INVT | User Manual

Hybrid Inverter

XD7~10KTL

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Contents

Chapter 1 Introduction

This Manual describes the specification, installation, operations and maintenance of INVT hybrid inverter.

Please read this Manual carefully to understand the safety information, functions and features of the product before installing and using it. The information provided in this Manual is subject to update from time to time due to product improvements. The latest version and more product information are available on our official website.

Chapter 2 Safety Precautions

Improper use may result in risk of electric shock or burns. This Manual provides important instructions for installation and maintenance of the product. Please read this Manual carefully before using the product, and keep it for future reference.

2.1 Safety Symbols

The following are the safety symbols used in this Manual to indicate potential safety risks and important safety instructions.

	WARNING! The warning symbol indicates important safety information that, if not followed properly, could result in serious personal injury or even death.
	RISK OF ELECTRIC SHOCK! The electric shock hazard symbol indicates important safety information that, if not followed, could result in electric shock.
	SAFETY TIPS! This symbol indicates important safety information that, if not followed, could result in serious personal injury or even death.
	HIGH TEMPERATURE! This symbol indicates safety information that, if not strictly followed, could result in burns.
	WARNING! When performing maintenance on the input and output of the inverter after disconnecting it, wait at least 5 minutes for the inverter to discharge any remaining electrical charge.

2.2 Precautions for Operation

The XD7-10KTL series hybrid inverter has been designed and tested according to the applicable safety regulations. This ensures the personal safety of the user. However, as an electrical equipment, the inverter could cause electric shock or other injuries if not operated properly. Please operate the inverter in accordance with the following requirements:

1. The wiring, installation and commissioning work should be carried out by professionals.

2. Be sure to read this Manual before operating the product. We shall not be held liable for any failure or loss caused by improper operation.

3. Before starting the installation or maintenance work, please break the connections at the AC side, DC side and battery side, and then wait at least 5 minutes before proceeding to avoid electric shock.

4. When the inverter is running, the temperature of the housing is high. Do not touch it to avoid getting burned.

5. All electrical installations must conform to local electrical standards. The inverter should be connected to the power grid by professionals with the permission of the local power provider.

6. During the installation, insulated tools and personal protective equipment should be used to ensure personal safety. To touch the electronic components of the inverter, please wear anti-static gloves, anti-static wrist strap or anti-static clothing so as to protect the inverter against electrostatic discharge.

7. Please install the inverter at a position that is out of the reach of children.

8. Do not plug or remove the AC/DC terminal during normal operation of the inverter.

9. The actual DC input voltage should not exceed the maximum allowable DC input voltage of the inverter.

10. Select an appropriate battery that matches the system, and set the battery type correctly. If you select a battery that does not match the hybrid inverter, the system cannot run.

11. If the battery has been completely discharged, please strictly follow the User Manual of the battery to charge the battery.

12. For system maintenance service, please contact our local authorized service personnel or our after-sales personnel.

13. The hybrid inverter system should be connected to the power grid only after getting permission.

14. Turn off the PV switch before installing a solar PV panel during the sunny daytime, or there could be a serious risk of electric shock.

15. Do not connect a PV string to more than one inverter, as this could cause damage to the inverters.

16. Do not connect a device that relies on continuous and stable power supply (such as a life-sustaining medical device), to the emergency power supply (EPS) port.

Chapter 3 Product Introduction

3.1 Intended User

The hybrid inverter in XD series should be installed only by trained professionals who are familiar with local regulations, standards and electrical systems and have a good knowledge of this product.

It is highly recommended that the installer read this Manual carefully, so as to learn about product installation, troubleshooting and communication networking.

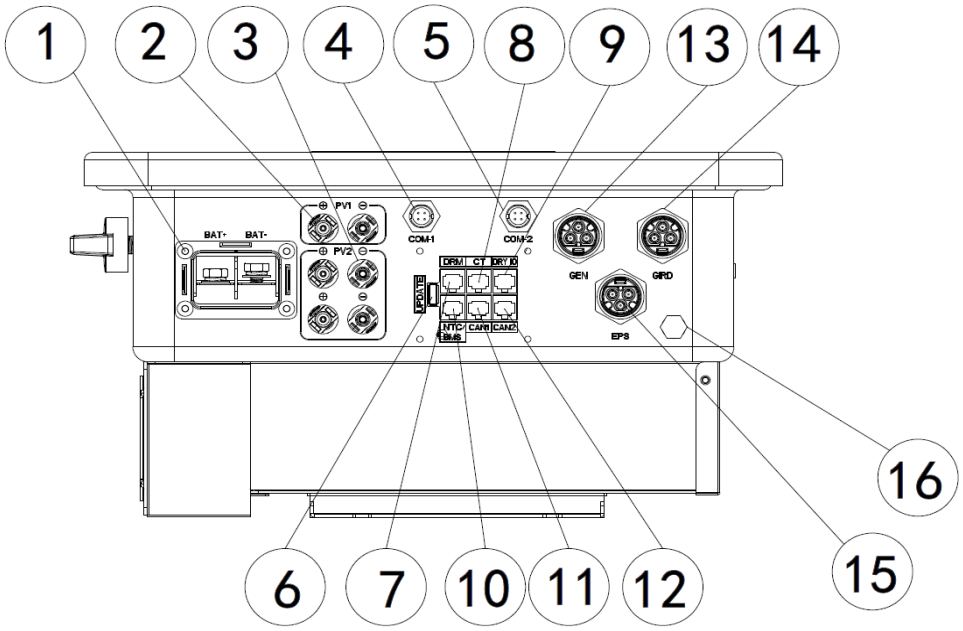
3.2 Product Overview

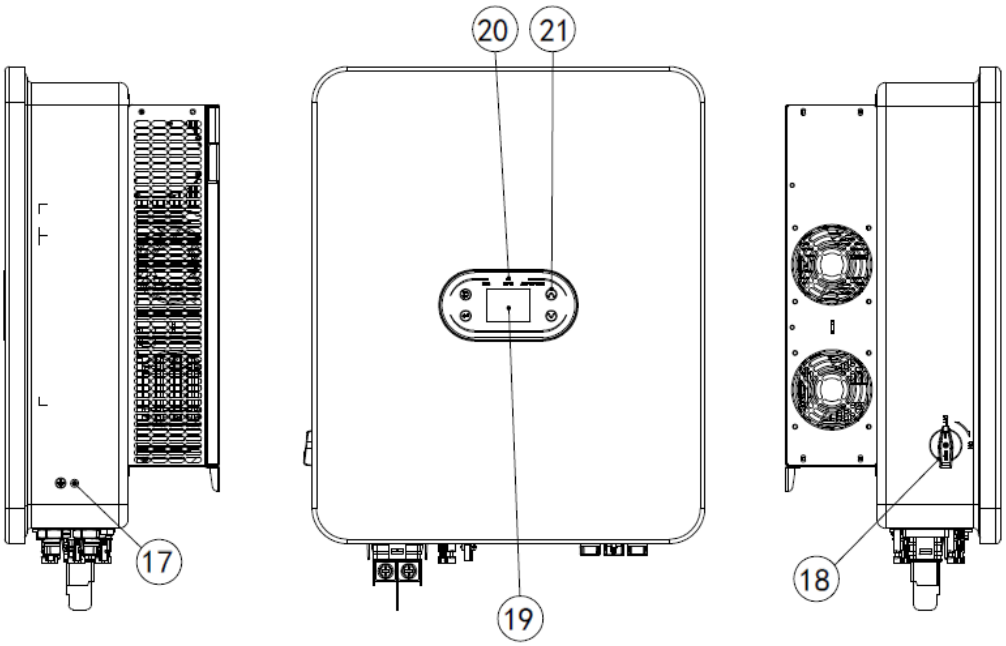
The inverter in XD series is intended to store the energy generated in the PV system or provided by the public power grid into the battery, and also output energy to the power grid. In the case of electric power failure, the hybrid inverter can provide energy to the load as a backup power supply.

This Manual applies to the following hybrid inverter models:

XD7KTL\XD8KTL\XD10KTL

Overview:





No.	Description	No.	Description
1	Battery Terminal	2	PV+ Input Terminal
3	PV- Input Terminal	4	COM-1 (RS485 / Wi-Fi / GPRS communication)
5	COM-2 (Smart meter RS485 communication)	6	USB Port (Software Upgrade)
7	DRM's RJ45 Interface	8	CT's RJ45 Interface
9	Generator Dry Contact	10	BMS lithium battery communication & NTC
11	CAN1 (Parallel Communication)	12	CAN2 (Parallel Communication)
13	GEN Terminal	14	GRID Terminal
15	EPS Terminal	16	Breather Valve
17	PE Grounding Point	18	PV DC Switch
19	LCD Screen	20	LED Indicator Light
21	Function Keys	/	/

3.3 Safety Instructions

1. Be sure to read this Manual before operating the product. We shall not be held liable for any failure or loss caused by improper operation.

2. Select an appropriate battery that matches the system, and set the battery type correctly. If you select a battery that does not match the hybrid inverter, the system cannot run.

3. If the battery has been completely discharged, please strictly follow the User Manual of the battery to charge the battery.

4. The wiring, installation and commissioning work should be carried out by professionals.

5. During the installation, insulated tools and personal protective equipment should be used to ensure personal safety. To touch the electronic components of the inverter, please wear anti-static gloves, anti-static wrist strap or anti-static clothing so as to protect the inverter against electrostatic discharge.

6. All electrical connections must comply with the safety regulations of the local power provider.

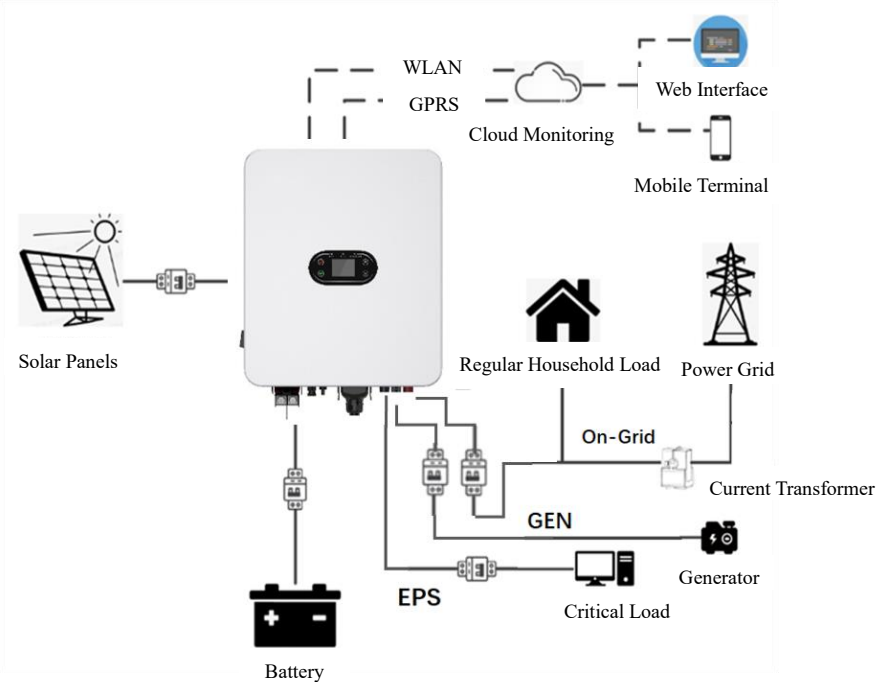
7. For system maintenance service, please contact our local authorized service personnel or our after-sales personnel.

8. The hybrid inverter system should be connected to the power grid only after getting permission.

9. Turn off the PV switch before installing a solar PV panel during the sunny daytime, or there could be a serious risk of electric shock.

10. Do not connect a PV string to more than one inverter, as this could cause damage to the inverters.

3.4 Schematic Diagram of the Basic System



As shown in the above diagram, a complete hybrid inverter system in XD series consists mainly of the solar PV panels, hybrid inverter, battery and power grid.

Note: The battery is an integral part of the hybrid inverter system. Please keep the installation environment well-ventilated and take necessary measures to control the ambient temperature, so as to prevent the risk of explosion caused by high temperature.

Battery characteristics: Ingress protection: ≥IP65; pollution degree: PD2; indoor temperature: 0℃~40℃; RH: 5%~85%

3.5 Product Features

1. Intelligent management system and multiple working modes, meeting different customer needs.
2. Allowing you to set the priority of grid connection, battery type and other inverter information on the LCD screen.
3. Dual MPPT with high current input, compatible with 500W+ components, offering flexible configuration.
4. All-in-one design, providing backup power and peak-shaving function.
5. With a battery safety management system, supporting remote upgrade of BMS system.
6. Supporting anti-reflux prevention.
7. Supporting over-temperature / over-current / short-circuit protection, ensuring safe, stable and reliable operation of the system.
8. Providing a variety of user-friendly communication modules (RS485, GPRS, Wi-Fi), supporting monitoring and remote operations through computer, mobile phone or Internet.
9. Supporting parallel configuration of a maximum of six inverters.
10. A maximum conversion efficiency of up to 97.5%.
11. IP66 rating, low weight, small size, easy installation.

Chapter 4 Installation

4.1 Unpacking Inspection

The inverter has been fully tested and strictly inspected before delivery, but damage may still occur during transportation. Before unpacking, carefully check whether the product information indicated on the carton is consistent with that indicated in the Purchase Order, and whether the product package is in good condition. If any damage is detected, contact the carrier or your dealer and provide photos of the damaged area, so as to receive the fastest and best service.

To keep the inverter idle for a long time, please place it in the original carton and protect it against moisture and dust.

After taking the inverter out of the carton, please check the following:

(1) Whether the inverter remains in good condition;

(2) Whether you have received the User Manual and all of the connection parts and mounting parts;

(3) Whether the items you have received are free from damage and shortage;

(4) Whether the product information indicated in the nameplate on the inverter is consistent with that indicated in the Purchase Order;

(5) Check with the List of Standard Deliverables below.

Standard deliverables for the hybrid inverter:

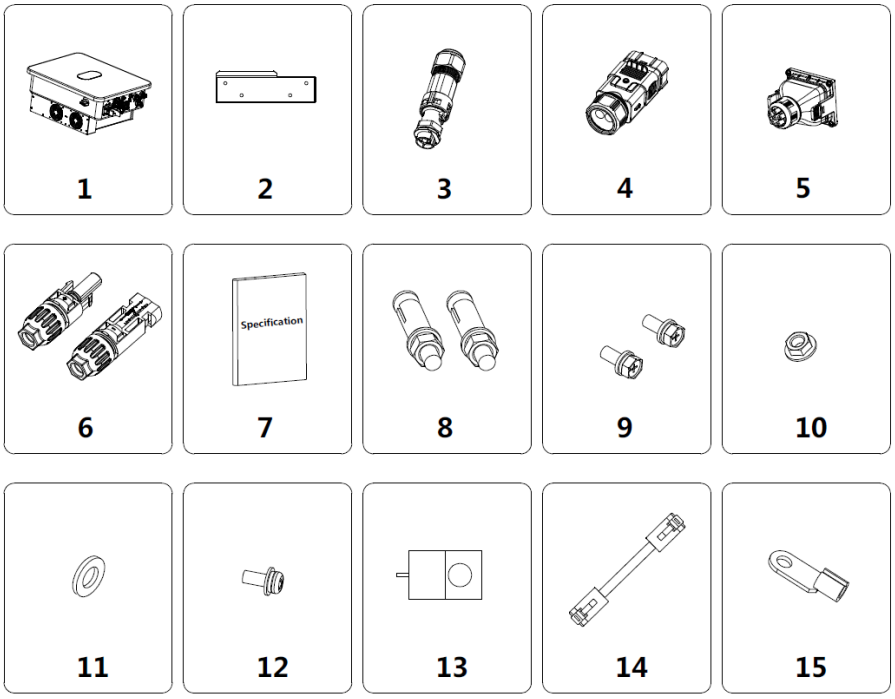


Fig.4-1 Deliverables for Hybrid Inverter XD7-10KTL

Table 4-1 List of Deliverables for Hybrid Inverter

No.	Name	Quantity
1	Inverter	1
2	Mounting Bracket	1
3	AC Terminal	3
4	Battery Terminal Protection Cover	1

No.	Name	Quantity
5	Communication Board Protection Cover	1
6	DC Connector (pair)	3
7	Accompanying Documents (set)	1
8	M6×50 Stainless-steel Expansion Bolt	4
9	M6×16 Combination Bolts	4
10	M6 Nut	4
11	M6 Flat Washer	4
12	M4 Screws	1
13	Output CT	1
14	Parallel Connection Cable	1
15	Ground Terminal	1

Please check the above items carefully, and contact your dealer immediately if you have any questions.

4.2 Before Installation

4.2.1 Installation Tools

Table 4-2 List of Installation Tools

No.	Installation Tools	Description
1	Marker	Mark mounting holes
2	Electric drill	Drill holes in the mounting bracket or wall
3	Hammer	Drive expansion bolts
4	Adjustable wrench	Fix the mounting bracket
5	Screwdriver	Fix the inverter and tighten the junction box
6	Slotted screwdriver or Phillips screwdriver	For AC wiring use
7	Megger	Measure the insulation performance and resistance to ground
8	Multimeter	Test circuits and measure AC/DC voltage
9	Electric soldering iron	Weld the communication cable
10	Wire crimper	Crimp the DC terminal
11	Hydraulic crimper	Crimp the AC O-terminal

4.2.2 Installation Conditions

(1) The inverter can be installed in an indoor or outdoor environment.

(2) During operation of the inverter, the housing and heat sinks will heat up. Do not install the inverter where it can be accessed easily.

(3) Do not install the inverter in an area where flammable or explosive materials are stored.

(4) Install the inverter in a well-ventilated environment, so as to facilitate heat dissipation.

(5) It is recommended to choose an installation position with shade, or build a sunshade.

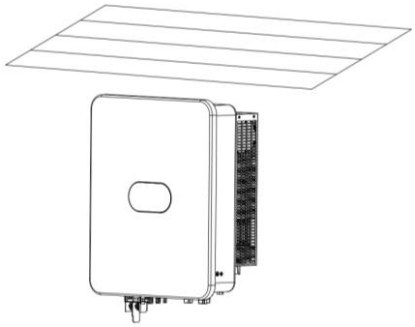


Fig. 4-2. Sunshade

(6) The ambient temperature should be between -30℃~60℃.

(7) Install the inverter away from electronic devices with strong electromagnetic interference.

(8) The product should be installed on a fixed and solid object surface, such as a wall or metal bracket.

(9) The installation position must provide reliable grounding for the inverter, and the grounding metal conductor must be made of the same material as the reserved grounding metal conductor of the inverter.

4.3 Space Requirements

(1) Install the inverter at such a height that allows the operator to observe the LCD indicator lights of the inverter easily.

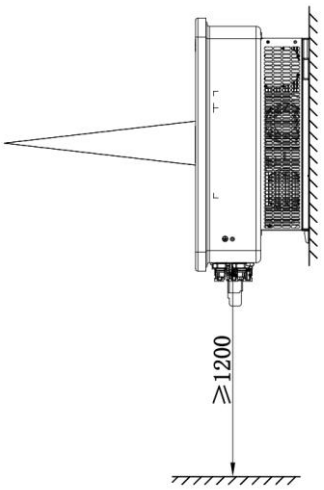


Fig. 4-3 Best Mounting Height

(2) Leave adequate space around the inverter to facilitate air circulation and future handling of the inverter. See Fig. 4-4.

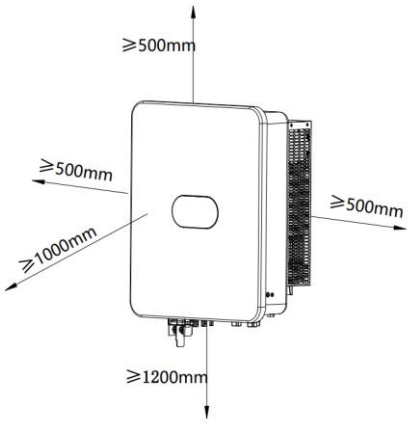


Fig. 4-4 Installation Spacing of Inverter

(3) To install more than one inverter, please keep a certain distance between the inverters and at the top/bottom of the inverters (see Fig. 4-5), so as to facilitate heat dissipation.

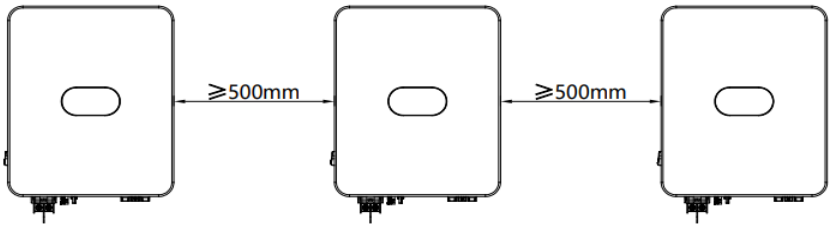


Fig. 4-5 Installation Dimension of Side-by-side Inverters

(4) The mounting surface should be upright (see Fig. 4-6). Install the inverter vertically or at a backward tilt of ≤15° so as to facilitate heat dissipation. Forward tilt, horizontal installation, upside-down installation, backward tilt of >15° and sideways tilt are not allowed.

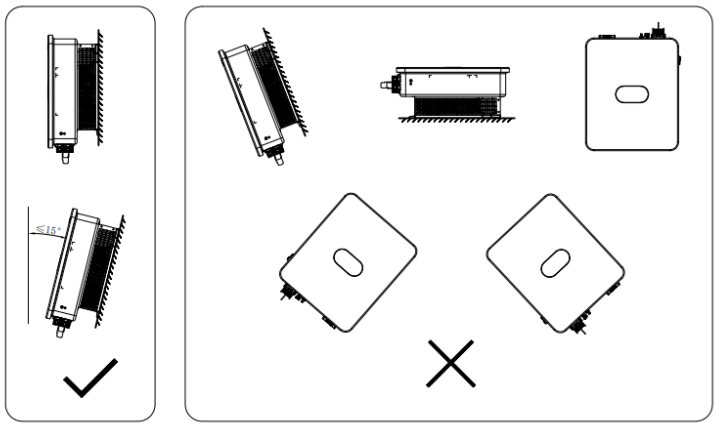


Fig. 4-6 Installation Location of Inverter

4.4 Dimension of Mounting Bracket

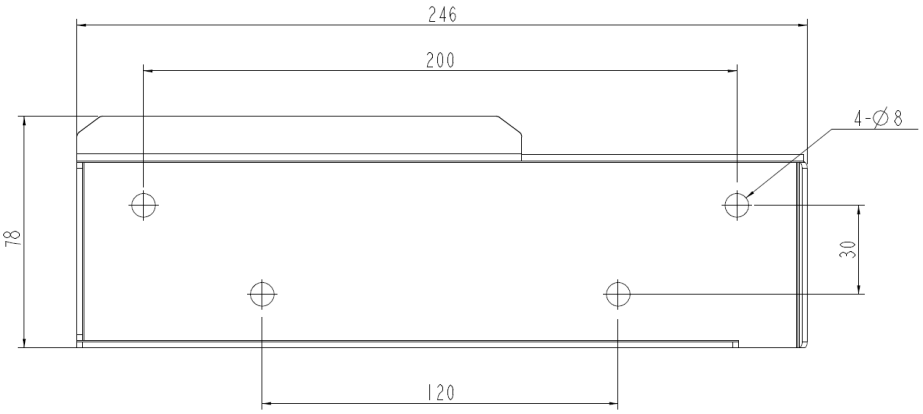


Fig. 4-7 Dimension of Mounting Bracket

4.5 Product Dimension and Weight

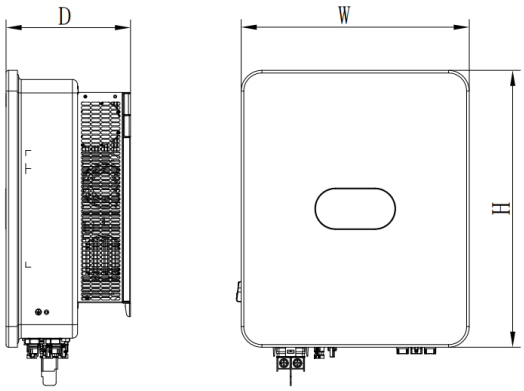


Fig. 4-8 Overall Dimension of Inverter

Dimension and net weight of Hybrid Inverter:

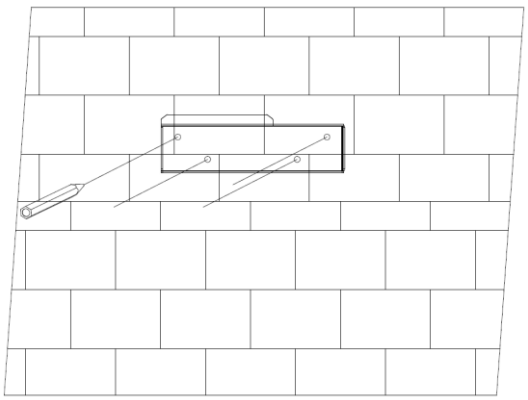
Model No.	Height (H) (mm)	Width (W) (mm)	Depth (D) (mm)	Net Weight (kg)
XD7-10KTL	534	440	245	31

Packaging Dimensions and Gross Weight

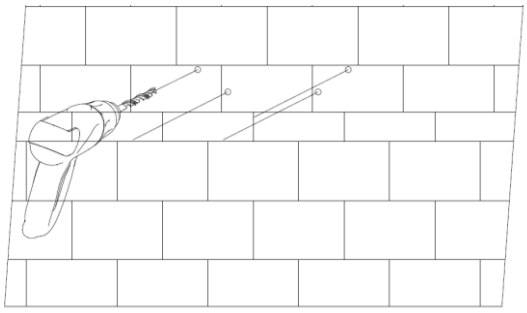
Model No.	Height (H) (mm)	Width (W) (mm)	Depth (D) (mm)	Weight (kg)	Packaging Material
XD7-10KTL	670	525	340	36	Corrugated cardboard box

4.6 Wall Mounting

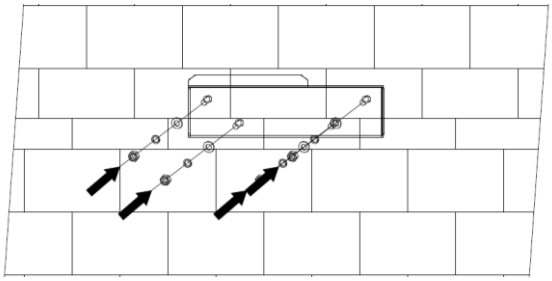
Step 1: Mark the installation positions for the mounting bracket on the wall, ensuring the correct orientation.



Step 2: Drill holes with an impact drill and install expansion bolts. Use M6×50 stainless steel expansion bolts.



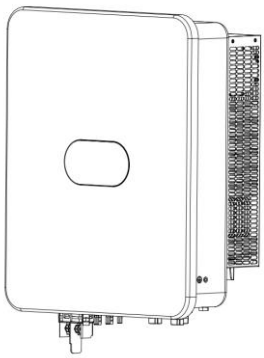
Step 3: Secure the mounting bracket with a torque of 5N•m.



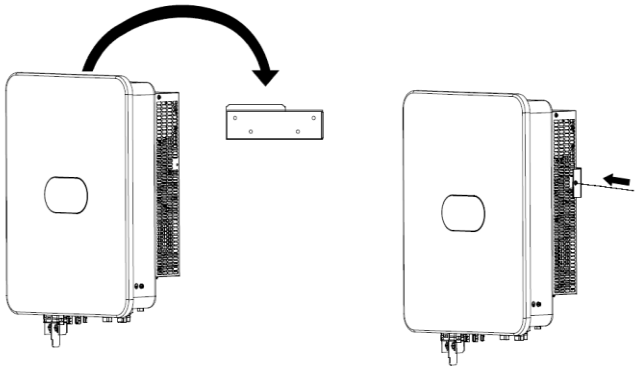
4.7 Installation of Inverter

Step 1: Take the inverter out of the carton.

Step 2: If the installation position is high, you can lift up the inverter to install it to the mounting bracket. Use a hoisting device to lift the inverter off the ground by 100 mm, then pause and check the fastening of the lifting ring and ropes. After confirming the inverter is fastened reliably, continue to lift it to its destination.



Step 3: Align the inverter's latch with the wall-mounting bracket and slide it down to secure the device. Ensure the radiator grooves are well-fitted with the mounting bracket. Secure with M4 screws on the side with a torque of 1.2 N•m.

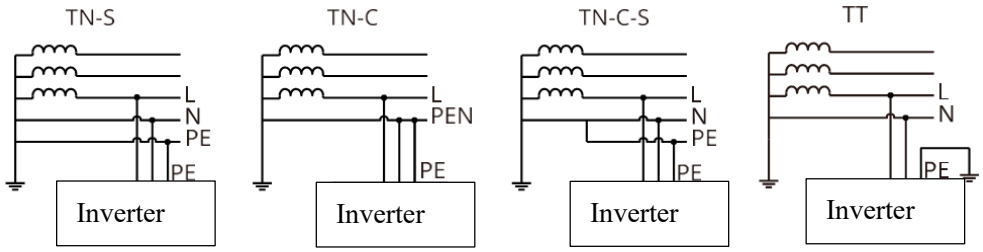


Chapter 5 Electrical Connection

5.1 Electrical Connection Overview

This product supports the following power grid systems.

Note: if the power grid system contains a N wire, the neutral to ground voltage should be lower than 10V.

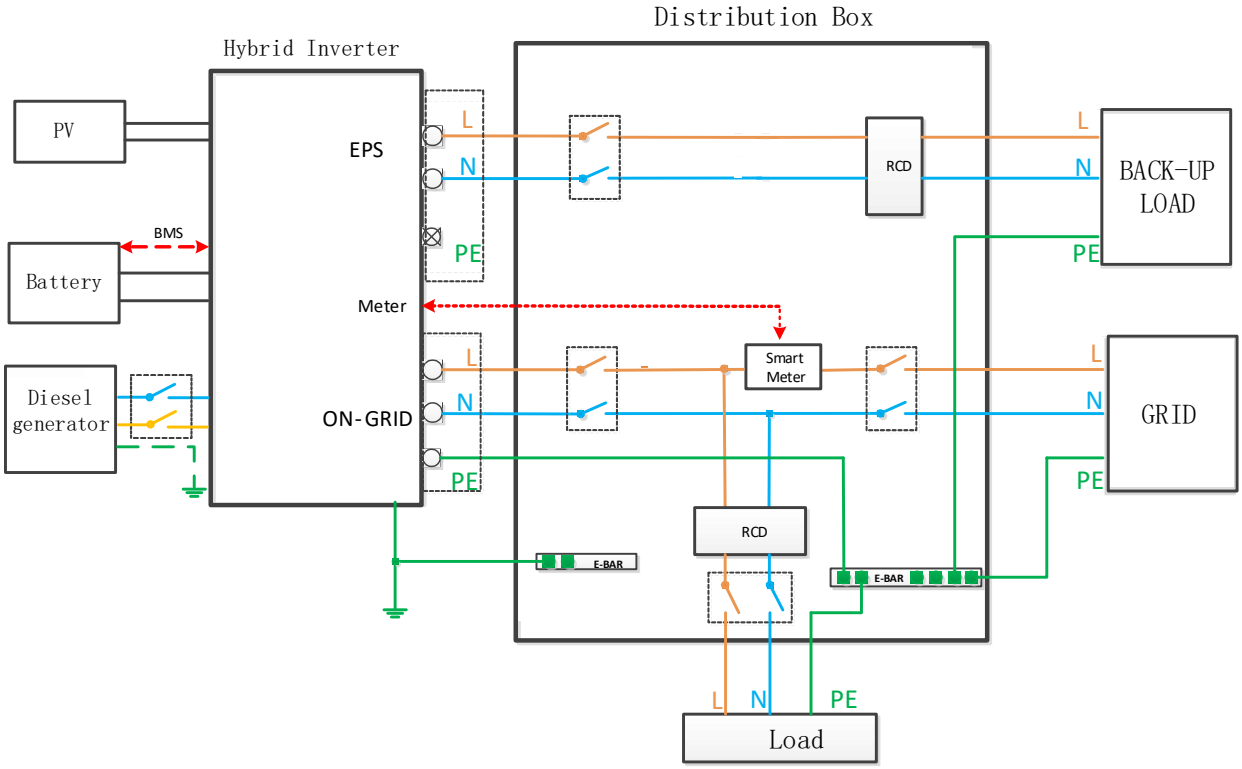


NOTE

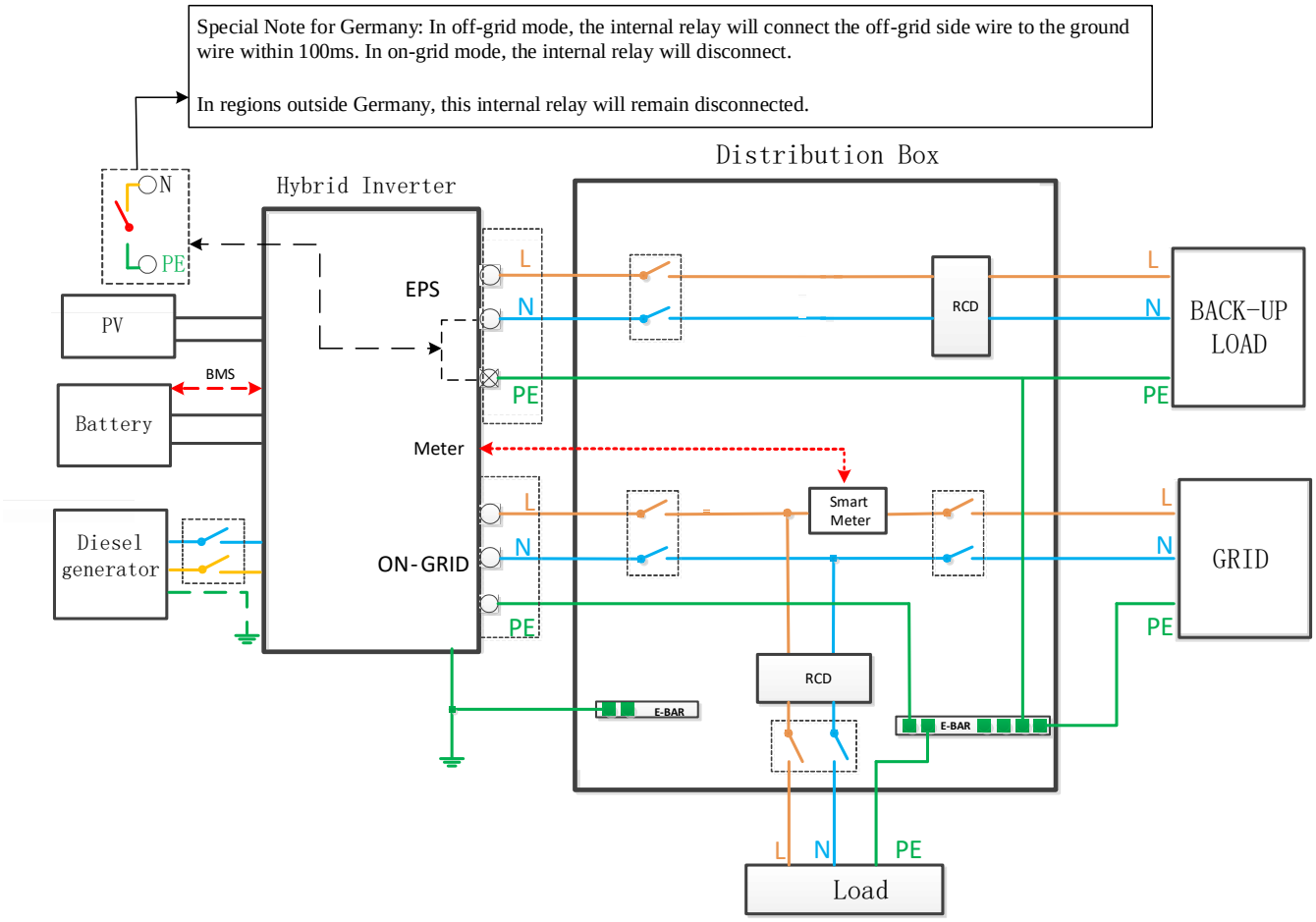
- The connection modes of the N wire and PE wire at the GRID port and EPS port of the inverter may vary in different regions. Please consult your local regulatory requirements.
- The GRID port and EPS AC port of the inverter have built-in relays. When the inverter works in off-grid state, the built-in GRID relay will be open; when the inverter works in on-grid state, the built-in GRID relay will be closed.
- When the inverter is powered on, the EPS AC port will be charged; if you need to perform maintenance of the EPS load, POWER OFF THE INVERTER FIRST in order to avoid electric shock.

NOTE

The following wiring method is applicable for Australia, New Zealand and South Africa.



Note
➢ Make sure the BACK-UP grounding wire is properly connected and secured; otherwise, the BACK-UP function may fail in the case of power grid failure. ➢ The following wiring method is applicable for regions other than Australia, New Zealand and South Africa.

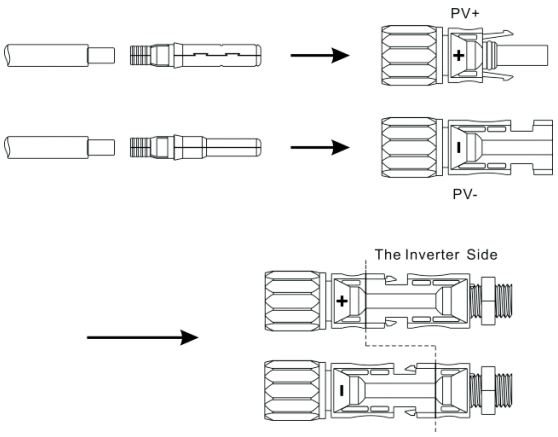


5.2 PV Wiring

MC4 connectors are provided at DC input side of the hybrid inverter. Below are the connection steps:

1. Turn off the DC switch.

2. Connect the positive terminal and negative terminal of the PV module respectively to the PV+ port and PV- port of the hybrid inverter. Make sure the actual input voltage and current fall within the allowable range.



- Maximum allowable PV input voltage: 600V (Please consider changes in the voltage at the minimum temperature).
- PV1 maximum input current: 20A
- PV2 maximum input current: 20A
- PV3 maximum input current: 20A

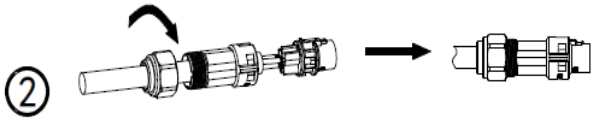
Note: It is recommended to use a specialized PV cable ≥4mm² (11AWG).

5.3 AC Wiring

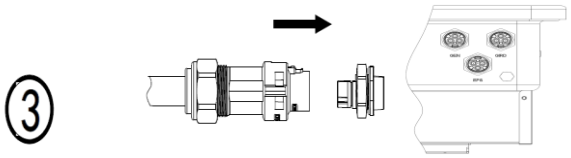
The output of the single-phase hybrid inverter includes grid output (red), EPS output (black), and GEN output (blue). The connections are made similarly, distinguished by different colors. The electrical connection steps for the hybrid inverter are as follows:

Step 1: Unscrew the AC terminal, and then use an appropriate tool to remove it as shown below.

Step 2: Pass the cable through the rubber nut, sealing ring and threaded sleeve in turn. Connect the cable to the corresponding terminal based on the polarity mark, and then tighten the threaded sleeve onto the AC terminal as shown below:



Step 3: Connect the prepared AC terminal to the EPS, GRID, or GEN ports on the hybrid inverter, as shown in the figure.



Note: 1. If you use the grid connection function only, connect the power grid to the GRID port of the inverter.

2. Do not directly connect the GRID port to the EPS port or the generator port, as this could cause damage to the inverter.

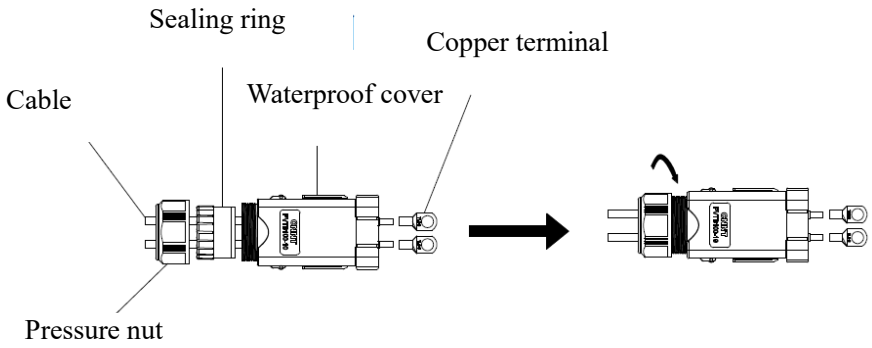
3. Do not connect the EPS port to the grid or generator, as this could cause damage to the inverter.

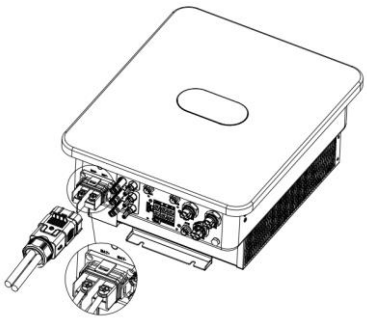
4. The wire gauge for the power connections to the GRID, EPS, and generator ports should be ≥8.4 mm² (8AWG).

5.4 BAT Wiring

Install the battery cable in the following steps:

1. Unscrew the rubber nut on the waterproof cover of the hybrid inverter;
2. Pass the cable through the rubber nut, sealing ring, threaded sleeve and waterproof cover in turn;
3. Crimp the battery cable (supplied in the original package) to the corresponding O-terminal,
4. and then connect the positive (negative) terminal of the battery to the positive (negative) battery terminal of the inverter.





Note: 1. It is recommended to equip a DC switch between the battery and the inverter.

2. The recommended length of the power cable between the battery and the energy storage unit should be ⩽1.5 m, with a wire gauge ⩾32 mm² (2AWG).

5.5 Communication Connection

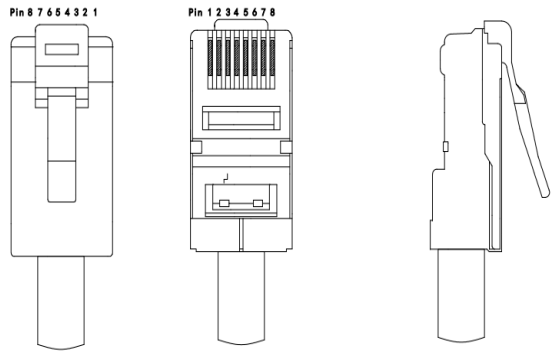
5.5.1 Connection of Lithium Battery

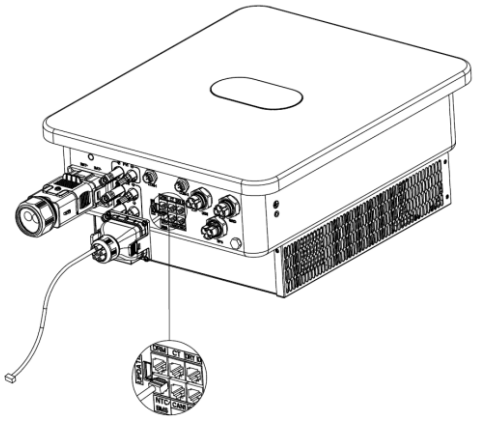
To use a lithium battery, you need to connect the BMS system of the lithium battery in the following steps:

1. Unscrew the rubber nut on the waterproof cover of the hybrid inverter;
2. Pass the LAN cable through the rubber nut, sealing ring, threaded sleeve and waterproof cover in turn;
3. Connect the RJ45 terminal of the LAN cable to the BMS/NTC port of the hybrid inverter;
4. Lock the waterproof cover with screws;
5. Screw the rubber nut reliably onto the waterproof cover.

Definition of RJ45 interface:

	BMS
Pin 1	BAT-TEMP
Pin 2	\
Pin 3	GND.S
Pin 4	CAN-H
Pin 5	CAN-L
Pin 6	\
Pin 7	GND.S
Pin 8	WAKE-UP



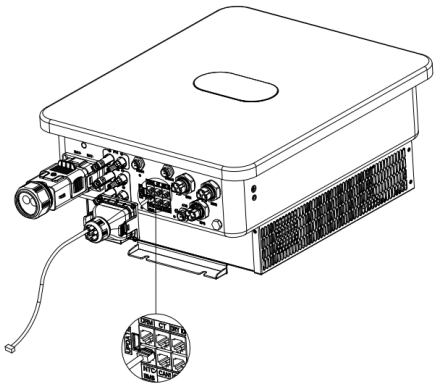


Note: to use a lead-acid battery, you can jump directly to Section 5.5.2 without connecting the BMS Communication cable.

5.5.2 Connection of Temperature Sensor

To use a lead-acid battery, you need to connect a temperature sensor to monitor the surface temperature of the battery. Connect the temperature sensor in the following steps:

1. Unscrew the rubber nut on the waterproof cover of the hybrid inverter;
2. Pass the NTC cable through the rubber nut, sealing ring, threaded sleeve and waterproof cover in turn;
3. Connect the RJ45 terminal of the NTC cable to the BMS/NTC port of the hybrid inverter;
4. Lock the waterproof cover with screws;
5. Screw the rubber nut reliably onto the waterproof cover.

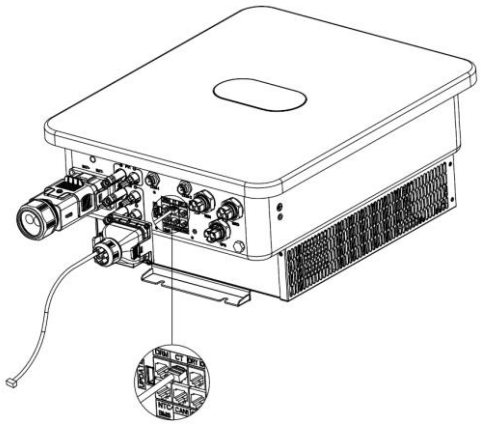


Note: The probe of the temperature sensor used to monitor the ambient temperature of the lead-acid battery should be shorter than 1.5 m; if you use lithium battery instead, there is no need to install a temperature sensor.

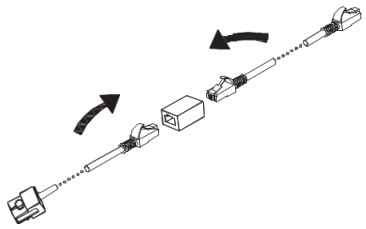
5.6 CT Connection

The current transformer (CT) used on the inverter can help monitor the energy use of the domestic consumer. Below are the CT connection steps.

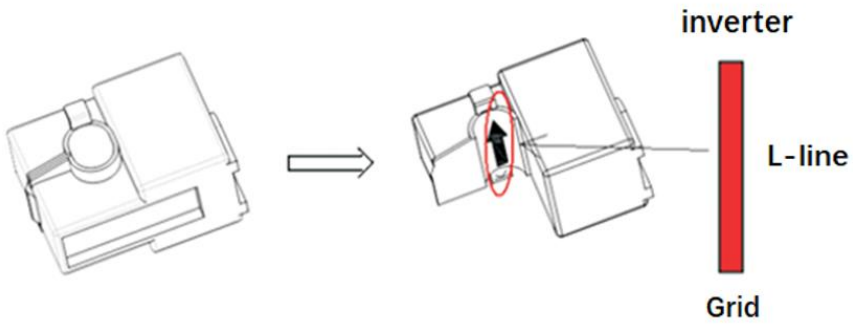
1. Unscrew the rubber nut on the waterproof cover of the hybrid inverter;
2. Pass the CT cable through the rubber nut, sealing ring, threaded sleeve and waterproof cover in turn;
3. Connect the RJ45 terminal of the CT cable to the CT port of the hybrid inverter;
4. Lock the waterproof cover with screws;
5. Screw the rubber nut reliably onto the waterproof cover.



CT cable: 5 m in length, RJ45, standard LAN cable (8-pin connector at one end, connecting current transformer at the other end). It can be extended by an extension cable to 15m if necessary. See the figure below.



Make sure the current transformer is installed in the correct direction as shown below.



Turn on the current transformer, and you will see an arrow indicating the direction of the current, as shown above. Pass the L wire through the detection hole of the current transformer and then lock the current transformer.

Note: The direction of the arrow (from K to L) corresponds to the L wire direction from the grid to the inverter. The current transformer should be placed in the distribution box.

The communication distance should be less than 30 m.

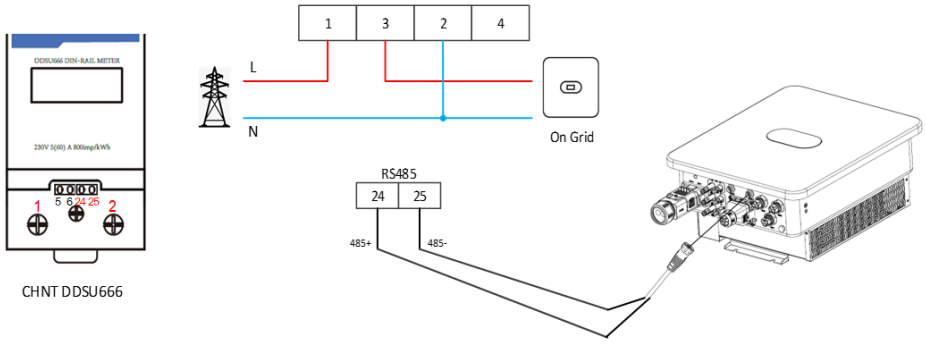
5.7 Connection of Smart Meter (Optional)

Ender user can also monitor domestic power consumption with a smart meter. You can connect the communication cable of the smart meter as described below.

Connect the smart meter to COM-2 (waterproof RS485 terminal) by plugging and tightening, as shown in the figure below:

Note: you cannot install the smart meter and CT at the same time, but select either CT or Meter as the sensor mode as described in Chapter 7.

Below is the connection diagram of CHINT smart meter:

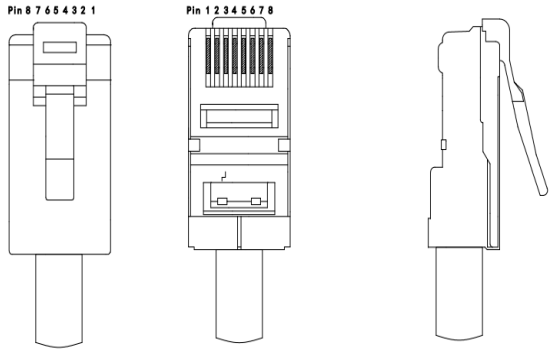


5.8 Generator Dry Contact Connection

The inverter has a dedicated generator interface. When using a generator, connect the dry contact of the generator as follows:

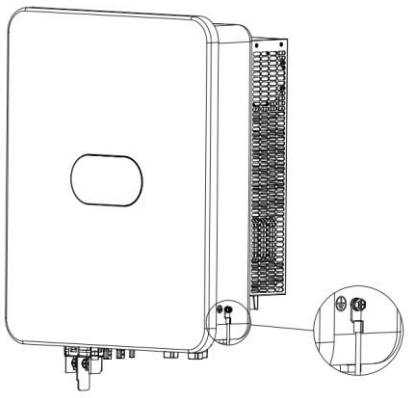
1. Set the generator to automatic mode.
2. Connect the generator's dry contact to pins 5 and 7 of the inverter's DRY IO.
3. Definition of DRY IO interface:

	Generator
Pin 1	
Pin 2	
Pin 3	
Pin 4	
Pin 5	G-VALUE1
Pin 6	G-VALUE1
Pin 7	G-VALUE2
Pin 8	G-VALUE2

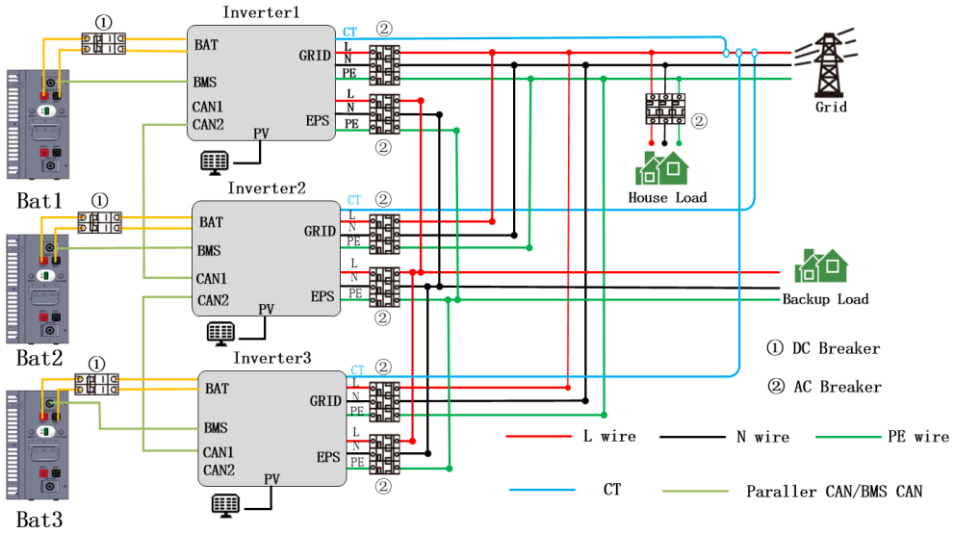


5.9 Connection of Grounding Wire

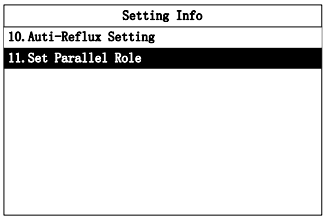
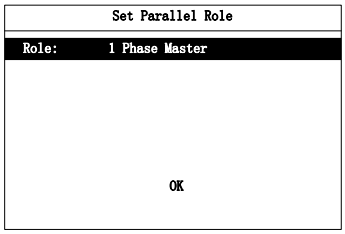
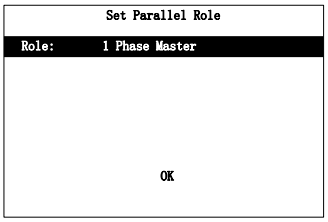
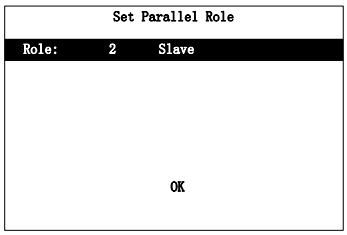
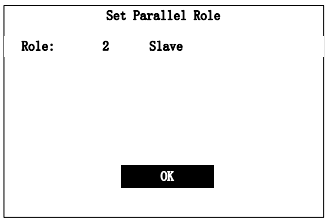
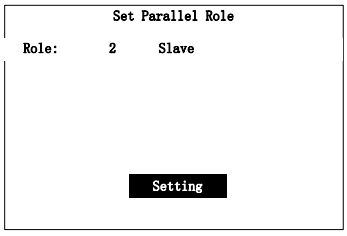
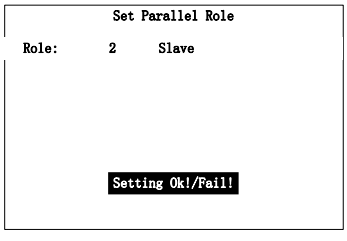
The hybrid inverter should be grounded reliably. The grounding wire should be ≥10mm². The grounding point (GND) is shown below.



5.10 Parallel Connection Wiring



Master-Slave Setting:

	Press the OK key.	
	Press the Up or Down key to select master and slave mode.	
⮟ Press the OK key.		⮟ Press the OK key.
	Press the OK key.	
		⮟ Wait for 3 seconds.
		

Chapter 6 Commissioning

6.1 Startup

Step 1: Close the AC circuit breaker of the inverter at GRID side.

Step 2: Close the DC circuit breaker of the inverter at BAT side.

Step 3: Close the AC circuit breaker of the inverter at EPS side.

Step 4: Turn on the PV switch of the inverter.

Note: The system will work in On Grid state upon normal connections at PV side, GRID side and BAT side.

The green LED will remain on, and the message “State: On Grid” will appear on the screen of the hybrid inverter.

6.2 Shutdown

To stop the operation of the hybrid inverter, please disconnect all energy sources to enter automatic shutdown.

Step 1: Turn off the PV switch.

Step 2: Turn off the BAT switch.

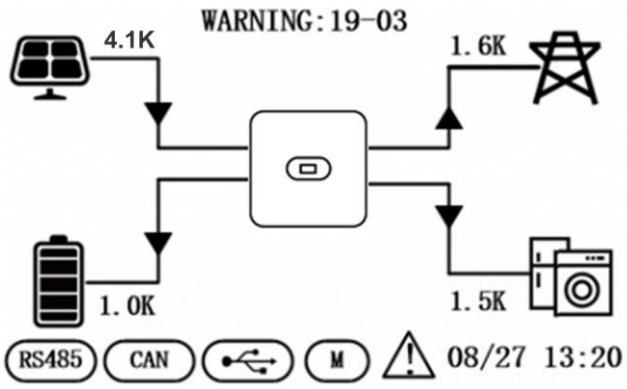
Step 3: Disconnect the power grid.

Both the LED light and LCD screen will be turned off.

Note: At the end of the above steps, please wait at least 5 minutes before proceeding to other operations.

Chapter 7 Parameter Settings

On the LCD screen, you can check the current state of the system, energy flow diagram, operation information and fault information, or set the language, priority of charging and discharging and system time. The main screen shows the energy flow diagram by default.

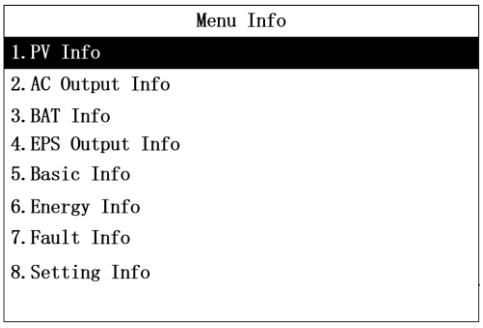


Below are the possible states of the inverter:

1. Initializing: In standby mode when no fault is detected, the inverter gets into waiting state for some reason.
2. Waiting: The inverter enters self-test. If no fault is detected, the system will enter standby mode or normal working mode.
3. On Grid: The inverter is working in on-grid state.
4. Fault: In case of a fault, the inverter will stop working and get into protected mode.
5. Programming: The inverter is currently programming.
6. Off Grid: The inverter is working in off-grid state.

7.1 Menu Information

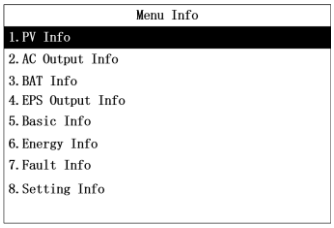
On the main screen, press the OK, ESC, Up or Down key to go to the Menu Info page. The Menu Info page is shown below.



On the Menu Info page, press the Up or Down key to select a menu item. The page of each menu item is shown below.

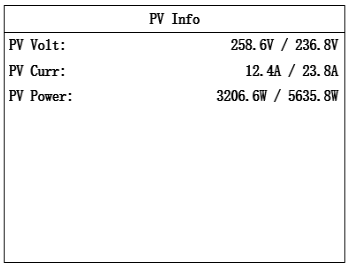
7.1.1 PV Input Information

Here you can check the PV input voltage, current and power.



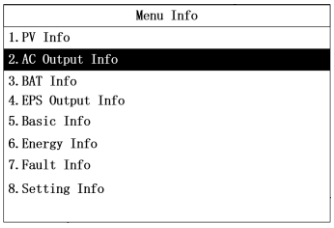
Press the Enter key to go to the PV Info page.

Press the ESC key to exit the PV Info page.



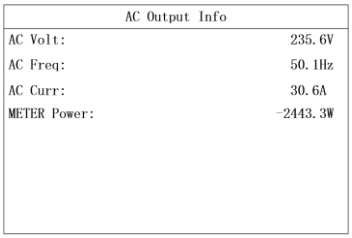
7.1.2 AC Output Information

Here you can check the AC voltage, frequency and current as well as the meter power.



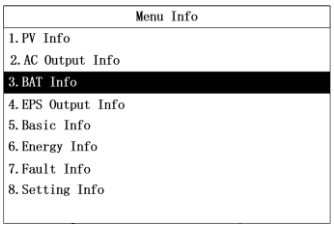
Press the Enter key to go to the AC Output Info page.

Press the ESC key to exit the AC Output Info page.



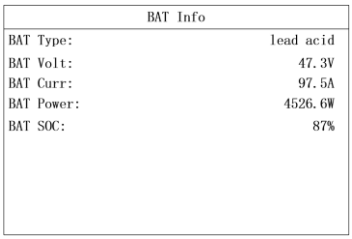
7.1.3 Battery Information

Here you can check the battery type, voltage, current and power as well as the battery SOC.



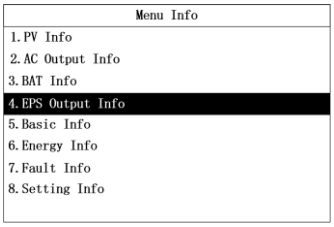
Press the Enter key to go to the Battery Info page.

Press the ESC key to exit the Battery Info page.



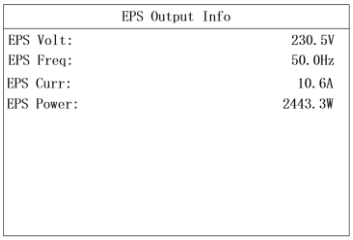
7.1.4 EPS Output Information

Here you can check the EPS voltage, frequency, current and power as well as the load power.



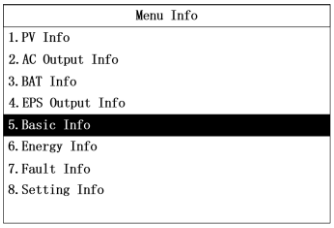
Press the Enter key to go to the EPS Output Info page.

Press the ESC key to exit the EPS Output Info page.



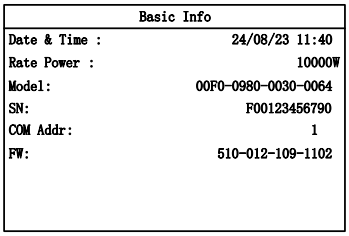
7.1.5 Basic Information

Here you can check the date & time, rated power, serial number, communication address and firmware version.



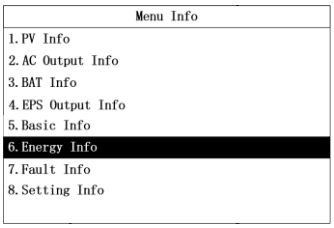
Press the Enter key to go to the Basic Info page.

Press the ESC key to exit the Basic Info page.



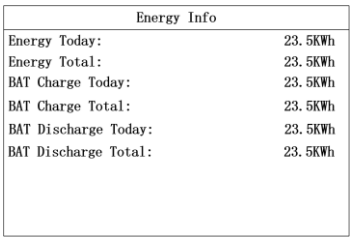
7.1.6 Energy Information

Here you can check daily and total energy generated by inverter, as well as daily battery charging/discharging energy and total battery charging/discharging energy.



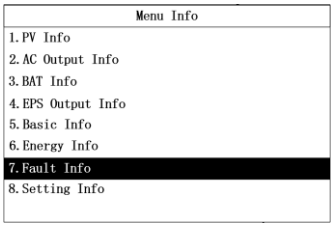
Press the Enter key to go to the Energy Info page.

Press the ESC key to exit the Energy Info page.



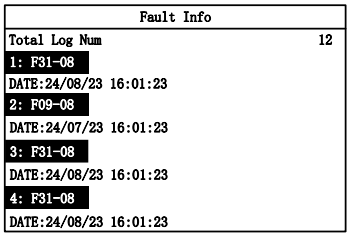
7.1.7 Fault Information

Here you can check the total number of fault logs as well as the fault code, date and time of each fault.



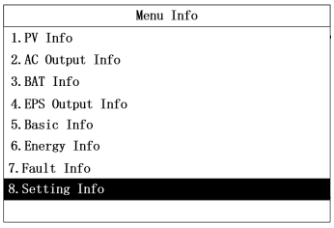
Press the Enter key to go to the Fault Info page.

Press the ESC key to exit the Fault Info page.

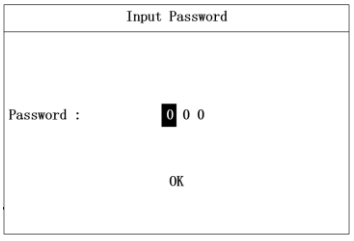


7.1.8 Setup Information

To access the Setting Info page, you need to enter the password. On the Menu Info page, select "Setting Info" to go to the Input Password page.

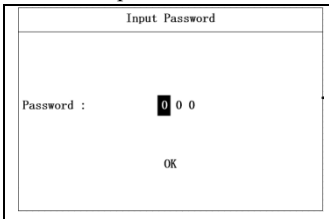
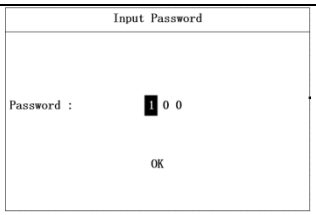
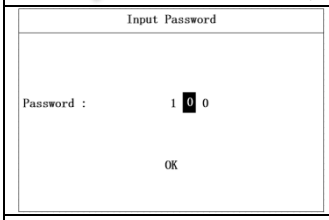
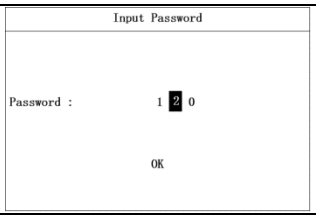
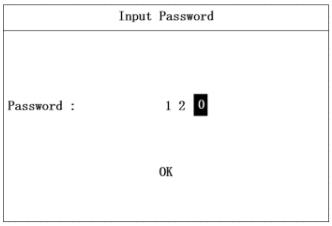
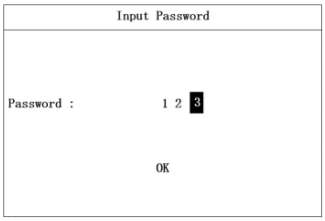
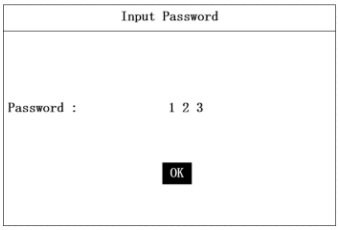
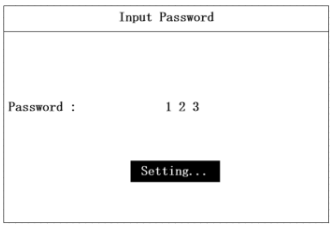
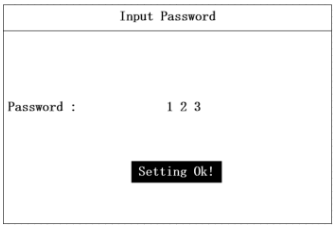


Press the Enter key to go to the Password Info page.



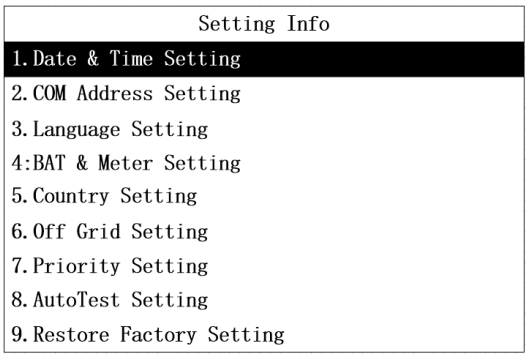
	Press the ESC key to exit the Password Info page.	

Enter the password in the following steps.

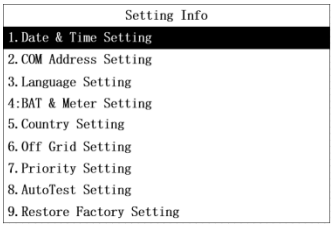
	Press the Up or Down key to increase or reduce the number.	
Press the OK key.		
	Press the Up or Down key to increase or reduce the number.	
Press the OK key.		
	Press the Up or Down key to increase or reduce the number.	
Press the OK key.		
	Press the Up or Down key to increase or reduce the number.	
		Wait for 3 seconds.
		

7.2 "Setting Info" Page

On the Setting Info page, you can set such parameters as the date & time, COM address, language, country, and priority. Some parameters can only be set when the inverter is in standby mode, during which the screen panel's green and yellow lights will not stay on. The Setting Info page is shown below.



7.2.1 Date & Time Setting

<table>
<tr><td> 
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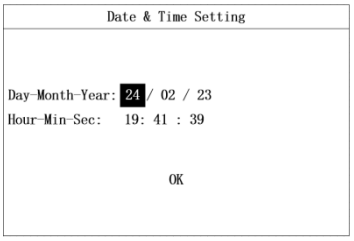
Press the OK key.</td><td> 
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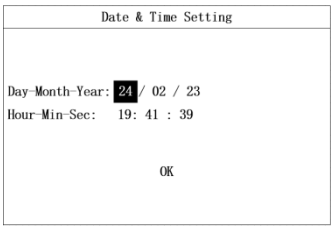
<tr><td> 
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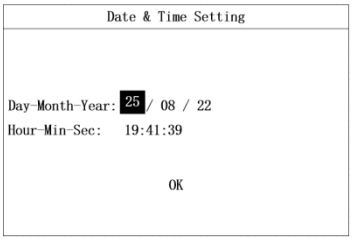
Press the Up or Down key to increase or reduce the number.</td><td> 
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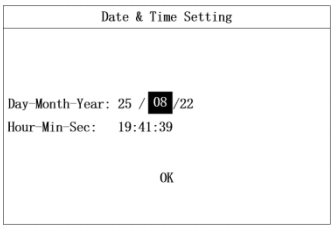
<tr><td> 
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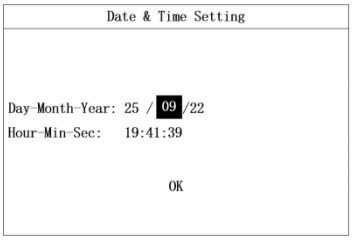
Press the Up or Down key to increase or reduce the number.</td><td> 
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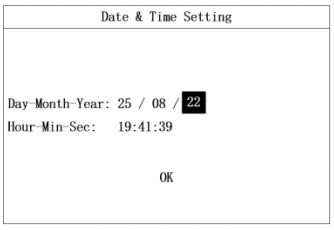
<tr><td> 
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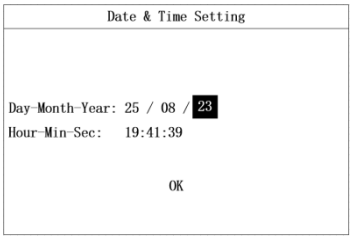
Press the Up or Down key to increase or reduce the number.</td><td> 
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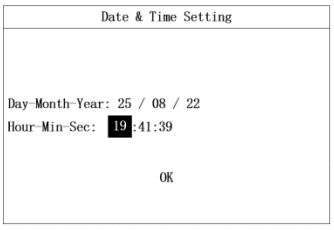
<tr><td> 
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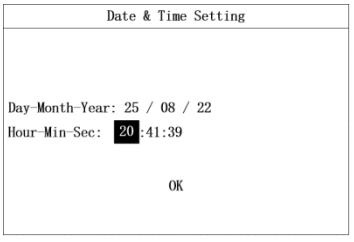
Press the Up or Down key to increase or reduce the number.</td><td> 
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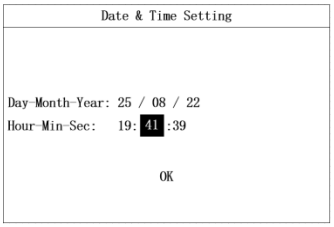
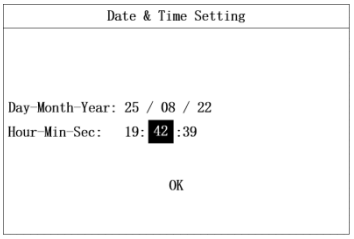
<tr><td> 
</td><td>Press the Up or Down key to increase or reduce the number.</td><td> 
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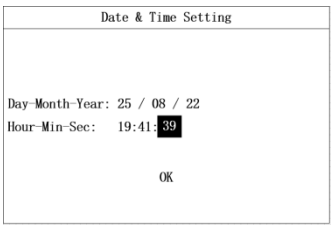
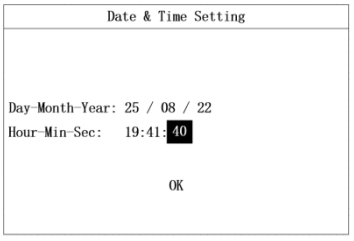
<tr><td> 
</td><td>Press the Up or Down key to increase or reduce the number.</td><td> 
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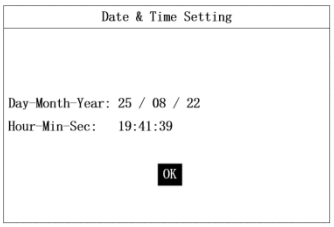
<tr><td> 
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7.2.2 COM Address Setting

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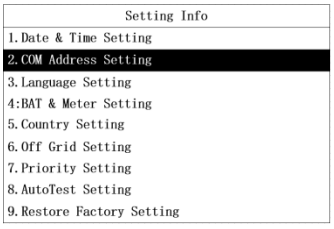
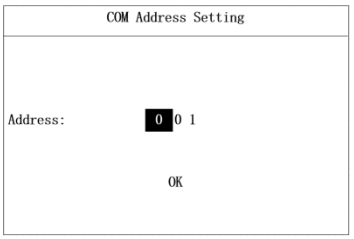
<tr><td> 
</td><td>Press the OK key.</td><td> 
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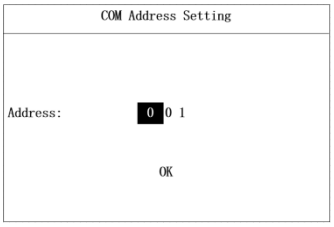
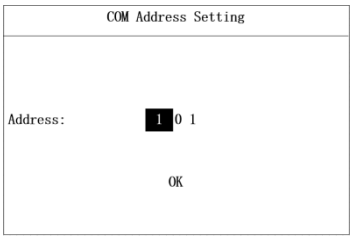
<tr><td> 
</td><td>Press the Up or Down key to increase or reduce the number.</td><td> 
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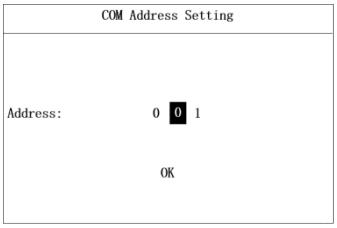
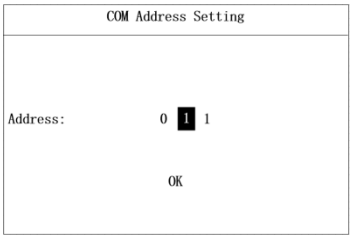
	→ Press the Up or Down key to increase or reduce the number.	
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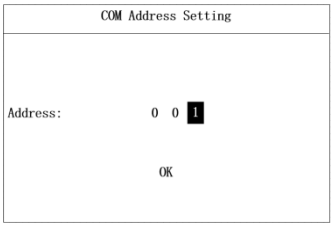
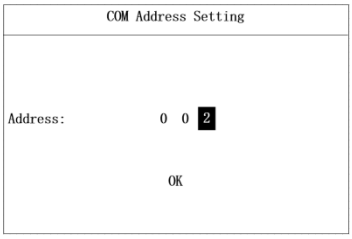
	→ Press the Up or Down key to increase or reduce the number.	
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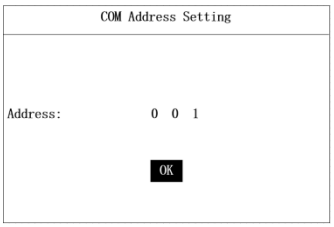
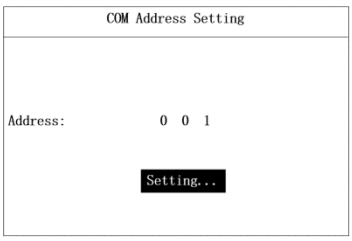
	→ Press the OK key.	
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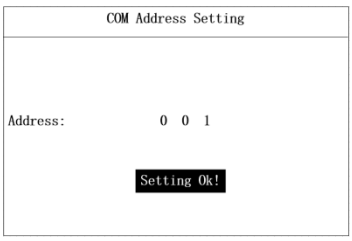
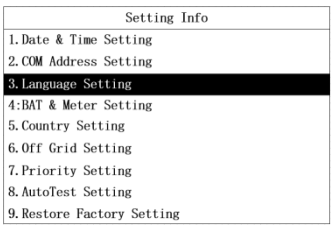
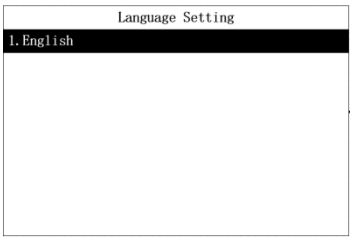
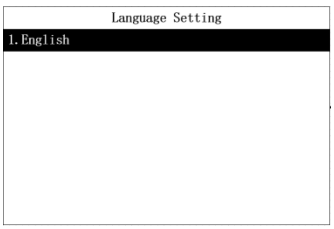
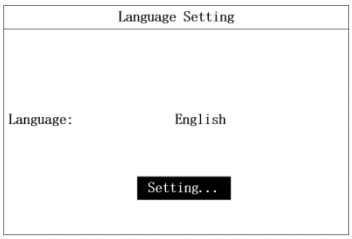
		

7.2.3 Language Setting

	→ Press the OK key.	
	→ Press the OK key.	
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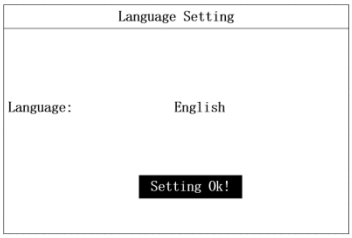
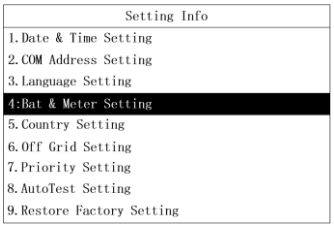
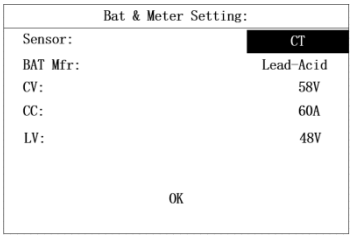
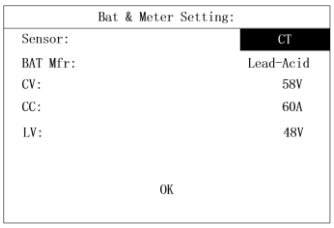
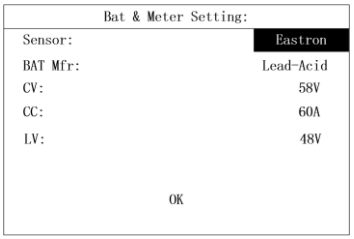
		

7.2.4 Meter Settings

On the BAT & Meter Setting page, you can select the CT mode or a meter manufacturer. See the following steps.

	→ Press the OK key.	
	→ Press the Up or Down key to select the CT mode or a meter manufacturer.	
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		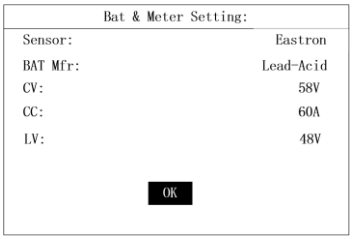
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		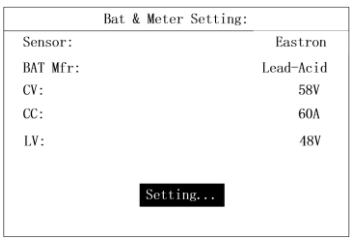
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		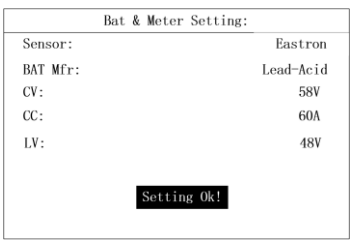

7.2.5 BAT Setting

The parameters displayed on the BAT & Meter Setting page depend on the battery manufacturer. For lead-acid batteries, the

adjustable parameters are LV, HV, Charge Curr, and Discharge Curr. For lithium batteries, the adjustable parameters are maximum charge current, maximum discharge current, DOD (Depth of Discharge), and BatWakeUp (Battery Wake-up function, which disables automatically after 5 minutes). You can set the lead-acid battery parameters in the following steps.

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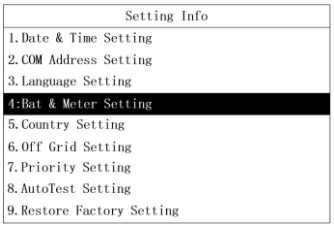
<tr><td> 
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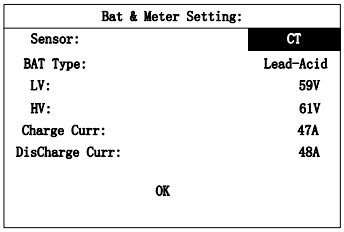
Press the OK key.</td><td> 
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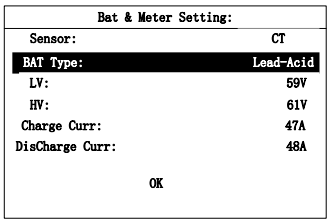
<tr><td> 
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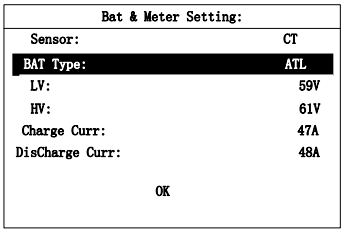
Press the Up or Down key to select “Lead-Acid” or a lithium battery manufacturer.</td><td> 
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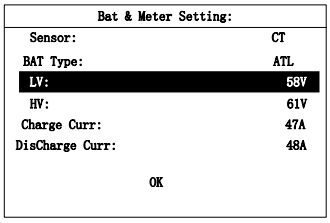
<tr><td> 
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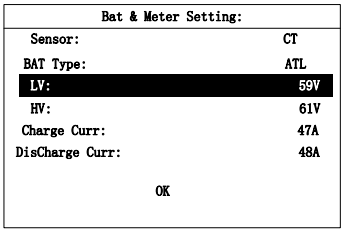
Press the Up or Down key to increase or decrease the minimum discharge voltage (LV).</td><td> 
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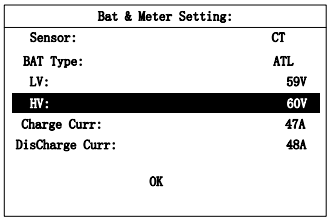
<tr><td> 
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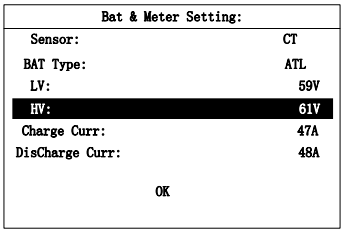
Press the Up or Down key to increase or decrease the maximum charge voltage (HV).</td><td> 
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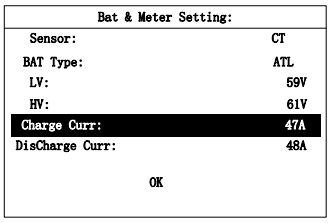
<tr><td> 
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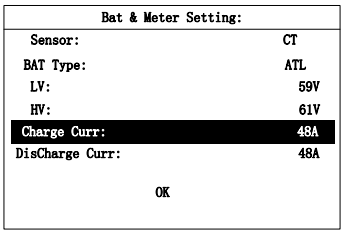
Press the Up or Down key to increase or decrease the charge current value. The discharge current setting follows the same procedure and is not further explained.</td><td> 
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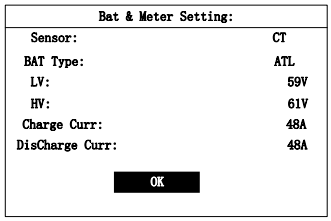

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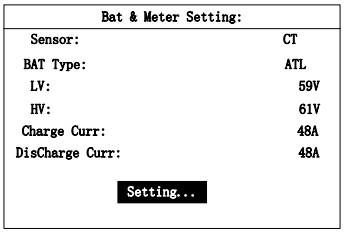

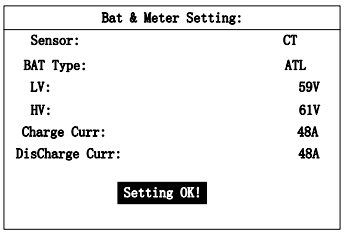

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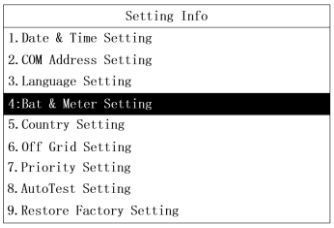
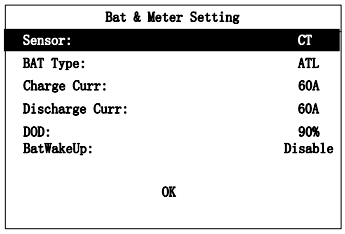


Press the OK key.



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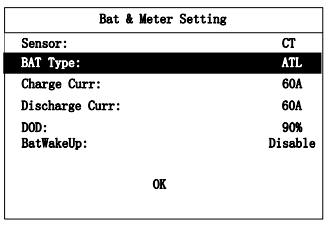
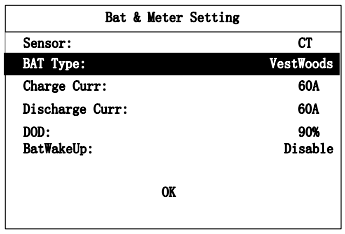


Press the Up or Down key to select a lithium battery manufacturer.



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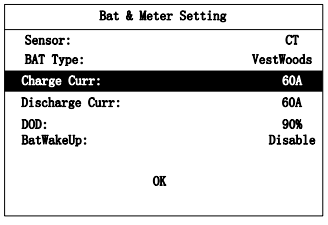
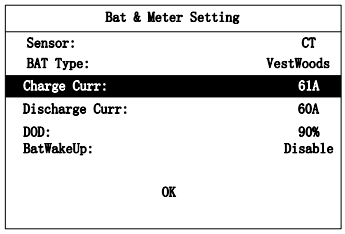
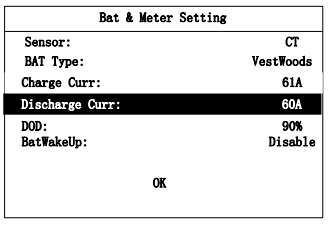
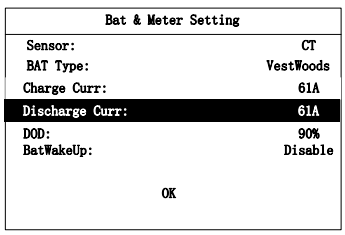


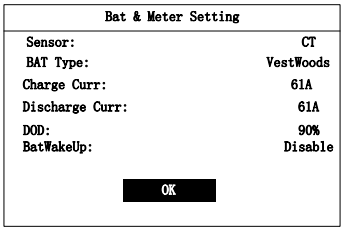
Press the Up or Down key to increase or reduce the maximum charge current value.





Press the Up or Down key to increase or decrease the maximum discharge current value. The DOD and BatWakeUp settings follow the same procedure and is



	not further explained.	
		⮟ Press the OK key.
		
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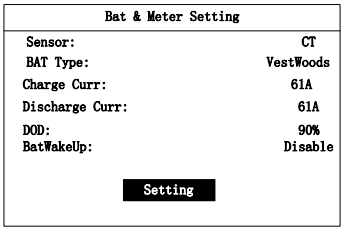
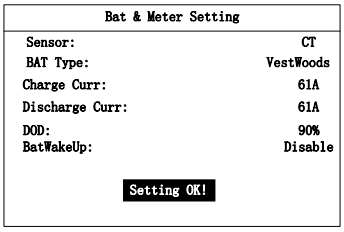
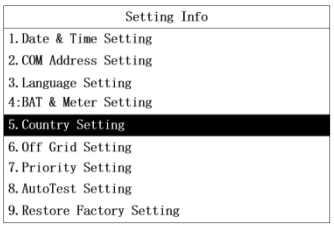
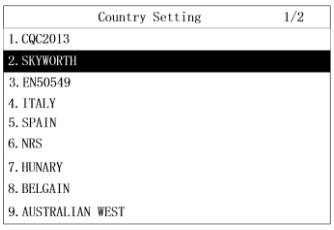
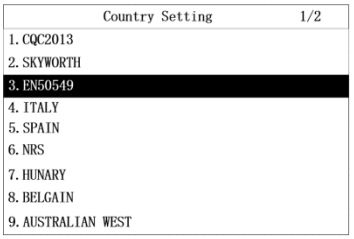
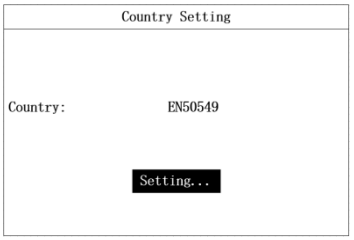
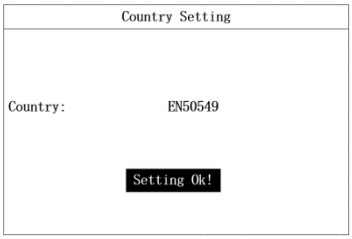
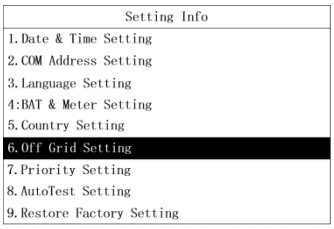
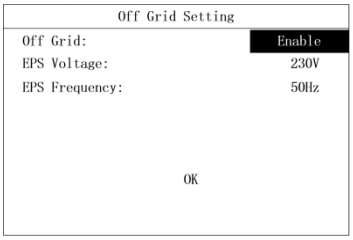
		
		⮟ Wait for 3 seconds.
		

7.2.6 Country Setting

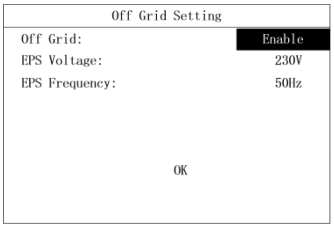
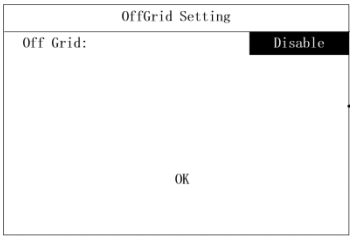
	→ Press the OK key.	
	→ Press the Up or Down key to select the country associated with the applicable safety standards.	
		⮟ Press the OK key.
		
		⮟ Wait for 3 seconds.

7.2.7 EPS Setting

	Press the OK key.	

Disable the off-grid mode in the following steps.

	Press the Up or Down key to select "Enable" or "Disable".	
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		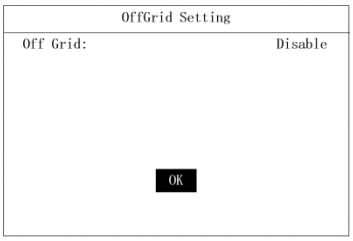
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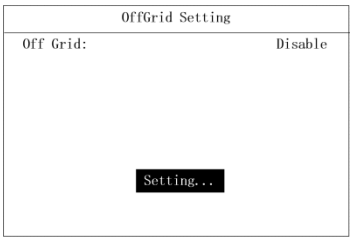
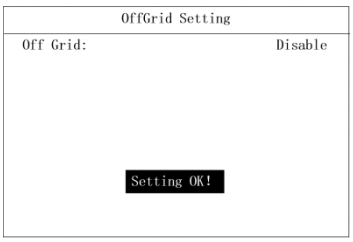
		
		Wait for 3 seconds.
		

Enable the off-grid mode and set the EPS voltage and frequency in the following steps.

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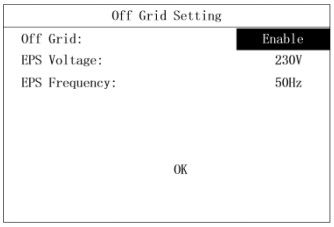
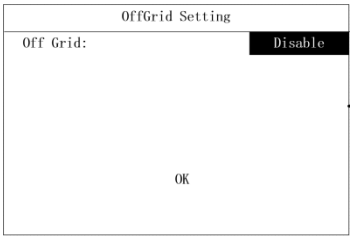
<tr><td> 
</td><td>Press the Up or Down key to select "Enable" or "Disable".</td><td> 
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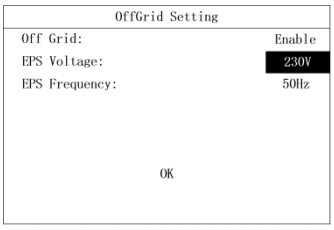
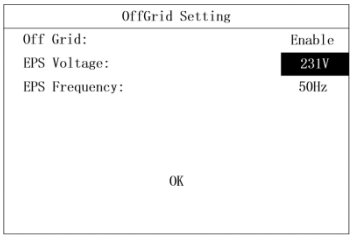
<tr><td> 
</td><td>Press the Up or Down key to increase or reduce the EPS voltage value.</td><td> 
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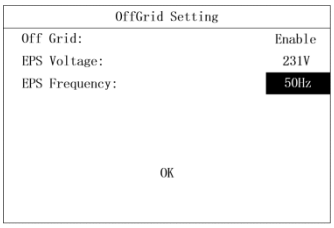
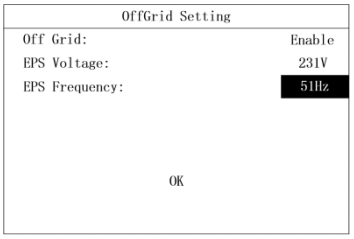
<tr><td> 
</td><td>Press the Up or Down key to increase or reduce the EPS frequency value.</td><td> 
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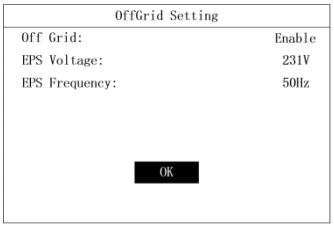
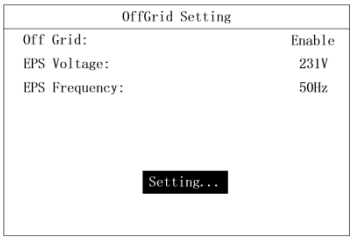
<tr><td> 
</td><td>Press the OK key.</td><td> 
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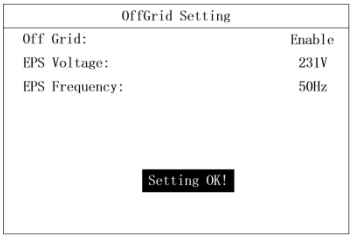
<tr><td></td><td></td><td> 
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7.2.8 Priority Setting

Priority setting includes Bat First mode and Grid First mode.

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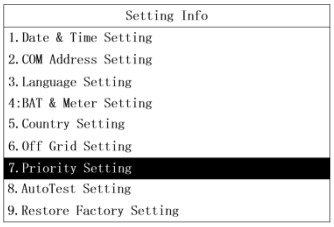
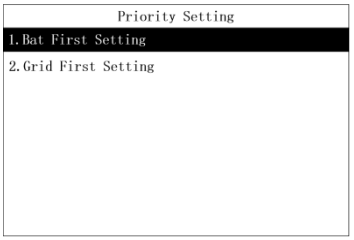
<tr><td> 
</td><td>Press the OK key.</td><td> 
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Set the Bat First mode in the following steps.

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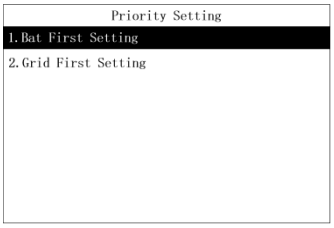
<tr><td> 
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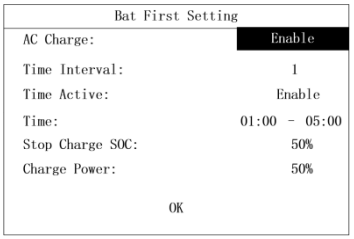
Press the OK key.</td><td> 
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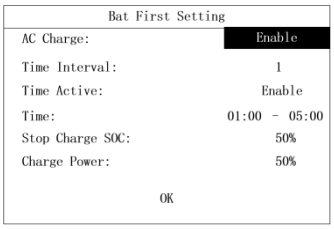
<tr><td> 
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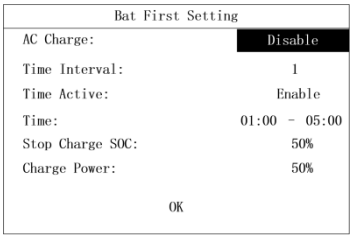
Press the Up or Down key to enable or disable the AC Charge function.</td><td> 
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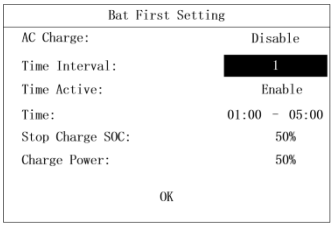
<tr><td> 
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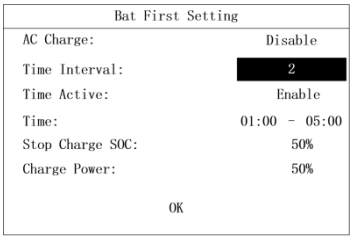
Press the Up or Down key to select a time interval.</td><td> 
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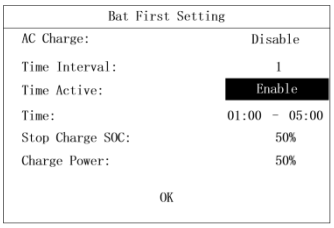
<tr><td> 
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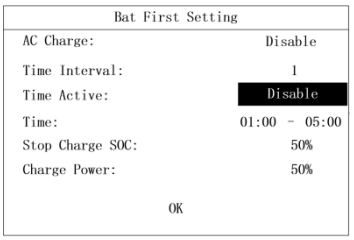
Press the Up or Down key to enable or disable the active time period.</td><td> 
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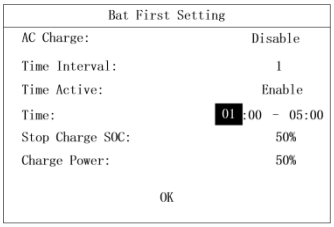
<tr><td> 
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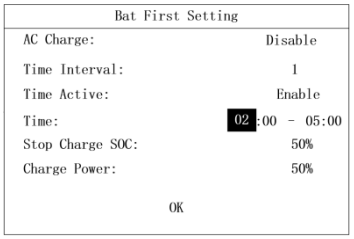
Press the Up or Down key to increase or reduce the time duration.</td><td> 
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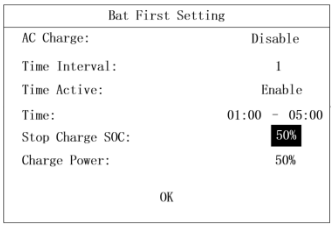
<tr><td> 
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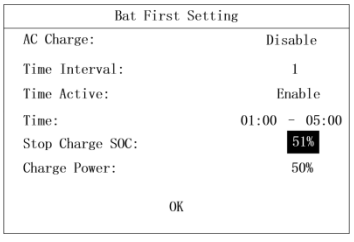
Press the Up or Down key to increase or reduce the Stop Charge SOC value.</td><td> 
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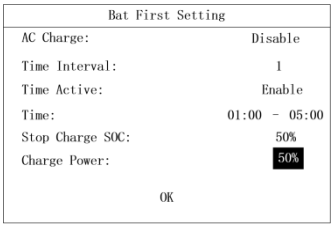
<tr><td> 
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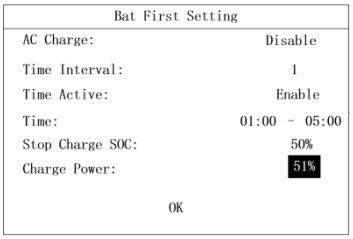
Press the Up or Down key to increase or reduce the Charge Power value.</td><td> 
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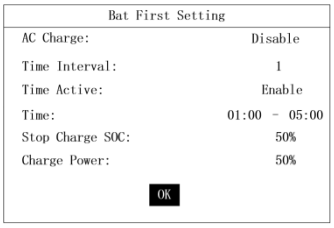
<tr><td> 
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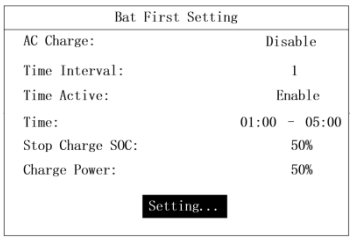
Press the OK key.</td><td> 
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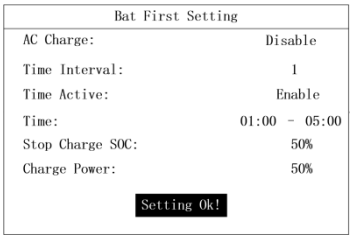
<tr><td></td><td></td><td> 
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Set Grid First mode in the following steps.

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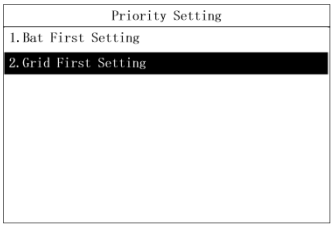
<tr><td> 
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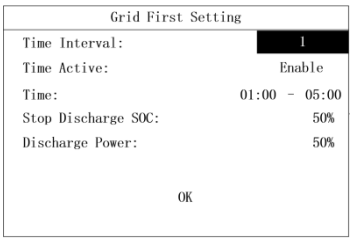
Press the OK key.</td><td> 
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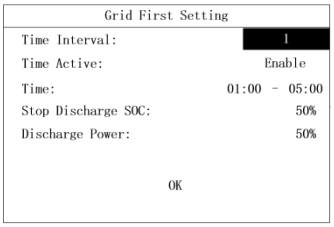
<tr><td> 
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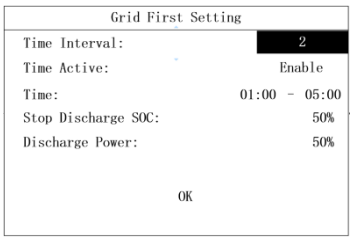
Press the Up or Down key to select a time interval.</td><td> 
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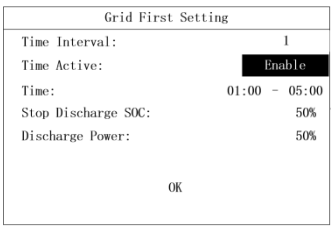
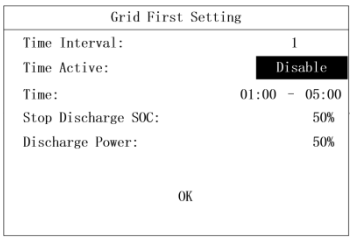
<tr><td> 
</td><td>→
Press the Up or Down key to enable or disable the active time period.</td><td> 
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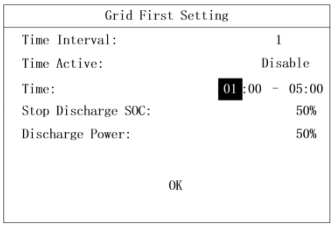
<tr><td> 
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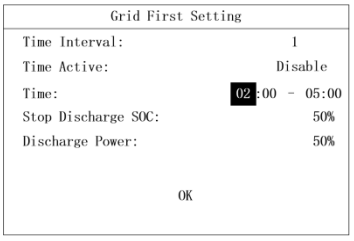
Press the Up or Down key to increase or reduce the time duration.</td><td> 
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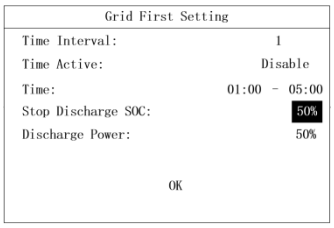
<tr><td> 
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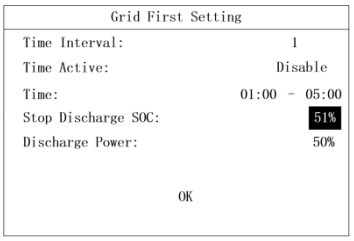
Press the Up or Down key to increase or reduce the Stop Discharge SOC value.</td><td> 
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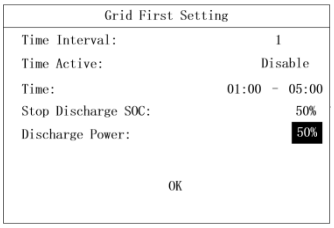
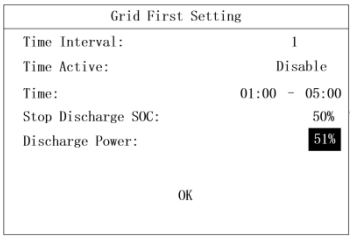
<tr><td> 
</td><td>→
Press the Up or Down key to increase or reduce the Discharge Power value.</td><td> 
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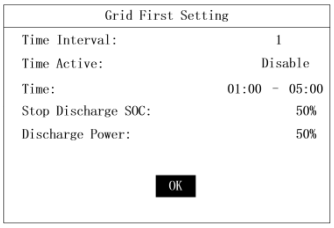
<tr><td>Press the OK key.</td><td></td><td></td></tr>
<tr><td> 
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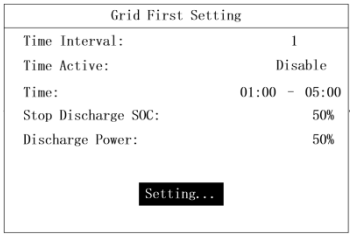
Press the OK key.</td><td> 
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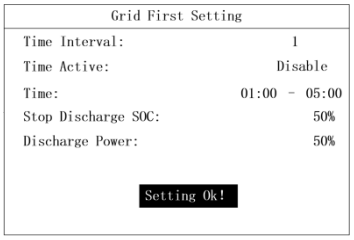
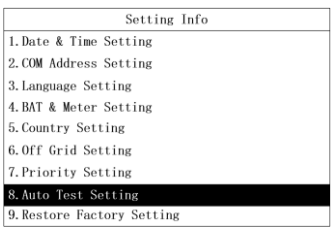
<tr><td></td><td></td><td>Wait for 3 seconds.</td></tr>
<tr><td></td><td></td><td> 
</td></tr>
</table>

7.2.9 AutoTest Setting

The auto test function will be available only if you have select “Italy” on the Country Setting page. If you select any other country, the AutoTest Setting page will indicate “Not Support!”

<table>
<tr><td> 
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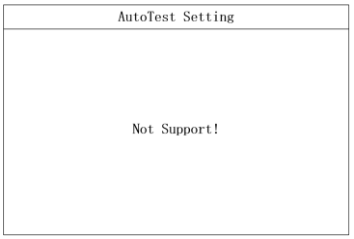
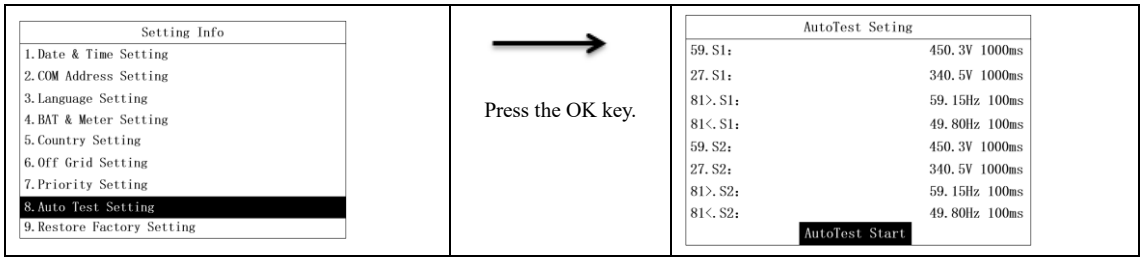
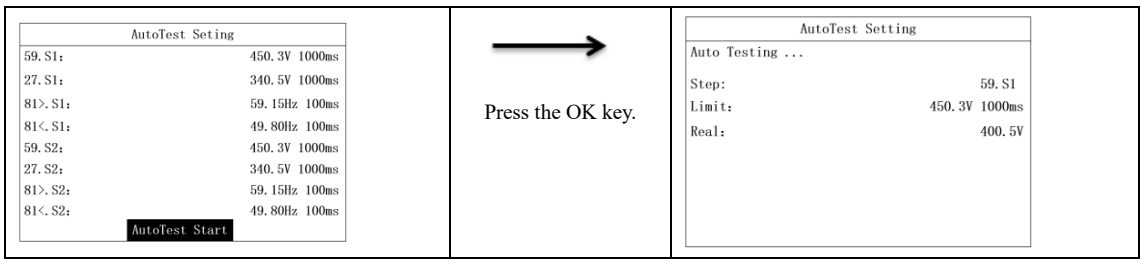
Press the OK key.</td><td> 
</td></tr>
</table>

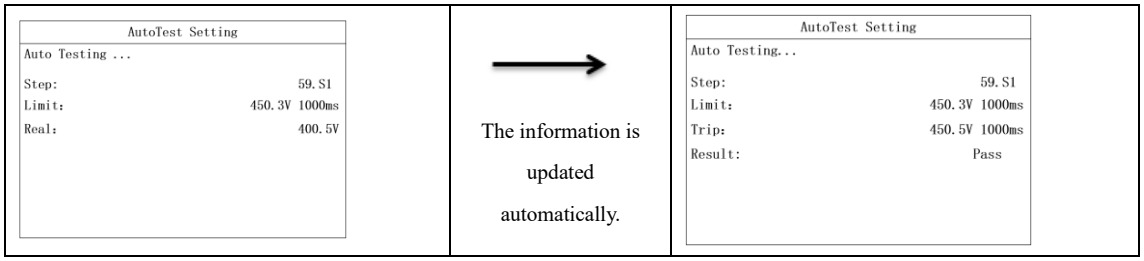
If "Italy" is selected, the AutoTest Setting page is shown below.



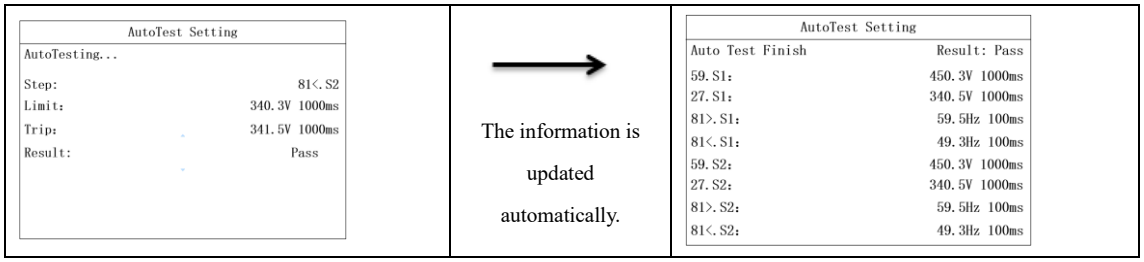
The Real value will vary with time once you start the auto test.



When an item has been tested, you can see its trigger limit and test result.

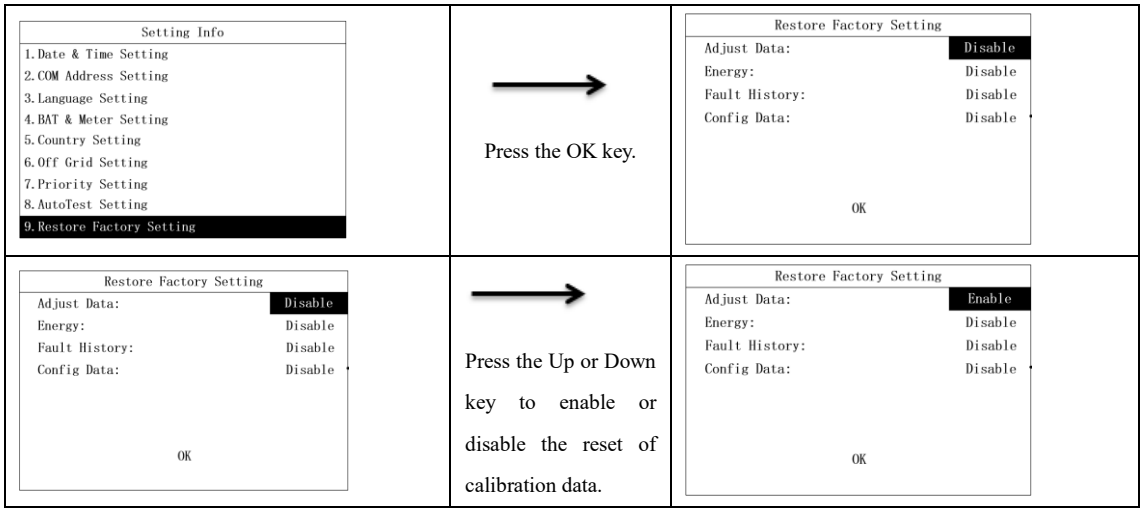


When all items have been tested, you can see the auto test results as well as the trigger limits of all items.



7.2.10 Restore Factory Setting

This function can restore calibration data and configuration parameters to default settings, as well as clear energy data and historical fault data. Restore factory settings is as follows:



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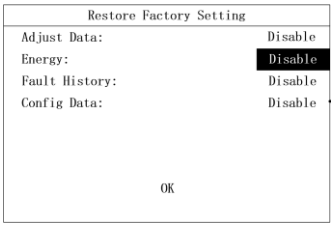
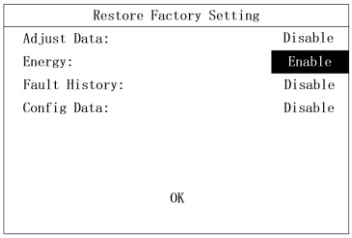
<tr><td>Press the OK key.</td><td></td><td></td></tr>
<tr><td> 
</td><td>Press the Up or Down key to enable or disable the clearing of energy data.</td><td> 
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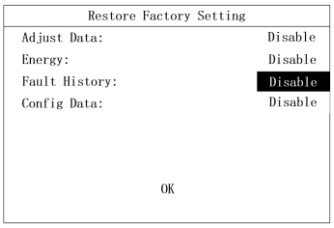
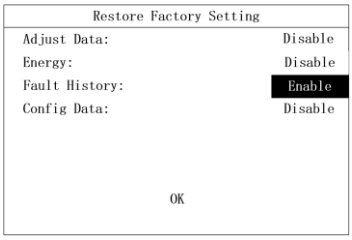
<tr><td> 
</td><td>Press the Up or Down key to enable or disable the clearing of fault history.</td><td> 
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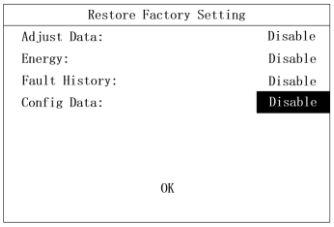
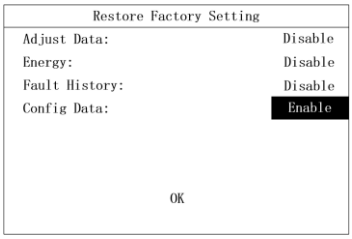
<tr><td>Press the OK key.</td><td></td><td></td></tr>
<tr><td> 
</td><td>Press the Up or Down key to enable or disable the reset of configuration data.</td><td> 
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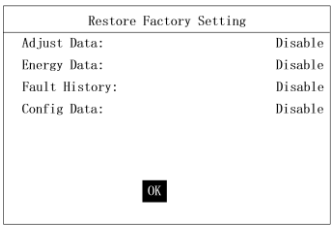
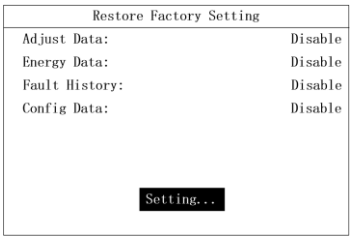
<tr><td> 
</td><td>Press the OK key.</td><td> 
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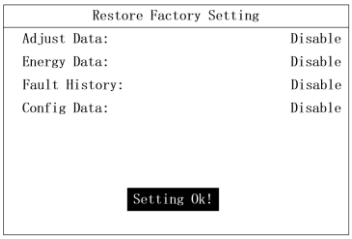
<tr><td></td><td></td><td>Wait for 10 seconds.</td></tr>
<tr><td></td><td></td><td> 
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7.2.11 Anti-reflux Meter Settings

These settings are used to enable/disable the anti-reflux meter, select the meter type, and limit grid power.

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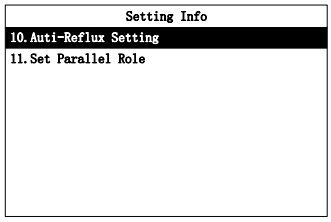
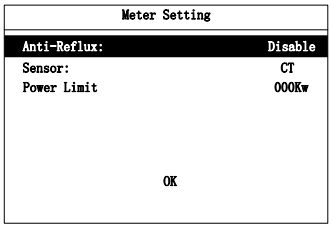
<tr><td> 
</td><td>→
Press the OK key to go to the Meter Setting page.
Press the Up or Down key to enable/disable the meter.</td><td> 
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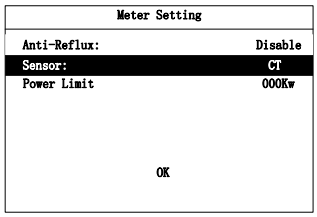
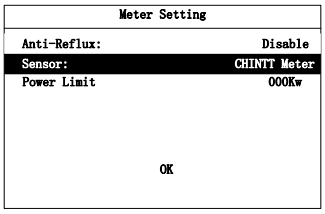
<tr><td> 
</td><td>→
Press the Up or Down key to select the type and brand of the meter.</td><td> 
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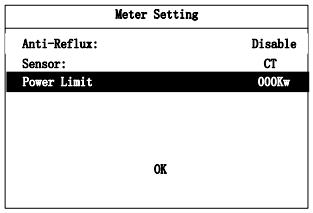
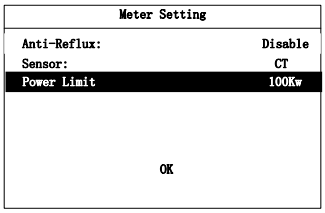
<tr><td> 
</td><td>→
Press the Up and Down keys to set limits on the power purchased or sold.</td><td> 
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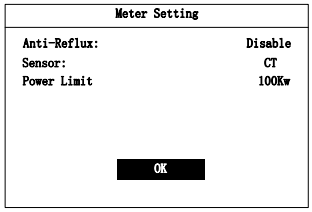
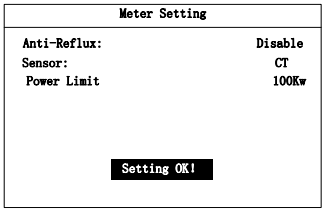
<tr><td> 
</td><td>→
Press Enter to save the settings.</td><td> 
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7.2.12 Grid Connection Role Setting

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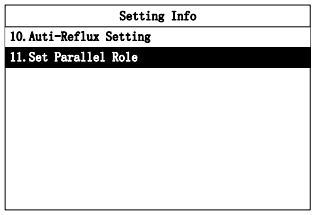
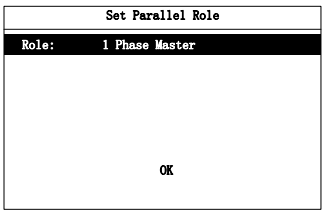
<tr><td> 
</td><td>→
Press Enter to open the interface.
Press the Up or Down key to set the device as either a master or a slave unit.</td><td> 
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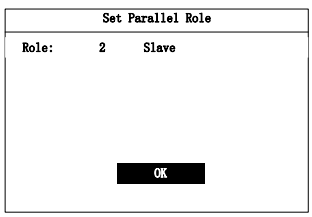
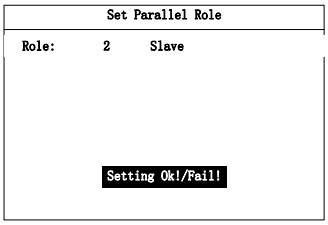
<tr><td colspan="3">▼ Press the OK key.</td></tr>
<tr><td> 
</td><td>→
Press the Enter key to confirm the settings and go to the next step.</td><td> 
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7.2.13 Generator Function Settings

The generator will start operating only when the inverter detects a grid outage and the battery SOC is too low.

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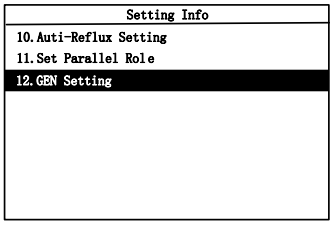
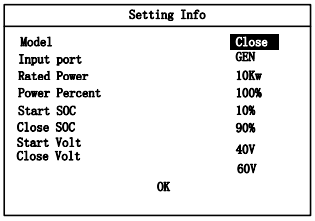
<td> 
</td>
<td>Press the OK key to go to the Generator Info page.</td>
<td> 
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<td>Press the OK key.</td>
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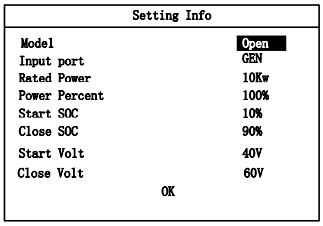
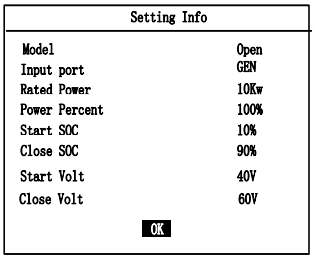
<td> 
</td>
<td>Press Up or Down to set the generator's on/off state. After setting, press OK to confirm.</td>
<td> 
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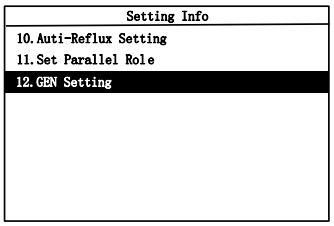
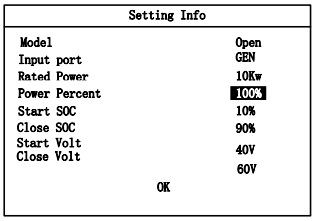
<td> 
</td>
<td>Press the OK key to go to the Generator Settings page.</td>
<td> 
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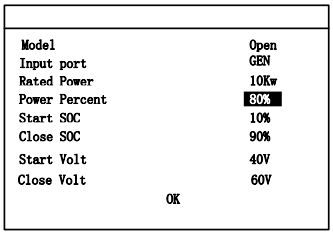
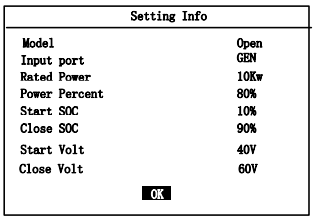
<tr>
<td>Press the OK key.</td>
<td></td>
<td></td>
</tr>
<tr>
<td> 
</td>
<td>Use the Up or Down key to set the generator's power percentage. Press Up to increase, and press Down to decrease. Press OK to confirm.</td>
<td> 
</td>
</tr>
</table>

Note: When using a generator, it is recommended to use a single-phase generator of at least 16 KW or a three-phase generator of at least 48 KW.

Chapter 8 System Debugging

8.1 LCD Screen and Keys

8.1.1 LCD Screen

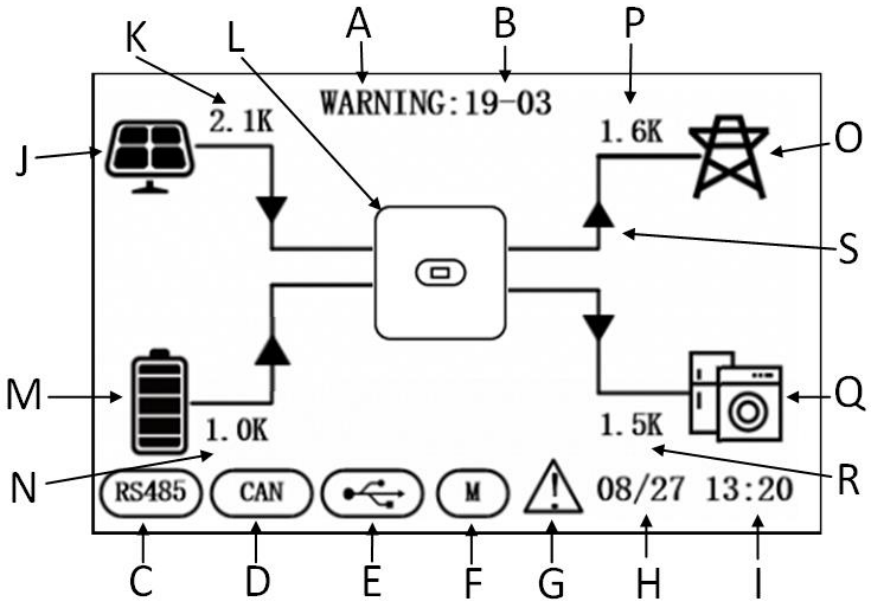


Fig. 8-1

Position	Description
A	State
B	Fault code
C	RS485 communication
D	CAN communication
E	USB port
F	Smart meter
G	Fault warning
H	Date
I	Time
J	PV input
K	PV power
L	Hybrid Inverter
M	Battery indicator (20% × 5 bars)
N	Battery power
O	Power Grid
P	Grid power
Q	Critical load
R	Load power
S	Energy flow arrow

8.1.2 LEDs, Screen and Keys

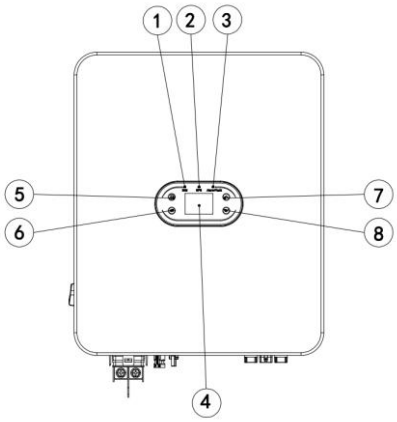


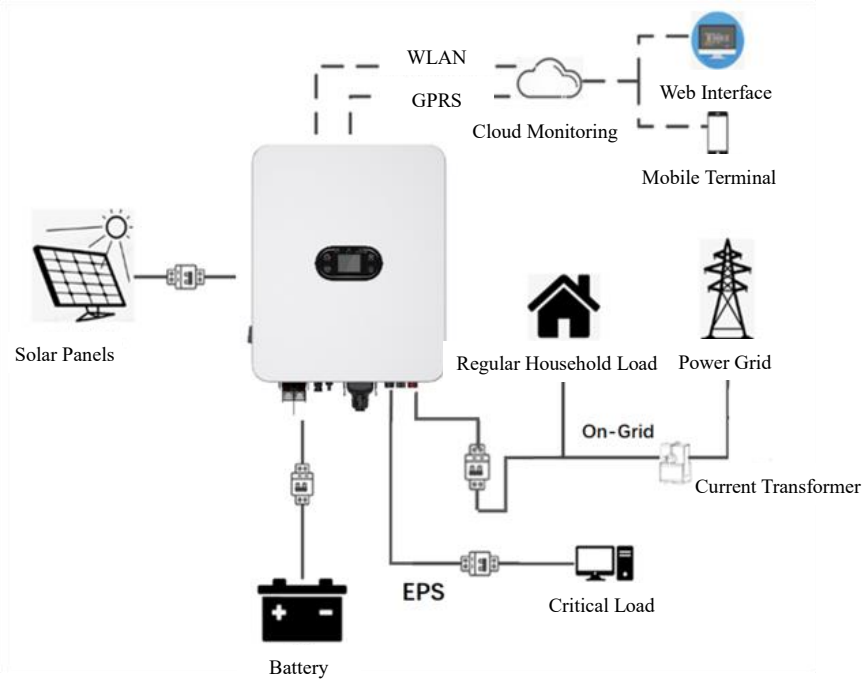
Fig. 8-2

Position	Description

1	Green LED remaining on: in the on-grid state.
	Green LED flashing: during the power-on self-test.
	Green and yellow LED flashing: during the programming process.
2	Yellow LED remaining on: in the off-grid state.
3	Red LED remaining on: in the fault state.
4	LCD screen
5	Return key
6	OK key
7	Up key
8	Down key

8.2 Working Mode

8.2.1 Basic Operation Mode



The basic operation mode includes both on-grid and off-grid states.

On-grid State

When the hybrid inverter works in on-grid state, you can select a priority mode as needed. On the LCD screen, you can only set one period for each priority mode; while on the App, you can set up to three periods for each priority mode.

1. Load First: This is the default priority mode. When the system works in this mode, the PV energy will be provided to the load first. When the PV energy is not sufficient to meet the load need, the battery will begin to supply power. When the PV energy has fulfilled the load need, the excess power will be stored in the battery. If no battery is connected or the battery is already full, the excess power will be supplied to the grid (if anti-reflux protection is not enabled).

2. Bat First: when the system works in this mode, the battery will be charged first. To charge the battery by AC power, you need to enable the AC Charge function and set the time interval and battery SOC. If the AC Charge function is not enabled, the hybrid inverter will only charge the battery by PV energy. You can also set the discharge power (maximum discharge percentage of the battery). In Bat First mode, the actual discharge energy of the battery will not exceed the set percentage.

3. Grid First: When the system works in this mode, the PV energy will be supplied to the grid first. Users can export energy to the grid during peak hours. You need to set the time interval and battery SOC. You can also set the discharge power (maximum discharge percentage of the battery). In Grid First mode, the actual discharge energy of the battery will not exceed the set percentage.

Off-grid State

In case of grid power failure, the system will automatically get into the off-grid state (you can disable this function as instructed in Section 9.1).

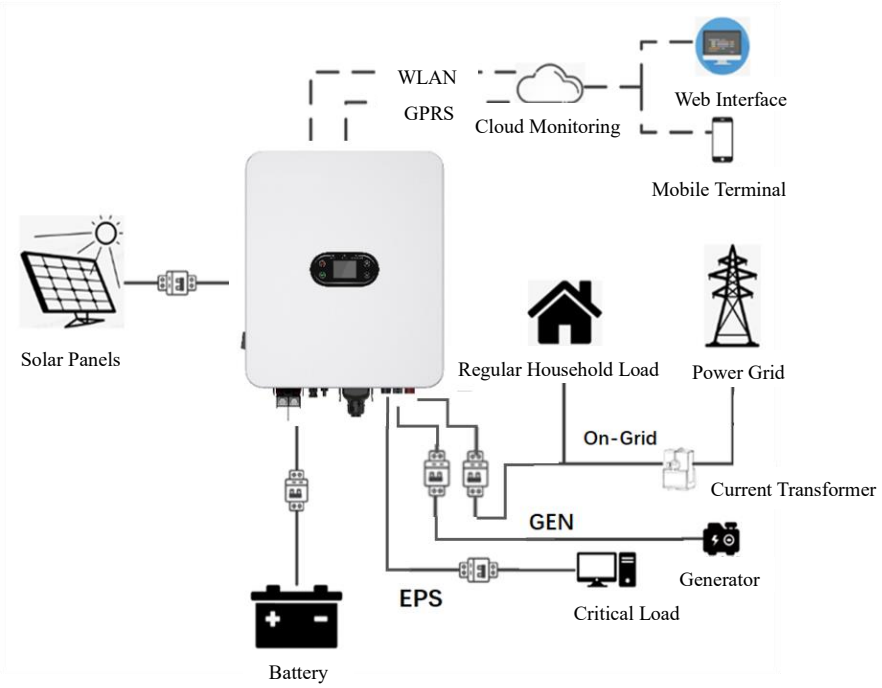
In this mode, the EPS output port will output voltage, and the system will supply power to the load using the battery and solar power. Note that in this mode, the maximum output power of the hybrid inverter is its rated power, so the load power at the EPS port should not exceed the rated power.

Note:

1. In Grid First mode or Bat First mode, you can only set one period on the LCD screen. If you need to set more periods, please use Invt Solar App.

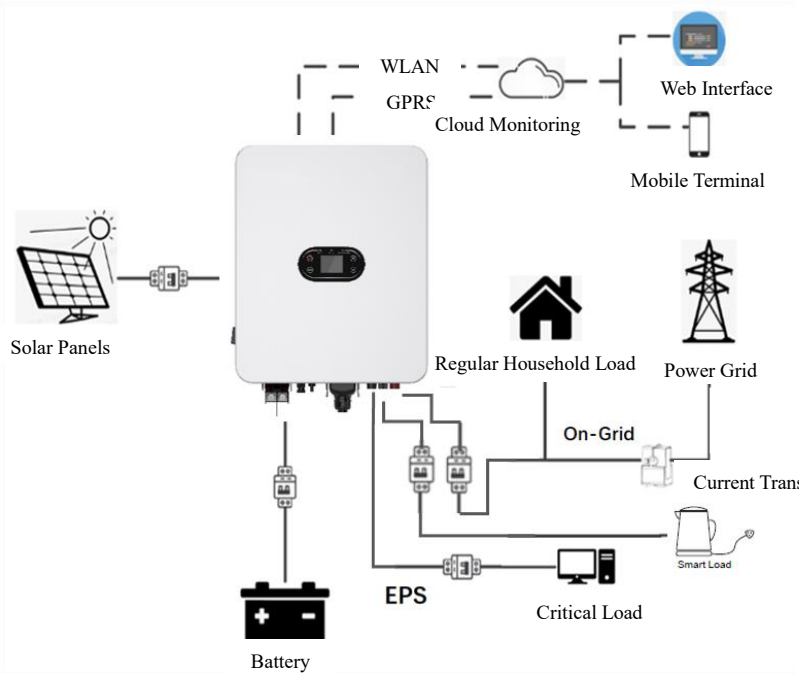
2. To charge the battery by AC power, you need to enter your login password and then enable the AC Charge function.

8.2.2 Generator Operation Mode



When sunlight is weak and there is no power from the grid, the battery will output off-grid power to supply energy to critical loads. When the battery SOC falls below the set value, the generator will start working, prioritizing energy supply to critical loads. Any surplus energy from the generator will be stored in the battery. When the grid returns to normal, the inverter will detect the grid voltage and send a command to disconnect the signals for the generator's dry contact and relay. The system will then return to the basic operation mode, as previously described.

8.2.3 Smart Load Operation Mode



The inverter's generator interface can connect not only to generators but also to smart loads. The combined load of smart loads and the EPS interface should not exceed the rated power. The operation is the same as that in the basic operation mode, and will not be repeated here.

8.2.4 Fault State

INVT Hybrid Inverter has an intelligent control system that can continuously monitor and adjust the state of the system. In case of a system fault or device fault, the fault information will be displayed on the LCD screen and the corresponding LED will be turned on.

Note:

A) See Section 10.1 for more fault information.

B) Some of the fault information is intended to remind you of possible internal faults of the inverter.

8.2.5 Firmware Upgrade

Do not turn off the power during the firmware upgrade progress. The system will automatically proceed to working mode at the end of firmware upgrade.

8.2.6 Self-test State

Before activating the working mode, the system will get into the power-on self-test state. If no fault is detected, the system will proceed to working mode; otherwise, it will get into the fault state.

8.2.7 Standby State

When no fault is detected and a certain operating condition has not been met, the system will get into the standby state.

8.2.8 Power-off State

To stop the operation of the hybrid inverter, please disconnect all energy sources to enter automatic shutdown.

Below are the shutdown steps:

1. Disconnect the PV side;

2. Turn off the BAT switch;

3. Disconnect the power grid. Both the LED light and LCD screen will be turned off.

Note: At the end of the above steps, please wait at least 5 minutes before proceeding to other operations.

NOTE
At the end of the above steps, please wait at least 5 minutes before proceeding to other operations.

8.3 Setting Inverter Parameters via Invt Solar App

Note: To ensure normal operation of the inverter, use Invt Solar App to set the parameters of the hybrid inverter first.

NOTE
To ensure normal operation of the inverter, please use Invt Solar App to set the parameters of the hybrid inverter first.

Invt Solar App is a mobile App that can communicate with the hybrid inverter via Wi-Fi or GPRS. It allows you to:

1. Check the running data, software version and fault information of the inverter;
2. Set the grid parameters and communication parameters of the inverter;
3. Perform maintenance of the inverter;
4. Update the software version of the inverter.

Chapter 9 System Maintenance

The INVT hybrid inverter has undergone a series of tests before delivery. To maintain and extend the service life of the inverter, you need to perform necessary routine maintenance in addition to using it in strict accordance with this Manual.

Make sure the inverter is disconnected from the power supply.
To operate the inverter, please wear personal protective equipment.

9.1 Regular Maintenance of Inverter

Maintenance Item	Process	Interval
Saving the inverter's running data	Use the monitoring software to read the inverter data in real time, and back up the recorded data periodically. Save the running data, parameters and logs of the inverter recorded by the monitoring software to a file. Check the monitoring software and view the parameter settings of the inverter through the hand-held device.	Every quarter
Inverter Running condition of the inverter	Observe whether the inverter is installed securely, damaged or deformed. Check if there is any abnormal sound during operation. Check the variables when the system is running in on-grid state. Check whether the heating of the inverter housing is normal, and use the thermal imager to monitor the heating of the system.	Every six months
Cleaning the inverter	Check the ambient humidity and dust around the inverter. If they affect the heat dissipation of the inverter, shut down the inverter and turn off the power supply, and clean the inverter with a soft brush or dry cloth after it cools down.	Every six months
DC switch	Check whether the DC switch functions properly by turning it on and off 10 times consecutively.	Every year

Maintenance Item	Process	Interval
Electrical Connection	Check whether the cable connections and the terminals of the inverter become loose. Check the cables for damage, especially whether there are any cuts on the cable sheath that may come in contact with metal surface.	Every six months
Sealing	Check whether the sealing of the cable holes meets the requirements. If any cable hole is not sealed or shows a large sealing gap, re-seal it.	Every year
Safety function	Check the LCD screen and the system shutdown function. Simulate a shutdown and check the shutdown signal communication. Check the warning labels and replace them if necessary.	Every year

9.2 Powering Off the Inverter

DANGER
•To perform maintenance of the inverter, please power off the inverter so as to avoid damage to the inverter and avoid the risk of electric shock. •When the inverter is powered off, it will take time for the internal components to discharge. Please wait for the time period specified on the label until the inverter is fully discharged.

Step 1: Disconnect the on-grid AC circuit breaker of the inverter.

Step 2: Disconnect the back-up AC circuit breaker of the inverter.

Step 3: Disconnect the EPS circuit breaker between the inverter and battery.

9.3 Removing the Inverter

Step 1: Disconnect all electrical connections of the inverter, including the DC wire, AC wire, communication cable, communication module and grounding wire.

Step 2: Remove the inverter from the mounting bracket.

Step 3: Remove the mounting bracket.

Step 4: Keep the inverter properly for future use, according to the storage environment requirements.

9.4 Scrapping the Inverter

If the inverter cannot be used any longer, dispose of the inverter according to the electrical waste disposal requirements of the laws and regulations of your country/region. Do not dispose of the inverter as household waste.

Chapter 10 Troubleshooting

Fault Codes and Troubleshooting

 WARNING	If you are not professional at troubleshooting, contact your dealer for help. Please wear personal protective equipment and power off the inverter before troubleshooting!

This Chapter lists the faults by a list of fault codes, so that you can find troubleshooting actions quickly.

You can use the following methods to do troubleshooting. If they cannot help you, contact our After-sales Service Center.

Please provide the following information to our After-sales Service Center so that we can help you more quickly.

- Model No. of the inverter:_____;
- SN of the inverter:_____;
- System version of the inverter — Version 1:_____;
  — Version 2:_____;
  — MCU software version:_____;
- Fault code:_____;
- Installation environment of the inverter:_____;

  Description of fault:_____.

Table 10-1 Fault Codes of Inverter

No.	Fault Type	Fault Code	Fault Information	Actions
1	PV voltage error	01-01	PV reverse connection	Check if the PV panel polarity is reversed.
		01-02	High PV voltage	Check whether the PV panel is connected properly, and whether the PV voltage is higher than the maximum working voltage of the inverter.
		01-03	Short circuit of PV panel	Check whether the PV panel is short-circuited.
		01-04	Short circuit of PV1	Restart the inverter. If the fault still exists, contact your dealer.
		01-05	Short circuit of PV2	Restart the inverter. If the fault still exists, contact your dealer.
		01-06	PV1 reverse connection	Check if the PV1 panel polarity is reversed.
		01-07	PV2 reverse connection	Check if the PV2 panel polarity is reversed.
2	Bus voltage error	03-01	Low Bus voltage	This fault usually occurs in the early morning. Please check the cleanliness of the PV panel surface.
		03-02	High Bus voltage	Check whether the PV panel is connected properly, and whether the PV voltage is higher than the maximum working voltage of the inverter.
		03-04	Over-voltage of hardware Bus	Restart the inverter. If the fault still exists, contact your dealer.
3	Over-current	05-01	Over-current of inverter hardware	Restart the inverter. If the fault still exists, contact your dealer.
		05-02	Over-current of inverter software	
		05-03	Over-current of boost hardware	
		05-04	Over-current of boost software	
		05-05	Auxiliary power hardware TZ failure	
		05-06	TZ Over-voltage of Bus hardware	
		05-07	Hardware TZ failure at LLC side	
		05-08	Over-current of buck-boost software	
4	Temperature error	06-01	Abnormal inverter temperature	Check the inverter temperature. If the temperature is too high, cool the inverter down before use.
		06-02	Abnormal Boost temperature	
		06-03	Abnormal radiator	

No.	Fault Type	Fault Code	Fault Information	Actions
			temperature	
		06-04	Abnormal ambient temperature	
		06-05	Abnormal buck-boost temperature	
		06-06	Open circuit of NTC thermistor	
5	Insulation monitoring error	07-01	Insulation monitoring error	Check whether the inverter and PV panel are grounded reliably. Power off the inverter for 5 minutes and then power it on again. If the fault still exists, contact your dealer.
6	Driver error	08-01	Driver error	Restart the inverter. If the fault still exists, contact your dealer.
7	Communication error	09-01	Communication error from ARM to master DSP	Restart the inverter. If the fault still exists, contact your dealer.
		09-02	Communication error from master DSP to ARM	
		09-03	Communication error from ARM to slave DSP	
		09-04	Communication error from slave DSP to ARM	
		09-05	Communication error between master and slave chips - master chip failure	Restart the inverter. If the fault still exists, contact your dealer.
		09-06	Communication error between master and slave chips - slave chip failure	Restart the inverter. If the fault still exists, contact your dealer.
		09-07	Communication error between DSP and AFCI	Restart the inverter. If the fault still exists, contact your dealer.
8	Leakage current error	10-01	High static leakage current	1. If the fault occurs occasionally, it may be caused by accidental abnormality of external cables. You can restart the inverter to resume normal operation. 2. If the fault occurs frequently or lasts long, check whether the PV string is grounded reliably.
		10-02	Abrupt fault of 30mA	
		10-03	Abrupt fault of 60mA	
		10-04	Abrupt fault of 150mA	

No.	Fault Type	Fault Code	Fault Information	Actions
9	Relay failure	11-01	Open circuit of relay	Restart the inverter. If the fault still exists, contact your dealer.
		11-02	Short circuit of relay	
10	Internal fan failure	12-01	Internal fan failure	Restart the inverter. If the fault still exists, contact your dealer.
11	DCI error	14-01	DCI error of R-phase	Check whether the inverter and PV panel are grounded reliably. Power off the inverter for 5 minutes and then power it on again. If the fault still exists, contact your dealer.
12	Consistency error	19-01	Inconsistent AC voltage values	Restart the inverter. If the fault still exists, contact your dealer.
		19-02	Inconsistent Bus voltage values	
		19-03	Inconsistent ISO voltage values	
		19-04	Inconsistent PV voltage values	
		19-05	Inconsistent GFCI	
		19-06	Bus voltage sampling error	
		19-07	PV current sampling error	
13	AC voltage error	31-01	Level-1 under-voltage of AC power	1. If the fault occurs occasionally, it may be caused by momentary abnormality of the power grid. The inverter will resume normal operation when the power grid gets back to normal. 2. If the fault occurs frequently, check whether the power grid is connected properly.
		31-02	Level-1 over-voltage of AC power	
		31-03	No AC voltage	Check whether the AC power is connected properly.
		31-04	Level-2 under-voltage of AC power	1. If the fault occurs occasionally, it may be caused by momentary abnormality of the power grid. The inverter will resume normal operation when the power grid gets back to normal. 2. If the fault occurs frequently, check whether the power grid is connected properly.
		31-05	Level-2 over-voltage of AC power	
		31-06	Startup under-voltage of AC power	
		31-07	Startup over-voltage of AC power	
		31-08	Transient over-voltage of interruptions	
		31-09	Anti-islanding over-voltage	
		31-10	Oscillation of grid voltage	
14	AC frequency error	33-01	Level-1 under-frequency of AC power	1. If the fault occurs occasionally, it may be caused by momentary abnormality of the power grid. The inverter will

No.	Fault Type	Fault Code	Fault Information	Actions
		33-02	Level-1 over-frequency of AC power	resume normal operation when the power grid gets back to normal. 2. If the fault occurs frequently, check whether the power grid is connected properly.
		33-03	Level-2 under-frequency of AC power	
		33-04	Level-2 over-frequency of AC power	
		33-05	Startup under-frequency of AC power	
		33-06	Startup over-frequency of AC power	
15	Remote shutdown	37-01	Remote shutdown instruction	Check whether any one is trying to shut down the inverter remotely.
16	AFCI error	38-01	Failure of PV string 1	Please turn off the inverter and open the input and output switches, and turn on the inverter again 5 minutes later. If the fault still exists, contact your dealer.
		38-02	Failure of PV string 2	
17	Power-on self-test error of AFCI	39-01	Power-on self-test error of PV string 1	Please turn off the inverter and open the input and output switches, and turn on the inverter again 5 minutes later. If the fault still exists, contact your dealer.
		39-02	Power-on self-test error of PV string 2	
18	AutoTest error	41-01	AutoTest failure	Please turn off the inverter and open the input and output switches, and turn on the inverter again 5 minutes later. If the fault still exists, contact your dealer.
19	N-PE fault	42-01	N-PE voltage error	Check whether the AC wires are connected properly and reliably to the inverter.
20	Power-on self-test error of leakage current	43-01	Leakage current sensor failure	Please turn off the inverter and open the input and output switches, and turn on the inverter again 5 minutes later. If the fault still exists, contact your dealer.
21	PV string detection error	44-01	PV string failure	Please turn off the inverter and open the input and output switches, and turn on the inverter again 5 minutes later. If the fault still exists, contact your dealer.
22	Auxiliary power error	45-01	Auxiliary power failure	Please turn off the inverter and open the input and output switches, and turn on the inverter again 5 minutes later. If the fault still exists, contact your dealer.
23	Short circuit of EPS	46-01	Short circuit of EPS	Check whether the output wiring is correct at the EPS port.
24	Parallel Fault	40-1	Multiple Master Unit Fault	Check the master-slave settings.
		40-2	Parallel CAN Communication Fault	Check the parallel CAN connection.
		40-3	Master Unit Lost Fault	1. Check the parallel CAN connection. 2. Check the master-slave settings.

No.	Fault Type	Fault Code	Fault Information	Actions
		40-4	Synchronization zero-crossing Fault	1. Check the parallel CAN connection. 2. Check the master-slave settings.

Table 10-2 Warning Codes of Inverter

No.	Fault Type	Fault Code	Fault Information	Displayed Information
1	Fan Malfunction	01-07	Internal fan 1	Please turn off the inverter and open the input and output switches, and turn on the inverter again 5 minutes later. If the fault still exists, contact your dealer.
	Fan Malfunction	01-01	External fan 1	Please turn off the inverter and open the input and output switches, and turn on the inverter again 5 minutes later. If the fault still exists, contact your dealer.
	Fan Malfunction	01-02	External fan 2	Please turn off the inverter and open the input and output switches, and turn on the inverter again 5 minutes later. If the fault still exists, contact your dealer.
2	Communication of anti-reflux meter	04-01	Meter failure	Check whether the smart meter is connected properly and supplies power normally.
		04-08	Communication error of meter	Check whether the smart meter is connected properly and supplies power normally.
		04-16	CT cable error	Check whether the CT cable is connected properly.
3	Out-of-range grid voltage alarm	05-00	Out-of-range voltage alarm	1. If the fault occurs occasionally, it may be caused by momentary abnormality of the power grid. The inverter will resume normal operation when the power grid gets back to normal. 2. If the fault occurs frequently, check whether the power grid is connected properly.
	Generator port out-of-range alarm	05-01	Generator out-of-range alarm	Restart the generator. If the fault persists, contact the dealer.
4	Short circuit of PV	06-01	Short circuit of PV1	Check whether the PV input is normal and whether the circuit is short.
		06-02	Short circuit of PV2	
5	Overload	07-01	EPS overload	Reduce the load at the EPS port.
6	Full battery	46-01	Full battery	The battery is fully charged.
7	Low battery voltage	47-01	The battery needs to be charged.	Please charge the battery soon.
		47-02	The battery can only be charged.	Check the mode settings and charge the battery.
8	EPS overload	07-01	EPS Power Exceeds 1.5x	Reduce the load at the EPS port.
		07-02	EPS Power Exceeds 1.2x	
		07-03	EPS Power Exceeds 1.1x	
		07-04	EPS Current Exceeds 1.5x	

		07-05	EPS Current Exceeds 1.2x	
		07-06	EPS Current Exceeds 1.1x	

Chapter 11 Product Specifications

	XD7KTL	XD8KTL	XD10KTL
Battery Parameters			
Battery type	Lithium battery or lead-acid battery		
Battery voltage (V)	40-60		
Maximum charge and discharge current (A)	175	190	220
Communication mode	CAN, 485		
DC input			
Maximum input voltage (V)	600		
Startup On-grid Voltage (V)	120		
MPPT voltage	100-550		
MPPT channels	2		
Number of MPPT Strings per Channel	1/2		
Maximum input current (A)	20/20+20		
Maximum input short-circuit current (A)	30/30+30		
AC output			
Rated output power (W)	7000	8000	10000
Maximum output power (VA)	7700	8800	11000
Maximum output current (A)	35	40	50
Rated voltage (V)	220/230		
Rated frequency (Hz)	50/60		
Total harmonic distortion of current (@ rated power)	＜3% (rated power)		
Power factor	0.8 lead ~ 0.8 lag		
EPS output			
Rated voltage (V)	220/230	220/230	220/230
Rated output power (W)	7000	8000	10000
Peak power (KW,s)	14, 0	16, 10	20, 10
Switching time (ms)	＜10		
Efficiency			
Maximum efficiency	＞98%		
European efficiency	＞97.5%		
Charge-discharge efficiency	＞95.5%		
Protection			
DC switch	Available		
Anti-islanding protection	Available		
Output overcurrent protection	Available		
DC (PV/Battery) Overcurrent Protection	Optional		
IV curve scanning	Available		
DC surge protection	Level II		
AC surge protection	Level II		
Insulation resistance detection	Available		
AC leak current detection	Available		

Arc fault detection	Optional
Display and communication	
Display	LCD
RS485	Supported
CAN	Supported
WIFI/4G/LAN	Supported
Bluetooth	Supported
General Specifications	
Ambient temperature	-30℃～+60℃
Topology	High-frequency isolation (for battery)
Ingress protection	IP66
RH	0~100%
Communication	RS485 & CAN & Wi-Fi & 4G & LAN & Bluetooth
Maximum working altitude (m)	4000
Noise	≤40 dB
Cooling mode	Smart Air Cooling
Display	LCD
Dimension	534 mm*440 mm*245 mm
Weight	31 Kg

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 202408 (V1.0)