

USER MANUAL



**Energy Storage Controller
Inverter Integrated Machine**

Preface

First of all, thank you for purchasing our Energy Storage Controller Inverter Integrated Machine!

This manual introduces the functional characteristics and usage of Energy Storage Controller Inverter Integrated Machine, including product parameters, installation and commissioning, fault maintenance check, etc. Please be sure to read this manual carefully before use.

Attention



- Please read the corresponding warning signs and the corresponding battery type specifications carefully before installing and using the equipment.
- Do not disassemble the equipment, if you need equipment repair and maintenance, please go to the designated maintenance center, if improper operation may lead to electric shock or even fire.
- To reduce the risk of electric shock, disconnect all circuits before performing repairs and maintenance.
- Warning: The battery must be installed by a professional technician.
- For maximum product functionality and efficiency, please configure the cable type as specified in the product.
- Please be careful to use metal tools for loading and unloading work to avoid short circuit and explosion caused by metal conductors.
- Equipment grounding requirements: Please select a permanently fixed place for product wiring!
- Do not short-circuit the AC output and DC input. Do not connect the power supply when the DC input is short-circuited.
- Warning! Only qualified service personnel should service this equipment. If the error persists after the troubleshooting sheet, return this unit to your local dealer or service center for maintenance.

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Chapter 1 Safety Information and Precautions

Safety Definition: In this manual, safety precautions are divided into the following two categories:

-  **Danger:** A situation in which serious injury, or even death, may result from a hazard caused by failure to operate as required;
-  **Caution:** Hazards caused by failure to operate as required, which may result in moderate injuries or minor injuries, and equipment damage;

Please read this chapter carefully when installing, commissioning and maintaining this system, and be sure to follow the safety precautions required by the contents of this chapter. Any injury or loss caused by irregular operation is not the responsibility of our company.

Usage Stage	Security Level	Item
Before installation	 Danger	<ul style="list-style-type: none"> ➤ Do not install the equipment if you find water, missing parts or damaged parts when you open the box! ➤ If the packing list does not match the actual name, please do not install it!
	 Attention	<ul style="list-style-type: none"> ➤ Handling should be done gently, otherwise there is a risk of damage to the equipment! ➤ Please do not use equipment with damage or missing parts. There is a risk of injury! ➤ Do not touch the components in the equipment with your hands, otherwise there is a risk of electrostatic damage!
At installation	 Danger	<ul style="list-style-type: none"> ➤ Please install on metal and other flame retardant objects; keep away from combustible materials. Otherwise it may cause fire! ➤ Do not unscrew the fixing bolts of the equipment components at will.
	 Attention	<ul style="list-style-type: none"> ➤ You can't just open the device case! ➤ Please install the equipment in a place with little vibration and avoid direct sunlight.
Wiring time	 Danger	<ul style="list-style-type: none"> ➤ The instructions in this manual must be followed and the work performed by professional electrical engineers, otherwise unexpected dangers can occur!
	 Attention	<ul style="list-style-type: none"> ➤ Pay attention to the markings of the terminals, do not connect the wrong line! Otherwise cause equipment damage! ➤ Please refer to the recommendations in the manual for the wire diameter of the wire used. Otherwise accidents may occur!
Before power on	 Danger	<ul style="list-style-type: none"> ➤ Please confirm whether the voltage level of the input power supply is the same as the rated voltage level of this equipment; whether the wiring of the terminals is correct; and check whether there is a short circuit in the peripheral circuit connected with this equipment and whether the connected lines are tight, otherwise it will cause damage to the equipment! ➤ Any part of the equipment does not need to be tested for voltage resistance, the product has been tested at the factory. Otherwise it will cause an accident!
	 Attention	<ul style="list-style-type: none"> ➤ The wiring of all peripheral accessories must comply with the instructions in this manual and be wired correctly according to the circuit connection method provided in this manual. Otherwise cause an accident!

Usage Stage	Security Level	Item
After power on	 Danger	<ul style="list-style-type: none"> ➤ Do not open the cover after the power is applied. Otherwise there is a risk of electric shock! ➤ Do not touch the equipment and surrounding circuits with wet hands. Otherwise there is a risk of electric shock! ➤ Do not touch any input and output terminals of the device. Otherwise there is a risk of electric shock!
	 Attention	<ul style="list-style-type: none"> ➤ Please do not change the manufacturer's parameters of the equipment at will. Otherwise, damage to the equipment may result!
In operation	 Danger	<ul style="list-style-type: none"> ➤ Non-technical professionals should not test the signal while the equipment is in operation. Otherwise it may cause personal injury or equipment damage!
	 Attention	<ul style="list-style-type: none"> ➤ When the equipment is running, avoid having something fall into the equipment. Otherwise cause damage to the equipment! ➤ Do not start and stop the equipment frequently, otherwise it will cause damage to the equipment!
Maintenance time	 Danger	<ul style="list-style-type: none"> ➤ Do not perform maintenance and repair on the equipment without professional training. Otherwise, personal injury or equipment damage will result! ➤ Please do not carry out maintenance and repair of the equipment with electricity. Otherwise there is a risk of electric shock! ➤ Make sure that the input power of the equipment is disconnected for 10 minutes before implementing maintenance and repair of the equipment, and pay attention to the residual charge on the capacitor when maintenance will cause harm! ➤ All pluggable plug-ins must be plugged in the case of power failure!

Chapter 2 Product Information

2.1 Introduction

The Energy Storage Controller Inverter Integrated Machine combines the functions of inverter, MPPT solar controller and utility charging to provide stable power supply for power-using equipment in areas with no power, lack of power and unstable power. The product is based on a fully digital intelligent design with advanced SPWM technology, outputting pure sine wave, converting DC power into AC power, suitable for AC loads such as household appliances, power tools, industrial equipment, electronic video and audio. LCD screen display design, real-time display of system operation data and operating status. Comprehensive electronic protection function ensures the whole system is safer and more stable.

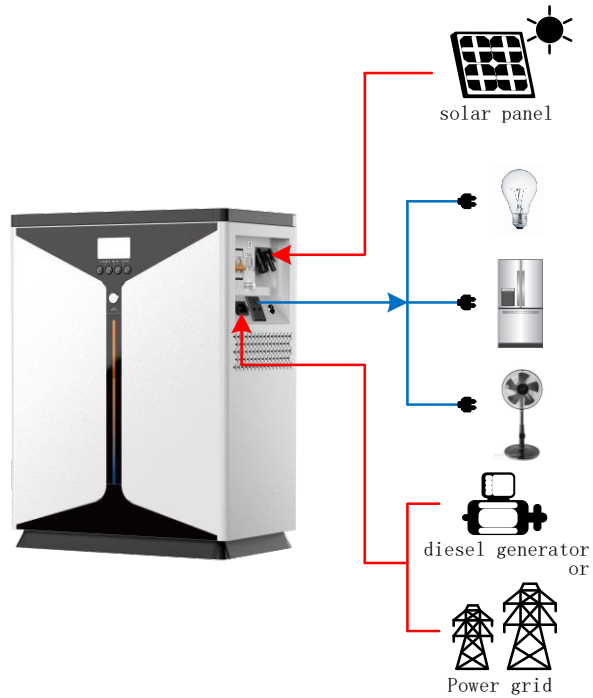
2.2 Functional Features

- Pure sine wave inverters;
- Integrated MPPT controller/charger;
- Settable priority of utility and PV power supply;
- Wide PV input voltage;
- Settable battery type, supporting lead-acid and lithium batteries;
- Functions and parameters can be set via the LCD;
- With battery equalization function to optimize battery performance and extend battery life.

2.3 System schematic

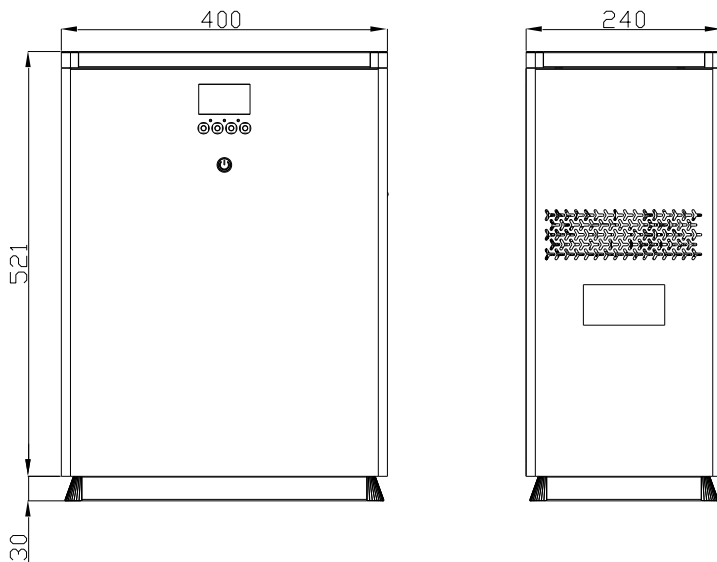
The following figure shows the system application scenario of this product. A complete system includes the following parts:

- 1. Photovoltaic module:** Convert light energy into DC electric energy, charge the battery through energy storage inverter, or directly reverse it into AC to power the load.
- 2. Utility or generator:** Connected at the AC input, it can supply power to the load and charge the battery at the same time. If no utility or generator is connected, the system can also operate normally, when the load power is provided by the battery and PV module.
- 3. Battery:** The role of the battery is to ensure the normal use of power for the system load when the solar energy is insufficient and there is no utility power.
- 4. Household load:** It can access various household and office loads, including refrigerators, lamps, TV sets, fans, air conditioners and other AC loads.
- 5. Energy Storage Controller Inverter Integrated Machine:** The energy conversion device of the whole system.



System schematic

2.4 Product Size (Unit: mm)

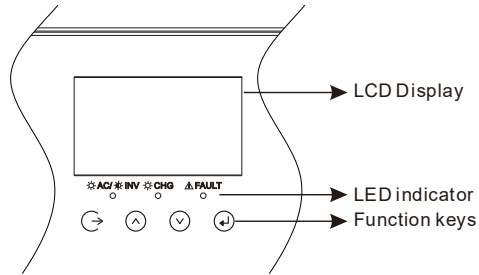


Chapter 3 Energy Storage Inverter Product Introduction

3.1 Panel Description

3.1.1 Running the display panel

The operation display board, as shown in the figure, is located on the front panel of the inverter. It contains 3 indicators, 4 function keys and 1 LCD display for displaying device operation status indication, input and output power information, etc.



LED indicator

LED indicator		Instruction Information	
☀️ AC/☀️ INV	Green Light	Always bright	The output is powered by the mains.
		Blinking	The output is powered by batteries or photovoltaic cells.
☀️ CHG	Green Light	Always bright	The battery is fully charged.
		Blinking	The battery is charging.
⚠️ FAULT	Red Light	Always bright	The inverter is malfunctioning.
		Blinking	A warning status appears in the inverter.

Function button

Function Keys	Description
➡️	Return to or exit from setup mode
⬆️	Go to the previous selection
⬇️	Go to the next selection
⬅️	Press and hold for 3 seconds to enter the setting mode or confirm in the setting mode

3.1.2 LCD display

Working mode display area:

- After 4s is started, this display area mainly displays the working mode of the inverter. Such as: standby mode, mains mode, battery mode, failure mode.

3.1.3 Inverter operating status table corresponding to the buzzer

Buzzer alarms	Description
Long singing, which lasts ten seconds and then stops	Failure mode
The long song stops after three seconds	PV voltage/input voltage is lost or restored
	The power master switch is closed or disconnected
It starts every second and stops after one minute	All other alarms (battery low voltage alarms will only beep in battery mode)

3.2 Daily on and off

3.2.1 Power-On Procedure

You can start the power on when proper batteries (the battery voltage must be greater than 11.5V) or mains (the mains must have a proper input range based on the output mode) are connected.

- Turn on the mains

Connect to the normal mains, press the switch, hit the ON state, the system will start, if set to the mains output priority, wait for a period of time after the panel displays the mains mode indicates that the boot is complete, enter the mains mode.

- Battery on

Plug in a normal battery, press the switch, and the inverter establishes a working power supply.

The system will start automatically, wait for a period of time after the panel display battery mode indicates that the boot is complete, enter the battery mode.

3.2.2 Power-off Procedure

When the system outputs in battery mode or mains mode, press the switch again and switch to OFF state, and the system will shut down.

3.2.3 Silent operation

When the inverter is in any mode, MUTE/unmute the inverter by setting MUTE ON or OFF.

3.2.4 Operation in the alarm state

When the inverter has an alarm tone and the LED fault light blinks, it indicates that the inverter is working in the alarm state. You can locate the cause of the alarm according to the alarm information or contact the supplier.

3.2.5 Operations in Fault Mode

When the inverter buzzer is long sounding and the LED fault light is long on, it means that the inverter is working in fault mode. You can contact the supplier or maintenance personnel to provide information about the fault alarm and help troubleshoot the fault.

3.3 Parameter Query Operations

Under normal circumstances, the display page has ten pages, press the query key $\text{\textcircled{\small \uparrow}}$ or $\text{\textcircled{\small \downarrow}}$ key 0.2 to 1 second to the display page page, display input and output voltage, input and output frequency, battery, PV voltage and current, load, software version, and other information. If there is an alarm, a page of alarm information will be added. If the inverter fails, the fault code page will be displayed by default. By default, the fault or alarm information is displayed on the main page. When the inverter has no fault or alarm, the output voltage and frequency are displayed on the main page.

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

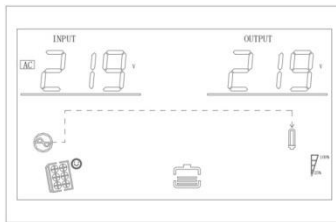


Figure 3-1 Display page 1

Display page 2: Display inverter input and output frequency, as shown in Figure 3-2.

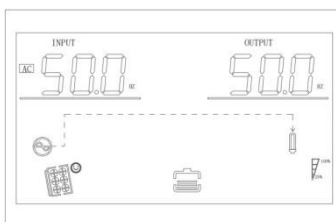


Figure 3-2 shows page 2

Display page 3: Battery information, showing battery voltage and charging current, as shown in Figure 3-3.

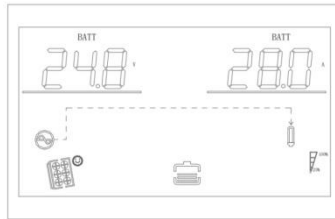


Figure 3-3 Shows page three

Display page 4: PV information, showing PV voltage and PV charging current, as shown in Figure 3-4.

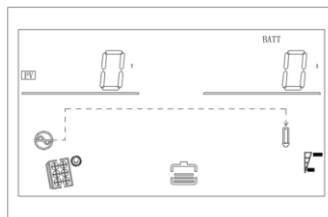


Figure 3-4 Shows page four

Display page 5: PV information, showing PV voltage and PV power, as shown in Figure 3-5.

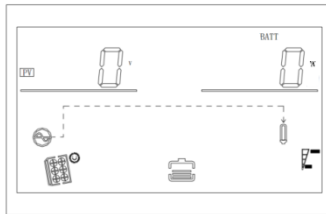


Figure 3-5 Shows page five

Display page 6: Output information, display output voltage and output active power, as shown in Figure 3-6.

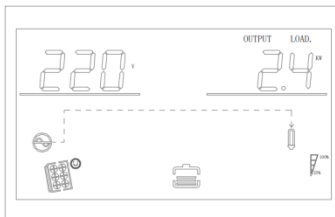


Figure 3-6 Display page six

Display Page 7: Output information, display output voltage and output complex power, as shown in Figure 3-7.

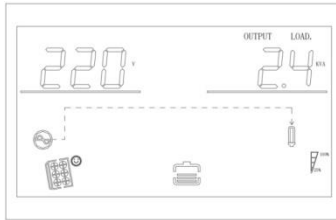


Figure 3-7 Display page seven

Display page 8: Output information, display output display voltage and load percentage, as shown in Figure 3 -8.

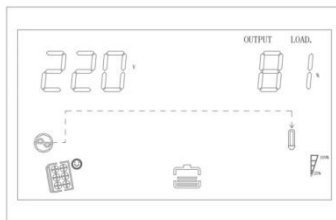


Figure 3-8 Display page eight

Displaypage 9:Softwareversion,showingtheinvertersystemsoftwareversion, as shown in Figure3-9.

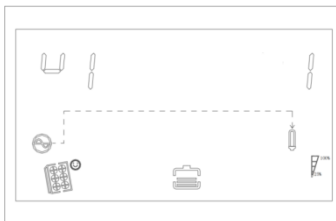


Figure 3-9 Display page nine

Show page 10: Software version. 3KVML/3KVP Displays the MPPT system software version, as shown in Figure 3-10.

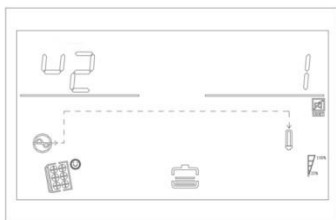


Figure 3-10 Display page 10 (Software version)

Display page 11: 5KVMH displays photovoltaic power generation, as shown in Figure 3-11.

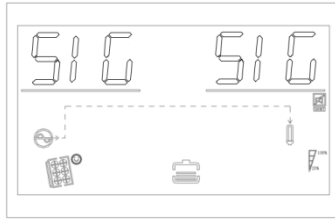


Figure 3-11 Display page eleven (PV power)

Display page 12: Parallel status. This page is not available for 3KVML/3KVP; 5KVMH photovoltaic power output is displayed, as shown in Figure 3-12.

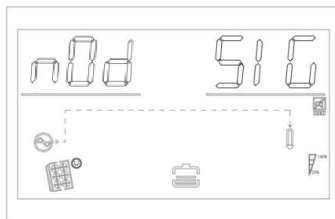


Figure 3-12 Display page twelve (parallel state)

Display page 13: Lithium battery networking status; When the SIG constant is displayed on the upper right, the battery pack runs in a single group; When displayed as PAR constant, battery packs run in parallel in multiple series; When displayed as PAR blinking, the battery pack is establishing a multiple series parallel state.

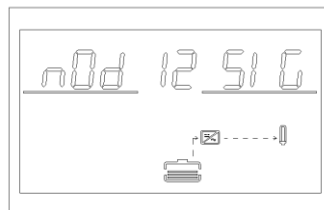


Figure 3-13 Display page 13
(Lithium battery networking status)

Display page 14: Lithium battery battery voltage and current information; The upper left is displayed as BMS battery voltage information; BMS battery current information is displayed on the top right. When BMS communication fails, both the upper left and upper right are displayed as blinking ERR.

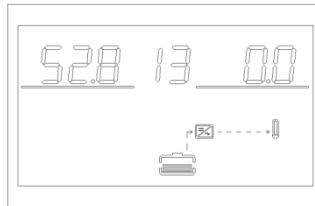


Figure 3-14 Display page 14
(Lithium battery voltage and current information)

Display page 15: Lithium battery battery temperature, SOC; BMS temperature information is displayed on the upper left; BMS SOC information is displayed on the top right. When BMS communication fails, both the upper left and upper right are displayed as blinking ERR.

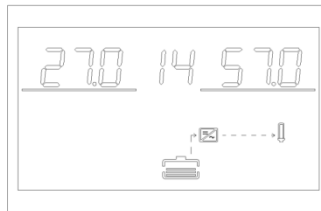


Figure 3-15 Display page 15
(Battery temperature and SOC information for lithium batteries)

Display page 16: Lithium battery battery capacity; The rated capacity is displayed on the left; The current capacity is displayed on the top right. When BMS communication fails, both the upper left and upper right are displayed as blinking ERR.

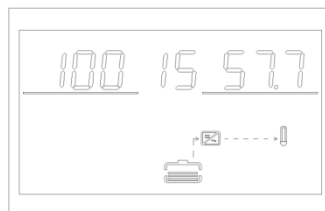


Figure 3-16 Display page 16
(Lithium battery capacity information)

Display page 17: Constant voltage point of lithium battery; The upper left is displayed as a fixed letter CV; BMS constant voltage charging point shown on top right. When the BMS communication fails, the upper right is displayed as flashing ERR.

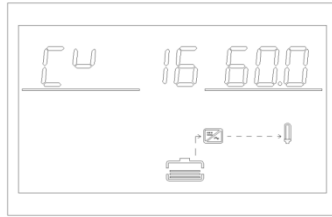


Figure 3-17 Display page 17
(Lithium battery constant voltage information)

Display page 18: Lithium battery fault alarm information. BMS alarm information is displayed on the upper left; BMS fault information is displayed on the upper right. When BMS communication fails, ERR is displayed on the upper left and upper right.

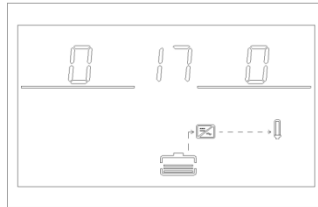


Figure 3-18 Display page 18 (Lithium battery fault alarm)

3.4 Function Setting Operations

➤ Function setting operation of inverter:

Enter/exit the function setting page and function setting specific operations are as follows:

- Press the function setting key \odot for more than 2 seconds, enter the function setting page, press the query key \wedge or \vee 0.1 to 2 seconds, select the function, turn the page to the required function setting page, the corresponding function words blink.
- Press the Confirm key \odot 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 long bright, and the value of the left side of the words of the selected function will blink. Press the query key \wedge or \vee for 0.1 to 2 seconds to select the value of the desired function parameter.
- After turning the page to the desired function parameter, press the confirm key \odot for 0.1 to 2 seconds, the function setting is completed, and the function parameter value will keep on bright and no longer blink.

Press \rightarrow 0.1 to more than 2 seconds, the function will be set successfully, and exit the function setting page, back to the main display page (can not operate, wait up to 30 seconds after the automatic jump back to the main display page).

3.4.1 Output Voltage (OPU)

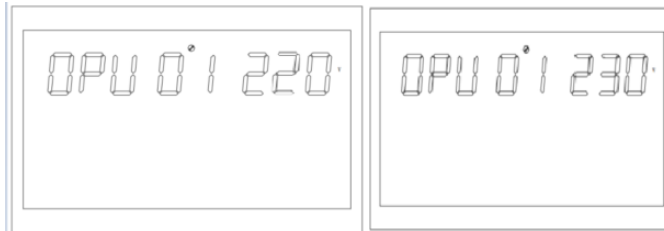




Figure 3-19 Output Voltage Settings page

- The default output voltage is 230V, 208V, 220V, 230V, 240V can be set in all working conditions, and it takes effect immediately.
- Press the function setting key \odot for more than 2 seconds, enter the function setting page, press the query key \wedge or \vee 0.1 to 2 seconds, select the function, turn the page to the output voltage OPU setting page, OPU words blink.
- Press the Confirm key \odot for 0.1 to 2 seconds, enter the output voltage OPU setting page, at this time the word OPU long bright, the value on the right side of
- the word OPU appears flashing. Press the query key \wedge or \vee 0.1 to 2 seconds,

select different output voltage values, available voltage values are 208V, 220V, 230V, 240V. By default, the output voltage is 230V, and the Settings are saved in real time.

- After turning the page to the desired output voltage value, press the Confirm button  for 0.1 to 2 seconds, and the output voltage OPU setting is completed. At this time, the value on the right side of OPU will keep bright and no longer blink.

Press  0.1 to more than 2 seconds, the function will be set successfully, exit the function setting page, back to the main display page (can not operate, wait up to 30 seconds after the automatic jump back to the main display page).

Attention:

- When the output voltage is set to 208V, the output derates to 90%.

3.4.2 Other function Settings

3.4.2.1 Output Frequency (OPF)

Output frequency setting, default 50Hz.

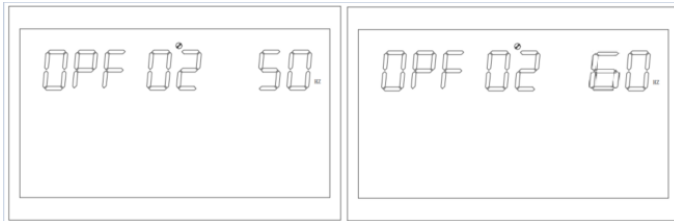
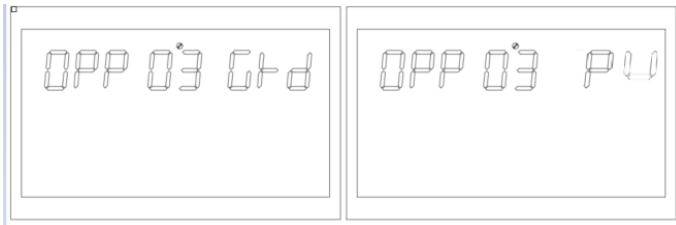


Figure 3-20 Output Frequency setting page

Function Description: Set the inverter output frequency. 50Hz and 60Hz can be set. The default frequency is 50Hz.

Setting conditions: all states can be set, battery mode will take effect when the machine restarts the next setting; The power mode takes effect immediately, after the setting is completed, the frequency will change slowly after switching back to the battery mode.

3.4.2.2 Output Priority Setting (OPP)



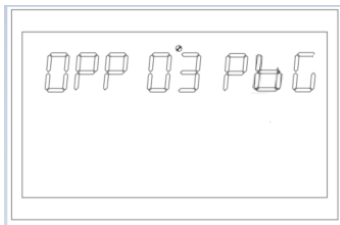


Figure 3-21 Output Priority Setting page

Function Description: Sets inverter output priority.

Setting conditions: All states can be set, the setting takes effect immediately.

Attention:

There are three options for output priority, the default is GRD: Mains output priority; The second is PU(PV): PV output priority; The third is PBG: photovoltaic cell mains output.

3.4.2.3 Output Mode (MOD)

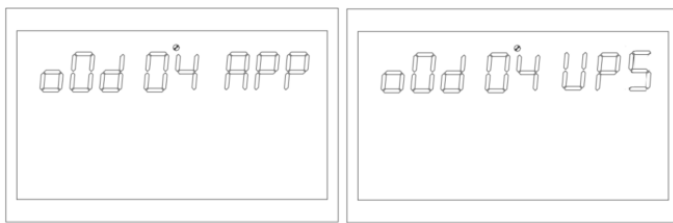


Figure 3-22 Output Mode Settings page

Function Description: Set inverter output mode.

Setting condition: All states can be set and take effect immediately.

Description:

AC output mode has two options, the default is APP: Appliance, used for home appliance equipment; The second is UPS mode, which is used for equipment such as computers. The switching time is typically 10ms.

3.4.2.4 Charging Priority (CHP)



Figure 3-23 Charging Priority setting page

Function Description: Sets the inverter charging priority.
Setting conditions: All states can be set, effective immediately.

Description:

There are four options for charging priority, the default is PNG (PV and Grid) :PV and Grid charge at the same time; The second is OPV(Only PV): only PV charging; The third is GRD(Grid): mains charging is preferred; The fourth is PV: PV priority charging.

3.4.2.5 Mains Charging Current (RCC)

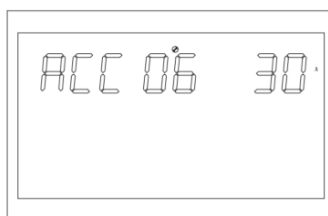


Figure 3-24 Setting the maximum mains charge page

Function Description: Sets the maximum mains rechargeable current of the inverter.
Setting conditions: All states can be set.

Instructions:

RCC:Grid Charge Current, the maximum charge current of the mains is set to 40A(3K VML-24V)/40A(3K VP-24V)/30A(5K VMH-48V) by default, Set the range of [2, 60A] (3k VML – 24V)/ [2,50A](3K VP-24V)/[2,80A](5K VMH-48V)。

3.4.2.6 Maximum Charging Current (MCC)

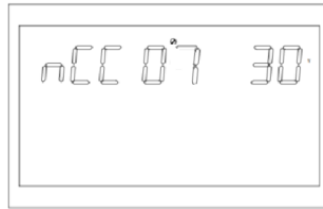


Figure 3-25 Setting the maximum charging current

Function Description: Set the maximum charging current of the inverter.

Setting conditions: All states can be set.

Instructions:

MCC: Maximum Charge Current, maximum charge current refers to the maximum PV and mains charge current.

3k-VML-24V version is 2/10/20/30/40/50/60/70/80/90/100/110/120A, optional.

3k-VP-24V version is 2/10/20/30/40/50/60/70/80/90/100A, optional.

5k-VMH-48V version is 2/10/20/30/40/50/60/70/80A optional.

3.4.2.7 Menu Default (MDF)

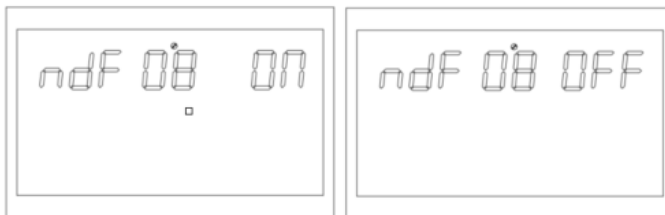


Figure 3-26 Return to the main page Settings page

Function Description: Return to the home screen Settings.

Setting conditions: All states can be set.

Instructions:

The default setting is ON. In the function setting operation, if set to ON, this time the page is not in the first interface (P1), 1min later back to the first interface; If set to OFF, if the page is not in the first interface (P1) at this time, the LCD will remain in this interface.

3.4.2.8 Overload Restart (LrS)

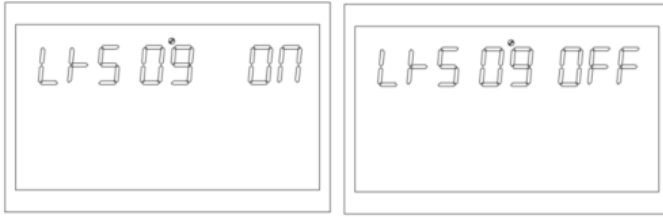


Figure 3-27 Overload Restart Settings page

Function Description: Overload restart Settings.

Setting conditions: All states can be set.

Instructions:

Overload restart is set to ON by default.

3.4.2.9 OverWarm Restart (TrS)

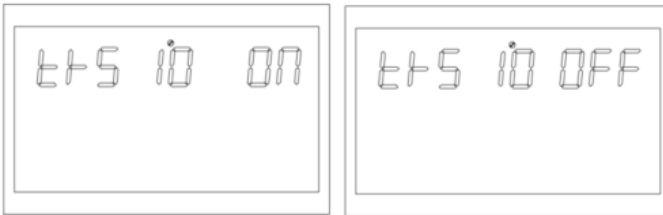


Figure 3-28 Overwarm Reboot Settings page

Function Description: Overtemperature restart Settings.

Setting conditions: All states can be set.

Instructions:

Overwarm restart is set to ON by default.

3.4.2.10 Main Input Power Failure Alarm (MIP)

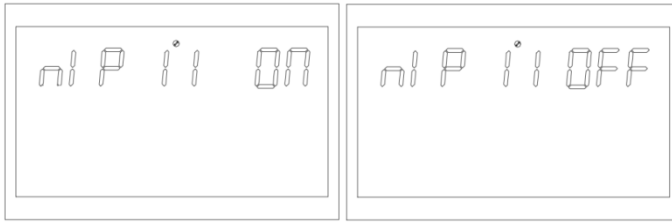


Figure 3-29 Main Input Power failure alarm setting page

Function: Set the long tone alarm for mains or PV loss.

Setting condition: All states can be set. The default value is ON. The mains or PV loss alarm will ring for a period of time. It can be set to OFF.

(All modes can be set)

Instructions:

MIP: Main Input cut warning

The default setting is ON. After the main input is lost, the buzzer will sound for 3s. If it is set to OFF, the buzzer will not sound frequently after the primary input is lost.

3.4.2.11 Power Saving Mode (PWS)

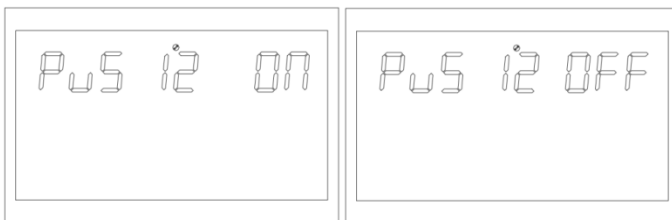


Figure 3-30 PWS Settings page

Function Description Set whether to enable the low power mode (energy saving mode) for the inverter.

Setting conditions: can be set in the single machine running mode (see 3.4.2.26).

Description:

PWS: Power Saving

The default setting is OFF, and the function is not enabled; When set to ON, in battery mode, if the load is less than 25W, the system will briefly stop output and then continue output. If the load is higher than 35W, the system will resume continuous normal output.

3.4.2.12 Overload to Bypass (OLG)

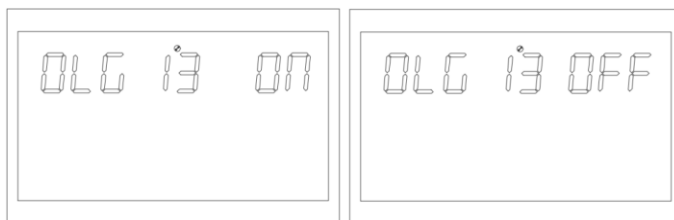


Figure 3-31 Overload to Bypass Settings page

Function Description: When battery mode is overloaded, you can set whether to switch to mains mode immediately (bypass mode).

Setting condition: All states can be set.

Instructions:

OLG:Overload to Bypass

The default setting is OFF, and the function is not enabled; Set to ON, in the case of PV priority output with load, if overload, the system will immediately transfer to bypass (mains output, that is, the so-called bypass mode).

3.4.2.13 Setting Mute Settings (MUE)

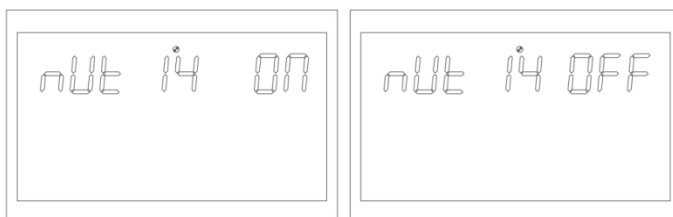


Figure 3-32 MUE Settings page

Function Description Sets whether the buzzer buzzes or not.

Setting condition: All states can be set.

Instructions:

MUE:Mute

The default setting is OFF and the function is not on; When it is set to ON, the buzzer does not sound under any circumstances, alarm, fault and other states.

All modes can be set, and the function is normal, the picture cannot be displayed.

3.4.2.14 Battery Return to Mains Voltage Point (BTG)

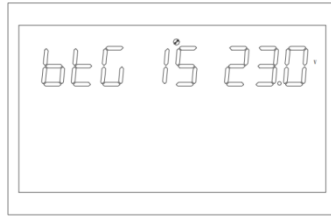


Figure 3-33 Battery switch back to mains voltage point setting page

Function Description: When the battery mains exists at the same time, the battery will switch to the mains when it discharges to a certain voltage to ensure that the battery will not empty.

Setting conditions: All states can be set, the output priority should be set in PV and PBG mode.

Instructions:

BTG:Back To Grid

The initial default setting for 3K -VML-24V/3K-VP-24V is 23V 5K-VMH-48V is initially set to 46V by default

When the battery definition mode is CUS(Customer Set Type) mode: 3K-VML-24V/3K-VP-24V can be set to range [22,26]

5K-VMH-48V can be set to range [44,52]

When the battery definition mode is AGM(lead -acid battery type), FLD (water injection battery type) mode:

3K-VML-24V/3K-VP-24V The default setting is 23V, and the range can be set to [22,26]
5K-VMH-48V Defaults to 46V and can be set to range [44,52]

When the battery definition mode is LIB (Lithium battery type) mode:

3K-VML-24V/3K-VP-24V The default setting is 23.8V, and the range can be set to [20,25]
5K-VMH-48V is set to 47.6V by default and can be set to range [40,50]

When the battery definition mode is Fe (iron lithium battery type) mode: 3K-VML-24V/3K-VP-24V The default value is 24.8V, and the range is [20,25].

3.4.2.15 Switch Back to Battery Mode Voltage Point (BTB)

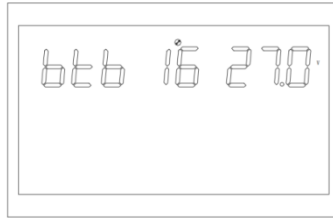


Figure3-34 Setting the battery voltage point of the city Switch Back to Battery mode

Function Description: After a low-voltage battery shuts down, the battery voltage must reach a certain value to start the battery mode again.

Setting conditions: All states can be set.

Instructions:

BTB:Back To Battery

3k-VML-24V/3K-VP-24V The initial default setting is 26V 5k-VMH-48V is initially set to 52V by default

When set to FUL, the battery will charge until it is fully charged before restarting in battery mode.

When the battery definition mode is set to CUS(Customer Set Type) mode:

3k-VML-24V/3K-VP-24V can be set in the range of [24,29] (when setting value Vbtb > TCFV-1V, switch back to battery mode voltage point to maintain TCFV-1V), when the output priority is set to photovoltaic (PV) priority output or photovoltaic cell mains (PBG) output, if this time is not in battery mode, If the battery voltage is higher than TCFV-1V, the system will switch back to battery mode.

5k-VMH-48V can be set to range [48,58] (logic same as above)

When the battery definition mode is AGM(lead-acid battery type), FLD (water injection battery type) mode:

3k-VML-24V/3K-VP-24V The default setting is 26V, and the range can be set to [24,29] (logic same as above)

5k-VMH-48V defaults to 52V and can be set to range [48,58] (logic same as above) When the battery definition mode is LIB (Lithium battery type) mode:

3k-VML-24V/3K-VP-24V The default setting is 27.2V, and the range can be set to [23,29] (logic same as above)

5k-VMH-48V defaults to 54.4V and can be set to range [46,58] (logic ditto) When the battery definition mode is Fe (Iron lithium battery type) mode:

3k-VML-24V/3K-VP-24V The default setting is 26.6V, and the range can be set to [23,29] (logic same as above)

3.4.2.16 Battery Type (BAT)



Figure 3-35 Battery Type setting page

Function Description: Battery type setting function.

Setting conditions: All states can be set.

Instructions:

BAT:Battery Type

Four battery type Settings: The default is AGM(lead -acid battery); The second is FLD(water injection battery); The third is LIB (lithium battery); The fourth is CUS(customer set type); The fifth is Fe (iron lithium battery, this type of battery is only supported by VML3K).

3.4.2.17 Battery Low Pressure Point (bAL)

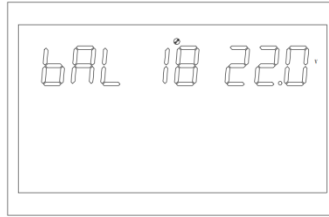


Figure 3-36 BAL setting page

Function Description Set low voltage alarm point.

Setting condition: All states can be set.

Instructions:

bAL:battery Low

Bal: cannot be set if the battery definition mode is AGM(lead-acid battery type) or FLD (water injection battery type).

The initial default setting for 3k -VML-24V/3K-VP-24V is 21.6V 5k-VMH-48V is initially set to 44V by default

You can modify the battery low voltage point when the battery type is set to CUS(customer set type).

3k-VML-24V/3K-VP-24V, can be set to range [21,27] 5k-VMH-48V, can be set to range [42,54]

The battery low voltage point can be modified when the battery type is set to LIB(lithium battery type).

3K-VML-24V/3K-VP-24V The default setting is 23.8V, and the range can be set to [20.6,25.0]

5K-VMH-48V is set to 47.6V by default and can be set to range [41.2,50.0] You can modify the battery low voltage point when the battery type is set to Fe(iron lithium battery type).

3K-VML-24V/3K-VP-24V The default setting is 24.0V, and the range can be set to [20.6,25.0]

3.4.2.18 Battery Shutdown Point (bAU)

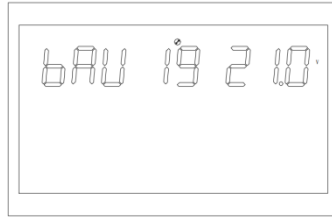


Figure 3-37 Battery Shutdown Point Settings page

Function Description: Set the low-voltage battery shutdown point.

Setting condition: All states can be set.

Instructions:

bAU: battery Under

This parameter cannot be set if the battery definition mode is AGM (lead-acid battery type) or FLD (water injection battery type).

The initial default setting for 3k -VML-24V/3K-VP-24V is 21V 5k-VMH-48V is initially set to 42V by default

The battery shutdown point can be modified when the battery type is set to CUS (customer setting type).

3k-VML-24V/3K-VP-24V can be set to range [20,24] 5k-VMH-48V can be set to range [40,48]

The battery shutdown point can be modified when the battery type is set to LIB (lithium battery type).

3k-VML-24V/3K-VP-24V The default setting is 23V, and the range can be set to [20,24] 5k-VMH-48V is set to 46V by default and can be set to range [40,48]

The battery shutdown point can be modified when the battery type is set to Fe (iron lithium battery type).

3k-VML-24V/3K-VP-24V The default setting is 23.2V and can be set in the range [20,24]

3.4.2.19 Constant Voltage Mode Voltage Point Setting (bCV)

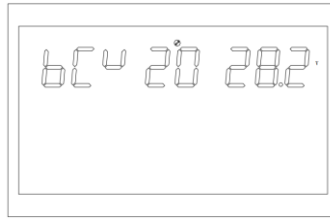


Figure 3-38 Constant Voltage mode voltage point setting page

Function Description: Constant voltage point setting function.

Setting conditions: All states can be set.

Instructions:

bCV:battery Constant Voltage

This parameter cannot be set if the battery mode is AGM(lead -acid battery type) or FLD (water injection battery type).

3k-VML-24V/3K-VP-24V Initial default Settings are 28.2V (AGM), 29V (FLD) 5k-VMH-48V Initial default Settings to 56.4V (AGM), 58V (FLD)

Constant voltage charging points can be modified when the battery type is set to CUS(customer set type).

The range of 3k-VML-24V/3K-VP-24V can be set to [24,29]. The constant voltage point voltage needs to be greater than the floating charge point voltage.

5k-VMH-48V can be set in the range [48,60]. The constant voltage point voltage needs to be greater than the floating charge point voltage.

You can change the constant voltage charge point when the battery type is set to LIB(lithium battery type).

The default setting for 3k-VML-24V/3K-VP-24V is 28.2 and can be set in the range [25,29]. The constant voltage point voltage needs to be greater than the float charge point voltage.

5k-VMH-48V is set to 56.4 by default and can be set in a range of [48,60]. The constant voltage point voltage needs to be greater than the floating charge point voltage.

You can change the constant voltage charging point when the battery type is set to Fe(lithium iron battery type).

The default setting for 3k-VML-24V/3K-VP-24V is 27.6, and the range can be set to [25,29]. The constant voltage point voltage needs to be greater than the float charge point voltage.

3.4.2.20 Floating C charge Mode Voltage Point Setting (bFL)

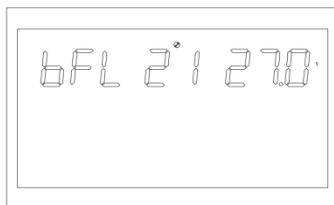


Figure 3-39 Setting the voltage point in floating charge mode

Function Description: Set the floating charging voltage point.

Setting conditions: All states can be set.

Instructions:

bFL: battery Float

This parameter cannot be set if the battery definition mode is AGM(lead-acid battery type) or FLD (water injection battery type)

The initial default setting for 3K -VML-24V/3K-VP-24V is 27V 5k-VMH-48V is initially set to 54V by default

Setting the battery type to CUS(customer setting type) allows you to modify the battery float charge point.

3K-VML-24V/3K-VP-24V can be set in the range [26.6,27.8]. The constant voltage point voltage needs to be greater than the floating charge point voltage.

5k-VMH-48V can be set in the range [48,60]. The constant voltage point voltage needs to be greater than the floating charge point voltage.

You can change the constant voltage charge point when the battery type is set to LIB(lithium battery type).

The 3K-VML-24V/3K-VP-24V is set to 27.6V by default, and can be set in a range of [24,28]. The constant voltage point voltage needs to be greater than the floating charge point voltage.

5k-VMH-48V The default setting is 55.2V, and can be set in a range of [50,58]. The constant voltage point voltage needs to be greater than the floating charge point voltage.

You can change the constant voltage charging point when the battery type is set to Fe(lithium iron battery type).

The 3K-VML-24V/3K-VP-24V is set to 27.6V by default, and can be set in the range [24,28]. The constant voltage point voltage needs to be greater than the floating charge point voltage.

3.4.2.21 Setting the Mains Low Voltage (LLV)

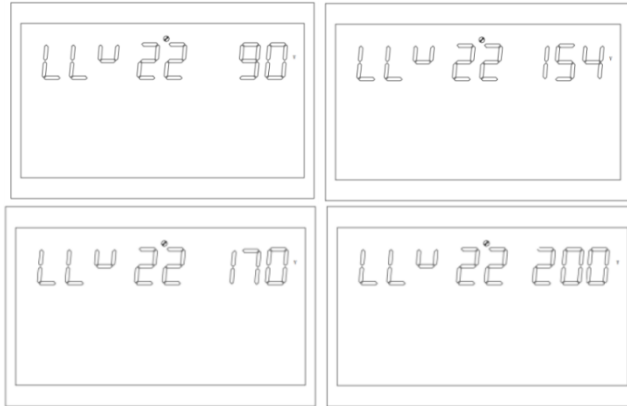


Figure 3-40 Inverter mode LLV setting page

Function Description: Sets the mains low voltage protection point.

Setting conditions: The inverter is in APP and UPS mode, and all states can be set.

Instructions:

LLV:Line Low Voltage

In inverter mode (output mode: MOD needs to be set to APP), the mains low voltage point setting, the default setting is 154V, and the range can be set to [90,154]. (Output mode: MOD needs to be set to UPS), the mains low voltage point setting, the default setting is 185V, the configurable range is [170,200].

3.4.2.22 Setting of Mains High Voltage Point (LHV)



Figure 3-41 Setting the mains High voltage point in inverter mode

Function Description: Sets the mains high voltage protection point.

Setting conditions: The inverter is in APP mode, and all states can be set.

Instructions:

LHV:Line High Voltage

In inverter mode (output mode: MOD needs to be set to APP), the mains high voltage point is set, the default setting is 264V, and the configurable range is [264,280].

3.4.2.23 Setting of Low Power Discharge Time (LWD)

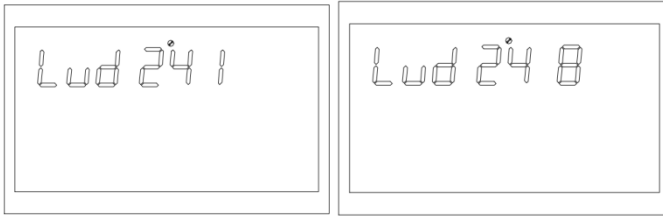


Figure 3-42 Low power discharge time setting page

Function Description: Low power discharge protection function. When the battery mode is in a low load, the unlimited discharge time will make the pool empty, affecting the battery life. When the inverter is in the low power discharge setting time, the 3k-VML-24V battery low-voltage shutdown point will be increased to 22V. 5k-VMH-48V battery low-voltage shutdown point will be increased to 44V.

Setting conditions: The inverter is set in APP mode. All states can be set.

Description:

LWD: Low Watt Discharge

In inverter mode, low power discharge time is set, the default is 8(8 hours), and the range can be set [1, 8].

In battery mode, after the continuous discharge time exceeds 8 hours and the battery shutdown point is not reached, the battery voltage shutdown point will be modified to 11V* number of batteries, and then when the battery discharge reaches 11V* number of batteries, the system will alarm for 1 minute and then shut down.

When the battery voltage exceeds 13.2V*the number of batteries exceeds 30s, the battery discharge time will be reset.

3.4.2.24 Inverter Soft Startup Settings (SRE)

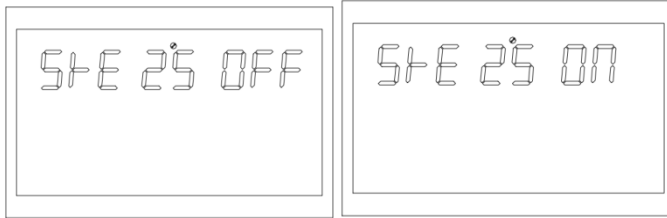


Figure 3-43 Inverter soft startup Settings page

Function Description: When the screen is ON, the inverter output gradually increases from 0 to the target voltage. When the interface is OFF, the inverter output is directly increased from 0 to the target voltage value.

Setting condition: It can be set in the single machine running mode (see 3.4.2.26).

Description:

SRE:Soft Relay Enable

The default setting is OFF, and the inverter voltage will not close the output switch until it reaches the rated output. If set to ON, the output switch will be closed before the inverter starts boosting.

3.4.2.25 Default Setting (STD)

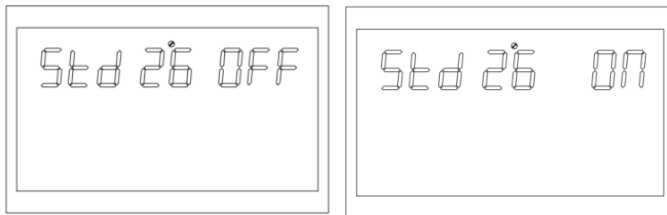


Figure 3-44 Default Settings page

Function Description: Restore all Settings to default values.

Setting conditions: In the mains mode and StandBy (StandBy: no output but bright screen state) can be set. In battery mode, it cannot be set.

Instructions:

STD:Set Default

Before setting this interface is displayed as OFF, when set to ON, the system will restore the default setting. After the setting is complete, this interface will display OFF again.

The mains and standby modes can be set and take effect immediately. The battery mode cannot be set and the picture cannot be displayed.

3.4.2.26 Parallel Mode Setting (PAM)



Figure 3-45 Default Settings page

Function Description: Set the parallel working mode.

Setting conditions: 5K-VMH-48V can be set in mains mode and StandBy (StandBy: no output but bright screen state), but cannot be set in battery mode. Other models can not be set.

Instructions:

PAM: Parallel operation mode.

The default setting is SIG (single mode) single-machine mode, and can be set to PAR (parallel mode) single-phase parallel mode, 3P1 (R phase mode), 3P2 (S phase mode), 3P3 (T phase mode).

When using the parallel function, first connect the parallel system in the correct way, and then correctly set the parallel mode of each machine. If a machine set to SIG exists in the parallel system, the machine reports fault 24. If there are machines set to 3P1, 3P2, 3P3 in the parallel system, then all machines must be set to one of these three modes and at least one machine in each mode exists, otherwise all machines set to these three modes report failure 24.

The mains and standby modes can be set and take effect immediately. The battery mode cannot be set, and the picture cannot be displayed.

3.4.2.27 Battery Failure Alarm (SBA)



Figure 3-46 Default Settings page

Function Description: Enables the battery miss alarm.

Setting condition: All states can be set.

Instructions:

SBA:Set battery alarm.

The default setting is OFF.

If this parameter is set to OFF, no battery missed, battery low, or battery undervoltage alarms will appear when the battery is not connected.

The 5K-VMH-48V can be set in single machine operation mode, but other models cannot be set.

3.4.2.28 Balanced Mode (EQM)



Figure 3-47 EQM Settings page

Function Description: Sets whether to enable the balance mode for the inverter.

Setting conditions: All states can be set.

Instructions:

EQM:Equalization Mode

The default setting is OFF, and the function is not enabled; Set to ON, when the floating charge stage reaches the set equalization interval (battery equalization cycle), or the equalization is activated immediately, the controller will start to enter the equalization stage.

3.4.2.29 Equalizing Voltage Point Settings (EQV)

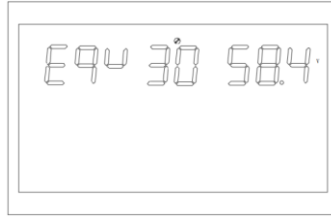


Figure3-48 Equalizing VoltagepointSettingspage

Function Description: Set voltage equalization point.

Setting conditions: All states can be set.

Instructions:

bCV:Equalization Voltage All modes can be set.

3k-VML-24V(except for Lithium Iron mode) /3K-VP-24V is set to 29.2 by default and can be set in a range of [25,31.5].

5k-VMH-48V is set to 58.4 by default and can be set to [48,60].

3K-VMH-24V (Lithium iron mode) is set to 28V by default and can be set to range [25,31.5].

3.4.2.30 Equalizing Charge Time Settings (EQT)

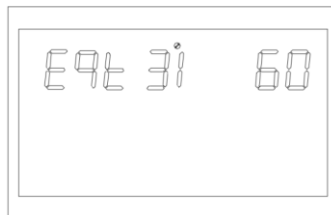


Figure 3-49 Equalizing Charge time Settings page

Function Description: Set balanced charge time.

Setting conditions: All states can be set.

Instructions:

EQT:Equalization Time

During the equalization phase, the controller will charge the battery as much as possible until the battery voltage rises to the battery equalization voltage. Constant voltage regulation is then used to maintain the battery voltage to maintain the battery equalization voltage. The battery will remain in the equalization phase until the set battery equalization time is reached.

The default setting is 60 minutes, with a range of [5,900] that can be set in increments of 5 minutes each time.

3.4.2.31 Equalizing Delay Time Settings (EQO)



Figure -50 Setting EQO

Function Description: Set equalizing delay charging time.

Setting conditions: All states can be set.

Instructions:

EQT:Equalization Timeout

In the equalization phase, when the battery equalization time expires and the battery voltage does not rise to the battery equalization voltage point, the charge controller will extend the battery equalization time until the battery voltage reaches the battery equalization voltage. When the battery equalization delay setting ends and the battery voltage is still lower than the battery equalization voltage, the charge controller will stop the equalization and return to the floating charge stage.

The default setting is 120 minutes, with a range of [5,900] that can be set in increments of 5 minutes each time.

3.4.2.32 Equalizing Interval Settings (EQI)

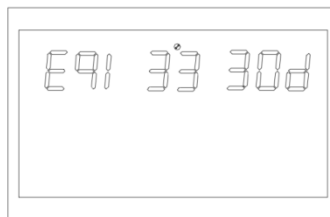


Figure 3-51 Setting the EQI Interval page

Function Description:Set the balanced charging interval.

Setting conditions:All states can be set.

Instructions:

EQI:Equalization interval

When battery access is detected during the floating charge phase with equalization mode on, the controller will begin to enter the equalization phase when the set equalization interval (battery equalization cycle) is reached.

The default setting is 30 days, and the range can be set [1,90] in increments of 1 day at a time.

3.4.2.33 Enabling Equalization Settings Immediately (EQN)



Figure 3-52 Opening EQN Now page

Function Description Sets whether to immediately enable balance mode for the inverter.
 Setting condition: All states can be set.

Instructions:

EQN:Equalization Now

The default setting is OFF and the function is not turned on; When it is set to ON, when the floating charge phase under the balanced mode is turned on and the battery is detected, the balanced charge is activated immediately and the controller will start to enter the balanced phase.

3.4.2.34 Grid-Connected Inverter Function (GTI)

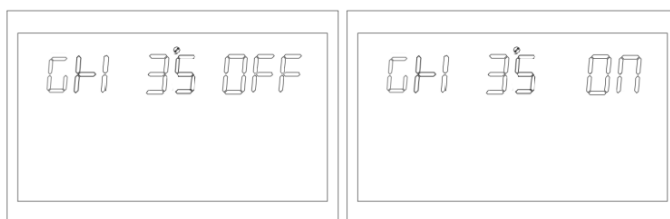


Figure3-53 Grid-connected inverter Settings page

Function Description:Set whether the inverter is grid-connected and fed in PV priority mode or PBG mode.

Setting conditions: All states can be set.

Instructions:

GTI:Grid Tie Invert

Default is set to OFF and the function is not turned on; When set to ON, the inverter through the maximum power point tracking, excess energy feed into the market power.

After the function is enabled, if the communication is abnormal, alarm 56 is generated, and the inverter no longer decides the operation logic according to the BMS information.

3.4.2.35 Battery Dual Output Low Voltage Shutdown Point (DBV)

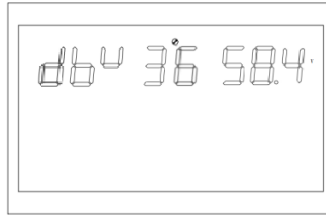


Figure 3-54 Battery Dual-output Low voltage shutdown point page

Function Description: When this function is enabled, the inverter sub-output is enabled by default. After entering battery mode, when the battery voltage is lower than the set point, the secondary output is turned off. When the battery voltage is back above the set point + 1V/ knot, the secondary output turns on.

Setting condition: All states can be set.

Instructions:

DBV: Dual output battery mode cut -off voltage

3k-VML-24V/3K-VP-24V The default is 24V, and the range can be set to [22,32]

5k-VMH-48V is set to 48V by default and can be set to range [44,60]

When the setting point is higher than the constant voltage charge (CV) point - 1V/ knot, the constant voltage charge point is used as the recovery voltage.

* This function needs to be used in conjunction with a dual-output auxiliary board.

3.4.2.36 Battery Dual Output Duration (DBT)

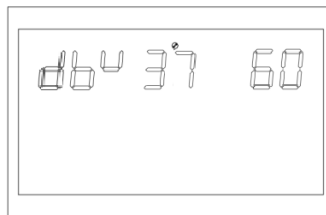


Figure 3-55 Battery Dual Output Low voltage shutdown point page

Function Description: When this function is enabled, the inverter sub-output is enabled by default. After entering the battery mode, when the battery discharge time reaches the set point, the secondary output is turned off.

Setting condition: All states can be set.

Instructions:

DBT: Dual output battery mode cut -off time

The default value is OFF, and the function is disabled. The range is [5,890], in minutes.

When set to FUL, the secondary output is not limited to output time.

* This feature needs to be used with a dual output auxiliary board.

3.4.2.37 BMS Communication Function (BMS)

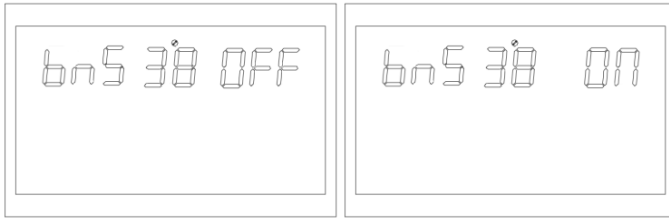


Figure3-56 Setting the BMS management function

Function Description Set whether the inverter communicates with the BMS of the lithium battery.

Setting conditions: All states can be set.

Instructions:

BMS:Battery Manage System

The default setting is OFF and the function is not turned on; When it is set to ON, the inverter communicates with the lithium battery BMS through the central centralized control board, and obtains battery information.

After the function is enabled, if the communication is abnormal, alarm 56 is generated, and the inverter no longer decides the operation logic according to the BMS information.

- * This function needs to be used in conjunction with the central controller board.
- * When the central control board is not connected, the option page is blocked.

3.4.2.38 Low SOC Shutdown F function (BSU)

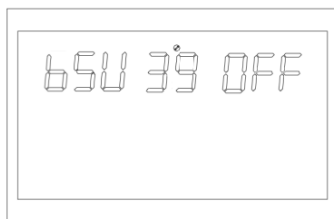


Figure 3-57 Setting the Low SOC Shutdown function

Function Description: Set the inverter to shut down when SOC is low.

Setting conditions: All states can be set.

Instructions:

BSU: Battery SOC under lock

The default is 20, and the range can be set to [5,50]. In battery mode, the lithium battery SOC is shut down when it reaches the set value, and alarm 68 is generated at the same time, and alarm 68 is cleared when it returns to the set value + 5%. In standby mode, when it reaches the set value + 10%, it can turn into battery mode. When it does not reach the set value, alarm 69 is cleared. After the function is enabled, alarm 69 is generated when the SOC of lithium battery reaches the set value + 5%, and alarm 69 is cleared when it returns to the set value + 10%.

It can be set to OFF. At this time, the inverter will no longer shut down, start up, and alarm according to the SOC.

After the function is enabled, if the communication is abnormal, the inverter no longer decides to run logic according to the SOC information, and the related alarm is cleared.

- * This function needs to be used in conjunction with the central controller board.
- * When the central control board is not connected, the option page is blocked.

3.4.2.39 High SOC to Battery Function (STB)

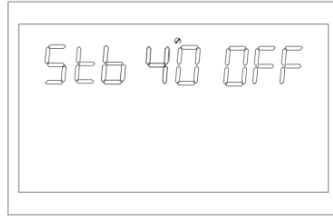


Figure 3-58 Setting Low SOC to mains

Function Description: Sets the SOC value of inverter to battery mode.

Setting conditions: All states can be set.

Instructions:

STG: Battery SOC turn to battery mode.

It is set to 90 by default and can be set to a range of [10,100]. PBG Priority Mains In normal mains mode, the lithium battery SOC is switched to battery mode when it reaches the set value. When turned on, the inverter will only switch to battery mode when the SOC is higher than the set point and the battery voltage is higher than the voltage point to switch back to battery mode (see 3.4.2.15).

It can be set to OFF, at which time the inverter will no longer switch from mains mode to battery mode according to the SOC condition.

After the function is enabled, if a communication exception occurs, the inverter no longer determines the running logic according to the SOC information, and the related alarm is cleared.

- * This function needs to be used in conjunction with the central controller board.
- * When the central control board is not connected, the option page is blocked.

3.4.2.40 Low SOC to Mains F unction (STG)

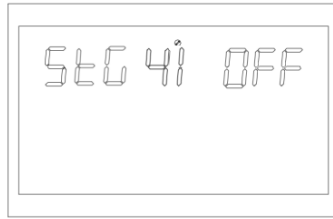


Figure 3-59 Setting Low SOC to mains

Function Description: Sets the SOC value for the inverter to switch to mains mode.
 Setting conditions: All states can be set.

Instructions:

STG: Battery SOC turn to grid mode.

The default is set to 50, and the range can be set to [10,90]. PBG Priority Mains In normal battery mode, the lithium battery SOC is switched to mains mode when it reaches the set value. When turned on, the inverter switches to mains mode when the SOC is below the set point or the battery voltage is below the switch back to mains voltage point (see 3.4.2.14).

It can be set to OFF, at which time the inverter will no longer switch from battery mode to mains mode according to SOC conditions.

After the function is enabled, if a communication exception occurs, the inverter no longer determines the running logic according to the SOC information, and the related alarm is cleared.

If this setting is higher than the STB point, the STB and STG will not take effect after the next effect.

* This function needs to be used with the central control board.

* When the central control board is not connected, the option page is blocked.

3.5 Fault and Alarm description

Function Description Alarm code ALA blinks and the buzzer sounds for 1s. The alarm stops for 1 minute. The fault indicator is steady on, and the buzzer will stop after 10S of sound. After stopping, the fault is eliminated. Try to restart the machine, and the machine will continue to be in the fault state after six failed restarts. You need to completely power off the machine or wait 30 minutes before restarting the machine. The fault and alarm LCD is displayed as shown in the above figure. The fault icon in fault mode is on, and the alarm icon in alarm status is blinking . Contact the manufacturer to rectify the fault according to the fault information.

3.5.1 Description of Faults

- Fault: inverter enters fault mode, LED red light is on, LCD displays fault code.

Faultcodetable

Trouble codes	Chinese meaning	English meaning	Related actions	Trigger conditions	Recovery conditions	Fault alarm	Applicable model
1	The bus boost soft lift fails	Bus soft start fail	Go to failure mode	When the bus is soft, it cannot reach the set voltage	Unrecoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
2	Overpressurized bus bars	Bus high	Go to failure mode	The bus is above the set value	Unrecoverable	breakdown	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
3	Bus undervoltage	Bus low	Go to failure mode	The bus is below the set value	Unrecoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
4	Battery overcurrent	Battery Over Current	Go to failure mode	The instantaneous value of battery current exceeds 580A, immediately protect	Non-recoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
5	Overwarm	Over temperature	Go to fault mode	The temperature sensor of the PFC or INV is above the overtemperature setpoint	After the restart function is enabled, the fault restart cannot be recovered after six failed attempts	breakdown	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
6	Battery overvoltage	Battery high	Go to failure mode	The battery voltage is above the set value	Recoverable	Malfunctions	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
7	The bus is soft and faulty	Bus soft Fault	Go to fault mode	The DC soft starting voltage of the bus has not reached the set value	Unrecoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
8	Short circuit of bus bar	Bus short Fault	Go to fault mode	In normal operation, the bus bar is momentarily below the set value	Unrecoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V

Trouble codes	Chinese meaning	English meaning	Related actions	Trigger conditions	Recovery conditions	Fault alarm	Applicable model
9	The inverter is soft faulty	INV soft Fault	Go to fault mode	After a period of soft start of the inverter, the rated output voltage still cannot be reached	Unrecoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
10	Inverter output overvoltage	INV over voltage	Fail-over mode	In battery mode, the inverter voltage is above the set value	Non-recoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
11	Inverter output undervoltage	INV under voltage	Go to failure mode	In battery mode, the inverter voltage is below the set value	Non-recoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
12	Inverter Short circuit	INV short	Go to fault mode	The inverter voltage is momentarily less than the set value, and the current is momentarily greater than the set value	The fault cannot be recovered after six failed restarts	Fault	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
13	Negative power protection	Negative power	Go to failure mode	The inverter power is less than the set value for a period of time	unrecoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
14	Overload failure	overload fault	Go to fault mode	Load out of specification	function is enabled, the fault restart cannot be recovered after six failed attempts	Fault	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
15	Model failure	Model Fault	Fail-over mode	Software recognition machine model does not match hardware detection	Unrecoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
16	Bootless programs	No boot loader	Go to failure mode	No bootstrap	Unrecoverable	Malfunction	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
17	The PV program is burning	Panel Flash Fault	Go to fault mode	The VML model is burning the PV control program	Resume after burning	Glitch	5K-VMH-48V 3K-VMH-24V 3K-VML-24V

Trouble codes	Chinese meaning	English meaning	Related actions	Trigger conditions	Recovery conditions	Fault alarm	Applicable model
19	Same serial number	Same Serial	Go to fault mode	In parallel mode, multiple machines with the same serial number are detected	unrecoverable	Malfunction	5K-VMH-48V 3K-VMH-24V
20	CAN communication error	CAN Fault	Go to fault mode	In parallel mode, CAN bus communication is abnormal	Unrecoverable	Malfunction	5K-VMH-48V
21	Excessive battery differential pressure	BAT Volt Different	Go to failure mode	In parallel mode, the battery pressure difference of different machines is too large	Unrecoverable	Malfunction	5K-VMH-48V
22	The input voltage differential is too large	Line Volt Different	Go to fault mode	In parallel mode, the input pressure difference between different machines is too large	Unrecoverable	Malfunction	5K-VMH-48V
23	Input voltage frequency difference	Line Freq Different	Fail-over mode	In parallel mode, the input voltage frequency difference between different machines is too large	Unrecoverable	Malfunction	5K-VMH-48V
24	Output mode setting exception	Output Config Different	Go to fault mode	In three-phase parallel mode, there is a lack of phase in the parallel mode Settings of different machines, or there is a three-phase parallel and a single phase parallel, or there is a single machine mode	Set to single machine operation and disconnect parallel communication, or meet the setting conditions for three phase operation, or meet the setting conditions for single phase	Fault	5K-VMH-48V

Trouble codes	Chinese meaning	English meaning	Related actions	Trigger conditions	Recovery conditions	Fault alarm	Applicable model
					parallel recovery		
25	Output out of step	Output Syn Loss	Fail-over mode	In parallel mode, the output voltage detection is out of sync	Unrecoverable	Malfunction	5K-VMH-48V
26	BMS failure	BMS Fault	Go to fault mode	A fault message exists on the battery BMS	Disable the BMS communication function, or restore the BMS fault	Fault	5K-VMH-48V 3K-VMH-24V

3.5.2 Alarm Description

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

A alarm code table

Alarm Codes	Chinese meaning	English meaning	Related actions	Trigger conditions	Recovery conditions	Fault alarm	Applicable model
50	Missing battery	Battery open	Alarm, battery is not charged	The battery voltage is lower than 8V/ knot	Recoverable (10V/ knot)	Alarm	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
51	Low-voltage battery shutdown	Battery Under	Alarm, battery under low voltage off or no power on	Battery voltage less than 10.5V/ knot (default)	Recoverable (10V/ knot +0.2* N (number of batteries))	Alarm	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
52	Low battery voltage	Battery low	Give an alarm	Depending on bAL Settings	Recoverable (action point +0.2V/ knot)	Alarm	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
53	Charger Short Circuit	Battery charge short	Alarm, battery is not charged	The battery voltage is less than 5V and the charging current is greater than 4A	Non-recoverable	Alarm	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
54	Low power discharge	Low watt discharge	Alarm	Battery discharge exceeds set low power discharge time	Recoverable (battery voltage higher than 13.2V/ knot)	Alarm	5K-VMH-48V 3K-VMH-24V
55	Battery overshoot	Over charge	Alarm, battery not charged	The battery voltage is higher than set value	Recoverable	Give an alarm	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
56	BMS lost	BMS Loss	Alarm, locked standby mode	After the BMS communication function is enabled, the communication fails	Recoverable	Alarms	5K-VMH-48V 3K-VMH-24V
57	Overwarm	Over Temperature	Alarm: The battery is not charged	The temperature sensor of the PFC or INV is higher than the set value	The temperature sensor of a PFC or INV is below the set value	Alarm	5K-VMH-48V 3K-VMH-24V 3K-VML-24V

Alarm Codes	Chinese meaning	English meaning	Related actions	Trigger conditions	Recovery conditions	Fault alarm	Applicable model
58	Fan failure	fan lock	Alarm: If one fan fails, the other fan turns full speed	No fan speed signal is detected	Recoverable	Alarms	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
59	EEPROM failure	EEPROM fail	Alarm	EEPROM read/write failure	Unrecoverable	Alarm	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
60	Overload	overload warning	The battery is not charged	Load >102%	Recoverable (load <97%)	Alarm	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
61	Abnormal generator waveform	Abnormal generator waveform	Alarms that continue to work in battery mode	Abnormal generator waveform detection	Recoverable	Alarms	5K-VMH-48V 3K-VMH-24V 3K-VML-24V
62	Weak PV energy	PV Energy Weak	Turn off PV output as well as charge	When the battery is not connected, the bus voltage is below the set value	It will resume after 10mins	Alarm	5K-VMH-48V 3K-VMH-24V
63	Sync loss	Synchronization signal fail	If the alarm is generated, go to fault mode	The parallel board is disconnected	Switch to standalone mode recovery Disconnect ion troubleshooting recovery	Alarm	5K-VMH-48V 3K-VMH-24V
64	Parallel Settings are not compatible	Parallel configuration incompatible	Alarm, switch to standby mode	When the three phase is combined, there is a phase loss setting	Restore when the three-phase setting is correct	Alarms	5K-VMH-48V 3K-VMH-24V
65	Parallel versions are not compatible	Parallel version incompatible	Alarm, switch to standby mode	An incompatible version number exists in the parallel system	Restore when all machine versions in the parallel system are compatible with each other	Give an alarm	5K-VMH-48V 3K-VMH-24V

Alarm Codes	Chinese meaning	English meaning	Related actions	Trigger conditions	Recovery conditions	Fault alarm	Applicable model
66	Parallel communication failure	Parallel Communication Fault	Alarm, switch to standby mode	Slave cannot be detected in parallel system	In the parallel system, the slave is recovered after being connected, and the recovery mode is set to single-machine mode	Alarm	5K-VMH-48V 3K-VMH-24V
67	There are differences in parallel mains	Parallel Line Differ	Alarm	The error of the mains voltage or frequency of the parallel machine is too large	When the mains voltage and frequency error of each machine is detected, it will be restored	Alarm	5K-VMH-48V 3K-VMH-24V
68	Low SOC Off	SOC Under	Alarm, switch to standby mode	The lithium battery SOC is below the set value	Turn off the low SOC shutdown function, or turn off the BMS communication function, or restore when the SOC returns to + 5% of the set value	Alarm	5K-VMH-48V 3K-VMH-24V
69	Low SOC	SOC Low	Alarm, if in standby mode, to keep standby mode not on	Lithium battery SOC below set value + 5% (mains mode or battery mode), below set value + 10% (standby mode)	Turn off the Low SOC shutdown function, or turn off the BMS communication function, or restore the SOC to + 10% of the set value	Alarm	5K-VMH-48V 3K-VMH-24V

3.5.3 Technical Specifications

Model		OLU-2000A	OLU-3000A
Inverter Parameters			
Inverter Output	Rated power	2kW	3kW
	AC rated voltage	230VAC	
	Rated frequency	50Hz	
	AC voltage	230VAC±5%	
	Max. power output	2kW	3kW
	Max. Efficiency	92%	
	Switchover time	10ms	
	Wave	Pure sine wave	
Inverter Input	Battery overvoltage	31.0V	
	Battery undervoltage warning	23.8V	
	Battery undervoltage	22.8V	
	Constant charge voltage	28.8V	
	Float charge voltage	28.0V	
Grid Input	Rated voltage	220V	
	Voltage range	90~280VAC	
	Rated frequency	50Hz	
	Frequency range	40~70Hz	
	Rated current	10.9A	
	Max. AC current	17A	
PV Input	Max. voltage	85VDC	
Inverter Charge	Inverter Max. charge current	100A	
	Grid Max. battery charge current	50A	
	PV Max. charge current	50A	
Battery Parameters			
Rated capacity		2.56 kWh	3.5 kWh
Nominal voltage		25.6V	

Model	OLU-2000A	OLU-3000A
Discharge voltage range	21.6-28.8V	
Standard charging current	0.5C@25°C	
Max.charging current	1C@25°C	
Max.discharge current	1C@25°C	
Depth of discharge DOD	0.9	
Cycles	6000 cycles 80%DOD.@25°C	
Working Temp.Range	Charge: 0°C ~ 50°C Discharge: -10°C ~ 50°C	
Storage temperature(°C)	-15°C ~ 50°C	
Recommendation: Charge and discharge the battery every 3 months.		



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