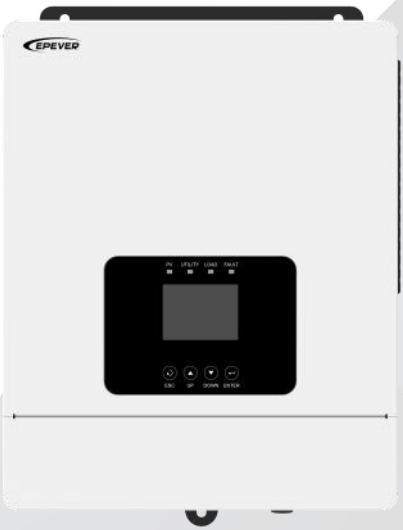
USER MANUAL



Inverter/charger

QI1522-0515C

EN

Table of Contents

Preface

Copyrights

Disclaimers

Before using the product, please read this manual carefully to ensure you fully understand the product and can use it correctly. Please keep this manual properly for future reference after reading. Improper use of this product may cause serious injury to you or others, or result in product damage and property loss. By using this product, you are deemed to have understood, acknowledged, and accepted all terms and contents in this manual. BEIJING EPSOLAR TECHNOLOGY CO., LTD. shall not be liable for any losses caused by the user's failure to use the product in accordance with this manual.

The warranty does not apply to the following conditions:

- Damage caused by improper use or inappropriate environment (Do not place flammable or explosive objects around the inverter, or install the inverter on the heat-intolerant buildings or under the direct sunlight).
- The actual current/voltage/power exceeds the limit value of the inverter/charger.
- Damage caused by working temperature exceeding the rated range.
- Electric arc, fire, explosion, and other accidents caused by failure to follow the inverter/charger labels or manual instructions.
- Unauthorized disassembly and maintenance of the inverter/charger.
- Damage caused by force majeure.
- Damage occurred during transportation or loading/unloading the inverter/charger.

Scope of application

This manual contains all the installation, connection, commissioning, maintenance, and troubleshooting for the QI(MT280) series inverter/charger (hereinafter referred to as "inverter/charger"). The QI series includes the following product model:

QI1522-0515C

This manual is only intended for professionals who are familiar with local regulations, standards and electrical systems, have received professional training, and know the product well. Please read this manual carefully to understand the safety information and familiarize yourself with the product's features before using the product.

Symbol definition

To ensure the user's personal and property safety while using this product, relevant information is provided in the manual and highlighted with the following symbols. Please read the relevant texts carefully when you encounter the following symbols in the manual.

DANGER

Indicates a high-level hazard that, if not avoided, will result in serious injury or death.

WARNING

Indicates a medium-level hazard that, if not avoided, could result in death or serious injury.

CAUTION

Indicates a low-level hazard that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates an important reminder during the operation which, if ignored, may result in an equipment error alarm.

Tip	Indicates recommendation for reference.
	Read through the user manual before any operations.

Important Safety Instructions

1. Requirements for professional and technical personnel

- Professionally trained.
- Familiar with related safety regulations of the electrical system.
- Read this manual carefully and master the related safety precautions.

2. Operations for professional and technical personnel

- Install the Inverter/charger to a specified position.
- Conduct test operations for the inverter/charger.
- Operate and maintain the inverter/charger.

3. Safety precautions before installation

⚠ DANGER

- When installing the inverter/charger, please evaluate whether there is a risk of electric arc in the operation area.
- Keep the inverter/charger out of reach of children.

NOTICE

- After receiving the inverter/charger, please check if there is any damage during transportation. If you find any problem, please contact the transportation company, our local distributor or our company in time.
- When installing or moving the inverter/charger, follow the instructions in the manual.

4. Safety precautions for mechanical installation

⚠ DANGER

Before installation, confirm the inverter/charger has no electrical connection.

5. Safety precautions for electrical connection

DANGER

- Both the utility input and AC output are of high voltage, do not touch the wiring to avoid electric shock.
- When the AC output terminal connects to the load, the inverter/charger needs to stop working.

WARNING

- Ensure all wirings are secure to prevent overheating due to loose connections.
- The inverter/charger shell should be connected to the ground, and the cross-sectional area of the wire connecting the ground terminal to the earth should not be less than $4mm^2$.
- A fast-acting fuse or breaker should be used between the battery and inverter/charger; whose rated current should be twice of the inverter/charger rated input current.

NOTICE

- Do not connect the AC output terminal to other power sources or utility. Otherwise, the inverter/charger will be damaged.
- It is strictly forbidden to connect a transformer or a load with a surge power (VA) exceeding the overload power at the AC output port. Otherwise, the damage will be caused to the inverter/charger.

6. Safety precautions for the inverter/charger operation

WARNING

- The inverter/charger generates much heat during operation with a high cabinet temperature. Do not touch the unit and keep it far away from the materials and devices that are sensitive to high temperature.
- When the inverter/charger is working, do not open the inverter/charger shell for any operation.
- When eliminating the fault that affects the safety performance of the inverter/charger, disconnect the DC input circuit breaker, disconnect the AC output circuit breaker, turn off the inverter/charger switch and operate it after the LCD is completely OFF.

7. Dangerous operations causing an electric arc, fire, or explosion

- Touch the uninsulated ends of potentially live cables.

- Touch the wiring copper busbars, terminals or internal components of the inverter/charger that might be electriferous.
- Loose connection of power cables.
- Accidental dropping of screws or other components into the inverter/charger.
- Improper operations by untrained non-professional or technical personnel.

⚠ DANGER

Once an accident occurs, it must be handled by professionals. Improper operation would cause a more serious accident.

8. Precautions for stopping the inverter/charger

- Turn off the AC output and disconnect the utility input. Then, turn off the DC switch.
- After the input and output wires are disconnected for 12 minutes, the internal conductive modules could be touched.
- The inverter/charger does not contain repair parts internally. If any maintenance service is required, please get in touch with our after-sales service personnel.

⚠ DANGER

Do not touch or open the shell after the inverter/charger is powered off within 12 minutes.

9. Precautions for inverter/charger maintenance

- It is recommended to test the inverter/charger with testing equipment to ensure there is no voltage at the input terminals or no current on the input and output cables.
- When conducting the electrical connection and maintenance, post a temporary warning sign or put up barriers to prevent unrelated personnel from entering the electrical connection or maintenance area.
- Improper maintenance of the inverter/charger may cause injury to personnel or damage to the equipment.
- It is recommended to wear an antistatic wrist strap or avoid unnecessary contact with the circuit board.

⚠ CAUTION

The safety mark, warning label and rating plate on the inverter/charger should be clearly visible, not removed or covered.

10. Working environment

- Ambient temperature: -20℃ to +65℃
- Storage temperature: -25℃ to +70℃ (No sharp temperature changing)
- Relative humidity: < 95% (Non-condensing)
- Altitude: < 4,000 meters (If the altitude exceeds 2,000 meters, the actual output power is reduced appropriately.)

NOTICE

The inverter/charger is strictly prohibited from being used in the following places. The company shall not assume any liability for damages caused by its use in inappropriate locations:

- Do not install the inverter/charger in harsh environments, including those with high humidity, salt spray, corrosion, grease, flammable or explosive materials, or excessive dust accumulation. When installing it outdoors, avoid direct sunlight and rainwater infiltration.
- Do not install the inverter/charger and lead-acid liquid batteries in a sealed space. The batteries produce combustible gases, and a spark at the connection terminals may cause a fire.

1 General Information

1.1 Product Overview

QI series is an upgrade hybrid inverter/charger that integrates charging and inverting functions. It supports charging from utility power, generators, and solar panels, as well as offers utility bypass, independent inverter output, and energy management capabilities.

The DSP chip in the product with an advanced control algorithm brings high response speed and conversion efficiency. In addition, this product adopts an industrial design to ensure high reliability and features multiple charging and output modes.

The product adopts the Three-stage charging method (Bulk Charging, Constant Charging, and Float Charging) to ensure battery safety. The segment LCD screen shows the operational status and full parameters. The communication interface with the standard Modbus protocol allows end-users to expand their applications and is suitable for different monitoring requirements.

The new optimized MPPT tracking technology can fast-track the PV array's maximum power point in any sunlight conditions and obtain the maximum energy in real time.

The AC to DC charging process adopts the advanced control algorithm brings the full digital PFC and dual closed-loop voltage-current control. It enables the input power factor close to 1 and improves the control accuracy. The fully smart digital DC to AC inverting process adopts the advanced SPWM technology, outputs a pure sine wave, and converts the DC power to AC power. It is suitable for household appliances, power tools, industrial equipment, audio systems, and other electronics.

End-users can choose energy sources according to actual needs to maximize solar energy utilization and flexibly take the Utility as a supplement in the hybrid system. QI series enhances the power supply reliability of the system. It is applicable to residences, schools, medical facilities, government buildings, mosques, religious sites, cabins as well as areas with unstable power supply.

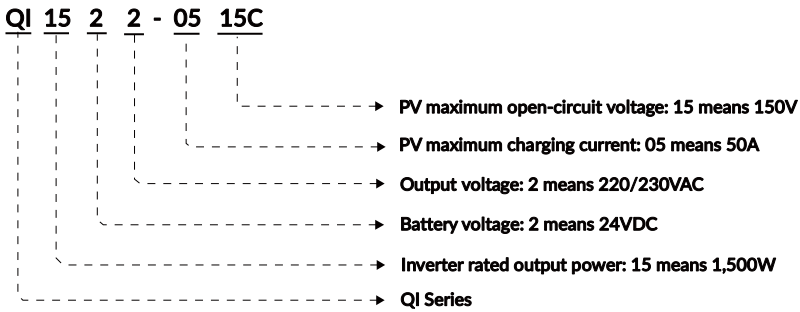
Features

- Full intelligent digital energy storage equipment
- Support battery mode or non-battery mode
- PFC technology with high power factor to reduce the grid usage, low harmonic content of AC current
- Advanced MPPT technology, with maximum tracking efficiency higher than 99.5%
- Support charging from multiple types of generators(1)
- Battery voltage controls the dry contact state to control the external equipment
- Battery charging or discharging current limit to compatible with different types of batteries

- Maximum utility charging current settings to flexibly configure utility charging power
- ECO Mode and low-voltage power-off functions to prolong the service life of the battery
- Control AC output
- RS485 communication port with optional WiFi, or TCP modules for remote monitoring
- Three-stage charging method to ensure battery safety
- Lithium battery BMS communication port to perform the safe charging and discharging
- -20℃ to +65℃ operating temperature range to meet more environment requirements

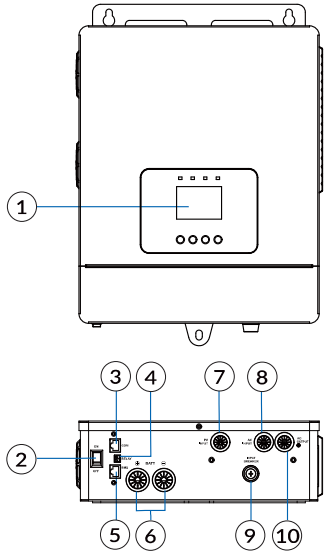
(1) When connecting a non-inverter generator, the charging current may cannot reach the rated power. It is recommended to connect an inverter generator. And when using the generator, you need to set the AC input to the generator mode, please refer to the Subsection 3.3.1 Parameter list for the specific setting method.

Naming rules



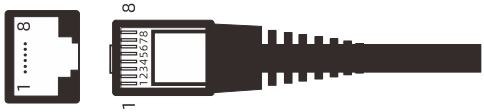
1.2 Product exterior

1.2.1 Appearance and ports



No.	Instruction	No.	Instruction
1	Color LCD (see Chapter 3 Operation)	6	Battery connection port
2	Power switch	7	PV connection port
3	RS485 port (RJ45, with isolation design)(1)	8	AC input terminal
4	Dry contact port(2)	9	Utility overcurrent protector
5	BMS com. port (RJ45, with isolation design)(3)	10	AC output terminal/Grounding terminal

(1) Remote monitoring is achieved by connecting the WiFi or TCP modules via RS485 communication port. The pins of the RS485 port (RJ45) are defined as follows:

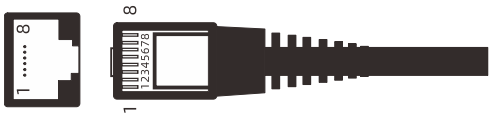


1, 2-+5VDC
3, 4-RS485-B
5, 6-RS485-A
7, 8-GND

Pin	Definition	Pin	Definition
1	+5VDC	5	RS485-A
2	+5VDC	6	RS485-A
3	RS485-B	7	GND
4	RS485-B	8	GND

(2) The dry contact port is connected with the oil generator switch in parallel and can turn on/off the oil generator. Dry contact specification: 1A@125VAC.

(3) Through a built-in BMS-Link module, direct connection of lithium batteries to the BMS communication port is enabled, and different BMS protocols can be converted into our company's standard BMS protocol. In addition, it realizes the communication between the inverter/charger and different BMS companies' standards. The pins of the BMS communication port (RJ45) are defined as follows:

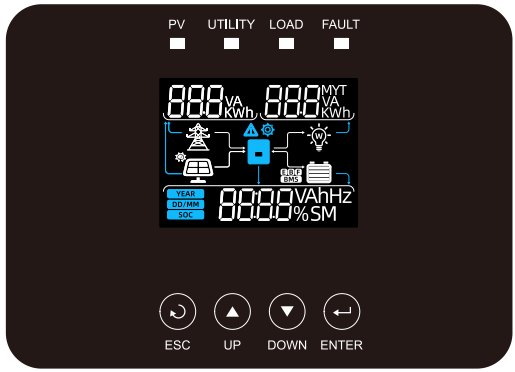


3-GND
7-RS485-A
8-RS485-B

Pin	Definition	Pin	Definition
1	/	5	/
2	/	6	/
3	GND	7	RS485-A
4	/	8	RS485-B

Tip	Please go to EPEVER official website to check or download the currently supported BMS manufacturers and the BMS parameters.

1.2.2 Indicators/Buttons/LCD



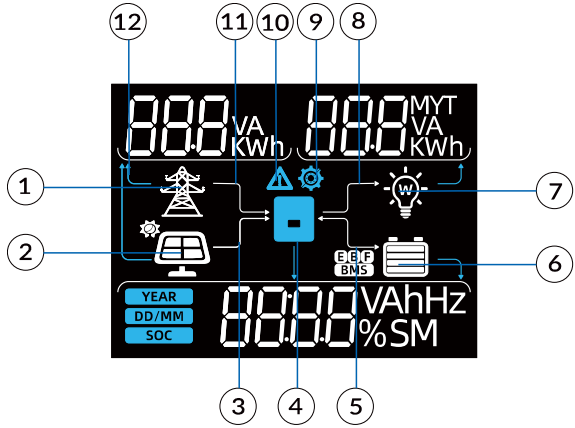
- **Indicator**

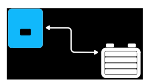
Indicator	Status	Instruction
PV	OFF	No PV input
	Solid green	PV normal
UTILITY	OFF	No utility input
	Solid green	Normal utility
	Flashing green (1s on, 1s off)	Oil generator charging
LOAD	OFF	No inverter output
	Solid green	Inverter, charging, and bypass are normal
FAULT	Red OFF	Inverter/charger normal
	Flashing red (0.5s on, 0.5s off)	Fault alarm

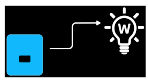
• **Buttons**

Button	Operation	Instruction
ESC	Press	• Exit the current interface. • View the fault code when there is a fault alarm.
ENTER	Press/ Press and hold	• Confirm the setting parameter. • Enter the setting interface.
UP	Press	• Scroll up and select the position of the component icon. • Parameters setting interface: Increase or decrease the parameter value per step size.
	Press and hold	• Enter the BMS parameters interface. • Parameters setting interface: Increase or decrease the parameter value per 10 times the step size.
DOWN	Press	• Scroll down and select the position of the component icon. • Parameters setting interface: Increase or decrease the parameter value per step size.
	Press and hold	• Enter the other parameters interface. • Parameters setting interface: Increase or decrease the parameter value per 10 times the step size.

• **LCD**

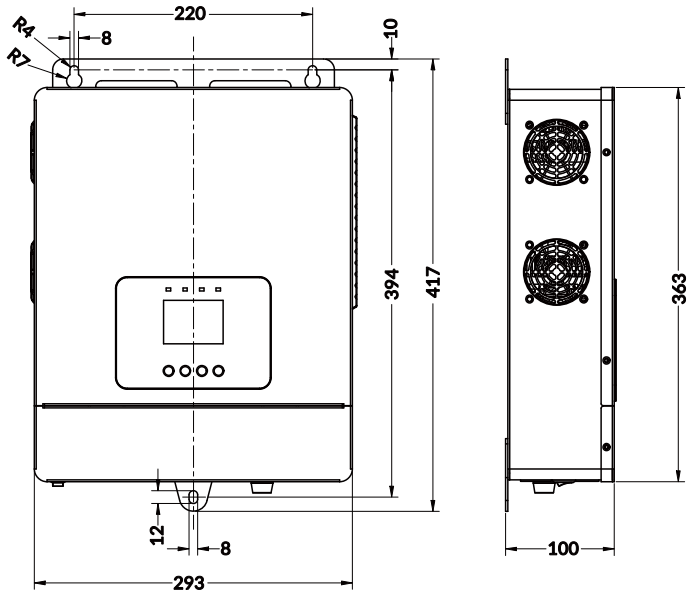


No.	Instruction	
1		Indicates the AC input terminal.
2		Indicates normal PV connection.
		Indicates there is no PV connection (or PV energy is too low).
3		• Indicates PV is charging the battery or independent inverter output. • No arrow indicates there is no PV connection.
4		Indicates the inverter/charger.
5		• The arrow points to the inverter/charger: The battery is discharging. • The arrow points to the battery: The battery is being charged. • No arrow indicates there is no battery connection.

6		Indicates the battery.
		• Battery charging status: Float — "F" icon is on; Equalize — "E" icon is on; Boost — "B" icon is on. • When the BMS communication is normal, the "BMS" icon is on, while when it is abnormal, the "BMS" icon is off. • When the lithium battery is currently prohibited from charging or discharging, the "BMS" icon is flashing.
7		Indicates the AC output terminal.
8		• Indicates the inverter/charger is supplying power to the load. • No arrow indicates there is no AC output.
9		The icon is on after entering the setting interface.
10		• When there is a fault, the icon is on. • When there is no fault, the icon is off. • Press the "ESC" button to view the real-time fault information.
11		• Indicates the grid is charging the battery or bypassing to the load. • No arrow indicates there is no utility connection.
12		A blue arrow points to the component: Display its parameter information.

1.2.3 Dimension

Unit: mm



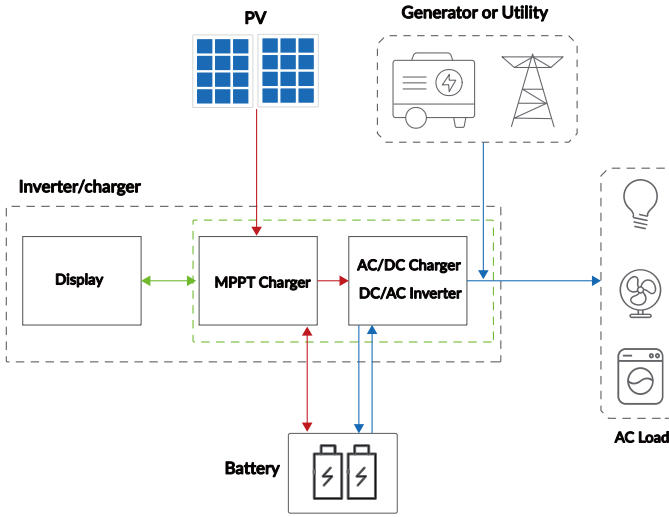
2 Installation and Connection

2.1 Precautions

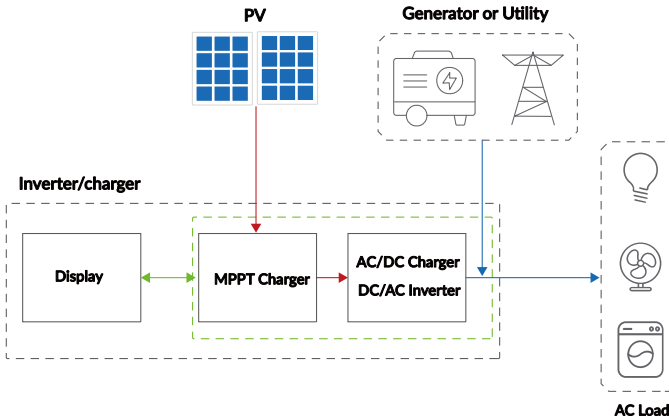
- Please read the manual carefully to get familiar with the installation steps before installation.
- Be very careful when installing the batteries, especially flooded lead-acid batteries. Please wear eye protection, and have fresh water available to rinse if any contact with battery acid.
- Keep the battery away from any metal objects, which may cause a short circuit of the battery.
- Combustible and harmful gases may come out from the battery during charging. Ensure the ventilation condition is good.
- Ensure that the bearing capacity of the wall meets the wall-mounted requirements.
- Ventilation is highly recommended if mounted in an enclosure. Never install the inverter/charger in a sealed enclosure with flooded batteries! Battery fumes from vented batteries will corrode and destroy the inverter/charger circuits.
- The inverter/charger can work with a lead-acid battery and lithium battery within its control scope.
- Ensure all switches and breakers are disconnected before wiring. Please operate the inverter/charger after checking that all wiring is correct.
- Loose connections and corroded wires can lead to overheating, which may cause the insulation of the wires to melt and ignite surrounding materials, thereby creating a fire hazard. Ensure that all connections are secure and utilize cable clamps to prevent movement of the cables.
- Select the system connection cables according to the current density no greater than 5A/mm^2.
- The inverter/charger is for indoor installation only. Do not install the inverter/charger in the humid, salt spray, corrosive, greasy, flammable, explosive, dust accumulative or other severe environments.
- High voltage still exists inside the inverter/charger after turning off the switch. Do not open or touch the internal devices; wait 12 minutes before conducting related operations.
- The inverter/charger has anti-reverse protection circuit at the PV input terminal. However, when the inverter/charger is working with the battery connected and powered on, PV reverse polarity may damage the inverter/charger.
- Both utility input and AC output are of high voltage. Please do not touch the wiring connection.
- When the fan is working, please do not touch it to avoid injury.

2.2 System schematic diagram

• Battery mode



• No-battery mode



NOTICE

- For different battery types, confirm the relevant parameters before power on.
- There are various types of oil generators with complex output situations. It is recommended to use the variable frequency oil generator. If a non-variable frequency oil generator is used, actual testing is required before use.
- In the no-battery mode, the inverter/charger will only start up when the open-circuit voltage of the PV system exceeds 30V.

2.3 Checking before installation

Packaging materials and components may be damaged during transportation. Therefore, before installing the inverter, please inspect its outer packaging for any damage such as holes, cracks, or tears. If you find any damage to the inverter, do not open the package and contact the distributor as soon as possible. It is recommended to inspect the packaging materials within 24 hours before installing the inverter. After opening the inverter package, check whether the product and its accessories are complete and undamaged. If you find any problem, please contact the distributor in time.

2.4 Mounting the inverter/charger

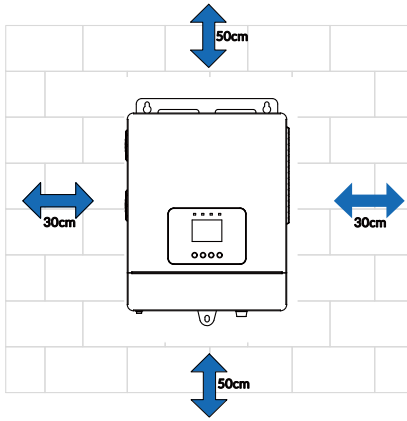
⚠ DANGER

- Risk of explosion! Do not install the inverter/charger in a sealed enclose with flooded batteries!
- Do not install the inverter/charger in a confined area where the battery gas can accumulate.

NOTICE

- The inverter/charger can be fixed to the concrete and solid brick walls, while it cannot be fixed to the hollow brick wall.
- The inverter/charger requires a minimum clearance of 30cm from the right and left edges, and clearance of 50cm from of upper and lower edges from the inverter/charger.

Step 1: Determine the installation location and heat-dissipation space. When installing the unit, ensure sufficient airflow is maintained around it—a minimum clearance of 50cm must be reserved above and below the unit to allow proper ventilation.



Step 2: Drill two M8 holes using an electric drill at the marked mounting hole positions.

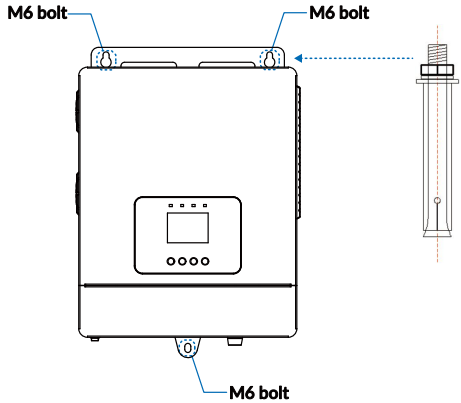
Step 3: Insert the screws and steel sleeves of the M6 expansion bolts into the two holes.

Step 4: Mount the inverter/charger onto the screws, then mark the positions of the mounting holes at the lower end of the unit.

Step 5: Remove the inverter/charger and drill an M8 hole at the newly marked positions in step 4 using an electric drill.

Step 6: Insert the screws and steel sleeves of the M6 expansion bolts into the new hole.

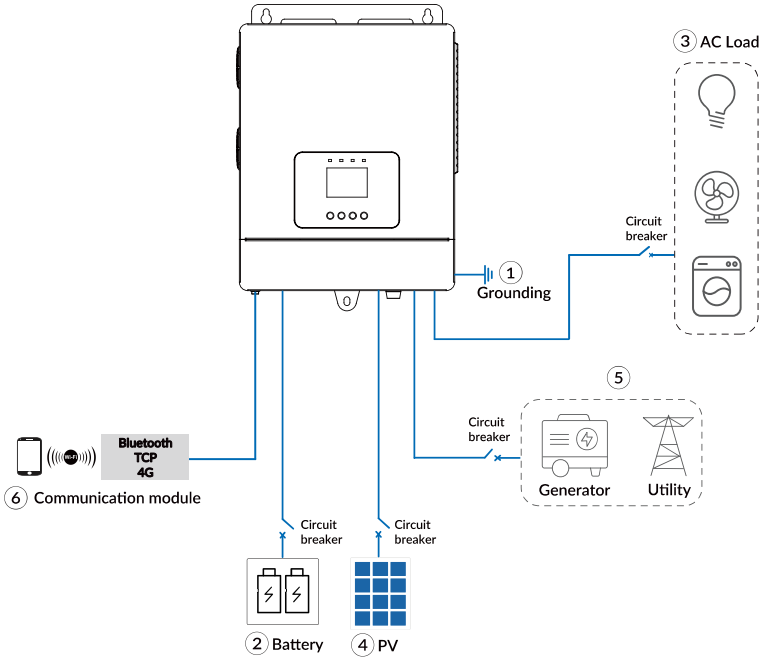
Step 7: Remount the inverter/charger onto all screws, then secure the three nuts using a socket wrench.



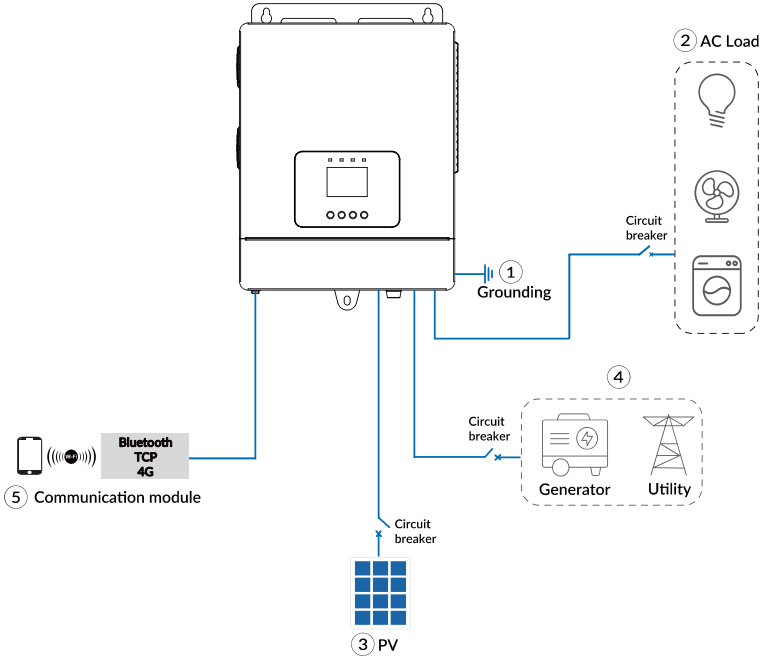
2.5 Wiring the inverter/charger

Connect the inverter/charger in the order of “grounding > battery > load > PV array > utility or generator > optional accessories”, and disconnect the inverter/charger in the reverse order.

- **Battery mode**



• **No-battery mode**



NOTICE

- Ensure that the length of battery connection cable is less than 3 meters.
- It is recommended that the length of the PV connection cable is less than 3 meters. If the length of the PV connection cable is less than 3 meters, it meets the requirements of EN/IEC61000-6-3 standard; If the length of the PV connection cable exceeds 3 meters, it may not meet the requirements of the EN/IEC61000-6-3 standard.

2.5.1 Wire size and circuit breaker

The wiring and installation methods must conform to all national and local electrical code requirements.

• **Recommended PV array wire and circuit breaker size**

The output current of a PV module varies based on its size, connection method, and sunlight angle.

The minimum wire size can be calculated using the PV Isc (maximum short-circuit current). Refer to the Isc value in the specifications of the PV module. When PV modules are connected in series, the total Isc is equal to the Isc of any individual module. In contrast, when connected in parallel, the total Isc is the sum of all modules' Isc values. The Isc of the PV array must not exceed the maximum input current of the PV system. For details on the maximum PV input current and the corresponding maximum wire size, please refer to the table below:

Model	PV Wire Size	Circuit Breaker
QI1522-0515C	6mm^2/10AWG	2P–40A

- **Recommended utility wire size**

Model	Utility Wire Size	Circuit Breaker
QI1522-0515C	2.5mm^2/14AWG	2P—16A

- **Recommended battery wire and breaker size**

Model	Battery Wire Size	Circuit Breaker
QI1522-0515C	20mm^2/4AWG	2P–125A

- **Recommended AC output wire size**

Model	Load Wire Size	Circuit Breaker
QI1522-0515C	2.5mm^2/14AWG	2P—16A

NOTICE

- The wire size is only for reference. Suppose a long-distance exists among the PV array, the inverter/charger, and the battery. In that case, larger wires shall be used to reduce the voltage drop and improve the system performance.
- The above sizes for wire and circuit breaker are for reference only; please choose a suitable wire and circuit breaker according to the actual situation.

2.5.2 Connecting the ground cable (PE)

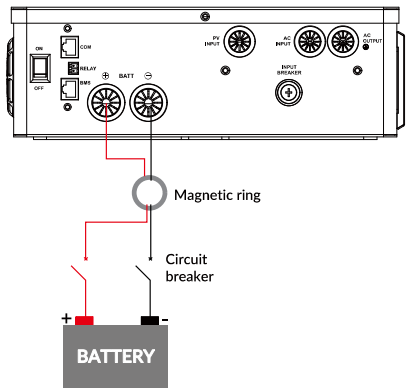
The inverter/charger has a dedicated grounding terminal, which must be grounded reliably. The grounding wire size must be consistent with the recommended load wire size. The grounding connection point shall be as close as possible to the inverter/charger, and the total grounding wire shall be as short as possible.

☒ NO GROUNDING	☒ Do not connect the and the battery terminals to ground. ☒ Do not connect the PV terminals to ground. ☒ Do not ground the AC input L or N terminals between the inverter/charger and the household power distribution cabinet. ☒ Do not connect the AC output L or N terminals to ground.
☑ GROUNDING	☑ The cabinet case and the PE terminal of AC input and output must be firmly grounded through the earth rail.

2.5.3 Connecting the battery

NOTICE

- Please disconnect the circuit breaker before wiring and ensure that the leads of "+" and "-" poles are polarity correctly. The positive ("+") and negative ("-") terminals of the battery have no reverse protection circuit. No reverse connection allowed.
- A circuit breaker must be installed on the battery side. Please refer to Subsection 2.5.1 Wire and circuit breaker size for selection.
- For optimal electromagnetic compatibility, please use the included magnetic ring provided with the inverter/charger. At a position close to the wiring hole of the cabinet, wind both the positive and negative battery terminals around the magnetic ring once simultaneously before connecting them to the internal wiring terminals.



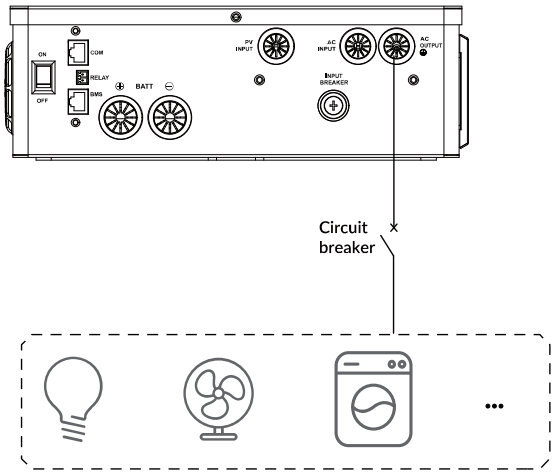
2.5.4 Connecting the AC output

DANGER

High voltage! Electric shock hazard! When wiring the AC load, please disconnect the circuit breaker and ensure that the poles' leads are connected correctly.

NOTICE

If inductive loads such as motors, or a bidirectional transfer switch is connected to the AC output terminal, a separate overvoltage and overcurrent protector (VA-Protector) needs to be installed at the AC output terminal.



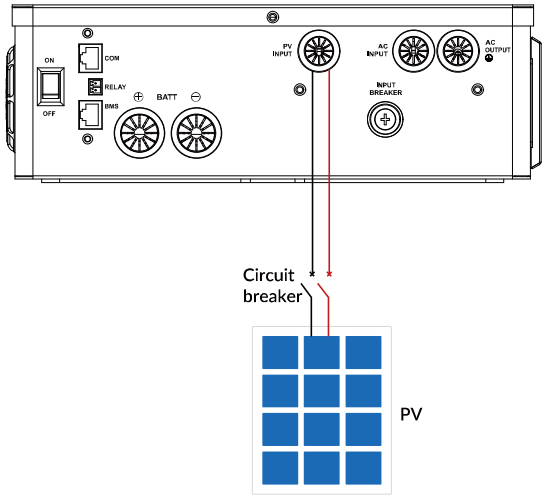
2.5.5 Connecting the PV modules

DANGER

High voltage! Electric shock hazard! The PV array can generate dangerous high voltage. Disconnect the circuit breaker before wiring, and ensure that the leads of “+” and “-” terminals are connected correctly.

NOTICE

Suppose the inverter/charger is used in an area with frequent lightning strikes. In that case, install an external surge arrester at the PV input and utility input terminals is a must.



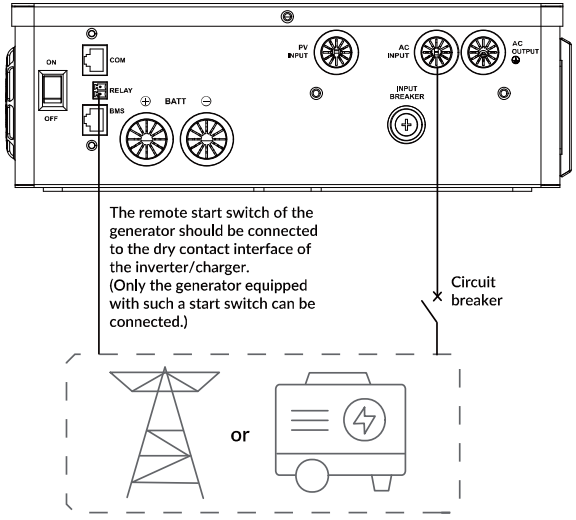
2.5.6 Connecting the utility or generator

DANGER

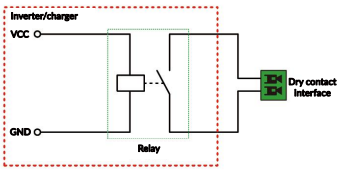
High voltage! Electric shock hazard! The utility input can generate very high voltage. Disconnect the circuit breaker or fast-acting fuse before wiring and ensure that the poles' leads are connected correctly.

NOTICE

There are various types of oil generators with complex output conditions. It is recommended to use the inverter oil generator. If non-inverter oil generators are used, they must be tested in practice before use.



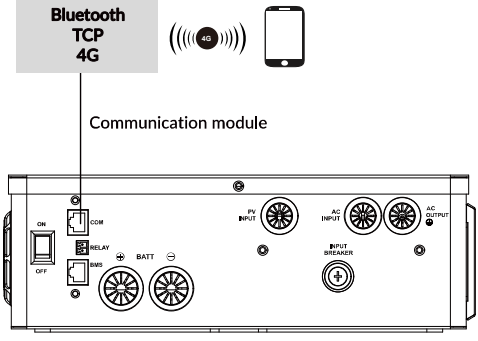
Dry contact interface: The dry contact interface can turn on/off the oil generator and is connected parallel with the oil generator's switch.



Working principle: When the battery voltage reaches the "Dry Contact ON Voltage", the dry contact is connected. Its coil is energized. The dry contact can drive loads of no more than 125VAC/1A, 30VDC/1A. According to different battery types of the inverter/charger, the default values of the Dry Contact ON/OFF Voltage are different. Please refer to Subsection 3.3.1 Parameter list - 61 drO and 62 drF for the details.

2.5.7 Connecting the communication module

End-users can remote monitor the inverter/charger or modify parameters on the phone APP after connecting the WiFi, 4G or other communication module to the RS485 interface on the inverter/charger. For detailed setting methods, please refer to the instructions on cloud APP, WiFi or 4G communication modules in user manual.



3 Operation

3.1 Operating the inverter/charger

Step 1: Double check whether the wire connection is correct.

Step 2: Connect the battery circuit breaker.

Step 3: Turn on the power switch. The LCD will be lit, which means the system running is normal.

Step 4: Set parameters by the buttons.

NOTICE

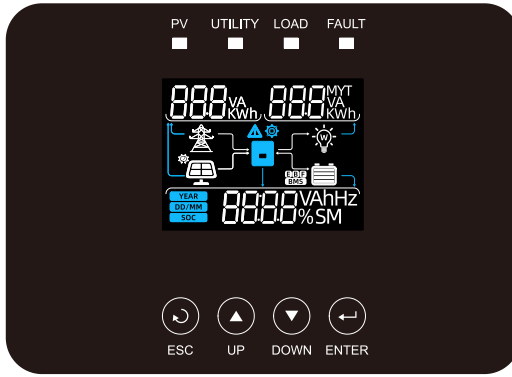
For detailed parameters setting, please refer to Section 3.3 Parameter settings. Please consult relevant technical personnel if you have any question before setting.

Step 5: Use the inverter/charger. Connect the load circuit breaker and the PV array circuit breaker in sequence; and then connect the utility input. After the AC output is normal, turn on the AC loads one by one. Do not turn on all the loads simultaneously to avoid protection action due to a large transient impulse from the current. The inverter/charger will perform normal work according to the set working mode. See Section 1.2.2 Indicators/Buttons/LCD for the details.

NOTICE

- When supplying power for different AC loads, it is recommended to turn on the load with larger impulse current first. After the load output is stable, turn on the load with smaller impulse current later.
- If the inverter/charger cannot work properly or the LCD/indicator shows an abnormality, please refer to Chapter 6 Troubleshooting or contact our company's service hotline.

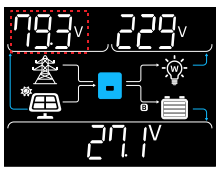
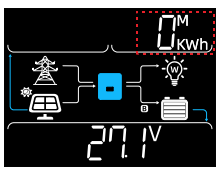
3.2 Real-time parameters



On the LCD main screen, press the "UP"/"DOWN" button to make the blue line next to the selected component flash slowly. After pressing the "ENTER" button, the blue line will stop flashing, and you can view the real-time data of the currently selected component. Press the "UP"/"DOWN" button to switch and display various parameters, and press the "ESC" button to return to the flowchart screen.

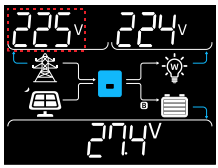
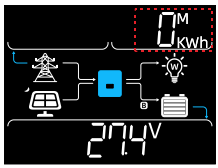
3.2.1 PV

Enter the PV real-time parameter interface from the flowchart screen, see Section 3.2 Real-time parameters for the details. The instructions of the interface are as follows:

Icon	Instruction
	According to the position indicated by the blue arrow on the PV component, press the "DOWN" button to view parameters in sequence at the LCD screen's upper left corner: PV input voltage, input current, input power, and daily energy. **Note:** Press the "UP"/"DOWN" button to switch and display various parameters, and press the "ESC" button to return to the flowchart screen.
	Press the "DOWN" button again to view parameters in sequence at the LCD's upper right corner: monthly, yearly, and total generation statistics of the PV module. **Note:** Press the "UP"/"DOWN" button to switch and display various parameters, and press the "ESC" button to return to the flowchart screen.

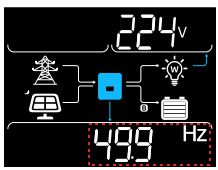
3.2.2 Utility

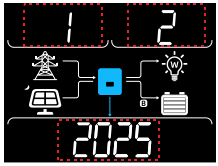
Enter the Utility real-time parameter interface from the flowchart screen, see Section 3.2 Real-time parameters for the details. The instructions of the interface are as follows:

Icon	Instruction
	According to the position indicated by the blue arrow on the Utility component, press the "DOWN" button to view parameters in sequence at the LCD screen's upper left corner: Utility input voltage, input current, input power, and daily energy. **Note:** Press the "UP"/"DOWN" button to switch and display various parameters, and press the "ESC" button to return to the flowchart screen.
	Press the "DOWN" button again to view parameters in sequence at the LCD's upper right corner: monthly, yearly, and total generation statistics of the Utility. **Note:** Press the "UP"/"DOWN" button to switch and display various parameters, and press the "ESC" button to return to the flowchart screen.

3.2.3 Device

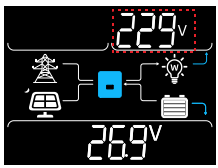
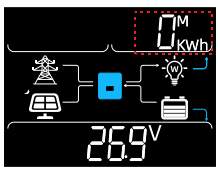
Enter the device real-time parameter interface from the flowchart screen, see Section 3.2 Real-time parameters for the details. The instructions of the interface are as follows:

Icon	Instruction
	According to the position indicated by the blue arrow on the device component, press the "DOWN" button to view parameters in sequence at the bottom of the LCD screen: frequency, charging mode, discharging mode, time, and date. **Note:** See Subsection 3.3.1 Parameter list for the details of charging mode and discharging mode. **Note:** Press the "UP"/"DOWN" button to switch and display various parameters, and press the "ESC" button to return to the flowchart screen.

	Date display interface: At the bottom of the LCD screen: Display the year. At the upper left corner of the LCD screen: Display the month. At the upper right corner of the LCD screen: Display the day. **Note:** Press the "UP"/"DOWN" button to switch and display various parameters, and press the "ESC" button to return to the flowchart screen.

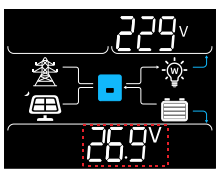
3.2.4 Load

Enter the load real-time parameter interface from the flowchart screen, see Section 3.2 Real-time parameters for the details. The instructions of the interface are as follows:

Icon	Instruction
	According to the position indicated by the blue arrow on the load component, press the "DOWN" button to view parameters in sequence at the LCD screen's upper right corner: load output voltage, output current, output power, and daily energy. **Note:** Press the "UP"/"DOWN" button to switch and display various parameters, and press the "ESC" button to return to the flowchart screen.
	Press the "DOWN" button again to view parameters in sequence at the LCD's upper right corner: monthly, yearly, and total generation statistics of the output. **Note:** Press the "UP"/"DOWN" button to switch and display various parameters, and press the "ESC" button to return to the flowchart screen.

3.2.5 Battery

Enter the battery real-time parameter interface from the flowchart screen, see Section 3.2 Real-time parameters for the details. The instructions of the interface are as follows:

Icon	Instruction
	According to the position indicated by the blue arrow on the battery component, press the "DOWN" button to view parameters in sequence at the bottom of the LCD screen: battery voltage, current, SOC, capacity, and battery type. **Note:** Press the "UP"/"DOWN" button to switch and display various parameters, and press the "ESC" button to return to the flowchart screen.

3.2.6 BMS

When a battery with BMS is connected, press and hold the “UP” button to enter the BMS real-time parameter interface.

Parameter Code	Parameter	Parameter Code	Parameter
1	Cells	37	Cell 16 Status
2	Battery Pack Voltage	38	Battery Protocol
3	Battery Main Circuit Current	39	Battery Status
4	Battery Pack Power	40	BMS Parallel
5	Battery Pack Full Charge Capacity	41	Battery Pack Voltage
6	Battery Pack State of Charge	42	Battery Pack Current
7	Battery Remaining Operating Duration	43	Charging Coefficient
8	Cells Highest Temperature	44	Discharging Coefficient Selection
9	Cells Lowest Temperature	45	BMS Charging Current Limit
10	Equalization Charging Temperature	46	BMS Discharging Current Limit
11	Ambient Temperature	47	Battery Pack Undervoltage Alarm
12	MOSFET Temperature	48	Battery Pack Undervoltage Protection
13	Cycles	49	Battery Pack Overvoltage Alarm
14	Equalization Charging Status	50	Battery Pack Overvoltage Protection
15	Battery Pack Voltage Status	51	Charging Current Rating
16	Current Status	52	Charging Current Protection
17	MOSFET Status	53	Discharging Current Rating

18	Cells Temperature Status	54	Discharging Current Protection
19	Equalization Charging Temperature Status	55	Charging High Temperature Protection
20	Ambient Temperature Status	56	Charging Low Temperature Protection
21	MOSFET Temperature Status	57	Discharging High Temperature Protection
22	Cell 1 Status	58	Discharging Low Temperature Protection
23	Cell 2 Status	59	Cell High Temperature Protection
24	Cell 3 Status	60	Cell Low Temperature Protection
25	Cell 4 Status	61	Equalization Charging High Temperature Protection
26	Cell 5 Status	62	Equalization Charging Low Temperature Protection
27	Cell 6 Status	63	Ambient High Temperature Protection
28	Cell 7 Status	64	Ambient Low Temperature Protection
29	Cell 8 Status	65	MOS High Temperature Protection
30	Cell 9 Status	66	MOS Low Temperature Protection
31	Cell 10 Status	67	Protocol Type
32	Cell 11 Status	68	Battery Pack Undervoltage Protection
33	Cell 12 Status	69	Battery Pack Overvoltage Protection
34	Cell 13 Status	70	Pack Charging Current Current Limit

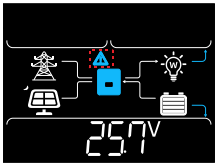
35	Cell 14 Status	71	Pack Discharging Current Current Limit
36	Cell 15 Status	72	MAP Temperature Control Selection

3.2.7 Other parameters

On the flowchart screen, press and hold the “DOWN” button to view the real-time interface for other parameters.

Parameter Code	Parameter	Parameter Code	Parameter
1	PV Temperature	10	Utility Relay Status
2	Battery Temperature	11	Inverter Module Temperature
3	SOC Full Charge	12	Equipment Internal Temperature
4	SOC Low Battery Alarm	13	Low Voltage Temperature
5	Low SOC	14	Product Series
6	DC BUS Voltage	15	Product Model
7	Utility Frequency	16	LCD Firmware Version
8	Output Frequency	17	DSP Firmware Version
9	Inverter Relay Status		

3.2.8 Real-time faults

Icon	Instruction
	A fault icon appears on the flowchart screen.

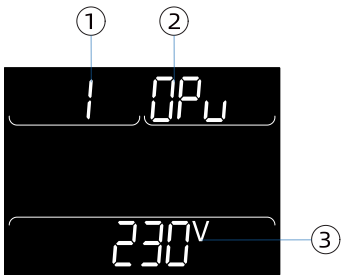
	Press the “ESC” button to view the current fault code.

- will be displayed on the flowchart screen when a fault occurs in the current system. Press the “ESC” button to view the current fault code. Press the “UP”/“DOWN” button to switch and display several faults, and press the “ESC” button to return to the flowchart screen.
- will not be displayed on the flowchart screen when no fault occurs in the current system.
- If manual fault reset is required, see Subsection 3.3.1 Parameter list - 57 rst for details.

Note: If a fault occurs, please refer to Chapter 6 Troubleshooting or contact our after-sales personnel.

3.3 Parameter settings

- Button operation instructions: On the flowchart screen, press and hold the "ENTER" button to enter the parameter setting interface. Press the “UP”/“DOWN” buttons to switch between the parameters to be set, then press the “ENTER” button to set the data, then the blue gear will light up. Press the “UP”/“DOWN” buttons to modify the data; press the “ENTER” button after modification, and wait for the blue gear to turn off, which indicates the setting is completed. Press the “ESC” button to return to the flowchart screen.
- After entering the parameter setting interface, press and hold the “ENTER” button to quickly switch the parameter setting options.



No.	Instruction
1	Parameter number

2	Parameter name abbreviation
3	Parameter value

3.3.1 Parameter list

Parameter No.	Parameter list	Default	Instructions
1	OPv (Inverter Output Voltage)	230V	User define: 220V, 230V
2	OPF (Inverter Output Frequency)	50Hz	User define: 50Hz/60Hz **Note:** When the utility is connected and the utility frequency is detected, the system will switch to the utility bypass output mode and output power at the utility frequency. The settings will take effect immediately after modification.
3	Ovd (Utility Overvoltage Disconnect Voltage)	265.0V	User define: (Utility Overvoltage Reconnect Voltage plus 10V) to 280.0V, step size: 0.1V
4	Ovr (Utility Overvoltage Reconnect Voltage)	255.0V	User define: 220.0V to (Utility Overvoltage Disconnect Voltage minus 10V), step size: 0.1V
5	Uvd (Utility Overvoltage Disconnect Voltage)	170.0V	User define: 170.0V to (Utility Undervoltage Recovery Voltage minus 10V), step size: 0.1V
6	Uvr (Utility Undervoltage Recovery Voltage)	180.0V	User define: (Utility Undervoltage Disconnect Voltage plus 10V) to 220.0V, step size: 0.1V
7	OFd (Overfrequency Disconnect Frequency)	65.0Hz	In the bypass state, when the actual utility input frequency exceeds this value, the inverter/charger will be switched to the inverter output state.

			User define: 52.0Hz to 65.0Hz, or (Underfrequency Disconnect Frequency plus 0.5Hz) to 65.0Hz, step size: 0.1Hz **Note:** Take the maximum value between 52.0Hz and (Underfrequency Disconnect Frequency plus 0.5Hz).
8	UFd (Underfrequency Disconnect Frequency)	45.0Hz	In the bypass status, when the actual utility input frequency is less than this value, the inverter/charger will be switched to the inverter output status. User define: 45.0Hz to 58.0Hz, or 45.0Hz to (Overfrequency Disconnect Frequency minus 0.5Hz), step size: 0.1Hz **Note:** Take the minimum value between 58.0Hz and (Overfrequency Disconnect Frequency minus 0.5Hz).
9	CHC (Utility Maximum Charging Current)	50A	User define: 5.0Hz to 50.0Hz, step size: 0.1Hz
10	bAC (Battery Capacity)	100.0AH	User define: 10.0AH to 2400.0AH, step size: 0.1AH
11	ECt Equalization Charging Time)	120Min	User define: 10 to 180 minutes, step size: 1 minute
12	bCt (Bulk Charging Time)	120Min	User define: 10 to 180 minutes, step size: 1 minute
13	tcc (Temperature Compensation Coefficient)	3	User define: 0–9, step size: 1 **Note:** This option is reserved, which is invalid currently. Unit: mV/℃/2V
14	ACF (Auxiliary Charging	28.0V	Under the “Solar prior” charging mode, the Utility will stop

	OFF Voltage)	(24V system)	charging the battery if the battery voltage exceeds this value. User define: (Auxiliary Charging ON Voltage plus 0.2*N) ≤ Auxiliary Charging OFF Voltage ≤ Charging Limit Voltage (N = Rated battery voltage/12), step size: 0.1V (subject to battery type)
15	ACO (Auxiliary Charging ON Voltage)	24V (24V system)	Under the “Solar prior” charging mode, the Utility will start charging the battery if the battery voltage is less than this value. User define: Low Voltage Disconnect Voltage ≤ Auxiliary Charging ON Voltage ≤ (Auxiliary Charging OFF Voltage minus 0.2*N), step size: 0.1V (subject to battery type) **Note:** N = Rated battery voltage/12.
16	bCC (Allowed Charging Current)	70.0A	User define: 5.0A to70.0A, step size: 1A
17	LdC (Allowed Discharging Current)	175.0A	User define: 5.0A to175.0A, step size: 1A
18	CdN (Charge and Discharge Management)	VOL	User define: VOL, SOC **VOL:** Set the parameter as “VOL”, the relevant battery voltage control parameters will be valid. **SOC:** Set the parameter as “SOC”, the relevant battery SOC parameters will be valid. **Note:** When “SOC” is selected, perform multiple complete charge-discharge cycles, and

			correctly set the battery capacity.
19	bnu (BMS Invalid Action)	DSP	User define: DSP (inverter/charger), nOA (disable) **DSP:** The inverter/charger works according to the default mode and parameters. **Disable:** No charging and discharging, equivalent to standby mode.
20	FCP (Full Charge Protection SOC)	100%	Valid only when "CdN" is set to "SOC". When the battery SOC is greater than or equals to this value, the inverter/charger will automatically stop charging the battery. User define: (Full Charge Protection Recovery SOC plus 5%) to 100%, or 80% to 100%, step size: 1% **Note:** Take the maximum value between (Full Charge Protection Recovery SOC plus 5%) and 80%.
21	FCr (Full Charge Protection Recovery SOC)	95%	Valid only when "CdN" is set to "SOC". When the battery SOC is less than this value, the inverter/charger will automatically charge the battery. User define: 60% to (Full Charge Protection SOC minus 5%), step size: 1%
22	Lbr (Low Battery Alarm Recovery SOC)	40%	Valid only when "CdN" is set to "SOC". It cannot be set separately (equals to the Discharging Protection Recovery SOC).
23	LbA (Low Battery Alarm SOC)	25%	Valid only when "CdN" is set to "SOC". User define: 10% to 35%, or

			(Discharging Protection SOC plus 5%) to (Discharging Protection Recovery SOC minus 5%), step size: 1% **Note:** Take the maximum value between 10% and (Discharging Protection SOC plus 5%). Take the minimum value between 35% and (Discharging Protection Recovery SOC minus 5%).
24	dCr (Discharging Protection Recovery SOC)	40%	Valid only when "CdN" is set to "SOC". User define: (Low Battery Alarm SOC plus 5%) to 60%, or 20% to 60%, step size: 1% **Note:** Take the maximum value between (Low Battery Alarm SOC plus 5%) and 20%.
25	dCP (Discharging Protection SOC)	20%	Valid only when "CdN" is set to "SOC". When the battery SOC is less than this value, the battery will automatically stop discharging. User define: 0 to 10%, or 0 to (Low Battery Alarm SOC minus 5%), step size: 1% **Note:** Take the maximum value between 10% and (Low Battery Alarm SOC minus 5%).
26	ACO (Utility Auxiliary Charging ON SOC)	30%	Valid only when "CdN" is set to "SOC". User define: 20% to 50%, or 20% to (Utility Auxiliary Charging OFF SOC minus 10%), step size: 1% **Note:** Take the minimum value between 50% and (Utility Auxiliary Charging OFF SOC minus 10%).

27	ACF (Utility Auxiliary Charging OFF SOC)	60%	Valid only when ""CdN" is set to "SOC". User define: (Utility Auxiliary Charging ON SOC plus 10%) to 100%, or 40% to 100%, step size: 1% **Note:** Take the maximum value between (Utility Auxiliary Charging ON SOC plus 10%) and 40%.
28	SOC (SOC Set Value)	Not fixed and updates in real time.	Read-only. When the BMS is connected, BMS updates the value.
29	LCt (Low-Temperature Charging Prohibition Temperature)	0℃	User define: -20.0℃ to 0℃, step size: 0.1℃ When the ambient or battery temperature is less than this value, the inverter/charger will stop charging the battery.
30	Ldt (Low-Temperature Discharging Prohibition Temperature)	0℃	User define: -20.0℃ to 0℃, step size: 0.1℃ When the ambient or battery temperature is less than this value, the inverter/charger will stop charging the battery.
31	OtP (Battery Over Temperature Protection)	50.0℃	User define: (Battery Over Temperature Protection Recovery plus 5℃) to 60.0℃, step size: 0.1℃
32	Otr (Battery Over Temperature Protection Recovery)	45.0℃	User define: 30℃ to (Battery Over Temperature Protection minus 5℃), step size: 0.1℃
33	Eqd (Equalization Charging Date)	28	User define: 1–28, step size: 1

34	NEq (Manual Equalizer Order)	OFF	User define: OFF, On This parameter is the setting for manual equalization charging of the inverter/charger. When set to "On", the inverter/charger enters the manual equalization operating mode. After the inverter/charger restarts, the default value reverts to "OFF" — this means the inverter/charger will perform regular charging according to the set equalization charging cycle.
35	rst (SOC Calibration)	--	Press the "ENTER" button to reset, then the SOC will be recalculated automatically.
36	bAt (Battery Type)	AGM	24V battery type: AGM, GEL, FLD, F08, n06, and n07
37	Ovd (Overvoltage Disconnect Voltage)	32.0V	User define: Charging Limit Voltage < Overvoltage Disconnect Voltage ≤ 16*N), step size: 0.1V **Note:** N = Rated battery voltage/12.
38	CLv (Charging Limit Voltage)	30.0V (24V system)	User define: Equalization Charging Voltage < Charging Limit Voltage < Overvoltage Disconnect Voltage, step size: 0.1V
39	Ovr (Overvoltage Recovery Voltage)	30.0V (24V system)	User define: 18 ≤ Overvoltage Recovery Voltage < (Overvoltage Disconnect Voltage minus 0.1*N), step size: 0.1V **Note:** N = Rated battery voltage/12.
40	ECv (Equalization Charging Voltage)	29.2V (24V system)	User define: Bulk Charging Voltage ≤ Equalization Charging Voltage ≤ Charging Limit Voltage, step size: 0.1V

41	bCv (Bulk Charging Voltage)	28.8V (24V system)	User define: Float Charging Voltage ≤ Bulk Charging Voltage ≤ Equalization Charging Voltage, step size: 0.1V
42	FLV (Float Charging Voltage)	27.6V (24V system)	User define: Bulk Recovery Voltage < Float Charging Voltage ≤ Bulk Charging Voltage, step size: 0.1V
43	bur (Bulk Recovery Voltage)	26.4V (24V system)	User define: Low Voltage Recovery Voltage < Bulk Recovery Voltage < Float Charging Voltage, step size: 0.1V
44	Lur (Low Voltage Recovery Voltage)	25.2V (24V system)	User define: Low Voltage Disconnect Voltage < Low Voltage Recovery Voltage < Bulk Recovery Voltage, step size: 0.1V
45	Uur (Undervoltage Alarm Recovery Voltage)	24.0V (24V system)	User define: (Undervoltage Alarm Voltage plus 0.1*N) < Undervoltage Alarm Recovery Voltage ≤ (Low Voltage Recovery Voltage minus 0.1*N), step size: 0.1V **Note:** N = Rated battery voltage/12.
46	Uv (Undervoltage Alarm Voltage)	24.0V (24V system)	User define: Low Voltage Disconnect Voltage ≤ Undervoltage Alarm Voltage < (Undervoltage Alarm Recovery Voltage minus 0.1*N), step size: 0.1V **Note:** N = Rated battery voltage/12.
47	Lud (Low Voltage Disconnect Voltage)	22.2V (24V system)	User define: (Discharging Limit Voltage plus 0.1*N) ≤ Low Voltage Disconnect Voltage < Low Voltage Recovery Voltage, step size: 0.1V **Note:** N = Rated battery voltage/12.

48	dLu (Discharging Limit Voltage)	21.2V (24V system)	Read-Only
49	bAC (Battery Connection)	HAv	User define: HAv (HAVE), nO (NO) **Note:** When the parameter is changed (i.e., switching from "HAv" to "nO", or from "Without nO" to "HAv"), the AC output of the inverter/charger will be cut off for approximately 3 seconds before resuming normal output.
50	CH5 (Charging Mode)	U50	User define: 50L: Solar 5Pr: Solar > Utility U50: Solar+ Utility **Note:** For detailed working modes, refer to Chapter 4 Working modes.
51	OP5 (Discharging Mode)	Inv	User define: Inv: Inverter bP: Bypass **Note:** For detailed working modes, refer to Chapter 4 Working modes.
52	LPE (Lithium Battery Protection)	OFF	User define: OFF, On Set the parameter as “On”, and the Low Temperature Charging Limit will be valid.
53	PuN (PV Mode)	ALI	User define: ALI (Single), ALP (Parallel) When two or more PV arrays are input independently, the “ALI” mode must be set. When two or more PV arrays are connected in parallel to the inverter/charger (the PV terminals of the

			inverter/charger to be externally paralleled), the “ALP” mode must be set. **Note:** PV Mode is invalid when the product only has one PV input.
54	5tN (Standby Mode)	nOr	User define: nOr (Normal), 5tA (Standby) When set to "5tA" mode, the inverter/charger stops AC output and enters the standby mode. After the parameter is adjusted, the inverter/charger will revert to the default value upon restart and will not save the previous modified value.
55	LCN (Low Consumption (Power Saving) Mode)	On	User define: OFF (Disable), On (Enable) When set to "On", the inverter/charger will enter the the low consumption mode after certain conditions are met, such as when there is no PV or utility and the battery is under-voltage. After the parameter is adjusted, the inverter/charger will revert to the default value upon restart and will not save the previous modified value.
56	rst (Factory Reset)	--	Restore factory settings. Note: After factory reset, the LCD screen will turn off and then restart, this indicates the settings are effective.
57	rst (Fault Reset)	--	Press the "ENTER" button to exit the current fault alarm state and return to the normal operating state. **Note:** This operation will not clear the historical fault records.

58	LOA (Load Switch)	On	User define: OFF, On This is the AC output switch, which controls the turning off and on of the AC output. **Note:** If the LOA is set OFF, it will restore to the default ON when the inverter/charger is restarted.
59	PuI	OFF	User define: OFF, On When using a DC power to replace the PV array for power supply testing, it is necessary to select as "On" for this parameter. Otherwise, the inverter/charger can not work properly. After the parameter is adjusted, the inverter/charger will revert to the default value upon restart and will not save the previous modified value.
60	ESd (Reset Energy Statistics)	--	Press the "Enter" button to clear the accumulated power of all charging and discharging.
61	drO (Dry Contact ON Voltage)	22.0V (24V system)	User define: 0 to (Dry Contact OFF Voltage minus 0.1*N), step size: 0.1V When the battery voltage is lower than the set voltage, the dry contact switch closes. **Note:** N = Rated battery voltage/12.
62	drF (Dry Contact OFF Voltage)	25.0V (24V system)	User define: 0 to (Dry Contact ON Voltage plus 0.1*N), step size: 0.1V When the battery voltage exceeds the set voltage, the dry contact switch disconnects. **Note:** N = Rated battery voltage/12.

63	AC1 (AC Mode)	GrI	User define: GrI (Utility), GEn (Generator) When a generator works as the AC input source, set this mode to "GEn" to enhance the charging of the inverter/charger. **Note:** If the configured AC input mode is not compatible with the actual AC source, the normal operation of the inverter/charger will be affected. After setting, restart the inverter/charger for the setting to take effect.
64	bLt (Backlight Time)	30S	User define: 6S, 30S, 60S, ALL (normally ON)
65	bEP (Buzzer Alarm)	On	User define: OFF, On Set the "bEp" as "ON", the buzzer will sound when a fault occurs. After the fault is eliminated, the buzzer will automatically mute. If the "bEp" is set as "OFF", even if a fault occurs, the buzzer will not sound.
66	brA (Baudrate)	1	User define: 1: 115200 2: 9600 3: 19200 4: 38400 5: 57600
67	C1d (COM ID)	1	User define: 1 to 254, step size: 1
68	tEP (Temperature Unit)	℃	User define: ℃, ℉
69	bNE (BMS Communication)	OFF	User define: OFF, On When this parameter is set to "On", the inverter/charger can communicate normally with the

			battery pack or temperature sensor.
70	bnP (BMS Protocol)	2	User define: 0 to 240, step size: 1 **Note:** Please go to EPEVER official website to check or download the currently supported BMS manufacturers and the BMS protocols.
71	LEd (Indicator)	On	User define: OFF, On Set whether the PV/LOAD/UTILITY/RUN indicators on the LCD are displayed.
72	bNu (BMS Voltage Control)	OFF	User define: OFF (Disable), On (Enable) Set the parameter as “On”, the internal voltage control parameters of the BMS will be automatically synchronized into the inverter/charger, and the inverter/charger will control the battery charging and discharging based on these data.
73	bNC (BMS Current Control Method)	Inv	User define: Inv (Invalid), bnS (BMS) Set the parameter as “bnS”, the inverter/charger controls the charging and discharging according to the read BMS value. Set the parameter as “Inv”, the inverter/charger controls the charging and discharging according to the value set on the LCD.
74	bdC (Discharging Coefficient)	3C	User define: 1C, 3C When this parameter is set to "3C", the inverter/charger will use the smaller value between "total battery capacity multiplied

			by 3" and "the allowable charging and discharging current set on the LCD" as the maximum current limit for charging and discharging current to control the charging and discharging.
75	YEA (Year)	--	User define
76	ddN (Month-Day)	--	User define
77	HNt (Hour-Minute)	--	User define

3.3.2 Battery mode

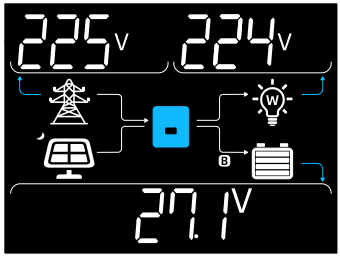
The following table lists the setting process for different application scenarios. According to your current battery status (such as whether it is a lithium-ion battery pack, whether it has BMS function, whether it has current control function at the end of charge and discharge, etc.), you can reasonably set the parameters to ensure that the battery works in the optimal performance, so as to ensure the safe operation of the system for a long time.

No.	Scenario	Setting Process
1	Battery without BMS	See Figure 1 Setting Process for Battery without BMS
2	Lithium battery with BMS	See Figure 2 Setting Process for Lithium Battery with BMS

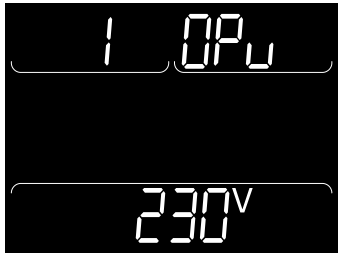
- **Figure 1 Setting Process for Battery Without BMS**

When the system adopts the battery without BMS, follow the table below to set parameters correctly. The inverter/charger controls charging and discharging based on the LCD settings.

Interface	Parameters	Define
Parameter Setting Interface	bAC (Total Battery Capacity)	Set according to the actual battery type.
	bAt (Battery Type)	
	Cdn (Charge and Discharge Management)	Set it to “VOL” or “SOC”, the inverter/charger controls charging and discharging based on the set battery voltage control parameters or SOC control parameters.



1. Press and hold the “Enter” button from the flowchart screen.

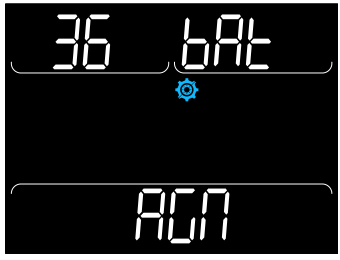


2. Enter the parameter setting interface.

3. Press the “UP”/”DOWN” buttons to navigate to the setting items.

Select the setting item 10: bAC (Total Battery Capacity).

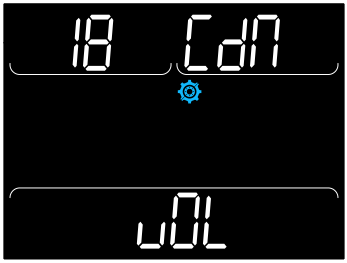
Press the “ENTER” button, then will illuminate. Press the “UP”/”DOWN” buttons to modify the values (set according to the actual battery). Press the “ENTER” button again to save new parameter values. Wait for turns off, indicates the setting is completed.



4. Press the “UP”/”DOWN” buttons to navigate to the setting items.

Select the setting item 36: bAt (Battery Type).

Press the “ENTER” button, then will illuminate. Press the “UP”/”DOWN” buttons to modify the values (set according to the actual battery). Press the “ENTER” button again to save new parameter values. Wait for turns off, indicates the setting is completed.



5. Press the “UP”/”DOWN” buttons to navigate to the setting items.

Select the setting item 18: CdN (Charge and Discharge Management).

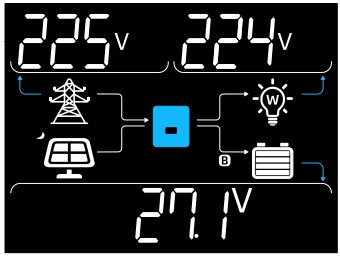
Press the “ENTER” button, then will illuminate. Press the “UP”/”DOWN” buttons to modify the values (set according to the actual needs). Press the “ENTER” button again to save new parameter values, then will turn off, indicates the setting is completed. Press the “ESC” button to return to the flowchart screen.

Note: See Subsection 3.3.1 Parameter list for the specific setting method.

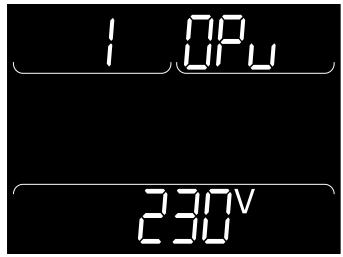
- **Figure 2 Setting Process for Lithium Battery with BMS**

When the system adopts the lithium battery with BMS, follow the table below to set parameters correctly.

Interface	Parameters	Define
Parameter Setting Interface	bAt (Total Battery Capacity) Parameter No.: 36	Set according to the actual battery type.
	CdN (Charge and Discharge Management) Parameter No.: 18	Set it to “VOL” or “SOC”, the inverter/charger controls charging and discharging based on the set battery voltage control parameters or SOC control parameters.
	bnP (BMS Protocol) Parameter No.: 70	Set according to the actual battery protocol.
	bNE(BMS On) Parameter No.: 69	On (Enable); OFF (Disable)
	bNu (BMS Voltage Control) Parameter No.: 72	On (Enable); OFF (Disable)
	bNC (BMS Current Control) Parameter No.: 73	BMS (Enable); Inv (Invalid)



1. Press and hold the “Enter” button from the flowchart screen.

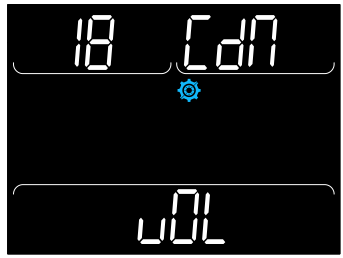


2. Enter the parameter setting interface.

3. Press the “UP”/”DOWN” buttons to navigate to the setting items.

Select the setting item 36: bAt (Battery Type).

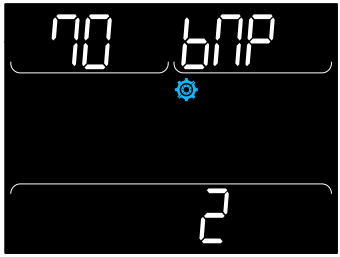
Press the “ENTER” button, then will illuminate. Press the “UP”/”DOWN” buttons to modify the values (set according to the actual battery). Press the “ENTER” button again to save new parameter values. Wait for turns off, indicates the setting is completed.



4. Press the “UP”/”DOWN” buttons to navigate to the setting items.

Select the setting item 18: CdN (Charge and Discharge Management).

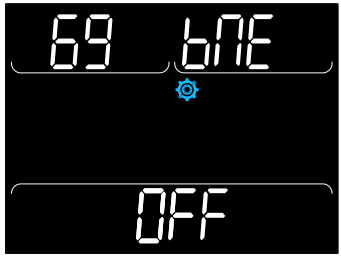
Press the “ENTER” button, then will illuminate. Press the “UP”/”DOWN” buttons to modify the values (set according to the actual needs). Press the “ENTER” button again to save new parameter values. Wait for turns off, indicates the setting is completed.



5. Press the “UP”/”DOWN” buttons to navigate to the setting items.

Select the setting item 70: bnP (BMS Protocol).

Press the “ENTER” button, then will illuminate. Press the “UP”/”DOWN” buttons to modify the values (set according to the actual battery). Press the “ENTER” button again to save new parameter values. Wait for turns off, indicates the setting is completed.



6. Press the “UP”/”DOWN” buttons to navigate to the setting items.

Select the setting item 69: bNE (BMS On).

Press the “ENTER” button, then will illuminate. Press the “UP”/”DOWN” buttons to modify the values (set according to the actual battery). Press the “ENTER” button again to save new parameter values. Wait for turns off, indicates the setting is completed.

7. Press the “UP”/”DOWN” buttons to navigate to the setting items.

Select the setting item 72: bNu (BMS Voltage Control).

Press the “ENTER” button, then will illuminate. Press the “UP”/”DOWN” buttons to modify the values (set according to the actual battery). Press the “ENTER” button again to save new parameter values. Wait for turns off, indicates the setting is completed.

Tip	Please go to EPEVER official website to download the currently supported BMS manufacturers and the BMS parameters.

NOTICE

The inverter/charger will control charging and discharging based on the LCD settings after

setting the “BMSCurr” as “Invalid” or the communication between battery and inverter/charger fails.

4 Working modes

4.1 Abbreviation

Abbreviation	Instruction
P_{PV}	PV Power
P_{LOAD}	Load Power
P_{CHG}	Charging Power
V_{BAT}	Battery Voltage
Lud	Low Voltage Disconnect Voltage
Lur	Low Voltage Recovery Voltage
dCP	Discharging Protection SOC
dCr	Discharging Protection Recovery SOC
ACF	Auxiliary Charging OFF Voltage (namely, Utility Charging OFF Voltage)
ACO	Auxiliary Charging ON Voltage (namely, Utility Charging ON Voltage)
ACF	Utility Auxiliary Charging OFF SOC
ACO	Utility Auxiliary Charging ON SOC
bCC	Battery Maximum Charging Current
SOC	The battery charging state, which indicates the ratio of the current storage capacity dividing the maximum storage capacity.
S_{BMS}	Battery BMS SOC
50L	Charging Mode: Solar
5Pr	Charging Mode: Solar > Utility
U50	Charging Mode: Solar+ Utility
Inv	Discharging Mode: Inverter
bP	Discharging Mode: Bypass

4.2 Battery mode

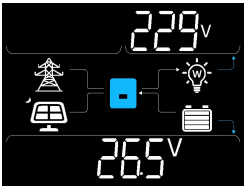
4.2.1 Scenario A: Both PV and utility are not available.

Regardless of the input and output sources, the working mode is as follows.

(A)

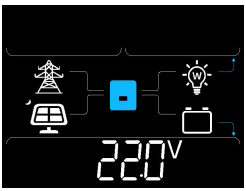
PV ☒

Utility ☒



$V_{BAT} \geq$ Lur /SOC ≥ dCr

$V_{BAT} \leq$ Lud /SOC ≤ dCP



① When any of the following conditions is met, the battery supplies the load.

- The battery voltage is greater than or equal to the Lur value.
- The battery SOC is greater than or equal to the dCr value.

② When any of the following conditions is met, the battery stops supplying the load.

- The battery voltage is less than or equal to the Lud value.
- The battery SOC is less than or equal to the dCP value.

NOTICE

- Set the "CdN (Charge and Discharge Management)" as "VOL", the working mode is determined by the battery voltage value.
- Set the "CdN (Charge and Discharge Management)" as "SOC", the working mode is determined by the battery SOC. Before starting the SOC mode, set the "CdN" as "SOC" first, the SOC control mode will be more accurate after a full charge-discharge cycle.
- For the setting of the "CdN", please refer to the Subsection 3.3.1 Parameter list.

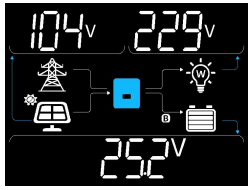
4.2.2 Scenario B: PV is available, but the utility is not available.

Regardless of the input and output sources, the working mode is as follows.

(B)

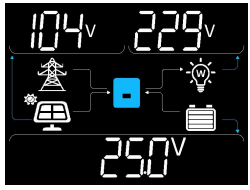
PV ☑

Utility ☒



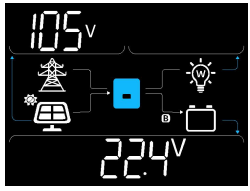
$P_{PV} > P_{LOAD}$ ⇅ $P_{PV} \leq P_{LOAD}$

① When the PV power is greater than the load power, PV charges the battery and supplies extra power to the load.



$V_{BAT} \geq$ Lur /SOC ≥ dCr ⇅ $V_{BAT} \leq$ Lud /SOC ≤ dCP

② When the PV power is less than or equal to the load power, the PV will not charge the battery, the battery will cut in to supply power to the load together with the PV.

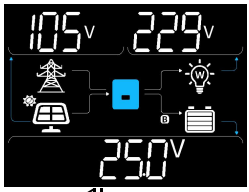
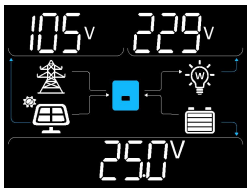
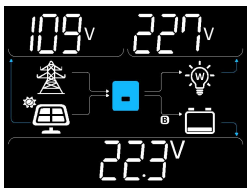


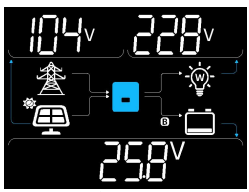
③ When any of the following conditions is met, the PV and the battery stop supplying power to the load, PV charges the battery alone.

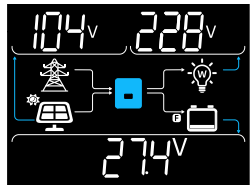
- The battery voltage is less than or equal to the Lud value.
- The battery SOC is less than or equal to the dCP value.

Note: When the battery voltage is greater than or equal to the Lur value, or the battery SOC is greater than or equal to the dCr value, the system returns to working mode ②.

4.2.3 Scenario C: Both PV and Utility are available.

	Charging Mode: Solar	Discharging Mode: Inverter
(C-1) PV ☑ Utility ☑	 $P_{PV} > P_{LOAD}$ ⇅ $P_{PV} \le P_{LOAD}$	① When the PV power is greater than load power, the PV charges the battery and supplies extra power to the load.
	 $V_{BAT} \ge$ Lur /SOC ≥ dCr ⇅ $V_{BAT} \le$ Lud /SOC ≤ dCP	② When the PV power is less than or equal to the load power, the PV will not charge the battery, the battery will cut in to supply power to the load together with the PV.
		③ Any of the following is satisfied, the Utility supplies power to the load and the PV charges the battery in priority. • The battery voltage is less than or equal to the Lud value. • The battery SOC is less than or equal to the dCP value.
	Note: When the battery voltage is greater than or equal to the Lur value, or the battery SOC is greater than or equal to the dCr value, the system returns to working mode ②.	

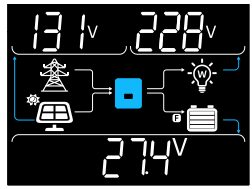
	Charging Mode: Solar	Discharging Mode: Bypass
(C-2) PV ☑ Utility ☑	 Bulk or Equalization ⇅ Float	① When the battery is under the bulk or equalization charging, the Utility supplies the load, and PV charges the battery.



$P_{PV} \leq P_{CHG}$
$P_{PV} > P_{LOAD}$

$P_{PV} > P_{CHG}$

② When the battery is under float charging, if $P_{PV} \leq P_{CHG}$, the Utility supplies the load, and PV charges the battery.



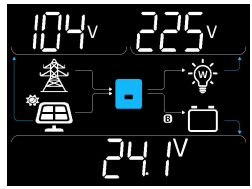
③ When the battery is under float charging, if $P_{PV} > P_{CHG}$, the Utility and PV supplies the load simultaneously, and PV charges the battery.

(C-3)

PV ☑

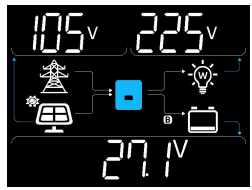
Utility ☑

Charging Mode: Solar prior



$V_{BAT} \leq ACO$
$/S_{BMS} \leq ACO$

$V_{BAT} \geq ACF$
$/S_{BMS} \geq ACF$



Bulk or Equalization

Float

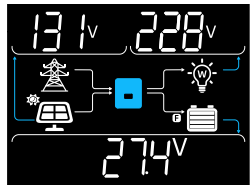
Discharging Mode: Not relevant

① When the battery is under the bulk or equalization charging, and any of the following conditions is met, the Utility supplies power to the load and charges the battery together with the PV.

- The battery voltage is less than or equal to the ACO value.
- The battery SOC is less than or equal to the SOC (ACO) value.

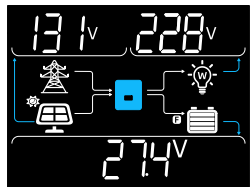
② When the battery is under the bulk or equalization charging, and any of the following conditions is met, the Utility supplies power to the load and PV charges the battery.

- The battery voltage is greater than or equal to the ACF value.
- The battery SOC is greater than or equal to the SOC (ACF) value.



$P_{PV} > P_{CHG}$ ⇅ $P_{PV} \le P_{CHG}$, $P_{PV} > P_{Load}$

③ When the battery is under float charging, if $P_{PV} > P_{CHG}$, the Utility and PV supplies the load simultaneously, and PV charges the battery.



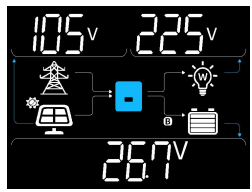
④ When the battery is under float charging, if $P_{PV} \le P_{CHG}$, the Utility supplies the load, and PV charges the battery.

Charging Mode: Solar plus Utility | **Discharging Mode: Not relevant**

(C-4)

PV ☑

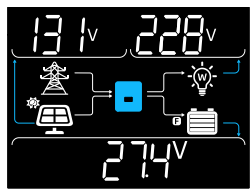
Utility ☑



Bulk or Equalization ⇅ Float

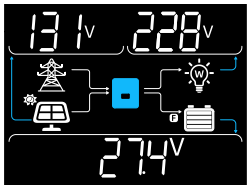
① When the battery is the bulk or equalization charging, the Utility supplies power to the load and charges the battery together with the PV.

Note: When the battery charging current is limited through the meter, if the actual PV power exceeds the charging power, only PV charges the battery.



$P_{PV} > P_{CHG}$ ⇅ $P_{PV} \le P_{CHG}$, $P_{PV} > P_{Load}$

② When the battery under float charging, if $P_{PV} > P_{CHG}$, the Utility and PV supply the load simultaneously, and PV charges the battery.



③ When the battery under float charging, if $P_{PV} < P_{CHG}$, the Utility supplies power to the load and charges the battery together with the PV.

4.2.4 Scenario D: The PV is not available, but the Utility is available.

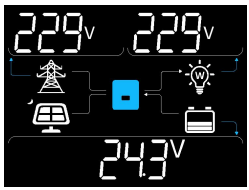
Charging Mode: Solar

Discharging Mode: Inverter

(D-1)

PV ☒

Utility ☑

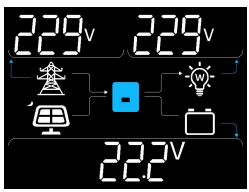


$V_{BAT} \geq Lur$ /SOC ≥ dCr

$V_{BAT} \leq Lu$ /SOC ≤ dCP

① When any of the following conditions is met, the battery supplies the load.

- The battery voltage is greater than or equal to the Lud value.
- The battery SOC is greater than or equal to the dCP value.



② When any of the following conditions is met, the Utility supplies power to the load.

- The battery voltage is less than or equal to the Lud value.
- The battery SOC is less than or equal to the dCP value.

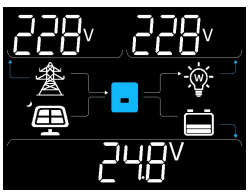
Charging Mode: Solar

Discharging Mode: Bypass

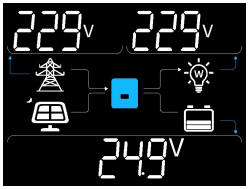
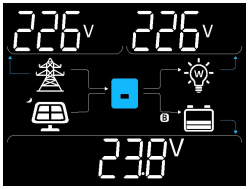
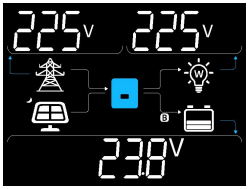
(D-2)

PV ☒

Utility ☑

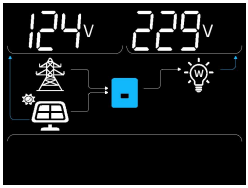


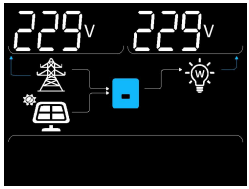
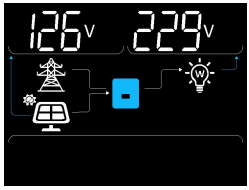
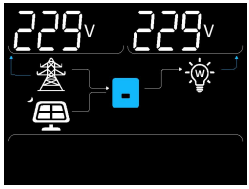
The Utility supplies power to the load.

(D-3) PV ☒ Utility ☑	**Charging Mode: Solar prior**  $V_{BAT} \geq ACF$ /$SOC \geq ACF$ ⇅ $V_{BAT} \leq ACO$ /$SOC \leq ACO$ 	**Discharging Mode: Not relevant** ① When any of the following conditions is met, the Utility supplies power to the load. • The battery voltage is greater than or equal to the ACF value. • The battery SOC is greater than or equal to the SOC (ACF) value. ② When any of the following conditions is met, the Utility supplies power to the load and charges the battery simultaneously. • The battery voltage is less than or equal to the ACO value. • The battery SOC is less than or equal to the SOC (ACO) value.
(D-4) PV ☒ Utility ☑	**Charging Mode: Solar plus Utility** 	**Discharging Mode: Not relevant** The Utility supplies power to the load and charges the battery simultaneously.

4.3 No-battery mode

Note: Under the no-battery mode, the “Charging Mode” and “Discharging Mode” settings will not take effect.

PV ☑ Utility ☑	 $P_{PV} > P_{LOAD}$ ⇅ $P_{PV} \leq P_{LOAD}$	① When the PV power is greater than the load power, the PV supplies power to the load. **Note:** The Utility maintains a minimum power input. When the load power is greater than the PV power, the Utility can replenish the power supply at any time to avoid device shutdown.

		② When the PV power is less than or equals to the load power, the PV and the Utility supply power to the load together.
PV ☑ **Utility ☒**		The PV supplies power to the load alone.
PV ☒ **Utility ☑**		The Utility supplies the load alone.

5 Protections

No.	Protections	Instruction
1	PV limit current	When the actual charging current/power of the PV array exceeds its rated current/power, it will charge the battery as per the rated current/power.
2	PV short-circuit	When the PV is not charging and a short circuit occurs, the inverter/charger will not be damaged. However, if a short circuit occurs in the PV array during the PV charging process, it may damage the inverter/charger.
3	PV reverse polarity	When the PV array polarity is reversed, the battery backup will not be damaged and will resume to normal operation after correction.
4	Utility input overvoltage	When the utility voltage exceeds the set value of "Ovd (Utility Overvoltage Disconnect Voltage)", the utility will stop charging and supplying the load.
5	Utility input undervoltage	When the utility voltage is less than the set value of "Uvd (Utility Low Voltage Disconnect Voltage)", the utility will stop charging and supplying the load.
6	Battery overvoltage	When the battery voltage exceeds the "Ovd (Overvoltage Disconnect Voltage)," the PV/Utility will stop charging the battery to protect the battery from overcharging.
7	Battery over discharge	When the battery voltage goes lower than the "Lud (Low Voltage Disconnect Voltage)", the battery will stop discharging to protect the battery from being over-discharged.
8	Load output short-circuit	The load output is turned off immediately when a short circuit occurs. And then, the output is recovered automatically after a delay time of 5s, 10s, and 15s separately (if the recovery is less than 3 times within 5 minutes, it will be recounted). The inverter/charger stops working after the 4th protection and can resume working after resetting or restarting. Clear the fault in time because it may damage the inverter/charger permanently. **Note:** "Reset" here refers to the operation in the Chapter 6 Troubleshooting, see Subsection 3.3.1 Parameter list for the specific setting of reset.

<table>
<tr><td>9</td><td>Device overheating</td><td colspan="4">When the internal temperature overheats, the inverter/charger will stop charging/discharging.
The inverter/charger will resume charging/discharging when the internal temperature is normal and the protection time lasts more than 20 minutes.</td></tr>
<tr><td rowspan="3">10</td><td rowspan="3">Inverter overload</td><td>1.05–1.3* Rated power</td><td>1.3–1.5* Rated power</td><td>1.5–2* Rated power</td><td>P ≥ 2* Rated power</td></tr>
<tr><td>Protect after 60 seconds</td><td>Protect after 10 seconds</td><td>Protect after 5 seconds</td><td>Protect immediately</td></tr>
<tr><td colspan="4">Note: The output is recovered automatically after a delay time of 5s, 10s, and 15s separately. The inverter/charger stops working after the 4th protection and can resume working after resetting or restarting.</td></tr>
<tr><td rowspan="3">11</td><td rowspan="3">Utility bypass overload</td><td colspan="2">1.6–2*Rated power</td><td colspan="2">2–2.5*Rated power</td><td>P ≥ 2.5*Rated power</td></tr>
<tr><td colspan="2">Protect after 30 seconds</td><td colspan="2">Protect after 5 seconds</td><td>Protect immediately</td></tr>
<tr><td colspan="5">Note: The output is recovered automatically after a delay time of 5s, 10s, and 15s separately. The inverter/charger stops working after the 4th protection and can resume working after resetting or restarting.</td></tr>
</table>

6 Troubleshooting

NOTICE

After the inverter/charger is powered on, the meter displays the boot screen all the time (unable to enter the home screen) and the red "RUN" indicator flashes. It means the communication with the inverter/charger is abnormal. When the above fault occurs, check whether the communication cable is disconnected. If not, please contact our after-sales engineer.

6.1 Battery faults

Error code[1]	Fault/Status	Indicator	Buzzer	Solution
ER04	Battery Overvoltage	--	--	Disconnect the utility and PV connection, and check whether the battery voltage is too high. Verify if the actual battery voltage matches the rated battery voltage; or check if the "Overvoltage Disconnect Voltage" is inconsistent with the battery specifications. After the battery voltage drops below the set value of "Overvoltage Recovery Voltage", the alarm will automatically be cleared.
ER05	Battery Undervoltage			Disconnect the loads connection, and check whether the battery voltage is too low. After the battery is charged and its voltage is restored to above the "Low Voltage Recovery Voltage", it will automatically return to normal, or use other methods to charge the battery.
ER11	Battery Over Temperature			Ensure the battery is installed in a cool and well-ventilated place, check that the battery actual charging and discharging current does not exceed the set values of "Battery Maximum Charging Current" and "Battery Maximum Discharging Current". It resumes normal work when the battery cools down to below the "Battery Over Temperature Protection Recovery".

ER37	Battery Charging Overcurrent			Check if the battery actual charging/discharging current exceeds the set values of "Battery Max. charging current " and "Battery limit discharging current."
ER58	Battery Discharging Abnormal			
ER39	Battery Cable Disconnected			Check whether the battery connection is normal, and whether the BMS protection occurs.
ER50	Battery Undervoltag Alarm			Check if the battery voltage is less than the "Undervoltage Alarm Voltage".
ER56	Battery Connection Failed			Check if the battery connection is normal and the BMS communication of the lithium battery is normal.

(1) The fault icon is displayed above the device icon of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value. Press the "UP"/"DOWN" buttons to view other fault codes.

6.2 PV faults

Error code(1)	Fault/Status	Indicator	Buzzer(2)	Solution
ER15	PV1 Overvoltage	PV indicator slowly flash green	Intermittent beeps	Check if the PV open-circuit voltage is greater than PV Overvoltage Protection.
ER17	PV1 Charging Overcurrent	PV indicator slowly flash green	--	Turn off the inverter/charger first, wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER43	PV1 Temp Sensor Disconnected	PV indicator solid green	--	Turn off the inverter/charger first, wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still

				abnormal, please contact our technical support.
ER34	PV Current OFFSET Error	--	--	--
ER60	PV Over Temperature	--	--	Ensure the inverter/charger is installed in a cool and well-ventilated place.

(1) The fault icon is displayed above the device icon of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value. Press the "UP"/"DOWN" buttons to view other fault codes.

(2) Set the "BuzzerAlert" as "ON", the buzzer will sound when a fault occurs. After the fault is eliminated, the buzzer will automatically mute. If the "BuzzerAlert" is set as "OFF", even if a fault occurs, the buzzer will not sound.

6.3 Inverter faults

Error code[1]	Fault/Status	Indicator	Buzzer[2]	Solution
ER02	Inverter Output Overcurrent	LOAD indicator slowly flash green	Intermittent beeps	Check if the load actual power exceeds the rated power (namely, the inverter/charger's continuous output power), disconnect the load completely and turn off the inverter/charger. Wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER07	Inverter Output Overvoltage	LOAD indicator slowly flash green	Intermittent beeps	Disconnect the load completely and turn off the inverter/charger. Wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER10	Inverter Over Temperature	--	--	Ensure the inverter/charger is installed in a cool and well-ventilated place.

ER22	Inverter Hardware Overvoltage	--	--	Disconnect the load completely and turn off the inverter/charger. Wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER23	Inverter Hardware Overcurrent	--	--	--
ER32	Inverter Voltage OFFSET Error	--	--	--
ER35	Inverter Current OFFSET Error	--	--	--
ER45	Inverter Temp Sensor Disconnected	LOAD indicator solid green	--	Turn off the inverter/charger first, wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER41	Inverter Temp Sensor Disconnected	--	--	--
ER49	Inverter Output Undervoltage	LOAD indicator slowly flash green	Intermittent beeps	Check if the load actual power exceeds the rated power (namely, the inverter/charger's continuous output power), disconnect the load completely and turn off the inverter/charger. Wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER61	Low voltage side Over Temperature	--	--	Ensure the inverter/charger is installed in a cool and well-ventilated place.

(1) The fault icon is displayed above the device icon of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value. Press the "UP"/"DOWN" buttons to view other fault codes.

(2) Set the "BuzzerAlert" as "ON", the buzzer will sound when a fault occurs. After the fault is eliminated, the buzzer will automatically mute. If the "BuzzerAlert" is set as "OFF", even if a fault occurs, the buzzer will not sound.

6.4 Utility faults

Error code[1]	Fault/Status	Indicator	Buzzer[2]	Solution
ER08	Utility Overvoltage	Utility indicator slowly flash green	Intermittent beeps	Check if the utility voltage is normal (i.e. within the "Utility work voltage range"), disconnect the AC input completely and turn off the inverter/charger. Wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal operation. If it is still abnormal, please contact our technical support.
ER09	Utility Overcurrent			Check if the load actual power exceeds the rated power (namely, the inverter/charger's continuous output power), disconnect the load completely and turn off the inverter/charger. Wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER25	Utility Undervoltage	Utility indicator slowly flash green	--	
ER28	Utility Pre-charge Timeout	Utility indicator solid on	--	Disconnect the Utility input and turn off the inverter/charger first. Wait for 12 minutes and then turn on the inverter/charger to
ER29	Utility Relay Adhesion			

ER31	Utility Frequency Error	Utility indicator slowly flash green	Intermittent beeps	check if it resumes normal. If it is still abnormal, please contact our technical support.

(1) The fault icon is displayed above the device icon of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value. Press the "UP"/"DOWN" buttons to view other fault codes.

(2) Set the "BuzzerAlert" as "ON", the buzzer will sound when a fault occurs. After the fault is eliminated, the buzzer will automatically mute. If the "BuzzerAlert" is set as "OFF", even if a fault occurs, the buzzer will not sound.

6.5 Load faults

Error code(1)	Fault/Status	Indicator	Buzzer(2)	Solution
ER33	Load Current OFFSET Error	--	--	Disconnect the load completely and turn off the inverter/charger. Wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER48	Load Over Load	LOAD indicator slowly flash green	Intermittent beeps	
ER55	Overload Lockdown			

(1) The fault icon is displayed above the device icon of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value. Press the "UP"/"DOWN" buttons to view other fault codes.

(2) Set the "BuzzerAlert" as "ON", the buzzer will sound when a fault occurs. After the fault is eliminated, the buzzer will automatically mute. If the "BuzzerAlert" is set as "OFF", even if a fault occurs, the buzzer will not sound.

6.6 BMS faults

Error code[1]	Fault/Status	Indicator	Buzzer[2]	Solution
ER66	BMS Overvoltage	--	Intermittent beeps	Check the BMS communication status or BMS setting parameters.
ER68	BMS Charging Temp Abnormal			
ER69	BMS Undervoltage			
ER71	BMS Discharging Temp Abnormal			
ER128	BMS Communication Failure			
ER129	Cell UV (Cell Undervoltage Protection)	--	--	Stop discharging and switch to charging, to avoid over-discharging of the lithium battery.
ER131	Pack UV (Pack Undervoltage Protection)			
ER130	Cell OV (Cell Overvoltage Protection)	--	--	Stop charging or switch to discharging, to avoid over-charging of the lithium battery.
ER132	Pack OV (Pack Overvoltage Protection)			
ER133	Charge OC (Charging Overcurrent Protection)	--	--	Reduce the charging current to avoid damaging the lithium battery due to excessive charging current.
ER134	Discharge OC (Discharging Overcurrent Protection) Note: The fault will be triggered when discharging overcurrent level 1	--	--	Reduce the discharging current to avoid damaging the lithium battery due to excessive discharge current.

	protection or level 2 protection is activated			
ER135	Discharge SC (Discharging Short Circuit Protection)	--	--	Stop charging and discharging, and check whether the lithium battery terminals and the connected device are damaged. Start discharging after clearing the faults.
ER136	Charge HT (Charging High Temperature Protection)	--	--	Ensure the lithium battery is installed in a cool and well-ventilated place.
ER138	Discharge HT (Discharging High Temperature Protection)			
ER140	MOSFET HT (MOSFET High Temperature Protection)			
ER137	Charge LT (Charging Low Temperature Protection)	--	--	Check whether the installation ambient temperature of lithium battery is too low.
ER139	Discharge LT (Discharging Low Temperature Protection)			

(1) The fault icon is displayed above the device icon of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value. Press the "UP"/"DOWN" buttons to view other fault codes..

(2) Set the "BuzzerAlert" as "ON", the buzzer will sound when a fault occurs. After the fault is eliminated, the buzzer will automatically mute. If the "BuzzerAlert" is set as "OFF", even if a fault occurs, the buzzer will not sound.

6.7 Other faults for single inverter/charger

Error code[1]	Fault/Status	Indicator	Buzzer	Solution
ER00	DC Bus Overvoltage	--	--	Turn off the inverter/charger first, wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER06	DC Bus Undervoltage			
ER12	Ambient Over Temperature			Ensure the inverter/charger is installed in a cool and well-ventilated place.
ER21	Battery or Bus Hardware Overvoltage			Turn off the inverter/charger first, wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER24	High Volt Bus Hardware Overcurrent			
ER36	High Volt Bus Current Abnormal			
ER38	Boost Drive Error			
ER40	Auxiliary Power Supply Abnormal			
ER42	Environment Temp Sensor Disconnected			Turn off the inverter/charger first, wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER46	Low Temperature Charging Limit			Check whether the ambient temperature is less than the set “Low Temperature Charging Limit” and "Low Temperature Discharging Limit”.
ER47	Low Temperature Discharging Limit			

ER54	EEprom Abnormal			Turn off the inverter/charger first, wait for 12 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
ER57	Model Abnormal	--	--	--

(1) The fault icon is displayed above the device icon of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value. Press the "UP"/"DOWN" buttons to view other fault codes.

7 Maintenance

The following inspections and maintenance tasks are recommended at least twice yearly for best performance.

- Make sure the well ventilation and heat dissipation of the inverter/charger and clear up dirt and fragments on the fan.
- Check for damage to exposed wires caused by sun exposure, friction with surrounding objects, dry rot, or insect and rodent activity. Repair or replace damaged wires as necessary.
- Check and confirm that LED or LCD is consistent with the required. Pay attention to any troubleshooting or error indication. Take necessary corrective action.
- Check for signs of corrosion, insulation damage, high temperature or burning/discoloration on the terminal screws. Tighten terminal screws to the suggested torque.
- Check for dirt, nesting insects, and corrosion, and clean up in time as required.
- Check and confirm that the lightning arrester is in good condition. Replace a new one in time to avoid damaging the inverter/charger and other equipment.

⚠ DANGER

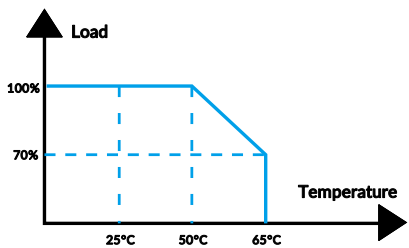
Electric shock hazard! Make sure that the power supply of the inverter/charger is disconnected when performing the above operations, and wait for 12 minutes for the power in the capacitor to be discharged before performing the corresponding checks or operations.

8 Technical Specifications

Model	QI1522-0515C
Battery (DC)	
Voltage Range	21.2V–32V
Rated Voltage	24V
Maximum Charging Current	70A
Maximum PV Charging Current	50A
Maximum Utility Charging Current	50A
PV Input (DC)	
Maximum Input Power	1,500W
Maximum Input Voltage	145V
Maximum Input Current	30A
MPPT Voltage Range	23V–120V
Number of MPPTs	1
Utility Input	
Rated Input Power (Charging+Bypass)	2,250W
Rated Input Voltage	220VAC/230VAC
Input Voltage Range	170V–280V
Input Frequency Range	45Hz–65Hz
Inverter Output	
Rated Output Power	1,500W
Transient Surge Output Power	2*Rated output power (5s)
Output Voltage Level	230VAC ± 3%
Output Voltage Waveform	Pure Sine Wave

Output Frequency Level		50Hz/60Hz
THDu		< 3%
Switch Time		< 10ms
Environmental Parameters		
Operating Temperature		-20℃ to +65℃(1)
Storage Temperature		-25℃ to +70℃
Relative Humidity		< 95% (N.C.)
Altitude		4,000m (> 2,000m derating)(2)
Ingress Protection		IP20
Mechanical Parameters		
Dimensions (L × W × H)		417mm × 293mm × 100mm
Weight		7.25kg
Others		
Display		LCD
Certifications	EMC	EN IEC 61000-6-2, EN IEC 61000-6-4, EN IEC 61000-3-2, EN 61000-3-3
	Safety Regulations	IEC 62109-1, IEC 62109-2
	RoHS	IEC 62321-5，IEC 62321-7, IEC62321-12

(1) The output load power, PV and utility charging power will decrease when the ambient temperature is higher than 50℃. The temperature-power curve is shown as the figure below:



(2) Altitude derating: For every 1,000-meter increase in altitude above 2,000 meters, the load-carrying capacity decreases by 10%.

9 Abbreviation Index

Interface	Abbreviations	Full Name
Voltage Control Strategy	Ovd	Overvoltage Disconnect Voltage
	CLv	Charging Limit Voltage
	Ovr	Overvoltage Recovery Voltage
	ECv	Equalization Charging Voltage
	bCv	Bulk Charging Voltage
	FLv	Float Charging Voltage
	bVr	Bulk Recovery Voltage
	Lvr	Low Voltage Recovery Voltage
	Uur	Undervoltage Alarm Recovery Voltage
	Uv	Undervoltage Alarm Voltage
	Lud	Low Voltage Disconnect Voltage
	dLv	Discharging Limit Voltage
	ACF	Auxiliary Charging OFF Voltage
	ACO	Auxiliary Charging ON Voltage
SOC Control Strategy	FCP	Full Charge Protection SOC
	FCr	Full Charge Protection Recovery SOC
	Lbr	Low Battery Alarm Recovery SOC
	LbA	Low Battery Alarm SOC
	dPr	Discharging Protection Recovery SOC
	dP	Discharging Protection SOC
	ACO	Utility Auxiliary Charging ON SOC
	ACF	Utility Auxiliary Charging OFF SOC
	Set SOC	Set SOC
Utility Setting Parameter	Ovd	Utility Overvoltage Disconnect Voltage
	Ovr	Utility Overvoltage Reconnect Voltage

	Uvd	Utility Undervoltage Disconnect Voltage
	Uvr	Utility Undervoltage Recovery Voltage
	OFd	Utility Overfrequency Disconnect Frequency
	UFd	Utility Underfrequency Disconnect Frequency
Load Setting Parameter	OPV	Inverter Output Voltage
	OPF	Inverter Output Frequency
	LOA	Load
Battery Basic Properties	bAC	Battery Status
	bAC	Battery Capacity
	bAt	Battery Type
	ECt	Battery Equalization Charging Time
	Eqd	Equalization Charging Date
	bCt	Battery Bulk Charging Time
	tcc	Battery Temperature Compensation Coefficient
	bdC	Discharging Coefficient
	rst	SOC Calibration
Advanced Battery Properties	LPE	Lithium Battery Protection
	LCt	Low Temperature Stop Charging Temperature
	Ldt	Low Temperature Stop Discharging Temperature
	OtP	Battery Over Temperature Protection
	Otr	Battery Over Temperature Protection Recovery
Charge and Discharge Management	bCC	Battery Available Charging Current
	Ldc	Battery Available Discharging Current
	CHC	Utility Available Maximum Charging Current
	CH5	Charging Mode
	OP5	Discharging Mode
	AC1	AC Input Mode

	PuN	PV Mode
	CdN	Charge and Discharge Management Mode
	bNP	BMS Protocol
	BNE	BMS Enable
	bNu	BMS Voltage Control
	bNC	BMS Current Control
	Bnu	BMS Invalid Action
Local Parameters	YEA	Year
	DDN	Month/Day
	HNt	Hour/Minute
	C1d	Communication ID
	BrA	Communication BaudRate
	DrO	Dry Contact ON Voltage
	DrF	Dry Contact OFF Voltage
	bEp	Buzzer Alarm
	LEd	Indicator
	bLt	Backlight Time
	rst	Factory Reset
	5tN	Standby Mode
	NEq	Manual Equalization Order
	PuI	PV DC Input
	rst	Clear Fault
	Esd	Reset Energy Statistics
	tEP	Temperature Unit
	LCN	Low Consumption Mode

10 Technical Support

For technical inquiries regarding our products, please contact us through the following channels:

Service Hotline: 010-82894896/82894112

0752-3889706

0755-89236770

Email: support@epever.com

For more product information, please visit: www.epever.com.

iOS

Android

Any changes without prior notice! Version number: V1.0

HUIZHOU EPEVER TECHNOLOGY CO., LTD.

+86 - 752-3889706

info@epever.com

www.epever.com