

USER MANUAL

Hybrid

Solar Inverter

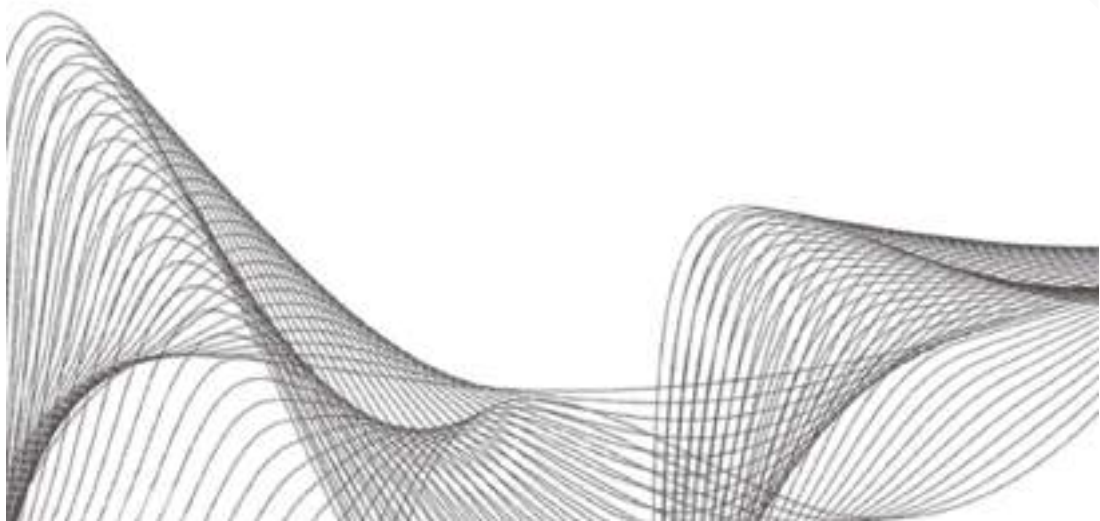


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1 About This Manual

1.1 Purpose

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations, Keep manual for future reference.

1.2 Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

2 Safety Instructions



WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

1. Before using the unit read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
2. **CAUTION**-To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
3. Do not disassemble the unit Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
5. **CAUTION**-Only qualified personnel can install this device with battery.
6. **NEVER** charge a frozen battery.
7. For optimum operation of this inverter/charger, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter/charger.
8. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals, Please refer to INSTALLATION section of this manual for the details
10. One piece of 150A fuse is provided as over-current protection for the battery supply.
11. **GROUNDING INSTRUCTIONS** -This inverter/ charger should be connected to a permanent grounder wiring system. Be sure to comply with local requirements and regulation to install this inverter.
12. **NEVER** cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
13. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for maintenance.

3 Introduction

This is a multi-function Inverter/charger, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support with portable size. Its comprehensive LCD display offers user-configurable and easy-accessible button operation such as battery charging current, AC/solar charger priority, and acceptable input voltage based on different applications.

3.1 Features

- ♦ Pure sine wave inverter
- ♦ Configurable input voltage range for home appliances and personal computers via LCD setting
- ♦ Configurable battery charging current based on applications via LCD setting
- ♦ Configurable AC/Solar Charger priority via LCD setting
- ♦ Compatible to mains voltage or generator power
- ♦ Auto restart while AC is recovering
- ♦ Overload/Over temperature/short circuit protection
- ♦ Smart battery charger design for optimized battery performance
- ♦ Cold start function

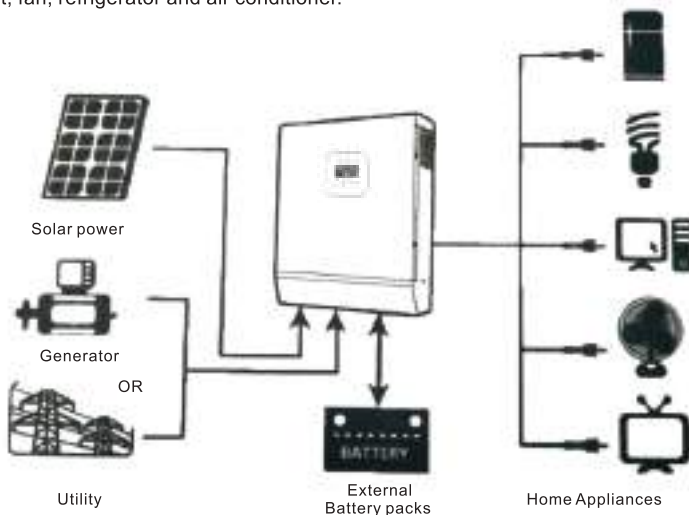
3.2 Basic System Architecture

The following illustration shows basic application for this inverter/charger. It also includes following devices to have a complete running system:

- ♦ Generator or Utility
- ♦ PV modules

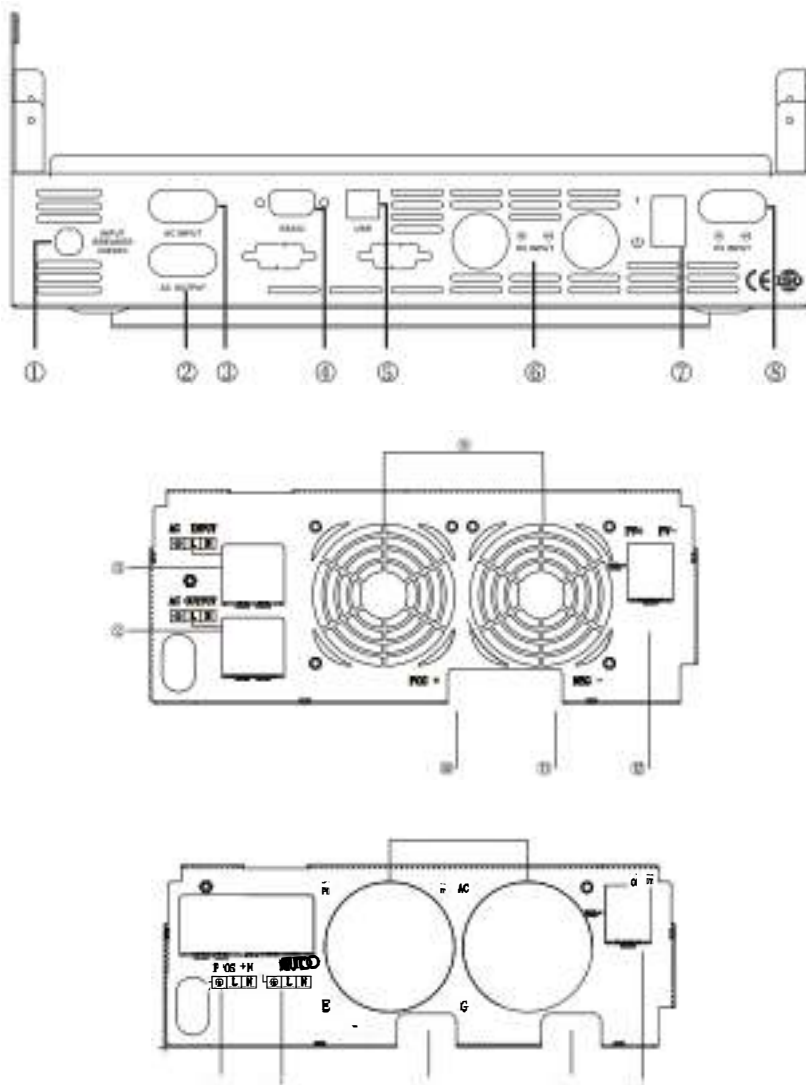
Consult with your system integrator for other possible system architectures depending on your requirements.

This inverter can power all kinds of appliances in home or environment, including motor-type appliances such as tube light, fan, refrigerator and air conditioner.



3.3 Product Overview 3.

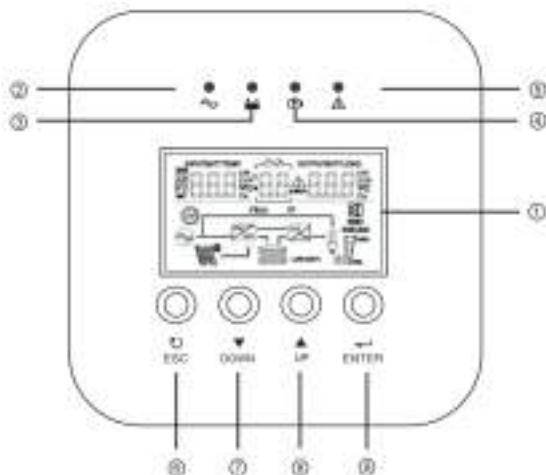
3.1 Back Panel



- 1.....Input Breaker
- 2.....AC Output
- 3.....AC Input
- 4.....RS232 Communication Port
- 5.....USB Communication Port
- 6.....Battery Input

- 7.....Power ON/OFF Switch
- 8.....PV Input
- 9.....Fan
- 10.....Battery Terminal Positive
- 11.....Battery Terminal Negative
- 12.....Solar Panel Input

3.3.2 LCD Screen



- ①.....LCD Display
- ②.....AC Mode Indicator
- ③.....Inverter Mode Indicator
- ④.....Charging Indicator
- ⑤.....Alarm Indicator

- ⑥.....ESC
- ⑦.....DOWN
- ⑧.....UP
- ⑨.....ENTER

4 INSTALLATION

4.1 Unpacking and inspection

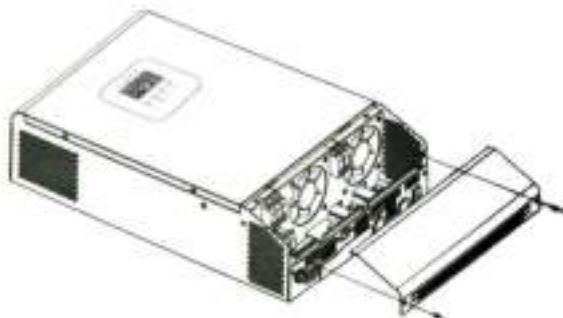
Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

The unit x 1

User manual 1

4.2 Preparation

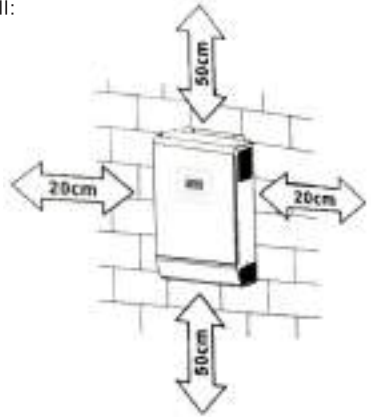
Before connecting all please take off bottom cover by removing two screws as shown below.



4.3 Mounting the Unit

Consider the following points before selecting where to install:

- ※ Do not mount the inverter on flammable construction materials.
- ※ Mount on a solid surface
- ※ Install this inverter at eye level in order to allow the LCD display to be read at all times.
- ※ For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit.
- ※ The recommended installation position is to be adhered to the wall vertically.
- ※ Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

Install the unit by screwing two screws.

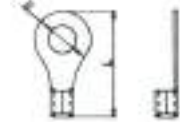
- 1,2 Use the M6*80mm expansion bolts.
- 3 Use M4 or M5.



4.4 Battery Connection

CAUTION: For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnect device between battery and inverter. It may not be requested to have a disconnect device in some applications, however, it's still requested to over-current protection installed. Please refer to typical amperage in below table as required fuse or breaker size.

Ring terminal:



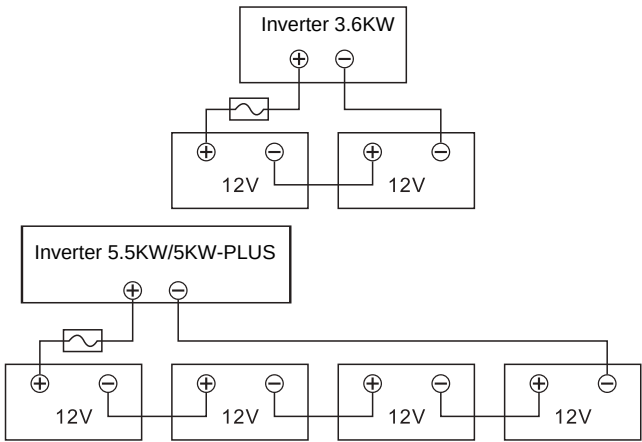
WARNING! All wiring must be performed by be qualified personnel.
WARNING! It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable and terminal size as below.

Recommended battery cable and terminal size:

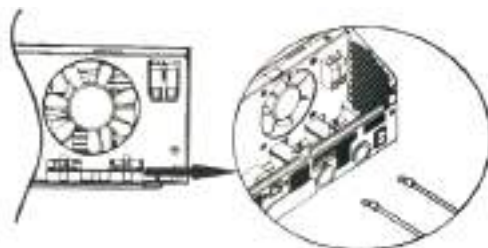
Model	Typical Amperage	Battery capacity	Wire Size	Ring Terminal			Torque value
				Cable(mm²)	Dimensions		
					D(mm)	L(mm)	
3.6KW	100A	100AH	1*4AWG	25	6.4	33.2	2-3Nm
		200AH	2*8AWG	25	6.4	29.2	
5.5KW 5KW-PLUS	110A	200AH	1*2AWG	38	6.4	39.2	2-3Nm
			2*6AWG	28	6.4	33.2	

please follow below steps to implement battery connection:

1.Assemble battery ring terminal based on recommended battery cable and terminal size.



2. Insert the battery wires flatly into battery connectors of inverter and make sure the bolts are tightened with torque of 2 Nm in clockwise direction. Make sure polarity at both the battery and the inverter/charge is correctly connected and conductors are tightly screwed into the battery terminals. Recommended tool: # 2 Pozzi Screwdriver



WARNING: Shock Hazard

Installation must be performed with care due to high battery voltage in series.



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

4.5 AC Input Output Connection

CAUTION!! Before connecting to AC input power source, please Install a separate AC breaker between inverter and AC input power source. This will ensure the Inverter can be disconnected during maintenance and fully protected from over current of AC input. The recommended spec of breaker is 32A for 3 KW and 50A for 5 KW.

CAUTION! ! There are two terminal blocks with " IN " and " OUT " markings. Please do NOT mis-connect input and output connectors.

WARNING! All wiring must be performed by qualified personnel.

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

Suggested cable requirement for AC wires

Model	Gauge	Torque value
3.6KW	12AWG	1.2~1.6Nm
5.5KW/5.5KW-PLUS	8AWG	1.4~1.6Nm

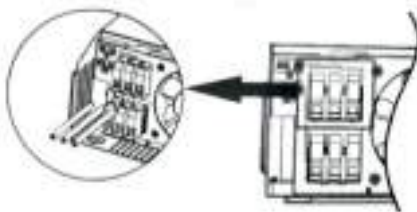
Please follow below steps to implement AC input/ output connection

1. Before making AC input/output connection be sure to open DC protector or disconnector first.
2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N3 mm.
3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor(⊕)first.

⊕→Ground(yellow-green)

L→LINE(brown or black

N→Neutral (blue)



WARNING:

Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

4.Make sure the wires are securely connected

Warning: Equipment such as air conditioners need at least 2-3 minutes to restart, as there needs to be enough time to balance the refrigerant gas in the loop. If a power shortage occurs and is restored within a short period of time, it can cause damage to connected devices. To prevent such damage, check whether the air conditioner manufacturer has a delay function before installation. Otherwise, this inverter/charger will trigger an overload failure and cut off the output to protect your device, but sometimes it can still cause internal damage to the air conditioner.

4.6 PVConnection

PV Connection(Only apply for the model with solar charger)

CAUTION:Before connecting to PV modules,please install separately a DC circuit breaker between inverter and PV modules.

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

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

Typical Amperage	Gauge	Torque Value
60A	12AWG	1.4~1.6Nm

PV modules selection

When choosing the right PV module, be sure to first consider the following requirements: The open circuit voltage (Voc) of the photovoltaic module does not exceed the maximum open circuit voltage of the photovoltaic array of the inverter. The maximum power supply voltage of the photovoltaic module should be close to the optimal photovoltaic access voltage range of the inverter to obtain the best performance. If one PV module cannot meet this requirement, it is necessary to connect multiple PV modules in series.

Model	GHL24V3.6KW	GHL48V5.5KW	GHBL48V5KW-PLUS
PV charging Mode	MPPT	MPPT	MPPT
Max PV Input power	5000W	6000W	6000W
MPPT Tracking Range	40-450Vdc	120-430Vdc	120-430Vdc
Max PV Input Voltage	500Vdc	500Vdc	500Vdc
Best open Circuit	370-430V	370-430V	370-430V
Voltage Range	300-400V	300-400V	300-400V
Max PV Charging Current	100A	100A	80A
Max AC Charging Current	100A	80A	80A
Max Charging Current	100A	100A	80A

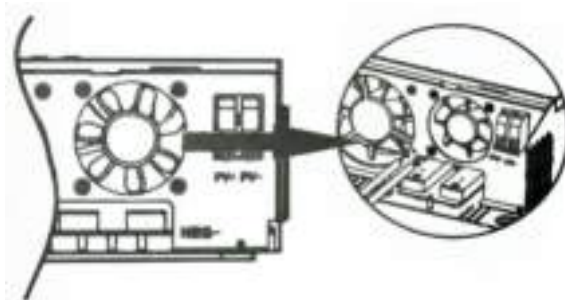
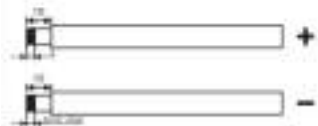
PV Module Wire Connection

Please follow below steps to implement PV module connection:

1.Remove insulator sleeve 10mm for positive and negative conductors.

2.Suggest to put bootlace ferrules on the end of positive and negative wires with a proper crimping tool.

3.Fix wire cover to the inverter with supplied screws as shown inbelow chart.



4.Check correct polarity of wire from PV modules and PV input connectors. Then, connect positive pole(+) of connection wire to positive pole(+) of PV input connector. Connect negative pole(-) of connection wire to negative pole(-) of PV input connector. Screw two wires tightly in clockwise direction. Recommended tool: 4mm blade screwdriver.

4.7 Final Assembly

After connecting all wirings, please put bottom cover back by screwing two screws as shown below.



4.8 Communication Connection

1. Please use supplied communication cable to connect to inverter and PC. Insert bundled CD into a compute and follow on-screen instruction to install the monitoring software. For the detailed software operation. please check user manual of software inside of CD.

2. Wi-Fi cloud communication(option):

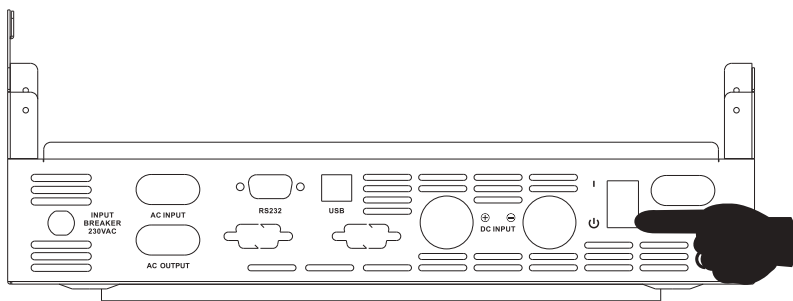
please use supplied communication cable to connect to inverter and Wi-Fi module. Download APP and installed from APP store, and Refer to "Wi-Fi Plug Quick Installation Guideline" to set up network and registering. The inverter status would be shown by mobile phone APP or webpage of computer.

3. GPRS cloud communication(option):

please use supplied communication cable to connect to inverter and GPRS module, and then applied external to GPRS module. Download APP and installed from APP store, and Refer to "GPRS RTU Quick Installation Guideline" to set up network and registering. The inverter status would be shown by mobile phone APP or webpage of computer.

5 OPERATION

5.1 Power ON/OFF



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

5.1.1 Steps to start up

Connect the battery that meets the requirements (battery voltage needs to beyond 23V) or AC(AC needs to confirm the suitable input range depene on the output mode),then you can start up theinverter.

➤ **Mains power on**

Connect to norma AC power, press the switch and the system automatically starts. If the mains output priority is set, wait for a period of time for the panel to display the AC mode, indicating that the machine is successfully started and the system enters the AC mode.

➤ **Battery boot**

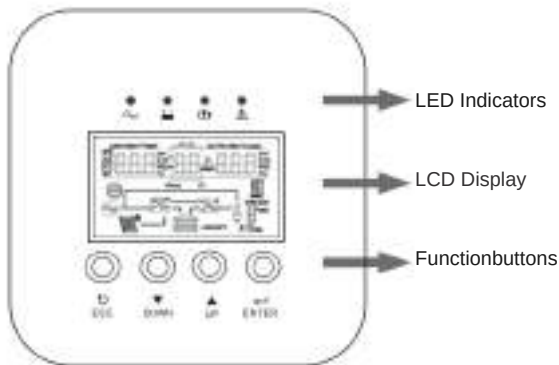
Connect to battery,press the switch and the system automatically starts. If the mains output priority is set, wait for a period of time for the panel to display the battery mode, indicating that the machine is successfully started and the system enters the battery mode.

5.1.2 Shut down steps

When the system is in battery mode or AC mode output press the switch again,then the system will be turned off.

5.20 peration and Display Panel

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



5.2.1 Buttons function

Buttons	Descriptions
Function settings /ENTER	Function settings Press the ENTER button on the display page for more than 2 seconds to enter the function seting page.After entering,press the ENTER button to turn the page and select the nterface to be set.
Page turning/inquiry button UP/DOWN	Page turning Press UP/DOWN on any page to turn the pages.
ESC	After setting up a single tem , press ESC and then press UP/ DOWN to select other settings. Confirm and save settings : On the function settings page press ESC for 2 seconds, and then go back to the main interface and set to save.

5.2.2 LED indicator functions



Indicator lights	Name	Descriptions:
Flash	LED-Off:	the AC is normal and enters the AC to work Input: the AC is normal, but does not enter the AC to work (Green) the AC is abnormal On:
Off:	LED-Off:	machine working in battery mode output power drops (Yellow)
Battery (Yellow)	Battery (Yellow)	the battery is full charging LED-Off: other faults
has	Inverter is	LED-Flash: inverter alarm (Red) Off: the inverter is normal 52.3 Inverter working

the corresponding indicator lamp descriptions are as follows:

Warning buzzer	Failure Mode
default 10 seconds then stop recovery of PV input voltage	top Loss or
main switch is on or off Beep	age So after beeping for 3 seconds then per second, continuous All day
alarm (battery low voltage)	alarm will only beep 1 min then stop in battery mode

5.2.4 Checking Parameter Operation

Under normal circumstances, there are ten pages in the display. Press the query button UP/DOWN to draw a page for the display, and display information such as input-output voltage, input-output rate, battery, PV electricity and electricity, negative and component versions, etc. If there is an alarm, a page of alarm information will be displayed, and if the inverter fails, a page of trouble code will be displayed. By default, the main panel displays the fault information. When the transformer has no fault or fault, the main page displays the voltage and rate information by default. Press UP/DOWN for more than 1 second, and LCD will enter polling mode display: automatically turn the page of display every 2 seconds, and long press UP/DOWN key again to exit polling mode.

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

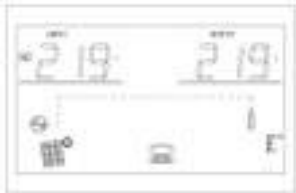


Figure 1-1 display page 1

Display Page 2: Display the input and output frequency of the inverter, as shown in Figure 1-2.



Figure 1-2 display page 2

Display page 3: battery information, showing battery voltage and battery capacity and charging current, as shown in Figure 1-3.



Figure 1-3 display page 3

Display page 4: PV info, display PV voltage and PV charging amps, as shown in Figure 1-4.



Figure 1-4 display page 4

Display page 5: PV info, display PV voltage and PV charging wattage, show as 1-5.



Figure 1-5 display page 5

Display page 6: Output Information shows the output voltage and output power, as shown in Figure 1-6.

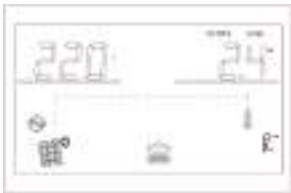


Figure 1-6 display page 6

Display page 7: Output Information shows the output voltage and output power, as shown in Figure 1-7



Figure 1-7 display page 7

Display page 8:Output information display output voltage and load percentage,as shown in Figure 1-8.



Display page 9:Software version display the inverter system software version, as shown in Figure 1-9(Software Version VER 01)



Display page 10:Software version display the MPPT system software version, as shown in Figure 1-10(Software Version VER 34)



Display page 11: Parallel status. 3.6KW does not have this page, as shown in Figure 1-11

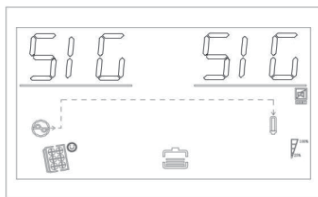


Figure 1-11 display 11 (Parallel status)

Display page 12: Lithium battery networking status (requires connecting lithium batteries and enabling lithium battery communication settings); When the SIG constant is displayed in the upper right corner, the battery pack operates as a single group; When displayed as PAR constant, the battery pack operates in series and parallel with multiple groups; When displayed as PAR flashing, the battery pack is establishing multiple series parallel states;

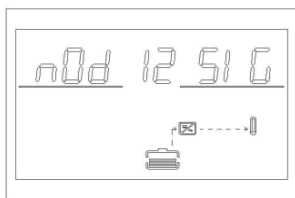


Figure 1-12 display 12 (Lithium battery networking status)

Display page 13: Lithium battery voltage and current information (requires connecting the lithium battery and opening the lithium battery communication settings); The upper left display BMS battery current information. When BMS communication fails, the upper left and upper right displays a flashing ERR.

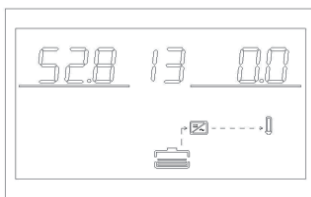


Figure 1-13 display 13 (Voltage and current information of lithium batteries)

Display page 14: Lithium battery temperature, SOC (requires connecting the lithium battery and opening the lithium battery communication settings); The upper left displays BMS temperature information; BMS SOC information is displayed in the upper right corner. When BMS communication fails, both the upper left and upper right are flashing ERRs.

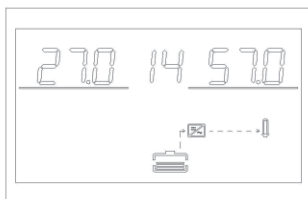


Figure 1-14 display 14 (Lithium battery temperature and SOC information)

Display page 15: Lithium battery capacity (requires connecting the lithium battery and opening the lithium battery communication settings); The upper left displays the rated capacity; The current capacity is displayed in the upper right corner. When BMS communication fails, the upper left and upper right displays a flashing ERR.

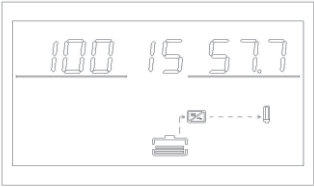


Figure 1-15 display 15 (Lithium battery capacity information)

Display page 16: Lithium battery constant voltage point (requires connecting the lithium battery and turning on the lithium battery communication settings); The upper left displays fixed letters; The upper right displays the BMS constant voltage charging point. When BMS communication fails, the upper left and upper right displays a flashing ERR.

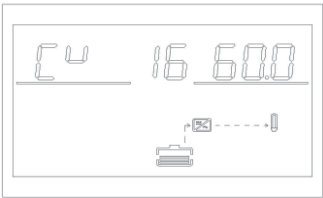


Figure 1-16 display 16 (Lithium battery constant voltage information)

Display page 17: Lithium battery fault alarm information (requires connecting the lithium battery and opening the lithium battery communication settings); The upper left displays BMS alarm information; The upper right displays BMS fault information. When BMS communication fails, the upper left and upper right displays a flashing ERR.

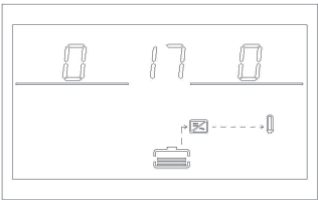


Figure 1-17 display 17 (Lithium battery fault alarm information)

5.3 Function setting operation

➤ Function setting operation:

The page for setting the exit function and setting as below:

- Long press “ENTER” button for more than 2 seconds, enter into function setting mode. Press “Enter” button to choose function, turn the page to you need to set, the corresponding indicator will flash.
- Press “ Enter ” button again, enter the function setting, you will see the word of function you choose lighting, on the left of word will occur numerical flashing, then you can press “ UP/DOWN ” button to use.
- After finish setting, press the enter button again, the data will be on instead of flashing.

Long press “ ESC ” button for more than 2 seconds, the function will complete setting. Return to function setting, then back to main page. (If you don't exit manually, after 30 seconds, it will be back to main page automatically).

5.3.1 Output Voltage (OPU)



Figure 1-18 Output Voltage Setting

- The default output voltage is 230V, 208V, 220V, 230V, 240V can be set, all working conditions can be set, and it will take effect immediately.
- Press the function setting key “ENTER” key for more than 2 seconds to enter the function setting page, press the query key “UP/DOWN” key for 0.1 to 2 seconds to select the function, after turning the page to the output voltage PU setting page, the word OPU flashes.
- Press the “ENTER” key for 0.1 to 2 seconds to enter the setting page of the output voltage OPU. At this time, the word OPU is long on, and the value flashes to the right of the word OPU. Press the query key “UP/DOWN” key for 0.1 to 2 seconds to select different output voltage values, 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 output voltage value, press the “ ENTER ” keyfor 0.1~2seconds, the output voltage OPU setting is completed, and the value on the right side of the OPU will be long on and no longer flashing.
- Press the “ESC” 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 (or do not operate, and automatically jump back to the main display page after waiting for up to 30S).

Note:

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

5.3.2 Output frequency

Output frequency setting, the default value is 50Hz.

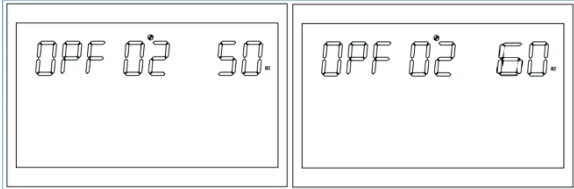


Figure 1-19 Output Frequency Setting Page

Function description: 50Hz or 60Hz can be adjusted, default value is 50Hz.

Setting conditions: The standby or mains power mode can be set, and it will take effect immediately after the setting is completed. After returning to battery mode, the frequency will change at a slower speed.

5.3.3 Output priority settings



Figure 1-20 Output Priority Setting Page

Function description: Set the inverter output priority.

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

Note:

There are three options for output priority, the default is GRD: mains output priority; the second is PU(PV): photovoltaic output priority; the third is PBG: PV first, battery second, mains third output;

5.3.4 Output Mode Settings (MOD)



Figure 1-21 Output Mode Setting Page

Function description: Set the inverter output mode.

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

Explanation:

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 computers and other equipment. The switching time is typically 10ms.

The third picture is GEN mode, which is used for AC connection to the generator. The typical switching time is 60ms, and this mode can only be set for 3.6KW models;

5.3.5 Charging priority settings (CHP)



Figure 1-22 Charging Priority Setting Page

Function description: Set the inverter charging priority.

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

Explanation:

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

5.3.6 Mains charging current (RCC)

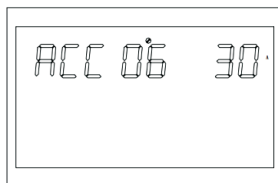


Figure 1-23 Mains Maximum Charging Setting Page

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

Setting conditions: All states can be set.

Explanation:

RCC:Grid Charge Current, The default maximum charging current for mains power is 40A, with a range of [2,100 A] (3.6KW model)

RCC: Grid Charge Current. The default maximum charging current for mains power is 30A, with a range of [2,80A] (5.5KW, 5KW-PLUS models)

5.3.7 Maximum charging current (MCC)

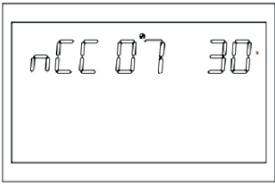


Figure 1-24 Maximum Charging Current Setting Page

Function description: Set the maximum charging current value of the inverter.
Setting conditions: All states can be set.
Explanation:
MCC: Maximum Charge Current, the maximum charging current refers to the maximum value of the PV and mains charging current.
3.6KW model is available in 2/10/20/30/40/50/60/70/80/90/100A options;
5.5KW, 5KW-PLUS models is available in 2/10/20/30/40/50/60/70/80/90/100A options;

5.3.8 Menu Front (MDF)

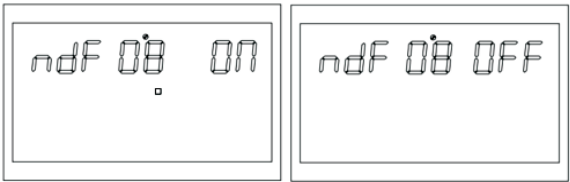


Figure 1-25 Return to Home Page Setting

Function description: Return to the main interface settings.
Setting conditions: All states can be set.
Explanation:
The default setting is ON. In the function setting operation, when it is set to ON, if the page is not in the first interface (P1) at this time, it will return to the first interface after 1 minute; if it is set to OFF, if the page is not in the first interface (P1) at this time, the LCD will Always stay on this interface.

5.3.9 Overload restart setting (LrS)

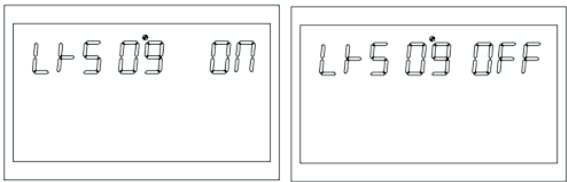


Figure 1-26 Overload Restart Setting Page

Function description: Overload restart setting.
Setting conditions: All states can be set.
Explanation:
Overload restart is set to ON by default.

5.3.10 Over temperature restart setting (TrS)

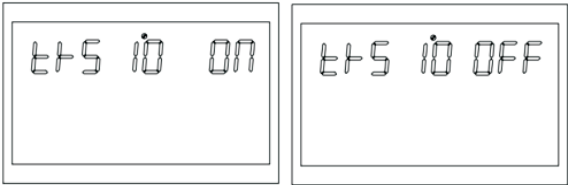


Figure 1-27 Over Temperature Restart Setting Page

Function description: Over-temperature restart settings.

Setting conditions: All states can be set.

Explanation:

The default setting for over-temperature restart is ON.

5.3.11 Main input power failure alarm setting (MIP)

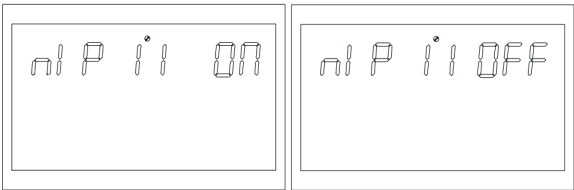


Figure 1-28 Main Input Power Failure Alarm Setting Page

Function description: Mains or PV loss alarm long beep setting

Setting conditions: All states can be set, the default is ON, and the mains or PV loss alarm will beep for a while. Can be set to OFF. (All modes can be set)

Explanation:

MIP:Main input cut warning

The default setting is ON, after the main input detection is lost, the buzzer will sound for 3s; when it is set to OFF, after the main input is lost, the buzzer will not sound constantly.

5.3.12 Power Saving Mode (PWS)

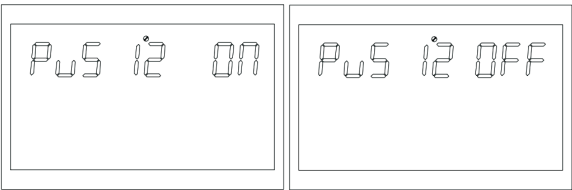


Figure 1-29 Power Saving Mode Setting Page

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

Setting conditions: All states can be set.

Explanation:

PWS: Power Saving

The default setting is OFF, the function is not turned on; when it is set to ON, in battery mode, if the load is lower than 25W, the system will temporarily stop the output, and then continue to output. If the load is higher than 35W, the system will resume continuous normal output.

5.3.13 Overload convert to bypass setting (OLG)

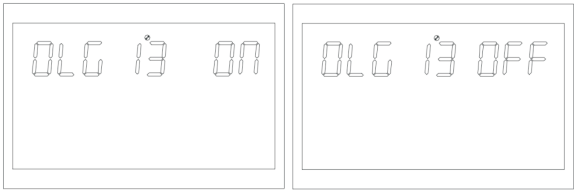


Figure 1-30 Overload Convert to Bypass Setting Page

Function description: When overload in the battery mode, set whether to switch to the mains mode (bypass mode) immediately.

Setting conditions: All states can be set.

Explanation:

OLG:Over load to Bypass

The default setting is OFF, the function is not enabled; when it is set to ON, under the condition of PV priority output with load, if overloaded, the system will immediately transfer to bypass (mains output, namely bypass mode).

5.3.14 Silent mode setting

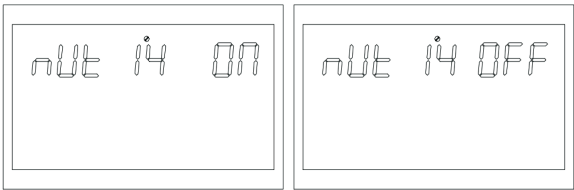


Figure 1-31 Silent Mode Setting Page

Function description: Set whether the buzzer beeps or not.

Setting conditions: All states can be set.

Explanation:

MUE Mute

The default setting is OFF, and the function is not turned on; when it is set to ON, the buzzer does not sound under any circumstances, such as alarms, faults, etc. All modes can be set and function normally, pictures cannot be displayed.

5.3.15 Battery mode to mains mode voltage point

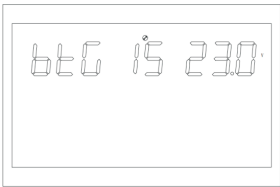


Figure 1-32 Battery Mode to Mains Mode Voltage Point Setting Page

Function description: When the battery and mains exists at the same time, the battery will be transferred to the mains when it is discharged to a certain voltage 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 or PBG modes.

Explanation:

BTG : Back To Grid

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

The default setting for the 3.6KW model is 23V, and the adjustable range is [22,26]

The default setting for 5.5KW and 5KW-PLUS models is 46V, with a range of [44,52].

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

The default setting for the 3.6KW model is 23V, and the adjustable range is [22,26]

The default setting for 5.5KW and 5KW-PLUS models is 46V, with a range of [44,52].

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

The default setting for the 3.6KW model is 23.8V, and the adjustable range is [20,25]

The default setting for 5.5KW and 5KW-PLUS models is 47.6V, with a range of [40,50]

5.3.16 Switch back to battery mode voltage point (BTB)

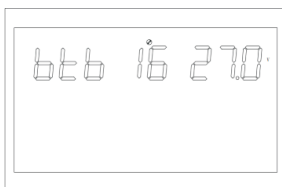


Figure 1-33 Setting of Battery Voltage Point When Mains Switch Back to Battery Mode

Function description: After the battery is turned off at low voltage, it needs to reach a certain battery voltage value before it can be restarted in battery mode.

Setting conditions: All states can be set.

Explanation:

BTB: Back To Battery

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

The default setting for the 3.6KW model is 26V, with a range of [24,29] (when the set value Vbtb>26V, the voltage point for switching back to battery mode remains at 26V).

When the output priority is set to photovoltaic (PV priority output or photovoltaic cell mains power (PBG output, if not in battery mode at this time, if the battery voltage is higher than 26V, the system will switch back to battery mode).

The default setting for 5.5KW and 5KW-PLUS models is 52V, with a range of [48,58] (same logic as above).

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

The default setting for the 3.6KW model is 26V, with a range of [24,29] (logical as above)

The default setting for 5.5KW and 5KW-PLUS models is 52V, with a range of [48,58] (same logic as above).

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

The default setting for the 3.6KW model is 27.2V, with a range of [23,29] (logical as above)

The default setting for 5.5KW and 5KW-PLUS models is 54.4V, and the adjustable range is [46,58] (same logic as above)

5.3.17 Battery mode setting

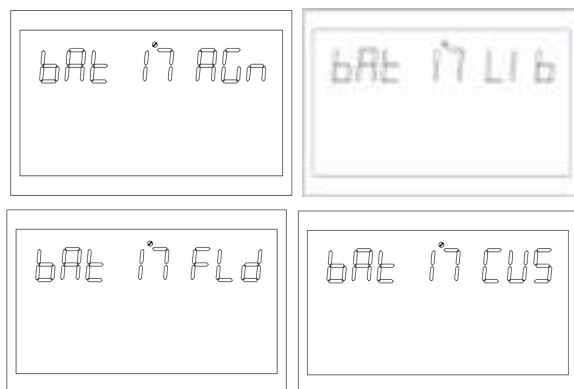


Figure 1-34 Battery Mode Setting Page

Function description: battery type setting function

Setting conditions: All states can be set.

Explanation:

BAT:Battery Type

Four battery type settings: the default setting is AGM (lead-acid battery); the second is FLD (water injection battery); the third is LIB (lithium battery); the fourth is Cus (customer setting type).

5.3.18 Battery low voltage point

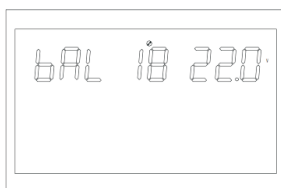


Figure 1-35 Battery Low Voltage Point Setting Page

Function description: Low voltage alarm point setting.

Setting conditions: All states can be set.

Explanation:

bAL: battery Low

When the battery type is set to CUS (customer set type), the low voltage point of the battery can be modified.

The default setting for the 3.6KW model is 21.6V, and the adjustable range is [21,27].

The default setting for 5.5KW and 5KW-PLUS models is 44V, and the adjustable range is [42,54]. When the battery type is set to LIB (lithium battery type), the low voltage point of the battery can be modified.

The default setting for the 3.6KW model is 23.8V, and the adjustable range is [20.6,25.0].

The default setting for 5.5KW and 5KW-PLUS models is 47.6V, and the adjustable range is [41.2,50.0]

5.3.19 Battery low voltage cut off point



Figure 1-36 Battery Low Voltage cut off Point Setting Page

Function description: Battery low voltage shutdown point setting function.

Setting conditions: All states can be set.

Explanation:

bAU: battery Under

When the battery type is set to CUS (customer set type), the battery shutdown point can be modified.

The default setting for the 3.6KW model is 21V, and the adjustable range is [20,24]

The default setting for 5.5KW and 5KW-PLUS models is 42V, with a range of [40,48].

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

The default setting for the 3.6KW model is 23V, and the adjustable range is [20,24].

The default setting for 5.5KW and 5KW-PLUS models is 46V, and the adjustable range is [40,48].

5.3.20 Constant voltage mode voltage point setting (bCV)

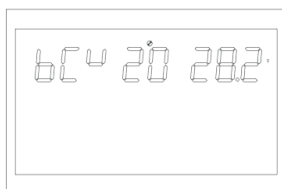


Figure 1-37 Constant Voltage Mode Voltage Point Setting Page

Function description: Constant voltage point setting function

Setting conditions: All states can be set

Explanation:

bCV : battery Constant Voltage

When the battery type is set to CUS (customer set type), the constant voltage charging point can be modified.

The default setting for the 3.6KW model is 28.2, and the adjustable range is [24,29].

The constant voltage point voltage needs to be greater than the float point voltage.

The default setting for 5.5KW and 5KW-PLUS models is 56.4, and the adjustable range is [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 3.6KW model is 28.2, and the adjustable range is [25,29].

The constant voltage point voltage needs to be greater than the float point voltage.

The default setting for 5.5KW and 5KW-PLUS models is 56.4, and the adjustable range is [48,60].

The constant voltage point voltage needs to be greater than the float point voltage.

5.3.21 Floating charge mode voltage point setting (bFL)

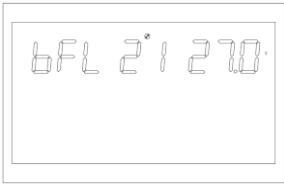


Figure 1-38 Floating Charge Mode Voltage Point Setting Page

Function description: Float voltage point setting function.

Setting conditions: All states can be set.

Explanation:

bFL : battery Float

Setting the battery type to CUS (customer set type) allows for modification of the battery float charging point.

The default setting for the 3.6KW model is 27V, and the adjustable range is [26.6,27.8].

The constant voltage point voltage needs to be greater than the float point voltage.

The default setting for 5.5KW and 5KW-PLUS models is 54V, and the adjustable range is [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 3.6KW model is 27.6V, and the adjustable range is [24,28].

The constant voltage point voltage needs to be greater than the float point voltage.

The default setting for 5.5KW and 5KW-PLUS models is 55.2V, and the adjustable range is [50,58].

The constant voltage point voltage needs to be greater than the float point voltage.

5.3.22 Mains low voltage point setting (LLV)

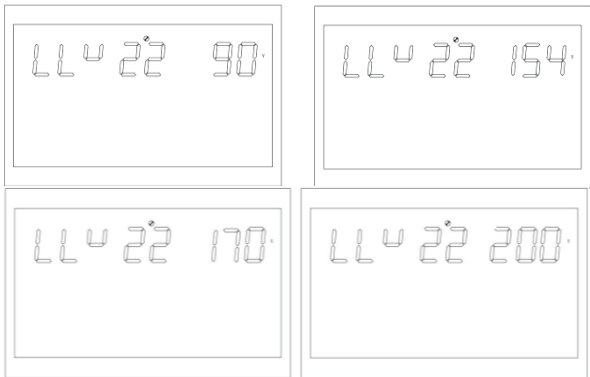


Figure 1-39 Mains Low Voltage Point Setting Page in APP Mode

Function description: Set the mains low voltage protection point.

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

Explanation:

LLV:Line Low Voltage

In inverter mode (output mode: MOD needs to be set to APP/GEN), the low voltage point of the mains is set to 154V by default, and the adjustable range is [90,154]. (Output mode: MOD needs to be set to UPS), low voltage point setting for mains power, default setting is 185V, adjustable range is [170,200].

5.3.23 Mains high voltage protecting point setting (LHV)

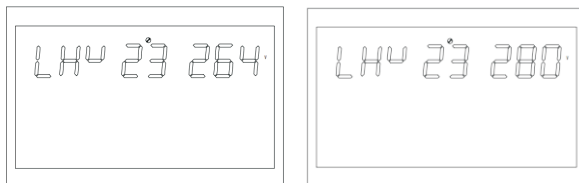


Figure 1-40 Mains High Voltage Protecting Point Setting Page in APP Mode

Function description: Set the mains high voltage protection point.

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

Explanation:

LHV:Line High Voltage

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

5.3.24 Low power discharging time setting (LWD)

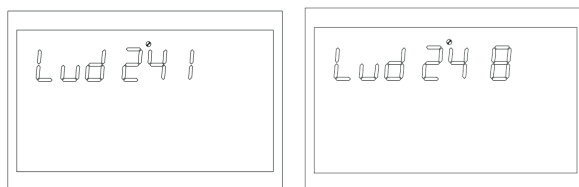


Figure 1-41 Low Power Discharging Time Setting Page

Function description: Low power discharge protection function. When in battery mode and under a low load, unlimited discharge time will leave the battery empty, affecting its lifespan. When the inverter is in the low-power discharge setting time, the low voltage shutdown point of the 3.6KW model battery will increase to 22V. The low voltage shutdown point of the 5.5KW and 5KW-PLUS models' batteries will be increased to 44V.

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

Explanation:

LWD : Low Watt Discharge

In inverter mode, the low power discharge time setting, the default is 8 (8 hours), the setting range is [1, 8]

In battery mode, after the continuous discharge time exceeds 8 hours and the battery shutdown point has not been reached, the battery voltage shutdown point will be modified to 11V * number of battery cells, and the system will alarm for 1 minute when the battery continues to discharge to 11V * number of battery cells. Then shut down again.

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

5.3.25 Inverter soft start setting (SRE)

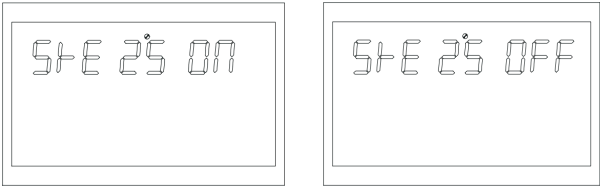


Figure 1-42 Inverter Soft Start Setting Page

Function description: When the setting is ON, the inverter output gradually increases from 0 to the target voltage point. This function is very suitable for the motor and the loads with motor. When the setting is OFF, the inverter output is directly increased from 0 to the target voltage point.

Setting conditions: It can be set in all states, but can only run in standalone mode.

Explanation:

SRE: Soft Relay Enable

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

5.3.26 Reset factory settings(SD)

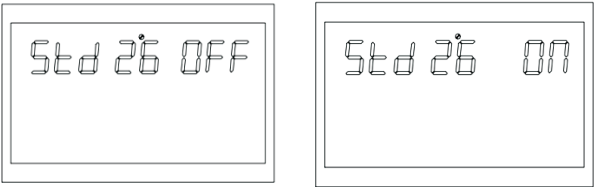


Figure 1-43 IDefault Value Setting Page

Function description: Restore all setting to factory settings.

Setting conditions: It can be set in mains mode and StandBy (no output but screen on state). It cannot be set when the battery mode.

Explanation:

SD:Set Default

Before the setting, this interface is displayed as OFF. When it is set to ON, the system will restore to factory settings. After the setting is completed, this interface will display OFF again.

5.3.27 Parallel Mode Settings(MOD)



Figure 1-44 Parallel Mode Setting Page

Function description: Setting parallel working mode.

Setting conditions:The 5KW-PLUS model can be set in mains mode and standby mode (StandBy: no output but screen on state), but cannot be set in battery mode. Other models cannot be set.

Explanation:

MOD:Operation mode.

The default set is SIG (single mode) Standalone mode, it can be set as PAR (parallel mode) Single-phase parallel mode, P1 (R phase mode), 3P2 (S phase mode), 3P3 (T phase mode)

When using the parallel function, first connect the parallel system in the correct way, and then set the parallel mode of each machine correctly. 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 the machines set to these three modes must be set to one of the three modes. The machine reports fault 24.

Mains mode and standby mode can be set and take effect immediately, but cannot be set in battery mode and cannot be displayed in pictures

5.3.28 Missing battery alarm (SBA)



Figure 1-45 Missing Battery Alarm Page

Function description: Set turn on no battery alarm

Setting conditions: Can be set in all states

Explanation:

SBA:Set battery alarm.

Default is OFF

If it is set to OFF, when the battery is not connected, there will be no battery-missing, low-battery, and under-battery alarms.

5.3.29 Equalization Mode (EQM)



Figure 1-46 Equalization Mode Setting Page

Function description: Setting whether the inverter turn on equalization mode

Setting conditions: Can be set in all states

Explanation:

EQM:Equalization Mode

The default setting is OFF, the function is not turned on; if it is set to ON, the controller will start to enter the equalization phase when the set equalization interval (battery equalization period) is reached during the float charging stage, or the equalization is activated immediately.

5.3.30 Equalization voltage point setting (EQV)

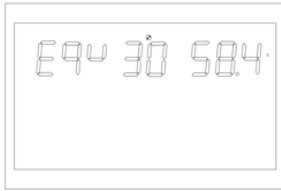


Figure 1-47 Equalization Voltage Point Setting Page

Function description: Equilibrium voltage point setting function

Setting conditions: Can be set in all states

Explanation:

bCV:Equalization Voltage

Can be set in all states

3k-VML-24V The default setting is 29.2, and the settable range is [25, 31.5]

5k-VMh-48V The default setting is 58.4, and the settable range is [48, 60]

5.3.31 Equalization charging time setting (EQT)



Figure 1-48 Equalization Charging Time Setting Page

Function description: Equalization charging time setting

Setting conditions: Can be set in all states

Explanation:

EQT:Equalization Time

During the equalization phase, the controller will charge the cells as much as possible until the cell voltage rises to the cell equalization voltage. Then use constant voltage regulation to maintain the battery voltage to maintain the battery balance voltage. The cells will remain in the equalization phase until the set cell equalization time is reached.

The default setting is 60 minutes, the settable range is [5,900], and the increment is 5 minutes each time.

5.3.32 Equalization Delay Time Settings (EQO)



Figure 1-49 Equalization Delay Time Setting Page

Function description: Equalization Delay Time Settings

Setting conditions: Can be set in all states

Explanation:

EQT: Equalization Timeout

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

The default setting is 120 minutes, the settable range is [5,900], and the increment is 5 minutes each time.

5.3.33 Equalization interval setting (EQI)

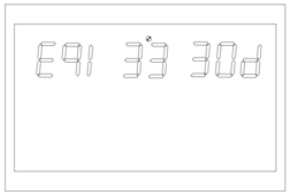


Figure 1-50 Equalization Interval Setting Page

Function description: Equalization interval setting

Setting conditions: Can be set in all states

Explanation

EQI:Equalization interval

When the battery connection is detected during the float phase with the equalization mode turned on, the controller will start to enter the equalization phase when the set equalization interval (cell equalization period) is reached.

The default setting is 30 days, the settable range is [1,90], and the increment of each setting is 1 day.

5.3.34 Turn on equalization settings immediately



Figure 1-51 Turn On Equalization Settings Immediately

Function description: Turn on equalization settings immediately

Setting conditions: Can be set in all states

Explanation

EQN:Equalization Now

The default setting is OFF, the function is not turned on; when it is set to ON, in the float charging stage when the balance mode is turned on and the battery connection is detected, the balance charging is activated immediately, and the controller will start to enter the balance stage.

5.4 Battery Equalization Description

Equalization function is added into charge controller, It reverses the buildup of negative chemical effects like stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Equalization also helps to remove sulfate crystals that might have built up on the plates. If left unchecked, this condition, called sulfation, will reduce the overall capacity of the battery. Therefore, it's recommended to equalize battery periodically.

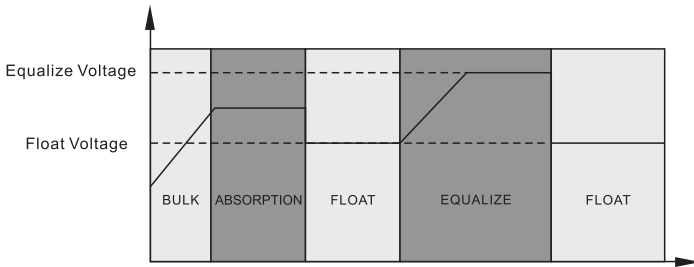
※ How to Apply Equalization Function

You must enable battery equalization function in monitoring LCD setting program 30 first. Then, you may apply this function in device by either one of following methods:

- 1.Setting equalization interval in program 35.
- 2.Active equalization immediately in program 36.

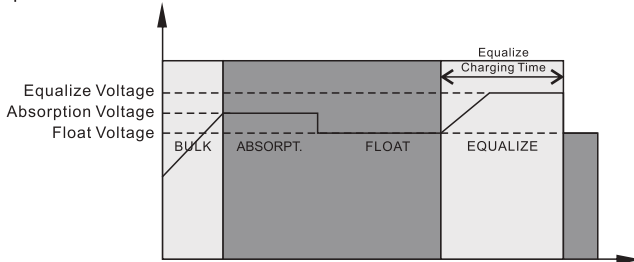
※ When to Equalize

In stage, when the setting equalization interval(battery equalization cycle) is arrived, or equalization is active immediately, the controller will start to enter Equalize stage.

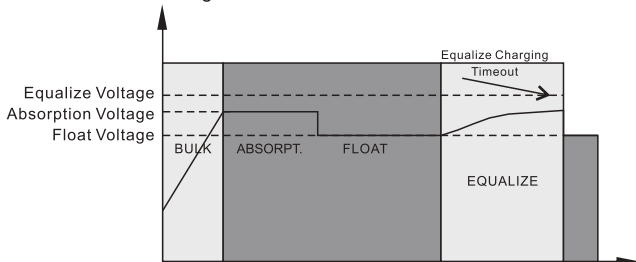


※ Equalize charging time and timeout

In Equalize stage, the controller will supply power to charge battery as much as possible until battery voltage raises to battery equalization voltage. Then, constant-voltage regulation is applied to maintain battery voltage at the battery equalization voltage. The battery will remain in the Equalize stage until setting battery equalized time is arrived.



However, in Equalize stage, when battery equalized time is expired and battery voltage doesn't rise to battery equalization voltage point, the charge controller will extend the battery equalized time until battery voltage achieves battery equalization voltage. If battery voltage is still lower than battery equalization voltage when battery equalized timeout setting is over, the charge controller will stop equalization and return to float stage.



5.3.36 Grid connected inverter function(GTI)



Figure 1-52 Grid connected inverter function Setting Page

Function description: Set whether the inverter is connected to the grid for power supply in PV priority mains mode or PBG mains mode.

Setting conditions: All states of the 5KW-PLUS model can be set, but not for other models.

EXplanation:

GTI:Grid Tie Invert

The default setting is OFF, and the function is not turned on; When set to ON, the inverter tracks the maximum power point and feeds excess energy into the mains.

5.3.37 Battery dual output low voltage shutdown point(DBV)



Figure 1-53 Battery dual output low voltage shutdown point Setting Page

Function description: When turned on, the secondary output of the inverter is turned on by default. After entering battery mode, if the battery voltage is lower than the set level, the secondary output will be turned off. When the battery voltage exceeds the set value by + 1V/cell again, the secondary output is turned on.

Setting conditions: All states can be set.

EXplanation:

DBV: Dual output battery mode cut-off voltage

The default setting for the 3.6KW model is 24V, and the adjustable range is [22,32]

The default setting for 5.5KW and 5KW-PLUS models is 48V, and the adjustable range is [44,60]

When the set point is higher than the constant voltage charging (CV) point by 1V/section, the constant voltage charging point is used as the recovery voltage.

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

5.3.38 Battery dual output duration(DBT)



Figure 1-54 Battery dual output duration Setting Page

Function description: When turned on, the secondary output of the inverter is turned on by default. After entering battery mode, if the battery voltage is lower than the set level, the secondary output will be turned off.

Setting conditions: All states can be set.

EXplanation:

DBT: Dual output battery mode cut-off time

The default setting is OFF, the function is not turned on, and the adjustable range is [58,90], measured in minutes.

When set to FUL, the secondary output has no limit on output time.

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

5.3.39 BMS communication function(BMS)



Figure 1-55 BMS Communication Management Function Settings Page

Function description: Set whether the inverter communicates with the lithium battery BMS.

Setting conditions: All states can be set.

EXplanation:

BMS: Battery Manage System

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

After the function is turned on, if there is a communication abnormality, an alarm 56 will be generated, and the inverter will no longer determine the operating logic based on BMS information.

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

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

5.3.40 Low SOC shutdown function(BUS)



Figure 1-56 Low SOC shutdown function Settings Page

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

Setting conditions: All states can be set.

Explanation:

BSU: Battery SOC under lock

The default setting is 20, and the adjustable range is [5,50]. When the SOC of the lithium battery reaches the set value in battery mode, it shuts down and an alarm 68 is triggered. When it returns to the set value+5%, the alarm 68 is cleared. When in standby mode, the battery mode can only be switched when the set value is reached by +10%. If it is not reached, an alarm will sound at 69. After the function is turned on, alarm 69 will be triggered when the lithium battery S00 reaches the set value+5%, and alarm 69 will be cleared when it returns to the set value+10%.

It can be set to OFF, at which point the inverter will no longer perform shutdown, startup, or alarm operations based on the SOC situation.

After the function is turned on, if there is a communication abnormality, the inverter will no longer determine the operating logic based on the SOC information and clear the relevant alarms.

5.3.41 High SOC turn to battery mode(STB)

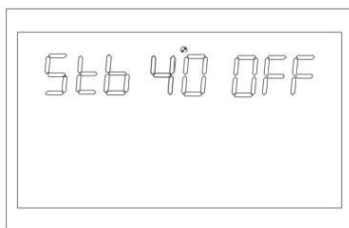


Figure 1-57 High SOC turn to battery mode Setting Page

Function description: Set the SOC value for inverter to battery mode.

Setting conditions: All states can be set.

Explanation:

STB: Battery SOC turn to battery mode.

The default setting is 95, and the adjustable range is [10,100]. When the lithium battery SOC reaches the set value in PBG priority mains power normal mode, it switches to battery mode. After activation, the inverter will only switch to battery mode when the SOC is higher than the set point and the battery voltage is higher than the voltage point for returning to battery mode (see 5.3.16).

It can be set to OFF, at which point the inverter will no longer switch from mains mode to battery mode based on the SOC situation.

After the function is turned on, if there is a communication abnormality, the inverter will no longer determine the operating logic based on the SOC information and clear the relevant alarms.

5.3.42 Low SOC turn to battery mode(STG)



Figure 1-58 Low SOC turn to battery modeSetting Page

Function description: Set the SOC value for inverter to battery mode.

Setting conditions: All states can be set.

Explanation:

STB: Battery SOC turn to battery mode.

The default setting is 95, and the adjustable range is [10,100]. When the lithium battery SOC reaches the set value in PBG priority mains power normal mode, it switches to battery mode. After activation, the inverter will only switch to battery mode when the SOC is higher than the set point and the battery voltage is lower than the voltage point for returning to battery mode (see 5.3.15).

It can be set to OFF, at which point the inverter will no longer switch from mains mode to battery mode based on the SOC situation.

After the function is turned on, if there is a communication abnormality, the inverter will no longer determine the operating logic based on the SOC information and clear the relevant alarms.

When this setting is higher than the STB point, STB and STG will no longer take effect after the next one takes effect.

5.4 Fault and alarm description



Figure 1-59 Fault and warning icons

Function description: The alarm code ALA flashes and the buzzer beeps for 1 second, lasting for 1 minute before stopping. The fault indicator code is constantly on, and the buzzer beeps for 10 seconds before stopping. After stopping, the fault is eliminated. After attempting to restart the machine, six attempts failed, and it continues to be in a fault state. You need to completely power off (turn off the screen) or wait for 30 minutes before restarting the machine. The fault and alarm LCD display is shown in the above figure, with the fault mode icon constantly on and the alarm status icon flashing. Contact the manufacturer to troubleshoot the abnormal situation based on the fault information.

5.4.1 Fault description

➤ **Fault:** The inverter enters fault mode, the LED red light is constantly on, and the LCD displays a fault code.

Fault code	Mean	Related actions	Trigger condition	Recovery conditions	Fault alarm	Applicable models
1	Bus soft start fail	Turn to fault mode	When the busbar is soft, it cannot reach the set voltage	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
2	Bus high	Turn to fault mode	The busbar is higher than the set value	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
3	Bus low	Turn to fault mode	The busbar is below the set value	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
4	Battery Over Current	Turn to fault mode	Instantaneous value of battery current exceeds the set value, immediately protected	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
5	Over temperature	Turn to fault mode	The temperature sensor of PFC or INV is higher than the over temperature setting value	After enabling the restart, the fault cannot be recovered after six failed restarts	Alarm	3.6KW 5.5KW 5KW-PLUS
6	Battery high	Turn to fault mode	The battery voltage is higher than the set value	Recoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
7	Bus soft Fault	Turn to fault mode	The DC soft start voltage for the busbar has not reached the set value	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
8	Bus short Fault	Turn to fault mode	During normal operation, the busbar momentarily drops below the set value	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
9	INV soft Fault	Turn to fault mode	After a period of soft start, the inverter still cannot reach the rated output voltage	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
10	INV Over voltage	Turn to fault mode	In battery mode, the inverter voltage is higher than the set value	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
11	INV Under voltage	Turn to fault mode	In battery mode, the inverter voltage is lower than the set value	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
12	INVShort	Turn to fault mode	The instantaneous voltage of the inverter is less than the set value, and the instantaneous current is greater than the set value	After six failed restarts due to malfunction, it cannot be restored	Alarm	3.6KW 5.5KW 5KW-PLUS
13	Negative power	Turn to fault mode	The inverter power is lower than the set value for a period of time	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
14	Overload fault	Turn to fault mode	The load exceeds the specifications	After enabling the restart, the fault cannot be recovered after six failed restarts	Alarm	3.6KW 5.5KW 5KW-PLUS
15	Model Fault	Turn to fault mode	Software recognition machine model does not match hardware detection	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS

Fault code	Mean	Related actions	Trigger condition	Recovery conditions	Fault alarm	Applicable models
16	Noboot loader	Turn to fault mode	No boot loader	Unrecoverable	Fault	3.6KW 5.5KW 5KW-PLUS
17	Panel Flash Fault	Turn to fault mode	Burning program in progress	Restore after burning is complete	Fault	3.6KW 5.5KW 5KW-PLUS
19	Same Serial	Turn to fault mode	In parallel mode, multiple machines with identical serial numbers were detected	Unrecoverable	Fault	5KW-PLUS
20	CAN Fault	Turn to fault mode	CAN bus communication abnormality in parallel mode	Unrecoverable	Fault	5KW-PLUS
21	BAT Volt Different	Turn to fault mode	In parallel mode, the voltage difference between batteries of different machines is too large	Unrecoverable	Fault	5KW-PLUS
22	Line Volt Different	Turn to fault mode	In parallel mode, the input pressure difference between different machines is too large	Unrecoverable	Fault	5KW-PLUS
23	Line Freq Different	Turn to fault mode	In parallel mode, there is a significant difference in input voltage and frequency between different machines	Unrecoverable	Fault	5KW-PLUS
24	Output Config Different	Turn to fault mode	In three-phase parallel mode, there may be phase loss in different machine parallel modes, or there may be three-phase parallel and single-phase parallel, or there may be single machine mode	Set to run on a single machine and disconnect parallel communication, or restore when three operating conditions are met, or when single-phase parallel setting conditions are met	Fault	5KW-PLUS
25	Output SynLoss	Turn to fault mode	In parallel mode, the output voltage detection loses synchronization	Unrecoverable	Fault	5KW-PLUS
26	BMS Fault	Turn to fault mode	Battery BMS has fault information	Turn off BMS communication function or BMS fault elimination and recovery	Fault	3.6KW 5.5KW 5KW-PLUS
28	NTC Fault	Turn to fault mode	NTCopen circuit fault	Unrecoverable	Fault	3.6KW
29	INV Over Current	Turn to fault mode	The instantaneous value of the inverter current exceeds the set value	After six failed restarts due to malfunction, it cannot be restored	Fault	3.6KW

5.4.2 Alarm Description



Alarm: The inverter has not entered fault mode, the LED red light is flashing, and the LCD displays an alarm code

Alarm code description

Fault code	Mean	Related actions	Trigger condition	Recovery conditions	Fault alarm	Applicable models
50	Battery open	Alarm, battery not charging	The battery voltage is below 8V/cell	Recoverable (10V/section)	Alarm	3.6KW 5.5KW 5KW-PLUS
51	Battery Under	Alarm, battery low voltage shutdown or inability to power on	Battery voltage below 10.5V/cell (default)	Recoverable (10V/cell+0.2 *N(number of battery cells))	Alarm	3.6KW 5.5KW 5KW-PLUS
52	Battery low	Alarm	According to BAL settings	Recoverable (action point+0.2V/section)	Alarm	3.6KW 5.5KW 5KW-PLUS
53	Battery charge short	Alarm, battery not charging	The battery voltage is less than 5V and the charging current is greater than 4A	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
54	Low watt discharge	Alarm	Battery discharge exceeds the set low-power discharge time	After enabling the restart, the fault cannot be recovered after six failed restarts	Alarm	3.6KW 5.5KW 5KW-PLUS
55	Over charge	Alarm, battery not charging	The battery voltage is higher than the set value	Recoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
56	BMS Loss	Alarm, lock standby mode	Communication failure after BMS communication function is enabled	Recoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
57	Over temperature	Alarm, battery not charging	The temperature sensor of PFCor INV is higher than the set value	The temperature sensor of PFCor INV is lower than the set value	Alarm	3.6KW 5.5KW 5KW-PLUS
58	Fan lock	Alarm, if one fan fails and the other fan is running at full speed	No fan speed signal detected	Recoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
59	EEPROM fail	Alarm	EEPROM read/write failure	Unrecoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
60	Overload warning	Alarm, battery not charging	Load>102%	Recoverable (load<97%)	Alarm	3.6KW 5.5KW 5KW-PLUS
61	Abnormal generator waveform	Alarm, continuously operating in battery mode	Abnormal waveform detection of generator	Recoverable	Alarm	3.6KW 5.5KW 5KW-PLUS
62	PV Energy Weak	Turn off PV output and charge	When the battery is not connected, the bus voltage is lower than the set value	Recoverable	Alarm	3.6KW 5.5KW 5KW-PLUS

Fault code	Mean	Related actions	Trigger condition	Recovery conditions	Fault alarm	Applicable models
63	Synchronization signal fail	Alarm, turn to standby mode	Parallel board disconnection fault	Switching to single machine mode for recovery/troubleshooting disconnection for recovery	Alarm	3.6KW 5.5KW 5KW-PLUS
64	Parallel configuration incompatible	Alarm, turn to standby mode	When three-phase parallel operation, there is a phase loss setting	Restore when three-phase settings are correct	Alarm	5KW-PLUS
65	Parallel version incompatible	Alarm, turn to standby mode	The parallel system has incompatible version numbers	Restore when all machine versions in the parallel system are compatible with each other	Alarm	5KW-PLUS
66	Parallel communication Fault	Alarm, turn to standby mode	Unable to detect slave under parallel system	Under the parallel system, it was detected that the slave was connected and restored, and it was set to single machine mode for recovery	Alarm	5KW-PLUS
67	Parallel Line Differ	Alarm	Excessive errors in the mains voltage or frequency of each parallel machine	Restore when reasonable errors in the mains voltage and frequency of machine are detected each	Alarm	5KW-PLUS
68	SOC Under	Alarm, turn to standby mode	Lithium battery SOC is lower than the set value	When the low SOC shutdown function is turned off, or the BMS communication function is turned off, or the SOC is restored to the set value+5%, it will be restored	Alarm	3.6KW 5.5KW 5KW-PLUS
69	SOC Low	Alarm, if in standby mode, maintain standby mode without turning on the device	Lithium battery SOC lower than set value +5% (mains mode or battery mode), lower than set value +10% (standby mode)	When the low SOC shutdown function is turned off, or the BMS communication function is turned off, or the SOC is restored to the set value+10%, it will be restored	Alarm	3.6KW 5.5KW 5KW-PLUS
70	Battery Terminal Source Fail	Alarm, turn to standby mode	When the battery is not connected, the voltage at the battery terminal is lower than the set value	Detected battery connection, or restored output when the battery terminal voltage is higher than the set value for 1 minute continuously	Alarm	3.6KW 5.5KW 5KW-PLUS

6 Troubleshooting

Fault	LCD/LED/Buzzer	Explain possible reasons	What needs to be done
The unit automatically shuts down during startup	The LCD/LED and buzzer will be activated for 3 seconds and then completely turned off	The battery voltage is too low (<1.91V per unit)	1. Charge the battery 2. Replace the battery
No response after booting up	There is no indication	1. Low battery voltage (<1.4V/cell) 2. Internal fuse tripped.	1. Please contact the repair center to replace the fuse. 2. Charge the battery 3. Replace the battery
The mains power exists, but the device is operating in battery mode	The input voltage is consistent with the LCD display, and the green LED is flashing	Input protector tripped	Check if the AC short circuit breaker trips and if the AC wiring is correct
	The green LED is flashing	Insufficient quality of AC power supply (coastal or generator)	1. Check if the AC wires are too thin or too long. 2. Check if the generator is working properly or if the input voltage range is set correctly (UPS/home circuit)
	The green LED is flashing	Set 'solar priority' as output source priority	Change the priority of the output source to the priority of the mains power supply
When the device is turned on, the internal relay repeatedly opens and closes	LCD display and LED flashing	Battery disconnection	Check if the battery wiring is intact

7 Technical Data Sheet

Model		GHL24V3.6KW	GHL48V5.5KW	GHBL48V5KW-PLUS
Input	Input Sources	L+N+PE		
	Rated Input Voltage	208/220/230/240VAC		
	Voltage Range	90~280V Settable(Appliance/ Generator mode) 170~264VSettable(UPS mode)		
	Frequency	40~70Hz		
Output	Rated Capacity	3600W	5500W	5000W
	Output Voltage	208/220/230/240VAC		
	Output Frequency	Line Mode: Synchronized range; Battery Mode: 50/60Hz		
	Wave Form	Pure Sine Wave		
	TransferTime	UPS: Line Mode to Battery Mode 10ms(Typical) Appliance/Generato: Line Mode to Battery Mode 10ms(Typical)		
	Over Load Ability	Battery Mode: 1min@102%~110%Load 10s@110%~130%Load 3s@130%~150%Load 0.2s@>150%Load		
	Peak Efficiency(Battery Mode)	92.7%@24VDC	94%@48VDC	
Battery	Battery Voltage	24Vdc	48Vdc	
	Constant Charing Voltage	28.2Vdc	56.4Vdc	
	Floated Charing Voltage	27Vdc	54Vdc	
Chargers	PV MAX Input Power	5000W	6000W	
	PV Charge Model	MPPT		
	MPPT Tracking Range	40-450Vdc	120-430Vdc	
	MAX PV Input Voltage	500Vdc		
	Best Voltage	300-400V		
	MAX PV Charging Current	100A	80A	
	MAX AC Charging Current	100A	80A	
MAX Charging Current	100A	80A		
Display	LCD Display	2*8pin/switch 2.54mm supports 128 bit segment codes,can support up to 4 buttons+4 LED lights,and can display running/input/output/load modes,etc.		
Interface	RS232	5PIN/Pitch 2.0mm, Baud Rate 9600	5PIN/Pitch 2.0mm,Baud Rate2400	
	Communication Port	Lithium battery BMS communication card RS485、USB.		
	Parallel Function	Without Parallel		DB9, Parallel board
Enviornments	Operate Temperature	- 10-50℃		
	Humidity	20%~95%(No condensing)		
	Storage Temperature	- 15-60℃		
	Altitude	The altitude should not exceed 1000m,and the height above 1000m should be reduced to a maximum of 4000m.Refer to IEC62040-3;		
	Noise	≤50db		
General parameters	Machine size	465*310*115mm	528*333*132mm	
	Package size	555*385*208mm	610*405*200mm	
	net weight	7.75kg	10.20kg	
	gross weight	9kg	11.65kg	

Appendix:Parallel Operation Guide

1. Parallel operation

Note:

1. Before paralleling, each machine needs to calibrate the inverter output voltage, DC component, and battery voltage. In theory, The more accurate the calibration, the better, but at least meet the inverter output voltage and battery voltage calibration deviation within $\pm 0.3V$, DC component calibration within $\pm 50mV$.

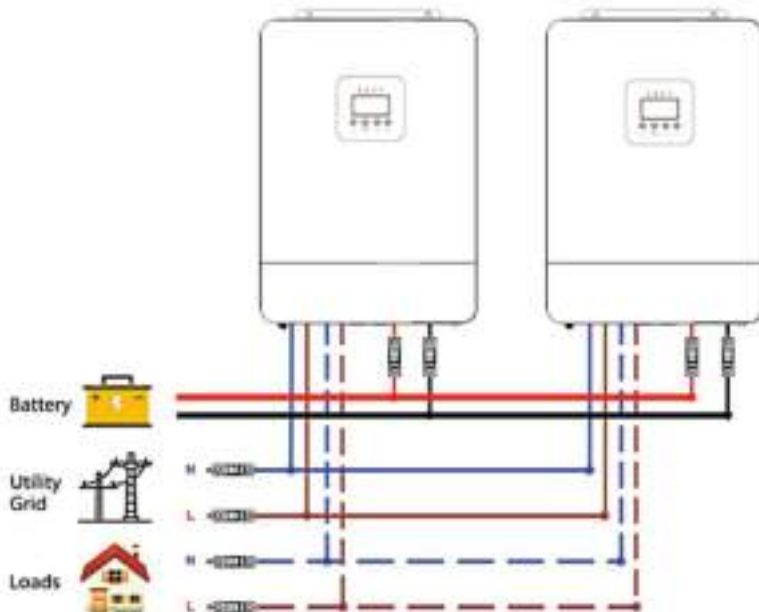
2. The shutdown state, that is, the standby state, refers to the state in which the inverter has no output, but the LCD screen is on.

The method of entering standby state: when the switch is closed, quickly turn on and then immediately (1 second) turn off, then the inverter enters the standby state.

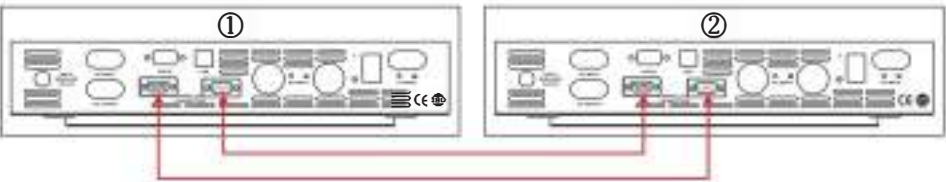
1.1 Single-phase parallel operation

1.1.1 Two inverters in parallel

System Connection

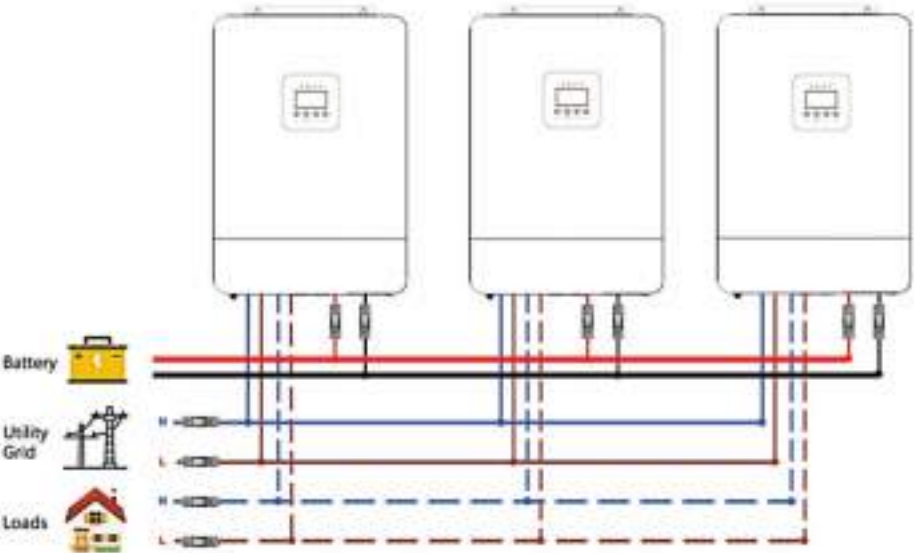


Communication Connection

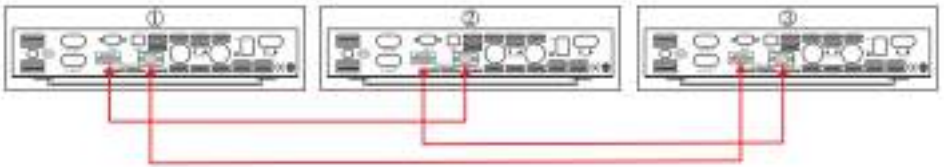


1.1.2 Three inverters in parallel

System Connection



Communication Connection

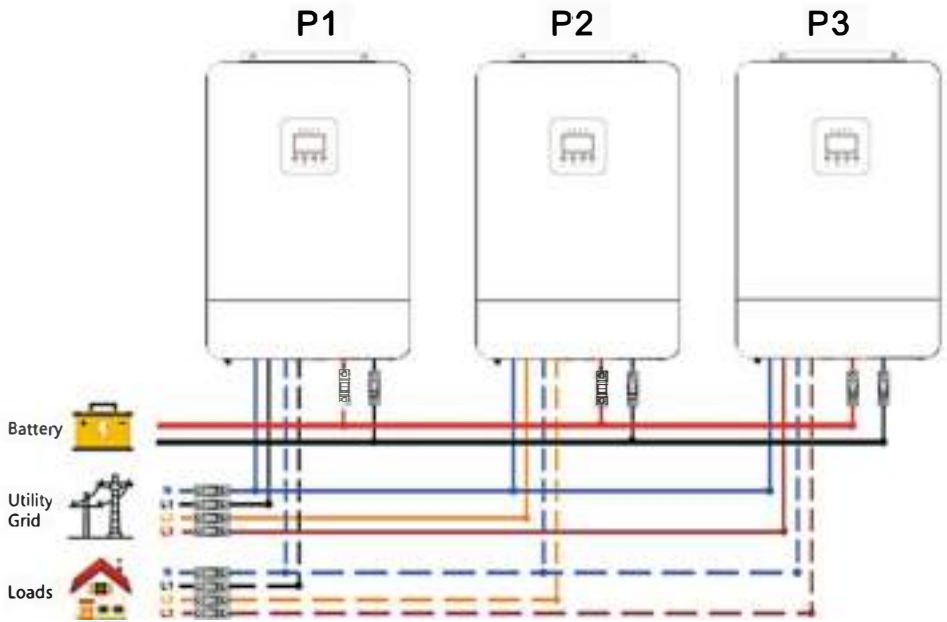


Multiple single-phase parallel systems can follow the extended wiring method of 2 single-phase parallels to three single-phase parallels.

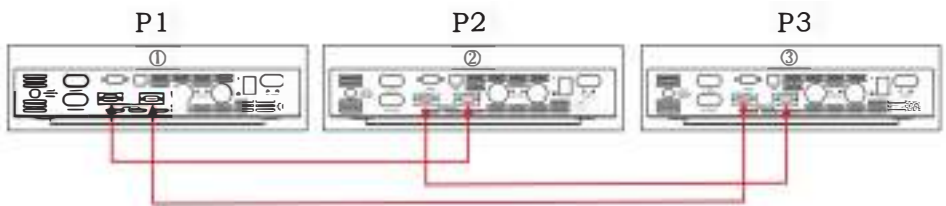
1.2 Three-phase parallel operation

1.2.1 One inverter per phase:

System Connection

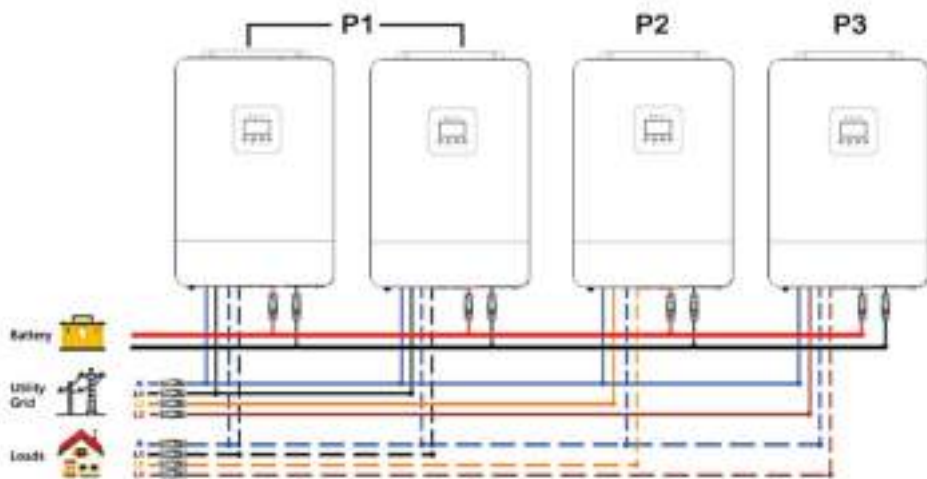


Communication Connection

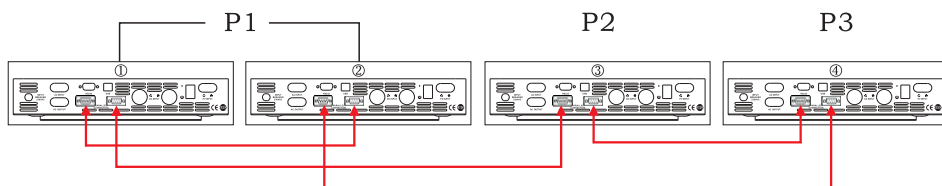


1.2.2 Two inverters for the first phase, only one inverter for the remaining phases:

System Connection

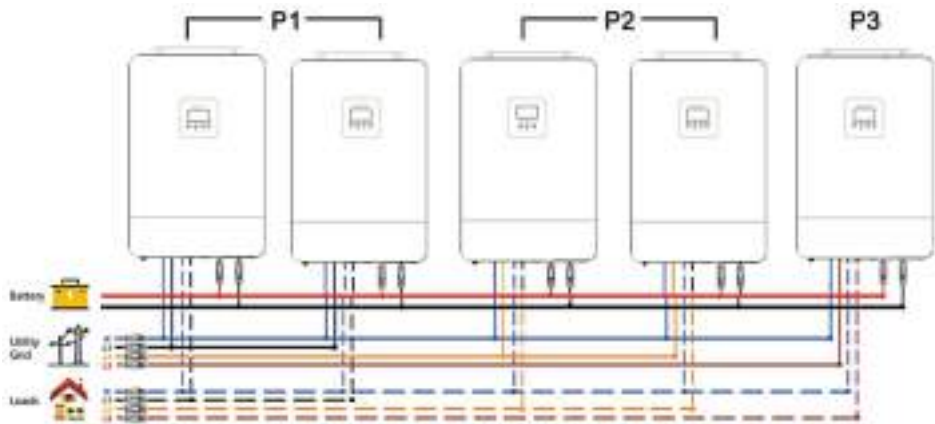


Communication Connection

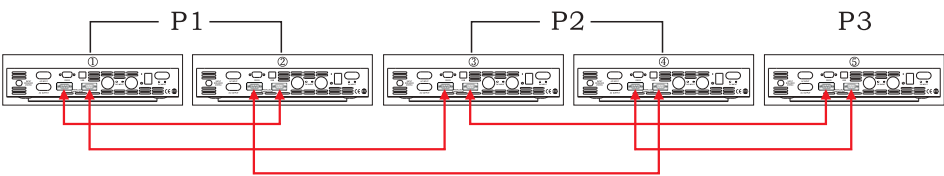


1.2.3 Two inverters for the first and second phases, and one inverter for the third phase:

System Connection

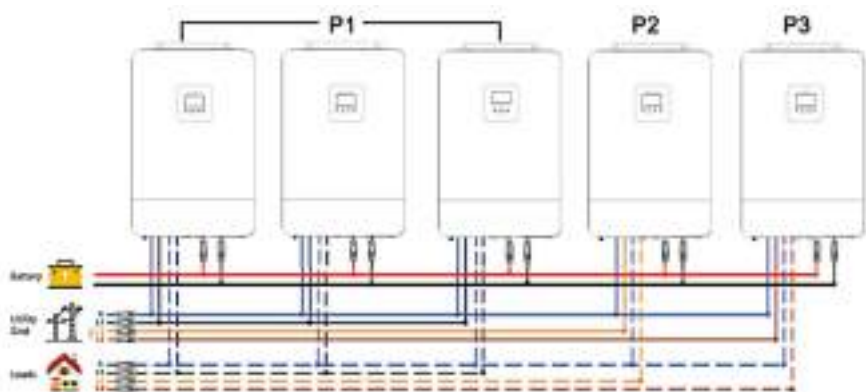


Communication Connection

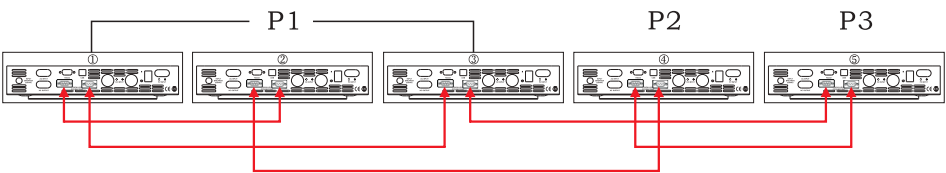


1.2.4 Three inverters for the first phase, only one inverter for the other two phases

System Connection

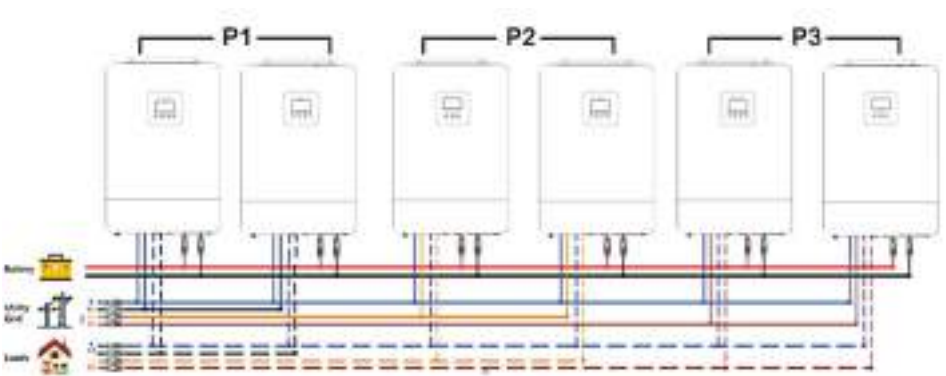


Communication Connection

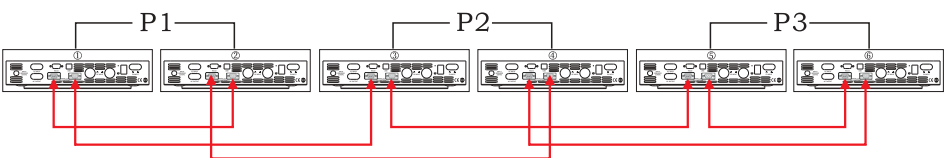


1.2.5 Two inverters per phase:

System Connection

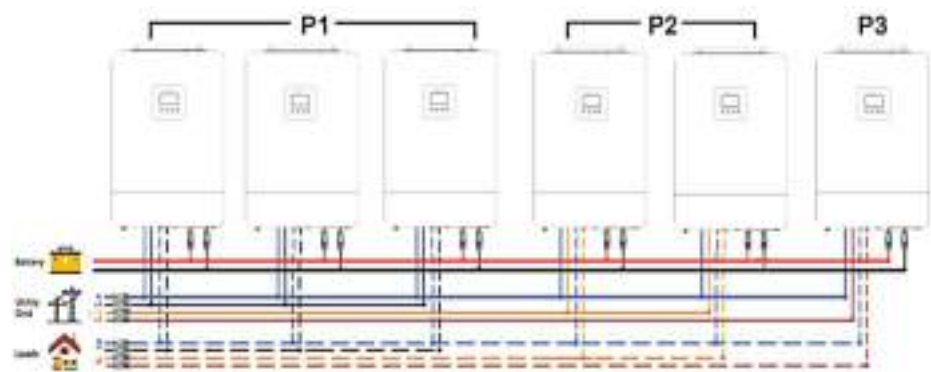


Communication Connection

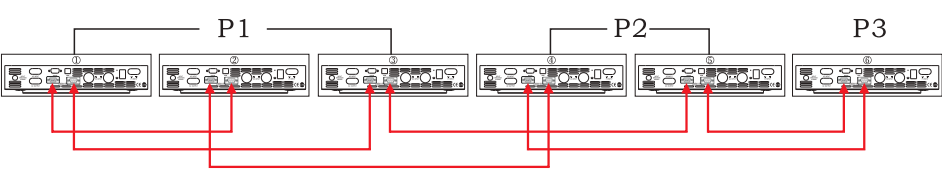


1.2.6 Three inverters for the first phase, two inverters for the second phase, and one inverter for the third phase:

System Connection

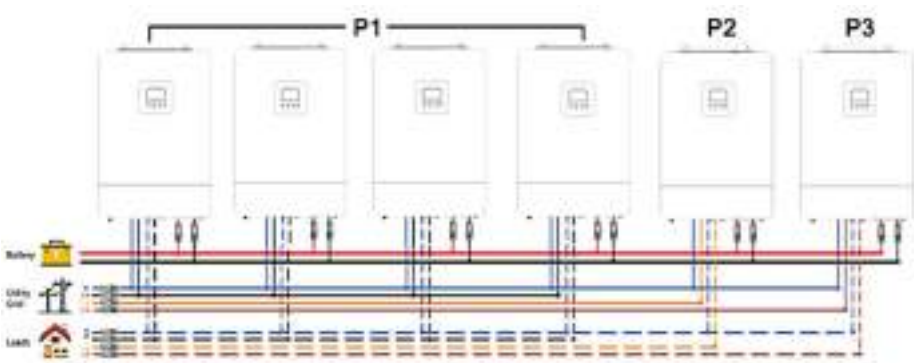


Communication Connection

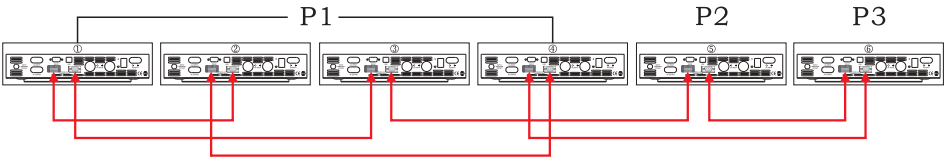


1.2.7 Four inverters for the first phase and one inverter for the other two phases:

System Connection



Communication Connection



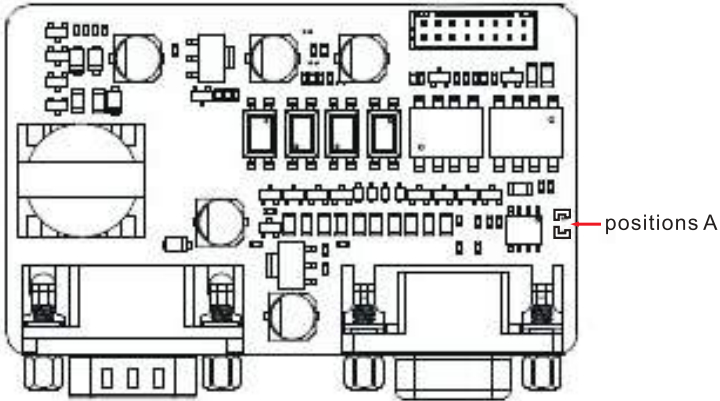
2. Connection Precautions

2.1 PV connection/Solar Panel Connection

Each inverter is connected to the solar panel separately, and the PVs of each inverter cannot be wired in parallel.

2.2 Parallel board connection

Note: In each set of parallel systems, select the two sets of machines with the farthest distance and short-circuit the positions A of the parallel board with jumper caps.



3. LCD Setup and Display

For the parallel setting operation, refer to the main manual - function setting operation, item 27 parallel mode setting.

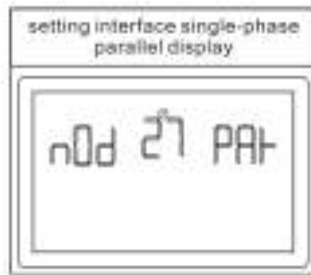
3.1 Single-phase parallel

Step 1: Before commissioning, please check the following requirements:
Is the wiring correct?

Make sure all circuit breakers in the load side line are open And each neutral line (N line) of the inverter is connected together, and the live line (L line) at the load side should also be connected together.

Step 2 Go into inverter setting mode and set "PAR" in program 2 on the LCD. Then turn off all inverters.

Notes When setting on the LCD, the power on switch must be turned off. Otherwise, settings cannot be made.

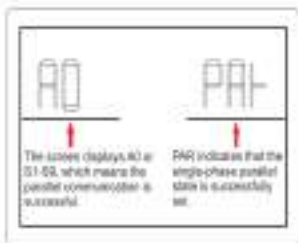


Notes: Automatic identification of primary and secondary inverters in the system

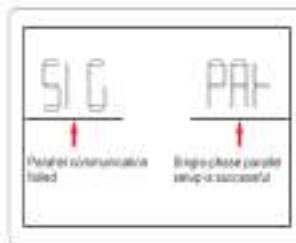
Step 3 Close the AC circuit breakers of all lines in the AC input, keep the rocker switch not closed, and wake up the parallel system. There are instructions on the next page of 9 on the LCD display interface, as shown in Figure 4.1.1. It is best to have all inverters connected to mains at the same time. If not, it will show fault 2 or 2.5.

Step 4 If there are no more fault alarms and the indicating interface is normal, the parallel system is fully installed.

Step 5 Close the circuit breaker on the load side. Turn on the system and start supplying power to the load. Then



a. all setting failure interface



b. communication is successful interface



c. but the communication failure

3.2 Parallel as three-phase system (the function is not open)

Step 1: Before commissioning, please check the following requirements:
Is the wiring correct?

Make sure that all circuit breakers on the load side are disconnected, and the neutral wires (N/neutral) of each inverter are connected together, the live wires (L wires) on the load side of the same phase are connected together, and the different phases are connected together. The live wires (L wires) are not connected together. Confirm that the output inverter voltage of each machine, the DC component and the battery voltage are all successfully calibrated.

Step 2: Wake up the inverter to put it into shutdown state, then use program 27 on the LCD to configure each Inverter as 3P1, 3P2, 3P3 in turn.

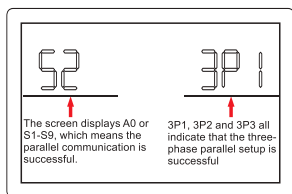
When using the LCD for program setting, the power-on switch must be turned off. Otherwise, settings cannot be made. S



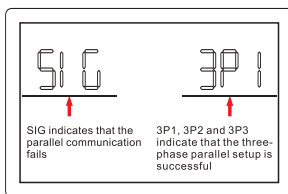
ction is detected and matches the device settings, the system is working properly. Otherwise, The system will display an alarm or fault, and will not operate in mains mode. Step 4 Close the AC circuit breakers of all lines in the AC input, keep the breaker

switch not closed, and wake up the parallel system. There are instructions on the next page of P9 on the LCD display interface as shown in Figure 4.1.2, which means three-phase power supply system installation is complete. Step 5 Please close the circuit breakers of all power lines on the load side, close

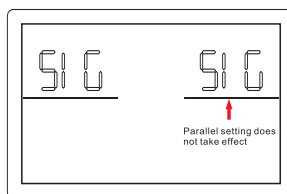
the breaker switch, and the system will start applying power to the load.



The parallel setting is successful,
the communication is successful interface.



The parallel setting is successful,
but the communication failure interface



Parallel setting failure interface

Note 1: To avoid overloading, it is best to let the whole system operate normally before closing the circuit breaker on the load side.

Note 2: There is a switching time for this power supply system. Power outages may occur for critical equipment with high power requirements.

Product Warranty Card

Customer Name : _____ Contact number: _____

Address : _____

Brand : _____ Product model: _____

Body number: _____ Purchase date: _____

Name of reseller: _____

Invoice number: _____ Invoice price: _____

Warranty Statement

- Please keep this warranty card properly as proof of repair.
- The warranty period is within 1 year from the date of purchase.
- During the warranty period, if there are any problems or malfunctions with the product's components, materials, and processes under normal use and maintenance, and the results are verified to be true, our company will provide free repair and replacement of parts.
- Our company reserves the right to repair and interpret all content.

The following situations cannot be repaired free of charge

- Damage caused by incorrect installation or operation of the product
- Has been repaired, altered, modified, or replaced with any internal components by non company technicians, or by users themselves.
- The product number has been sprayed or does not match the information provided in this certificate.
- Negligent use or damage caused by someone or other substances infiltrating the product.
- Malfunctions or damages caused by unexpected events or natural disasters.

QUALIFIED CERTIFICATE

Name _____

Model _____

Date _____

Inspector _____

Factory _____



This product is approved to leave the factory after it has been inspected to meet the requirements of the regulations.