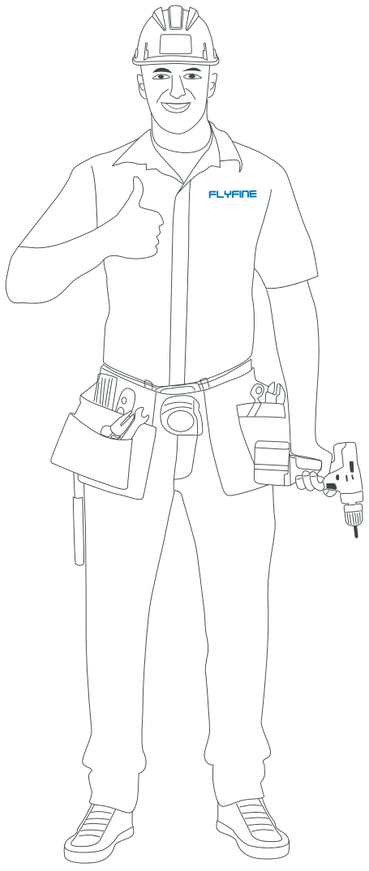
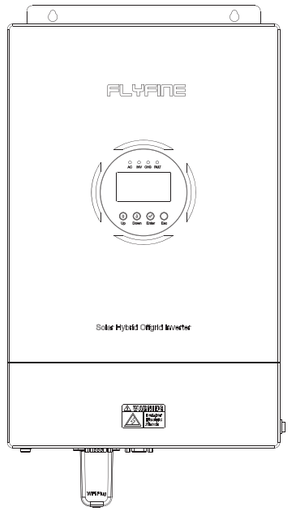
User Manual

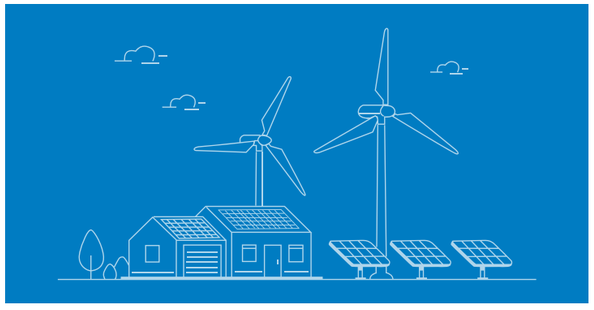
Off Grid Single Phase Inverter

Model: FO-3000/FO-5000





FLYFINE DIGITAL ENERGY CO.LTD



Contents

Information on this Manual

Validity

This manual is valid for the following devices:

► F0-3000/ FO-5000

Scope

This manual describes the assembly, installation, operation and troubleshooting ofthis unit. Please read this manual carefully before installations and operations.

Target Group

This documentis intended for qualified persons and end users. Qualified persons must have the following skills:

- Knowledge ofhow an inverter works and is operated
- Training in how to deal with the dangers and risks associated with installing and using electrical
- devices and installations
- Training in the installation and commissioning of electrical devices
- Knowledge ofthe applicable standards and directives
- Knowledge of and compliance with this document and all safety information

Safety Instructions

⚠ WARNING This chapter contains important safety and operating instructions.

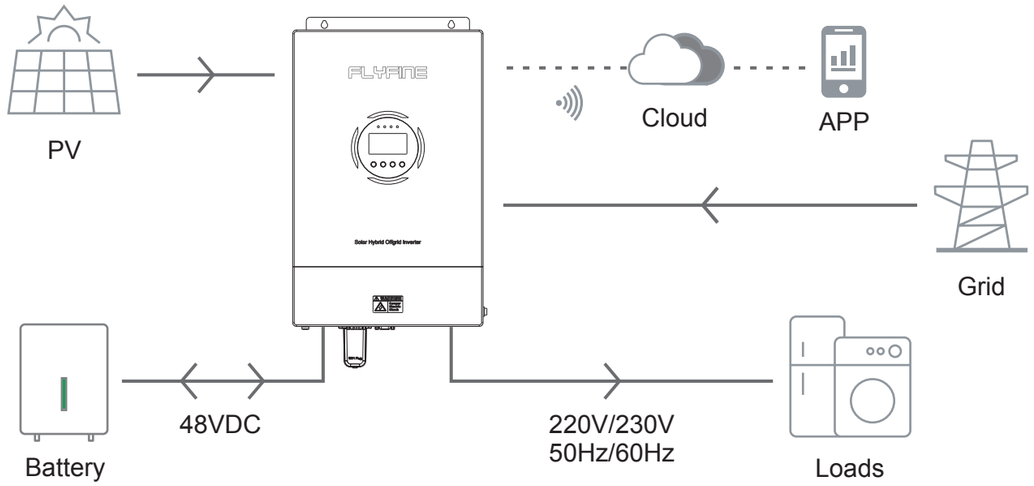
Read and keep this manual for reference.

1. Please be clear which kind ofbattery system you want, lithium battery system or lead-acid battery system, if you choose the wrong system, energy storage system can't work normally.
2. Before using the unit, read all instructions and warning mark on the unit, the batteries and all appropriate sections ofthis manual. The company has the right notto provide quality assurance, if don’t install the unit according to the instructions ofthis manual and cause equipment damage.
3. All the operation and connection must be executed by professional electrical or mechanical engineer.
4. All the electrical installation must comply with the local electrical safety standards.
5. When install PV modules in the daytime, installer should cover the PV modules by opaque materials, otherwise it will be dangerous because ofhigh terminal voltage of modules in the sunshine.
6. **CAUTION**-To reduce risk ofinjury, charge only deep-cycle lead-acid type rechargeable batteries and lithium batteries. Other types ofbatteries may burst, causing personal injury and damage.
7. Do not disassemble the unit. Take itto a qualified service center when service or repair is required. Incorrect reassembly may resultin a risk of electric shock or fire.
8. To reduce risk of electric shock, disconnect all wires before attempting any maintenance or cleaning.

Turning offthe unit will not reduce this risk.

9. **NEVER** charge a frozen battery.
10. For optimum operation ofthis inverter, please follow required specification to select appropriate cable size. It's very importantto correctly operate this inverter.
11. Be very cautious when work with metal tools on or around batteries. A potential risk exists to drop a tool to spark or cause batteries or other electrical parts short circuited and it could cause an explosion.
12. Please strictly follow installation procedure when you wantto disconnect AC or DC terminals. Please refer to INSTALLATION section ofthis manual for the details.
13. GROUNDING INSTRUCTIONS -This inverter should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
14. **NEVER** cause AC output and DC input short circuited. Do NOT connectto the utility grid when DC input is short circuited.
15. Make sure the inverter is completely assembled before the operation.

Introduction



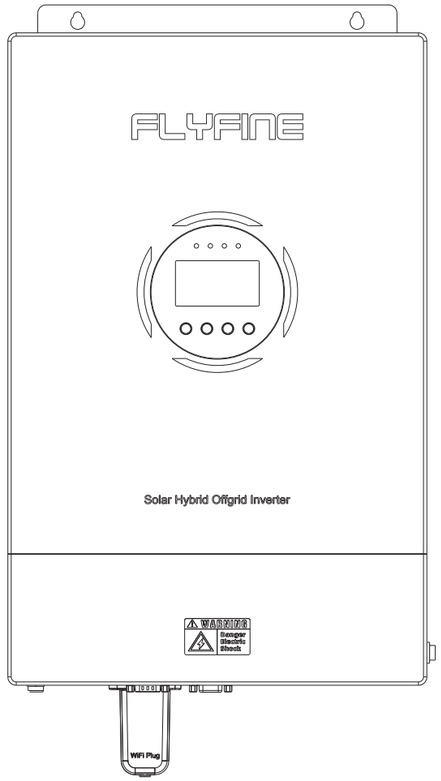
This is a multifunctional off grid solar inverter, integrated with a MPPT solar charging controller, a high frequency pure sine wave inverter and a UPS function module in one machine, which is perfectfor off grid backup power and self-consumption applications. This inverter can work with or without batteries.

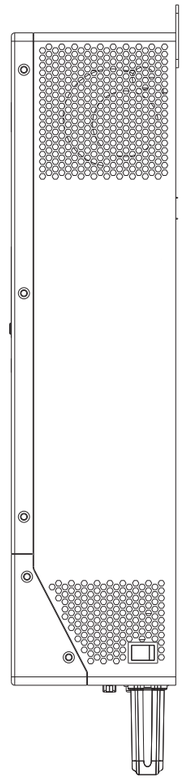
The whole system also need other devices to achieve completed running such as PV modules, generator, or utility grid. Please consult with your system integrator for other possible system architectures depending on your requirements. The WiFi / GPRS module is a plug-and-play monitoring device to be installed on the inverter. With this device, users can monitor the status ofthe PV system from the mobile phone or from the website anytime anywhere.

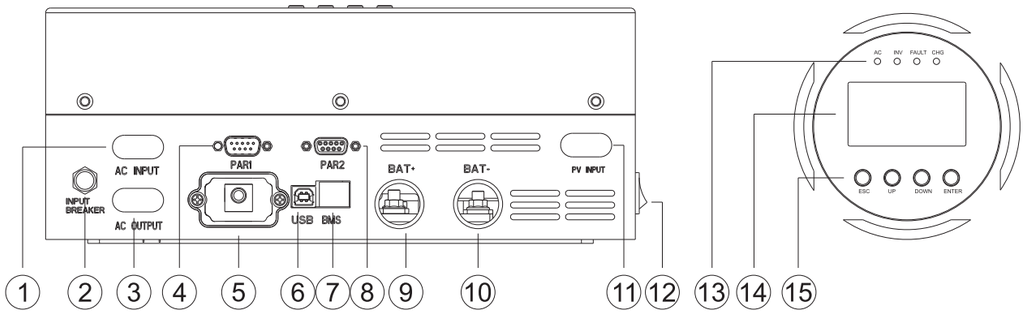
Features

- Rated power 5KW, power factor 1
- MPPT ranges 120V~430V, 500VDC
- High frequency inverter with small size and light weight
- Pure sine wave AC output
- Solar and utility grid can power the loads atthe same time
- With CAN/RS485 for BMS communication
- With the ability to work without battery
- Parallel operation up to 6 unit (only with battery connected)
- WIFI/ GPRS Remote monitoring (Optional)

Product Overview







1.AC input
2. Circuit breaker
3. AC output
4. Parallel 1
5. WIFI
6.USB
7. BMS
8. Parallel 2
9. Battery+
10. Battery-
11. PV input
12. Power on/off switch
13. Status indicator
14. LCD display
15. Function button

Installation

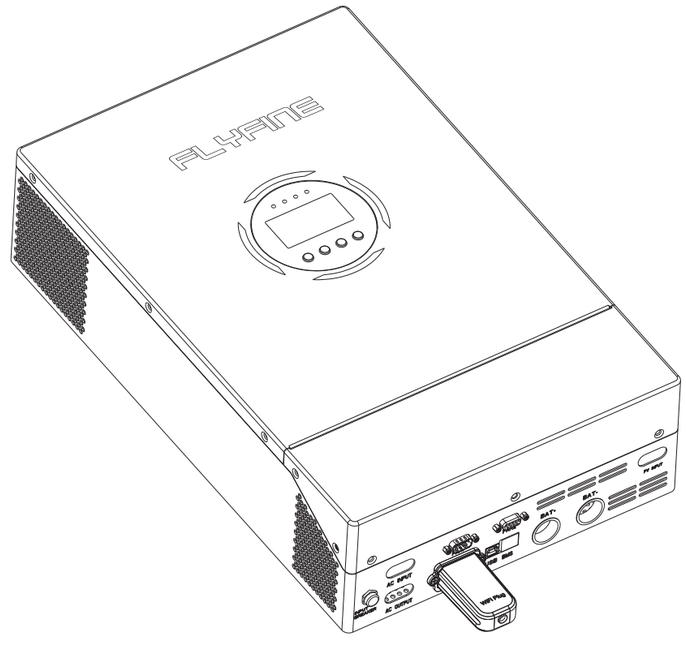
Unpacking and Inspection

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

- The unit x 1
- Set screws x 2
- User manual x 1
- Communication cable x 1
- Parallel communication cable x 2
- Smart WIFI Dongle(Optional)x 1

Preparation

Before connecting all wires, please take off bottom cover by removing seven screws as shown below.

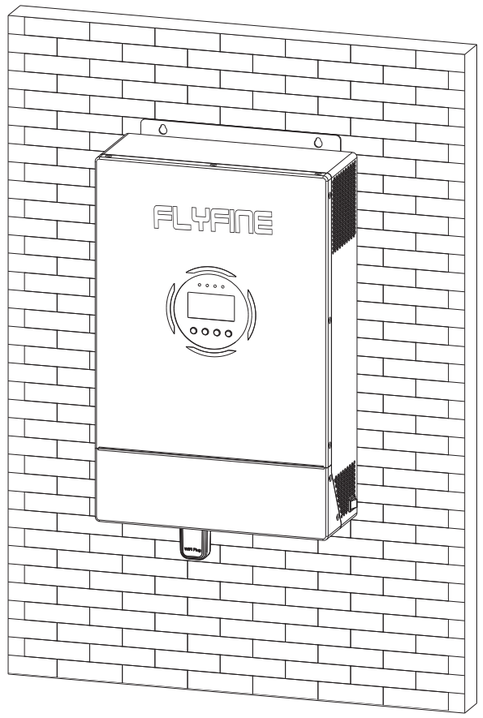


Mounting the Unit

Consider the following points before selecting the position to install:

- Do not mountthe 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.
- The ambienttemperature should be between 0 °C and 55°C 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 below diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.

NOTICE SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY. Install the unit by screwing two screws. It is recommended to use M5 or M6 screws.



Lead-acid Battery Connection

User can choose proper capacity lead acid battery with nominal voltage 48V. Also, you need to choose battery type as "AGM(default) or FLD"

CAUTION For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnecting device between battery and inverter. It may not be requested to have a disconnecting device in some applications, however, it's still requested to have over-current protector installed. Please select required fuse or breaker size.

WARNING All wiring must be performed by a qualified person.

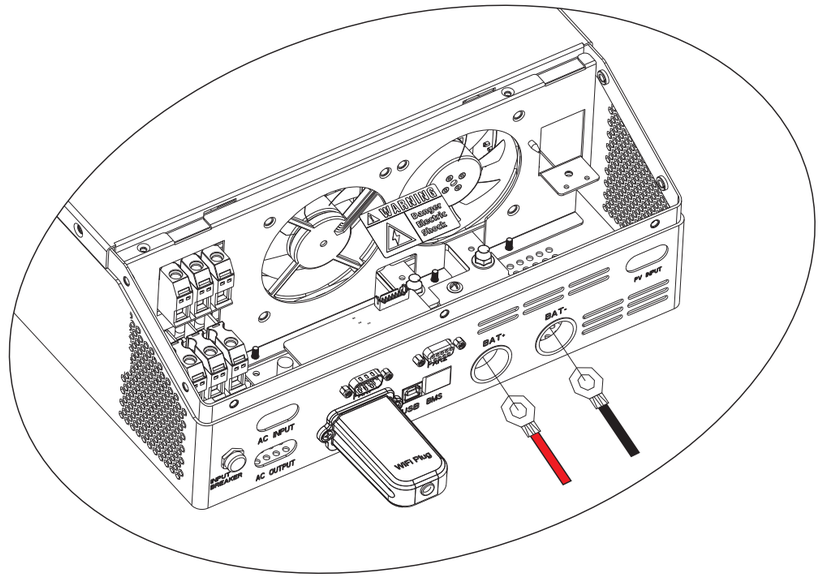
WARNING It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable and terminal size as below.

Model	Wire Size	Cable (mm2)	Torque value (max)
FO-3000/ FO-5000	1 x 4AWG	25	2-3 Nm

Note: For lead acid battery, the recommended charge currentis 0.2C(C= battery capacity)

Please follow below steps to implement battery connection:

1. Assemble battery ring terminal based on recommended battery cable and terminal size.
2. Connect all battery packs as units requires. It's suggested to connect at least 200Ah capacity battery for FO-5000.
3. Insertthe ring terminal ofbattery cable flatly into battery connector ofinverter and make sure the bolts are tightened with torque of 2-3Nm. Make sure polarity ofthe battery and the inverter charging portis correctly connected and ring terminals are tightly screwed to the battery terminals.



WARNING **Electric Shock Hazard**

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

NOTICE Do not place anything between the flat part of the inverter terminal and the ring terminal. Otherwise, overheating may occur.

NOTICE Do not apply anti-oxidant substance on the terminals before terminals are connected tightly.

NOTICE 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 (-)。

Lithium Battery Connection

If choosing lithium battery for FO-5000, you are allowed to use the lithium battery only we have configured. There are two connectors on the lithium battery, that are RJ45 port of BMS and power cable.

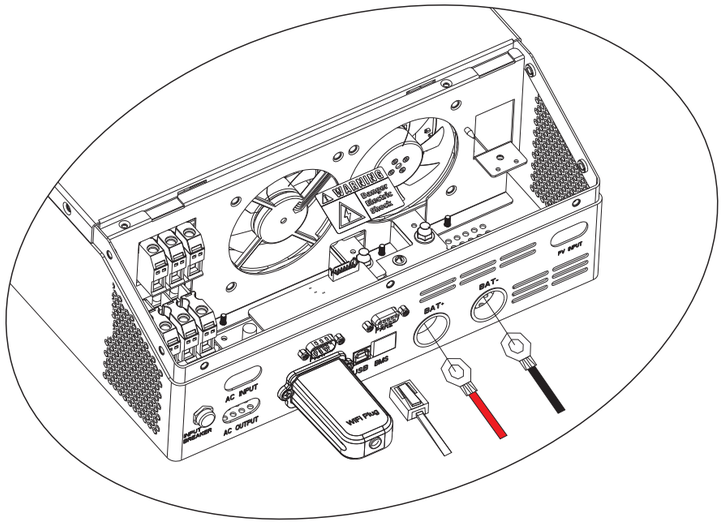
Please follow below steps to implement lithium battery connection:

1. Assemble battery ring terminal based on recommended battery cable and terminal size (same as Lead acid, see section Lead-acid Battery connection for details).

2. Insertthe ring terminal ofbattery cable flatly into battery connector ofinverter and make sure the bolts are tightened with torque of 2-3Nm. Make sure polarity ofthe battery and the inverter charging port is correctly connected and ring terminals are tightly screwed to the battery terminals.

3. Connectthe end of RJ45 ofbattery to BMS communication port(RS485 or CAN) ofinverter.

4. Another end of RJ45 is inserted to battery communication port(RS485 or CAN)



Note: If choosing lithium battery, make sure to connectthe BMS communication cable between the battery and the inverter. You need to choose battery type as ''lithium battery".

Lithium battery communication and setting

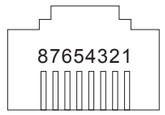
In order to communicate with battery BMS, you should setthe battery type to 'LI" in Program 17 of LCD setting. Then set BMS in Program 38 of LCD settings, and select OFF or ON to turn off or on the BMS communication function

Connectthe end of RJ45 ofbattery to BMS communication port ofinverter

Make sure the BMS port oflithium battery connecting to the inverter is Pin to Pin, the pin assignment of

inverter BMS port shown as below:

Pin	BMS port
1	RS485B
2	RS485A
3	-
4	CANH
5	CANL
6	-
7	-
8	--



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 ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input. The recommended specification of AC breaker is 40A for FO-5000.

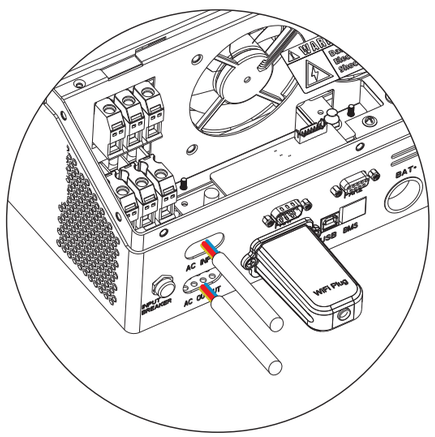
⚠ CAUTION There are two terminal blocks with "IN" and "OUT" markings. Please do NOT misconnect input and output connectors.

⚠ WARNING All wiring must be performed by the qualified personnel.

⚠ WARNING Its 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	Cable (mm^2)	Torque Value
FO-3000/ FO-5000	10 AWG	6	1.2-1.6 Nm



⚠ WARNING Be sure that AC power source is disconnected before attempting to connect the hard wire to the unit.

⚠ CAUTION **Important**

Be sure to connect AC wires with correct polarity. If L and N wires are connected reversely, it may cause utility short-circuited when these inverters are worked in parallel operation.

⚠ CAUTION Appliances such as air conditioner need at least 2~3 minutes to restart because it requires to have enough time to balance refrigerant gas inside of circuits. If 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 with manufacturer of air conditioner if it's equipped with time-delay function before installation. Otherwise, this off grid solar inverter will trigger overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

PV Connection

⚠ 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 the 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 connection. To reduce risk of injury, please use the proper recommended cable size as below

Model	Wire Size	Cable (mm^2)	Torque value (max)
FO-3000	1 x 8AWG	8	1.2-1.6 Nm
FO-5000	1 x 12AWG	6	1.2-1.6 Nm

PV Module Selection:

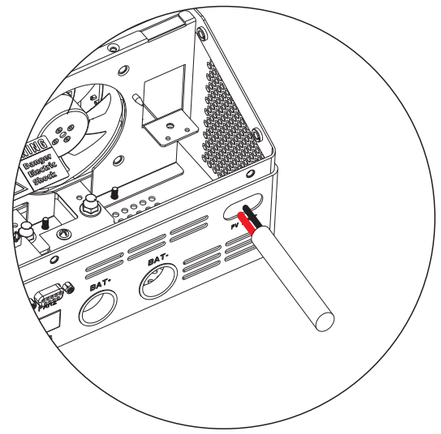
When selecting proper PV modules, please be sure to consider below parameters:

1. Open circuit Voltage (Voc) of PV modules not exceeds max. PV array open circuit voltage ofinverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than min. battery voltage.

INVERTER MODEL	FO-3000	FO-5000
Max. PV Array Open Circuit	500Vdc	
Start-up Voltage	150Vdc	
PV Array MPPT Voltage Range	120Vdc~430Vdc	

Please follow below steps to implement PV module connection:

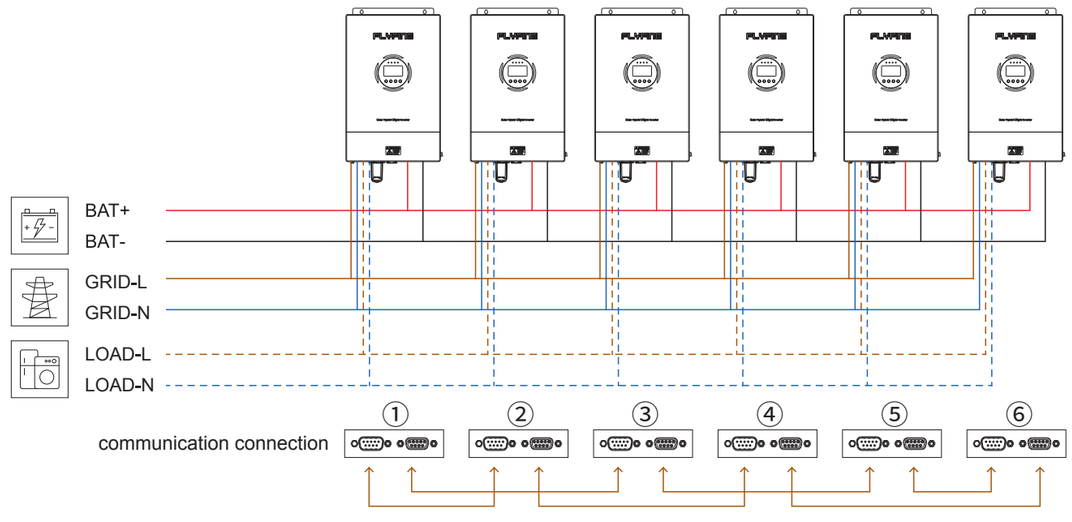
1. Insertthe positive and negative cables of PV panel with wire stripped, then connect positive pole(+)of connection cable to positive pole(+)of PV input connector, connect negative pole(-)of connection cable to negative pole(-) of PV input connector.
2. Make sure the wires are securely connected.



Parallel Operation in Single Phase

⚠ WARNING Each machine needs to calibrate the inverter output voltage, including DC voltage and battery voltage. Theoretically, the more calibration, the better, but at least the inverter output voltage and battery voltage calibration deviation are within ± 1V, and the DC component calibration is within ± 50mV. Up to 6 parallel machines are allowed.

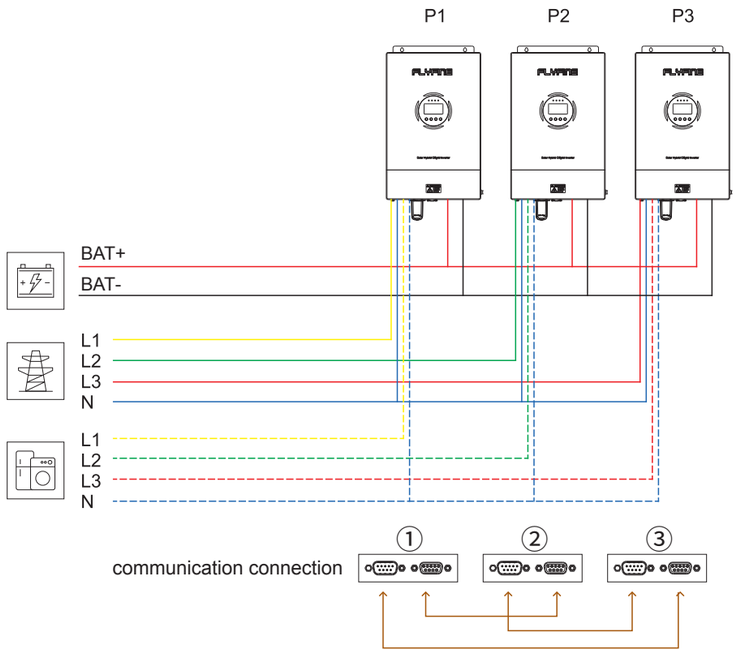
Six inverters in parallel:



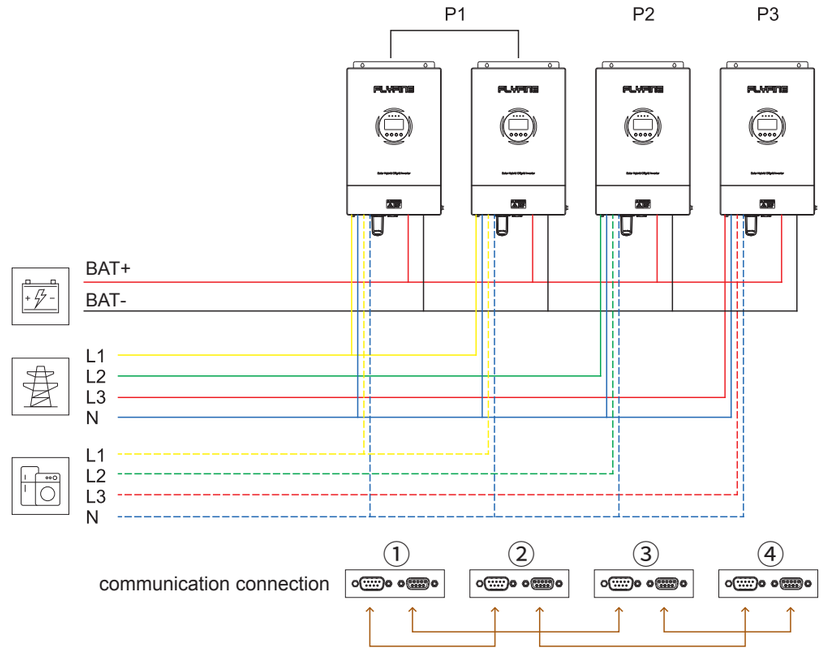
Parallel Operation in Three Phase

⚠ WARNING Each machine needs to calibrate the inverter output voltage, DC voltage and battery voltage. Theoretically, the more calibration, the better, but at least the inverter output voltage and battery voltage calibration deviation are within ± 1V, and the DC component calibration is within ± 50mV. Up to 6 parallel machines are allowed.

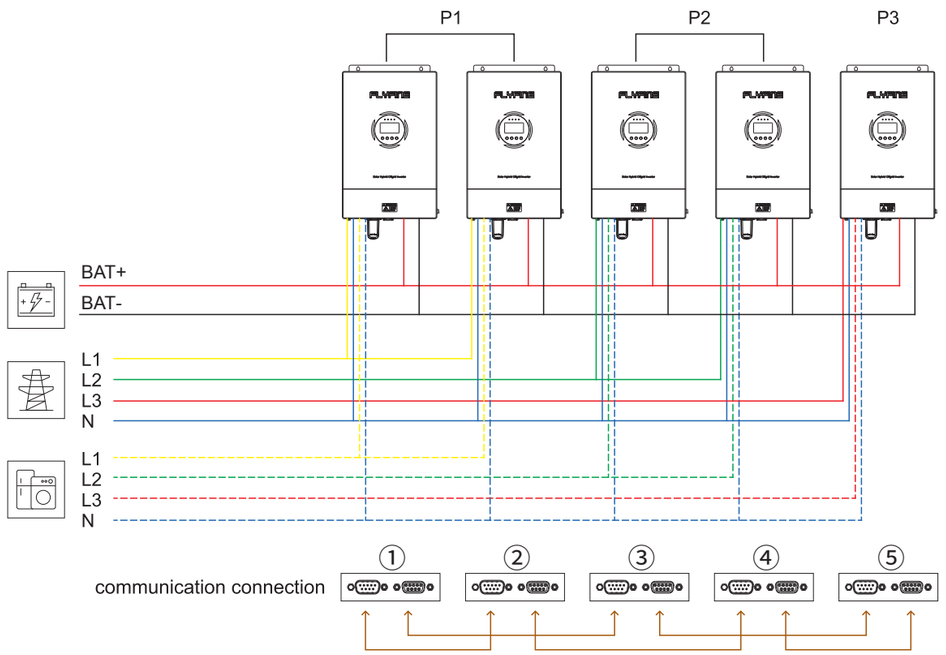
One inverter in each phase:



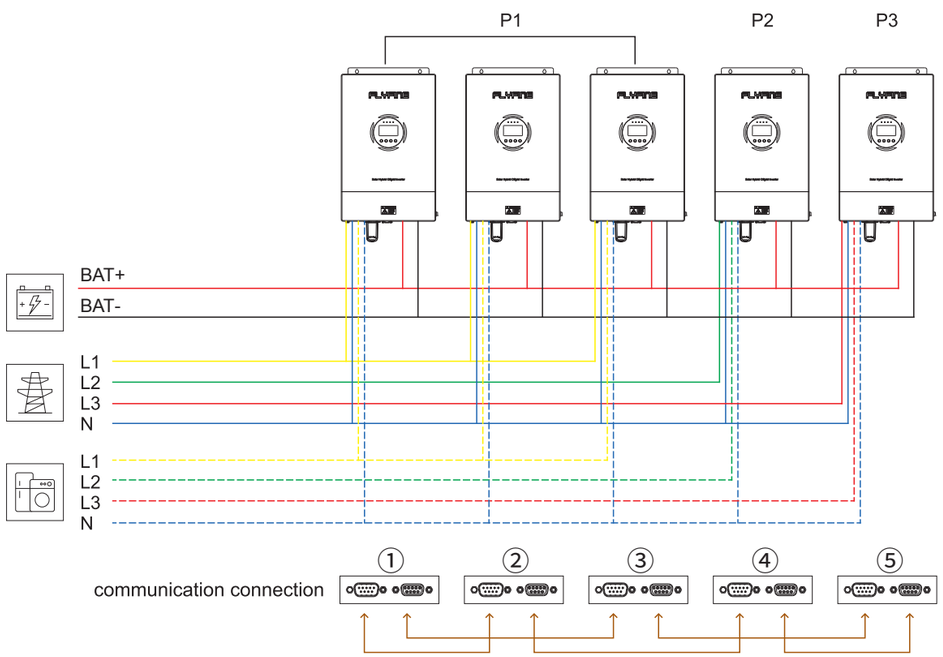
Two inverters in one phase and only one inverter for the remaining two phases:



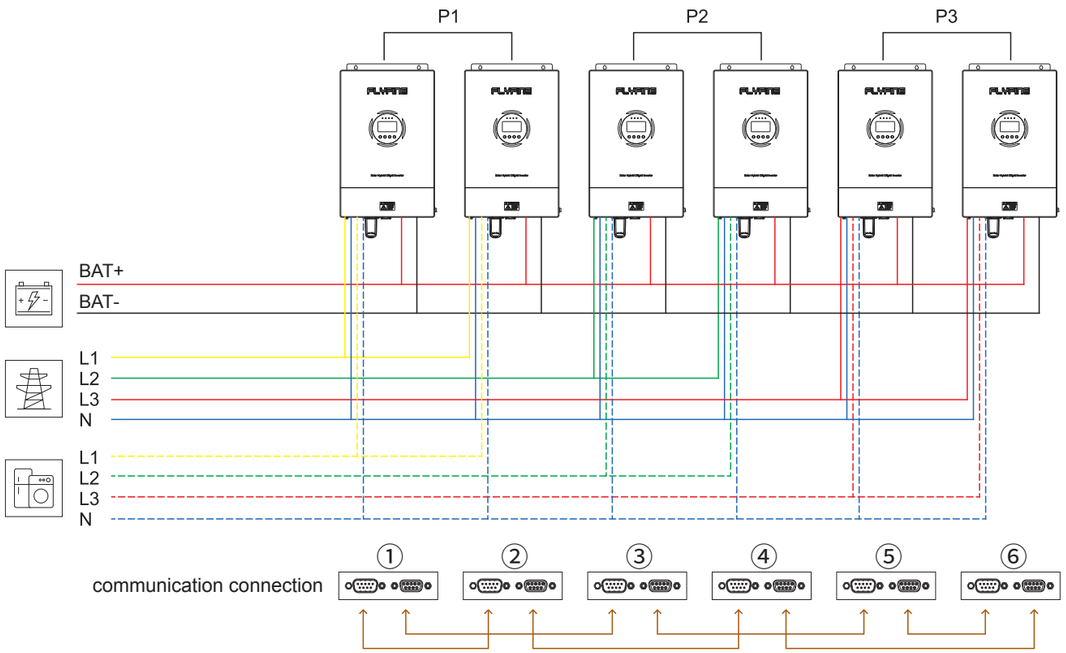
Two inverters in two phases and only one inverter for the remaining one phase:



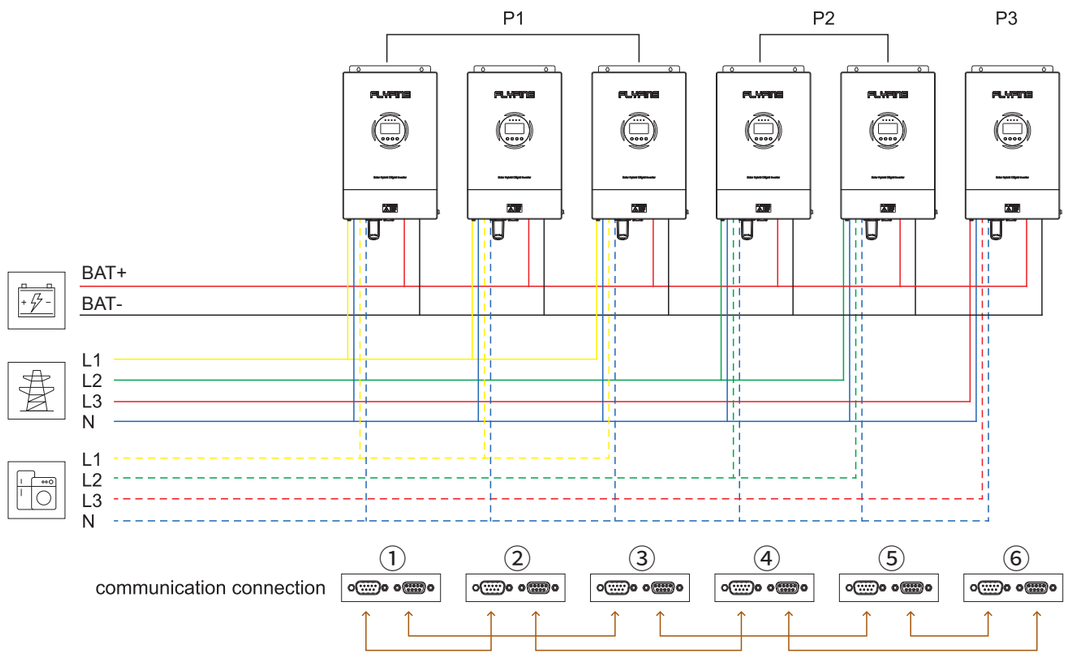
Three inverters in one phase and only one inverter for the remaining two phases:



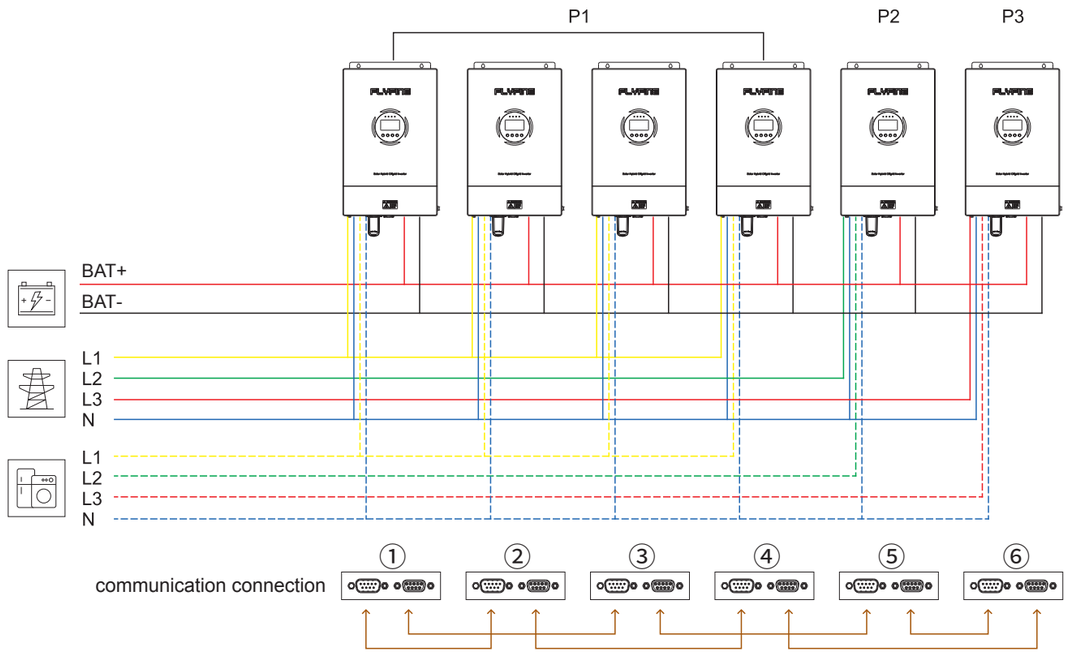
Two inverters in each phase:



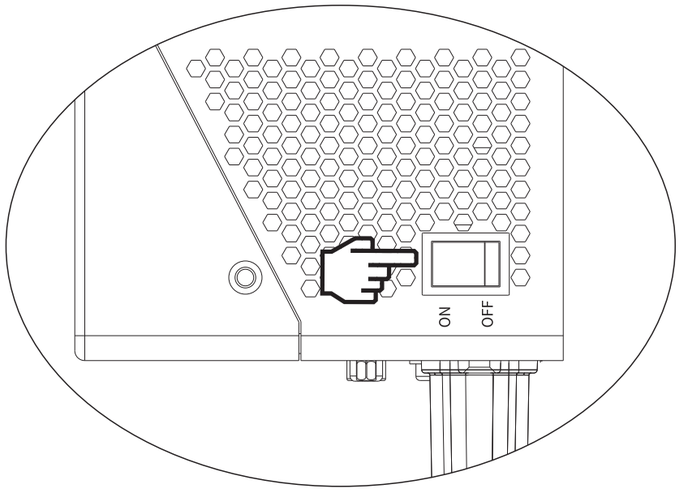
Three inverters in one phase, two inverters in the second phase and one inverter for the third phase:



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



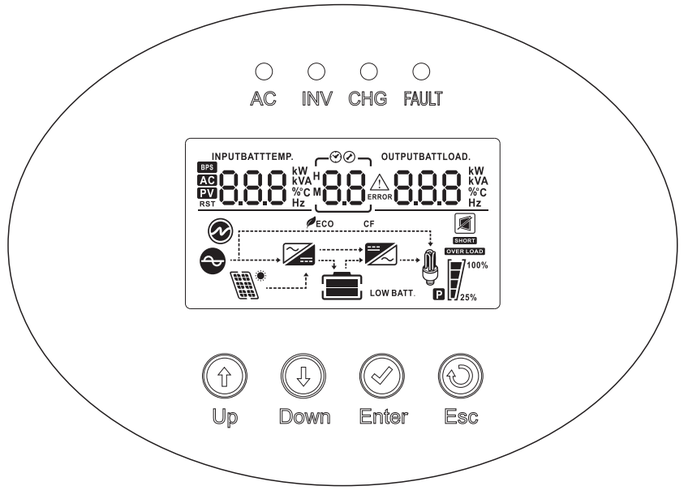
Operation



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

Instructions for operation panel

The operation and display panel, shown in below chart, is on the front panel ofthe inverter. Itincludes four indicators, four function keys and LCD display, indicating the operating status and input/output power information.



1.1 Four-button function

The keys	Functional specifications
Function Setting / Identifying key	Function setting: Press ENTER key on the display page for more than 2 seconds to enter the function setting page. After entering the setting interface, press UP or DOWN key to turn the page up and down to select the interface to be set. OK: On the Function Settings page, press ESC key for 0.1 second to 2 seconds to determine the options for setting.
Page Turn/Query key	Page turning: Press UP or DOWN key on any page for more than 0.1 second to turn the page left or right.

1.1.1 LED Indicator Functions

LED Indicator			Messages
AC	Green	Solid On	The utility grid is running properly
		Flashing	The utility grid is normal, but the utility grid supply is not working
		light off	The utility grid power is abnormal
INV	Yellow	Solid On	The machine is working in battery mode
		light off	Indicates other status
CHG	Yellow	Solid On	The battery is floating charged
		Flashing	The battery is being charged at constant voltage
		light off	Indicates other status
FAULT	Red	Solid On	The inverter is faulty
		Flashing	An alarm is generated on the inverter
		light off	The inverter is working properly

1.1.2 Function Buttons

Button	Description
ESC	To exit setting mode
UP	Go to previous selection
DOWN	Go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

1.1.3 LCD Function Display

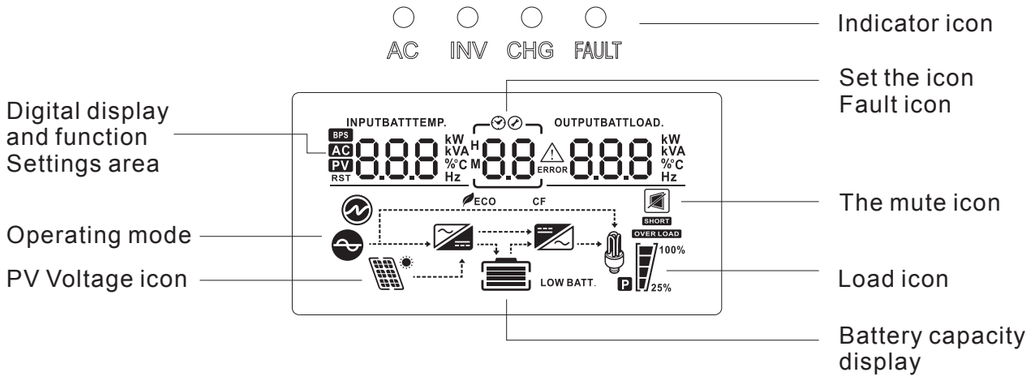


Figure 1-2 Four-button LCD screen

LCD display can be divided into: icon display, numerical display and function setting area, working mode display area.

Icon display:

- Load and battery graph indicates load and battery capacity. Each square represents 25% ofthe capacity. The load icon blinks when the inverter is overloaded, and the battery icon blinks when the battery capacity is too low or the battery is not connected.
- Buzzer icon Indicates whether the buzzer is silent. Normally, this icon is not displayed. In any mode, the backstage software sets MUTE ON, the inverter enters the MUTE state, and the buzzer disabled icon will be displayed.
- The Settings icon will be on when enter the Settings menu. Otherwise, the icon will not be displayed.
- The faulticon is displayed only in fault mode. In other cases, the faulticon is not displayed.

Value display and function setting area:

- In non-functional mode, the inverter information is displayed in this area.Outputinformation is displayed in normal mode. Pressing query key (UP or DOWN key) can display input voltage and output voltage, inputfrequency and outputfrequency, battery voltage and current, PV voltage and PV current, PV voltage and power, output power and output voltage, output apparent power and output voltage, load percentage and output voltage, software version and other related information. Fault mode displays the fault code.
- On the Function Setting page, you can setthe output voltage (OPU) and battery low-voltage shutdown point (EOd) by using the Operation function setting key and the UP and Down searching keys.

Working mode display area:

- After starting for 4 seconds, this display area mainly displays the working mode ofthe inverter. For example, standby mode, utility grid mode, battery mode, and Fault mode.

1.1.4 Inverter working status table ofthe buzzer

A buzzer alarm is generated	describe
A long sound lasts ten seconds and then stops	Failure mode
The long sound stops after three seconds	The PV/input voltage is lost or recovered
	The main switch of startup is turned on or off
Sound one time per second, last for one minute, and then stop	All other alarms (it will beep for low battery voltage only in battery mode)

1.2 Daily Power on and Off

Please refer to this manual for switching on and offthe machine.

1.2.1 Startup Procedure

You can startthe device when a qualified battery or the utility grid (the utility grid input range must comply with the output mode) is connected.

➢ Switch utility grid on

Connectto utility grid, press the switch, and switch to ON. The system starts. If utility grid outputis preferred, waitfor a while until the utility grid mode is displayed ON the rear panel.

➢ Switch the battery on

Connectto the normal battery, press the switch, the inverter to establish working power supply.

The system automatically starts. After a while, the system enter the battery mode ifthe battery mode is displayed on the rear panel,.

1.2.2 Shutdown Procedure

Press the switch again to turn it OFF when the system is in battery mode or utility grid mode, and the system will shut down.

1.2.3 Mute operations

Can set MUTE ON or OFF to MUTE or UNMUTE the inverter when the inverter is in any mode.

1.2.4 Operations performed in the Alarm State

Itindicates thatthe inverter is in the alarm state ifthe inverter has an alarm sound and the LED fault indicator blinks.You can locate the cause ofthe alarm or contactthe supplier based on the alarm information.

1.2.5 Operations in Fault Mode

Itindicates thatthe inverter is working in fault mode when the inverter buzzer is always ringing and the LED faultindicator is always on. Contactthe supplier or maintenance personnel to provide information aboutthe fault alarm and help to troubleshootthe fault.

1.3 Parameter Query operations

Under normal circumstances, it has a total often pages for the display. Press the query key UP or DOWN 0.2 to 1 second to turn the display page, display input and output voltage, input and output frequency, battery, PV voltage and current, load, software version, and other information. A page of alarm information is added if an alarm is generated. The fault code page is displayed by default Ifthe inverter is faulty. The fault or alarm information is displayed on the main page by default. The output voltage and frequency information are displayed on the main page by default when the inverter has no fault or alarm.

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

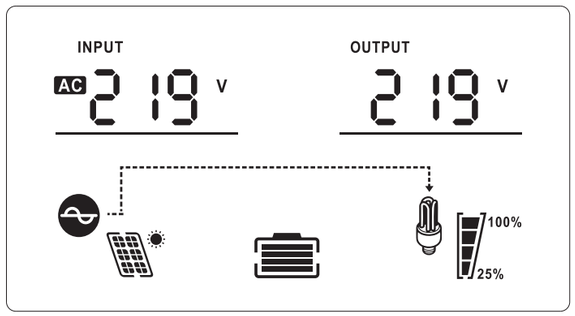


Figure 1-3 shows page 1

Page 2: Displays the inverter input and outputfrequency, as shown in Figure 1-4

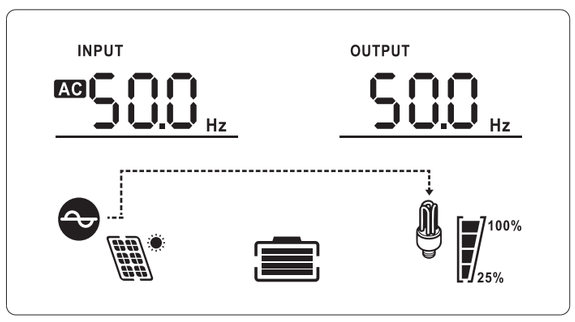


Figure 1-4 Showing page 2

Page 3: Battery information is displayed, showing the battery voltage and charging current, as shown in Figure 1-5

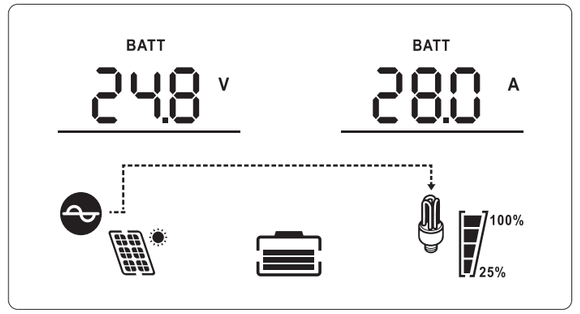


Figure 1-5 shows page 3

Page 4 :PV information is displayed, showing the PV voltage and PV charging current, as shown in Figure 1-6

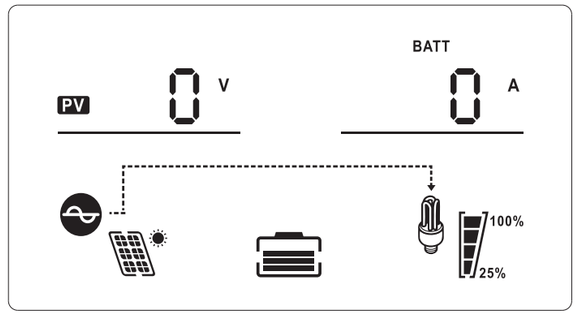


Figure 1-6 shows page 4

Page 5:PV Information is displayed, showing the PV voltage and PV charging power, as shown in Figure 1-7

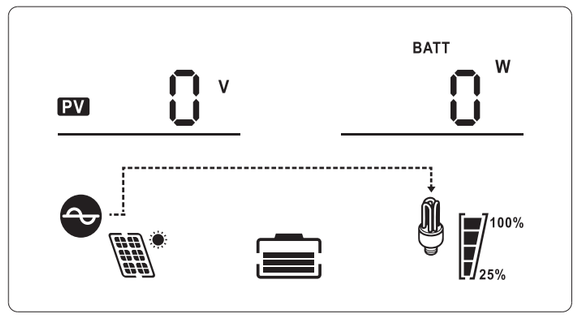


Figure 1-7 Display page 5

Display page 6: Output Information is displayed, showing the output voltage and active power, as shown in Figure 1-8

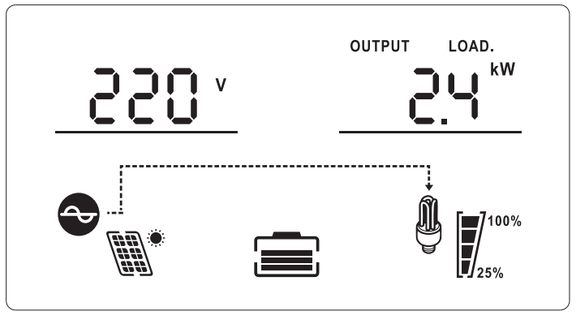


Figure 1-8 Display page 6

Display page 7: Output Information is displayed, showing the output voltage and output complex power, as shown in Figure 1-9

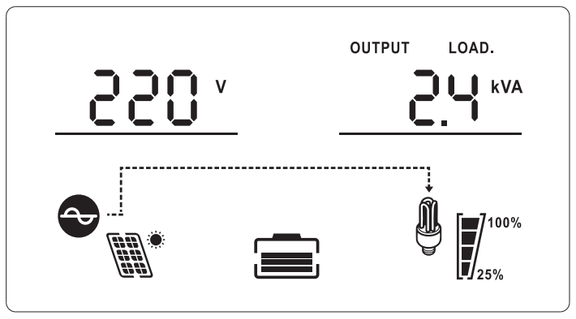


Figure 1-9 shows page 7

Display page 8: Outputinformation is displayed, showing the voltage and load percentage, as shown in Figure 1-10

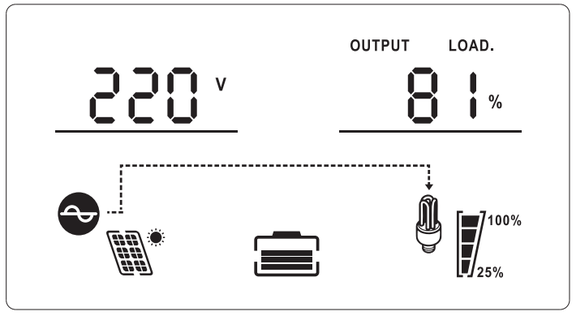


Figure 1-10 Display page 8

Display page 9: The software version ofthe inverter is displayed, as shown in Figure 1-11

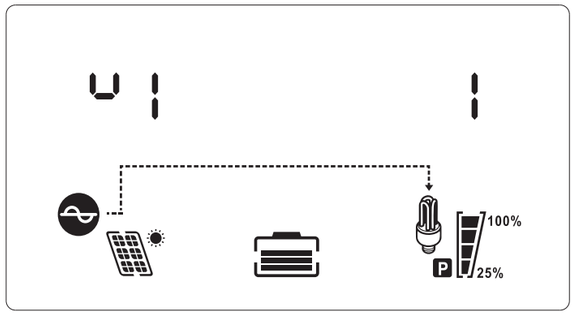


Figure 1-11 Display page 9

Display page 10: Displays the MPPT software version, as shown in Figure 1-12

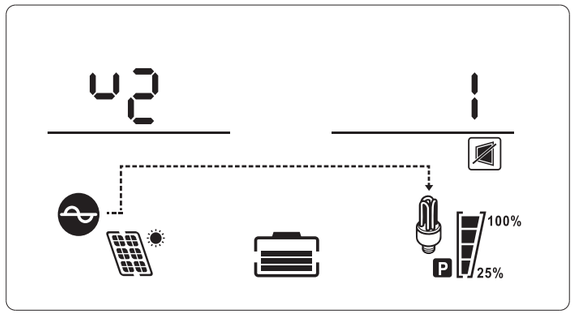


Figure 1-12 shows page 10

Display Page 11: Shows the photovoltaic power generation, as shown in Figure 1-13

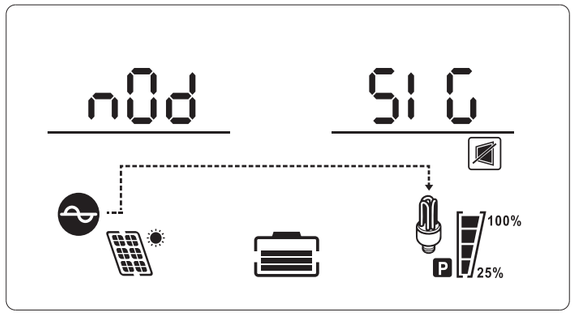


Figure 1-13 Display Page 11 (parallel status)

Display page 12: Lithium battery networking status; For SIG constant, the battery pack is in single group operation; For PAR constant, the battery pack is in parallel operation; The battery pack is in parallel operation when PAR is flashing.

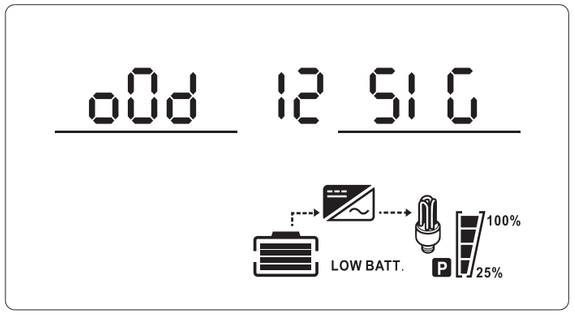


Figure 1-14 Display page 12 (lithium battery networking status)

Display page 13: Lithium battery voltage and currentinformation; BMS voltage information is displayed on the upper left; BMS currentinformation is displayed on the upper right. The upper left and right shows the flashing ERR when BMS communication fails.

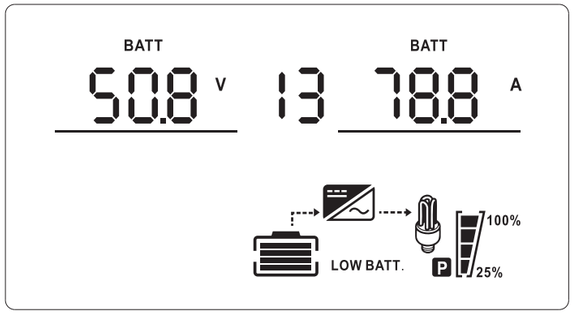


Figure 1-15 Display Page 13 (lithium battery voltage and currentinformation)

Display page 14: Lithium battery temperature and SOC. BMS temperature is displayed on the upper left and BMS SOC is displayed on the upper right. Itflashes ERR when BMS communication fails.

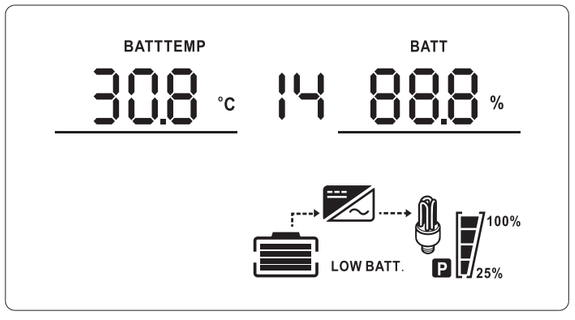


Figure 1-16 Display Page 14 (lithium battery temperature & SOC information)

Display page 15: Lithium battery capacity; The rated capacity is displayed on the upper left and the current capacity displayed on the upper right. The upper left and right show the flashing ERR when BMS communication fails.

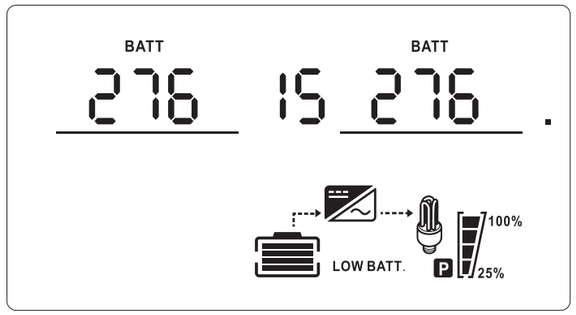


Figure 1-17 Display Page 15 (lithium battery capacity information)

Display page 16: Constant voltage point oflithium battery; Fixed letter CV is displayed on upper left and BMS constant voltage charging pointis displayed on the upper right. The upper left and right show the flashing ERR when the BMS communication fails.

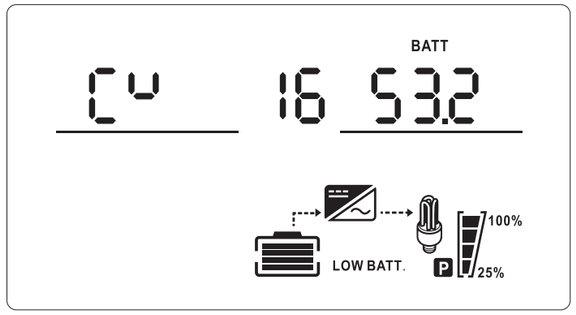


Figure 1-18 Display page 16 (lithium battery battery constant voltage information)

Display page 17: Lithium battery fault alarm information; BMS alarm information on the upper left; BMS faultinformation on the upper right. Itflashes ERR on upper left and upper right when BMS communication fails.

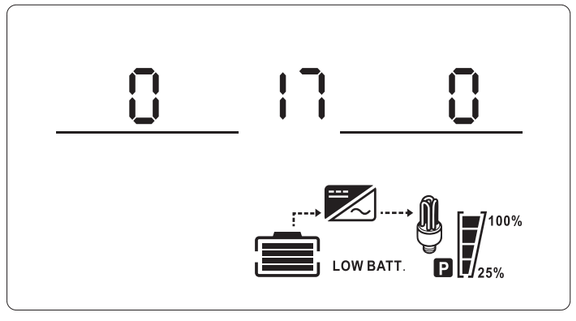


Figure 1-19 Display page 17 (lithium battery fault alarm information)

1.4 Function Setting Operations

➢ Function setting operation ofinverter:

Enter the exitfunction setting page and the operations details are as below:

- Press the function setting key ENTER for more than 2 seconds to enter the function setting page. Press the query key UP or DOWN for 0.1 to 2 seconds to selectthe function. The corresponding function will blink after turning the page to the required function setting page.
- Press the key ENTER for 0.1 to 2 seconds to enter the setting page ofthe selected function. Atthis time, the words ofthe selected function will be steady bright, and the value will blink on the left ofthe words ofthe selected function. Press QUERY KEY UP or DOWN for 0.1 to 2 seconds and selectthe value ofthe desired function parameter.
- Press the key ENTER for 0.1 to 2 seconds after turning the page to the desired function parameters. The function setting is completed. Atthis time, the value ofthe function parameters will be steady bright and no longer blink.

Press ESC key for 0.1 to 2 seconds to setthe function successfully. Atthe same time, exitthe function setting page and return to the main display page (you can also do nothing, and it will automatically turn back to the main display page after waiting for 30 seconds at most).

1.4.1 Output Voltage (OPU)

Figure 1-12 Setting the output voltage

- The default output voltage is 230V. 208V, 220V, 230V and 240V can be setfor all working conditions and take effectimmediately.
- Press the function setting key ENTER for more than 2 seconds to enter the function setting page. Press the query key UP or DOWN for 0.1 to 2 seconds to selectthe function. The word OPU flashes when turn the page to the setting page of output voltage OPU.
- Press the key ENTER for 0.1 to 2 seconds to enter the setting page of output voltage OPU. Atthis time, the word OPU will be steady bright and the value of OPU will blink on the right ofthe word OPU. Press the query key UP or DOWN for 0.1 to 2 seconds, and select different output voltage values. The available voltage values are 208V, 220V, 230V and 240V. The output voltage is 230V by default. The Settings are saved in real time.
- Press the key ENTER for 0.1 to 2 seconds after turning the page to the desired output voltage value. The output voltage OPU is set. Atthis time, the value on the right side of OPU will be steady bright and no longer flicker.
- The function is set successfully after press ESC key for more than 0.1 to 2 seconds, then exitthe function setting page, return to the main display page (If not operate, waitfor maximum 30

seconds to automatically turn back to the main display page).

- Note:
- The output voltage must be derated to 90% ifthe output voltage is setto 208V.

1.4.2 Setting Other Functions

1.4.2.1 Output Frequency (OPF)

The outputfrequency is set. The default value is 50Hz.

Figure 1-13 Setting the outputfrequency

Function description: Setthe inverter outputfrequency 50Hz and 60Hz can be set. The default value is 50Hz.

Setting conditions: All status can be set. In battery mode, the setting will take effect when the machine is restarted nexttime. The utility grid mode takes effectimmediately. The frequency changes slowly after you switch itto battery mode.

1.4.2.2 Setting Output Priority (OPP)

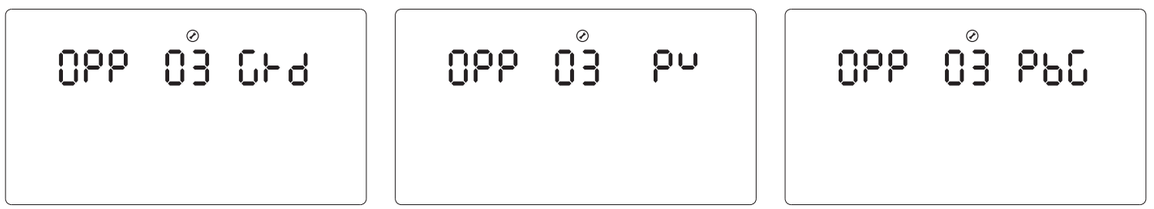


Figure 1-14 Setting the output priority page

Function description: Setthe inverter output priority.

Setting conditions: All status can be set, and the setting takes effectimmediately.

Note:

There are three options for the inverter output priority. The default output priority is GRD: The utility grid outputis preferred. The second is PU(PV): photovoltaic outputis preferred; The third is PBG: photovoltaic >battery >utility grid output.

1.4.2.3 Output Mode (MOD)

Figure 1-15 Setting the output mode

Function description: Setthe inverter output mode.
Setting conditions: All status can be set and take effectimmediately.

Description:

There are two options for AC output mode, the default mode is APP: Appliance, which is used for household appliances; The second is UPS mode, which is used for equipment such as computers. The typical switchover time is 10ms.

1.4.2.4 Charging Priority (CHP)

Figure 1-16 Setting the charging priority page

Function description: Setthe charging priority ofthe inverter.
Setting conditions: All status can be set, and the Settings take effectimmediately.

Description:

There are four charging priorities, the default priority is PNG (PV and Grid):PV charging and Grid charging are atthe same time; The second is OPV(Only PV): Only PV charging; The third is GRD(Grid): the charging priority is utility grid; The fourth is PV: the charging priority is PV charging

1.4.2.5 Grid Charging Current (RCC)

Figure 1-17 Setting the grid maximum charging current

Function description: Setthe grid maximum rechargeable current ofthe inverter.
Setting conditions: All status can be set.

Description:

RCC:The maximum charging current of grid is setto 30A by default, and the setting range is [1,80A]

1.4.2.6 Maximum Charging Current (MCC)

Figure 1-18 Setting the maximum charging current

Function description: Setthe maximum charging current ofthe inverter.
Setting conditions: All status can be set.

Description:

MCC:Maximum Charge Current refers to the Maximum value of PV and grid charging current.

Itis optional (2/10/20/30/40/50/60/70/80A)

1.4.2.7 Menu Default (MDF)

Figure 1-19 Returning to the Settings page

Function Description: Return to the main screen.
Setting conditions: All status can be set.

Description:

The default setting is ON. In the function setting operation, ifitis setto ON, the page is notin the first interface (P1) atthis time, and will return to the firstinterface after 1min; Ifthis parameter is setto OFF, the LCD remains on this screen ifthe page is notin the first screen (P1).

1.4.2.8 Overload Restarting (LrS)

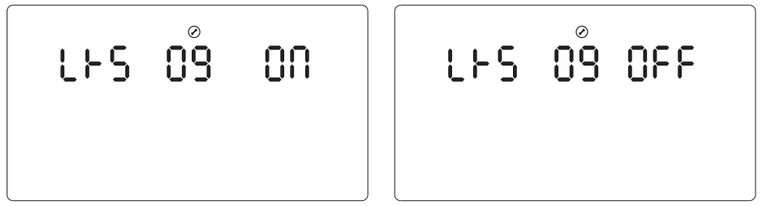


Figure 1-20 Setting the overload restart page

Function description: Set overload restart.
Setting conditions: All status can be set.

Description:

The default setting of overload restartis ON.

1.4.2.9 Over-temperature Restart (TrS)

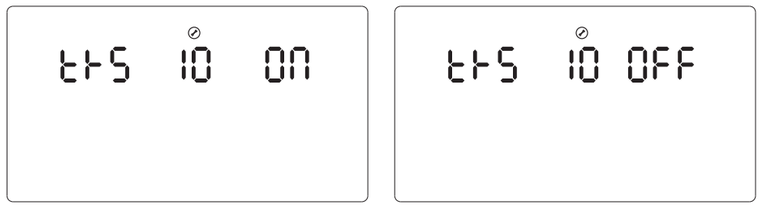


Figure 1-21 Setting the over-temperature restart page

Function description: Restartthe system from over-temperature.
Setting conditions: All status can be set.

Description:

The default setting of over-temperature is ON.

1.4.2.10 Main Input Power Failure (MIP)

Figure 1-22 Setting the alarm page of main input power failure

Function description: Setthe constant alarm for grid or PV loss.
Setting condition: All status can be set. The default status is ON. The grid or PV loss alarm keeps ringing for a period oftime. You can setitto OFF.
(All modes can be set)

Description:

MIP:Main Input cut warning

The default value is ON. The buzzer will ring for 3 seconds ifthe primary input detection is lost. The buzzer does not sound frequently after the main inputis lost when the parameter is setto OFF.

1.4.2.11 Energy Saving Mode (PWS)

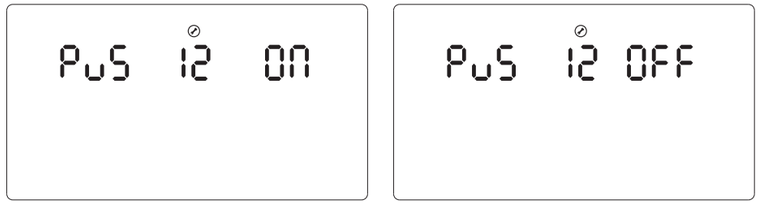


Figure 1-23 Setting the energy saving mode

Function description: Set whether to enable the low-power mode (energy saving mode) for the inverter.
Setting conditions: All status can be set.

Description:

PWS:Power Saving
The default value is OFF, and the function is disabled. In battery mode, the output of system will temporarily stop ifthe load is lower than 25W when this parameter is setto ON; The output will continue ifthe load is higher than 35W, and the output of system will resume normal.

1.4.2.12 Transition from Overload to Bypass Mode (OLG)

Figure 1-24 Setting the transition from overload to bypass mode

Function description: Set whether to switch to grid mode immediately (also known as bypass mode) when itis overloaded in battery mode.
Setting conditions: All status can be set.

Description:

OLG:Overload to Bypass
The default value is OFF, and the function is disabled. The system will immediately switch to bypass mode (grid output, thatis, bypass mode) ifthe PV outputis overloaded when the value is setto ON, .

1.4.2.13 Setting Mute (MUE)

Figure 1-25 Setting the mute page

Function description: Sets whether the buzzer beeps.
Setting conditions: All status can be set.

Description:

MUE:Mute
The default value is OFF, and the Mute function is disabled. The buzzer does not sound in any state, such as alarm or fault when the parameter is setto ON.

It can be setin any modes , and the function is normal, butthe picture can not be displayed.

1.4.2.14 Battery Return to Grid Voltage Point (BTG)

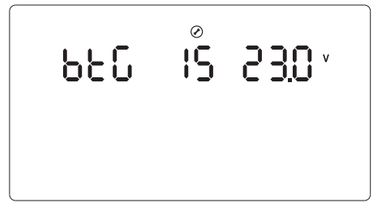


Figure 1-26 Switching the battery back to the grid voltage point

Function Description: Ittransfers to grid power supply only to ensure thatthe battery will not be empty when the battery and grid power supply atthe same time and the battery discharging reaches a certain voltage.
Setting conditions: All status can be set, and the output priority must be setin PV and PBG mode.

Description:

BTG:Back To Grid
The default value is 46V

When the definition mode ofbattery is CUS(Customer Set Type) mode:
The range can be [44,52]

When the battery is AGM(lead-acid battery type) or FLD (water-injection battery type) :
The default value is 46V. The range can be [44,52].

When the battery is LIB (lithium battery type) :
The default value is 47.6V. The range can be [40,50].

1.4.2.15 Switching Back to Battery Mode Voltage Point (BTB)

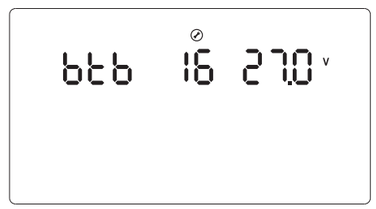


Figure 1-27 Setting the battery voltage pointthat let Grid mode switch back to battery mode

Function Description: It needs to reach a certain battery voltage value to restartthe battery mode after

shutdown for a low battery voltage.
Setting conditions: All status can be set.

Description:

BTB:Back To Battery
The default value is 52V
When itis setto FUL, the battery will be charged until itis fully charged before restarting in battery mode.

When the definition mode ofbattery is CUS(Customer Set Type) mode:
It can be setin the range of [48,58]

When the definition mode ofbattery is AGM(lead-acid battery type) or FLD (water-injection battery type) :
The default value is 52V. The range can be [48,58]

When the definition mode ofbattery is LIB (lithium battery type) :
The default setting is 54.4v, and the range can be setto [46,58]

1.4.2.16 Battery Type (BAT)

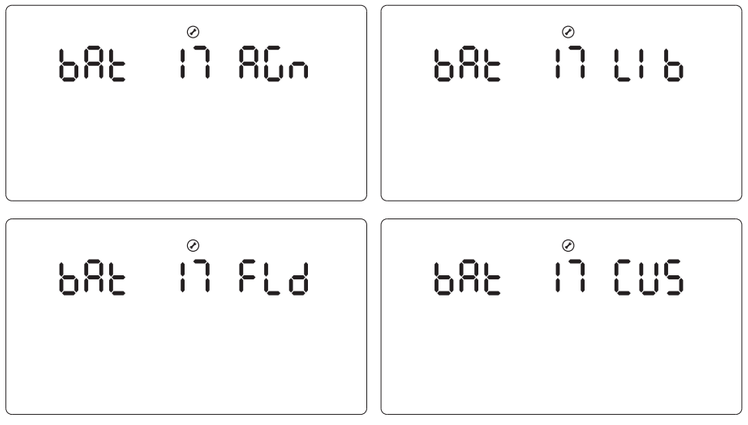


Figure 1-28 Battery type setting page

Function Description:Setthe battery type.
Setting conditions: All status can be set.

Description:

BAT:Battery Type
Four battery types are set: AGM(lead-acid battery) is set as the default; The second is FLD(water injection battery); The third type is LIB (lithium battery); The fourth is CUS(Customer setting type)

1.4.2.17 Battery Low Voltage Point (bAL)

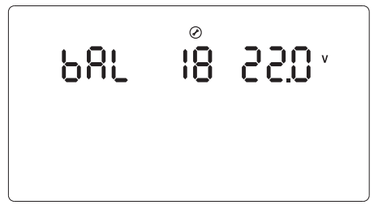


Figure 1-29 Setting the battery low voltage point

Function Description: Sets the low alarm point.
Setting conditions: All status can be set.

Description:

bAL:battery Low
This parameter cannot be set when the definition mode ofbattery is AGM(lead-acid battery type) or FLD (water-injection battery type).
The default value is 44V
The battery low voltage point can be modified when the battery type is setto CUS(Customer settype).
The value range is [42,54].

Ifthe battery type is setto LIB(lithium battery type), you can change the battery low voltage point.
The default value is 47.6V, and the range is [41.2,50.0].

1.4.2.18 Battery Shutdown Point (bAU)

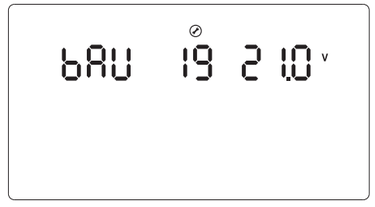


Figure 1-29 Setting the battery shutdown point

Function Description: Battery low voltage shutdown point setting.
Setting conditions: All status can be set.

Description:

bAU:battery Under
This parameter cannot be set when the battery definition mode is AGM(lead-acid battery type) or FLD (water-injection battery type).
The default value is 42V

The battery shutdown point can be modified when the battery type is setto CUS(Customer Setting type).
The value range is [40,48].

When the battery type is setto LIB(lithium battery type), you can change the battery shutdown point.
The default value is 46V. The value range is [40,48].

1.4.2.19 Setting Voltage Points in Constant Voltage Mode (bCV)

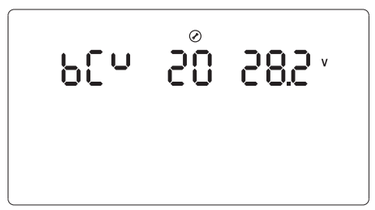


Figure 1-30 Setting the voltage pointin constant voltage mode

Function Description: Constant voltage point setting.
Setting conditions: All status can be set.

Description:

bCV:battery Constant Voltage
This parameter cannot be set when the definition mode ofbattery is AGM(lead-acid battery type) or FLD (water-injection battery type).
Initial default Settings: 56.4V (AGM), 58V (FLD)

The constant voltage charging point can be modified when the battery type is setto CUS(Customer Setting type).
The value ranges from 48 to 60. The constant point voltage needs to be greater than the floating point voltage.

Ifthe battery type is setto LIB(lithium battery type), the constant voltage charging point can be changed.
The default value is 56.4V and the value range is [48,60]. The constant point voltage needs to be greater than the floating point voltage.

1.4.2.20 Voltage Point Setting in Floating Charge Mode (bFL)

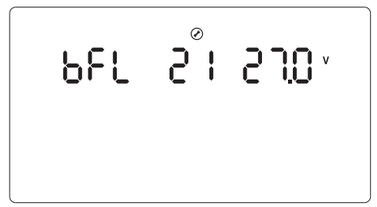


Figure 1-31 Setting voltage pointin floating charge mode

Function Description: Float charging voltage point setting.
Setting conditions: All status can be set.

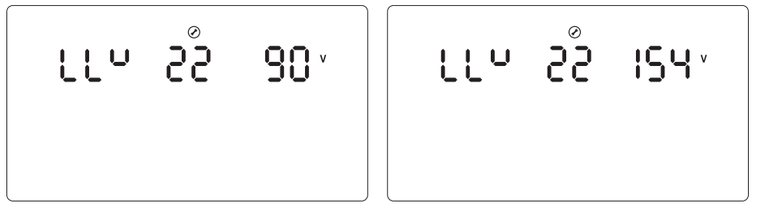
Description:

bFL:battery Float
This parameter can not be set when the definition mode ofbattery is AGM(lead-acid battery type) or FLD (water-injection battery type)
The default value is 54V

The battery type is setto CUS(Customer Setting Type) to modify the floating battery charge point.
The value ranges from 48 to 60V. The constant point voltage needs to be greater than the floating point voltage.

Ifthe battery type is setto LIB(lithium battery type), the constant voltage charging point can be changed.
The default value is 55.2V. The value range is [50,58]. The constant point voltage needs to be greater than the floating point voltage.

1.4.2.21 Low Voltage Point Setting of Grid (LLV)



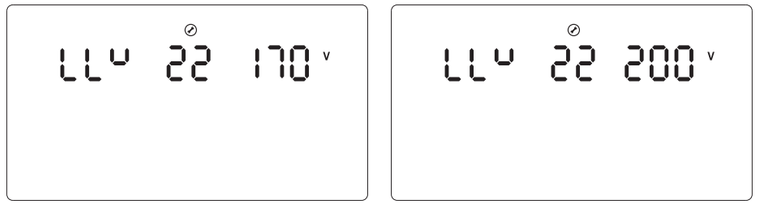


Figure 1-32 Setting the low-voltage point of grid in inverter mode

Function Description: Setthe low voltage protection point of grid.
Setting conditions: The inverter is in APP and UPS mode, and all status can be set.

Description:

LLV:Line Low Voltage
Output mode: MOD needs to be setto APP, the default value oflow voltage point of grid is 154V, and the range of setting is [90,154]; Output mode: MOD needs to be setto UPS, the default value is 185V, and the range is [170,200].

1.4.2.22 Setting High Voltage Point of Grid (LHV)

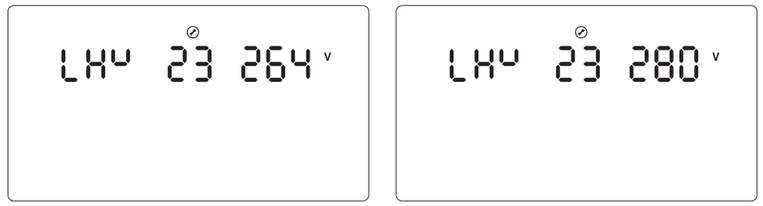


Figure 1-33 Setting high voltage point of grid

Function Description: Setthe high voltage protection point of grid.
Setting conditions: The inverter is in APP mode, and all status can be set.

Description:

LHV:Line High Voltage
Output mode: MOD needs to be setto APP, the default value ofhigh voltage point of grid is 264V, and the range is [264,280].

1.4.2.23 Setting Low Power Discharging Time (LWD)

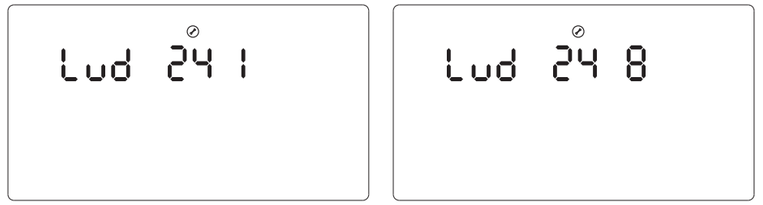


Figure 1-34 Setting the low-power discharging time

Function Description: LOW POWER DISCHARGING PROTECTION FUNCTION, IN BATTERY MODE, at a low load, unlimited time of discharging will make the battery very empty, affecting the battery life. In the setting time oflow power amplifier of Inverter, the low voltage shutdown point ofbattery will be increased to 44V.
Setting conditions: All status can be set when the inverter is setin APP mode.

Description:

LWD:Low Watt Discharge
The default value oflow-power discharging time is 8(8 hours), and the range can be [1, 8].
In battery mode, if not reached the battery shutdown point, the battery voltage shutdown point will be changed to 11V* number ofbatteries after the continuous discharging time of more than 8 hours. The system will alarm for 1 minute and then shut down when the battery is discharged to 11V* number of batteries.
The battery discharging time is reset when the battery voltage exceeds 13.2V x the number ofbatteries for more than 30s, .

1.4.2.24 Inverter Soft Start Setting (SRE)

Figure 1-35 Setting the soft startup ofthe inverter

Function: The inverter output voltage gradually increases from 0 to the target value when the interface is in the ON state. The inverter output voltage is directly increased from 0 to the target value when the interface is in the OFF state.

Setting conditions: All status can be set.

Description:

SRE:Soft Relay Enable
Ifthe default value is OFF, the output switch is turned to on only when the inverter voltage rises to the rated output. Ifthis parameter is setto ON, the output switch is turned to ON before the inverter starts to boost voltage.

1.4.2.25 Setting Default Values (STD)

Figure 1-36 Setting default values

Restore all Settings to default values.
Setting conditions: This parameter can be setin grid mode or StandBy (StandBy: no output butthe screen is on). It can not be setin battery mode.

Description:

STD:Set Default
Before the setting, the screen is displayed as OFF. The system restores the default setting when the screen is setto ON. After the setting is completed, the screen will display OFF again.
It can be setin grid and standby mode and take effectimmediately. It can not be setin battery mode and pictures can not be displayed.

1.4.2.26 Setting Parallel Mode (PAM)

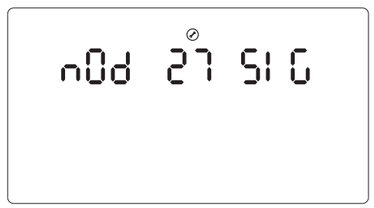


Figure 1-36 Setting default values

Set parallel working mode.
Setting conditions: This parameter can be setin grid mode or StandBy (StandBy: no output butthe screen is on). It can not be setin battery mode.

Description:

PAM: Parallel operation mode.
The default single mode is SIG. Butit can be setto parallel mode (PAR) : 3P1 (R phase), 3P2 (S phase) and 3P3 (T phase) .
To use the parallel function, firstly connectthe parallel system in the correct way, and then setthe parallel mode of each machine correctly. Ifthere is one machine setto SIG in the parallel system, the machine reports fault 24. Ifthere are machines setto 3P1, 3P2 and 3P3 in the parallel system, all machines must be setto one ofthe three modes and at least one machine exists in each mode; otherwise, all machines setto the three modes reportfault 24.
It can be setin grid and standby mode and take effectimmediately. It can not be setin battery mode and pictures can not be displayed.

1.4.2.27 Battery Missed (SBA)

Figure 1-36 Setting default values

Function Description: Enable the unconnected battery alarm.
Setting conditions: All status can be set.

Description:

SBA:Set battery alarm.
The default setting is OFF.
Ifthis parameter is setto OFF, no battery unconnected, battery low voltage, or battery undervoltage alarms will be generated when the battery is not connected.

1.4.2.28 Balancing Mode (EQM)

Figure 1-37 Setting the balancing mode

Function: Sets whether to enable the balance mode.
Setting conditions: All status can be set.

Description:

EQM:Equalization Mode

The default value is OFF, and the function is disabled. Setto ON, the controller will enter the equalization phase when the equalization interval (battery equalization cycle) setis achieved during the floating charging phase, or when the equalization is activated immediately.

1.4.2.29 Setting the Equalization Voltage Point (EQV)

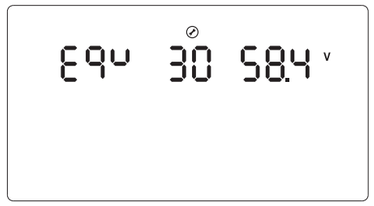


Figure 1-38 Setting the voltage balancing point

Function Description: Equalization voltage point setting function.
Setting conditions: All status can be set.

Description:

bCV:Equalization Voltage

All modes can be set.

The default value is 58.4V , and the value range is [48,60].

1.4.2.30 Setting Balanced Charging Time (EQT)

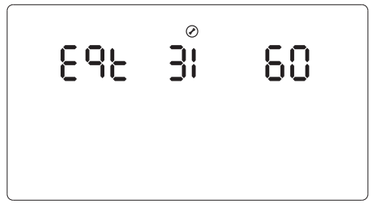


Figure 1-39 Setting the balanced charging time

Function Description: Balance charging time setting.
Setting conditions: All status can be set.

Description:

EQT:Equalization Time

In the equalization phase, the controller will charge the battery as much as possible until the battery voltage rises to the equalization voltage. Then constant voltage regulation is used to maintain the balanced

voltage ofthe battery. The battery will remain in the equalization phase until the setting equalization time ofbattery is up.

The default value is 60 minutes. The value can be setin the range of [5,900], and the value can be set in increments of 5 minutes every time.

1.4.2.31 Setting the Balancing Delay (EQO)

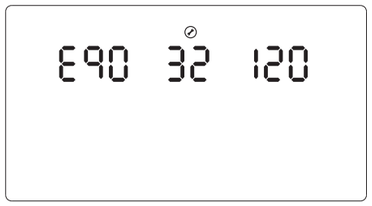


Figure 1-40 Setting the delay balancing page

Function Description: Balancing delay charging time setting.
Setting conditions: All status can be set.

Description:

EQT:Equalization Timeout

In the equalization phase, the charging controller extends the battery equalization time until the battery voltage become balanced when the battery equalization time expires and the battery voltage does not rise to equalization voltage point. The charging controller stops equalization and returns to the floating charging phase when the battery equalization delay is completed and the battery voltage is still lower than the equalization voltage.

The default value is 120 minutes. The value can be setin the range [5,900], and the value can be setin increments of 5 minutes every time.

1.4.2.32 Setting the Balancing Interval (EQI)

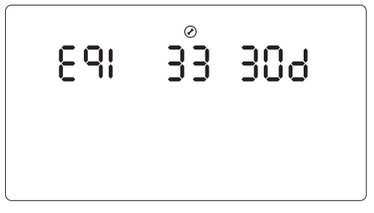


Figure 1-41 Setting the balancing interval

Function Description: Balanced charging interval setting.
Setting conditions: All status can be set.

Description:

EQI:Equalization interval

In the float charging stage with balanced mode enabled, ifbattery connection is detected and the setting equalization interval (battery equalization period) is reached, the controller start entering the equalization phase.

The default value is 30 days. The value range is [1,90], and the increments are 1 day every time.

1.4.2.33 Enabling Balancing Settings Immediately (EQN)

Figure 1-42 Start Balancing Settings Immediately page

Function: Set whether to enable the balancing mode for the inverter immediately.

Setting conditions: All status can be set.

Description:

EQN:Equalization Now

The default value is OFF, and the function is disabled. When setto ON, the equalization charging is activated immediately and the controller begins to enter the equalization phase when the battery is detected in the floating charging phase under the equalization mode.

1.4.2.34 Grid-connected inverter function (GTI)

Figure 1-43 Grid-connected inverter function setting page

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

Setting conditions: All status can be set.

Description:

GTI:Grid Tie Invert

The default setting is OFF, and the function is notturned on; The inverter supply the extra energy for

grid by tracking the maximum power point when setto ON. After the function is turned on, an alarm 56 is generated, and the inverter no longer decides the operation logic according to the BMS information ifthe communication abnormality occurs.

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

1.4.2.35 Battery dual-circuit output low-voltage shutdown point (DBV)

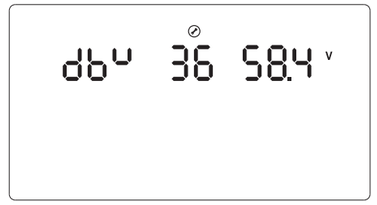


Figure 1-44 Dual-way output low-voltage shutdown point of Battery page

Function description: The secondary circuit output ofinverter is turned on by default after turn the inverter on. The secondary outputis closed when the battery voltage is lower than the shutdown point after entering the battery mode. The secondary outputis turned on when the battery voltage is again higher than the setting value + 1V / section.

Set conditions: All status can be set.

Description:

DBV:Dual output cut-off voltage in battery mode

Dual output cut-off voltage in battery mode is set by defaultto 48V and can be set range [44,60]

Take the constant voltage charging point as the recovery voltage when the setting pointis higher than the constant voltage charging (CV) point-1V / section, .

* This function needs to be used together with a dual-way output auxiliary board.

1.4.2.36 Battery dual-output Duration (DBT)

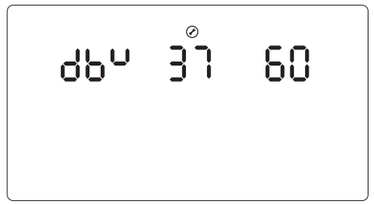
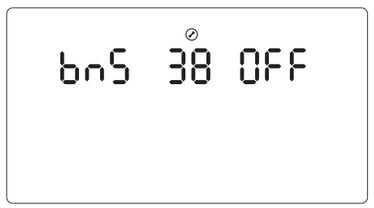


Figure 1-45 Battery dual-way output low-voltage shutdown point page

Function description: The secondary circuit output ofinverter is turned on by default after turn the inverter on. The secondary outputis closed when the battery discharging time reaches the setting point after entering the battery mode.
Setting conditions: All status can be set.
Description:
DBT:Dual output cut-offtime in battery mode
The default setting is OFF, the function is not on, it can be setto [5,890] in minutes. The secondary output has unlimited outputtime when setto FUL, .
* This function needs to be used together with a dual-way output auxiliary board.

1.4.2.37 BMS communication function (BMS)



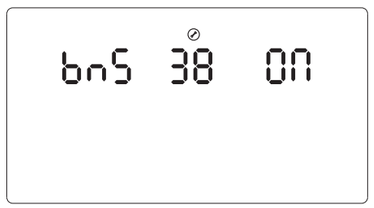


Figure 1-46 The B M S Management Function Settings page

Function description: Set whether the inverter communicates with the BMS oflithium battery.
Setting conditions: All status can be set.
Description:
BMS:Battery Management System
The default setting is OFF, and the function is not on; The inverter communicates with the BMS of lithium battery through the central control board, and receive the battery information when setto ON. After the function is turned on, ifthe communication abnormality occurs, an alarm 56 is generated, and the inverter no longer decides the operation logic according to the BMS information.
* This function needs to be used together with the central centralized control board.
* This page is blocked when the central centralized control board is not accessed.

1.4.2.38 Low SOC shutdown function (BSU)

Figure 1-47 Low SOC Shutdown function setting page

Function description: Shutdown when low SOC is set.
Setting conditions: All status can be set.
Description:
BSU:Battery SOC under lock
The default value is 20, and the range can be setto [5,50]. In battery mode,shut down and call the alarm 68 when the lithium battery SOC reaches the setting point. Clear the alarm 68 when returning to the set value + 5%. In standby mode, itis necessary to reach the setting value+10% before switching to battery mode. An alarm 69 will be triggered ifitis not reached. An alarm 69 will be triggered when the lithium battery SOC reaches the setting value + 5% after the function is turned on, and alarm 69 will be cleared when it returns to the setting value + 10%.
It can be setto OFF, and the inverter will no longer turn down, startup and alarm according to SOC.
After the function is turned on, the inverter will no longer decide the operation logic according to the SOC information, and clear the relevant alarms if an abnormal communication occurs.
* This function needs to be used together with the central centralized control board.
* The page is blocked when the central centralized control board is not accessed.

1.4.2.39 Setthe SOC to turn to battery mode (STB)

Figure 1-48 Setthe SOC to turn to battery mode

Function description: Setthe SOC value to turn to battery mode.
Set conditions: All status can be set
Description:
STB:Setthe grid to battery mode.
The default setting is 90, and the range can be setto [10,100]. The inverter will switch to battery mode

when the lithium battery SOC reaches the setting value Ifthe PBG priority is set and the grid power is normal.
It can be setto OFF, and atthis time the inverter will no longer switch to battery mode from grid mode according to the SOC situation.
The function is enabled, if an abnormal communication occurs, the inverter will no longer decide the operation logic according to the SOC information and clear the relevant alarm.
* This function needs to be used together with the central centralized control board.
* This option page is blocked when the central centralized control board is not accessed.

1.4.2.40 Set SOC to grid function (STG)

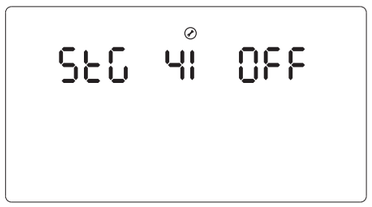


Figure 1-49 Set SOC to grid function setting page

Function description: Setthe SOC value ofinverter switching to grid mode.
Set conditions: All status can be set.
Description:
STG:Switch to grid mode when the battery SOC is low.
The default value is 50, and the range can be setto [10,90]. The inverter will switch to grid mode when the lithium battery SOC reaches the setting value Ifthe PBG priority is set and the grid power is normal.
It can be setto OFF, and atthis time the inverter will no longer switch to grid mode from battery mode according to the SOC situation.
The function is enabled, if an abnormal communication occurs, the inverter will no longer decide the operation logic according to the SOC information, and clear the relevant alarm.
* This function needs to be used together with the central centralized control board.
* This option page is blocked when the central centralized control board is not accessed.

1.5 Fault and Alarm Description

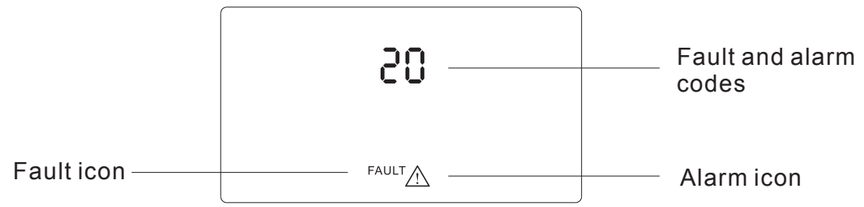


Figure 1-43 Fault and alarm ICONS

Function: The alarm code ALA blinks and the buzzer rings one time per second and lastfor 1 minute. The buzzer will ring for 10 seconds and stop ifthe faultindicator is steady on, and the fault will be eliminated after the buzzer ringing stops. It will remain in the fault state if you try to restartthe inverter and fail to restartitfor six times. You need to completely power it off (display distinguish) or waitfor 30 minutes before you can restartthe machine.
The fault and alarm on LCD display is shown as above figure. The faulticon is steady on in fault mode, and the alarm icon blinks in Alarm Status. Contactthe manufacturer to rectify the fault.

1.5.1 Fault Description

- Fault: The inverter enters fault mode, the LED is steady red, and the LCD displays the fault code.

Table offault codes

Fault code	Fault	Relevant action	The trigger condition	Restore conditions	The fault alarm
1	Bus soft start fail	Transfer to failure mode	The setting voltage can not be reached when the bus soft start	unrecoverable	The fault
2	Bus over voltage	Transfer to failure mode	The bus is above the setting value	unrecoverable	The fault
3	Bus low voltage	Transfer to failure mode	The bus is below the setting value	unrecoverable	The fault
4	Battery Over Current	Transfer to failure mode	The battery is immediately protected when the battery current exceeds 580A.	unrecoverable	The fault
5	Over temperature	Transfer to failure mode	The temperature of PFC or INV sensor is higher than the over-temperature setting point	Restart after this function is enabled, the system can not be recovered after three failed restarts	The fault

6	Battery over voltage	Transfer to failure mode	The battery voltage is above the setting value	recoverable	The fault
7	Bus soft Fault	Transfer to failure mode	The DC soft starting voltage of the bus does not reach the setting value	unrecoverable	The fault
8	Bus short Fault	Transfer to failure mode	The bus is below the setting value instantaneously when working normally.	unrecoverable	The fault
9	INV soft Fault	Transfer to failure mode	It still can not reach the rated output voltage after soft-starting the inverter for a period oftime	unrecoverable	The fault
10	INV over voltage	Transfer to failure mode	In battery mode, the inverter voltage is higher than the setting value	unrecoverable	The fault
11	INV under voltage	Transfer to failure mode	In battery mode, the inverter voltage is lower than the setting value	unrecoverable	The fault
12	INV short circuit	Transfer to failure mode	The inverter voltage is lower than the setting value, and the currentis higher than the setting value	It can not be recovered if a fault restartfails for six times	The fault
13	Negative power	Transfer to failure mode	The inverter power is less than the setting value for a period of time	unrecoverable	The fault
14	Overload fault	Transfer to failure mode	The load exceeds specifications	Restart After this function is enabled, the system can not be recovered after three failed restarts	The fault
15	Model Fault	Transfer to failure mode	The software identification machine model does not match the hardware detection	unrecoverable	The fault
16	No bootstrap program	Transfer to failure mode	No bootstrap	unrecoverable	The fault
17	PV program burning	Transfer to failure mode	Burning the PV control program	It will be restored after finishing burning	The fault
19	Same Serial No.	Transfer to failure mode	In parallel mode, multiple machines with the same serial number are detected	unrecoverable	The fault
20	CAN Fault	Transfer to failure mode	In parallel mode, the communication between the CAN and bus is abnormal	unrecoverable	The fault
21	BAT Volt Different	Transfer to failure mode	In parallel mode, the battery voltage value of different machines is too different	unrecoverable	The fault
22	Input Volt Different	Transfer to failure mode	In parallel mode, the input voltage value of different machines is too different	unrecoverable	The fault

23	Input Freq Different	Transfer to failure mode	In parallel mode, the input voltage frequency of different machines is too different.	unrecoverable	The fault
24	Output Setting Different	Transfer to failure mode	In the three-phase parallel mode, there is phase deficiency in the parallel mode Settings of different machines	Recover when set to single machine operation or when the conditions for three-phase operation are met	The fault
25	Output out of sync	Transfer to failure mode	In parallel mode, the output voltage detection is out of sync	unrecoverable	The fault
26	BMS Fault	Transfer to failure mode	The battery BMS has fault information	Turn off the BMS communication function, or eliminate the BMS faults and restore it	The fault

1.5.1 Alarm Description

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

Table of alarm codes

The alarm code	Alarm	Relevant action	The trigger condition	Restore conditions	The fault alarm
50	Battery Disconnected	Alarm: The battery is not charged	The battery voltage is lower than 8V/ node	Recoverable (10V/ knot)	The alarm
51	Battery low voltage and shutdown	Alarm: Low battery voltage to shutdown or no startup	Battery voltage lower than 10.5V/ node (default)	Recoverable (10V/ node +0.2* N (number of batteries))	The alarm
52	Battery low voltage	The alarm	Depending on bAL Settings	Recoverable (action point +0.2V/ knot)	The alarm
53	Battery charger short circuit	Alarm: The battery is not charged	The battery voltage is lower than 5V and the charging current is higher than 4A	unrecoverable	The alarm
54	Low power discharge	Alarm	Battery discharging time exceeds the setting time of low-power discharging	Recoverable (battery voltage above 13.2V/)	The alarm
55	Over charge	Alarm: The battery is not charged	The battery voltage is higher than the setting value	Recoverable	The alarm
56	BMS Loss	Alarm, lock in standby mode	Communication has failed after the BMS communication function is turned on	Recoverable	The alarm

57	Over Temperature	Alarm: The battery is not charged	The temperature of PFC or INV sensor is higher than the setting value	The temperature of PFC or INV sensor is lower than the setting value	The alarm
58	Fan Fault	Alarm: One fan is faulty and another fan is working at full speed	No fan speed signal is detected.	recoverable	The alarm
59	EEPROM fail	The alarm	EEPROM read/write fails.	unrecoverable	The alarm
60	Overload	Alarm: The battery is not charged	Load > 102%	Recoverable (load <97%)	The alarm
61	Abnormal generator waveform	Alarm, continue to work in battery mode	Generator waveform detection is abnormal	recoverable	The alarm
62	PV Energy Weak	Shut down PV output and charge	The bus voltage is lower than the setting value when the battery is not connected.	Recover after 10 minutes	The alarm
63	Synchronization signal fail	Alarm, transfer to fault mode	The parallel board is disconnected	Switch to single machine mode or eliminate the disconnecting fault	The alarm
64	Parallel configuration incompatible	Alarm: Switch to standby mode	There is a missing phase when the three phase is combined	The three phases are restored when the setting are correct	The alarm
65	Parallel version incompatible	Alarm: Switch to standby mode	The parallel system has incompatible version number.	Restore when all machine versions in a parallel system are compatible with each other	The alarm
66	Parallel Communication Fault	Alarm: Switch to standby mode	Slave machine can not be detected in parallel system	The slave machine is detected in the parallel system, or the single-machine mode is set.	The alarm
67	Different in grid power supply under parallel operation	The alarm	Excessive error in grid voltage or frequency of each machine under parallel operation	Restore when detecting reasonable errors in the grid voltage and frequency of each machine	The alarm
68	Low SOC to shut down	Alarm, turn to standby mode	Lithium battery SOC is below the setting value	Turn off the shutdown function of low SOC, or turn off the BMS communication function, or recover when the SOC returns to the Setting value + 5%	The alarm
69	Low SOC	Alarm, Maintain shutdown status if in standby mode	Lithium battery SOC is below setting value+ 5% (grid or battery mode) or below setting value + 10% (standby mode)	Turn off the shutdown function of low SOC , or turn off the BMS communication function, or recover when the SOC returns to Setting value + 10%	The alarm

Specifications

Table 1 Line Mode Specifications

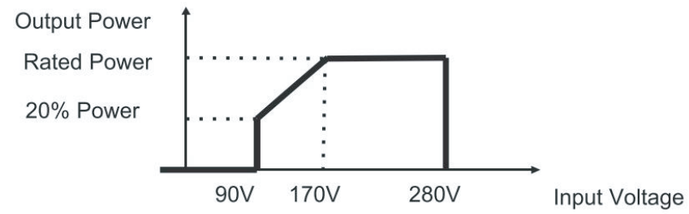
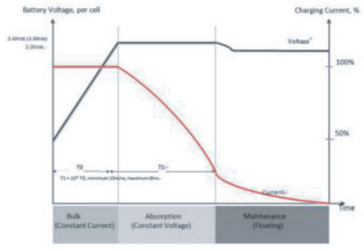
INVERTER MODEL	FO-3000	FO-5000
Input Voltage Waveform	Sinusoidal (utility grid or generator)	
Nominal Input Voltage	230Vac	
Low Loss Voltage	185Vac (UPS); 90Vac (Appliances)	
Low Loss Return Voltage	185ac+10V (UPS);90+10V (Appliances)	
High Loss Voltage	264Vac (UPS); 280Vac (Appliances)	
High Loss Return Voltage	264ac-10V (UPS);280-10V (Appliances)	
Nominal Input Frequency	50Hz / 60Hz (Auto detection)	
Low Loss Frequency	40±1 Hz	
Low Loss Return Frequency	42±1 Hz	
High Loss Frequency	70±1 Hz	
High Loss Return Frequency	65±1 Hz	
Output Short Circuit Protection	Circuit Breaker	
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)	
Transfer Time	10ms typical, 20ms Max@ Single <30ms @ Parallel	
Output power derating: The output power will be derated when AC input voltage drops to 170V.		

Table 2 Inverter Mode Specifications

INVERTER MODEL	FO-3000	FO-5000
Rated Output Power	3KVA/3KW	5KVA/5KW
Output Voltage Waveform	Pure Sine Wave	
Output Voltage Regulation	230Vac±3%	
Output Frequency	50Hz/60Hz	
Nominal Output Current	13.1A	21.7A
Peak Efficiency	>93%	
Overload Protection	5s@>150% load; 10s@110%~150% load	
Surge Capacity	2* rated power for 0.2 seconds	2* rated power for 5 seconds
Nominal DC Input Voltage	24Vdc	48Vdc

Cold Start Voltage(Lead-Acid	24Vdc	48Vdc
Cold Start SOC(Li Mode)	Default 30%, Low DC Cut-off SOC +5%	
Low DC Warning Voltage (Lead-Acid Mode)	21.6Vdc	44.0Vdc
Low DC Warning Return Voltage (Lead-Acid Mode)	24.0Vdc	46.0Vdc
Low DC Cut-off Voltage (Lead-Acid Mode)	21.0Vdc	42.0Vdc
Low DC Warning SOC (Li Mode)	Low DC Cut-off SOC +5%	
Low DC Warning Return SOC (Li Mode)	Low DC Cut-off SOC +10%	
Low DC Cut-off SOC(Li Mode)	Default 20%, 5%~50% settable	
High DC Recovery Voltage	58Vdc (C.V. charging voltage)	
High DC Cut-off Voltage	32Vdc	64Vdc
No Load Power Consumption	<50W	<60W

Table 3 Charging Mode Specifications

Utility Charging Mode			
INVERTER MODEL		FO-3000	FO-5000
Charging Algorithm		3-Step	
Max. AC Charging Current		60Amp(@VI/P=230Vac)	80Amp(@VI/P=230Vac)
Bulk Charging Voltage	Flooded Battery	28.2Vdc	58Vdc
	AGM / Gel Battery	28.2Vdc	58Vdc
Floating Charging Voltage		27.8Vdc	58Vdc
Charging Curve			
MPPT Solar Charging Mode			
Max. PV Array Power		4000W	5500W

Max. PV Input Current	20A	18A
Start-up Voltage	150Vdc±10Vdc	
PV Array MPPT Voltage Range	120Vdc~430Vdc	
Max. PV Array Open Circuit Voltage	500Vdc	
Max. PV Charging Current	50A	80A
Max. Charging Current (AC Charger Plus Solar Charger)	120A	80A

Table 4 General Specifications

INVERTER MODEL	FO-3000	FO-5000
Operating Temperature Range	0°C ~40 °C	
Storage temperature	-15°C~ 60 °C	
Humidity	5% to 95% Relative Humidity (Non-condensing)	
Altitude	<2000m	
Dimension(D*W*H)mm	485 x 300 x 120	
Net Weight, kg	9.5	

END

FLYFINE DIGITAL ENERGY CO.LTD