



Off grid hybrid inverter

User's Manual

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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

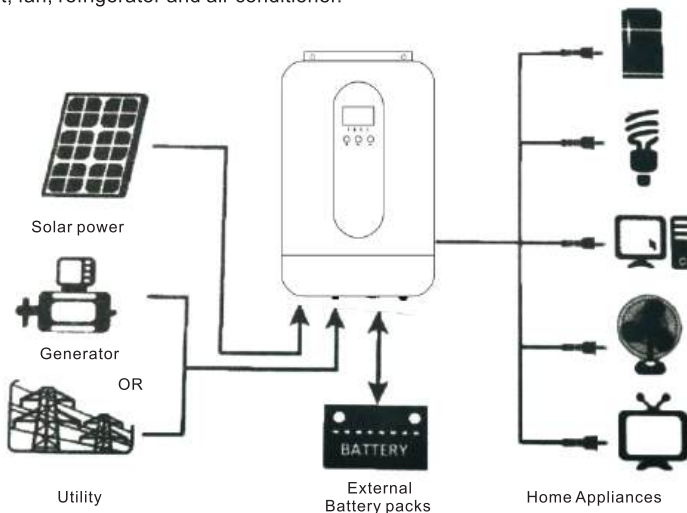
#### 3.2 Basic System Architecture

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.

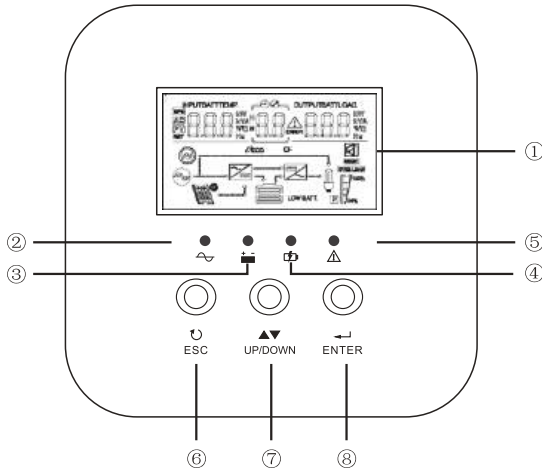
This inverter can power all kinds of appliances in home or environment, including motor-type appliances such as tube light, fan, refrigerator and air conditioner.





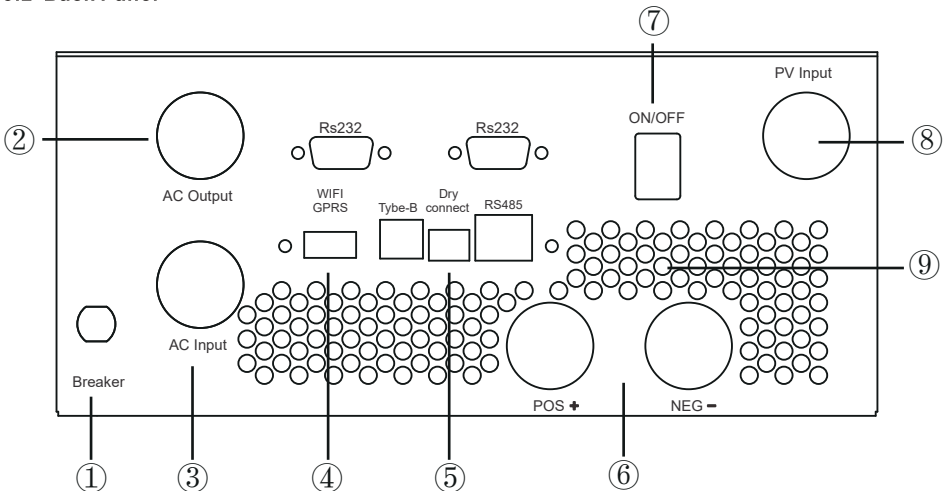
### 3.3 Product Overview

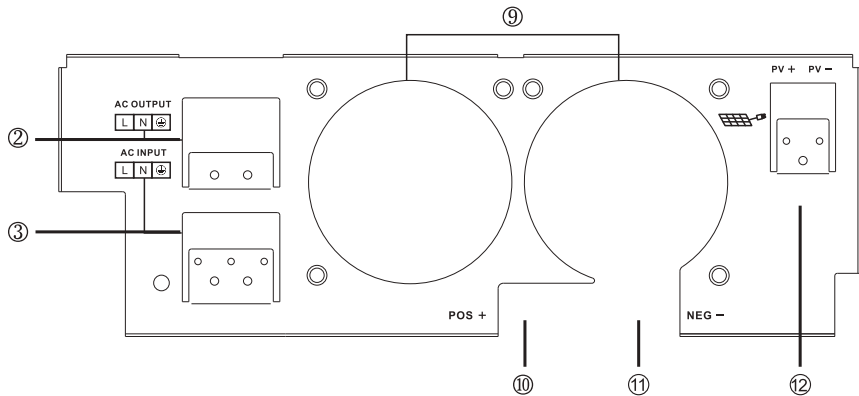
#### 3.3.1 LCD Screen



- ①.....LCD Display
- ②.....AC Mode Indicator
- ③.....Inverter Mode Indicator
- ④.....Charging Indicator
- ⑤.....Alarming Indicator
- ⑥.....ESC
- ⑦.....UP/DOWN
- ⑧.....ENTER

#### 3.3.2 Back Panel





- |                              |                                |
|------------------------------|--------------------------------|
| 1.....Input Breaker          | 7.....Power ON/OFF Switch      |
| 2.....AC Output              | 8.....PV Input                 |
| 3.....AC Input               | 9.....Fan                      |
| 4.....Communication Port     | 10...Battery Terminal Positive |
| 5.....USB Communication Port | 11...Battery Terminal Negative |
| 6.....Battery Input          | 12...Solar Panel Input         |

## 4 INSTALLATION

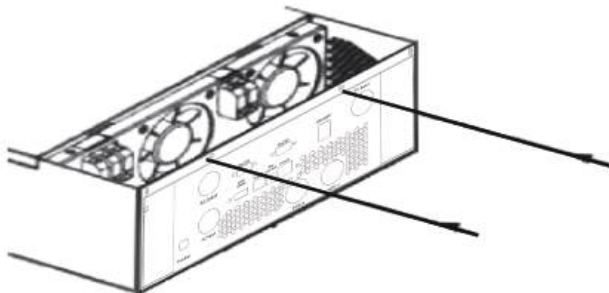
### 4.1 Unpacking and Inspection

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

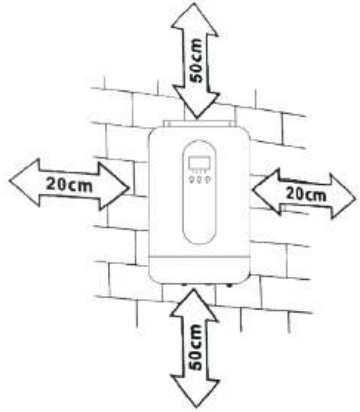
Before connecting all please take off bottom cover by removing two screws as shown below.



### 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 ambient temperature should be between and to ensure optimal operation.
- ※ 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.

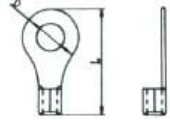


#### 4.4 Battery Connection

**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.

**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.

Ring terminal:

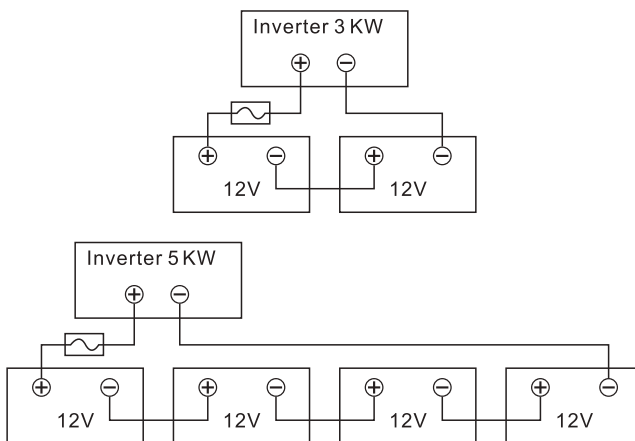


Recommended battery cable and terminal size:

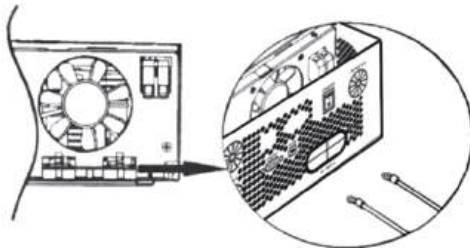
Model	Typical Amperage	Battery capacity	Wire Size	Ring Terminal			Torque value
				Cable(mm <sup>2</sup> )	Dimensions		
					D(mm)	L(mm)	
1KVA/2KVA	66A	100AH	1*6AWG	14	6.4	39.2	2~3 Nm
			2*10AWG	8	6.4	23.8	
3KVA	100A	100AH	1*4AWG	22	6.4	33.2	2~3 Nm
		200AH	2*8AWG	14	6.4	29.2	
4KVA	110A	200AH	1*2AWG	38	6.4	39.2	2~3 Nm
			2*6AWG	28	6.4	33.2	
5KVA	110A	200AH	1*2AWG	38	6.4	39.2	2~3 Nm
			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



	<p><b>WARNING:</b> Shock Hazard Installation must be performed with care due to high battery voltage in series.</p>
--	---

	<p><b>CAUTION!!</b> 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 ( - ).</p>
--	---

**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
1KVA	16AWG	0.5~0.6Nm
2KVA	14AWG	0.8~1.0Nm
3KVA	12AWG	1.2~1.6Nm
4KVA	10AWG	1.4~1.6Nm
5KVA	8AWG	1.4~1.6Nm

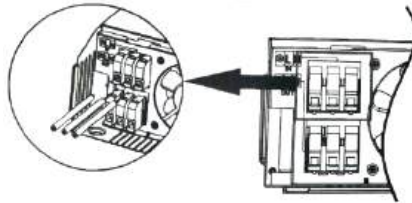
Please follow below steps to implement AC input/ output connection

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

**CAUTION:** Appliances such as air conditioner are required at least 2~3 minutes to restart because it's required to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it's equipped with time-delay function before installation. Otherwise, this inverter/ charger will trig overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

#### 4.6 PV Connection

##### 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	3AWG	1.4~1.6Nm

##### PV module selection:

When choosing the right PV module, be sure to first consider the following requirements:

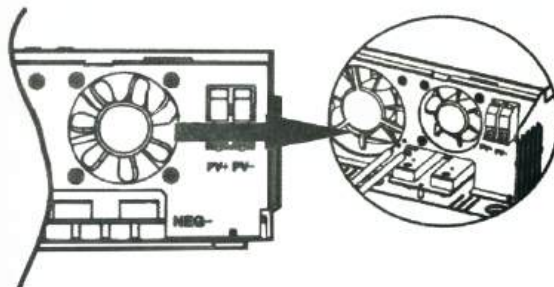
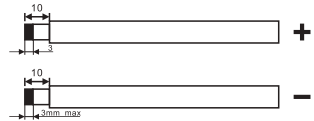
The open circuit voltage (Voc) of the PV modules does not exceed the maximum PV array open circuit voltage of the inverter. The maximum supply voltage of the PV modules should be close to the optimal PV access voltage range of the inverter for best performance. If one PV module cannot meet this requirement, it is necessary to connect multiple PV modules in series.

Model			ISGC-T 3024	ISGC-T 5048
PV Charging Mode	PWM	PWM	MPPT	MPPT
MAX. PV Input Power	600W	1200W	1500W	5500W
MPPT Tracking Range	N/A	N/A	30~115Vdc	120~430Vdc
MAX. PV Input Voltage	55Vdc	80Vdc	145Vdc	450Vdc
Best open circuit voltage range	15-30V	30-32V	70-110V	370-430V
Best voltage	15V	30V	60-90V	300-340V
MAX. PV Charging Current	50A	50A	60A	80A
MAX. AC Charging Current	50A	50A	60A	80A
MAX. Charging Current	100A	100A	120A	80A

### PV Module Wire Connection

Please follow below steps to implement PV module connection:

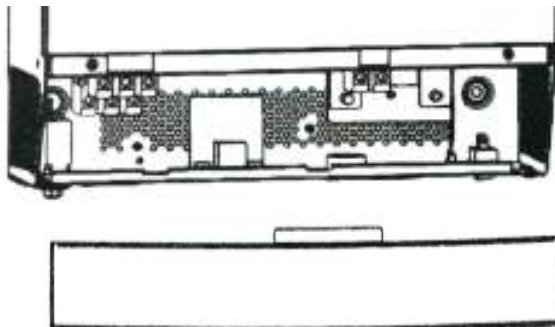
1. Remove insulation sleeve 10 mm for positive and negative conductors.
2. Suggest to put bootlace ferrules on the end of positive and negative wires with a proper crimping tool
3. Fix wire cover to the inverter with supplied screws as shown in below chart.



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):

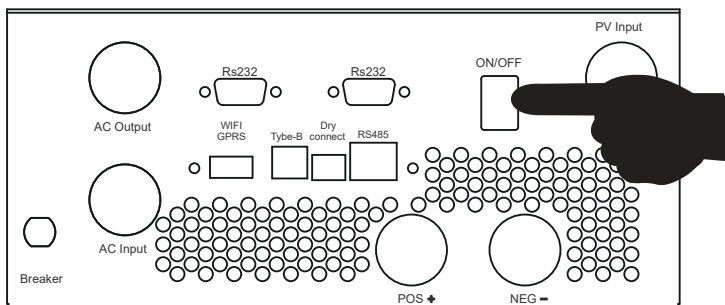
please use supplied communication cable to connect to inverter and Wi-Fi module. Download APP and installed from APP store, and Refer to "Wi-Fi Plug Quick Installation Guideline" to set up network and registering. The inverter status would be shown by mobile phone APP or webpage of computer.

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 be beyond 23V) or AC (AC needs to confirm the suitable input range depends on the output mode), then you can start up the inverter.

#### ➤ Mains power on

Connect to normal AC power, press the switch, the system will automatically turn on. If you set AC output power priority, after waiting for a period of time, the panel will display AC mode that represents turn on the machine successfully, then will enter the AC mode.

When the normal mains power is connected and press the power-on button then the system will automatically power on. If it is set as AC output priority, after a period of time, the panel will display the AC mode to indicate that the power-on is complete and enter the AC mode.

#### ➤ Battery boot

Connect to battery, press the power-on button to establish a working power source.

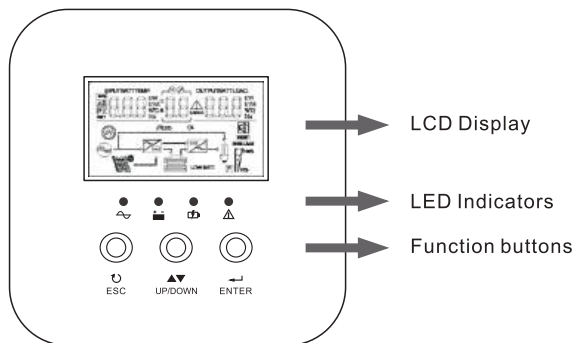
The system will automatically turn on, after waiting for a period of time, the panel will display battery mode that represents turn on the machine successfully, then will enter the battery mode.

### 5.1.2 Shutdown steps

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

## 5.2 Operation and Display Panel

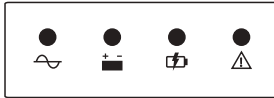
The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes four indicators, three function buttons and a LCD display, indicating the operating status and input/output power information.



### 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 setting page. After entering, press the ENTER button to turn the page and select the interface 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 item, 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
LED-G	Input light (Green)	On: the AC is normal and enters the AC to work. Flash: the AC is normal, but does not enter the AC to work Off: the AC is abnormal
LED-Y	Invert (Yellow)	On: machine working in battery mode output Off: other states
LED-Y	Battery (Yellow)	On: the battery is float charging Flash: battery charging off at constant voltage Off: other states
LED-R	Warning (Red)	On: inverter fault Flash: inverter has alarm Off: The inverter is normal

### 5.2.3 Inverter working state table corresponding to indicator lamp

Warning buzzer	Descriptions
Long beeping, continuous for 10 seconds then stop.	Failure Mode
Stop after beeping for 3 seconds	Loss or recovery of PV/input voltage
	The main switch is on or off
Beep per second, continuous for 1 min then stop	All other alarms (battery low voltage alarm will only beep 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.

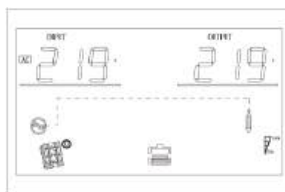


Figure 1-1 display page 1

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

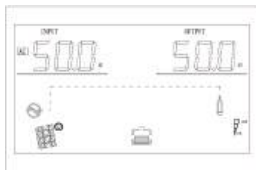


Figure 1-2 display page 2

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

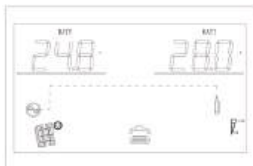


Figure 1-3 display page 3

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

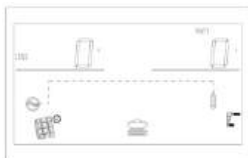


Figure 1-4 display page 4

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

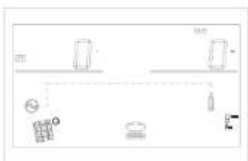


Figure 1-5 display page 5

**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

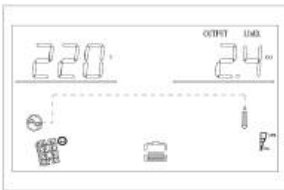


Figure 1-7 display page 7

**Display page 8:** Output Information displays output voltage and load percentage, as shown in Figure 1-8.

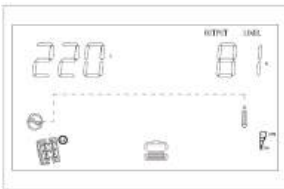


Figure 1-8 display page 8

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

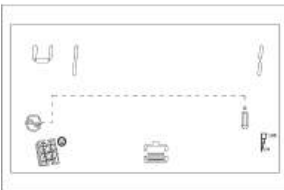


Figure 1-9 display page 9

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

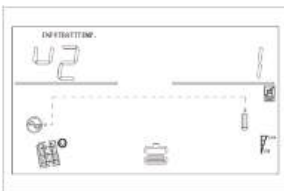
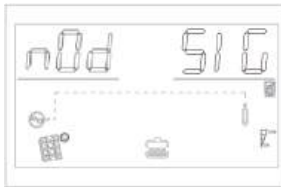


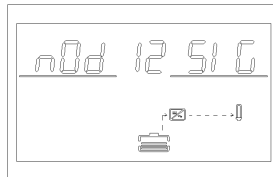
Figure 1-10 display page 10



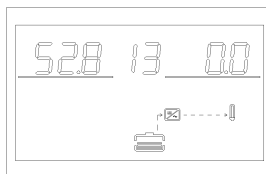
Display page 11: Parallel status。 3KW/3KVP without such page; 5KVMH displays the PV power output,



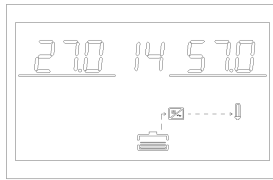
Display page 12: Lithium battery pack status; When the SIG constant is displayed on the upper right, the battery pack runs in one group. When displayed as PAR constant, the battery pack runs in parallel in multiple series. When the display blinks as PAR, the battery pack is establishing a multiple series parallel state.



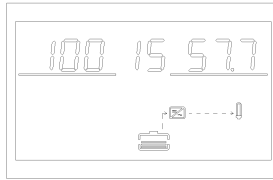
Display page 13: Lithium battery voltage and current information; The BMS battery voltage information is displayed on the upper left. The BMS battery current information is displayed on the upper right. When the BMS communication fails, both the upper left and upper right are displayed as blinking ERR.



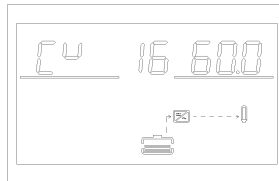
Display page 14: Lithium battery temperature, SOC; BMS temperature information is displayed on the upper left. BMS SOC information is displayed on the upper right. When the BMS communication fails, both the upper left and upper right are displayed as blinking ERR



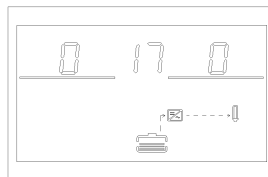
Display page 15: Lithium battery capacity; Rated capacity shown on the upper left; The current capacity is displayed on the upper right. When the BMS communication fails, both the upper left and upper right are displayed as blinking ERR.



Display page 16: Lithium battery constant voltage point; Fixed letters CV shown on the upper left; The BMS constant voltage charging point is shown on the upper right. When the BMS communication fails, the ERR on the upper right is flashing.



Display page 17: Lithium battery fault alarm information; The upper left display shows BMS alarm information; The upper right display shows BMS fault information. When BMS communication fails, a flashing ERR is displayed on the upper left and right sides.



### 5.3 Function setting operation

#### ➤ Function setting operation:

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

- 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 1-11 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” key for 0.1~2 seconds, the output voltage PU 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 1-12 Output Frequency Setting Page

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

**Setting conditions:** All states can be set. In battery mode, the setting will take effect when the Inverter is restarted next time; in mains mode, it will take effect immediately. After the setting is completed, after switching back to battery mode, the frequency will change at a slower rate.

### 5.3.3 Output priority settings

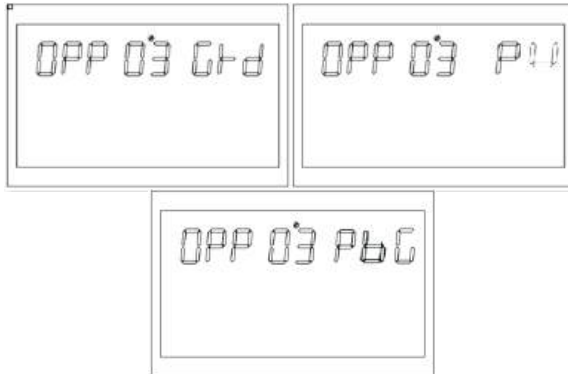


Figure 1-13 Output priority settings page

**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)

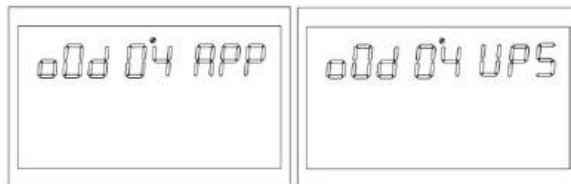


Figure 1-14 Output mode setting page



**Function description:** Set the inverter output mode.

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

### 5.3.5 Charging priority settings (CHP)



Figure 1-15 Charging priority setting page

**Function description:** Set the inverter charging priority.

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

**illustrate:**

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)

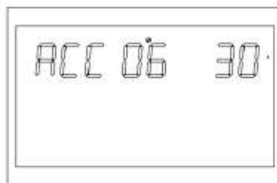


Figure 1-16 Mains maximum charging setting page

### 5.3.7 Maximum charging current (MCC)

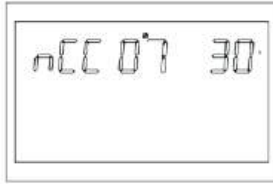


Figure 1-17 Maximum charging current setting page

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

**Setting conditions:** All states can be set.

**illustrate:**

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

3KV 150V-MPPT Version is 2/10/20/30/40/50/60/70/80/90/100/110/120A optional;

5KV-48V 450V MPPT Voltage version is 2/10/20/30/ 40/50/60/70/80A optional;

### 5.3.8 Menu Front (MDF)

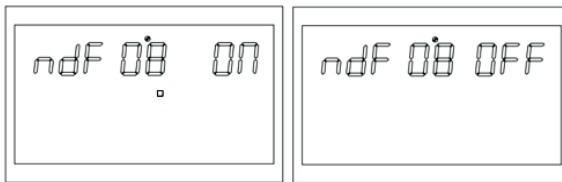


Figure 1-18 Return to the home page setting page

**Function description:** Return to the main interface settings.

**Setting conditions:** All states can be set.

**illustrate:**

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)

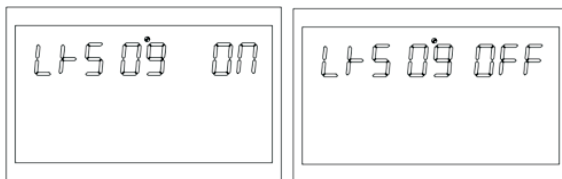


Figure 1-19 Overload restart setting page

**Function description:** Overload restart setting.

**Setting conditions:** All states can be set.

**illustrate:**

Overload restart is set to ON by default.

### 5.3.10 Over temperature restart setting (TrS)

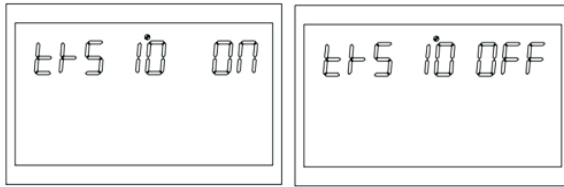


Figure 1-20 Over temperature restart setting page

**Function description:** Over-temperature restart settings.

**Setting conditions:** All states can be set.

**illustrate:**

The default setting for over-temperature restart is ON.

### 5.3.11 Main input power failure alarm setting (MIP)

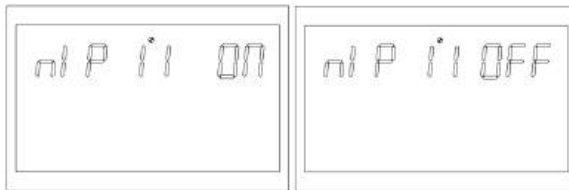


Figure 1-21 Main input power failure alarm setting page

**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)

**illustrate:**

**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)

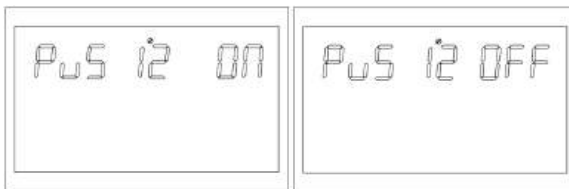


Figure 1-22 Power Saving Mode Setting Page

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

**Setting conditions:** All states can be set.

**illustrate:**

**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)

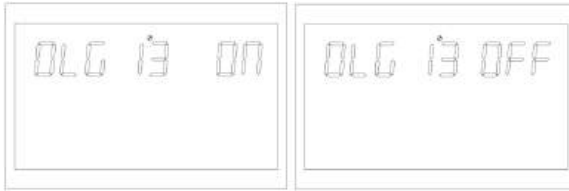


Figure 1-23 Overload convert to bypass setting page

**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.

**illustrate:**

**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

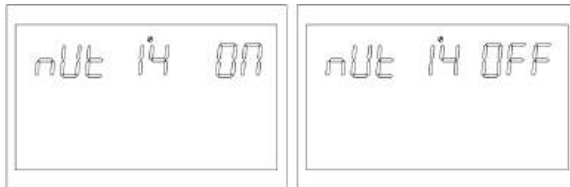


Figure 1-24 Silent mode setting page

**Function description:** Set whether the buzzer beeps or not.

**Setting conditions:** All states can be set.

**illustrate:**

**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 1-25 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.  
**illustrate:**

**BTG: Back To Grid**

When the battery definition mode is CUS (customer set type) mode:

The default setting of 3KVA-24Vdc-150V-MPPT model is 23v, and the settable range is [22, 26].

The default setting of 5KVA-48Vdc-450V MPPT model is 46V, and the settable range is [44, 52].

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

3KVA-24Vdc-150V MPPT model default setting is 23v, and the settable range is [22, 26].

The default setting 5KVA-48Vdc-450V-MPPT model is 46V, and the settable range is [44, 52].

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

The default setting of 3KVA-24Vdc-150V MPPT model is 23.8v, and the settable range is [20, 25].

The default setting of 5KVA-48Vdc-450V MPPT model is 47.6V, and the settable range is [40, 50].

5.3.16 Switch back to battery mode voltage point (BTB)



Figure 1-26 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.

**illustrate:**

**BTB: Back To Battery**

When the battery definition mode is CUS (customer set type) mode:

The default setting of 3KVA-24Vdc-150V-MPPT model is 26V, and the settable range is [24, 29] (when the setting value  $V_{btb} > 26V$ , the voltage point of switching back to battery mode remains at 26V), and the output priority is set to photovoltaic (PV priority output Or photovoltaic battery mains (PBG output, if it is 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 of 5KVA-48Vdc-450V-MPPT model is 54V, and the settable range is [48, 58] (the logic is the same as above).

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

3KVA-24Vdc-150V-MPPT model default Set to 26V, the settable range is [24, 29] (the logic is the same as above).

5KVA-48Vdc-450V-MPPT model default setting is 52v, the settable range is [48, 58] (the logic is the same as above).

The battery definition mode is LIB (lithium battery type) mode:

The default setting of 3KVA-24Vdc-150V-MPPT model is 27.2v, and the settable range is [23, 29] (the logic is the same as above).

The default setting of 5KVA-48Vdc-450V-MPPT model is 54.4V, and the settable range is [46, 58] (the logic is the same as above).

### 5.3.17 Battery mode setting

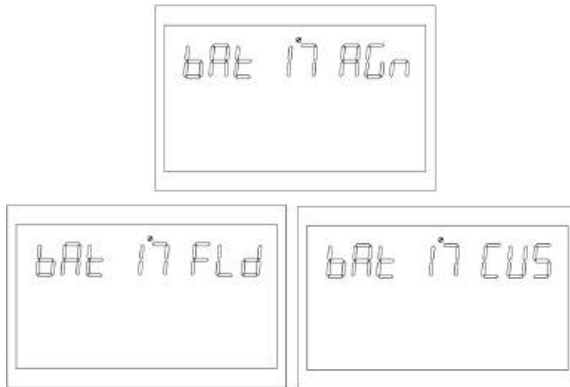


Figure 1-27 Battery mode setting page

**Function description:** battery type setting function

**Setting conditions:** All states can be set.

**illustrate:**

**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 1-28 Battery low voltage point setting

**Function description:** Low voltage alarm point setting.

**Setting conditions:** All states can be set.

**illustrate:**

**bAL:** battery Low

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

3KVA-24Vdc-150V-MPPT model is set to 22v by default, and the settable range is [21, 27]

5KVA-48Vdc-450V-MPPT model is set to 44V by default, and the settable range is [42, 54]

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

The default setting of 3KVA-24Vdc-150V-MPPT model is 23.8v, the settable range is [20.6, 25.0]

The default setting of 5KVA-48Vdc-450V-MPPT model is 47.6V, and the settable range is [41.2, 50.0]

### 5.3.19 Battery low voltage cut off point



Figure 1-29 Battery low voltage cut off point setting page

**Function description:** Battery low voltage shutdown point setting function.

**Setting conditions:** All states can be set.

**illustrate:**

**bAU:** battery Under

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

The default setting of 3KVA-24Vdc-150V-MPPT model is 21V, and the setting range is [20,24]

The default setting of 5KVA-48Vdc-450V-MPPT is 42V, and the settable range is [40,48]

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

3KVA-24Vdc-150V-MPPT model is set to 23V by default, and the settable range is [20,24]

The default setting of 5KVA-48Vdc-450V-MPPT model is 46V, and the setting range is [40, 48]

### 5.3.20 Constant voltage mode voltage point setting (bCV)



Figure 1-30 Constant voltage mode voltage point setting page

**Function description:** Constant voltage point setting function

**Setting conditions:** All states can be set

**illustrate:**

**bCV :** battery Constant Voltage

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

The default setting of 3KVA-24Vdc-150V-MPPT model is 28.2, and the setting range is [24,29]. The constant voltage point voltage needs to be higher than the floating point voltage.

The default setting of 5KVA-48Vdc-450V-MPPT model is 56.4, and the settable range is [48,60]. The constant voltage point voltage needs to be higher than the floating point voltage.

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

The default setting of 3KVA-24Vdc-150V-MPPT model is 28.2, and the setting range is [25,29]. The constant voltage point voltage needs to be higher than the floating point voltage.

The default setting of 5KVA-48Vdc-450V-MPPT model is 56.4, and the setting range is [48,56]. The constant voltage point voltage needs to be higher than the floating point voltage.

### 5.3.21 Floating charge mode voltage point setting (bFL)



Figure 1-31 Floating charge mode voltage point setting page

**Function description:** Float voltage point setting function.

**Setting conditions:** All states can be set.

**illustrate:**

**bFL :** battery Float

Set the battery type to cUS (customer set type) to modify the battery floating point.

The default setting of 3KVA-24Vdc-150V-MPPT model is 27.6V, and the setting range is [26.6, 27.8].

The constant voltage point voltage needs to be higher than the floating point voltage.

The default setting of 5KVA-48Vdc-450V-MPPT model is 54V, and the setting range is [48, 60]. The constant voltage point voltage needs to be higher than the floating point voltage.

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

The default setting of 3KVA-24Vdc-150V-MPPT model is 27.6V, and the setting range is [24, 28].

The constant voltage point voltage needs to be higher than the floating point voltage.

The default setting of 5KVA-48Vdc-450V-MPPT model is 55.2V, and the settable range is [50, 58].

The constant voltage point voltage needs to be higher than the floating point voltage.

### 5.3.22 Mains low voltage point setting (LLV)

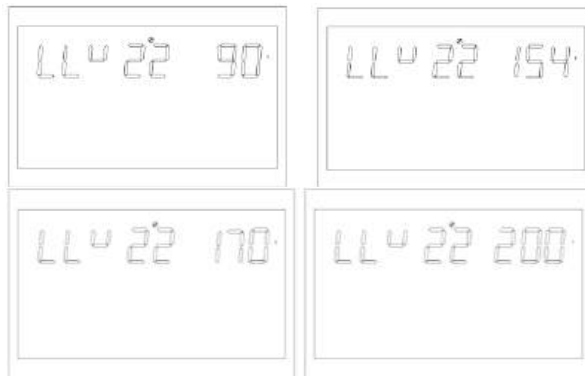


Figure 1-32 Mains low voltage point setting page in APP mode

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

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

**illustrate:**

**LLV:**Line Low Voltage



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

### 5.3.23 Mains high voltage protecting point setting (LHV)

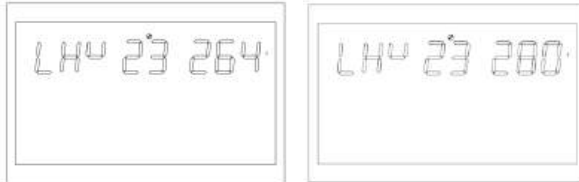


Figure 1-33 Mains high voltage protecting point setting page in APP mode

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

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

**illustrate:**

**LHV:**Line High Voltage

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

### 5.3.24 Low power discharging time setting (LWD)

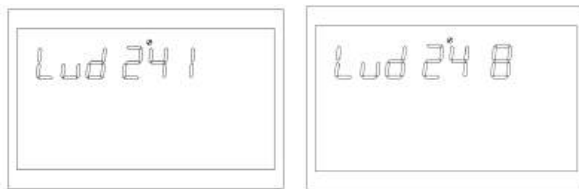


Figure 1-34 Low power discharging time setting page

**Function description:** Low power discharge protection function, when in battery mode, under a low load, the discharge of unlimited time will make the battery empty and affect the battery life. When the inverter is in the low power discharge setting time, the low voltage shutdown point of the 3KVA-24Vdc -150V-MPPT model battery will increase to 22V. 5KVA-48Vdc-450V-MPPT model battery low voltage shutdown point will be raised to 44V.

**Setting conditions:** All states of the inverter can be set in APP mode.

**illustrate:**

**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 1-35 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:** at all states can be set.

**illustrate:**

**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(SED)



Figure 1-36 Default value settings 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.

**illustrate:**

**SED:**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 operation mode (PAM)



Function description: Set the parallel operation mode.

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

illustrate:

PAM: Parallel operation mode.

The default setting is SIG (single 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).

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

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

### 5.3.28 Set battery alarm (SBA)



Function description: Set to enable the battery not connected alarm.

Setting conditions: All states can be set.

illustrate:

SBA: Set battery alarm.

The default setting is OFF.

When it is set to OFF, when the battery is not connected, there will be no battery disconnection, battery low voltage, and battery undervoltage alarms.

5K-VMH-48V can be set in stand-alone mode, but not in other models.

### 5.3.29 Equalization Mode (EQM)



Functional description: set whether use the equalization mode of the inverter.

Setting conditions: All states can be set.

illustrate:

EQM: Equalization Mode

The default setting is OFF, the function is closed; setting is ON, the controller will start to enter the equalization model when the set equalization interval (battery equalization period) is reached during the float phase, or equalization is activated immediately.

### 5.3.30 Equalization Voltage Setting (EQV)



Functional description: Equalization Voltage Setting function

Setting conditions: All states can be set.

illustrate:

bCV: Equalization Voltage

All models can be set.

### 5.3.31 Equalization charging time setting (EQT)



Function description: Equalization charging time setting.

Setting conditions: All states can be set.

illustrate:

EQT: Equalization Time

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

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

### 5.3.32 Equalization delay time setting (EQO)



Function description: Balanced delay charging time setting.

Setting conditions: All states can be set.

illustrate:

EQT: Equalization Timeout

In the balance stage, when the battery balance time expires and the battery voltage has not risen to the battery balance voltage point, the charge controller will extend the battery balance time until the battery voltage reaches the battery balance voltage. When the battery equalization delay setting ends, the battery voltage is still lower than the battery equalization voltage, the charge controller will stop the equalization and return to the float charge stage.

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

### 5.3.33 Equalization interval setting (EQI)



Function description: Equalization charging interval setting.

Setting conditions: All states can be set.

illustrate:

EQI:Equalization interval

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

The default setting is 30 days, and the range that can be set is [1,90], and each setting increment is 1 day.

### 5.3.34 Immediately open the equalization setting (EQN)



Function description: Set whether to enable the balance mode of the inverter immediately.

Setting conditions: All states can be set.

illustrate:

EQN:Equalization Now

The default setting is OFF, and the function is not enabled; when it is set to ON, the equalizing charge will be activated immediately and the controller will start to enter the equalizing stage when the battery is connected to the floating charging stage when the equalizing mode is turned on.

### 5.3.35 Grid-tie inverter function (GTI)



Function description: Set whether the inverter is grid-tie to feed power in PV priority mains mode or PBG mains mode.

Setting conditions: All states can be set.

illustrate:

GTI: Grid Tie Invert

The default setting is OFF, and the function is not enabled; when it is set to ON, the inverter conducts maximum power point tracking, and the excess energy is fed into the mains.

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

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

### 5.3.36 Dual output battery mode cut-off voltage (DBV)



Function description: When enabled, the secondary output of the inverter is enabled by default. After entering the battery mode, when the battery voltage is lower than the set point, the secondary output is turned off. When the battery voltage is higher than the set value + 1V/cell again, the secondary output is turned on.

Setting conditions: All states can be set.

illustrate:

DBV: Dual output battery mode cut-off voltage

The default setting of 3k-VML-24V/3K-VP-24V is 24V, and the setting range is [22,32]

The default setting of 5k-VMH-48V is 48V, and the setting range is [44,60]

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

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

### 5.3.37 Dual output battery mode cut-off time (DBT)



Function description: When enabled, the secondary output of the inverter is enabled by default. After entering the battery mode, when the battery discharge time reaches the set point, the secondary output will be turned off.

Setting conditions: All states can be set

illustrate:

DBT: Dual output battery mode cut-off time

The default setting is OFF, the function is not enabled, the setting range is [5,890], and the unit is minute.

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

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

### 5.3.38 BMS communication function (BMS)



Functional description:Set whether the inverter communicates with the lithium battery BMS.  
Setting conditions; All states can be set.

Description:

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.

When the function is ON, if communication abnormality occurs, alarm 56 will be generated and the inverter will no longer decide the operation logic based on BMS information.

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

\*This option page is blocked when the central control board is not connected.

### 5.3.39 Low SOC shutdown function(BSU)



Functional description:set the inverter to shutdown at low SOC.

Setting conditions: All states can be set.

Description:

BSU:Battery SOC under lock.

The default setting is 20, and the settable range is [5,50]. When the SOC of lithium battery reaches the set value in battery mode, the power will be turned off and the alarm fault code 68.The fault code 68 will be cleared when the SOC returns to the set value + 5%. When the standby is on, the SOC of lithium battery reaches the set value + 10% before it can be transferred to battery mode ,and the alarm fault code 69 will be alarmed when the SOC does not reach the set value + 10%.When the function is turned on, the fault code 69 is warned when the lithium battery SOC reaches the set value + 5%, and clears warning 69 when it returns to the set value + 10%.

The function can be set to OFF, and the inverter will no longer perform shutdown, power on and alarm operation according to the SOC condition.

After the function is turned on,if communication abnormality occurs.The inverter will no longer decide the operation logic base on SOC information and clears the related alarms.

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

\*This option page is blocked when the central control board is not connected.

### 5.3.40 Low SOC to mains electricity function (STB)



Functional description:Set inverter to battery mode SOC value.

Setting conditions: All states can be set.

#### Description:

STG:Battery SOC turn to battery mode.

The default setting is 90 and can be set in the range of [10,100]. PBG priority mains normal mains mode Lithium battery SOC switches to battery mode when it reaches the set value. When turned on, the inverter will switch to battery mode only when the SOC is above the set point and the battery voltage is above the switch back to battery mode voltage point (refer to 1.4.2.15).

The function can be set to OFF, and the inverter will no longer cut the battery mode in mains mode according to the SOC situation.

After the function is turned on, if communication abnormality occurs, the inverter will no longer decide the operation logic based on SOC information and clear the related alarm.

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

\*This option page is blocked when the central control board is not connected.

#### 5.3.41 Low SOC to mains electricity function (STG)



Function description: Set the SOC value of the inverter to the grid mode.

Setting conditions: All states can be set.

illustrate:

STG:Battery SOC turn to grid mode.

The default setting is 50, and the settable range is [10,90]. PBG priority grid normal battery mode Switch to grid mode when the lithium battery SOC reaches the set value. After it is turned on, when the SOC is lower than the set point or the battery voltage is lower than the return-to-mains voltage point (see 1.4.2.14), the inverter will switch to the grid mode.

It can be set to OFF. At this time, the inverter will no longer switch from battery mode to grid mode according to the SOC.

After the function is enabled, if a communication abnormality occurs, the inverter no longer determines the operation logic based on the SOC information, and clears the relevant alarm.

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

\*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.

### 5.4 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

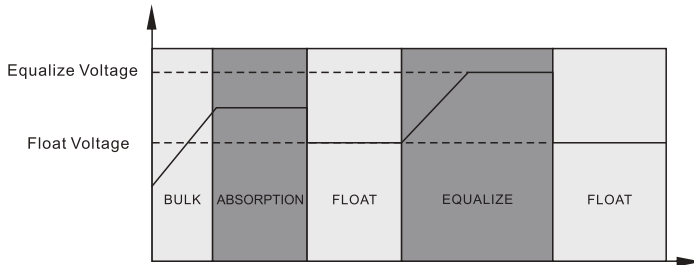
You must enable battery equalization function in monitoring LCD setting program 30 first. Then, you may apply this function in device by either one of following methods:

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



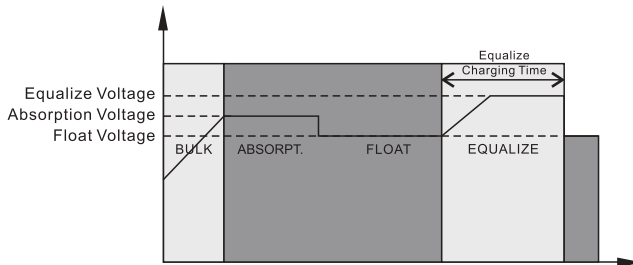
※ **When to Equalize**

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.

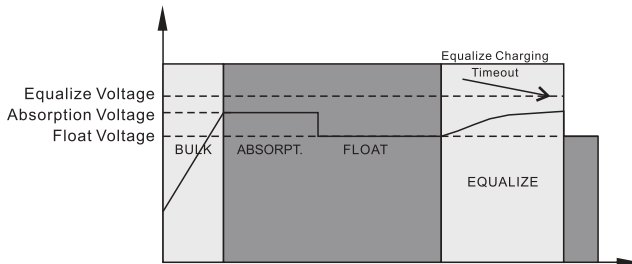


※ **Equalize charging time and timeout**

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.



## 5.5 Fault and alarm description



Figure 1-37 Fault and warning icons

**Function description:** The alarm code ALA flashes and the buzzer beeps once for 1s and stops after 1 minute. The fault indicator code is always on, the buzzer beeps for 10 seconds and then stops. After the fault is stopped and the fault is eliminated, Then try to restart the inverter. If the restart fails for three times, it will continue to be in the fault state.

The fault and alarm LCD display is as shown in the figure above, the fault icon in the fault mode is always on, and the alarm icon in the alarm state flashes. Kindly contact the manufacturer to eliminate the abnormal condition according to the fault information.

### 5.5.1 Faults Descriptions

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

#### Fault code descriptions

Fault Code	English meaning	Related actions	Triggering reasons	Recovery conditions	Fault
1	Bus soft start fail	Turn to failure mode	Bus soft start, unable to reach the set voltage	Unrecoverable	alarm
2	Bus high	Turn to failure mode	Bus is higher than the set voltage	Unrecoverable	Fault
3	Bus low	Turn to failure mode	Bus is lower than the set voltage	Unrecoverable	Fault
4	Battery Over Current	Turn to failure mode	The instantaneous battery current exceeds 580A, protect immediately	Unrecoverable	Fault
5	Over temperature Battery high	Turn to failure mode	Temperature Sensor of PFC or INV is higher than the set over temperature	After the restart is enabled, it cannot be recovered after failing to restart six times	Fault
6	Bus soft Fault	Turn to failure mode	The battery voltage higher than the set value	recoverable	Fault
7	Bus short Fault	Turn to failure mode	Bus use DC soft voltage can't reach set voltage	Unrecoverable	Fault
8	INV soft Fault	Turn to failure mode	When normally working, the bus momentarily falls below the set value	Unrecoverable	Fault

Fault Code	English meaning	Related actions	Triggering reasons	Recovery conditions	Fault
9	Bus short Fault	Turn to failure mode	When normally working, the bus momentarily falls below the set value	Unrecoverable	alarm
10	INV soft Fault	Turn to failure mode	After a period of soft start of the inverter, the rated output voltage still cannot be reached	Unrecoverable	Fault
11	INV over voltage	Turn to failure mode	In battery mode, inverter voltage is higher than setting value	Unrecoverable	Fault
12	INV under voltage	Turn to failure mode	In battery mode, inverter voltage is lower than the setting value	Unrecoverable	Fault
13	INV short	Turn to failure mode	Inverter voltage is lower than setting value momentarily and current is larger than the setting value momentarily	After the restart is enabled, it cannot be recovered after failing to restart six times	Fault
14	Negative power overload fault	Turn to failure mode	Inverter power is lower than the setting voltage for a period of time	recoverable	Fault
15	Model Fault	Turn to failure mode	Loads out of specification Software identification machine model does not match hardware detection	Unrecoverable	Fault
16	No boot loader	Turn to failure mode	No boot loader	Unrecoverable	Fault
17	Panel Flash Fault	Related actions	VML model is burning PV control program	Restore after burning	Fault
19	Same Serial	Turn to failure mode	In parallel mode, detected there are many same serial machines	Unrecoverable	Fault
20	CAN Fault	Turn to failure mode	In parallel mode, CAN bus communication is abnormal	Unrecoverable	Fault
21	BAT Volt Different	Turn to failure mode	In parallel mode, the BAT Volt difference between different machines is too large	Unrecoverable	Fault
22	Line Volt Differential Pressure excessive	Turn to failure mode	In parallel mode, the input voltage difference between different machines is too large	Unrecoverable	Fault
23	Input voltage frequency difference	Enter failure mode	In parallel mode, the input voltage frequency difference of different machines is too large	Restore after burning	Fault
24	Set output parameters asynchronously	Enter failure mode	In the three-phase parallel mode, there is a phase-loss in different relays parallel mode settings	Unrecoverable	Fault
25	the output voltage detection is out of sync	Enter failure mode	In parallel mode, the output voltage detection is out of sync	Unrecoverable	Fault
26	BMS Fault	Enter failure mode	Battery BMS has fault information	Unrecoverable	Fault

## 5.5.2 Warning Descriptions

➤ **Alarm:** The red LED flashes, and the LCD displays an alarm code, the inverter does not enter the failure mode

### Alarm code descriptions

Alarm Code	English meaning	Inverter action	Trigger conditions	Recovering conditions	Alarm Warning
50	Battery not connect	Warning, battery not charging	Battery voltage below 8V/cell	Recoverable (10V/cell)	Alarm
51	Battery low voltage causes shutdown	Warning, Battery low voltage causes shutdown or can not boot	Battery voltage below 10.5V/cell (default)	Recoverable (10V/cell +0.2* N (number of cells))	Alarm
52	battery low voltage	Warning	The battery low voltage point can be modified when setting the battery type	Recoverable (action +0.2V/cell)	Alarm
53	Charger short circuit	Warning, battery not charging	The battery voltage is less than 5V and the charging current is more than 4A	Unrecoverable	Alarm
54	Low watt discharge	Warning, battery not charging	The battery voltage is less than 5V and the charging current is more than 4A	Unrecoverable	Alarm
55	Over charge	Warning, battery not charging	Battery voltage is higher than the set value	Recoverable	Alarm
56	BMS Loss	Warning, lock standby mode	When the BMS communication function is enabled, the communication fails	Recoverable	Alarm
57	BMS Loss	Warning, battery not charging	The temperature sensor of PFC or INV is higher than the set value	The temperature sensor of PFC or INV is lower than the set value	Alarm
58	fan lock	Warning, if one of the fans fails, the other fan runs at full speed	Fan speed signal not detected	Recoverable	Alarm
59	EEPROM fail	Warning	EEPROM reading and writing failure	non-recoverable	Alarm
60	overload warning	Warning, battery not charging	Load>102%	Recoverable ( Load<97%)	Alarm
61	Abnormal generator waveform	Warning, continue to work in battery mode	Generator waveform detection abnormality	Recoverable	Alarm
62	PV Energy Weak	Turn off PV output and stop charging	When the battery is not connected, the bus voltage is lower than the set value	Recover after 10mins	Alarm
63	Synchronization signal fail	Warning and switch to failure mode	Parallel board disconnection fault	1.Switch to stand-alone mode and Recovery 2.Or Disconnection Troubleshooting and Recovery	Alarm

64	Parallel configuration incompatible	Warning and switch to standby mode	When three phases are paralleled, there is a phase loss setting	Recover when three-phase setting is correct	Alarm
65	Parallel version incompatible	Warning and switch to standby mode	There are incompatible version numbers in the parallel system	Recover when all machine versions in a parallel system are compatible with each other	Alarm
66	Parallel Communication Fault	Warning and switch to standby mode	The slave machine cannot be detected in the parallel system	1.In the parallel system, it will recover after detecting slave access 2.Switch to stand-alone mode and recovery	Alarm
67	Parallel Line Differ	Warning	The mains voltage or frequency error of each machine in parallel is too large	Recover when it detects that the mains voltage and frequency errors of each machine are reasonable	Alarm
68	SOC Unders	Warning and switch to standby mode	Lithium battery SOC is lower than the setting value	1.Turn off the low SOC shutdown function 2.Or turn off the BMS communication function 3.Or recover when the SOC returns to the set value + 5%9	Alarm
69	SOC Low	Warning, if it is in standby mode, it will remain in standby mode and not turn on	Lithium battery SOC is lower than the setting value + 5% (mains power mode or battery mode), lower than the setting value + 10% (standby mode)	1.Turn off the low SOC shutdown function 2.Or turn off the BMS communication function 3.Or recover when the SOC returns to the set value + 10%	Alarm

## 6 TROUBLE SHOOTING

Problem	LCD/LED/Buzzer	Explanation Possible cause	What to do
Unit shuts down automatically during startup process	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low (<1.91v/Cell)	1. Recharge battery 2. Replace battery
No response after power on.	No indication	1. The battery voltage is far too low. (<1.4V/Cell) 2. Internal fuse tripped.	1. Contact repair center for replacing the fuse. 2. Recharge battery 3. Replace battery
Mains exist but the unit works in battery mode.	Input voltage is displayed as on the LCD and green LED is flashing	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well.
	Green LED is flashing	Insufficient quality of AC power. (Shore or Generator)	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS↔Appliance)
	Green LED is flashing	Set "SBU" as the priority of output source	Change output source priority to Utility first.
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected	Check if battery wires are connected well.

## 7. Technical datasheet

Model		ISGC-T 1012	ISGC-T 2024	ISGC-T 3024	ISGC-T 5048	ISGC-T 5548
Input	Input Sources	L+N+PE				
	Rated Input Voltage	208/220/230/240VAC				
	Voltage Range	154-264VAC±3V(APP Mode)185-264VAC±3V(UPS Mode)				
	Frequency	50Hz/60Hz(Auto Adaptive)				
Output	Rated Capacity	1000W	2000W	3000W	5000W	5500W
	Output Voltage	208/220/230/240VAC±5%				
	Output Frequency	50/60Hz±0.1%				
	Waveform	Pure Sine Wave				
	Transfer Time (adjustable)	Computers(UPS Mode)10ms, Appliance(APP Mode)20ms				
	Peak Power	2000VA	4000VA	6000VA	10000VA	11000VA
	Over Load Ability	Battery Mode: 1min@102%~110% Load 10s@110%~130% Load 3s@130%~150% Load 200ms@>150% Load				
Peak Efficiency (battery Mode)	>93%	>93%	>94%	>94%	>94%	
Battery	Battery Voltage	12Vdc	24Vdc	24Vdc	48Vdc	48Vdc
	Constant Charging Voltage(Adjustable)	14. 1Vdc	28. 2Vdc	28. 2Vdc	56. 4Vdc	56. 4Vdc
	Floate Charging Voltage(Adjustable)	13. 5Vdc	27Vdc	27Vdc	54Vdc	54Vdc
Chargers	PV Charging Mode	PWM	PWM	MPPT	MPPT	MPPT
	MAX.PV Input Power	600W	1200W	1500W	5500W	5500W
	MPPT Tracking Range	N/A	N/A	30~115Vdc	120~430Vdc	120~430Vdc
	MAX.PV Input Voltage	55Vdc	80Vdc	145Vdc	450Vdc	450Vdc
	Best open circuit voltage range	15-30V	30-32V	70-110V	370-430V	370-430V
	Best voltage	15V	30V	60-90V	300-340V	300-340V
	MAX.PV Charging Current	50A	50A	60A	80A	80A
	MAX.AC Charging Current	50A	50A	60A	80A	80A
MAX.Charging Current	100A	100A	120A	80A	80A	
Display	LCD Display	Display Running Mode/Loads/Input/Output etc.				
Interface	RS232	5PIN/Pitch2.0mm, Baud Rate2400				
	Communication Port	2×5PIN/Pitch2.54mm,Lithium Lattery BMS Communication Card, WifiCard,DryContact				
	Parallel Connect Interface	Without Parallel Connect			With Parallel	
Environments	Operating Temperature	0~40℃				
	Humidity	20%~95%(Non-condensing)				
	Storage Temperature	-15~60℃				
	Altitude	Altiude Not Over 1000m,Derating over 1000m,Max 4000m, Refer to IEC62040				
	Noise	≤50db				