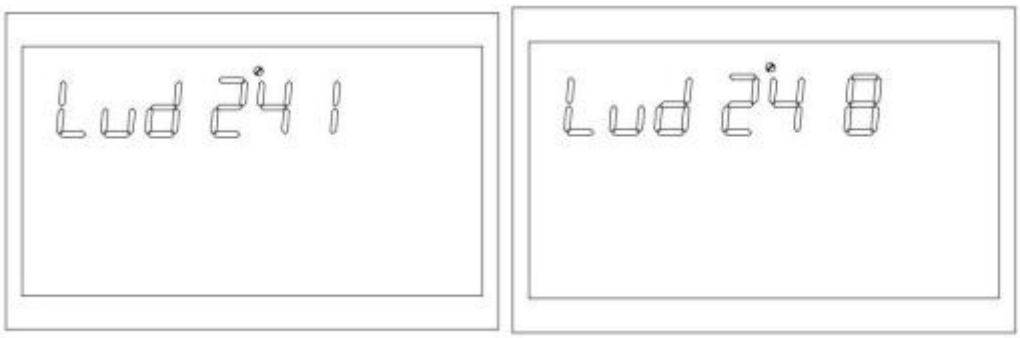


Figure 1-34 Setting the low-power discharging time

Function Description: LOW POWER DISCHARGING PROTECTION FUNCTION, IN BATTERY MODE, at a low load, unlimited time of discharging will make the battery very empty, affecting the battery life. In the setting time of low power amplifier of Inverter, the low voltage shutdown point of battery will be increased to 44V.
Setting conditions: All status can be set when the inverter is set in APP mode.
Description:
LWD:Low Watt Discharge
The default value of low-power discharging time is 8(8 hours), and the range can be [1, 8]. In battery mode, if not reached the battery shutdown point, the battery voltage shutdown point will be changed to 11V* number of batteries after the continuous discharging time of more than 8 hours.

The system will alarm for 1 minute and then shut down when the battery is discharged to 11V* number of batteries.
The battery discharging time is reset when the battery voltage exceeds 13.2V x the number of batteries for more than 30s, .

4.5.2.24 Inverter Soft Start Setting (SRE)

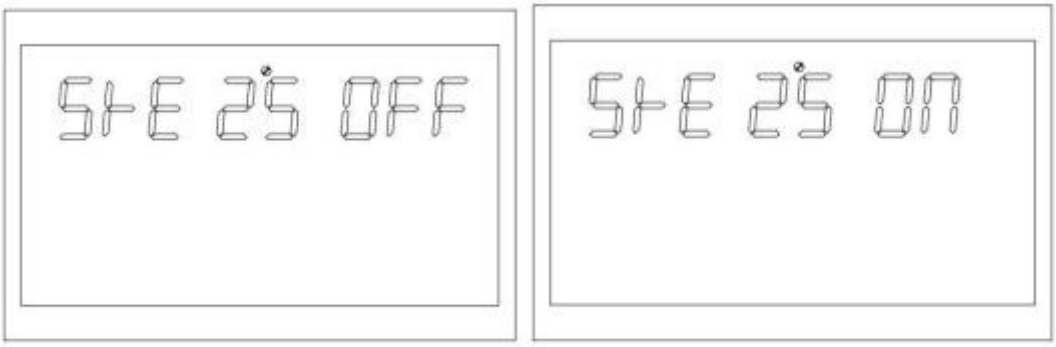


Figure 1-35 Setting the soft startup of the inverter

Function: The inverter output voltage gradually increases from 0 to the target value when the interface is in the start state. The inverter output voltage is directly increased from 0 to the target value when the interface is in the OFF state.
Setting conditions: All status can be set.
Description:
SRE:Soft Relay Enable
If the default value is OFF, the output switch is turned to on only when the inverter voltage rises to the rated output. If this parameter is set to ON, the output switch is turned to ON before the inverter starts to boost voltage.

4.5.2.25 Setting Default Values (STD)

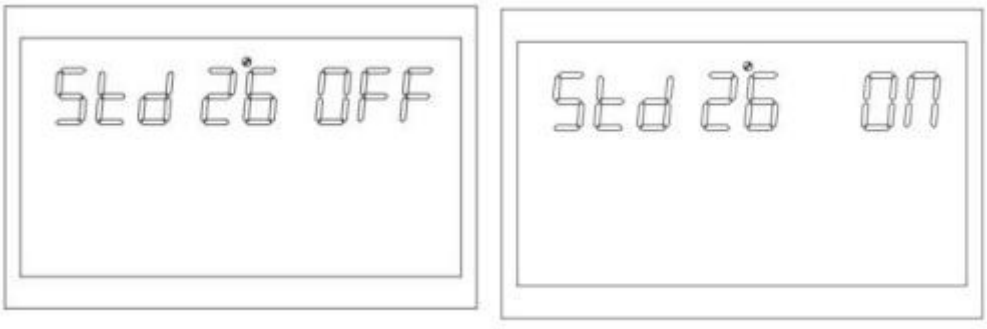


Figure 1-36 Setting default values

Restore all Settings to default values.
Setting conditions: This parameter can be set in grid mode or StandBy (StandBy: no output but the screen is on). It can not be set in battery mode.

Description:
STD:Set Default
Before the setting, the screen is displayed as OFF. The system restores the default setting when the screen is set to ON. After the setting is completed, the screen will display OFF again. It can be set in grid and standby mode and take effect immediately. It can not be set in battery mode and pictures can not be displayed.

4.5.2.26 Battery Missed (SBA)

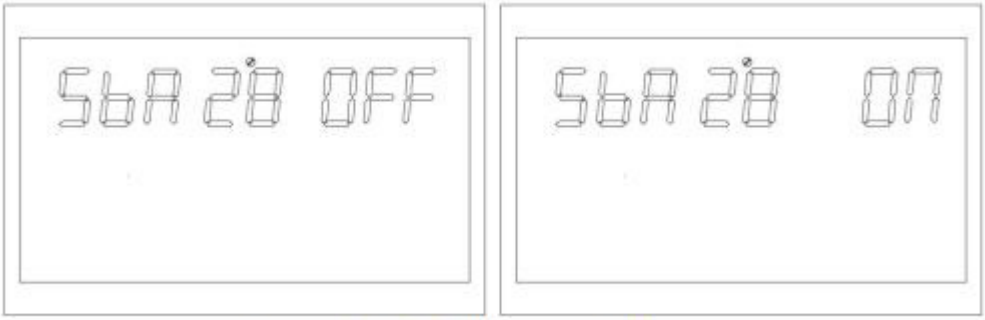


Figure 1-36 Setting default values

Function Description: Enable the unconnected battery alarm.
Setting conditions: All status can be set.
Description:
SBA:Set battery alarm
The default setting is OFF.
If this parameter is set to OFF, no battery unconnected, battery low voltage, or battery under voltage alarms will be generated when the battery is not connected.

4.5.2.27 Balancing Mode (EQM)

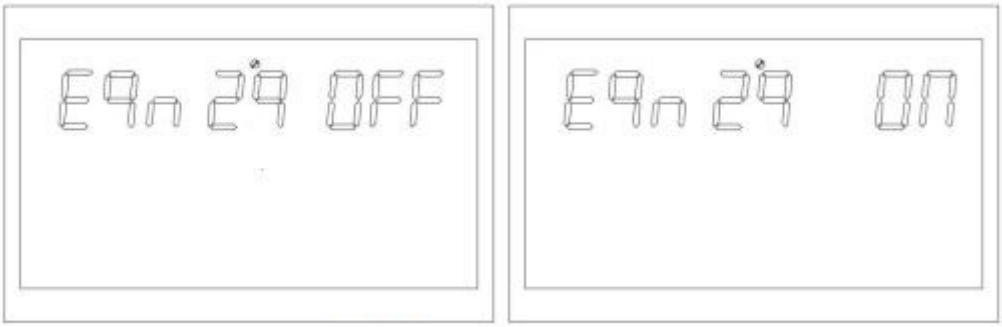


Figure 1-37 Setting the balancing mode

Function: Sets whether to enable the balance mode.
Setting conditions: All status can beset.
Description:

EQM:Equalization Mode
The default value is OFF, and the function is disabled. Set to ON, the controller will enter the equalization phase when the equalization interval (battery equalization cycle) set is achieved during the floating charging phase, or when the equalization is activated immediately.

4.5.2.28 Setting the Equalization Voltage Point (EQV)

Figure 1-38 Setting the voltage balancing point

Function Description: Equalization voltage point setting function.
Setting conditions: All status can be set.
Description:
bCV:Equalization Voltage
All modes can be set.
The default value is 58.4V , and the value range is [48,60].

4.5.2.29 Setting Balanced Charging Time (EQT)

Figure 1-39 Setting the balanced charging time

Function Description: Balance charging time setting.
Setting conditions: All status can be set.
Description:
EQT:Equalization Time
In the equalization phase, the controller will charge the battery as much as possible until the battery voltage rises to the equalization voltage. Then constant voltage regulation is used to 47 maintain the balanced voltage of the battery. The battery will remain in the equalization phase until the setting equalization time of battery is up.

The default value is 60 minutes. The value can be set in the range of [5,900], and the value can be set in increments of 5 minutes every time.

4.5.2.30 Setting the Balancing Delay (EQO)

Figure 1-40 Setting the delay balancing page

Function Description: Balancing delay charging time setting.
Setting conditions: All status can be set.
Description:
EQT:Equalization Timeout
In the equalization phase, the charging controller extends the battery equalization time until the battery voltage become balanced when the battery equalization time expires and the battery voltage does not rise to equalization voltage point. The charging controller stops equalization and returns to the floating charging phase when the battery equalization delay is completed and the battery voltage is still lower than the equalization voltage.
The default value is 120 minutes. The value can be set in the range [5,900], and the value can be set in increments of 5 minutes every time.

4.5.2.31 Setting the Balancing Interval (EQI)

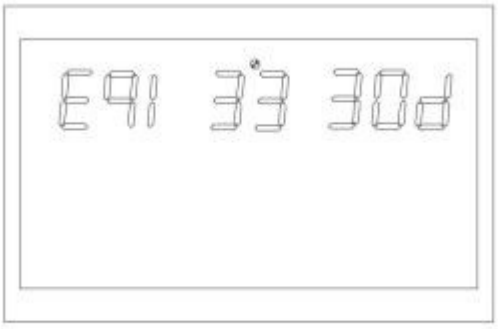


Figure 1-41 Setting the balancing interval

Function Description: Balanced charging interval setting.
Setting conditions: All status can be set.
Description:

EQI:Equalization interval
In the float charging stage with balanced mode enabled, if battery connection is detected and the setting equalization interval (battery equalization period) is reached, the controller start entering the equalization phase.
The default value is 30 days. The value range is [1,90], and the increments are 1 day every time.

4.5.2.32 Enabling Balancing Settings Immediately (EQN)

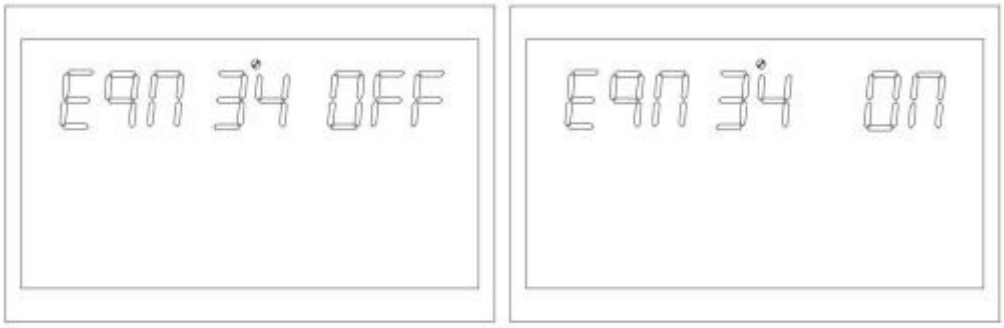


Figure 1-42 Start Balancing Settings Immediately page

Function: Set whether to enable the balancing mode for the inverter immediately.
Setting conditions: All status can beset.
Description:
EQN:Equalization Now
The default value is OFF, and the function is disabled. When set to ON, the equalization charging is activated immediately and the controller begins to enter the equalization phase when the battery is detected in the floating charging phase under the equalization mode.

4.5.2.33 Battery dual-circuit output low-voltage shutdown point (DBV)

Figure 1-44 Dual-way output low-voltage shutdown point of Battery page

Function description: The secondary circuit output of inverter is turned on by default after turn the inverter on. The secondary output is closed when the battery voltage is lower than the shutdown point after entering the battery mode. The secondary output is turned on when the battery voltage is again higher than the setting value + 1V / section.
Set conditions: All status can be set.
Description:
DBV:Dual output cut-off voltage in battery mode
Dual output cut-off voltage in battery mode is set by default to 48V and can be set range [44,60]
Take the constant voltage charging point as the recovery voltage when the setting point is higher than the constant voltage charging (CV) point-1V / section, .
* This function needs to be used together with a dual-way output auxiliary board.

4.5.2.34 Battery dual-output Duration (DBT)

Figure 1-45 Battery dual-way output low-voltage shutdown point page

Function description: The secondary circuit output of inverter is turned on by default after turn the inverter on. The secondary output is closed when the battery discharging time reaches the setting point after entering the battery mode.
Setting conditions: All status can bet.
Description:
DBT:Dual output cut-off time in battery mode
The default setting is OFF, the function is not on, it can be set to [5,890] in minutes. The secondary output has unlimited output time when set to FUL.
* This function needs to be used together with a dual-way output auxiliary board.

4.5.2.35 BMS communication function (BMS)

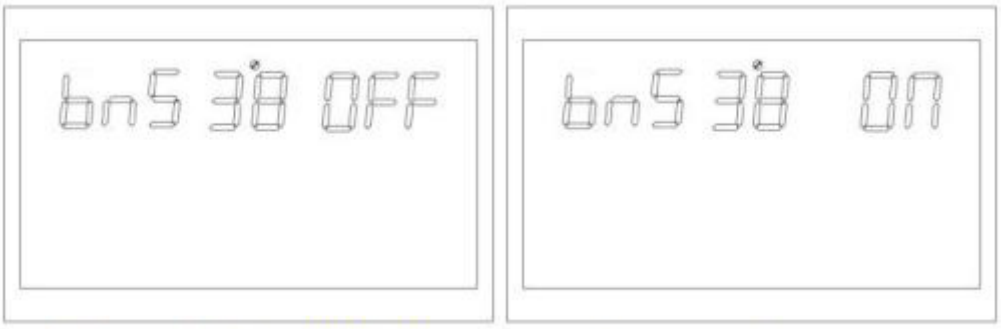


Figure 1-46 The B M S Management Function Settings page

Function description: Set whether the inverter communicates with the BMS of lithium battery. Setting conditions: All status can beset.
Description:
BMS:Battery Management System
The default setting is OFF, and the function is not on; The inverter communicates with the BMS of lithium battery through the central control board, and receive the battery information when set to ON.
After the function is turned on, if the communication abnormality occurs, an alarm 56 is generated, and the inverter no longer decides the operation logic according to the BMS information.
* This function needs to be used together with the central centralized control board.
* This page is blocked when the central centralized control board is not accessed.

4.5.2.36 Low SOC shutdown function (BSU)

Figure 1-47 Low SOC Shutdown function setting page

Function description: Shutdown when low SOCis set.
Setting conditions: All status can be set.
Description:
BSU:Battery SOC under lock

The default value is 20, and the range can be set to [5,50]. In battery mode, shut down and call the alarm 68 when the lithium battery SOC reaches the setting point. Clear the alarm 68 when returning to the set value +

5%. In standby mode, it is necessary to reach the setting value+10% before switching to battery mode. An alarm 69 will be triggered if it is not reached. An alarm 69 will be triggered when the lithium battery SOC reaches the setting value + 5% after the function is turned on, and alarm 69 will be cleared when it returns to the setting value + 10%.
It can be set to OFF, and the inverter will no longer turn down, startup and alarm according to SOC.
After the function is turned on, the inverter will no longer decide the operation logic according to the SOC information, and clear the relevant alarms if an abnormal communication occurs.
* This function needs to be used together with the central centralized control board.
* The page is blocked when the central centralized control board is not accessed.

4.5.2.37 Set the SOC to turn to battery mode (STB)

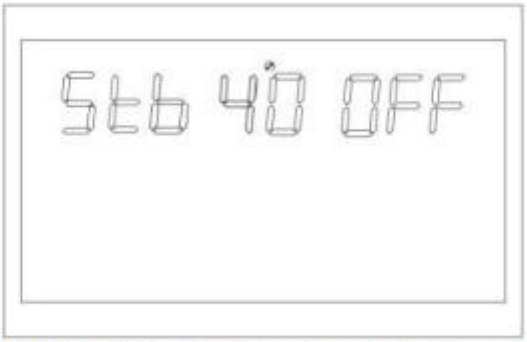


Figure 1-48 Set the SOC to turn to battery mode

Function description: Set the SOC value to turn to batterymode.
Set conditions: All status can be set
Description:
STB:Set the grid to battery mode.
The default setting is 90, and the range can be set to [10,100]. The inverter will switch to battery mode when the lithium battery SOC reaches the setting value If the PBG priority is set and the grid power is normal.
It can be set to OFF, and at this time the inverter will no longer switch to battery mode from grid mode according to the SOC situation.
The function is enabled, if an abnormal communication occurs, the inverter will no longer decide the operation logic according to the SOC information and clear the relevant alarm.
* This function needs to be used together with the central centralized control board.
* This option page is blocked when the central centralized control board is not accessed.

4.5.2.38 Set SOC to grid function (STG)

Figure 1-49 Set SOC to grid function setting page

Function description: Set the SOC value of inverter switching to grid mode.
Set conditions: All status can be set.
Description:
STG:Switch to grid mode when the battery SOC is low.
The default value is 50, and the range can be set to [10,90]. The inverter will switch to grid mode when the lithium battery SOC reaches the setting value If the PBG priority is set and the grid power is normal.
It can be set to OFF, and at this time the inverter will no longer switch to grid mode from battery mode according to the SOC situation.
The function is enabled, if an abnormal communication occurs, the inverter will no longer decide the operation logic according to the SOC information, and clear the relevant alarm.
* This function needs to be used together with the central centralized control board.
* This option page is blocked when the central centralized control board is not accessed.

4.6 Fault and Alarm Description

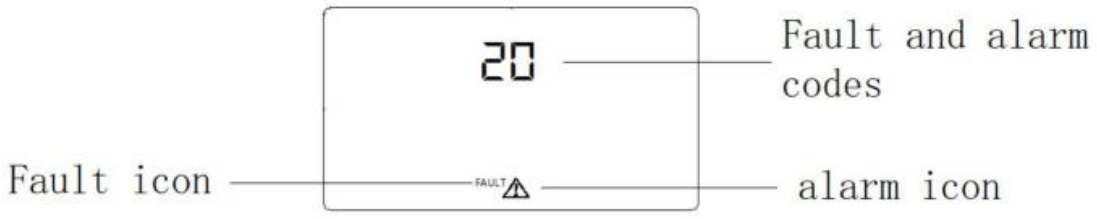


Figure 1-43 Fault and alarm ICONS

Function: The alarm code ALA blinks and the buzzer rings one time per second and last for 1 minute. The buzzer will ring for 10 seconds and stop if the fault indicator is steady on, and the fault will be eliminated after the buzzer ringing stops. It will remain in the fault state if you try to restart the inverter and fail to restart it for six times. You need

to completely power it off (display distinguish) or wait for 30 minutes before you can restart the machine.
The fault and alarm on LCD display is shown as above figure. The fault icon is steady on in fault mode, and the alarm icon blinks in Alarm Status. Contact the manufacturer to rectify the fault.

4.6.1 Fault Description

Fault: The inverter enters fault mode, the LED is steady red, and the LCD displays the fault code.

Table of fault codes

Fault code	Fault	Relevant action	The trigger condition	Restore conditions	The fault alarm
1	Bus soft start fail	Transfer to failure mode	The setting voltage can not be reached when the bus soft start	unrecoverable	The fault
2	Bus over voltage	Transfer to failure mode	The bus is above the setting value	unrecoverable	The fault
3	Bus low voltage	Transfer to failure mode	The bus is below the setting value	unrecoverable	The fault
4	Battery Over Current	Transfer to failure mode	The battery is immediately protected when the battery current exceeds 580A.	unrecoverable	The fault
5	Over temperature	Transfer to failure mode	The temperature of PFC or INV sensor is higher than the	Restart after this function is enabled, the system can not	The fault

			over-temperature setting point	be recovered after three failed restarts	
6	Battery over voltage	Transfer to failure mode	The battery voltage is above the setting value	recoverable	The fault
7	Bus soft Fault	Transfer to failure mode	The DC soft starting voltage of the bus does not reach the setting value	unrecoverable	The fault
8	Bus short Fault	Transfer to failure mode	The bus is below the setting value instantaneously when working normally.	unrecoverable	The fault
9	INV soft Fault	Transfer to failure mode	It still can not reach the rated output voltage after soft-starting the inverter for a period of time	unrecoverable	The fault
10	INV over voltage	Transfer to failure mode	In battery mode, the inverter voltage is higher than the setting value	unrecoverable	The fault
11	INV under voltage	Transfer to failure mode	In battery mode, the inverter voltage is lower than the setting value	unrecoverable	The fault
12	INV short circuit	Transfer to failure mode	The inverter voltage is lower than the setting value, and the current is higher than the setting value	It can not be recovered if a fault restart fails for six times	The fault
13	Negative power	Transfer to failure mode	The inverter power is less than the setting value for a period of time	unrecoverable	The fault
14	Overload fault	Transfer to failure mode	The load exceeds specifications	Restart After this function is enabled, the system can not be recovered after three failed restarts	The fault
15	Model Fault	Transfer to failure mode	The software identification machine model does not match the hardware detection	unrecoverable	The fault

16	No bootstrap program	Transfer to failure mode	No bootstrap	unrecoverable	The fault
17	PV program burning	Transfer to failure mode	Burning the PV control program	It will be restored after finishing burning	The fault
19	Same Serial No.	Transfer to failure mode	In parallel mode, multiple machines with the same serial number are detected	unrecoverable	The fault
20	CAN Fault	Transfer to failure mode	In parallel mode, the communication between the CAN and bus is abnormal	unrecoverable	The fault
21	BAT Volt Different	Transfer to failure mode	In parallel mode, the battery voltage value of different machines is too different	unrecoverable	The fault
22	Input Volt Different	Transfer to failure mode	In parallel mode, the input voltage value of different machines is too different	unrecoverable	The fault
23	Input Freq Different	Transfer to failure mode	In parallel mode, the input voltage frequency of different machines is too different.	unrecoverable	The fault
24	Output Setting Different	Transfer to failure mode	In the three-phase parallel mode, there is phase deficiency in the parallel mode Settings of different machines	Recover when set to single machine operation or when the conditions for three-phase operation are met	The fault
25	Output out of sync	Transfer to failure mode	In parallel mode, the output voltage detection is out of sync	unrecoverable	The fault
26	BMS Fault	Transfer to failure mode	The battery BMS has fault information	Turn off the BMS communication function, or eliminate the BMS faults and restore it	The fault

4.6.2 Alarm Description

Alarm: The inverter is not in fault mode, the LED blinks red, and the LCD displays the alarm code.

Table of alarm codes

The alarm code	Alarm	Relevant action	The trigger condition	Restore conditions	The fault alarm
50	Battery Disconnected	Alarm: The battery is not charged	The battery voltage is lower than 8V/ node	Recoverable (10V/ knot)	The alarm
51	Battery low voltage and shutdown	Alarm: Low battery voltage to shutdown or no startup	Battery voltage lower than 10.5V/ node (default)	Recoverable (10V/ node +0.2* N (number of batteries))	The alarm
52	Battery low voltage	The alarm	Depending on bAL Settings	Recoverable (action point +0.2V/ knot)	The alarm
53	Battery charger short circuit	Alarm: The battery is not charged	The battery voltage is lower than 5V and the charging current is higher than 4A	unrecoverable	The alarm
54	Low power discharge	Alarm	Battery discharging time exceeds the setting time of low-power discharging	Recoverable (battery voltage above 13.2V/)	The alarm
55	Over charge	Alarm: The battery is not charged	The battery voltage is higher than the setting value	Recoverable	The alarm
56	BMS Loss	Alarm, lock in standby mode	Communication has failed after the BMS communication function is turned on	Recoverable	The alarm
57	Over Temperature	Alarm: The battery is not charged	The temperature of PFC or INV sensor is higher than the setting value	The temperature of PFC or INV sensor is lower than the setting value	The alarm
58	Fan Fault	Alarm: One	No fan speed	recoverable	The alarm

		fan is faulty and another fan is working at full speed	signal is detected.		
59	EEPROM fail	The alarm	EEPROM read/write fails.	unrecoverable	The alarm
60	Overload	Alarm: The battery is not charged	Load > 102%	Recoverable (load <97%)	The alarm
61	Abnormal generator waveform	Alarm, continue to work in battery mode	Generator waveform detection is abnormal	recoverable	The alarm
62	PV Energy Weak	Shut down PV output and charge	The bus voltage is lower than the setting value when the battery is not connected.	Recover after 10 minutes	The alarm
63	Synchronization signal fail	Alarm, transfer to fault mode	The parallel board is disconnected	Switch to single machine mode or eliminate the disconnecting fault	The alarm
64	Parallel configuration incompatible	Alarm: Switch to standby mode	There is a missing phase when the three phase is combined	The three phases are restored when the setting are correct	The alarm
65	Parallel version incompatible	Alarm: Switch to standby mode	The parallel system has incompatible version number.	Restore when all machine versions in a parallel system are compatible with each other	The alarm
66	Parallel Communication Fault	Alarm: Switch to standby mode	Slave machine can not be detected in parallel system	The slave machine is detected in the parallel system, or the single-machin	The alarm

				e mode is set.	
67	Different in grid power supply under parallel operation	The alarm	Excessive error in grid voltage or frequency of each machine under parallel operation	Restore when detecting reasonable errors in the grid voltage and frequency of each machine	The alarm
68	Low SOC to shut down	Alarm, turn to standby mode	Lithium battery SOC is below the setting value	Turn off the shutdown function of low SOC, or turn off the BMS communicatio n function, or recover when the SOC returns to the Setting value + 5%	The alarm
69	Low SOC	Alarm, Maintain shutdown status if in standby mode	Lithium battery SOC is below setting value+ 5% (grid or battery mode) or below setting value + 10% (standby mode)	Turn off the shutdown function of low SOC , or turn off the BMS communicatio n function, or recover when the SOC returns to Setting value + 10%	The alarm

Specifications

Table 1 Line Mode Specifications

Input Voltage Waveform	Sinusoidal (utility grid or generator)
Nominal Input Voltage	230Vac
Low Loss Voltage	185Vac (UPS); 90Vac (Appliances)
Low Loss Return Voltage	185ac+10V (UPS);90+10V (Appliances)
High Loss Voltage	264Vac (UPS); 280Vac (Appliances)
High Loss Return	264ac-10V (UPS);280-10V (Appliances)
Nominal Input Frequency	50Hz / 60Hz (Auto detection)

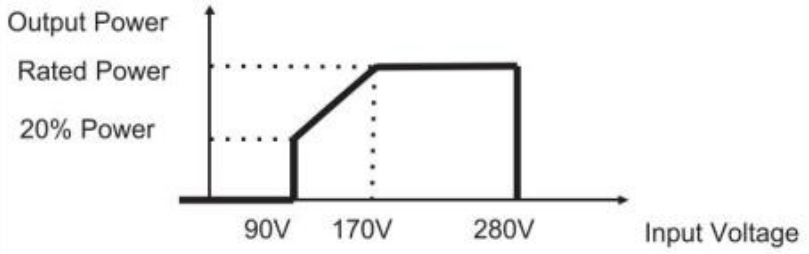
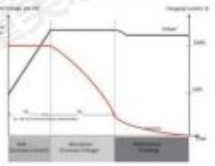
Low Loss Frequency	40±1 Hz
Low Loss Return	42±1 Hz
High Loss Frequency	70±1 Hz
High Loss Return	65±1 Hz
Output Short Circuit	Circuit Breaker
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)
Transfer Time	10ms typical, 20ms Max@ Single <30ms @ Parallel
Output power derating: The output power will be derated when AC input voltage drops to 170V.	

Table 2 Inverter Mode Specifications

Rated Output Power	5KVA/5KW
Output Voltage Waveform	Pure Sine Wave
Output Voltage Regulation	230Vac±3%
Output Frequency	50Hz/60Hz
Nominal Output Current	21.7A
Peak Efficiency	>93%
Overload Protection	5s@>150% load; 10s@110%~150% load
Surge Capacity	2* rated power for 5 seconds
Nominal DC Input Voltage	48Vdc
Cold Start Voltage(Lead-Acid Mode)	48Vdc
Cold Start SOC(Li Mode)	Default 30%, Low DC Cut-off SOC +5%
Low DC Warning Voltage (Lead-Acid Mode)	44.0Vdc
Low DC Warning Return Voltage (Lead-Acid Mode)	46.0Vdc
Low DC Cut-off Voltage (Lead-Acid Mode)	42.0Vdc
Low DC Warning SOC (Li Mode)	Low DC Cut-off SOC +5%
Low DC Warning Return SOC (Li Mode)	Low DC Cut-off SOC +10%
Low DC Cut-off SOC(Li Mode)	Default 20%, 5%~50% settable
High DC Recovery Voltage	58Vdc (C.V. charging voltage)
High DC Cut-off Voltage	64Vdc
No Load Power Consumption	<60W

Table 3 Charging Mode Specifications

Utility Charging Mode	
INVERTER MODEL	OH5000TL
Charging Algorithm	3-Step

Max. AC Charging Current		80Amp(@VI/P=230Vac)
Bulk Charging Voltage	Flooded Battery	58Vdc
	AGM / Gel Battery	56.4Vdc
Floating Charging Voltage		54Vdc
Charging Curve		
MPPT Solar Charging Mode		
Max. PV Array Power		5500W
Max. PV Input Current		18A
Start-up Voltage		150Vdc±10Vdc
PV Array MPPT Voltage Range		120Vdc~430Vdc
Max. PV Array Open Circuit Voltage		500Vdc
Max. PV Charging Current		80A
Max. Charging Current (AC Charger Plus Solar Charger)		80A

Chapter 5. Introduction and Installation of Energy Storage Battery

5.1 Safety Precautions

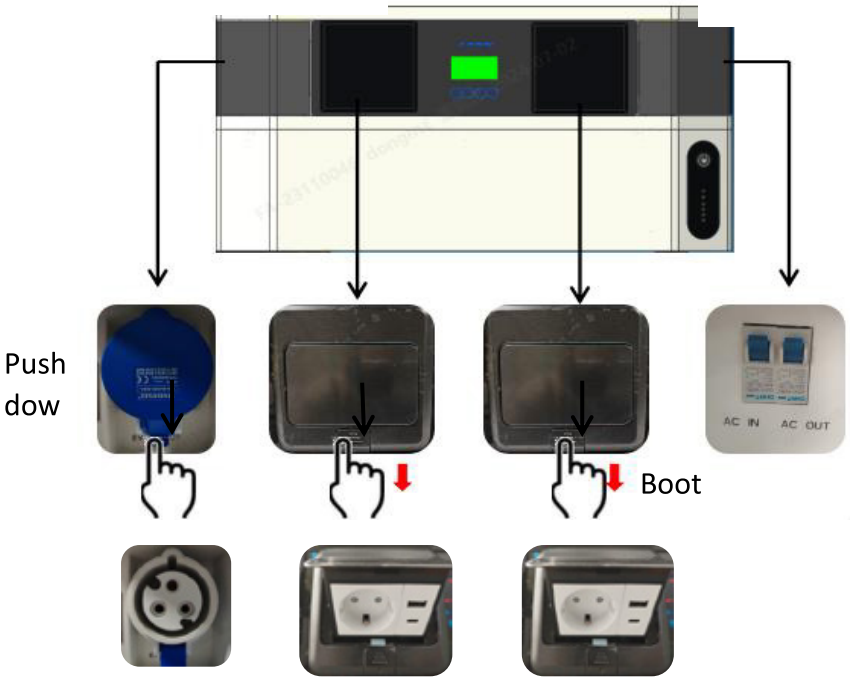
- If the battery is stored for a long period of time, it needs to be recharged every three to six months and the SOC should be no less than 80%.
- If the battery is fully discharged, it needs to be recharged within 12 hours.
- Do not connect the battery to the photovoltaic solar energy directly with.
- It is prohibited to insert any foreign object into any part of the battery.
- Always disconnect power from the grid and make sure the battery is in the off mode before installation.
- Prohibit connection of batteries to different types of batteries.
- If it is necessary to move or repair the battery system, the power must first be disconnected and the battery completely shut down.
- In the event of a fire, only dry powder fire extinguishers may be used, and the use of liquid fire extinguishers is prohibited.
- Do not open, repair or disassemble the battery. We do not accept any responsibility or liability for the consequences of any violation of safe operation or of design, production and equipment safety standards.

5.2 Introduction to Interfaces

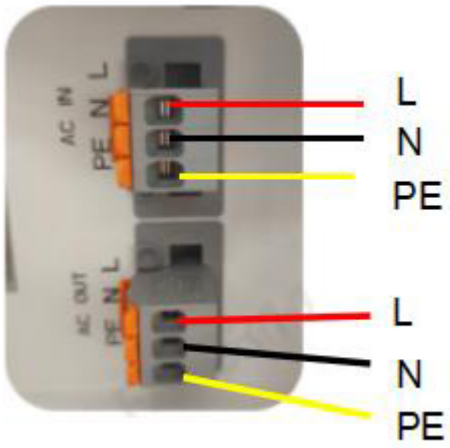
The interface is schematically shown below:

AC Circuit input and output

PV input and AC Circuit input



5.2.1 Mains access and mains output (as shown below)



Take connecting one of the wires as an example:

Press the buckle to remove the terminal

Peel one end of the wire about 10mm

Push the terminal upward

Insert the exposed wire into the terminal

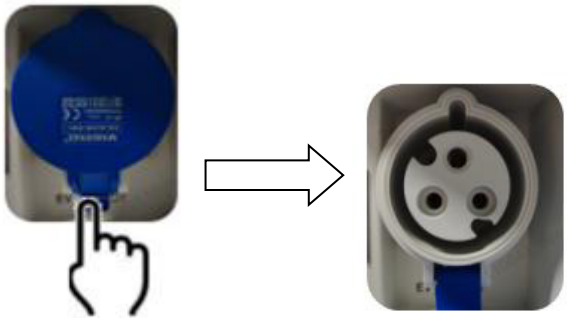
Press the terminal downwards to tighten the wire

After connecting the three cables, insert the terminals into the docking slots on the inverters

5.2.2 Pin header charging interface

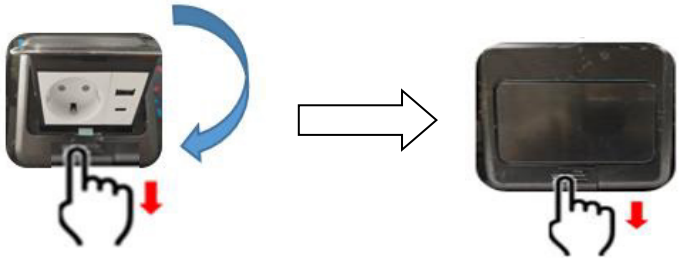
Connect one end of the charging cable to the pin and the other end to the socket

5.2.3 Industrial plug interface ($I_{max} \leq 32A$)



5.2.4 Socket use

Hold down the center and drag down. Wipe the panel and slowly spring up



Hold down the center and drag down, and then press down the socket panel to reset the socket panel

5.3Connections

Battery and inverter are combined by stacking

5.4 Use of All-in-one

After the batteries are combined by stacking, press the power-on key switch in sequence, the sequence first presses the PDU breaker, and finally opens the PDU power switch , the system is powered on and auto-encoded.

Chapter 6. Technical Parameters

Model	**5kW/5kWh Energy Storage System with All-in-one**
PV Data	
Maximum Input Power(W)	5500W
MPPT Voltage Range (V)	120 to 430
Number of MPPT	1
Maximum Number of Input Strings per MPPT	1
Maximum input current per MPPT	18A
AC Output Data	
Nominal grid voltage (V)	220/230/240
Nominal grid frequency (Hz)	50/60
Battery Data	
Battery Type	LiFePo4
Individual battery nominal capacity (kWh)	5.12
Number of expandable batteries	1
Usable battery power range (kWh)	5.12
Battery voltage range (V)	51.2
Conversion Efficiency	
Maximum efficiency	93.6%
MPPT efficiency	99.9%
System Parameter	
Operating temperature (°C)	-20 to 55°C
Relative humidity	≤95% (25°C)
Vibratory	<0.5G
Height above sea level	<2000 meters
Protection class	IP20
Cooling method	Natural cooling for battery and intelligent heat dissipation for inverter
Communication method	RS485/CAN/WiFi