

「User's Manual」

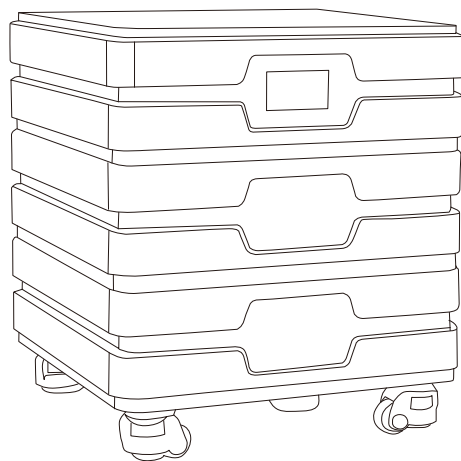
物料编码：210110034



Applicable Models: SI485KP(Button Screen)

Solar hybrid inverter

Stacking



Applicable Models: SI485KP(Button Screen)

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1. Basic Information

1.1 Product Overview and Features

This integrated machine combines solar charging & utility charging with pure sine wave AC output. Utilizing DSP control and advanced control algorithms, it offers high response speed, reliability, and industrial standardization. The machine features four selectable charging modes: solar-only, utility-priority, solar-priority, and hybrid, as well as two output options: inverter and utility, to meet various application needs. The solar charging module employs the latest MPPT tracking technology, ensuring rapid tracking of the photovoltaic array's maximum power point in any environment, maximizing energy harvest from solar panels.

The AC-DC charging module incorporates advanced control algorithms for fully digitalized voltage and current dual-loop control, offering high precision, compact size, wide AC voltage input range, comprehensive input/output protection, and stable, reliable battery charging and protection.

The DC-AC inverter module, based on fully digital and intelligent design, uses advanced SPWM technology to produce pure sine wave output, converting DC to AC power suitable for household appliances, power tools, industrial equipment, and electronic audio-visual loads. The product features a segmented LCD display for real-time system operation data and status, along with comprehensive electronic protection functions, ensuring safer and more stable system operation.

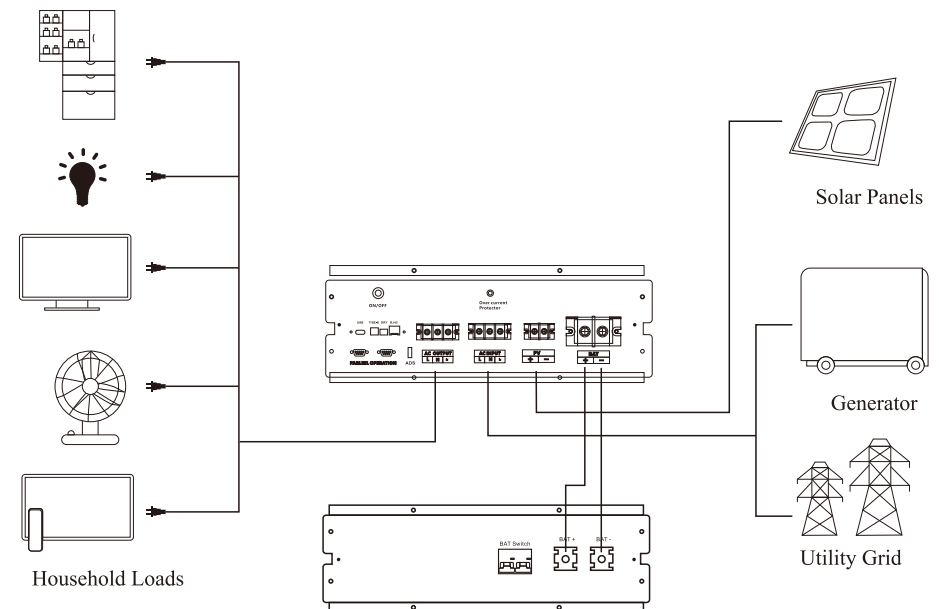
『Features: 』

1. Digital voltage and current dual-loop control with advanced PWM technology for pure sine wave output.
2. Offers both utility bypass and inverter output, with uninterrupted power supply functionality.
3. Four selectable charging modes: solar, utility-priority, solar-priority, and hybrid.
4. Advanced MPPT technology with up to 99.9% efficiency.
5. LCD display and 4 LED indicators for dynamic system data and operational status.
6. ON/OFF self-lock switch controls AC output.
7. Power-saving mode to reduce no-load loss.
8. Intelligent, adjustable-speed fan for efficient cooling and extended system life.
9. Comprehensive protection features, providing 360-degree all-round protection.
10. Complete protection against short-circuit, under/over-voltage, overload, and reverse current.

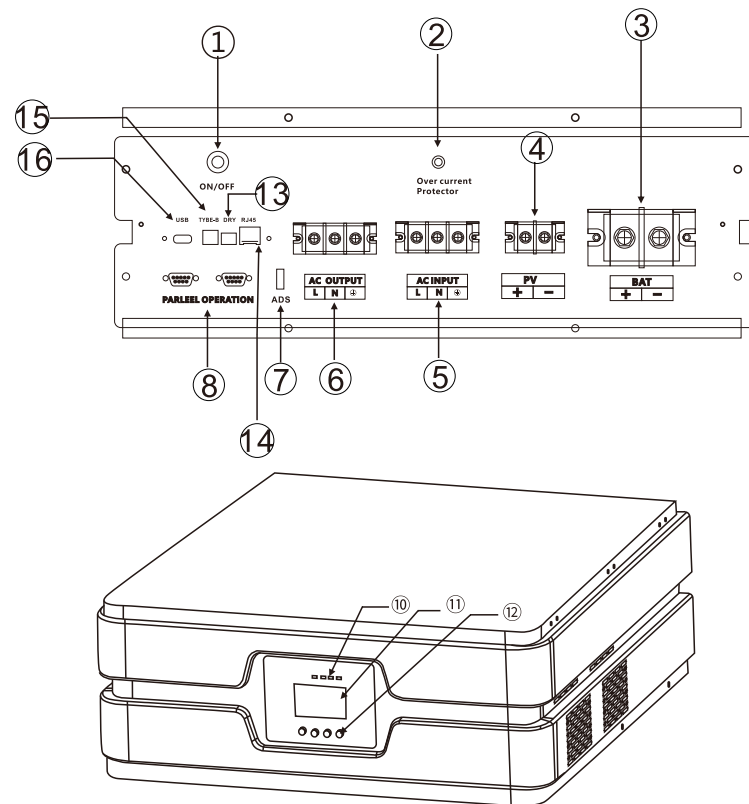
1.2 Basic System Introduction

The figure below displays the application scenario of this product. A complete system comprises the following parts:

1. Photovoltaic (PV) Panels: Convert solar energy into direct current (DC) power, which charges the battery through an integrated machine or directly inverts it into alternating current (AC) to supply power to the load.
2. Utility or Generator: Connected at the AC input end, it provides energy for load power supply and charges the battery. If the utility or generator is not connected, the system operates normally, with the load powered by the battery or photovoltaic panels.
3. Battery: The battery ensures normal power supply to the system load when solar energy is insufficient or there is no utility power available.
4. Household Loads: Can be connected to various residential and office loads, including refrigerators, lighting, televisions, fans, air conditioning, and other AC loads.
5. Inverter-Control Integrated Machine: The energy conversion device of the entire system, with the specific system wiring method determined by the actual application scenario.

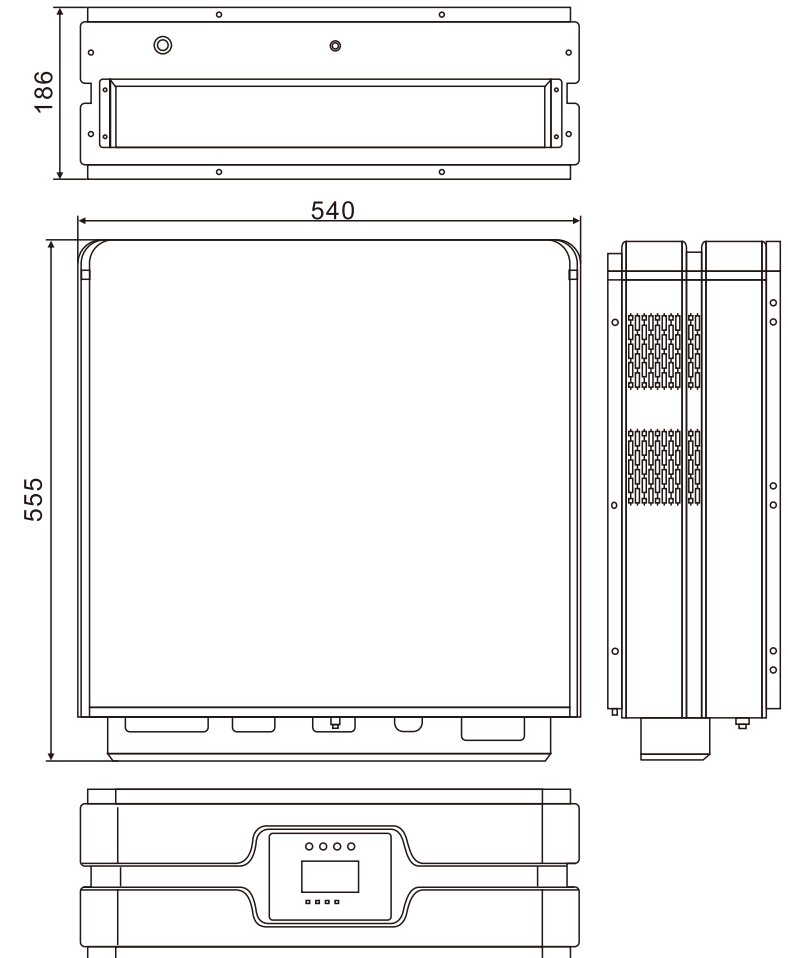


1.3 Product Features



1	ON/OFF Round Switch	8	Parallel Machine Communication Interface
2	AC Input Overload Protector	10	Indicator Light
3	BAT+ - Inverter Input Terminal	11	Display Screen
4	PV+ - Inverter Input Terminal	12	Button
5	AC INPUT Terminal	13	Dry Contact
6	AC OUTPUT Terminal	14	BMS Communication 485 Interface
7	Parallel Machine DIP Switch	15	TYPE-B Communication Interface
-	-	16	WIFI/GPRS Communication Interface

1.4 Dimensional Diagram



2. Installation Instructions

2.1 Installation Precautions

Do not install the integrated machine in environments that are damp, flammable, explosive, or where there is a high concentration of dust.

Before installation, carefully read this manual to familiarize yourself with the installation steps.

Avoid placing metal objects near the battery connections to prevent short-circuiting.

When installing in a cabinet, ensure there is more than 300mm of space on either side of the integrated machine for heat dissipation.

Loose connections and corroded cables can cause significant heating, melt wire insulation, burn surrounding materials, and even cause fires. Ensure all connections are tight and cables are secured to prevent them from moving.

When installed outdoors, avoid direct sunlight and rainwater infiltration.

After turning off the power switch, the inside of the integrated machine still has high voltage. Do not open or touch internal components until the capacitors have fully discharged.

The polarity of the battery input should not be reversed, as this will damage the product.

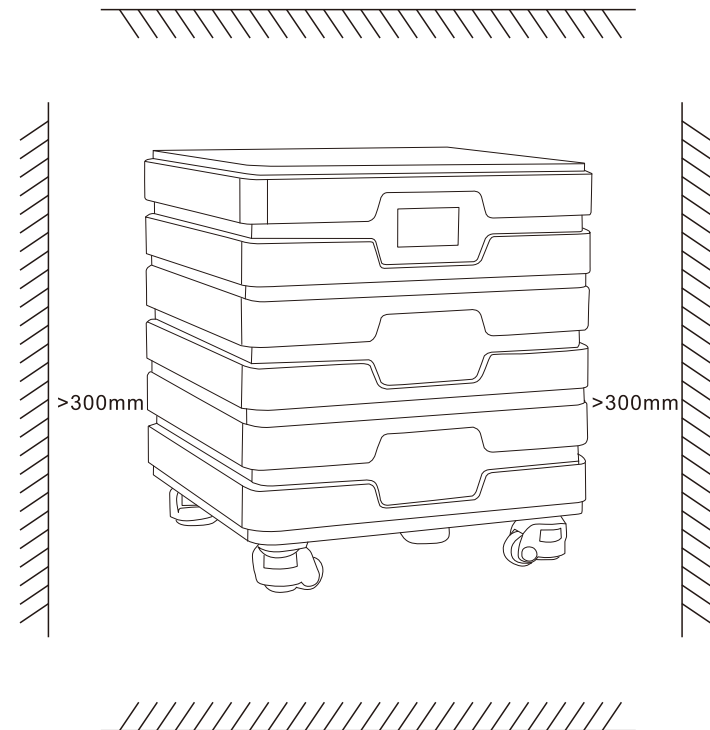
The utility power input and AC output are high voltage; do not touch them.

Avoid touching the fan when it is operating to prevent injury.

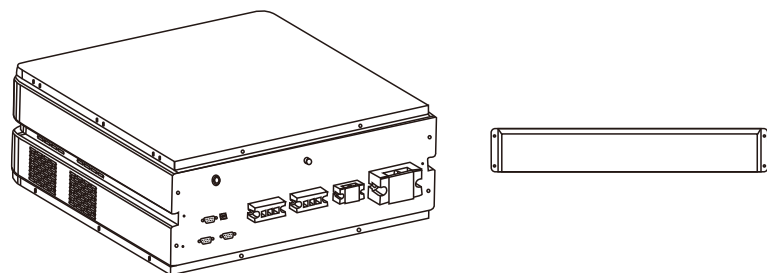
2.2 Installation and Wiring

Installation steps:

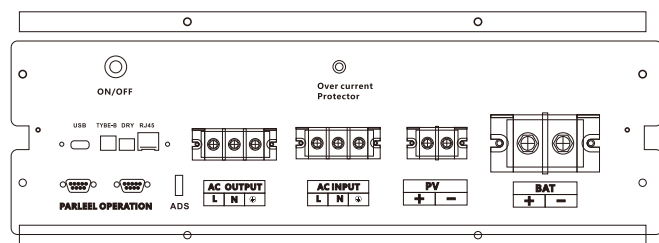
Step 1: Determine the installation location of the integrated machine. If mounting on a wall, ensure there is sufficient air circulation, with more than 300mm space at the left and right outlets for convective cooling. Refer to the following diagram for the complete installation guide.



Step 2: Remove the terminal protective cover.



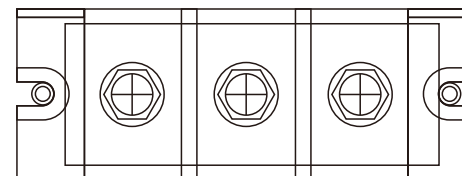
Step 3: Wiring



Wiring Method for AC Input/Output:

1. Before connecting the AC input/output, first disconnect the external circuit breaker.
2. Following the sequence and terminal positions shown in the diagram, correctly connect the AC input wires. Connect the ground wire first, followed by the live wire and the neutral wire.

L: Live wire N: Neutral wire  :Ground wire

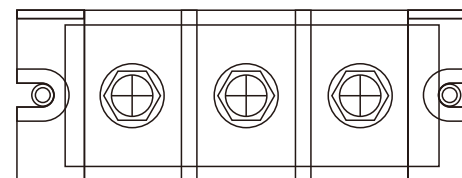


AC INPUT		
L	N	

- ③ As per the diagram, correctly connect the AC output wires in the same sequence and terminal positions. Connect the ground wire first, then the live and neutral wires.

Appropriate wire gauge: Wire cross-sectional area $>4\text{mm}^2$

L: Live wire N: Neutral wire  :Ground wire



AC OUTPUT		
L	N	

- ③ For the AC output wiring, follow the sequence and terminal positions shown in the diagram. Connect the ground wire first, then the live wire, and finally the neutral wire.

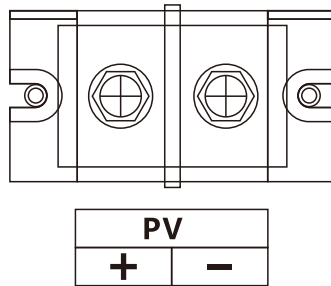
Appropriate wire gauge: Use wires with a cross-sectional area greater than 4mm^2 .

PV Input Wiring:

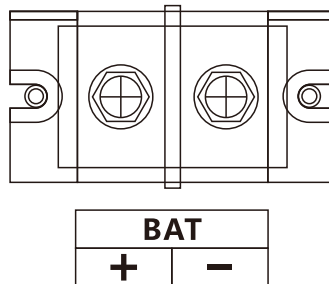
- ① Before wiring, first disconnect the external circuit breaker.
- ② Follow the sequence and terminal positions indicated in the diagram to correctly connect the PV input wires.

Appropriate wire gauge: Wire cross-sectional area $>4\text{mm}^2$

PV+: PV input positive PV-: PV input negative



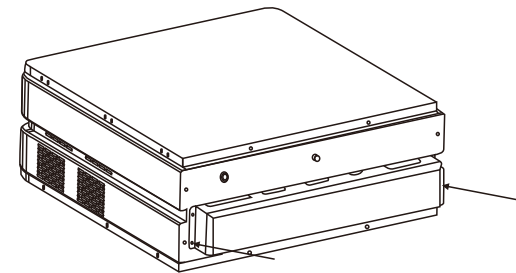
BAT+: Battery positive BAT-: Battery negative



Warning Notes:

- ① High voltage is generated by AC input, AC output, and the photovoltaic array. Ensure the circuit breaker or fuse is disconnected before wiring.
- ② Exercise caution during the wiring process. Do not close the circuit breaker or fuse until wiring is complete. Ensure correct polarity of each component, and a circuit breaker must be installed at the battery end. Disconnect this breaker to prevent strong electric sparks during wiring and avoid battery short circuits. If the integrated machine is used in areas with frequent lightning, it is advisable to install an external surge protector at the PV input.

Step 4: Install the Terminal Protective Cover



Step 5: Starting the Integrated Machine

Close the circuit breaker at the battery end, turn the machine's round switch to "ON". The "AC/INV" indicator flashing signifies that the inverter is operating normally. Then, close the circuit breakers for the photovoltaic array and utility power. After ensuring AC output is normal, gradually turn on AC loads one by one to avoid large instantaneous impact and triggering protective measures. The integrated machine will enter the operating state according to the set working mode.

Note: When powering different AC loads, it is advised to first turn on loads with higher impact currents, and then, after the load stabilizes, turn on those with smaller impact currents.

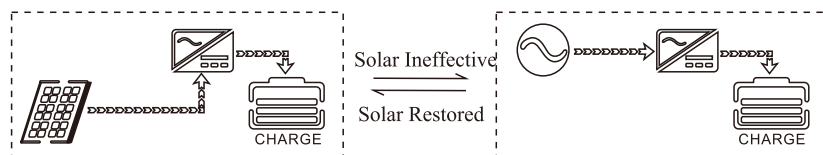
Note: If the integrated machine is not operating normally, and the LCD or indicator lights show abnormalities, please refer to section 6 for troubleshooting.



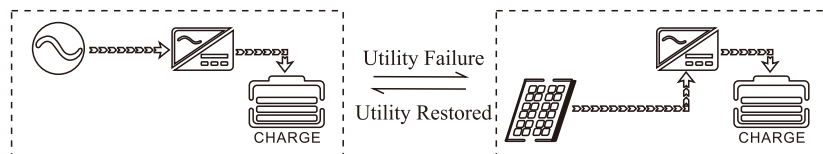
3. Operating Modes

3.1 Charging Modes

1) Solar Priority: Charging is primarily from solar power, with utility power charging activated only when solar is insufficient. During the day, solar energy is maximally utilized for charging, and at night, it switches to utility power. This mode maintains battery charge and is suitable for areas with relatively stable electricity grids and higher electricity costs.

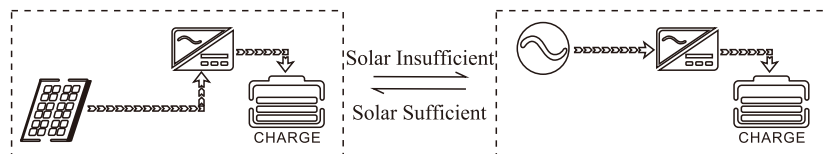


2) Utility Priority: The battery is charged primarily from utility power, with solar charging activated only when utility power is unavailable.



3) Hybrid Charging: Both solar and utility power are used for charging. It prioritizes solar MPPT charging and uses utility power as a supplement when solar energy is insufficient. When sufficient solar energy is available, utility power charging stops. This is the fastest charging method and is ideal for areas with unstable power grids, providing ample backup power supply.

4) Solar Only Charging: Solely uses solar power for charging without activating utility power. This mode is the most energy-efficient, with all battery power coming from solar energy. It's typically used in areas with favorable sunlight conditions.



3.2 Output Mode

Switches to utility power for supply and charging when solar power is ineffective. This mode maximizes the use of solar energy while maintaining battery charge and is suitable for areas with relatively stable electricity grids. The default output voltage is set at 230V, but options of 208V, 220V, 230V, and 240V are available. All conditions are adjustable and take immediate effect.

To adjust the settings, hold the function setting button (Button 4) for more than 2 seconds to enter the settings page. Press the query button (Button 2 or 3) for 0.1 to 2 seconds to navigate to the output voltage (OPU) setting page. The "OPU" will blink.

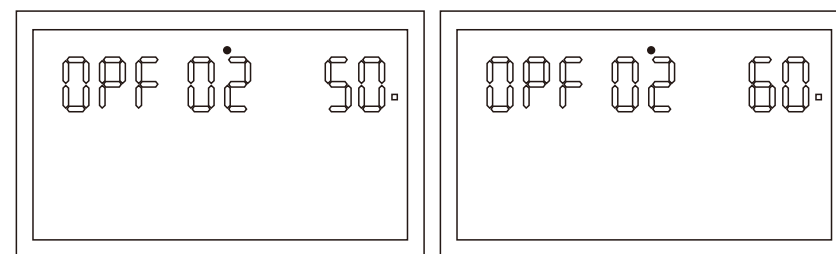
Press the confirmation button (Button 4) for 0.1 to 2 seconds to enter the OPU setting page. Here, the OPU label will remain lit, and the value beside it will blink. Choose the desired output voltage (208V, 220V, 230V, or 240V; default is 230V) by pressing the query button. Once selected, confirm the setting by pressing the confirmation button for 0.1 to 2 seconds. The OPU value will then stay lit and stop blinking.

To finalize the setting, press button 1 for 0.1 to 2 seconds. Exit the settings page and return to the main display (or wait up to 30 seconds for it to automatically return to the main display page).

Note:

When the output voltage is set to 208V, the output must be derated to 90%.

The default output frequency setting is 50Hz.

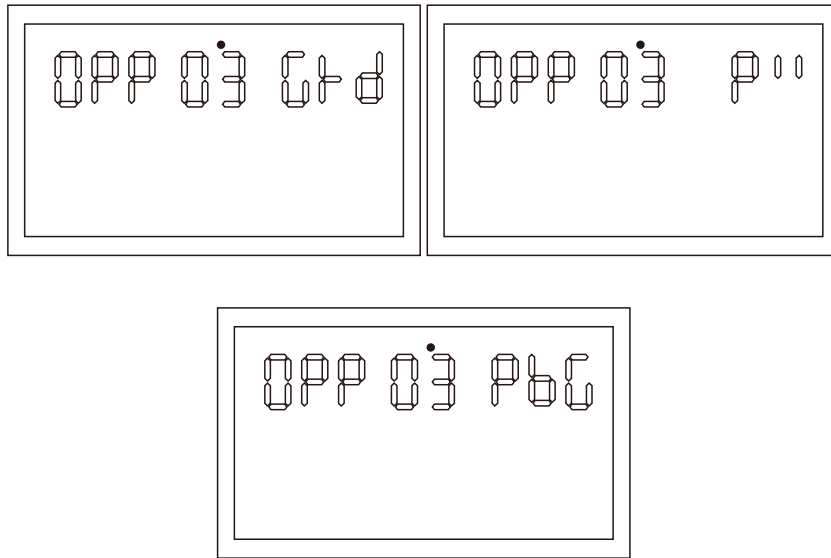


Output Frequency Setting Page

Function Description: This setting adjusts the output frequency of the inverter, with options for 50Hz and 60Hz available, defaulting to 50Hz.

Setting Conditions: This can be set under all states. In battery mode, the change will take effect upon the next restart of the machine; in utility mode, it takes effect immediately. After setting, when switching back to battery mode, the frequency change will occur at a slower pace.

3.3 Output Priority Setting (OPP)



Output Priority Setting Page

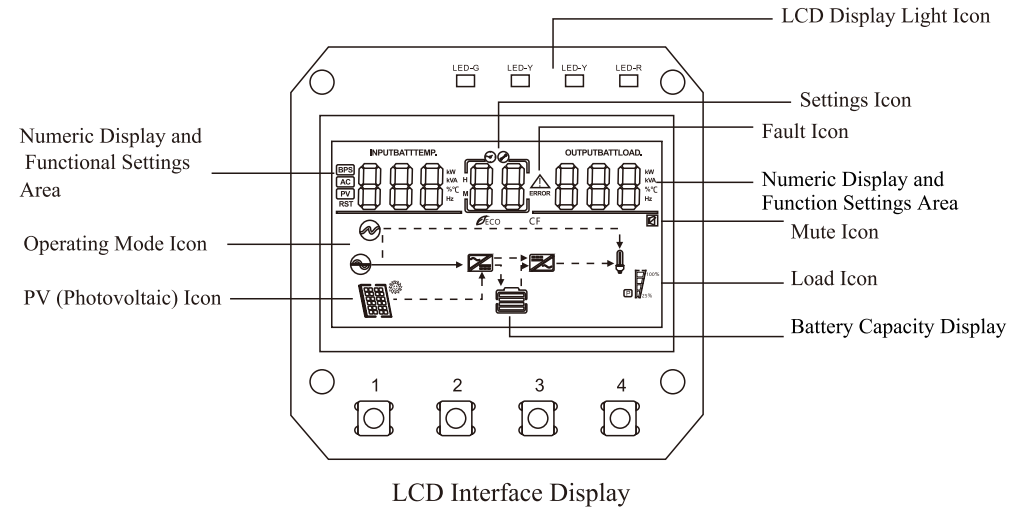
Function Description: This setting adjusts the output priority of the inverter.
Setting Conditions: Can be set in all states and takes immediate effect after setting.

Note:

There are three customizable choices for output priority:
GRD: Utility power output priority.
PU (PV): Photovoltaic output priority.
PBG: Photovoltaic, battery, and utility power output.

4. Panel Operation Instructions

4.1 LCD Function Display



Indicator Light Introduction



Indicator	Color	Description	Indicator
LED-G (Green)	Green	On: Mains power normal and in utility mode. Flashing: Mains power normal, but not in utility mode. Off: Mains power abnormal.	LED-G (Green)
LED-Y (Yellow)	Yellow	On: Output in battery mode. Off: Other states.	LED-Y (Yellow)
LED-Y (Yellow)	Yellow	On: Battery in float charging. Flashing: Battery in constant voltage charging. Off: Other states.	LED-Y (Yellow)
LED-R (Red)	Red	On: Inverter fault. Flashing: Inverter warning. Off: Inverter normal.	LED-R (Red)

Utility Power Startup

➤ When connected to utility power, press the switch to the ON position. The system will automatically start. If set to utility power output priority, after waiting for a while, the panel displaying "Utility Mode" indicates the startup is complete, and the system enters utility mode.

Battery Startup

➤ Connect the battery and close the battery switch. Press the switch to the ON position, and the inverter starts. The system will automatically start and, after waiting for some time, the panel displaying output voltage indicates the startup is complete, entering battery mode operation.

4.2.2 Shutdown Steps

When the system is outputting in either battery mode or utility mode, press the switch again to the OFF position to shut down the system.

4.2.3 Mute Setting

When the inverter is in any mode, it can be muted or unmuted by setting MUTE ON or OFF.

4.2.4 Operations in Alarm State

When the inverter has an alarm sound and the LED fault light is flashing, it indicates that the inverter is operating in an alarm state. The alarm information can be consulted to check the fault code and investigate the cause of the alarm.

4.2.5 Operations in Fault Mode

When the inverter's buzzer sounds continuously and the LED fault light stays on, it indicates that the inverter is operating in fault mode. Contact a service technician and provide relevant fault alarm information for troubleshooting assistance.

4.3 Parameter Query Operations

Press query buttons 2 and 3 to display input/output voltage, input/output frequency, battery, PV voltage and current, load, software version, etc. If the inverter encounters a fault, the main page will display the fault code or alarm information.

Display Page One (Main Display Page):

Shows the input and output voltage of the inverter, as illustrated in Figure 1-3.

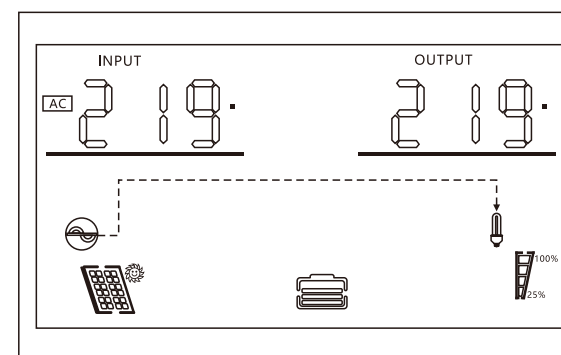


Figure 1-3 Display Page One

Display Page Two:

Shows the input and output frequency of the inverter, as illustrated in Figure 1-4.

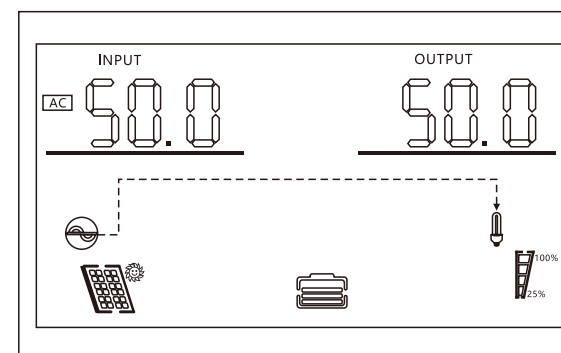


Figure 1-4 Display Page Two

Display Page Three:

Battery Information – displays battery voltage and charging current, as shown in Figure 1-5.

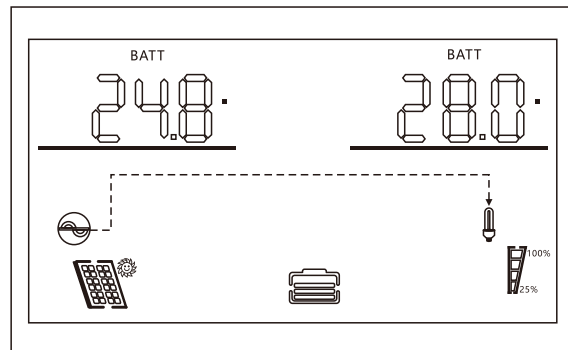


Figure 1-5 Display Page Three

Display Page Five:

PV Information – displays PV voltage and PV charging power, as shown in Figure 1-7.

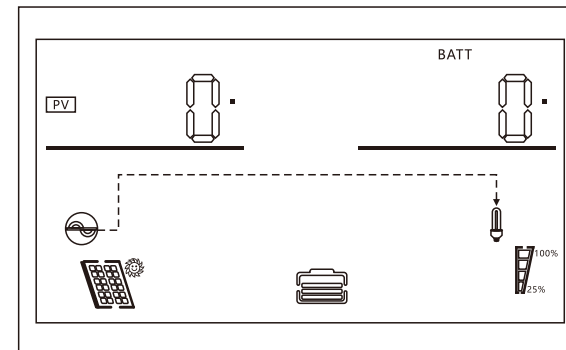


Figure 1-7 Display Page Five

Display Page Four:

PV Information – shows PV voltage and PV charging current, as illustrated in Figure 1-6.

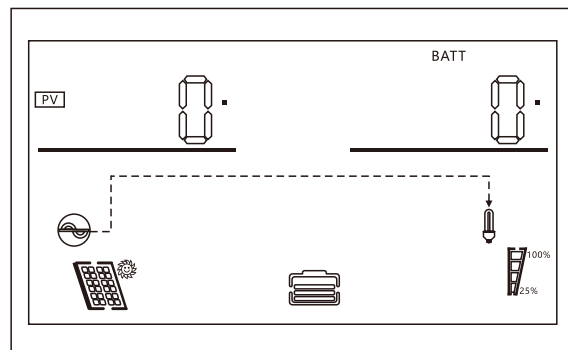


Figure 1-6 Display Page Four

Display Page Six:

Output Information – shows output voltage and active output power, as depicted in Figure 1-8.

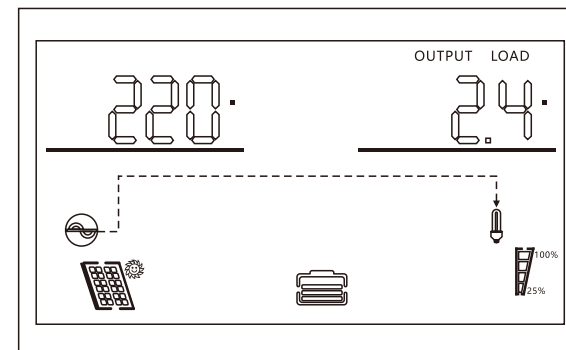


Figure 1-8 Display Page Six

Display Page Seven:

Output Information – displays output voltage and output power, as illustrated in Figure 1-9.

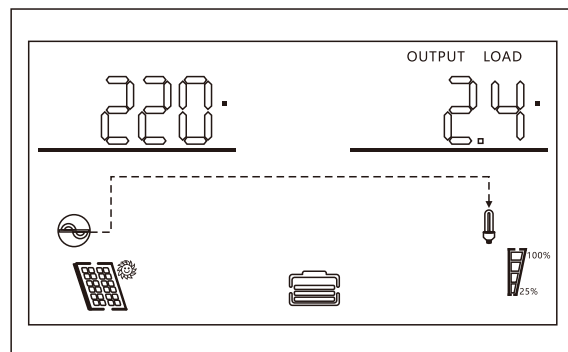


Figure 1-9 Display Page Seven

Display Page Nine:

Software Version – displays the inverter system software version, as shown in Figure 1-11.

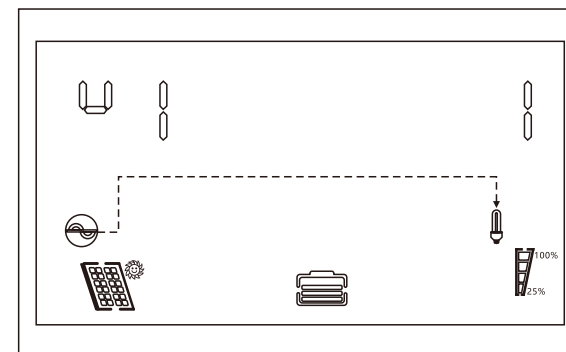


Figure 1-11 Display Page Nine

Display Page Eight:

Output Information – shows output voltage and load percentage, as depicted in Figure 1-10.

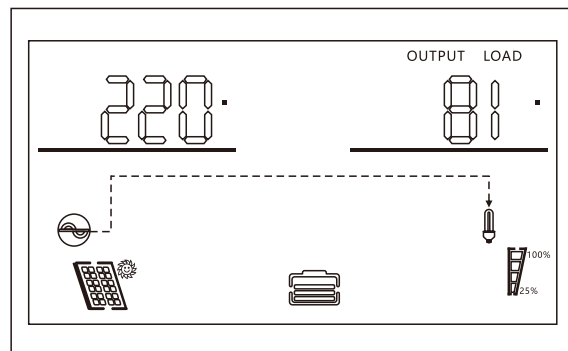


Figure 1-10 Display Page Eight

Display Page Ten:

Displays the photovoltaic power generation, as illustrated in Figure 1-12.

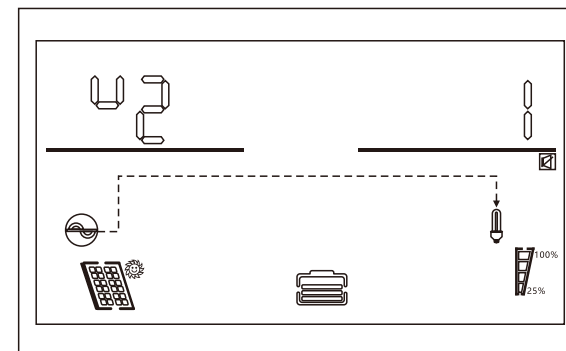


Figure 1-12 Display Page Ten

Display Page Eleven:

Parallel Operation Status – displays photovoltaic power generation, as shown in Figure 1-13.

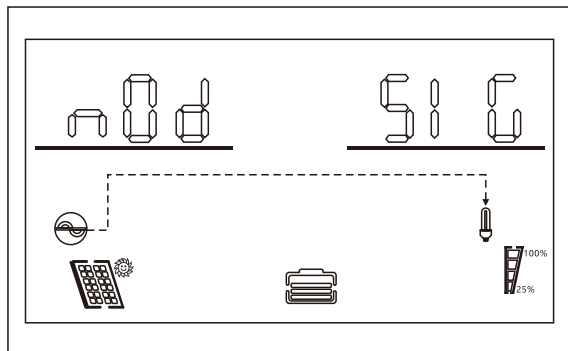


Figure 1-13 Display Page Eleven

Display Page Twelve:

Lithium Battery Bank Status – The top right corner shows SIG when the battery pack is operating individually, and PAR when the battery packs are in a series-parallel configuration. When PAR is blinking, it indicates that the battery packs are establishing a series-parallel connection.

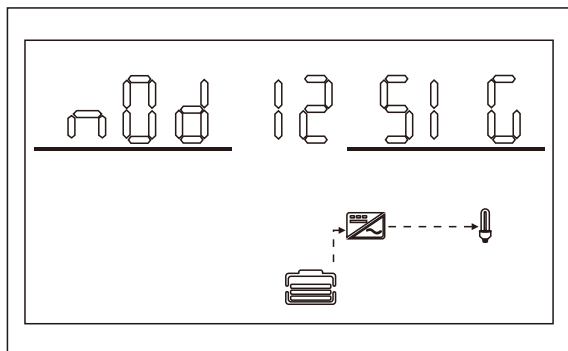


Figure 1-14 Display Page Twelve

Display Page Thirteen:

Lithium Battery Voltage and Current Information – The top left displays BMS battery voltage information, and the top right shows BMS battery current information. If BMS communication fails, both top left and top right display the blinking ERR.

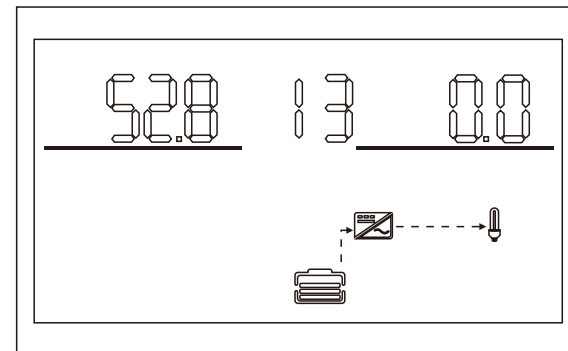


Figure 1-15 Display Page Thirteen

Display Page Fourteen:

Lithium Battery Capacity and SOC – The top left shows the rated capacity, while the top right displays BMS SOC information. If BMS communication fails, both top left and top right display the blinking ERR.

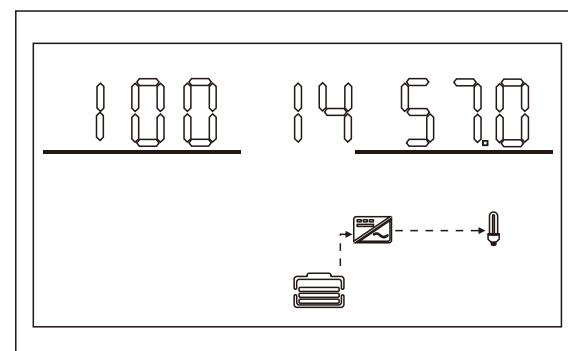


Figure 1-16 Display Page Fourteen
(Lithium Battery Capacity and SOC Information)

Display Page Fifteen

Lithium Battery Constant Voltage Point – The top left shows the fixed letter CV, while the top right displays the BMS constant voltage charging point. If BMS communication fails, the top right shows the blinking ERR.

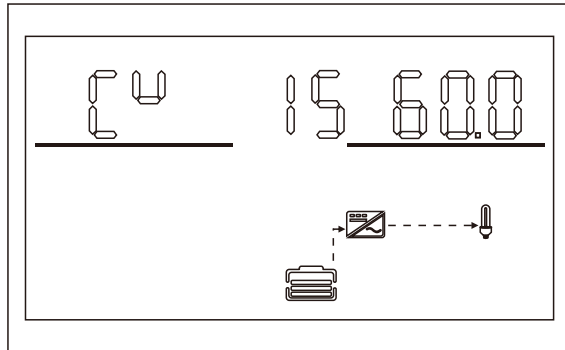


Figure 1-17 Display Page Fifteen
(Lithium Battery Constant Voltage Information)

Display Page Sixteen:

Lithium Battery Fault and Alarm Information – The top left shows BMS alarm information, and the top right displays BMS fault information. If BMS communication fails, both top left and top right display the blinking ERR.

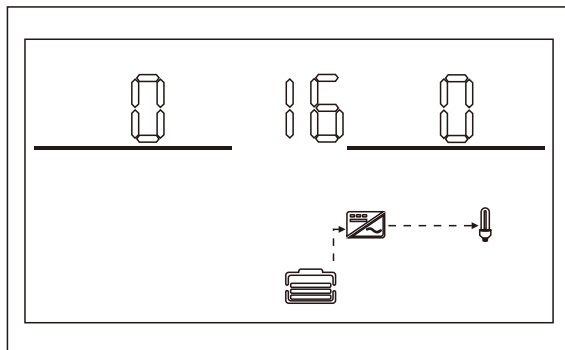


Figure 1-18 Display Page Sixteen
(Lithium Battery Fault Information)

5. Function Settings

5.1 Output Frequency (OPF)

Function Description: Sets the inverter's output frequency, with options of 50Hz and 60Hz, defaulting to 50Hz.

Setting Conditions: Can be set under all states. In battery mode, the setting takes effect upon the next restart of the machine; in utility mode, it takes effect immediately. After setting, when switching back to battery mode, the frequency change will occur at a slower pace.



5.2 Output Priority Setting (OPP)

Function Description: Sets the output priority of the inverter.

Setting Conditions: Can be set in all states, with immediate effect post-setting.

There are three choices for output priority:

GRD: Utility power output priority.

PU (PV): Photovoltaic output priority.

PBG: Photovoltaic and battery with utility power output.



5.3 Output Mode (MOD)

Function Description: Sets the inverter's output mode.

Setting Conditions: Can be set in all states and takes immediate effect.

Description:

There are two AC output modes; the default is APP (Appliance), suitable for household appliances.

The second is the UPS mode, ideal for computers and similar devices, with a typical switch time of 10ms.



5.4 Charging Priority (CHP)

Function Description: Sets the charging priority of the inverter.

Setting Conditions: Can be set in all states, with immediate effect.

Description:

There are four choices for charging priority: PNG (PV and Grid): Simultaneous charging from PV and Grid.

OPV (Only PV): Charging only from photovoltaics.

GRD (Grid): Utility power charging priority.

PV: Photovoltaic charging priority.



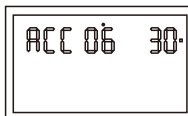
5.5 Utility Charging Current (RCC)

Function Description: Sets the maximum charging current that the inverter can draw from utility power.

Setting Conditions: Can be set under all states.

Description:

RCC (Grid Charging Current) is the maximum charging current from the utility. The default setting is 60A, with a selectable range from 2A to 80A.



5.6 Maximum Charging Current (MCC)

Function Description: Sets the maximum charging current value for the inverter.

Setting Conditions: Can be set in all states.

Description:

MCC (Maximum Charge Current) refers to the maximum value of charging current from both PV and utility power.

Selectable options for a 5K model include 2A, 10A, 20A, 30A,

40A, 50A, 60A, 70A, and 80A.

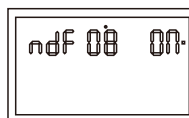


5.7 Main Interface Setting (MDF)

Function Description: Returns to the main interface setting.

Setting Conditions: Can be set in all states.

Description:



The default setting is ON. During function setting operations, if set to ON and the current page is not the first interface (P1), it will return to the first

interface after 1 minute. If set to OFF, and the current page is not the first interface (P1), the LCD will continuously display the current interface.

5.8 Overload Restart (LrS)

Function Description: Setting for overload restart.

Setting Conditions: Can be set under all states.

Description:

The default setting for overload restart is ON.



5.9 Overtemperature Restart (TrS)

Function Description: Setting for overtemperature restart.

Setting Conditions: Can be set under all states.

Description:

The default setting for overtemperature restart is ON.



6.0 Main Input Power Failure Alarm (MIP)

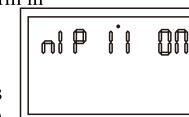
Function Description: Setting for an extended alarm in case of utility power or PV loss.

Setting Conditions: Can be set under all states, default is ON. The system will emit a prolonged alarm for a certain period if utility power or PV is lost. Can be set to OFF. (Applicable in all modes)

Description:

MIP (Main Input cut warning): Default setting is ON.

Upon detection of main input loss, the buzzer will sound continuously for 3 seconds. If set to OFF, the buzzer will not sound in case of main input loss.



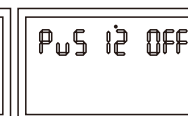
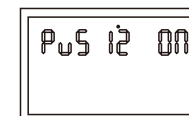
6.1 Power Saving Mode (PWS)

Function Description: Sets whether the inverter activates low power consumption mode (power-saving mode).

Setting Conditions: Can be set under all states.

Description:

PWS (Power Saving): The default setting is OFF, and the function is not activated. If set to ON, in battery mode, if the load is below 25W, the system will temporarily stop output and then continue. If the load is above 35W, the system will resume continuous normal output.



6.6 Battery Type (BAT)

Function Description: Setting for the battery type.

Setting Conditions: Can be set under all states.

Description:

BAT (Battery Type) allows the selection from four battery types: the default is AGM (Lead Acid Battery); the second is FLD (Flooded Battery); the third is LIB (Lithium Battery); the fourth is CUS (Customer Set Type).



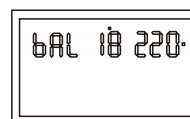
6.7 Battery Low Voltage Point (bAL)

Function Description: Setting for the low voltage alarm point.

Setting Conditions: Can be set under all states.

Description:

bAL (Battery Low) setting is not adjustable in AGM (Lead Acid Battery Type) and FLD (Flooded Battery Type) modes.



The initial default setting for 5K is 44V.

The low voltage point can be modified when the battery type is set to CUS (Customer Set Type).

For 5K, the adjustable range is [42-54V].

For LIB (Lithium Battery Type), the low voltage point can be modified.

The default setting for 5K is 47.6V, with an adjustable range of [41.2-50.0V].

6.8 Battery Shutdown Point (bAU)

Function Description: Setting for the battery low voltage shutdown point.

Setting Conditions: Can be set under all states.

Description:

bAU (Battery Under) setting is not adjustable in AGM (Lead Acid Battery Type) and FLD (Flooded Battery Type) modes.

The initial default setting for 5K is 42V.

The shutdown point can be modified when the battery type is set to CUS (Customer Set Type).

For 5K, the adjustable range is [40-48V].

For LIB (Lithium Battery Type), the shutdown point can be modified.

The default setting for 5K is 46V, with an adjustable range of [40-48V].

For Fe (Lithium Iron Phosphate Battery Type), the shutdown point can be modified.



6.9 Constant Voltage Mode Setting (bCV)

Function Description: Setting for the constant voltage charge point.

Setting Conditions: Can be set under all states.

Description:

bCV (Battery Constant Voltage) setting is not adjustable in AGM (Lead Acid Battery Type) and FLD (Flooded Battery Type) modes.

The initial default setting for 5K is 56.4V (AGM) - 58V (FLD).

The constant voltage charge point can be modified when the battery type is set to CUS (Customer Set Type).



6.2 Overload Transfer to Bypass (OLG)

Function Description: In battery mode, this setting determines whether to immediately switch to utility mode (also known as bypass mode) when an overload occurs.

Setting Conditions: Can be set under all states.

Description:

OLG (Overload to Bypass) is set to OFF by default, meaning the function is not activated. If set to ON, in cases where PV prioritized output is overloaded, the system will immediately switch to bypass (utility power output).



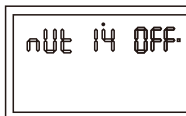
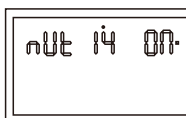
6.3 Mute Setting (MUE)

Function Description: Determines whether the buzzer will sound or not.

Setting Conditions: Can be set under all states.

Description:

MUE (Mute) is set to OFF by default, meaning the buzzer will be active. When set to ON, the buzzer will not make any sound in any condition, including alarms and faults. This setting is applicable in all modes and operates normally, though it can't be demonstrated in pictures.



6.4 Battery to Utility Voltage Transition Point (BTG)

Function Description: When both battery and utility power are available, this setting determines at which voltage the system switches from battery discharge to utility power, ensuring the battery does not deplete fully.

Setting Conditions: Can be set under all states, with output priority set to PV or PBG modes.

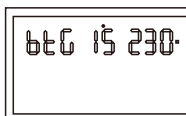
Description:

BTG (Back To Grid)

default setting for 5K is 46V.

In battery CUS (Customer Set Type) mode:

Range for 5K is [44-52V].



In AGM (Lead Acid Battery Type) or FLD (Flooded Battery Type) modes:

Default setting for 5K is 46V, with a range of [44-52V].

In LIB (Lithium Battery Type) mode:

Default setting for 5K is 47.6V, with a range of [40-50V].

6.5 Transition Back to Battery Mode Voltage Point (BTB)

Function Description: When both battery and utility power are available, this setting determines the voltage at which the system switches from utility charging to battery discharge. This maximizes battery discharge usage and effectively conserves utility power.

Setting Conditions: Can be set under all states.

Description:

BTB (Back To Battery) is initially set to 52V by default for 5K models.



When set to FUL, the battery will charge to full capacity before the system can restart in battery mode.

In Customer Set (CUS) mode:

The adjustable range is [48 - 59V]. When the setting value Vbtb is greater than TCFV - 1V, the voltage point for transitioning back to battery mode will be maintained at TCFV - 1V. If the system is not in battery mode and the output priority is set to Photovoltaic (PV) priority or Photovoltaic-Battery-Utility (PBG) output, the system will switch back to battery mode if the battery voltage exceeds CFV - 1V.

In AGM (Lead-Acid Battery Type) or FLD (Flooded Battery Type) mode:

The default setting for 5K is 52V, with an adjustable range of [48 - 58V] (following the same logic as above).

In LIB (Lithium Battery Type) mode:

The default setting for 5K is 54.4V, with an adjustable range of [46 - 58V] (following the same logic as above).

For 5K models, the adjustable range for constant voltage setting is [48-60V]. The constant voltage point must be set higher than the float charging voltage.

When the battery type is set to LIB (Lithium Battery Type), the constant voltage charging point can be modified.

The default setting for 5K is 56.4V, with an adjustable range of [48-60V]. Again, the constant voltage point must be set higher than the float charging voltage.

7.0 Float Charging Mode Voltage Setting (bFL)

Function Description: Setting for the float charging voltage point.

Setting Conditions: Can be set under all states.

Description:

bFL (Battery Float): The setting is not adjustable in AGM (Lead Acid Battery Type) and FLD (Flooded Battery Type) modes.

The initial default setting for 5K is 54V.

For batteries set as CUS (Customer Set Type), the float charge point can be modified.

The adjustable range for 5K is [48-60V], with the constant voltage point needing to be higher than the float charge voltage.

When the battery type is set to LIB, the float charging point can be modified.

The default setting for 5K is 55.2V, with an adjustable range of [50-58V]. Again, the constant voltage point must be set higher than the float charge voltage.

7.1 Utility Low Voltage Setting (LLV)

Function Description: Sets the low voltage protection point for utility power.

Setting Conditions: Can be set when the inverter is in APP and UPS modes, under all states.

LLV 22 90

LLV 22 154

bFL 21 270

Description:

LLV (Line Low Voltage): In inverter mode (Output mode: MOD needs to be set to APP), the default setting for utility low voltage is 154V, with an adjustable range of [90-154V]. In UPS mode (Output mode: MOD needs to be set to UPS), the default utility low voltage setting is 185V, with an adjustable range of [170-200V].

LLV 22 170

LLV 22 200

7.2 Utility High Voltage Setting (LHV)

Function Description: Sets the high voltage protection point for utility power.

Setting Conditions: Can be set when the inverter is in APP mode, under all states.

Description:

LHV (Line High Voltage): In inverter mode (Output mode : MOD needs to be set to APP), the default setting for utility high voltage is 264V, with an adjustable range of [264-280V].

LHV 23 264

LHV 23 280

7.3 Low Power Discharge Time Setting (LWD)

Function Description: This function protects the battery when operating at a low load in battery mode. Continuous discharge at low load can deplete the battery significantly, affecting its lifespan. After the set time for low power discharge, the low voltage shutdown point for the SI243K-24V will increase to 22V, and for the SI485K-48V, it will increase to 44V.

Setting Conditions: Can be set when the inverter is in APP mode, under all states.

Description:

LWD (Low Watt Discharge): In inverter mode, the default setting for low power discharge time is 8 hours, with an adjustable range of [1-8 hours]. In battery mode, if the continuous discharge time exceeds 8 hours without reaching the battery shutdown point, the battery voltage shutdown point will be modified to 11V per battery cell. If the discharge continues to reach 11V per battery cell, the system will alarm for 1 minute and then shut down. The discharge time is reset if the battery voltage exceeds 13.2V per battery cell for more than 30 seconds.

LWD 24 1

LWD 24 8

7.4 Soft Start Setting (SRE)

Function Description: When ON, the inverter output gradually increases from 0 to the target voltage. When OFF, the inverter output jumps directly from 0 to the target voltage.

Setting Conditions: Can be set under all states.

Description:

SRE (Soft Relay Enable) is set to OFF by default, meaning the output switch will close only after the inverter voltage reaches the rated output. If set to ON, the output switch closes before the inverter begins to ramp up the voltage.



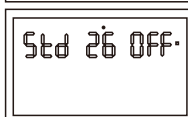
7.5 Default Setting (STD)

Function Description: Resets all settings to their default values.

Setting Conditions: Can be set in utility power mode and standby mode (StandBy: no output but with display on). Cannot be set in battery mode.

Description:

STD (Set Default): Before setting, this option shows as OFF. When set to ON, the system will revert to default settings. After the setting is completed, it will display OFF again. Can be set in utility and standby modes with immediate effect; cannot be set in battery mode.



7.6 Parallel Operation Mode Setting (MOD)

Function Description: Sets the parallel operation mode.

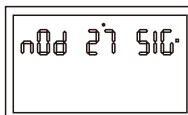
Setting Conditions: Can be set in utility power mode and standby mode (StandBy: no output but with display on). Cannot be set in battery mode.

Description:

MOD (Operation Mode) is set to SIG (single mode) by default. Options include PAR (parallel mode), 3P1 (R phase mode), 3P2 (S phase mode), and 3P3 (T phase mode).

When using parallel operation, first connect the systems correctly, then set each machine's parallel mode appropriately. If a machine in a parallel system is set to SIG, it will report error 24. If any machine is set to 3P1, 3P2, or 3P3, all machines in the system must be set to one of these three modes, with at least one machine in each mode; otherwise, all machines set to these modes will report error 64.

Can be set in utility and standby modes with immediate effect; cannot be set in battery mode, and cannot be shown in pictures.



7.7 Battery Disconnection Alarm (SBA)

Function Description: Sets the alarm for when the battery is not connected.

Setting Conditions: Can be set under all states.

Description:

SBA (Set Battery Alarm) is set to OFF by default.

When set to OFF, there will be no alarm for battery disconnection, low battery voltage, or under-voltage, even if the battery is not connected.

For the 5K model, this can be set in single machine operation mode. Other models do not have this setting option.



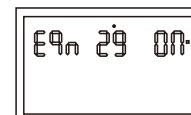
7.8 Equalization Mode (EQM)

Function Description: Sets whether the inverter enables equalization mode.

Setting Conditions: Can be set under all states.

Description:

EQM (Equalization Mode) is set to OFF by default, meaning the function is not activated. When set to ON, the controller will enter the equalization phase during the float charging stage at the set equalization interval (battery equalization period) or when immediate equalization activation is triggered.



7.9 Equalization Voltage Setting (EQV)

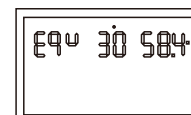
Function Description: Sets the equalization voltage point.

Setting Conditions: Can be set under all states.

Description:

EQV (Equalization Voltage) can be set in all modes.

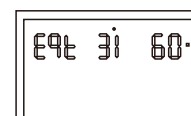
The default setting for 5K is 58.4V, with an adjustable range of [48-60V].



8.0 Equalization Charging Time Setting (EQT)

Function Description: Sets the duration for equalization charging.

Setting Conditions: Can be set under all states.



Description:

EQT (Equalization Time): During the equalization phase, the controller will charge the battery as much as possible until the battery voltage rises to the equalization voltage. It then maintains this voltage using constant voltage regulation. The battery remains in the equalization phase until the set equalization time is reached.

The default setting is 60 minutes, with an adjustable range of [5-900] minutes, and the adjustment increment is 5 minutes.

8.1 Equalization Delay Time Setting (EQO)

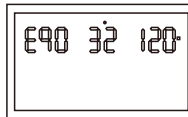
Function Description: Sets the delay time for equalization charging.

Setting Conditions: Can be set under all states.

Description:

EQO (Equalization Timeout): During the equalization phase, if the battery voltage does not rise to the equalization voltage point by the time the equalization duration expires, the controller extends the equalization time until the battery voltage reaches the equalization voltage. If the battery voltage remains below the equalization voltage when the equalization delay setting ends, the controller will stop equalization and return to the float charging stage.

The default setting is 120 minutes, with an adjustable range of [5-900] minutes, and the adjustment increment is 5 minutes.



8.2 Equalization Interval Time Setting (EQI)

Function Description: Sets the interval time for equalization charging.

Setting Conditions: Can be set under all states.

Description:

EQI (Equalization Interval): In float charging stage under equalization mode, when a battery is detected, the controller enters the equalization phase upon reaching the set equalization interval (battery equalization period).

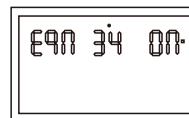
The default setting is 30 days, with an adjustable range of [1-90] days, and the adjustment increment is 1 day.



8.3 Immediate Equalization Activation (EQN)

Function Description: Sets whether the inverter immediately starts equalization mode.

Setting Conditions: Can be set under all states.



Description:

EQN (Equalization Now): The default setting is OFF, meaning the function is not activated. When set to ON, in the float charging stage under equalization mode with a detected battery, equalization charging is immediately activated, and the controller begins the equalization phase.

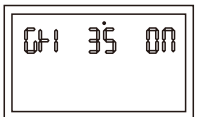
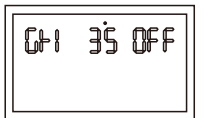
8.4 Grid-Tied Inverter Function (GTI)

Function Description: Sets whether the inverter feeds excess energy to the grid in PV priority utility mode or PBG utility mode.

Setting Conditions: Can be set under all states.

Description:

GTI (Grid Tie Invert): Default setting is OFF, and the function is not activated. When set to ON, the inverter performs maximum power point tracking, feeding excess energy back into the grid.



8.5 Dual Path Battery Low Voltage Shutdown (DBV)

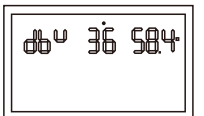
Function Description: When activated, the secondary output of the inverter is default enabled. In battery mode, if the battery voltage falls below the set point, the secondary output shuts off. The secondary output reactivates when the battery voltage exceeds the set value + 1V per cell.

Setting Conditions: Can be set under all states.

Description:

DBV (Dual output battery mode cut-off voltage): The default setting for 5k is 48V, with an adjustable range of [44-60V]. The recovery voltage is set at the constant voltage charge (CV) point - 1V per cell, if the setting point is higher.

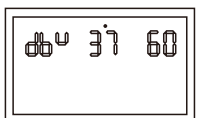
*This feature requires a dual output auxiliary board.



8.6 Dual Path Battery Duration (DBT)

Function Description: When activated, the secondary output of the inverter is default enabled. In battery mode, if the battery discharges for the duration reaching the set point, the secondary output shuts off.

Setting Conditions: Can be set under all states.



Description:

DBT (Dual output battery mode cut-off time): The default setting is OFF, meaning the function is not activated. The adjustable range is [5-890] minutes. When set to FUL, the secondary output is not limited by time.

*This function requires compatibility with a dual output auxiliary board.

8.7 BMS Communication Function (BMS)

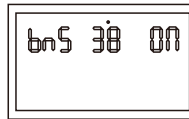
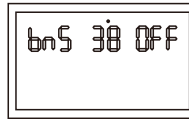
Function Description: Sets whether the inverter communicates with the lithium battery's BMS (Battery Management System).

Setting Conditions: Can be set under all states.

Description:

BMS (Battery Management System): Default setting is OFF, and the function is not activated. When set to ON, the inverter communicates with the lithium battery BMS through a central control board to acquire battery information. If a communication error occurs when this function is active, alarm 56 is triggered, and the inverter will no longer make operational decisions based on BMS information.

*This function requires a BMS-compatible communication module.



8.8 Low SOC Shutdown Function (BSU)

Function Description: Sets the inverter to shut down at a low SOC (State of Charge).

Setting Conditions: Can be set under all states.

Description:

BSU (Battery SOC Under Lock): The default setting is 20, with an adjustable range of [5-50]. In battery mode, the lithium battery will shut down when the SOC reaches the set value, triggering alarm 68. The alarm clears when the SOC returns to the set value + 5%. In standby mode, the inverter switches to battery mode only when the SOC reaches the set value + 10%; otherwise, alarm 69 is triggered. When the function is active, if the lithium battery SOC reaches the set value + 5%, alarm 69 is triggered, and it clears when the SOC returns to the set value + 10%.

Can be set to OFF, at which point the inverter will no longer shut down, start up, or alarm based on SOC status. If a communication error occurs when this function is active, the inverter will no longer make operational decisions based on SOC information, and related alarms are cleared.

*This function requires a BMS-compatible communication module.



8.9 High SOC Transition to Battery Mode (STB)

Function Description: Sets the SOC value at which the inverter transitions to battery mode.

Setting Conditions: Can be set under all states.

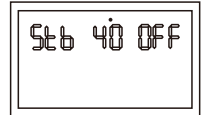
Description:

STB (Battery SOC Turn to Battery Mode): Default setting is 90, with an adjustable range of [10-100]. In PBG priority utility mode, when the lithium battery SOC reaches the set value, the inverter switches to battery mode. Once activated, the inverter switches to battery mode only when the SOC is above the set point and the battery voltage is higher than the voltage point for transitioning back to battery mode (see 6.5).

Can be set to OFF, in which case the inverter will not switch from utility to battery mode based on SOC.

If a communication error occurs once the function is active, the inverter will no longer base its operational decisions on SOC information and will clear related alarms.

*This function requires a compatible BMS communication module.



8.10 Low SOC Transition to Utility Power Mode (STG)

Function Description: Sets the SOC value at which the inverter transitions to utility power mode.

Setting Conditions: Can be set under all states.

Description:

STG (Battery SOC Turn to Grid Mode): Default setting is 50, with an adjustable range of [10-90]. In PBG priority utility mode with lithium batteries, when the SOC reaches the set value, the inverter switches to utility power mode. Once activated, the inverter switches to utility mode when the SOC falls below the set point or the battery voltage is lower than the voltage point for transitioning back to utility power (see 6.4).

Can be set to OFF, meaning the inverter will not switch from battery to utility mode based on SOC.

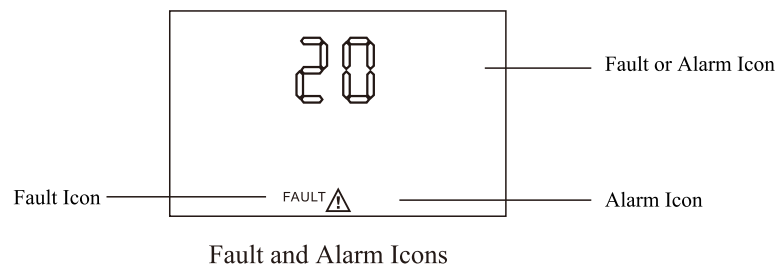
If a communication error occurs after activation, the inverter will no longer make operational decisions based on SOC information and will clear related alarms.

When this setting is higher than the STB point, STB and STG will no longer be effective after the next activation.

*This function requires a compatible BMS communication module.



9. Troubleshooting and Alarm Explanation



Function Description: Alarm code flashes with the buzzer sounding for 1 second, then continues for 1 minute before stopping. The fault indication code remains illuminated, and the buzzer sounds continuously for 10 seconds before stopping. After stopping, if the fault is cleared, attempt to restart the machine. If three restart attempts fail, the system remains in a fault state. A complete power-off (screen off) is required to restart the machine.

The fault and alarm LCD displays as shown above: in fault mode, the fault icon is continuously lit, and in alarm status, the alarm icon flashes.

9.1 Fault Explanation

Fault: The inverter enters fault mode, the LED red light remains on, and the LCD displays the fault code.

Fault Code Table

Fault Code	Meaning	Action	Trigger Condition	Recovery Condition	Alarm
1	Bus boost soft start failure	Switch to fault mode	Unable to reach the set voltage during bus soft start	Non-recoverable	Fault
2	Bus overvoltage	Switch to fault mode	Bus voltage above the set value	Non-recoverable	Fault
3	Bus undervoltage	Switch to fault mode	Bus voltage below the set value	Non-recoverable	Fault
4	Battery overcurrent	Switch to fault mode	Battery current instantaneous value exceeds 580A	Non-recoverable	Fault
5	Overtemperature	Switch to fault mode	Temperature of PFC or INV sensor above the overtemperature set value	Recoverable after three unsuccessful restart attempts	Fault
6	Battery overvoltage	Switch to fault mode	Battery voltage above the set value	Recoverable	Fault
7	Bus soft start failure	Switch to fault mode	Bus DC soft start voltage does not reach the set value	Non-recoverable	Fault
8	Bus short circuit	Switch to fault mode	Bus voltage drops below the set value suddenly during normal operation	Non-recoverable	Fault
9	Inverter soft start failure	Switch to fault mode	Unable to reach the rated output voltage after inverter soft start	Non-recoverable	Fault
10	Inverter output overvoltage	Switch to fault mode	Inverter voltage above the set value in battery mode	Non-recoverable	Fault
11	Inverter output undervoltage	Switch to fault mode	Inverter voltage below the set value in battery mode	Non-recoverable	Fault
12	Inverter short circuit	Switch to fault mode	Inverter voltage drops suddenly below the set value and current exceeds the set value	Non-recoverable after three unsuccessful restart attempts	Fault
13	Negative power protection	Switch to fault mode	Inverter power below the set value for a duration	Non-recoverable	Fault

Fault Code	Meaning	Action	Trigger Condition	Recovery Condition	Alarm
14	Overload fault	Switch to fault mode	Load exceeds specifications	Non-recoverable after three unsuccessful restart attempts	Fault
15	Model fault	Switch to fault mode	Software model identification does not match hardware detection	Non-recoverable	Fault
16	No boot program	Switch to fault mode	Absence of boot program	Non-recoverable	Fault
17	PV program burning in progress	Switch to fault mode	PV control program is being burned into a VML model	Recovers after burning is complete	Fault
19	Duplicate serial number	Switch to fault mode	Multiple devices with the same serial number detected in parallel mode	Non-recoverable	Fault
20	CAN communication error	Switch to fault mode	CAN bus communication abnormal in parallel mode	Non-recoverable	Fault
21	Large battery voltage difference	Switch to fault mode	Large voltage difference between batteries in different machines in parallel mode	Non-recoverable	Fault
22	Large input voltage difference	Switch to fault mode	Large input voltage difference between machines in parallel mode	Non-recoverable	Fault
23	Input voltage frequency difference	Switch to fault mode	Large frequency difference in input voltage between machines in parallel mode	Non-recoverable	Fault
24	Asynchronous setting of output parameters	Switch to fault mode	Phase missing in three-phase parallel mode settings	Recovers when set to single machine operation or meets three-phase operation settings	Fault
25	Output out of sync	Switch to fault mode	Output voltage detection loses sync in parallel mode	Non-recoverable	Fault
26	BMS fault	Switch to fault mode	Fault information in the battery BMS	Recovers by turning off BMS communication or after BMS fault is cleared	Fault

9.2 Alarm Explanation

Alarm: The inverter does not enter fault mode, but the LED red light flashes, and the LCD displays the alarm code.

Fault Code	Meaning	Action	Trigger Condition	Recovery Condition	Alarm
50	Battery not connected	Alarm, battery not charging	Battery voltage below 8V/cell	Recoverable (10V/cell)	Alarm
51	Battery low voltage shutdown	Alarm, low voltage shutdown or unable to start	Battery voltage below 10.5V/cell (default)	Recoverable (10V/cell + 0.2 * N (number of cells))	Alarm
52	Battery low voltage	Alarm	As per bAL setting	Recoverable (action point + 0.2V/cell)	Alarm
53	Charger short circuit	Alarm, battery not charging	Battery voltage less than 5V and charging current greater than 4A	Non-recoverable	Alarm
55	Battery overcharge	Alarm, battery not charging	Battery voltage above the set value	Recoverable	Alarm
57	Overtemperature	Alarm, battery not charging	PFC or INV temperature sensor above set value	Temperature sensor below set value	Alarm
58	Fan fault	Alarm, other fan runs at full speed if one fails	No fan speed signal detected	Recoverable	Alarm
59	EEPROM fault	Alarm	EEPROM read/write failure	Non-recoverable	Alarm
60	Overload	Alarm, battery not charging	Load > 102%	Recoverable (Load < 97%)	Alarm
61	Generator waveform abnormal	Alarm, continues in battery mode	Generator waveform detection abnormal	Recoverable	Alarm
62	Pv energy weak (5K)	Shut down PV output and charging	Battery not connected and bus voltage below set value	Recoverable after 10 mins	Alarm

Fault Code	Meaning	Action	Trigger Condition	Recovery Condition	Alarm
63	Synchronization lost	Alarm, switch to fault mode	Parallel board card disconnection fault	Recover by switching to single mode and fixing disconnection	Alarm
64	Parallel setting incompatibility	Alarm, switch to standby mode	Phase missing during three-phase parallel operation	Recovery when three-phase settings are corrected	Alarm
65	Parallel version incompatibility	Alarm, switch to standby mode	Incompatible version numbers in parallel system	Recovery when all machine versions in parallel system are compatible	Alarm
66	Parallel communication fault	Alarm, switch to standby mode	Unable to detect slave units in parallel system	Recovery upon detecting slave unit connection or switch to single mode	Alarm
67	Parallel utility power discrepancy	Alarm	Large voltage or frequency error among machines in parallel	Recovery when utility voltage and frequency discrepancies are resolved	Alarm
68	Low SOC shutdown	Alarm, switch to standby mode	Lithium battery SOC below set value	Recovery by turning off low SOC shutdown feature, or BMS communication, or when SOC reaches set value + 5%	Alarm
69	Low SOC	Alarm, maintain standby mode if already in standby	Lithium battery SOC below set value + 5% (utility or battery mode), or below set value + 10% (standby mode)	Recovery by turning off low SOC shutdown feature, or BMS communication, or when SOC reaches set value + 10%	Alarm

10.0 Technical Specifications

Model	SI485KP
Parallel Mode	
Allowed Number of Parallel Units	9

Utility Mode	
Rated Input Voltage	208/220/230/240 VAC
Input Voltage Range	90280V (for computer equipment)
Frequency	50Hz/60Hz
Frequency Range	40~70Hz, Default
Overload/Short Circuit Protection	Circuit breaker (40A) with 2x bypass
Maximum Efficiency	99%
Conversion Time	<10ms

Inverter Mode	
Output Voltage Waveform	Pure Sine Wave
Rated Output Power (VA)	5000VA
Rated Output Power (W)	5000W
Power Factor	1
Rated Output Voltage (Vac)	208/220/230/240VAC, default 230V
Output Voltage Error	±5%
Output Frequency Range (Hz)	50/60Hz ±0.1%
Maximum Efficiency	94%
Overload Protection (Battery Mode)	1min at 102%~120% Load, 10s at 110%~130% Load, 3s at 130%~190% Load, 200ms at >190% Load

Peak Power	10000VA
Load Bearing Capacity	100% L (inductive load)
Output Short Circuit Protection	Yes
Bypass Circuit Breaker Specification	40A
Rated Battery Input Voltage	40-60V
Battery Voltage Range	40-60V
Power Saving Mode	Yes

Utility Charging	
Battery Type	Lithium / Lead-acid (selectable)
Maximum Charging Current (Adjustable)	80A
Charging Current Error	±5%
Charging Voltage Range	<205V for 80A charging; 90V < utility voltage < 205V with linear derating
Short Circuit Protection	Circuit breaker (40A)
Circuit Breaker Specification	40A
Overcharge Protection	61V
Solar Charging	
Maximum PV Open Circuit Voltage	500V
PV Operating Voltage Range	120 - 450V
MPPT Voltage Range	120 - 430V
Battery Voltage Range	40 - 60V
Maximum PV Input Power	5500W

Maximum PV Input Current	18A
Maximum PV Charging Power	5000W
Charging Short Circuit Protection	Fuse protection
Maximum Combined Charging Current (PV + AC)	
Maximum Combined Charging Current (Adjustable)	80A
EMC Certification Level	CLASS A
Operating Temperature Range	-10 to 50°C
Storage Temperature Range	-15 to 60°C
Humidity Range	20% to 95% (non-condensing)
Noise Level	<50dB
Cooling	Natural cooling / Air cooling
Display Interface	LCD
Dimensions	559.7 x 539 x 186 mm
Packaging Dimensions	600 x 595 x 245 mm
Gross Weight	16.5 kg
Net Weight	14.5 kg

10.1 Packing List

Item No.	Name	Quantity/Unit	Remarks
1	Integrated Inverter Host	1 unit	
2	User Manual	1 copy	
3	Accessory Kit	1 set	

10.2 Inverter Maintenance Service



Danger!

Incorrect operation can pose a risk of inverter damage or personal injury.

Please strictly follow the following steps for operation:

1. Select the "Stop" option on the inverter screen or monitoring application to turn off the inverter.
2. Disconnect the AC circuit breaker on the mains side.
3. Disconnect the inverter DC switch.
4. Disconnect the battery switch and disconnect the battery side DC circuit breaker (if any).
5. Wait for 10 minutes to ensure that the energy of the capacitor is completely dissipated.
6. Confirm that all indicator lights are off.



Warn!

Unprofessional personnel, please stay away and do not operate:

When conducting electrical connections and maintenance, temporary alarm signs or obstacles

must be set up to keep unprofessional personnel away.



Caution!

Prohibit arbitrary replacement of internal components,

Reminder: Please seek maintenance support from dealer Otherwise, we will not assume any responsibility. Please remember not to self maintain until you are familiar with the correct guidance throughout the entire process.

Item	Method	Period
System Cleaning	Check for dust or foreign objects on the radiator and air inlet and outlet.	Once every 3-6 months
CircuitCconnection	Check if the cable connection is good.	Once every 3-6 months

10.3 After-sales Service Guide

Product Warranty Card	
Customer Name	
Product Model	
Date of Purchase	
Address	
Contact Telephone	

(Cut along the dotted line)

Please keep this warranty card safe, as it serves as a proof for repair services.

- ◎ This product is under warranty for 24 months from the date of purchase.
- ◎ During the warranty period, if the product fails under normal usage conditions, you can present this warranty card along with the invoice to receive after-sales service in accordance with the warranty terms. However, our company is not obligated to provide warranty service if the product damage is caused by the following reasons:

Exclusions from the Warranty Coverage:

- ◎ Unauthorized disassembly or replacement of any parts of the product.
- ◎ Damage due to improper use or storage.
- ◎ If the product damage is caused by the user's actions, our company will charge the corresponding repair fees.

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