



Power Anything Anywhere Anytime

User Manual

LIPOWER NEW ENERGY TECHNOLOGY LIMITED No.11,
Tongfucun Industrial Zone, Dalang, Longhua District, Shenzhen,
Guangdong
Website :<https://www.lipowergroup.com>

Applicable product model : PH5000E PH5000EIN PH5000EBT

Table of Contents

1 basic information	4
1.1 Product overview and features	4
1.2 Basic System Introduction	5
1.3 product features	6
1.4 Dimensions	7
2 Installation Instruction	8
2.1 Installation Precautions	8
2.2 Installation and connection	9
2.3 Battery parameters	14
3 Operating mode	15
3.1 charging mode	15
3.2 output mode	16
3.3 Output Priority Settings (OPP)	17
4 Panel Operation Instructions	18
4.1 Panel description	18
4.2 On/Off Operation	19
4.3 Parameter query operation	20
5 function setting	25
5.1 Output frequency(OPF)	25
5.2 Output Priority Settings(OPP)	25
5.3 output mode(MOD)	25
5.4 charging priority (CHP)	25
5.5 Utility charging current (RCC)	26
5.6 Maximum charging current (MCC)	26
5.7Menu Default(MDF)	26
5.8 overload restart (Lrs)	27
5.9 over temperature restart (Trs)	27

6 Main input power failure alarm(MIP)	27
6.1 energy saving mode(PWS)	27
6.2 Overload to bypass(OLG)	28
6.3 Mute settings(MUE)	28
6.4 Battery back to utility voltage point(BTG)	28
6.5 Switch back to battery mode voltage point (BTB)	29
6.6 Battery Type(BAT)	30
6.7 battery low voltage point(bAL)	30
6.8 battery shutdown point(bAU)	31
6.9 Constant voltage mode voltage point setting(bCV)	31
7.Float mode voltage point setting (bFL)	32
7.1 Mains low voltage point setting(LLV)	32
7.2 Mains high voltage point setting(LHV)	33
7.3 Low power discharge time setting(LWD)	33
7.4 Inverse soft start settings (SRE)	34
7.5 default settings (STD)	34
7.6 Parallel mode setting (MOD)	34
7.7 Battery missing warning (SBA)	35
7.8 balanced mode(EQM)	35
7.9 Balance voltage point setting (EQV)	35
8.Equalization charging time setting (EQT)	35
8.1 Equalization delay time setting(EQO)	36
8.2 Equalization interval setting(EQI)	36
8.3 Immediately turn on equalization settings(EQN)	36
9 Fault and warning description	37
9.1 Troubleshooting	37
9.2 Alarm description	40
10. Technical Parameters	42
10.1Packing List	44
10.2Product After-sales Guide	45

1 . basic information

1.1 Product overview and features

MAX series is a new type of hybrid solar energy storage inverter control integrated machine integrating solar energy storage & mains charging energy storage and AC sine wave output. It adopts DSP control and advanced control algorithm, which has high response speed and high reliability. and high industrialization standards. There are four optional charging modes: solar only, mains priority, solar priority, and mains & solar; two output modes, inverter and mains, are optional to meet different application requirements.

The solar charging module adopts the latest MPPT tracking technology, which can quickly track the maximum power point of the photovoltaic array in any environment, and obtain the maximum energy of the solar panel in real time.

The AC-DC charging module adopts advanced control algorithm to realize fully digital voltage and current double closed-loop control, with high control precision and small size. The AC voltage input range is wide, and the input/output protection functions are complete, which can realize the charging and protection of the battery stably and reliably.

Based on the all-digital intelligent design, the DC-AC inverter module uses advanced SPWM technology to output pure sine waves and convert DC to AC. It is suitable for AC loads such as household appliances, electric tools, industrial equipment, and electronic audio and video. The product adopts a segmented LCD display design to display the operating data and operating status of the system in real time. Comprehensive electronic protection functions ensure that the entire system is safer and more stable.

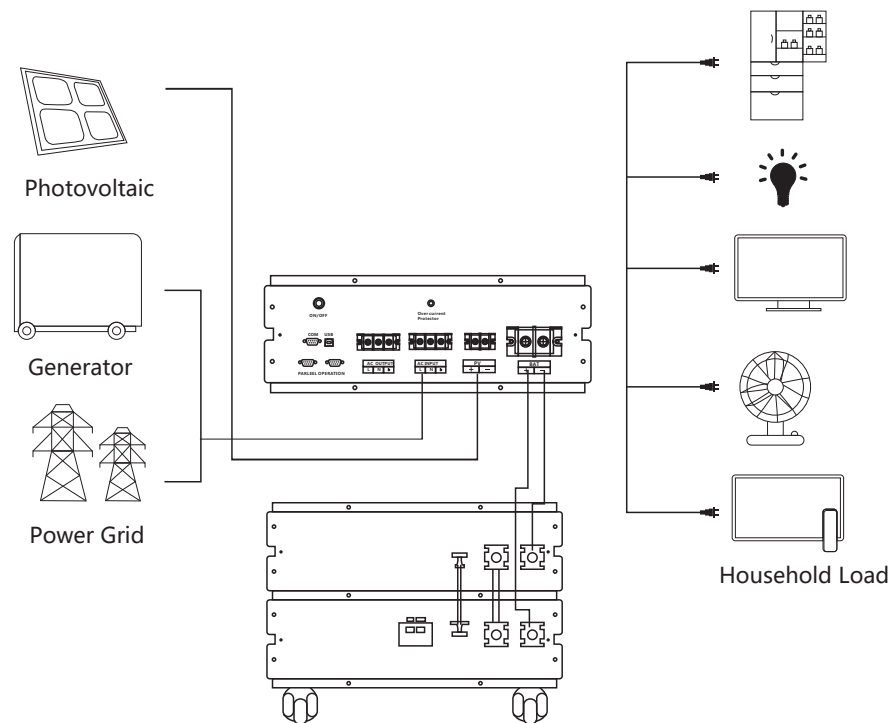
『features : 』

1. Adopt fully digital voltage and current double closed-loop control, advanced PWM technology, output pure sine wave.
2. It has mains bypass, inverter output and other output modes, and has the function of uninterrupted power supply.
3. There are 4 optional charging modes: solar energy, mains priority, solar energy priority, and hybrid charging.
4. Advanced MPPT technology, the efficiency is as high as 99.9%.
5. LCD liquid crystal screen design, 4 LED indicators, dynamic display of system data and operating status.
6. ON/OFF self-locking switch controls AC output.
7. It has the function of power saving mode to reduce the no-load loss.
8. The intelligent adjustable speed fan is used to dissipate heat efficiently and prolong the life of the system.
9. With multiple protection functions, 360° all-round protection.
10. It has perfect short circuit protection, overvoltage and undervoltage protection, overload protection, backfeed protection, etc.

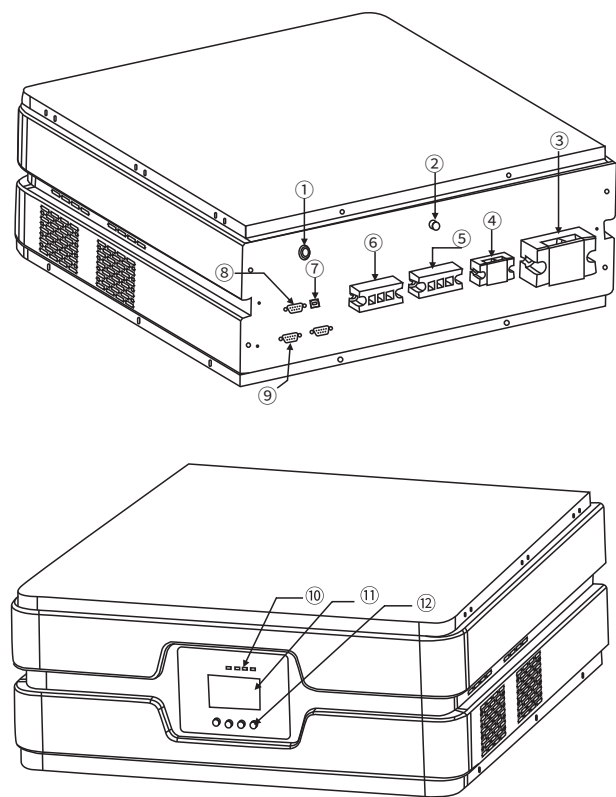
1.2 Basic System Introduction

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

1. Photovoltaic module: convert light energy into DC power, charge the battery through the all-in-one machine, or directly invert it into AC power to supply power to the load.
2. Mains power or generator: connected to the AC input terminal, it can supply power to the load and charge the battery at the same time. If the mains or generator is not connected, the system operates normally, and the load power supply is provided by the battery and photovoltaic modules.
3. Battery: The role of the battery is to ensure the normal power consumption of the system load when the solar energy is insufficient and there is no mains power.
4. Household loads: It can be connected to various household and office loads, including AC loads such as refrigerators, lamps, TVs, fans, and air conditioners.
5. Inverter control integrated machine: the energy conversion device of the whole system. The specific system wiring method is determined by the actual application scenario.

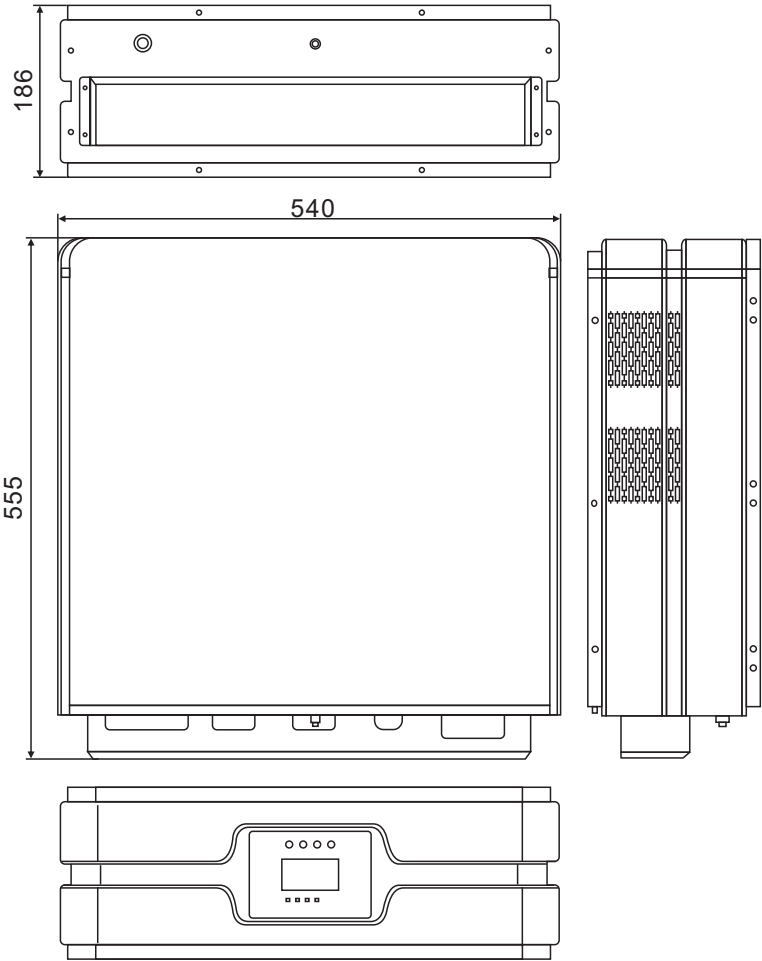


1.3 product features



①	ON/OFF round switch	⑦	USB communication port
②	ACinput overload protector	⑧	COM
③	BAT+ -Inverter input	⑨	PARALLEL CONNECTION
④	PV+ -Inverter input	⑩	indicator light
⑤	AC INPUT	⑪	display screen
⑥	AC OUTPUT	⑫	button

1.4 Dimensions



2 . Installation Instruction

2.1 Installation Precautions

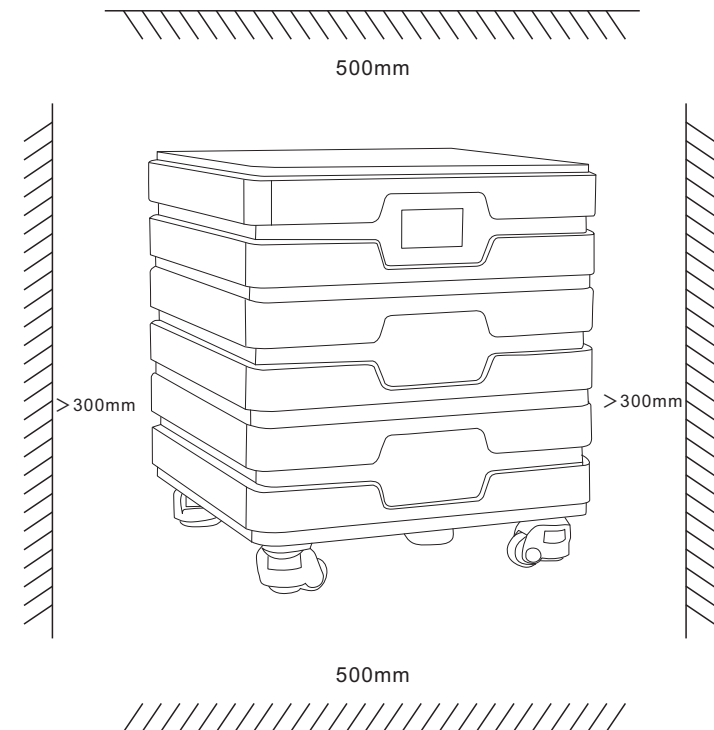
Do not install the all-in-one in harsh environments such as humid, flammable, explosive, or where a large amount of dust gathers. Before installation, please read this manual carefully and be familiar with the installation steps.

- Avoid placing metal objects near the battery to prevent short circuit of the battery.
- When installing the cabinet, be sure to leave enough space around the all-in-one machine for heat dissipation.
- Only charge the battery type compatible with this all-in-one.
- False connection points and corroded wires may cause extreme heat to melt the wire insulation layer, burn surrounding materials, and even cause a fire, so make sure that the connectors are tightened and the wires are fixed with cable ties to avoid moving the wires. Shake the connector loose.
- The system connection line is selected according to the current density not greater than 5A/mm².
- When installing outdoors, avoid direct sunlight and rainwater infiltration.
- After the power switch is turned off, there is still high voltage inside the all-in-one, please do not open or touch the internal components, and perform relevant operations after the capacitor is fully discharged.
- It is forbidden to reverse the polarity of the battery input terminal of this product, otherwise it is easy to damage the equipment or cause unpredictable dangers. Mains input and AC output are high voltage, please do not touch the wiring.
- When the fan is working, do not touch it to avoid injury.

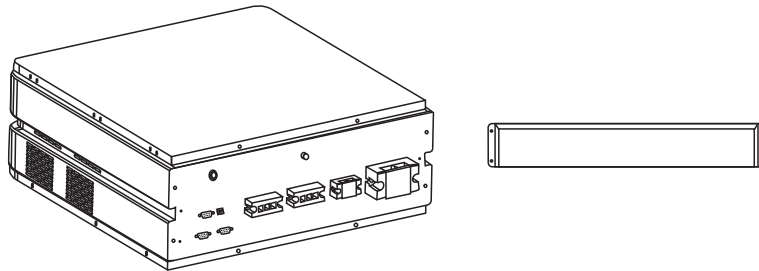
2.2 Installation and connection

installation steps :

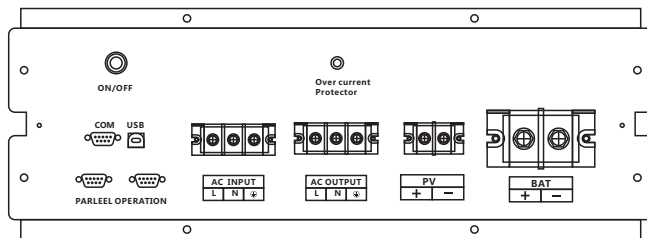
Step 1: Determine the installation location and heat dissipation space to determine the installation location of the all-in-one machine. For example, when installing the all-in-one machine on the wall, ensure that there is enough air to flow through the heat sink of the all-in-one machine. Leave at least > 300mm space for the left and right air outlets of the all-in-one machine to ensure natural convection. For heat dissipation, refer to the installation schematic diagram above.



Step 2: Remove the terminal protection cover



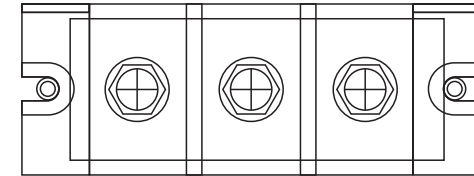
Step 3: Wiring



Wiring method for AC input/output :

- ① Before wiring the AC input/output, disconnect the external circuit breaker and confirm that the cables used are sufficient.
- ② According to the cable sequence and terminal position shown in the figure below, correctly connect the AC input wire, please connect the ground wire/earth wire first, and then connect the live wire and neutral wire;

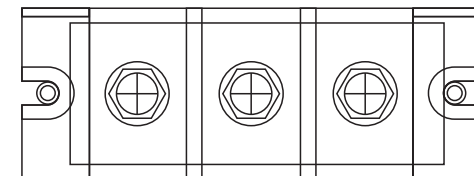
L: LIVE WIRE N: NEUTRAL WIRE  :EARTH WIRE



AC INPUT		
L	N	

- ③ According to the cable sequence and terminal position shown in the figure below, correctly connect the AC output wire, please connect the ground wire first, then connect the live wire and the neutral wire, and connect the ground wire to the chassis ground screw hole through the O-type terminal.

L: LIVE WIRE N: NEUTRAL WIRE  :EARTH WIRE



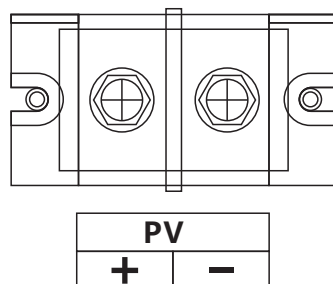
AC OUTPUT		
L	N	

Note: Use thicker wire diameter as possible for the grounding cable (the cross-sectional area of the wire is not less than 4mm²), and the grounding point should be as close as possible to the all-in-one machine. The shorter the grounding wire, the better.

PV input wiring method :

- ① Before wiring, disconnect the external circuit breaker first, and confirm whether the cables used are thick enough.
- ② Correctly connect the PV input wires according to the cable sequence and terminal positions shown in the figure below.

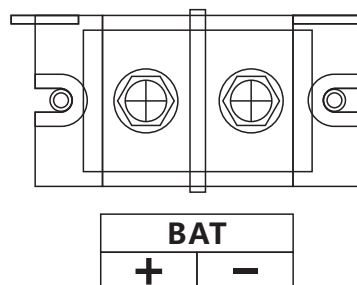
PV+:PV input positive PV-:PV input negative



BAT Wiring method :

- ① Before wiring, disconnect the external circuit breaker first, and confirm whether the cables used are thick enough. The BAT line needs to be connected to the machine through an O-type terminal. It is recommended to use an O-type terminal with an inner diameter of 5MM. The O-type terminal must be firmly pressed against the BAT line to prevent excessive contact resistance and excessive heating;
- ② Correctly connect the BAT cable according to the cable sequence and terminal position shown in the figure below.

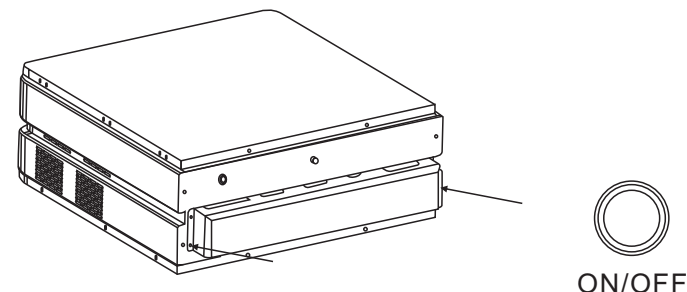
BAT+:battery positive BAT-:battery negative



Warnings :

- ① The mains input, AC output, and photovoltaic array will generate high voltage. Before wiring, be sure to disconnect the circuit breaker or insurance;
- ② During the wiring process, please pay attention to safety; during the wiring process, please do not close the circuit breaker or fuse, and ensure that the positive and negative leads of each component are connected correctly; the battery terminal must be equipped with a circuit breaker, please refer to the chapter "2.2 Wiring specifications and open circuit Before wiring, be sure to disconnect the circuit breaker to prevent strong electric sparks during wiring and avoid battery short circuit during wiring; if the all-in-one unit is used in areas with frequent lightning, it is recommended to install an external lightning arrester at the PV input end.

Step 4: Install the terminal protection cover



Step 6: Turn on the machine

First close the circuit breaker at the battery end, then turn the round switch on the left side of the machine to the "ON" state, the "AC/INV" indicator flashes to indicate that the inverter is working normally, close the circuit breaker of the photovoltaic array and the mains power again, and finally open the AC load one by one after the AC output is normal, so as to avoid the protection action due to the large instantaneous impact of the load at the same time, and the all-in-one machine works normally according to the set mode.

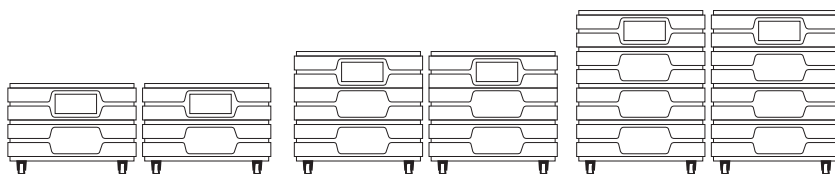
Attention : If you supply power to different AC loads, it is recommended to turn on the load with a large inrush current first, and then turn on the load with a small inrush current after the load is stable.

Attention : If the appliance does not work normally and the LCD or LED displays abnormally, refer to Section 6 to troubleshoot the fault.

3.0 The basic parameters of the battery used in this machine

This machine adopts lithium iron phosphate battery, which has high energy density, stable quality and long life. Multiple battery packs can be connected in parallel. According to the power, it can be used together with photovoltaic modules and inverters. The built-in BMS protection module has over-discharge Overcurrent, overheating, short circuit and other multiple protection functions.

The stacking method is shown in the figure below :



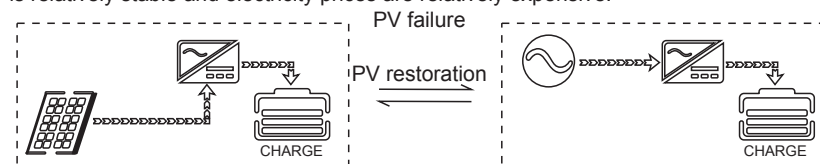
MAX series stack diagram

Model	PH5000EBT
Number of battery packs	1group
Battery Type	15Serial LiFePO4
Nominal Voltage	51.2V
Battery Capacity	6144Wh
Rated output current	150A
Storage Temperature Range	-25°C~ 60°C
Single battery box size(L*W*D)	540mm*550mm*186.5mm
Battery Weight (kg)	69kg

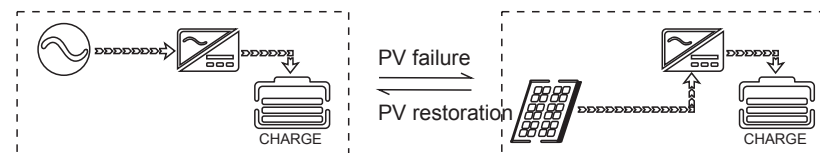
3 . Working Mode

3.1 Charging mode

1)PV priority: PV priority charging, only when PV fails, start mains charging. Make full use of solar power generation during the day, and switch to the market at night to charge, which can maintain battery power and be used in areas where the power grid is relatively stable and electricity prices are relatively expensive.

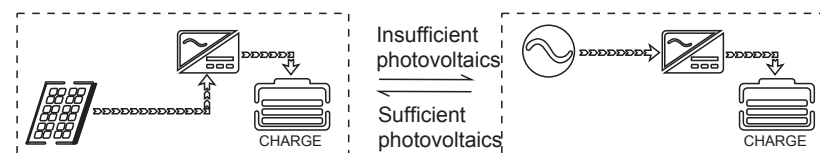


2) Utility priority: Mains power gives priority to charging the battery, and only starts photovoltaic charging when the mains power is invalid.



3)Hybrid charging: photovoltaic and utility power hybrid charging, priority photovoltaic MPPT charging, when photovoltaic energy is insufficient, mains supplementation. When the photovoltaic energy is sufficient, the utility power stops charging. This method is the fastest way to charge, suitable for areas with unstable power grids, and can provide sufficient backup power supply at any time.

4)Only photovoltaic charging (Only Solar): only photovoltaic charging, do not start mains charging, this way is the most energy-saving way, battery power is from solar energy, usually used in areas with good light conditions.



3.2 Output mode

- When the PV is invalid, switch to mains power supply and charging. This mode maximizes the use of solar energy, while maintaining battery power, suitable for relatively stable areas of the power grid, the output voltage default value is 230V, 208V, 220V, 230V, 240V can be set, all working conditions can be set, and effective immediately.
- Press the function setting key 4 for more than 2 seconds, enter the function setting page, press the query key 2 or 3 for 0.1 to 2 seconds, select the function, turn the page to the output voltage OPU setting page, and the OPU word flashes.
- Press the confirmation button No. 4 for 0.1 to 2 seconds to enter the setting page of the output voltage OPU, at which time the OPU word is long on, and the value flashes on the right side of the OPU word. Press the query key No. 2 or No. 3 for 0.1 to 2 seconds, select different output voltage values, and the 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 selected output voltage value, press the confirmation button 4 for 0.1 to 2 seconds, the output voltage OPU is set, and the value on the right side of the OPU is long and no longer flashing.
- Press the number 1 key for more than 0.1 to 2 seconds, the function will be set successfully, exit the function setting page, and return to the main display page (you can also leave it alone, wait for up to 30S and automatically jump back to the main display page).

Note:

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

Output frequency setting, default 50Hz.

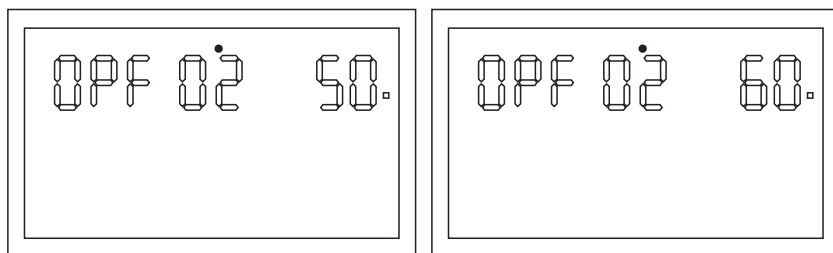


Figure 1- 13 Output frequency setting page

- Function description: set the inverter output frequency, 50Hz and 60Hz can be set, default 50Hz.
- Setting conditions: all states can be set, and the battery mode will take effect the next time the machine is restarted; Mains mode takes effect immediately, and after setting, after switching back to battery mode, the frequency will change at a slower speed.

3.3 Output Priority Setting (OPP)

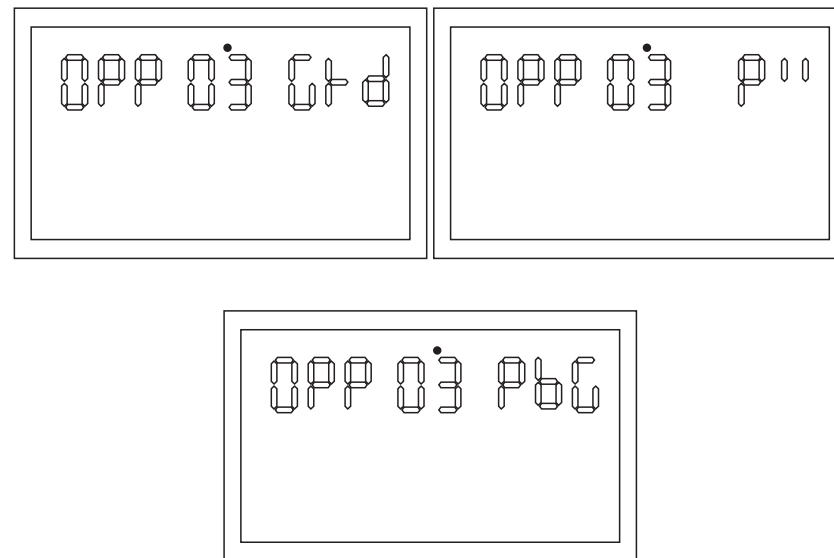


Figure 1- 14 Output priority setting page

Function description: Set inverter output priority.

Setting conditions: All states can be set and take effect immediately after setting.

Note:

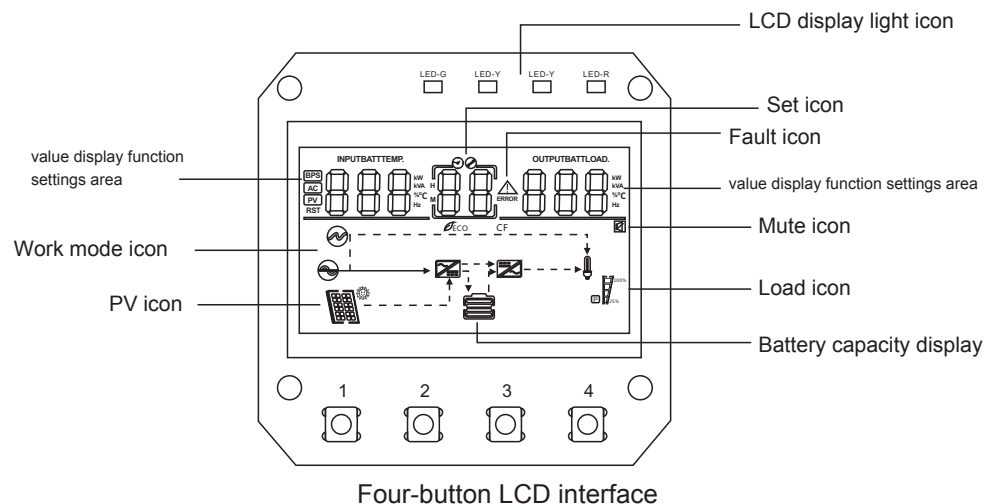
There are three choices for output priority, the default is GRD: mains output priority;

The second is PU (PV): photovoltaic output priority;

The third is PBG: photovoltaic cell mains output;

4 .Panel Operational Instructions

4.1 LCD function display



Indicator Introduction



Indicator	Color	Description
LED-G	Input Light (Green)	On : Utility Power Normal and Working in Utility Mode Flash : Utility Power Normal but not Working in Utility Mode Off : Utility Power Abnormal
LED-Y	Inverter Light (Yellow)	On : Working in Battery Mode Off : Working in Other Mode
LED-Y	Inverter Light (Yellow)	On : The battery is float charging Flash : The battery is charging under a constant voltage Off : Other Status
LED-R	Warn Light (Red)	On : Inverter Fault Flash : Inverter Warning Off : Inverter Normal

4.2 On/Off Operation

Please refer to this manual for power on and off operation.

4.2.1 Operation for Power On

When a battery that meets the requirements (the battery voltage needs to be greater than 11.5V per cell) or mains power (the mains needs to confirm a reasonable input range according to the output mode), the power can be turned on.

➤ Utility Power On

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

➤ Battery Power On

Connect the normal battery, press the switch, and the inverter establishes the working power.

The system will automatically turn on the system, wait for a period of time after the panel shows the battery mode to indicate that the boot is complete, enter the battery mode.

4.2.2 Operation for Power Off

When the system is output in battery mode or mains mode, press the switch again, hit the OFF state, and the system shuts down.

4.2.3 Operation for Mute

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

4.2.4 Operation in the alarm state

When the inverter has an alarm tone and the LED fault light flashes, it means that the inverter is working in the alarm state. You can use the alarm information to troubleshoot the cause of the alarm or contact the supplier.

4.2.5 Operation in failure mode

When the inverter buzzer is long and the LED fault light is long, it means that the inverter is working in a failure mode. You can contact the supplier or maintenance personnel to provide relevant information about the fault alarm and assist in troubleshooting.

4.3 Parameter query operations

Press the query key 2 or 3 (four-button screen, 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, and if the inverter fails, the fault code page will be displayed by default. The main page displays fault or alarm information by default, and when the inverter does not have any fault or alarm, the main page displays output voltage and frequency information by default.

Display Page 1 (Main Display Page) :

Display the inverter input and output voltage, as shown in Figure 1-3

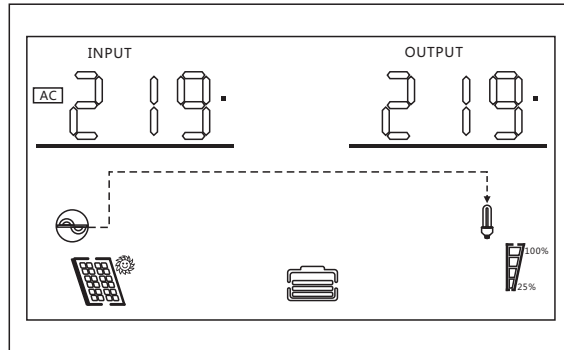


Figure 1-3 Display page one

Display page 2:

The inverter input and output frequencies are shown in Figure 1-4

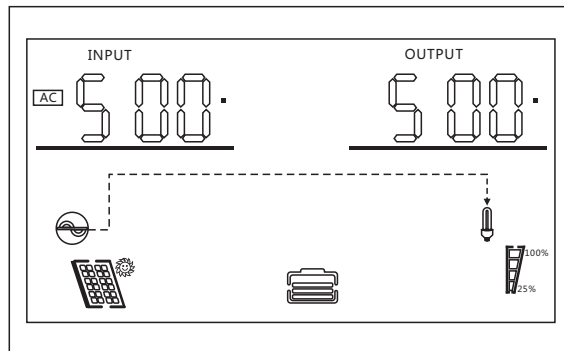


Figure 1-4 display page two

Display page 3:

Battery information, showing battery voltage and charge current, as shown in Figure 1-5

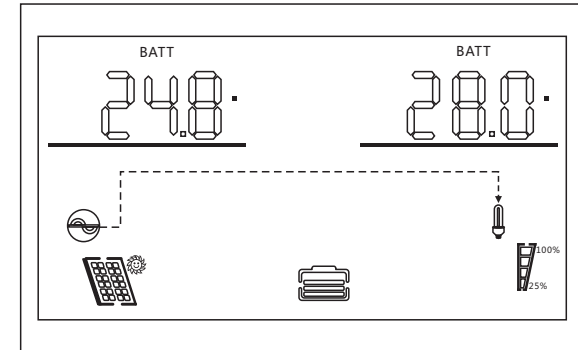


Figure 1-5 Display page three

Display page 4:

PV information, showing PV voltage and PV charging current, as shown in Figure 1-6

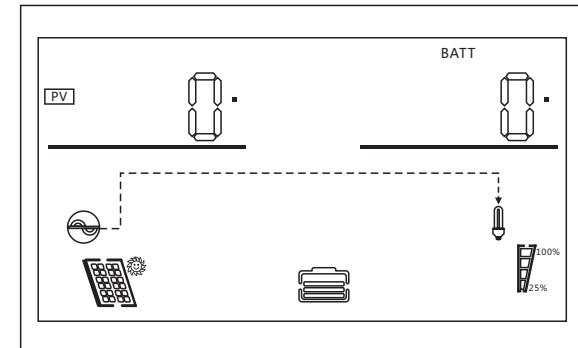


Figure 1-6 shows page four

Display page 5:

PV information, showing PV voltage and PV charging power, as shown in Figure 1-7

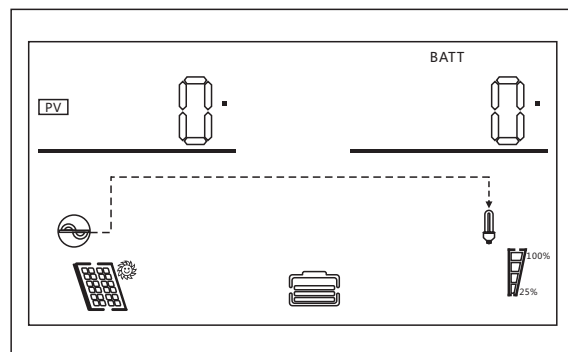


Figure 1-7 display page five

Display page 7:

Output information, showing output voltage and output complex power, as shown in Figure 1-9

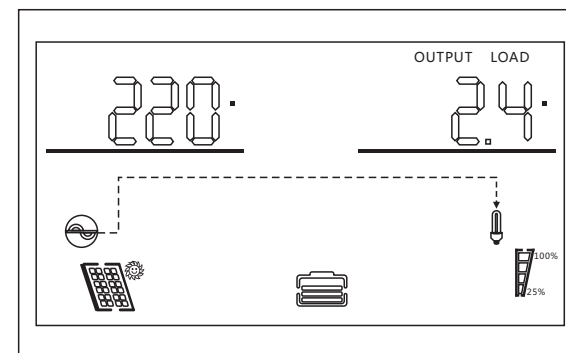


Figure 1-9 display page seven

Display page 6:

Output information, showing the output voltage and output active power, as shown in Figure 1-8

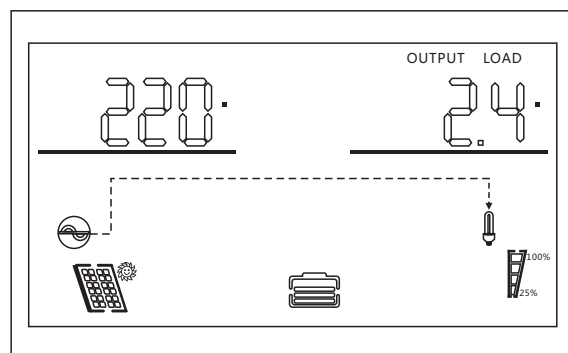


Figure 1-8 display page six

Display page 8:

Output information, showing the voltage and load percentage, as shown in Figure 1-10

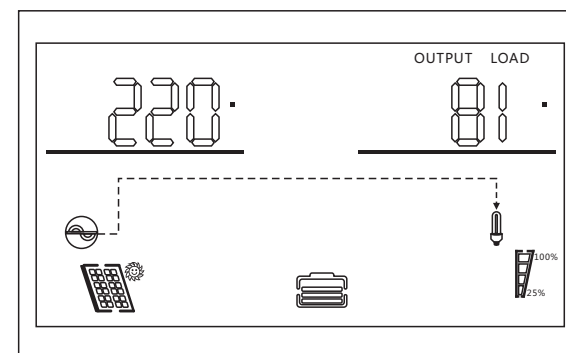


Figure 1-10 display page eight

Display page 9:

Software version, showing the inverter system software version, as shown in Figure 1-11

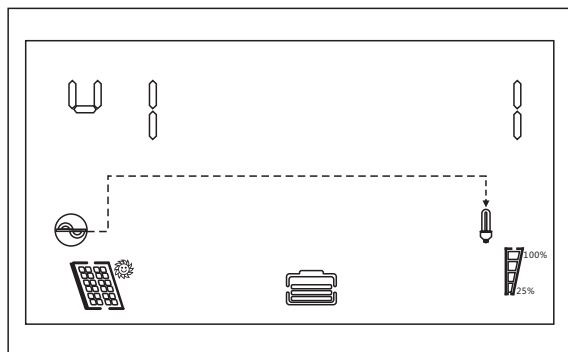


Figure 1-11 display page nine

Display page 10:

Software Version, showing the MPPT system software version, as shown in Figure 1-12

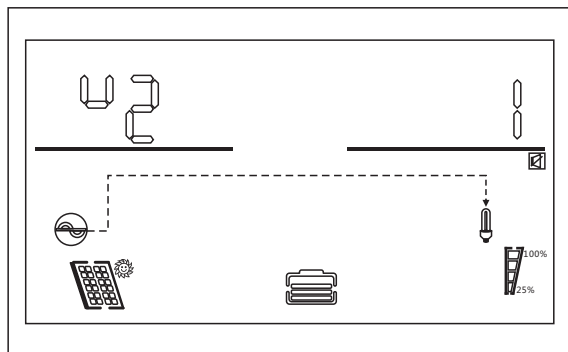


Figure 1-12 display page ten

5 .Function settings

5.1 Output Frequency (OPF)

Function description: set inverter output frequency, 50Hz and 60Hz can be set, default 50Hz.

Setting conditions: all states can be set, and the battery mode will take effect the next time the machine is restarted; Mains mode takes effect immediately, and after setting, after switching back to battery mode, the frequency will change at a slower speed.



5.2 Output Priority Setting (OPP)

Function description: Set inverter output priority.

Setting conditions: All states can be set, and they take effect immediately after setting.

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



5.3 Output Mode (MOD)

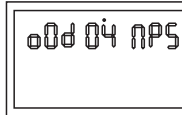
Function description: Set the inverter output mode.

Set conditions: All states can be set and take effect immediately.

Illustrate:

There are two options for AC output mode, the default is APP: Appliance, which is used for home appliances;

The second is UPS mode, which is used for devices such as computers. The switching time is typically 10ms



5.4 Charging Priority (CHP)

Function description: Set the inverter charging priority.

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

There are four choices for charging priority, and the default is PNG (PV and Grid) :P V and Grid charge at the same time; The second is OPV (Only PV): only photovoltaic charging; The third is GRD(Grid): Mains charging priority; The fourth PV priority charging.



5.5 Mains Charging Current (RCC)

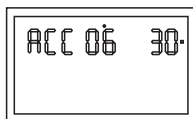
Function description: Set the maximum current that can be charged by the inverter.

Set conditions: All states can be set.

Illustrate:

RCC: Grid Charge Current, the maximum charging current of the mains is set to 40A by default, and the setting range is [1-60A] (3K VML-24V)

RCC: Grid Charge Current, the maximum charging current of the mains is set to 30A by default, and the setting range is [1-80A] (5K VMH-48V)



5.6 Maximum Charging Current (MCC)

Function description: Set the maximum charging current value of the inverter.

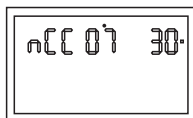
Set conditions: All states can be set.

Illustrate:

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

SI243K 2/10/20/30/40/50/60/70/80/90/100/110/ 120A optional;

SI485K 2/10/20/30/40/50/60/70/80A optional;



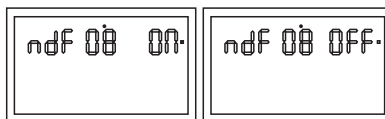
5.7 Menu Default (MDF)

Function description: Return to the main interface settings.

Set conditions: All states can be set.

Illustrate:

The default setting is ON. When the function is set to operation, if it is set to ON, the page is not on the first interface (P1), and returns to the first interface after 1min; If set to OFF, if the page is not on the first screen (P1), the LCD will remain on this interface.



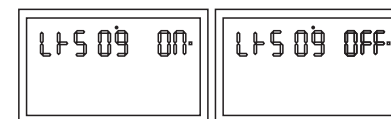
5.8 Overload restart (LrS)

Function description: Overload restart setting.

Set conditions: All states can be set.

Illustrate:

The overload restart setting is ON by default.



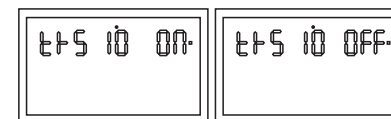
5.9 Overtemperature restart (TrS)

Function description: Overtemperature restart setting.

Set conditions: All states can be set.

Illustrate:

The overtemperature restart setting is ON by default.



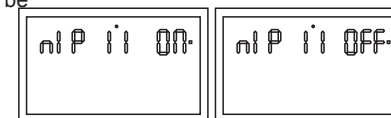
6.0 Main Input Power Down Alarm (MIP)

Function description: Mains or PV loss alarm long sound setting. Setting conditions: All states can be set, the default is ON, mains power or PV loss alarm for a period of time. Can be set to OFF. (All modes can be set)

Illustrate:

MIP: Main Input cut warning

The default setting is ON, and after the main input detection is lost, the buzzer will beep for 3s; When set to OFF, the buzzer does not sound frequently after the main input is lost.



6.1 Power Saving Mode (PWS)

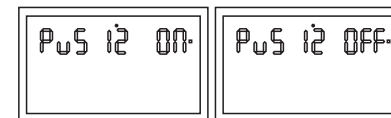
Function description: Set whether the inverter enables low-power mode (energy-saving mode).

Set conditions: All states can be set.

Illustrate:

PWS: Power Saving

The default setting is OFF, and the function is not enabled; When set to ON, if the load falls below 25W in battery mode, the system will briefly stop the output before continuing the output. If the load is higher than 35W, the system resumes continuous normal output.



6.2 Overload to Bypass (OLG)

Function description: When the battery mode is overloaded, set whether to immediately switch to mains mode (the so-called bypass mode).

Set conditions: All states can be set.

Illustrate:

OLG: Overload to Bypass

The default setting is OFF, and the function is not enabled; When set to ON, the system immediately turns to bypass (mains output, also known as bypass mode) if overloaded in the case of PV priority output loading.

6.3 Mute Setting (MUE)

Function description: Set whether the buzzer tweets.

Set conditions: All states can be set.

Illustrate:

MUE: Mute

The default setting is OFF, and the function is not enabled; When set to ON, the buzzer does not sound under any circumstances, alarm, fault, etc. All modes can be set and function normally, and pictures cannot be displayed.

6.4 Battery turns back to the mains voltage point (BTG)

Function description: When the battery mains power exists at the same time, the battery will be discharged to the mains power to ensure that the battery will not be empty.

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

Illustrate:

BTG: Back To Grid

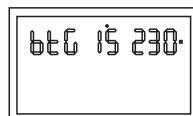
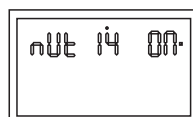
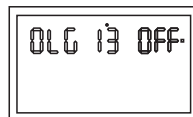
The initial default setting for the SI243K-24V is 23V

The SI485K-48V is initially set to 46V by default

When the battery definition mode is CUS (Customer Setting Type) mode:

SI243K-24V can be set in the range [22,26]

SI485K-48V can be set in the range [44,52]



The battery definition mode is AGM (lead-acid battery type), FLD (water-injected battery type) mode

Formula:

SI243K-24V is set to 23V by default, and the range can be set to [22,26]

The default setting for SI485K-48V is 46V, and the range can be set to [44,52]

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

The default setting for SI243K-24V is 23.8V, and the range is [20,25]

The SI485K-48V is set to 47.6V by default and can be set to [40,50]

6.5 Turn back to the battery mode voltage point (BTB)

Function description: After the battery is shut down with low voltage, it is necessary to reach a certain battery voltage value to restart the battery mode to turn on.

Set conditions: All states can be set.

Illustrate:

BTB: Back To Battery

The SI243K-24V is initially set to 26V by default

The SI485K-48V is initially set to 52V by default

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

When the battery definition mode is CUS (Customer Setting Type) mode:

SI243K-24V can be set in the range of [24,29] (when the setting value Vbtb>TCFV-1V, the switch back battery mode voltage point remains at TCFV-1V), and the output priority is set to photovoltaic

(PV) priority output or photovoltaic cell mains (PBG) output, if it is not in battery mode at this time, if the battery voltage is higher than CFV-1V, the system will switch back to battery mode. SI485K-48V can be set in the range [48-58] (logic as above)

When the battery definition mode is AGM (lead-acid battery type), FLD (water-injected battery type) mode: SI243K-24V The default setting is 26V, and the range can be set to [24-29] (Logic as above) SI485K-48V The default setting is 52V, and the range can be set to [48-58] (Logic as above)

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

SI243K-24V The default setting is 27.2V, and the range can be set to [23-29] (Logic is the same as above) SI485K-48V The default setting is 54.4V, and the range can be set to [46-58] (Logic as above)



6.6 Battery Type (BAT)

Function description: Battery type setting function.

Set conditions: All states can be set.

Illustrate:

BAT:BatteryType

Four battery type settings: AGM (lead-acid battery) by default;
The second type is FLD (water-filled battery); The third is LIB
(lithium battery); The fourth type is CUS (customer setting type)

6.7 Battery low voltage point (bAL)

Function description: Low voltage alarm point setting.

Set conditions: All states can be set.

Illustrate:

bAL:batteryLow

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

The initial default setting for the SI243K-24V is 21.6V

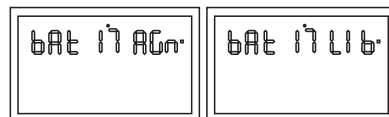
The SI485K-48V is initially set to 44V by default

When the battery type is set to CUS (Customer Setting Type),
you can modify the battery low voltage point. SI243K-24V,
programmable range is [21-27]

SI485K-48V, configurable range [42-54]

When the battery type is set to LIB (lithium battery type), the
low voltage point of the battery can be modified. SI243K-24V is
set to 23.8V by default, and the range can be set to [20.6-25.0]

The SI485K-48V is set to 47.6V by default and the range can
be set to [41.2-50.0]



6.8 Battery shutdown point (bAU)

Function description: battery low voltage shutdown point setting function.

Set conditions: All states can be set.

Illustrate:

bAU:batteryUnder

The battery definition modes are AGM (lead-acid battery type), FLD
(water-injected battery type) mode

Not configurable.

The initial default setting for the SI243K-24V is 21V

The SI485K-48V is initially set to 42V by default

When the battery type is set to CUS (Customer Setting Type), you can
modify the battery shutdown point. SI243K-24V can be set from [20-24]

SI485K-48V can be set from [40-48]

When the battery type is set to LIB (lithium battery type), you can modify
the battery shutdown point. SI243K-24V is set to 23V by default, and the
range can be set to [20-24] The default setting of SI485K-48V is 46V, and
the range can be set to [40-48]

6.9 Constant voltage mode voltage point setting (bCV)

Function description: constant voltage point setting function.

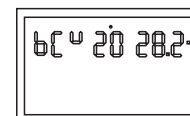
Set conditions: All states can be set.

Illustrate:

bCV:batteryConstant Voltage

Not allowed when the battery definition mode is AGM (lead-acid battery
type) or FLD (water-filled battery type) mode Set up.

SI243K-24V Initial Default Settings 28.2V (AGM) -29V (FLD) SI485K-48V
Initial Default Settings to 56.4V (AGM) -58V (FLD) The constant voltage
charging point can be modified when the battery type is set to CUS
(Customer Setting Type). The SI243K-24V can be set from [24-29]. The
constant voltage point voltage needs to be greater than the float point
voltage.



SI485K-48V can be set from [48-60]. The constant voltage point voltage needs to be greater than the float point voltage.

When the battery type is set to LIB (lithium battery type), the constant voltage charging point can be modified. The default setting for SI243K-24V is 28.2, and the range can be set to [25-29]. The constant voltage point voltage needs to be greater than the float point voltage.

The default setting for SI485K-48V is 56.4, and the range can be set to [48-60]. The constant voltage point voltage needs to be greater than the float point voltage.

7.0 Float Mode Voltage Point Setting (bFL)

Function description: floating charge voltage point setting function.

Set conditions: All states can be set.

Illustrate:

bFL:batteryFloat

The battery definition mode is AGM (lead-acid battery type), FLD (water-injected battery type) mode is not configurable

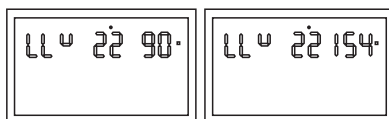
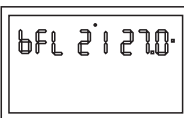
The initial default setting for the SI485K-48V is 54V

Battery type set to CUS (Customer Setting Type) allows you to modify the battery float point. The SI243K-24V can be set from [26.6-27.8]. The constant voltage point voltage needs to be greater than the float point voltage.

SI485K-48V can be set from [48-60]. The constant voltage point voltage needs to be greater than the float point voltage.

When the battery type is set to LIB (lithium battery type), the constant voltage charging point can be modified. The default setting for the SI243K-24V is 27.6V, and the range can be set to [24-28]. The constant voltage point voltage needs to be greater than the float point voltage.

The default setting for the SI485K-48V is 55.2V, and the range can be set to [50-58]. The constant voltage point voltage needs to be greater than the float point voltage.



7.1 Mains Low Voltage Point Setup (LLV)

Function description: Set the mains low-voltage protection point.

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

Remark:

LLV:Line Low Voltage

Inverter mode (output mode: MOD needs to be set to APP),

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

7.2 Mains High Voltage Point Setting (LHV)

Function description: Set the mains high-voltage protection point.

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

LHV:Line High Voltage

Inverter mode (output mode: MOD needs to be set to APP),

Mains high voltage point setting, the default setting is 264V, and the range can be set to [264-280].

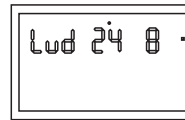
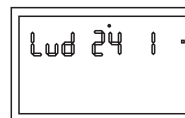
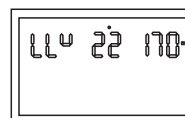
7.3 Low Power Time of Discharge Setting (LWD)

Function description: low power discharge protection function, when the battery mode, in a low load, unlimited time discharge will make the pool very empty, affecting the battery life. When the inverter is at the low power discharge set time, the low-voltage shutdown point of the SI243K-24V battery will be increased to 22V. The low voltage shutdown point of the SI485K-48V battery will be increased to 44V. Setting conditions: The inverter setting can be set in all states in APP mode.

Illustrate:

LWD:Low Watt Discharge

In inverter mode, the low power discharge time is set, the default is (8 hours), and the range can be set [1, 8]. In battery mode, after the continuous discharge time exceeds 8 hours, the battery shutdown point has not yet reached the battery shutdown point, the battery voltage shutdown point will be modified to 11V * battery number of cells, when the battery is discharged to 11V * battery cell voltage, the system will alarm for 1 minute and then shut down. When the battery voltage exceeds 13.2V* and the number of cells exceeds 30s, the battery discharge time will be reset.



7.4 Contrachange Soft Start Setting (SRE)

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

Set conditions: All states can be set.

Illustrate:

SRE:Soft Relay Enable

SRE 25 ON

SRE 25 OFF

The default setting is OFF, and the inverter voltage does not close the output switch until it rises to the rated output. If set to ON, the output switch is closed before the inverter starts to boost.

7.5 Default Settings (STD)

Function description: Restore all setting values to the default values.

Setting conditions: In mains mode and standby (StandBy: No output But the bright-screen state) can be set. It cannot be set in battery mode.

Illustrate:

STD:Set Default

Before setting, this screen is displayed as OFF, when set to ON, the system restores the default settings. After the setup is complete, the screen will show OFF again. Mains and standby modes can be set and take effect immediately, battery mode cannot be set.

Std 26 ON

Std 26 OFF

7.6 Parallel Mode Setup (MOD)

Function description: Set the parallel working mode.

Setting conditions: can be set in mains mode and standby (StandBy: no output but bright screen state). It cannot be set in battery mode. Illustrate: MOD:Operationmode.

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

MOD 27 SIG

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 there is a machine set to SIG in the parallel system, the machine reports fault 24. If there are machines set to 3P1, 3P2, 3P3 in the parallel system, all machines must be set to one of these three modes, and at least one machine exists in each mode, otherwise all machines set to these three modes report a failure 64.

Mains and standby modes can be set and take effect immediately, battery mode cannot be set, and pictures cannot be displayed or displayed.

7.7 Battery Missed Alarm (SBA)

Function description: Set the alarm to turn on the battery missed alarm.

Set conditions: All states can be set.

Illustrate:

SBA:Set battery alarm.

The default setting is OFF.

When the battery is not connected, there will be no battery failure, low battery voltage, or battery undervoltage alarm.

SI485KP-48V can be set in stand-alone operation mode. Other models cannot be set.

7.8 Equalization Mode (EQM)

Function description: Set whether the inverter enables equalization mode.

Set conditions: All states can be set.

Illustrate:

EQM:Equalization Mode

SBA 28 ON

SBA 28 OFF

EQM 29 ON

EQM 29 OFF

The default setting is OFF, and the function is not enabled; Set to ON, the controller will begin to enter the equalization phase when the set equalization interval (battery equalization cycle) is reached during the float charge phase, or when equalization is activated immediately.

7.9 Equalization voltage point setting (EQV)

Function description: equalization voltage point setting function.

Set conditions: All states can be set.

Illustrate:

BCV:EqualizationVoltage

All modes can be set.

The default setting for the SI243K-24V is 29.2, and the range can be set to [25-31.5].

The default setting for SI485K-48V is 58.4, and the range can be set to [48-60].

8.0 Equalization Charge Time Setting (EQT)

Function description: equalize charging time setting.

Set conditions: All states can be set.

EQV 30 58.4

EQV 31 60

Remark :

EQT:EqualizationTime

During the equalization phase, the controller will charge as much of the battery as possible until the battery voltage rises to the battery equalization voltage. After using constant voltage adjustment, the battery voltage is maintained to maintain the battery equilibrium voltage. The battery will remain in the equalization phase until the set battery equalization time is reached.

The default setting is 60 minutes, and the range can be set to [5-900], and each setting is set in increments of 5 minutes.

8.1Equalization Delay Time Setting (EQO)

Function description: equalize delay charging time setting.

Set conditions: All states can be set.

Illustrate:

EQT:EqualizationTimeout

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, the battery voltage is still lower than the battery equalization voltage, and the charge controller stops equalization and returns to the float stage.

The default setting is 120 minutes, and the range can be set to [5-900], and each setting is set in increments of 5 minutes.

8.2Equalization Interval Time Setting (EQI)

Function description: equalize charging interval time setting.

Set conditions: All states can be set.

Illustrate:

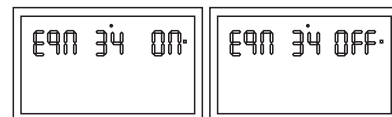
EQI:Equalizationinterval

When the battery is detected during the float charge phase with equalization mode on, the controller will begin to enter the equalization phase when the set equalization interval (battery equalization period) is reached. The default setting is 30 days, and the range can be set to [1-90], and each setting is set in increments of 1 day.

8.3Turn on Equalization Settings (EQN) now

Function description: Set whether the inverter immediately turns on the equalization mode.

Set conditions: All states can be set.

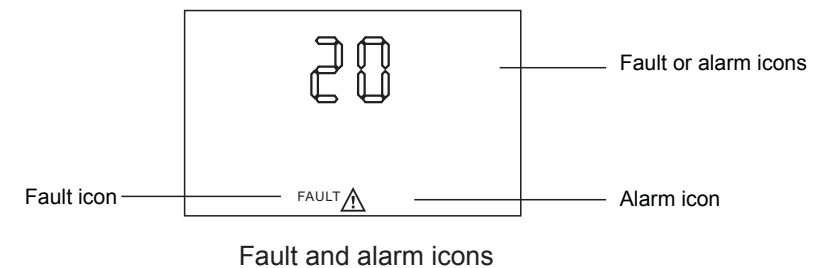


Remark :

EQN:EqualizationNow

The default setting is OFF, and the function is not enabled; When set to ON, the float charge phase under equalization mode is turned on and the battery is detected, the equalization charge is immediately activated and the controller will begin to enter the equalization phase.

9.Description of faults and alarms



Function description: The alarm code ALA flashes and the buzzer rings for 1s and stops for 1 minute. The fault indicator code is always on, the buzzer stops after 10S, the fault is eliminated after stopping, try to restart the machine, and the three restarts fail, and it continues in the fault state. A complete power off (screen) is required to restart the machine.

The fault and alarm LCD display is shown in the figure above, the fault mode fault icon is long on, the alarm status alarm icon flashes, and the manufacturer is contacted according to the fault information to eliminate the abnormal condition.

9.1 Description of the fault

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

Fault code table

Fault Code	In Chinese	In English	Action	Trigger conditions	Recovery Conditions	Alarm Type
1	母线升压软起失败	Bus soft start fail	Turn to Failure Mode	When the bus bar is soft, the set voltage cannot be reached	Not recoverable	Fault
2	母线过压	Bus high	Turn to Failure Mode	The bus bar is higher than the set value	Not recoverable	Fault
3	母线欠压	Bus low	Turn to Failure Mode	The bus bar is below the set value	Not recoverable	Fault
4	电池过流	Battery Over Current	Turn to Failure Mode	The instantaneous value of the battery current exceeds 580A, and it is protected immediately	Not recoverable	Fault
5	过温	Over temperature	Turn to Failure Mode	The temperature sensor of PFC or INV is higher than the overtemperature setpoint	After restarting, the failure fails three times and cannot be recovered after three failures	Fault
6	电池过压	Battery high	Turn to Failure Mode	The battery voltage is higher than the set value	Recoverable	Fault
7	母线软起故障	Bus soft Fault	Turn to Failure Mode	The DC soft-start voltage for the bus bar does not reach the set value	Not recoverable	Fault
8	母线短路	Bus short Fault	Turn to Failure Mode	During normal operation, the bus bar is momentarily below the set value	Not recoverable	Fault
9	逆变软起故障	INV soft Fault	Turn to Failure Mode	After a period of inverter soft start, the rated output voltage still cannot be reached	Not recoverable	Fault
10	逆变输出过压	INV over voltage	Turn to Failure Mode	In battery mode, the inverter voltage is higher than the set value	Not recoverable	Fault
11	逆变输出欠压	INV under voltage	Turn to Failure Mode	In battery mode, the inverter voltage is below the set value	Not recoverable	Fault
12	逆变短路	INV short	Turn to Failure Mode	The inverter voltage is momentarily less than the set value, and the current is instantly greater than the set value	After restarting, the failure fails three times and cannot be recovered after three failures	Fault
13	负功保护	Negative power	Turn to Failure Mode	The inverter power is less than the set value for a period of time	Not recoverable	Fault

Fault Code	In Chinese	In English	Action	Trigger conditions	Recovery Conditions	Alarm Type
14	过载故障	overload fault	Turn to Failure Mode	The load is out of specification	After restarting, the failure fails three times and cannot be recovered after three failures	Fault
15	机型故障	Model Fault	Turn to Failure Mode	The software identifies that the machine model does not match the hardware detection	Not recoverable	Fault
16	无引导程序	No boot loader	Turn to Failure Mode	There is no bootstrapper	Not recoverable	Fault
17	PV程序烧录中	Panel Flash Fault	Turn to Failure Mode	The VML model is burning the PV control program	Recover after burning software	Fault
19	相同序列号	Same Serial	Turn to Failure Mode	In parallel mode, multiple machines with the same serial number are detected	Not recoverable	Fault
20	CAN通信错误	CAN Fault	Turn to Failure Mode	In parallel mode, the CAN bus communicates abnormally	Not recoverable	Fault
21	电池压差过大	BAT Volt Different	Turn to Failure Mode	In parallel mode, the battery pressure difference between different machines is too large	Not recoverable	Fault
22	输入电压压差过大	Line Volt Different	Turn to Failure Mode	In parallel mode, the input pressure difference between different machines is too large	Not recoverable	Fault
23	输入电压频率差异	Line Freq Different	Turn to Failure Mode	In parallel mode, the difference in input voltage and frequency between different machines is too large	Not recoverable	Fault
24	异步设置输出参数	Output Config Different	Turn to Failure Mode	In three-phase parallel mode, there is phase loss in different machine parallel mode settings	Resume when set to stand-alone operation or when the conditions set for three-phase operation are met	Fault
25	输出失步	Output Syn Loss	Turn to Failure Mode	In parallel mode, the output voltage is detected out of synchronization	Not recoverable	Fault

9.2 Alarm

Alarm: The inverter has not entered the failure mode, the LED flashes red, and the LCD displays the alarm code.

Fault Code	In Chinese	In English	Action	Trigger conditions	Recovery Conditions	Alarm Type
50	电池未接	Battery open	Alarm, Battery No Charge	The battery voltage is less than 8V/cell	Recoverable (10V/cell)	Fault
51	电池低压关机	Battery Under	Alarm, battery low voltage shutdown or no power on	Battery voltage below 10.5V/cell (default)	Recoverable (10V/cell + 0.2*N (number of cells))	Fault
52	电池低压	Battery low	Alarm	Depending on the bAL setting	Recoverable (Action Point +0.2V/cell)	Fault
53	充电器短路	Battery charge short	Alarm, Battery No Charge	The battery voltage is less than 5V and the charging current is greater than 4A	Unrecoverable	Fault
55	电池过冲	Over charge	Alarm, Battery No Charge	The battery voltage is higher than the set value	Recoverable	Fault
57	过温	Over Temperature	Alarm, Battery No Charge	The temperature sensor of PFC or INV is above the set value	The temperature sensor for PFC or INV is below the set value	Fault
58	风扇故障	fan lock	Alarm, If one fan was failure, the other fan will run in full speed	No fan speed signal detected	Recoverable	Fault

Fault Code	In Chinese	In English	Action	Trigger conditions	Recovery Conditions	Alarm Type
59	EEPROM故障	EEPROM fail	Alarm	EEPROM Read/Write Fail	Unrecoverable	Fault
60	过载	overload warning	Alarm, Battery No Charge	Load > 102%	Recoverable (Load < 97%)	Fault
61	发电机波形异常	Abnormal generator waveform	Alarm, continuously operating in battery mode	Abnormal generator waveform detection	Recoverable	Fault
62	PV能量弱 (5K)	PV Energy Weak	Turn off the PV output and charging	When the battery is not connected, the bus voltage is lower than the set value	Recover after 10mins	Fault

The pictures or diagrams mentioned in this manual are for reference only,

In the end, please refer to the actual product, and the content is subject to change without notice.

10.0 Technical parameters

Model	PH5000EIN
Parallel mode	
Number of parallel allowed	9 (only SI485KP)
Utility Power Mode	
Rated input voltage	208/220/230/240VAC
Input voltage range	90~280V(Household appliances) 170~280V(Computer equipment)
frequency	50Hz/60Hz
Frequency range	40~70Hz, Default
Overload/short circuit protection	Circuit breaker (40A) bypasses 2x
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
Output voltage error	± 5%
Output frequency range(Hz)	50/60Hz±0.1%
Maximum efficiency	94%
Overload protection Battery Mode:	1min@102%~110% Load 10s@110%~130% Load 3s@130%~150% Load 200ms@>150% Load

Peak power	10000VA
On-load motor capability	100%L
Output short-circuit protection	Current limiting.
Bypass circuit breaker specifications	40A
Rated battery input voltage	40- 60V
Battery voltage range	40-60V
Power saving mode	Yes

Utility Power Charging	
Battery Type	Lithium battery / lead-acid battery
Maximum charging current (configurable)	80A
Charge current error	± 5%
Charging voltage range	<205 80A charging; 90< mains voltage < 205 linear derating
Short-circuit protection	Circuit Breaker(40A)
Circuit breaker specifications	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
Max PV charging power	5000w
Charging short-circuit protection	Fuse protection

Maximum mixed charging current(PV+ AC)	
Maximum mixed charge current (configurable)	80A
EMC Certificate Level	CLASSA
Working Temperature	-10-50°C
Storage Temperature	-15°C~60°C
Humidity range	20%~95% (No condensation)
noises	<50db
Cooling	Natural heat dissipation/forced air cooling
Display interface	LCD
Product Size	466*310*120.6
Package Size	600*590* 245MM
Gross Weight	16.5KG
Net Weight	14.5KG

10.1 Packing checklist

SN	Name	Quantity/Unit	Remark
1	Host Machine	1set	
2	User Manual	1pcs	
3	Accessory kit	1pack	

10.2 Product after-sales guide

Product warranty card	
Client Name	
Product Model	
Date of Purchase	
Address	
Telephone	

Cut along the dotted line

This warranty card should be kept properly by the customer as a proof of maintenance.

- This product is guaranteed for 24 months from the date of purchase.
- If the failure occurs during the normal use of the product during the warranty period, the warranty card and invoice can be presented according to the content of the warranty clause, and the company provides after-sales service. If the damage to the product is caused by the following reasons, the company will not be obliged to provide warranty service.

The following conditions are not covered by the warranty

- The inside of the product is disassembled without permission, or any part of it is replaced
- Damage caused by improper use and improper storage.
- If the user causes damage to the product due to human factors, the company will charge the corresponding maintenance fee when repairing.