V1.0 2026-06-12

Commercial and Industrial Smart Inverter

ETR Series (50-125kW)

User Manual

GOODWE

Copyright Statement

NOTICE

Due to product version upgrades or other reasons, the document content will be updated periodically. Unless otherwise agreed, the document content cannot replace the safety precautions on product labels. All descriptions in the document are for guidance only.

Table of Contents

1 Preface

1.1 Overview

This document primarily introduces the product information, transportation and storage, installation and wiring, configuration and commissioning, troubleshooting, and maintenance of the inverter. Please read this manual carefully before installing and using this product to understand the product safety information and familiarize yourself with the product's functions and features. The document may be updated periodically. Please obtain the latest version of the materials and more product information from the official website: https://www.goodwe.com.

1.2 Applicable Model

This document applies to the following inverter models:

ETR Series Energy Storage Inverter	BTR Series Coupling Inverter
• GW50K-ETR-L-G10 • GW75K-ETR-L-G10 • GW75K-ETR-G10 • GW80K-ETR-G10 • GW99.99K-ETR-G10 • GW100K-ETR-G10 • GW110K-ETR-G10 • GW124.99K-ETR-G10 • GW125K-ETR-G10	• GW50K-BTR-L-G10 • GW75K-BTR-L-G10 • GW75K-BTR-G10 • GW80K-BTR-G10 • GW99.99K-BTR-G10 • GW100K-BTR-G10 • GW110K-BTR-G10 • GW124.99K-BTR-G10 • GW125K-BTR-G10

Model Description

Identifier	Meaning	Description
1	Brand code	GW: GOODWE
2	Power	75K: Rated power is 75kW
3	Series code	• ETR: ETR Series • BTR: BTR Series
4	voltage	• With L: AC voltage is 127/220V • Without L: AC voltage is 220/380V, 230/400V, 240/415V
5	Version code	G10: First generation product

1.3 Symbol Definition

⚠DANGER
Indicates a highly hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING
Indicates a moderately hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION

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

NOTICE

It emphasizes and supplements the content, may provide tips or tricks for optimal product use, and can help you solve a problem or save you time.

2 Safety Precautions

The safety precaution information contained in this document must always be followed when operating the equipment.

⚠WARNING
The inverter has been strictly designed and tested in accordance with safety regulations. However, as an electrical device, relevant safety instructions must be followed before performing any operations on the equipment. Improper operation may lead to serious injury or property damage.

2.1 General Safety

⚠DANGER

- Before making electrical connections, disconnect all upstream switches of the equipment to ensure it is de-energized. Live working is strictly prohibited, otherwise hazards such as electric shock may occur.
- For equipment supporting PV string connection, the PV input terminals have weak surge current withstand capability. It is strictly forbidden to directly power on the equipment via the PV ports using a DC voltage source. If powering on from the PV ports is necessary, please follow the steps below. Damage caused by improper operation is considered人为损坏 and is not covered under the product warranty.
  1. First, limit the output current of the DC voltage source within the maximum input current range allowed by the PV ports.
  2. Then, close the DC switch of the inverter.
  3. Finally, slowly increase the DC source output voltage from 0 to the target value at a rate of ≤50V/s.
- To prevent personal injury or equipment damage caused by live working, a circuit breaker must be added to the voltage input side of the equipment.
- All operations, including transportation, storage, installation, operation, use, and maintenance, must comply with applicable laws, regulations, standards, and specifications.
- The specifications of cables and components used for electrical connections must comply with local laws, regulations, standards, and specifications.
- Please use the cable connectors provided in the package to connect equipment cables. If other models of connectors are used, any resulting equipment damage is not within the manufacturer's responsibility.
- Ensure all equipment cable connections are correct, secure, and not loose. Improper wiring may cause poor contact or damage the equipment.
- The equipment's protective earth wire must be securely connected.
- To protect the equipment and its components from damage during transportation, ensure transport personnel are professionally trained. Record the operational steps during transportation and keep the equipment balanced to avoid dropping.
- The equipment is heavy. Assign personnel according to the equipment's weight to prevent it from exceeding the human lifting capacity, which could cause injury.
- Ensure the equipment is placed stably and not tilted. Equipment tipping over may cause equipment damage and personal injury.

⚠WARNING

- During device installation, avoid placing stress on the terminals, as this may cause terminal damage.
- If excessive tension is applied to the cable, poor connections may result. When wiring, leave a certain length of slack in the cable before connecting it to the device's terminal port.
- Cables of the same type should be bundled together. Different types of cables must be routed with at least 30mm separation and are prohibited from being intertwined or crossed.
- Using cables in high-temperature environments may cause aging or damage to the insulation layer. Maintain a distance of at least 30mm between cables and heating components or the periphery of heat source areas.

NOTICE

- Due to product version upgrades or other reasons, the document content will be updated periodically. Unless otherwise agreed, the document content cannot replace the safety precautions on the product label. All descriptions in the document are for guidance only.
- Please read this document carefully before installing the device to understand the product and precautions.
- All operations on the device must be performed by professional, qualified electrical technicians who are familiar with the relevant standards and safety regulations in the project location.
- When operating the device, use insulated tools and wear personal protective equipment to ensure personal safety. Wear anti-static gloves, wrist straps, clothing, etc., when touching electronic components to protect the device from electrostatic damage.
- Unauthorized disassembly or modification may cause device damage, which is not covered by the warranty.
- Device damage or personal injury caused by not installing, using, or configuring the device according to the requirements of this document or the corresponding user manual is beyond the manufacturer’s liability. For more product warranty information, please visit the official website: https://en.goodwe.com/warrantyrelated.html.

2.2 personnel requirements

NOTICE

To ensure safety, compliance, and efficiency throughout the entire process of equipment transportation, installation, wiring, operation, and maintenance, all work must be performed by professionals or qualified personnel.

1. Professionals or qualified personnel include:
   - Personnel who have mastered the knowledge of equipment working principles, system structure, risks, and hazards, and have received professional operation training or possess extensive practical experience.
   - Personnel who have received relevant technical and safety training, possess certain operational experience, are aware of the potential dangers specific tasks may pose to themselves, and can take protective measures to minimize risks to themselves and others.
   - Qualified electrical technicians who meet the regulatory requirements of the country/region where the work is performed.
   - Personnel holding a degree in electrical engineering/an advanced diploma in electrical disciplines or equivalent/professional qualifications in the electrical field, with at least 2/3/4 years of experience in testing and regulatory work using electrical equipment safety standards.
2. Personnel involved in special tasks such as electrical work, work at heights, and operation of special equipment must hold valid qualification certificates required by the location of the equipment.
3. Operation of medium-voltage equipment must be performed by certified high-voltage electricians.
4. Replacement of equipment and components is only permitted to be carried out by authorized personnel.

2.3 PV String Safety

⚠WARNING

- Ensure the component frame and mounting system are properly grounded.
- After connecting the DC cables, ensure the connections are tight and secure. Improper wiring may cause poor contact or high impedance, and damage the inverter.
- Use a multimeter to measure the positive and negative poles of the DC cables to ensure correct polarity (no reverse connection) and that the voltage is within the permissible range.
- Use a multimeter to measure the DC cables to ensure correct polarity (no reverse connection); the voltage should be lower than the maximum DC input voltage. Damage caused by reverse connection and overvoltage is not covered by the equipment manufacturer's liability.
- The PV string output does not support grounding. Before connecting the PV string to the inverter, ensure the minimum insulation resistance to ground of the PV string meets the minimum insulation resistance requirement (R=Max. Input Voltage (V)/30mA).
- Do not connect the same PV string to multiple inverters, as this may cause damage to the inverters.
- The photovoltaic modules used with the inverter must comply with IEC 61730 Class A standard.
- When the PV string input voltage or input current is high, it may cause the inverter output power to derate.

2.4 Inverter Safety

⚠WARNING

- Ensure the voltage and frequency at the grid connection point comply with the inverter's grid-tie specifications.
- It is recommended to add protective devices such as circuit breakers or fuses on the AC side of the inverter. The rating of the protective device must be greater than 1.25 times the maximum AC output current of the inverter.
- If the inverter triggers an arc fault alarm less than 5 times within 24 hours, the alarm can be cleared automatically. After the 5th arc fault alarm, the inverter will shut down for protection and can only resume normal operation after the fault is cleared.
- If the PV system is not configured with a battery, the use of the BACK-UP function is not recommended, as it may cause a system power outage risk.
- Changes in grid voltage and frequency may cause the inverter output power to derate.

2.5 EU Declaration of Conformity

2.5.1 Equipment with Wireless Communication Modules

GoodWe Technologies Co., Ltd. hereby declares that the Equipment with Wireless Communication Modules that can be sold in the European market meets the following directive requirements:

- Radio Equipment Directive 2014/53/EU (RED)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

2.5.2 Devices Without Wireless Communication Functionality

Growatt Technology Co., Ltd. hereby declares that the devices without wireless communication functionality sold in the European market comply with the requirements of the following directives:

- Electromagnetic compatibility Directive 2014/30/EU (EMC)
- Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

More EU Declarations of Conformity can be obtained from the official website: https://en.goodwe.com.

2.6 Safety Symbols and Certification Marks

DANGER

- After the device is installed, the labels and warning signs on the box must be clearly visible. It is prohibited to block, alter, or damage them.
- The following box warning label descriptions are for reference only. Please refer to the actual labels used on the device.

No.	Symbol	Meaning
1		Potential hazards exist during device operation. Take protective measures when operating the device.
2		High voltage hazard. High voltage is present during device operation. Ensure the device is powered off before performing any operations.
3		The inverter surface is at a high temperature. Do not touch during operation to avoid burns.
4		Use the device properly. There is a risk of explosion under extreme conditions.
5		Risk of fire.

No.	Symbol	Meaning
6		The device contains corrosive electrolyte. Avoid contact with leaked electrolyte or vapor.
7		Delayed discharge. After powering off the device, wait for 5 minutes until it is completely discharged.
8		The device must not be installed in an explosive environment.
9		The device must not be installed in a corrosive environment.
10	 	Keep the device away from open flames or ignition sources.
11		Keep the device out of reach of children.
12		Children are prohibited from touching.
13		Do not lift the device.
14		Disassemble is forbidden.
15		Do not switch off under load, as it may cause hazards such as electric shock or fire.
16	 	Read the product manual carefully before operating the device.

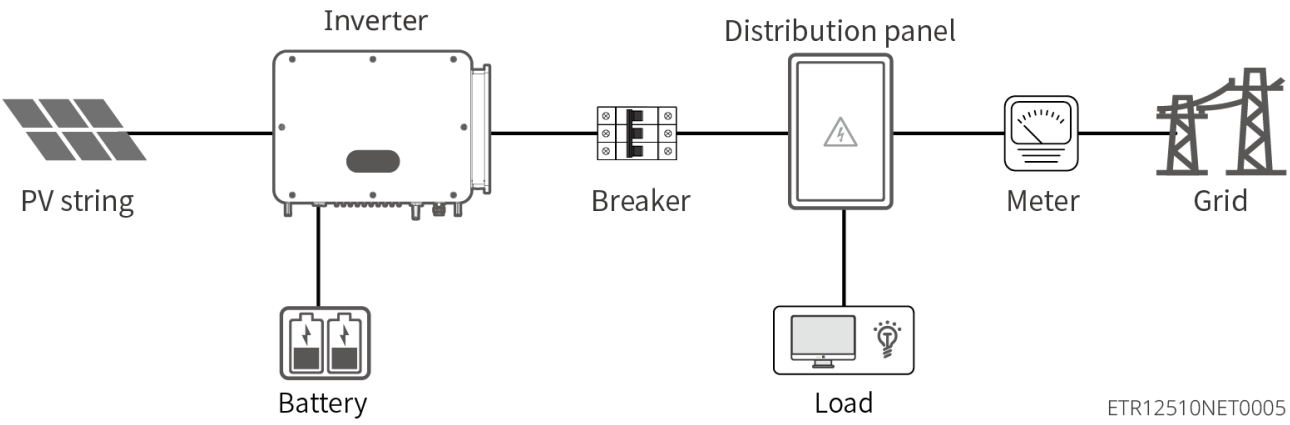
No.	Symbol	Meaning
17		Wear personal protective equipment during installation, operation, and maintenance.
18		The device must not be disposed of as household waste. Dispose of it according to local laws and regulations, or return it to the manufacturer.
19		Grounding point.
20		Recycling symbol.
21		CE marking.
22		TUV mark.
23		RCM mark.

3 Product Introduction

3.1 Product Overview

The smart inverter controls and optimizes energy flow through an integrated energy management system within a photovoltaic system. It can supply the generated electricity to loads, store it in batteries, or feed it into the grid. It supports multiple solutions, enabling efficient and economical energy utilization.

System Overview



Name	Description
PV String	Maximum number of strings per MPPT is 2.
Inverter	ETR/BTR series inverters.
Battery	Supports BAT-C and BAT-S series battery systems.
Electricity meter	GM330 electricity meter.
Utility grid	For supported utility grid types, please refer to 3.3.Utility grid type(Page 23).

Features

- **Three-Phase Unbalanced Output**

Both the grid connection side and the BACK-UP side of the inverter support three-phase unbalanced output, allowing different power loads to be connected to each phase. The maximum output power per phase for different models is shown in the table below:

Model	Maximum Output Power per Phase
GW50K-ETR-L-G10	1/3 x 50kW
GW75K-ETR-L-G10	1/3 x 75kW
GW75K-ETR-G10	1/3 x 75kW
GW80K-ETR-G10	1/3 x 88kW
GW99.99K-ETR-G10	1/3 x 99.99kW
GW100K-ETR-G10	1/3 x 110kW
GW110K-ETR-G10	1/3 x 121kW
GW124.99K-ETR-G10	1/3 x 124.99kW
GW125K-ETR-G10	1/3 x 137.5kW

- **AFCI (Optional)**

The inverter integrates an AFCI circuit protection device, which detects arc faults and quickly cuts off the circuit upon detection, thereby preventing electrical fires.
Causes of arc faults:

- Damage to connectors in the photovoltaic system.
- Incorrect or damaged cable connections.
- Aging of connectors or cables.

Fault handling methods:

1. When the inverter detects an arc fault, the fault type can be viewed on the inverter's LCD display or APP.
2. If the inverter triggers an arc fault <5 times within 24 hours, it will automatically reconnect to the grid after a 5-minute wait for each fault. Upon the 5th trigger of an arc fault, the fault must be cleared before the inverter can resume normal

operation. For specific operations, please refer to the "SEMS+ App User Manual".

model	AFCI	Description
GW50K-ETR-L-G10	F-I-AFPE-1-6/4/6/4-4	F (Full coverage): Full coverage of inverter PV input ports I (Integrated): AFPE (arc fault protection equipment) integrated within the inverter, combining both AFD and AFI arc detection functions 1: One pair of PV input ports (PV+, PV-) connects to one string of PV input 6/4/6/4: Number of PV input ports detected by one arc fault detection sensor 4: Number of arc fault detection sensors
GW75K-ETR-L-G10		
GW75K-ETR-G10		
GW80K-ETR-G10		
GW99.99K-ETR-G10		
GW100K-ETR-G10		
GW110K-ETR-G10		
GW124.99K-ETR-G10		
GW125K-ETR-G10		

- **Load Control (Optional)**

The inverter's dry contact control port supports connection to an additional contactor for controlling load turn-on or turn-off. It supports household loads, heat pumps, etc. Load control methods are as follows:

- Time Control: Set the time for the controlled load to turn on or off. The load will automatically turn on or off during the set time period.
- Switch Control: When the control mode is set to ON, the load turns on; when set to OFF, the load turns off.
- BACK-UP Load Control: The inverter has a built-in relay dry contact control port, which can control whether a load is turned off via the relay. In off-grid mode, if an overload on the BACK-UP side is detected and the battery SOC value falls below the set off-grid protection value, the load connected to the relay port can be turned off.

- **Rapid Shutdown RSD (Optional)**

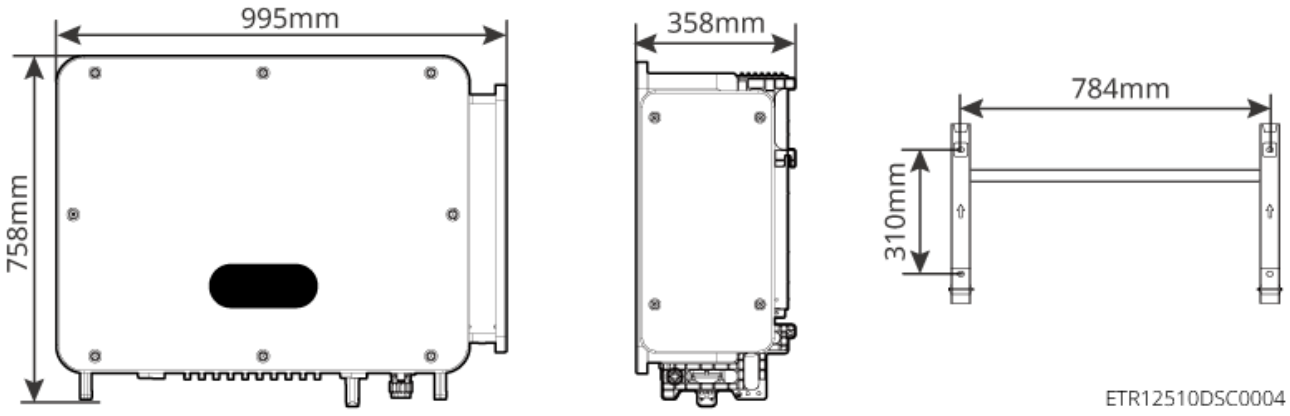
In a rapid shutdown system, the rapid shutdown transmitter and receiver work

together to achieve rapid system shutdown. The receiver maintains module output by receiving signals from the transmitter. The transmitter can be external or built into the inverter. In an emergency, by enabling an external trigger device, the transmitter stops working, thereby shutting down the modules.

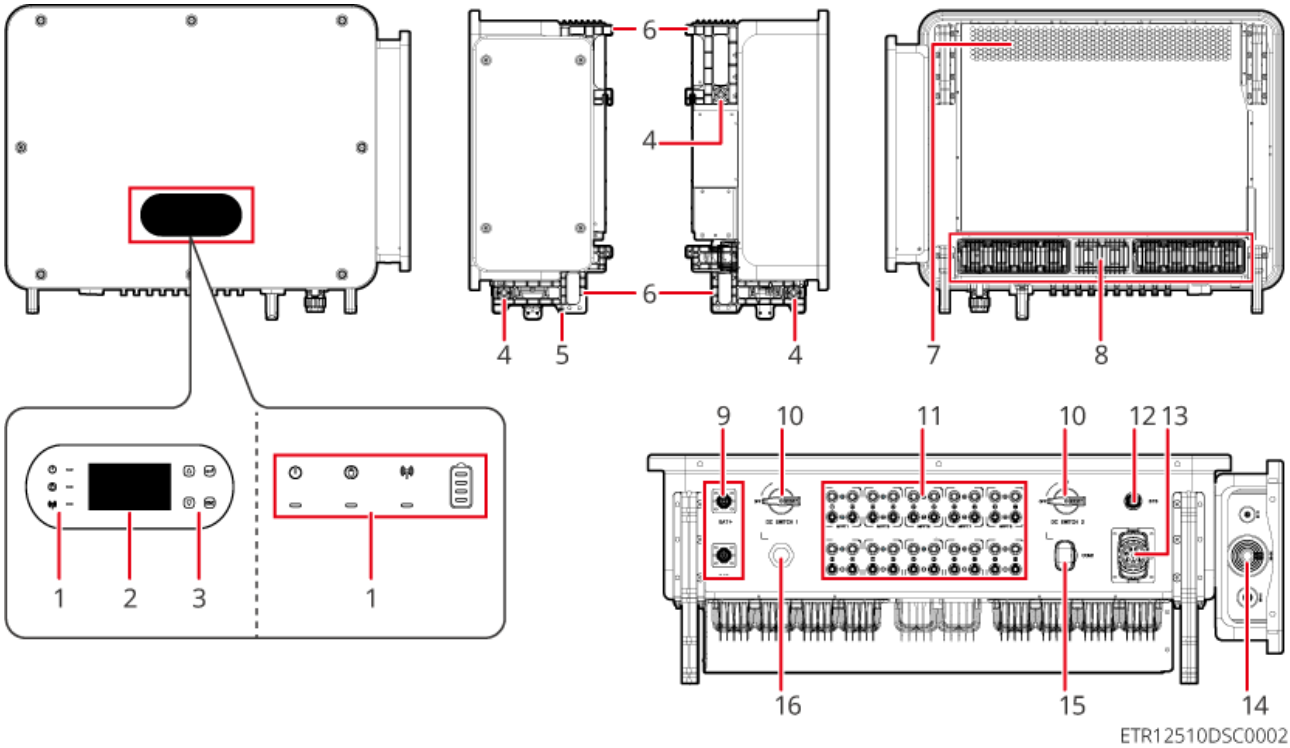
External Transmitter	◦ Transmitter model: GTP-F2L-20, GTP-F2M-20 https://www.goodwe.com/Ftp/Installation-instructions/RSD2.0-transmitter.pdf ◦ Receiver model: GR-B1F-20, GR-B2F-20 https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_RSD-20_Quick-Installation-Guide-POLY.pdf
Built-in Transmitter	◦ External trigger device: External switch ◦ Receiver model: GR-B1F-20, GR-B2F-20 https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_RSD-20_Quick-Installation-Guide-POLY.pdf

3.2 Appearance Description

Dimensions



Parts & Ports Introduction

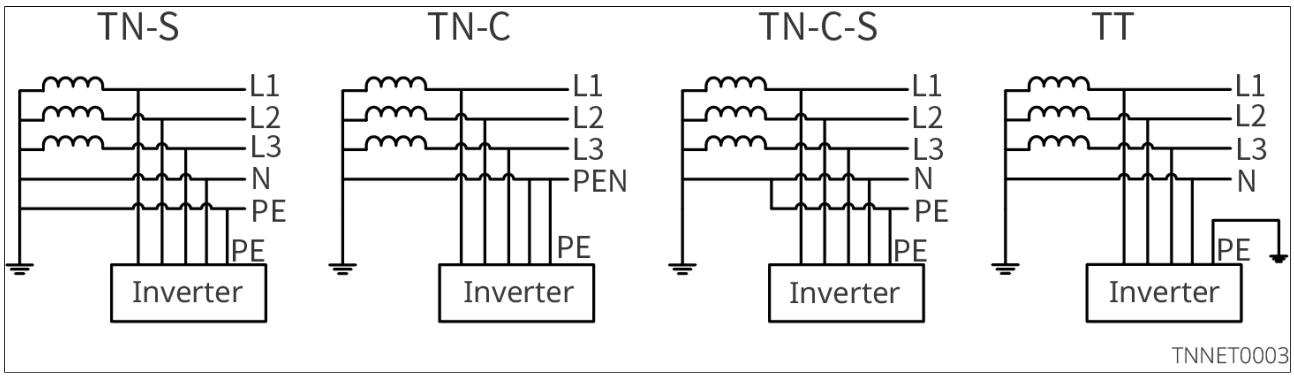


No.	Component	Description
1	LED Indicator	Indicates the operating status of the inverter.
2	LCD Display	Displays the operating data of the inverter.
3	Buttons	Used for setting inverter parameters, etc.
4	Carrying Handle Mounting Hole	Used for installing the carrying handle.
5	Protective Grounding Point	Used for connecting the ground wire.
6	Mounting Bracket	Used for mounting the inverter onto the backplate.
7	Ventilation Holes	Used for heat dissipation.
8	Cooling Fan	Used for heat dissipation.
9	BAT Port	Used for connecting the battery system.

No.	Component	Description
10	DC SWITCH	• DC SWITCH 1: Used to control the on/off of MPPT1~MPPT5. • DC SWITCH 2: Used to control the on/off of MPPT6~MPPT10.
11	MPPT DC Input Port	Used for connecting PV strings.
12	STS Port	Used for connecting STS.
13	COM2 Port	Used for communication connection.
14	AC Port	Used for connecting AC wiring.
15	COM1 Port	Used for connecting the communication module.
16	Ventilation valve	-

3.3 Grid Types

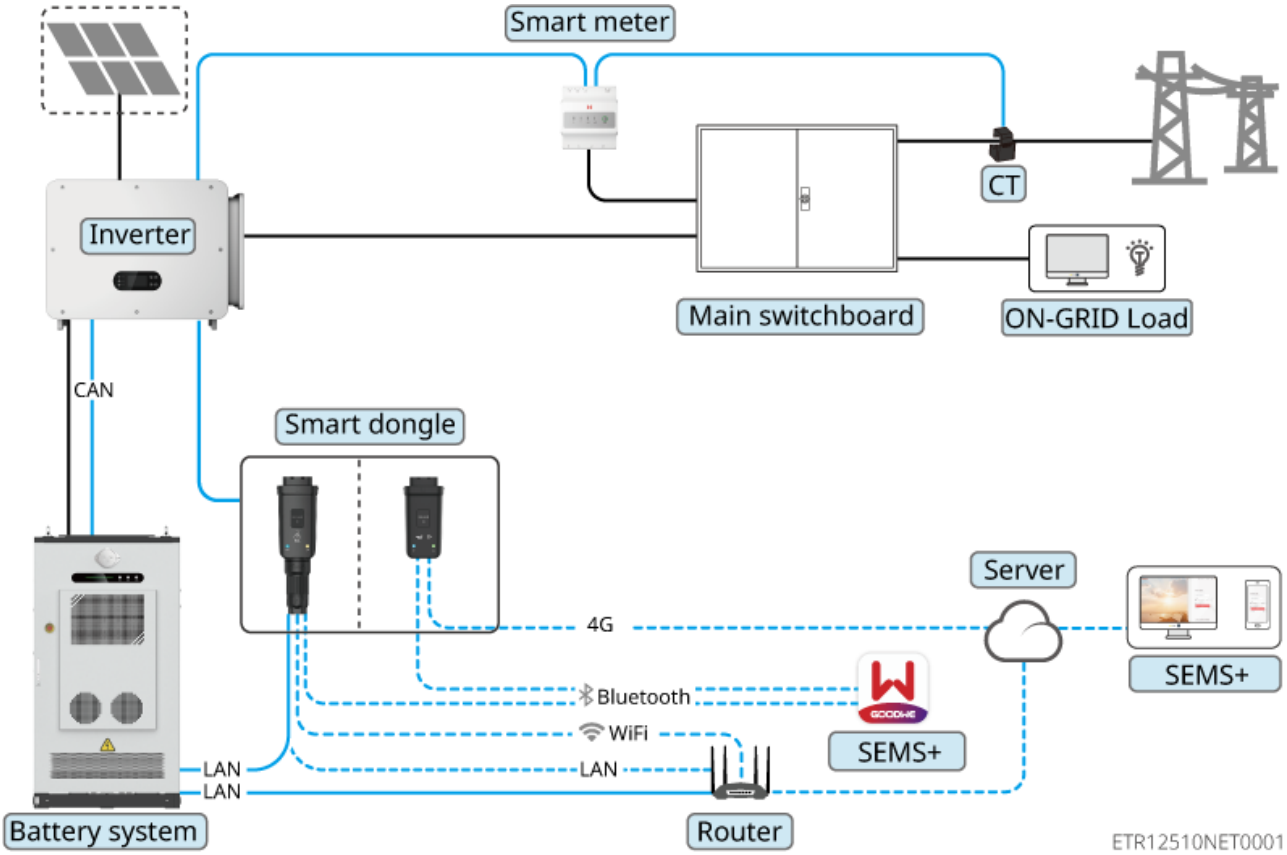
Different grid systems have different wiring methods. Inverters support the following grid types: TN-S, TN-C, TN-C-S, and TT.



3.4 Application Scenarios

3.4.1 Grid-Connected Scenario

- **Grid-Connected Single Unit**



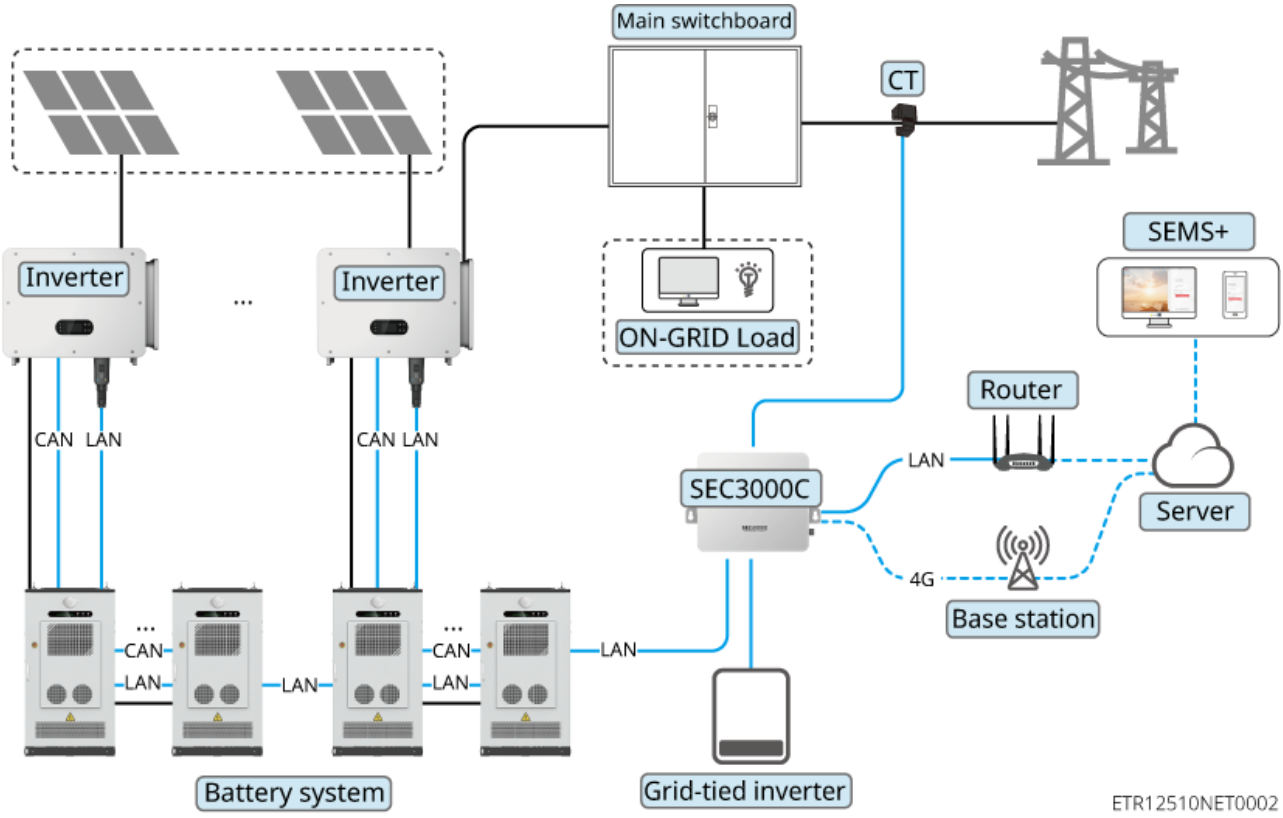
Name	Model/Specifications	Description
Inverter	GW50K-ETR-L-G10	Purchase from GoodWe. Only compatible with BAT-S 64.3-257.2kWh commercial and industrial battery system.
	GW75K-ETR-L-G10	
	GW75K-ETR-G10	Purchase from GoodWe.
	GW80K-ETR-G10	
	GW99.99K-ETR-G10	
	GW100K-ETR-G10	
	GW110K-ETR-G10	
	GW124.99K-ETR-G10	

Name	Model/Specifications	Description
	GW125K-ETR-G10	
Battery system	GW208.9-BAT-LCD-G10	Purchase from GoodWe. The battery system supports up to 4 units in parallel cluster.
	GW261.2-BAT-LCD-G10	
Smart Meter	GM330	Provided with the package.
CT	CT ratio is: nA/5A. • nA: CT primary input current, where n depends on the actual copper busbar or cable specifications at the PCC point. • 5A: CT secondary output current.	Customers can purchase on their own or from GoodWe. To be used with the GM330 Smart Meter.
Smart Dongle	WiFi/LAN Kit-20	Uploads system operation information to the monitoring platform via WiFi or LAN signals. Supports use in parallel machine scenarios and single machine scenarios.
	4G Kit-G20	Uploads system operation information to the monitoring platform via 4G signals. Only supports use in single machine scenarios.
	4G Kit-CN-G21	

- **Grid-Connected Parallel Units**

NOTICE

In grid-connected and parallel operation scenarios, it is not recommended to set parameters via the LCD screen. It is recommended to use the WEB interface of the SEC3000C for operation.



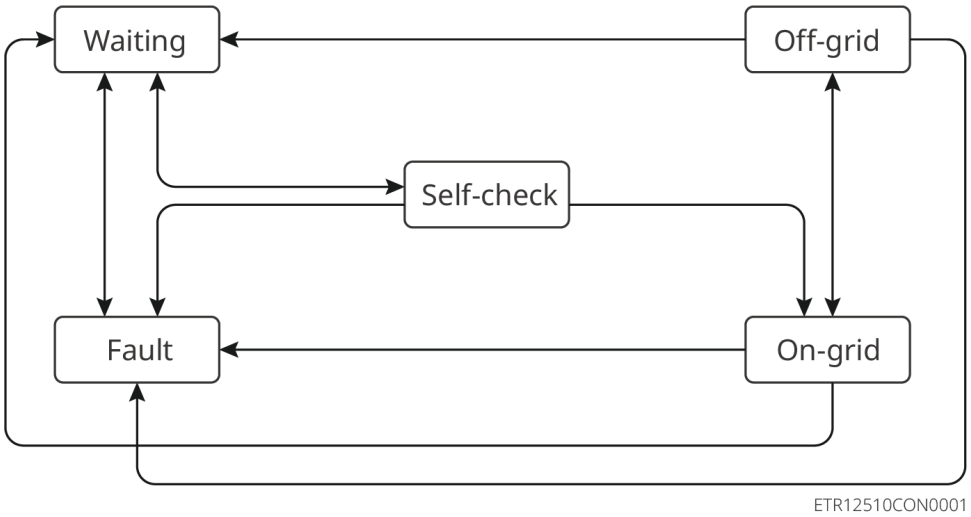
Name	Model/Specification	Description
Inverter	GW50K-ETR-L-G10	Purchase from GoodWe. Only compatible with the BAT-S 64.3-257.2kWh commercial & industrial battery system.
	GW75K-ETR-L-G10	
	GW75K-ETR-G10	Purchase from GoodWe.
	GW80K-ETR-G10	
	GW99.99K-ETR-G10	
	GW100K-ETR-G10	

Name	Model/Specification	Description
	GW110K-ETR-G10	
	GW124.99K-ETR-G10	
	GW125K-ETR-G10	
Battery system	GW208.9-BAT-LCD-G10	Purchase from GoodWe. The battery system supports a maximum of 4 clusters in parallel.
	GW261.2-BAT-LCD-G10	
Smart Meter	GM330	Included in the package.
CT	CT ratio is: nA/5A . • nA: CT primary side input current. The value of n depends on the actual specifications of the PCC point busbar or cable on site. • 5A: CT secondary side output current.	Purchased separately by the customer or from GoodWe. Used with the GM330 Smart Meter.
Smart Energy Controller Box	SEC3000C	Purchase from GoodWe. The main program version of SEC3000C must be V7.8.19 or above.
Smart Dongle	WiFi/LAN Kit-20	Purchase from GoodWe. Uploads system operation information to the monitoring platform via WiFi or LAN signals. Supports use in both parallel and single-unit scenarios.
	4G Kit-G20	

Name	Model/Specification	Description
	4G Kit-CN-G21	Purchase from GoodWe. Uploads system operation information to the monitoring platform via 4G signals. Supports use in single-unit scenarios only.

3.5 Work Mode

3.5.1 Inverter Operating Mode



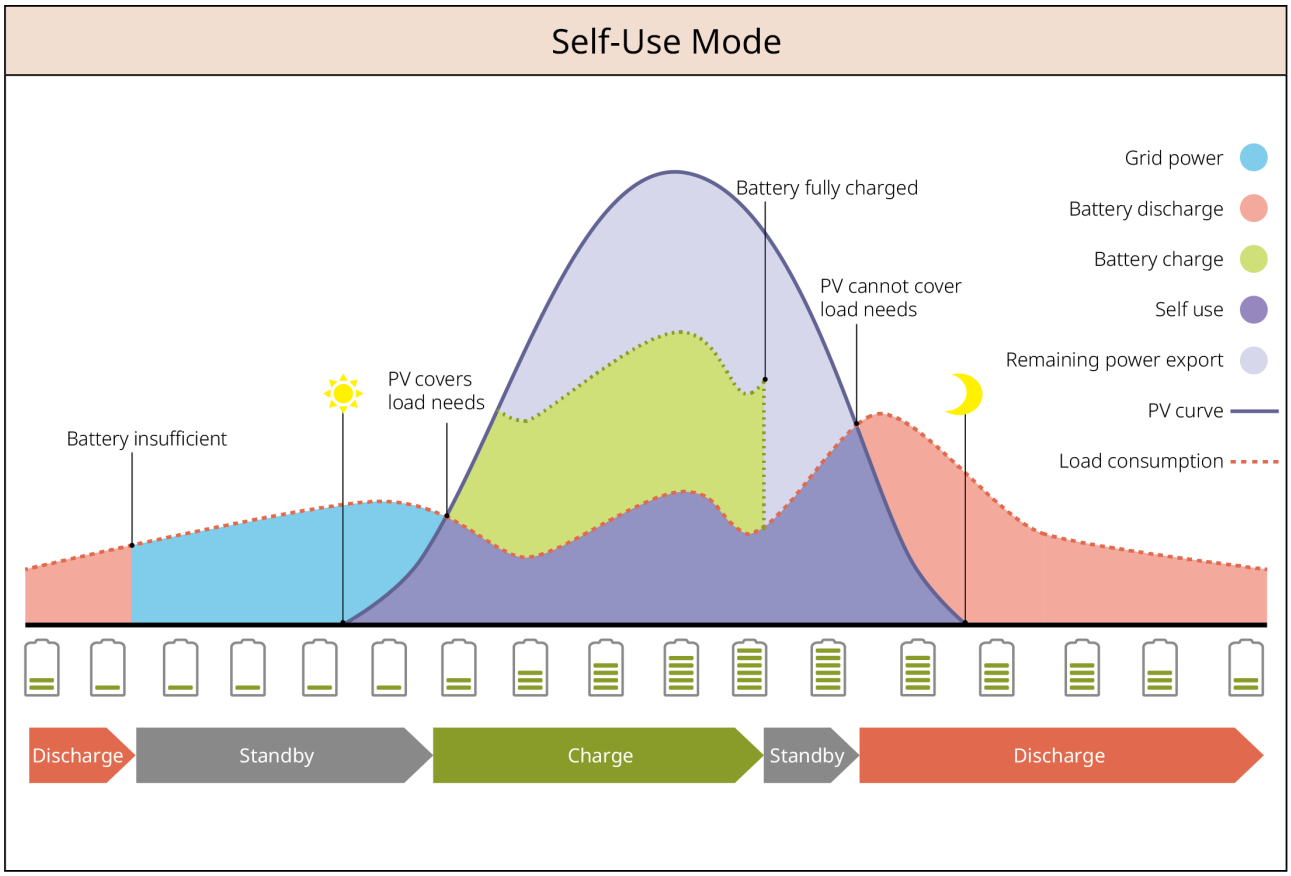
No.	Mode	Description
1	Standby Mode	Waiting phase after the machine is powered on. • When conditions are met, it enters Self-check Mode. • If a fault is detected, the inverter enters Fault Mode.

No.	Mode	Description
2	Self-check Mode	Before the inverter starts, it continuously performs self-check and initialization. • If conditions are satisfied, it enters On-grid mode, and the inverter starts and operates connected to the grid. • If no grid is detected, it enters Off-grid mode, and the inverter operates off-grid; if the inverter does not have off-grid functionality, it enters Standby Mode. • If the self-check fails, it enters Fault Mode.
3	On-grid mode	The inverter operates normally connected to the grid. • If the grid is detected to be absent, it enters Off-grid Operation Mode. • If a fault is detected, it enters Fault Mode. • If grid conditions are detected to not meet the grid-connection requirements, and the off-grid output function is not enabled, it enters Standby Mode.
4	Off-grid Mode	When the grid power fails, the inverter switches to Off-grid Mode to continue supplying power to the load. • If a fault is detected, it enters Fault Mode. • If grid conditions are detected to not meet the grid-connection requirements and the off-grid output function is not enabled, it enters Standby Mode. • If grid conditions are detected to meet the grid-connection requirements and the off-grid output function is enabled, it enters On-grid mode.
5	Fault Mode	If a fault is detected, the inverter enters Fault Mode. After the fault is cleared, it enters Standby Mode.

3.5.2 System Working Mode

Self-Use Mode

- The basic mode of system operation.
- PV generation first powers the loads, excess electricity charges the battery, and any remaining electricity is sold to the grid. When PV generation does not meet the load demand, the battery powers the loads; when the battery power is also insufficient, the grid powers the loads.



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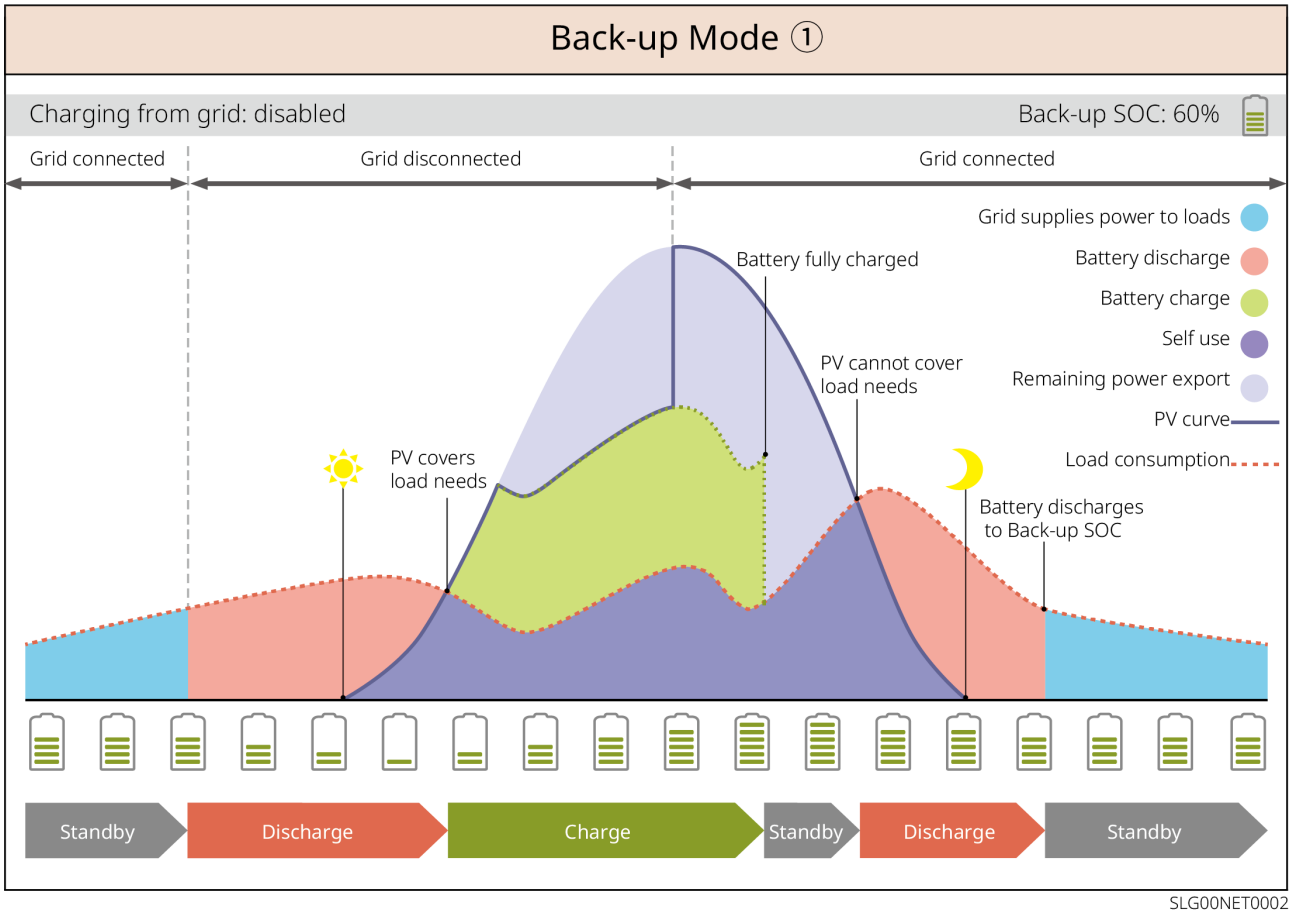
Backup Mode

- Recommended for areas with unstable grid.
- When the grid is out, the inverter switches to off-grid working mode, and the battery discharges to power the loads ensuring that BACK-UP Loads do not lose power; when the grid is restored, the inverter switches back to grid-connected working mode.
- To ensure that the battery SOC is sufficient to maintain normal operation when the system is off-grid, during grid-connected operation, the battery will use PV or buy electricity from the grid to charge to the backup power SOC. If it is necessary to buy electricity from the grid to charge the battery, please confirm that it meets local grid laws and regulations.



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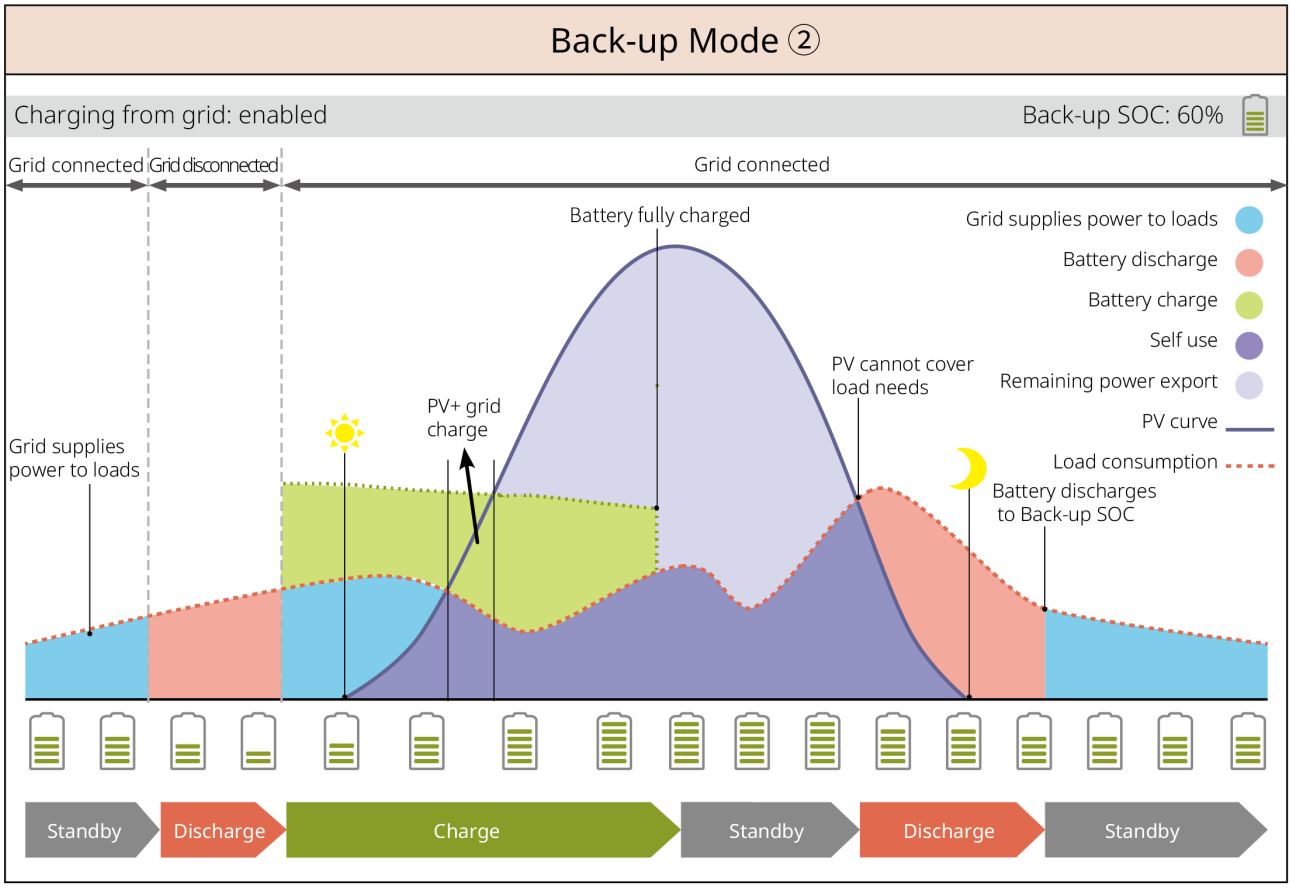

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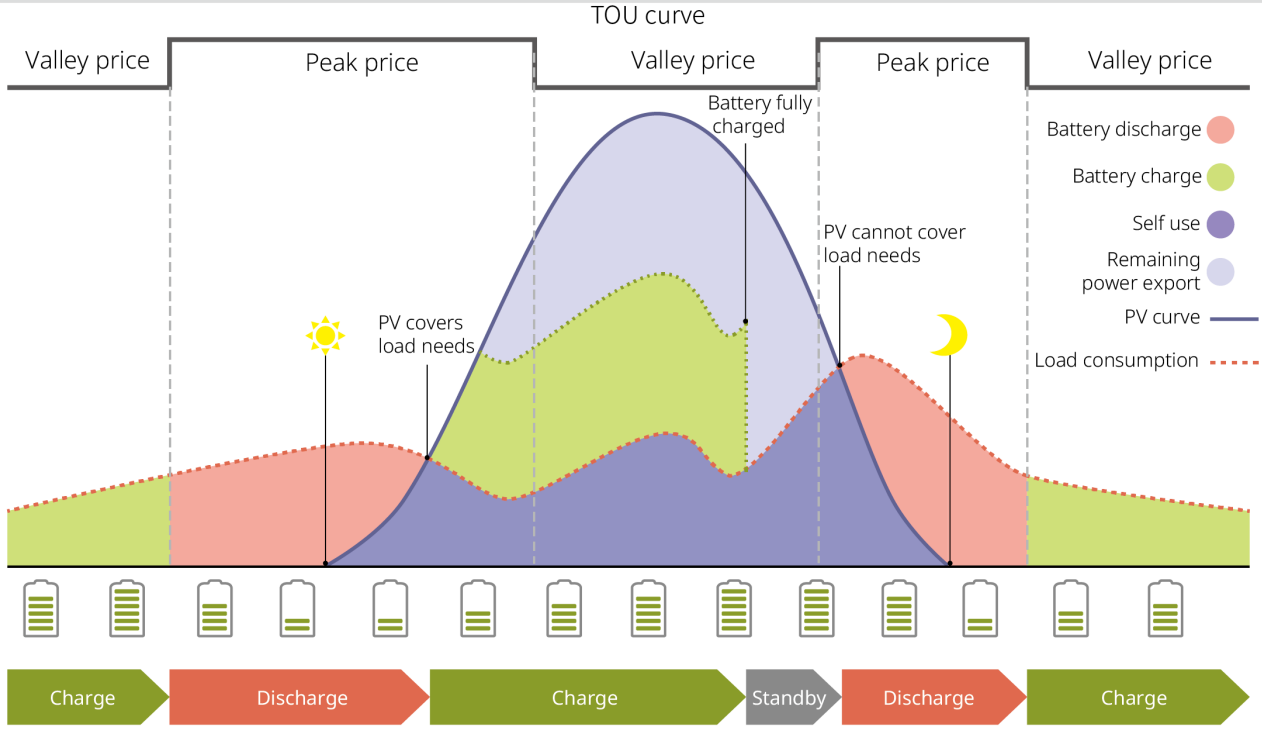
TOU Mode

Under the premise of complying with local laws and regulations, set different time periods for buying and selling electricity based on the peak and valley electricity price differences of the grid.

For example: during valley electricity price periods, set the battery to charging mode to buy electricity from the grid for charging; during peak electricity price periods, set the battery to discharging mode to power the loads through the battery.

TOU Mode ①

PV: Charge battery in priority



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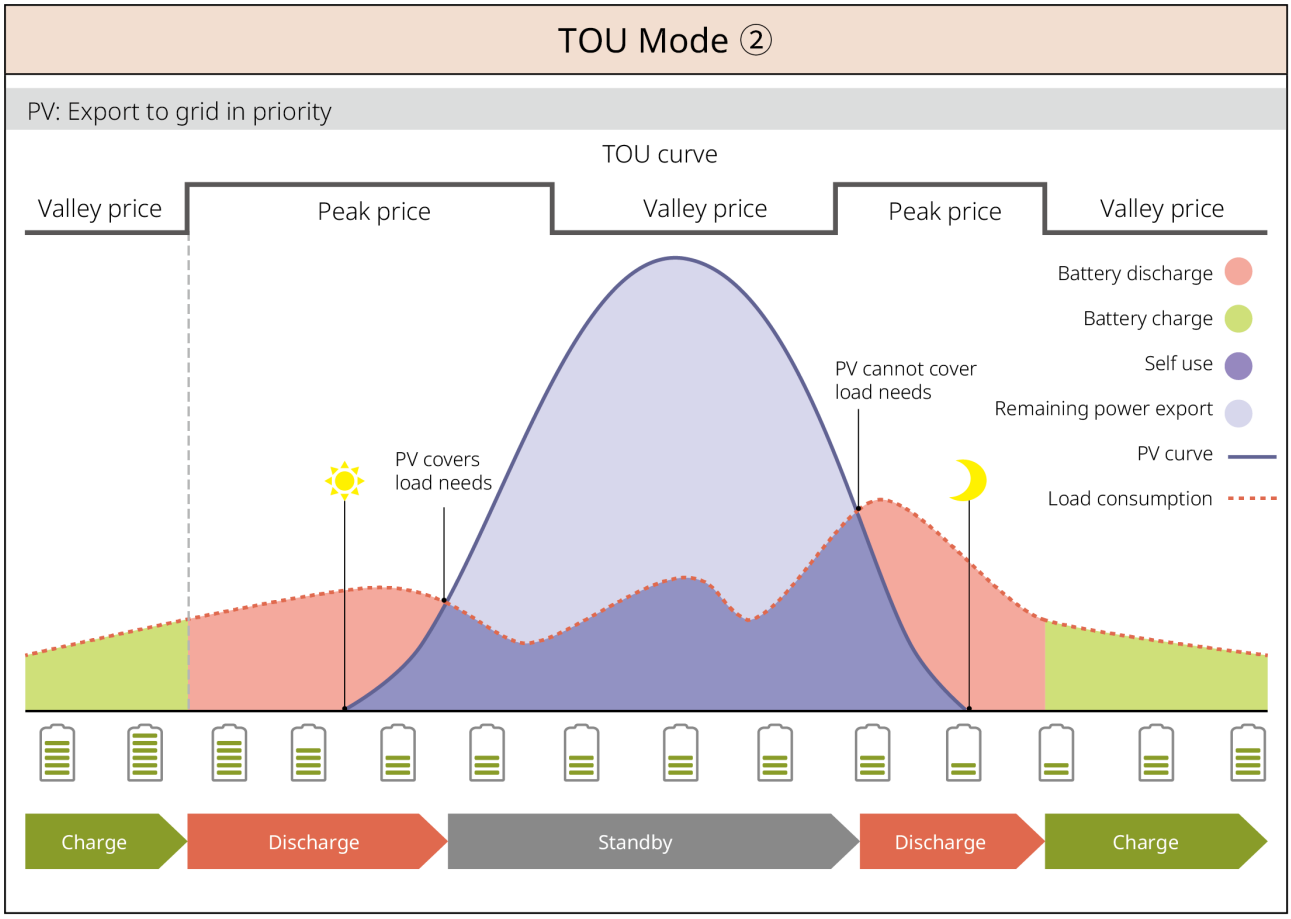


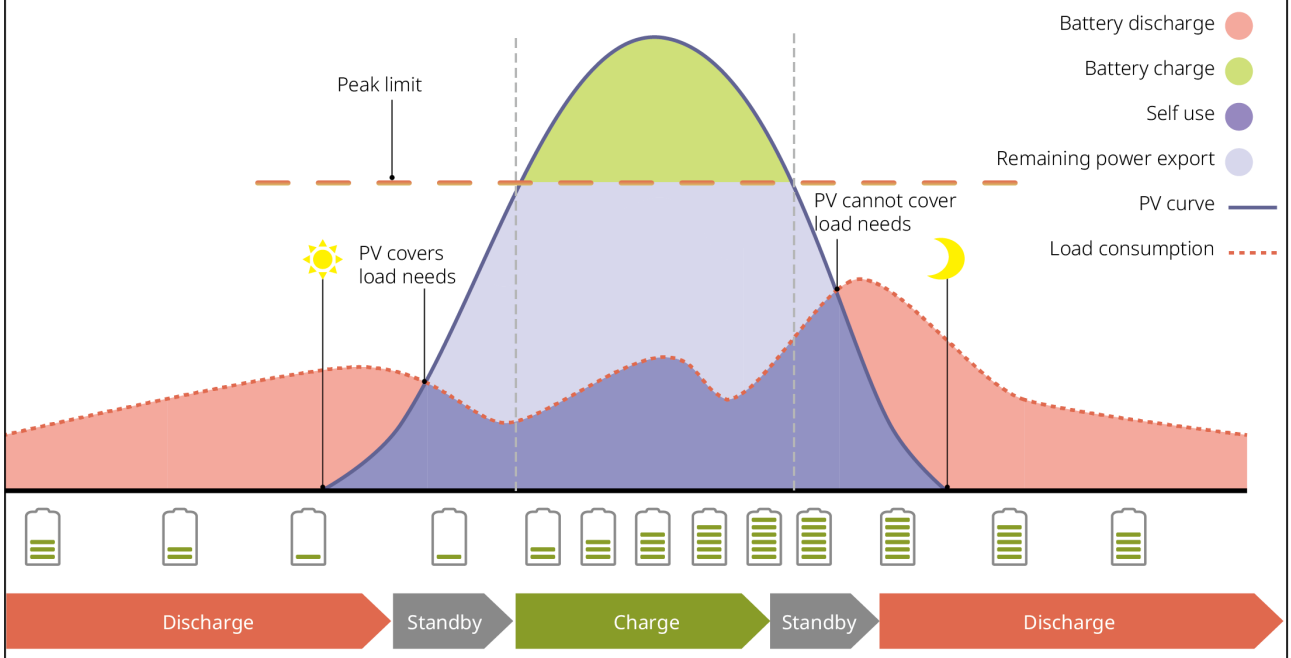
SLG00NET0005

Delayed Charging Mode

- Suitable for areas with grid-connected power output limitations.
- Setting a peak power limit can use the PV generation that exceeds the grid-connected limit to charge the battery; or set PV charging periods to use PV generation to charge the battery during those periods.

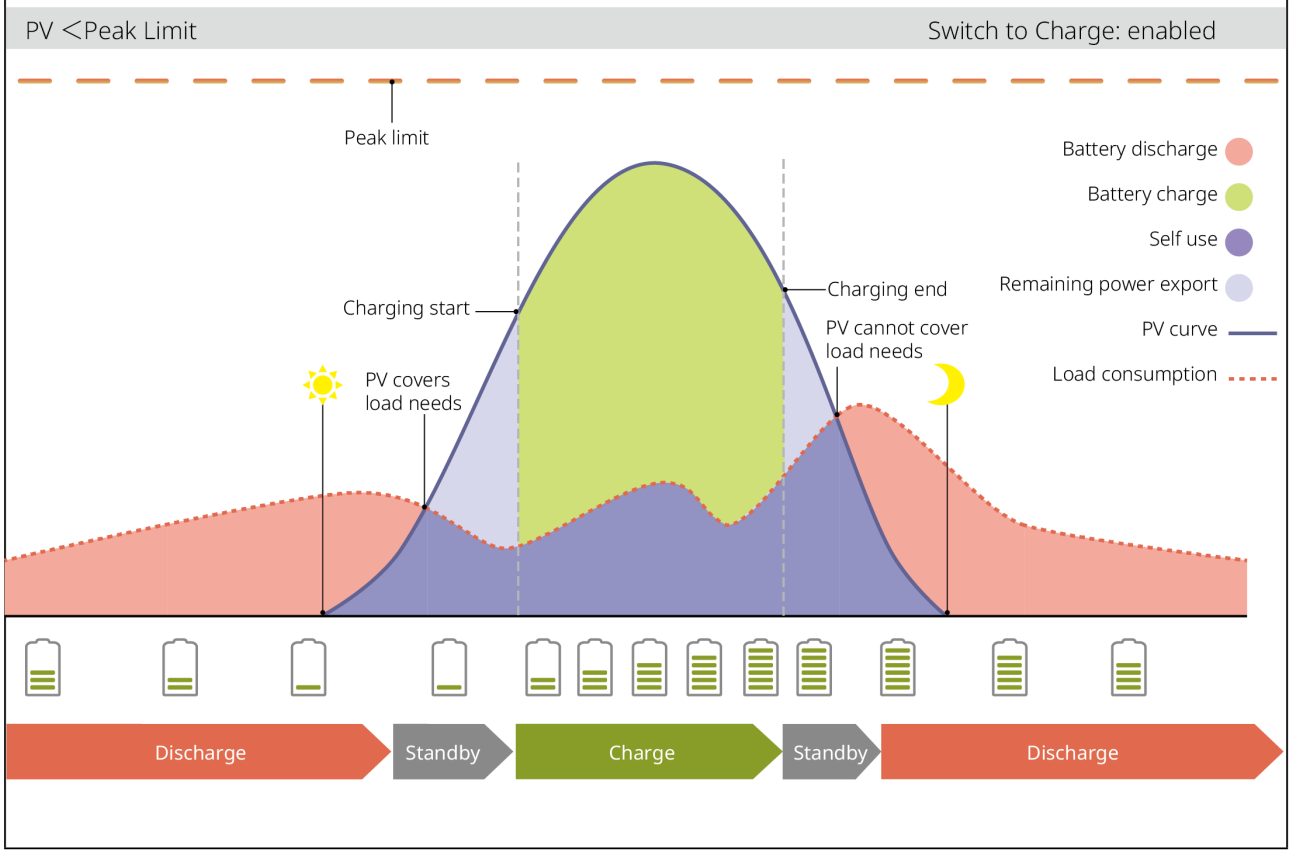
Delayed Charging ①

PV > Peak Limit | Switch to Charge: enabled/disabled

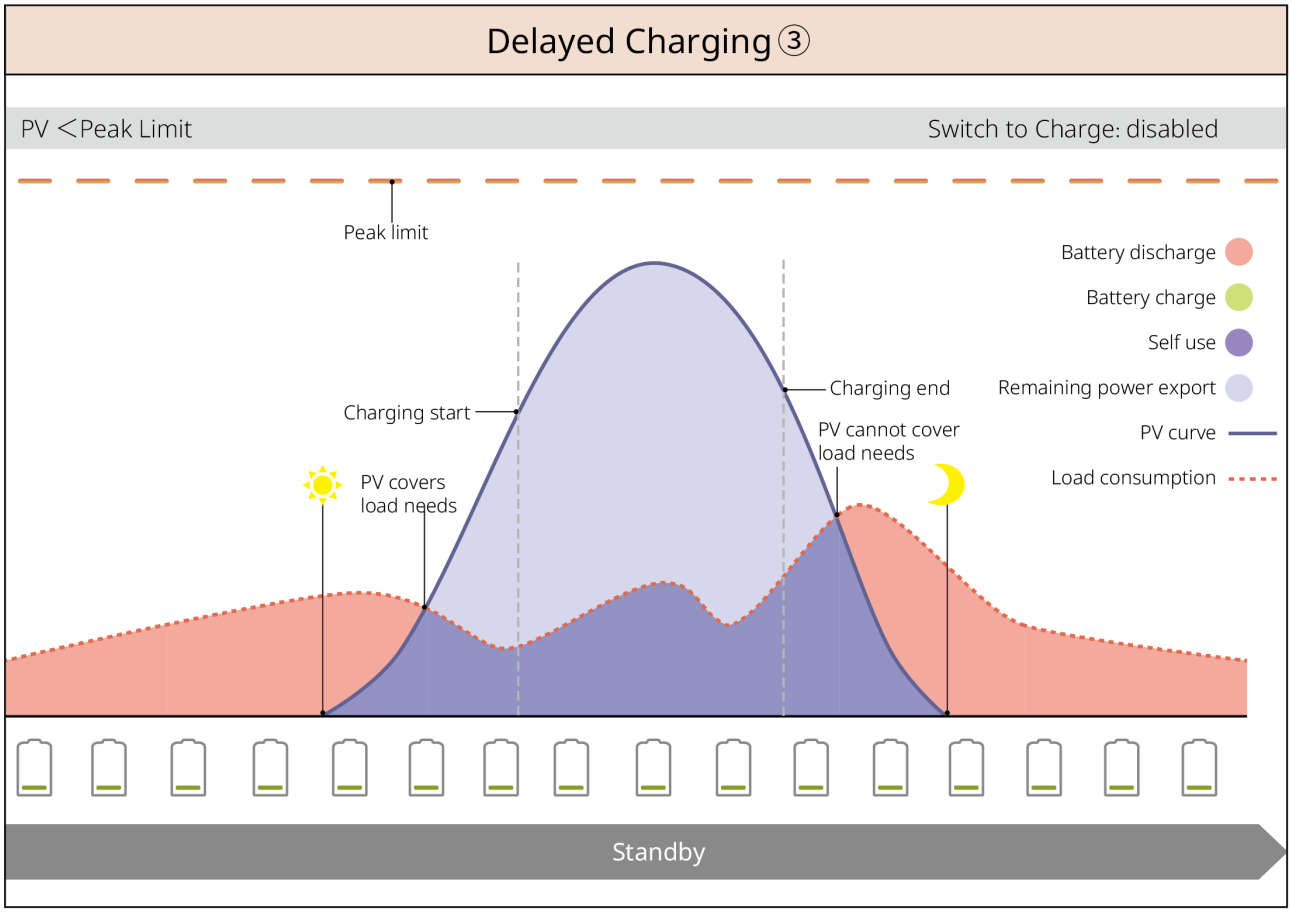


SLG00NET0006

Delayed Charging ②



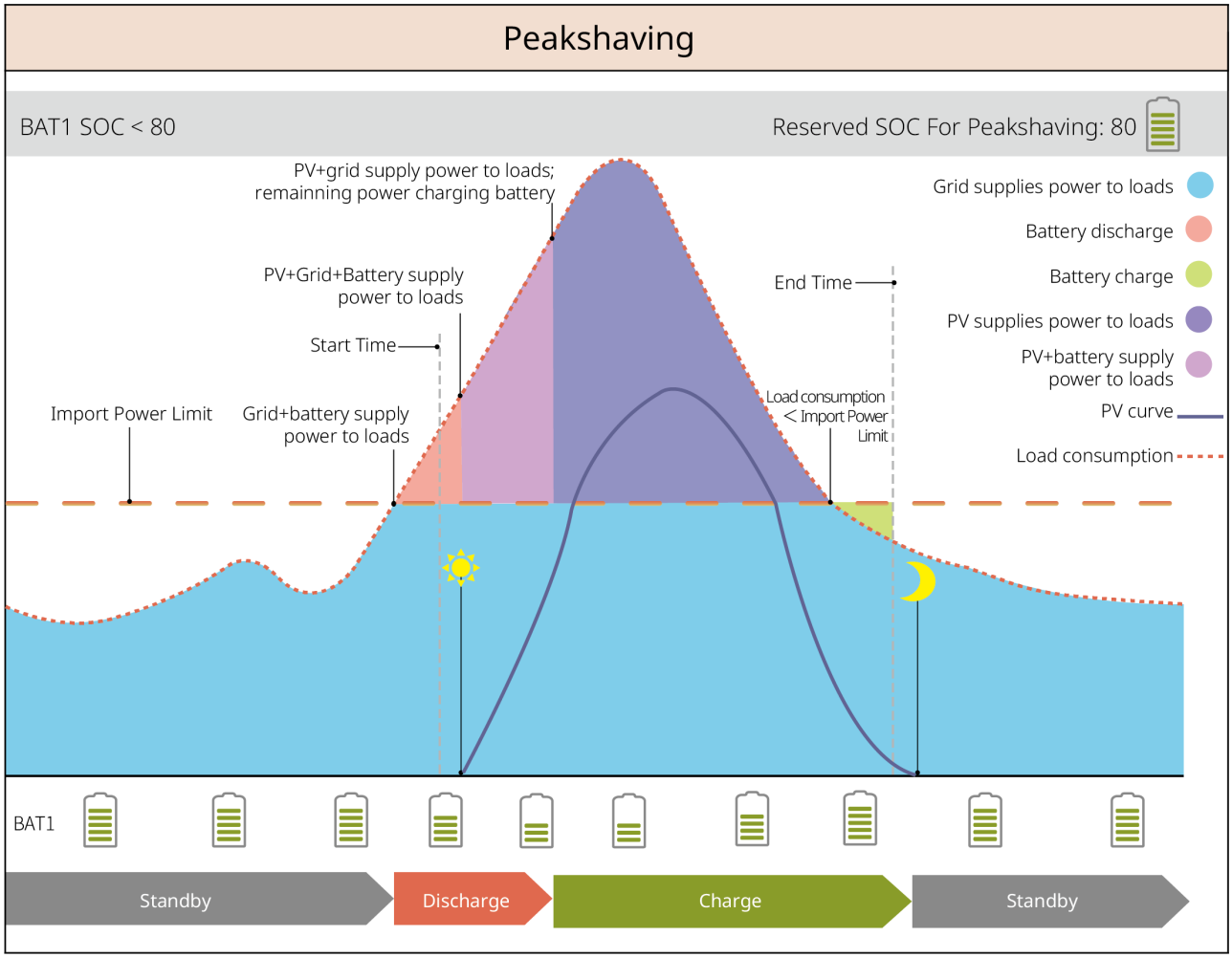
SLG00NET0007



SLG00NET0008

Peakshaving Mode

- Mainly applicable to industrial and commercial scenarios.
- When the total load power consumption exceeds the electricity quota in a short time, battery discharge can be used to reduce the electricity consumption beyond the quota.
- When the battery SOC is below the reserved SOC for peakshaving management, the system buys electricity from the grid based on time periods, load consumption, and peak buying limits.



SLG00NET0001

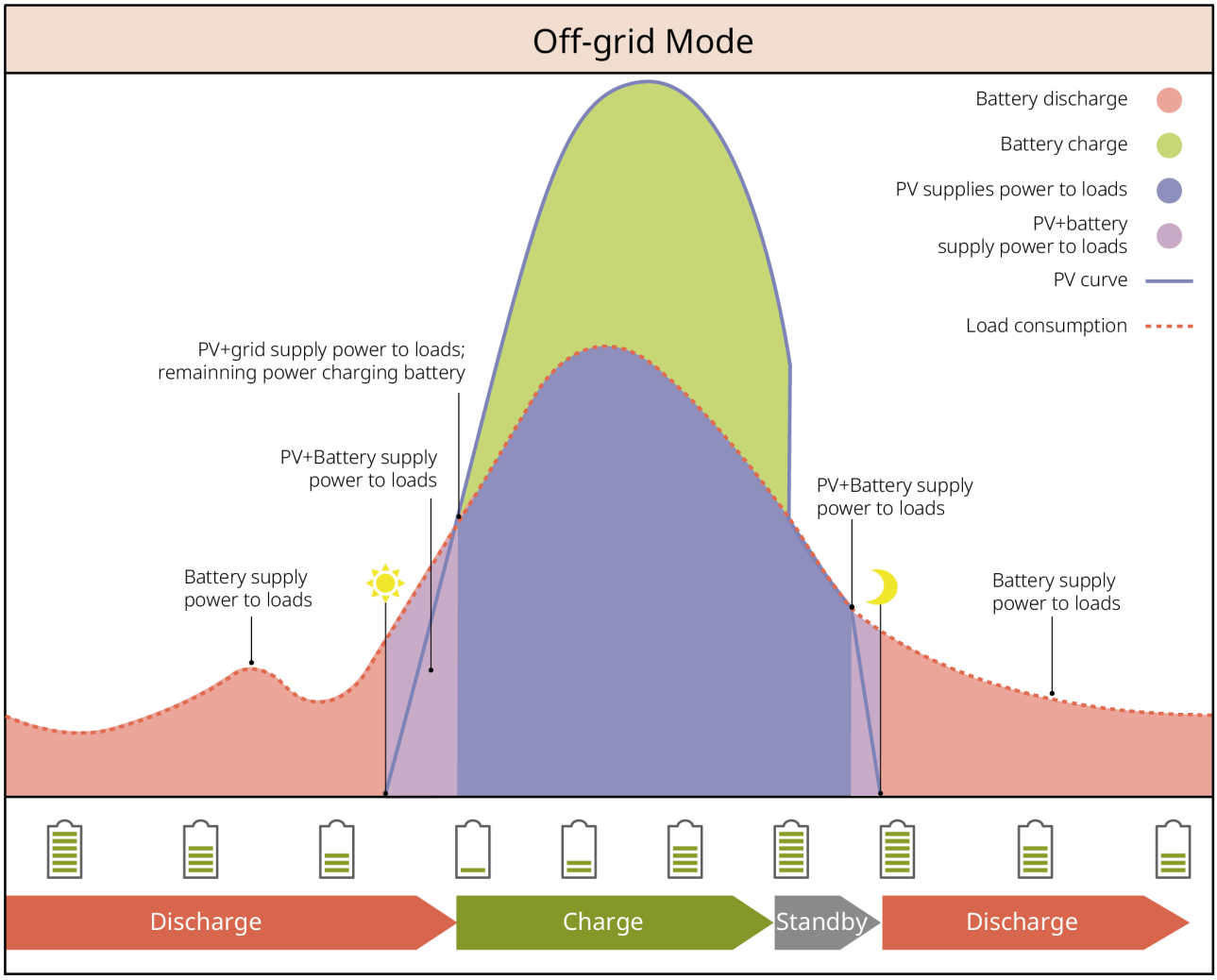
Off-Grid Mode

NOTICE

Do not operate in pure off-grid mode when the inverter is not connected to the battery system.

When the grid is out, the inverter switches to off-grid working mode.

- During the day, PV generation first powers the loads, and excess electricity charges the battery.
- At night, the battery discharges to power the loads ensuring that BACK-UP Loads do not lose power.



SLG00NET0012

3.6 Inverter Indicators

Indicator	Status	Description
		Inverter powered on, in standby mode
		Inverter starting up, in self-check mode
		Inverter operating normally in grid-tied generation or off-grid mode
		BACK-UP output overload
		System fault

Indicator	Status	Description
		Inverter powered off
		Grid abnormal, inverter BACK-UP port supplying power normally
		Grid normal, inverter BACK-UP port supplying power normally
		BACK-UP port has no power supply
		Inverter monitoring module resetting
		No connection established between inverter and communication terminal
		Communication failure between communication terminal and cloud server
		Inverter monitoring normal
		Inverter monitoring module not started

4 Check and Storage

4.1 Pre-delivery Inspection

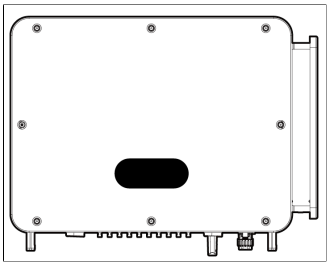
Before signing for the product, please carefully inspect the following:

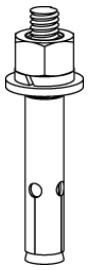
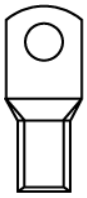
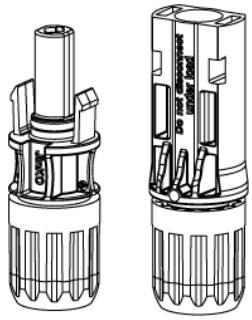
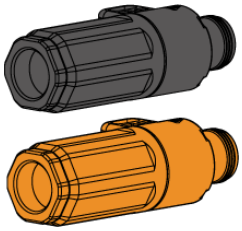
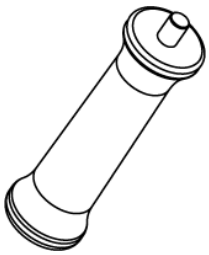
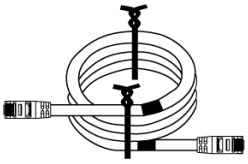
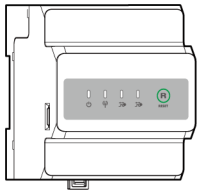
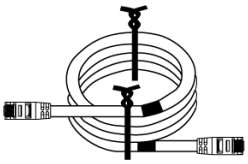
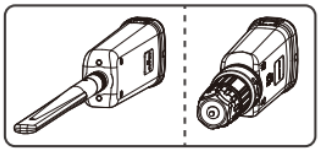
- Check the outer packaging for any damage, such as deformation, holes, cracks, or other signs that could indicate damage to the equipment inside the box. If damaged, do not open the packaging and contact your dealer.
- Check if the inverter model is correct. If it does not match, do not open the packaging and contact your dealer.
- Check if the type and quantity of delivered items are correct. If they do not match, please contact your dealer.
- Check the inverter for any damage. If damaged, please contact your dealer.

4.2 deliverables

⚠WARNING

When making electrical connections, please use the terminal blocks shipped with the unit. Damage to the equipment caused by using incompatible connectors is not covered under warranty.

Part	Description	Part	Description
	Inverter ×1		Back mounting bracket ×1

Part	Description	Part	Description
	Expansion bolt ×4		Grounding terminal ×2
	PV connector ×N		Battery connector ×1
	PIN terminal ×30		Lifting rod ×3
	Communication cable (10m) ×1 For connecting to the meter		GM330 Meter ×1
	Communication cable (5m) ×1 For inverter off-grid parallel connection		PV unlocking tool ×1
	Smart Dongle ×1		Product manual ×1

4.3 Storage

NOTICE
The storage time for the inverter should not exceed two years. If the storage time exceeds two years, it must be inspected and tested by qualified personnel before being put into use.

If the inverter is not put into use immediately, please store it according to the following requirements:

- Ensure that the outer packaging box is not removed, and the desiccant inside the box is not lost.
- Ensure that the storage environment is clean, with appropriate temperature and humidity ranges, and no condensation.
- Ensure that the stacking height and direction of the inverters are arranged according to the instructions on the packaging box label.
- Ensure that there is no risk of tipping over after stacking the inverters.
- After long-term storage, the inverter must be inspected and confirmed by professionals before it can continue to be used.

5 Installation

5.1 Installation Requirements

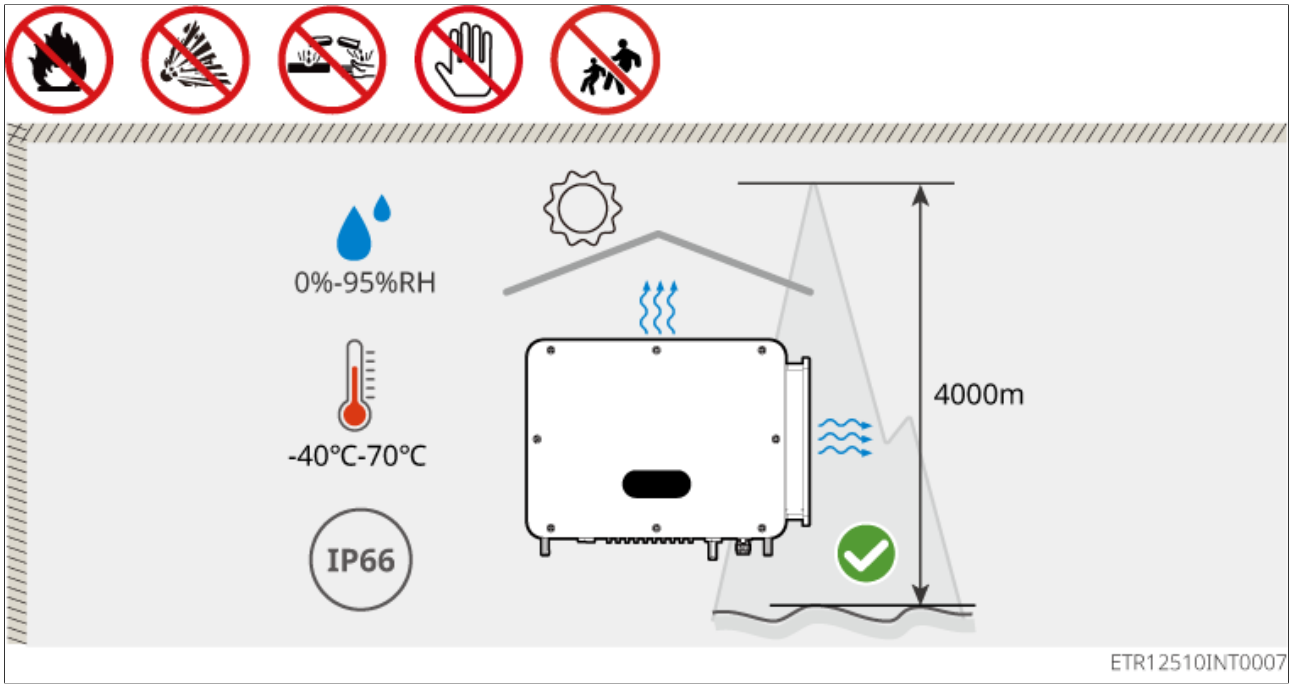
Installation Environment

1. The device must not be installed in flammable, explosive, corrosive, or similar environments.
2. The temperature and humidity of the installation environment must be within a suitable range.
3. The installation location must be out of reach of children and should avoid easily accessible positions.
4. The enclosure temperature may exceed 60°C during inverter operation. Do not touch the enclosure before it cools down to prevent burns.
5. The device should be installed away from direct sunlight, rain, snow accumulation, and similar conditions. It is recommended to install it in a sheltered location; a sunshade can be constructed if necessary.
6. Adverse environmental conditions such as direct sunlight and high temperatures may cause derating of the inverter output power.
7. The installation space must meet the ventilation, heat dissipation, and operational space requirements of the device.
8. The installation environment must satisfy the device's ingress protection rating. The inverter is suitable for both indoor and outdoor installation.
9. The device installation height should facilitate operation and maintenance, ensuring the indicator lights, all labels are easily visible, and the wiring terminals are easily accessible.
10. The device installation altitude must be lower than the maximum operating altitude.
11. Before installing the device outdoors in a salt damage area, consult the equipment manufacturer. Salt damage areas mainly refer to regions within 500m of the coast. The affected area is related to sea winds, precipitation, terrain, and other conditions.
12. Keep away from strong magnetic field environments to avoid electromagnetic interference. If there are radio stations or wireless communication devices below 30MHz near the installation location, install the device according to the following requirements:
    - Inverter: Add a ferrite core with multiple windings at the inverter's DC input or

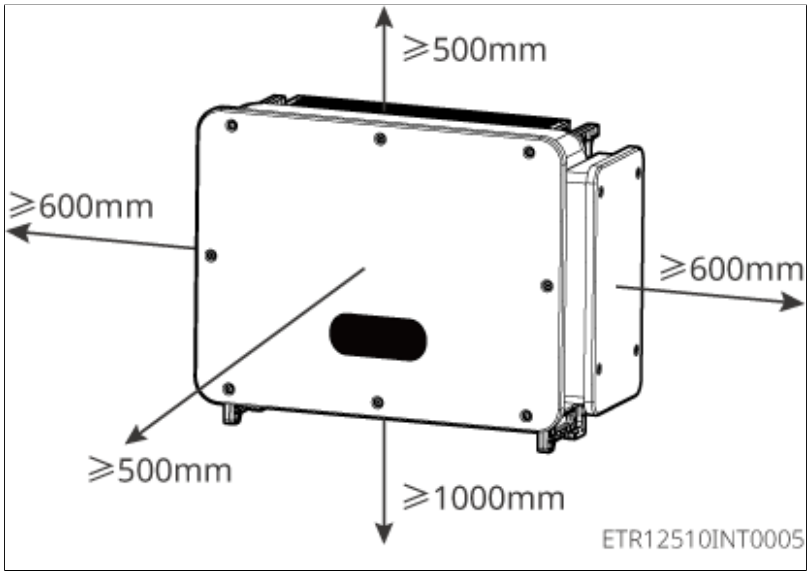
AC output lines, or add a low-pass EMI filter; or maintain a distance of over 30m between the inverter and the wireless electromagnetic interference device.

- Other devices: Maintain a distance of over 30m between the device and the wireless electromagnetic interference device.

13. The device generates noise during operation. The installation location should be away from noise-sensitive areas, such as residential living areas, schools, and hospitals, to prevent disturbance to people living in the nearby environment from the noise generated during device operation.

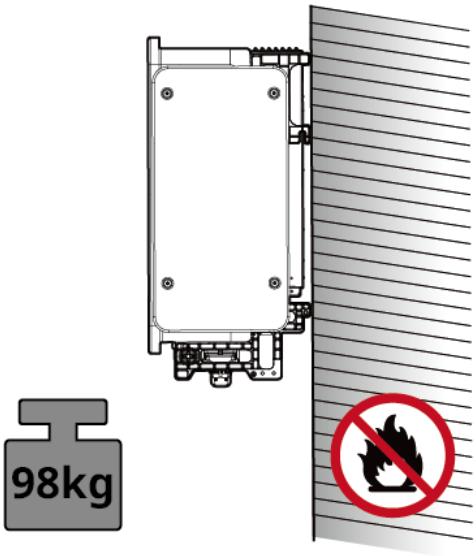


Installation Space



Installation Carrier

- The installation carrier must not be made of flammable materials and must possess fire-resistant properties.
- Ensure the installation carrier is sturdy and reliable, capable of bearing the weight of the inverter.
- The device generates noise during operation. Do not install it on a carrier with poor sound insulation to prevent disturbance to residents in the living area from the noise generated during device operation.



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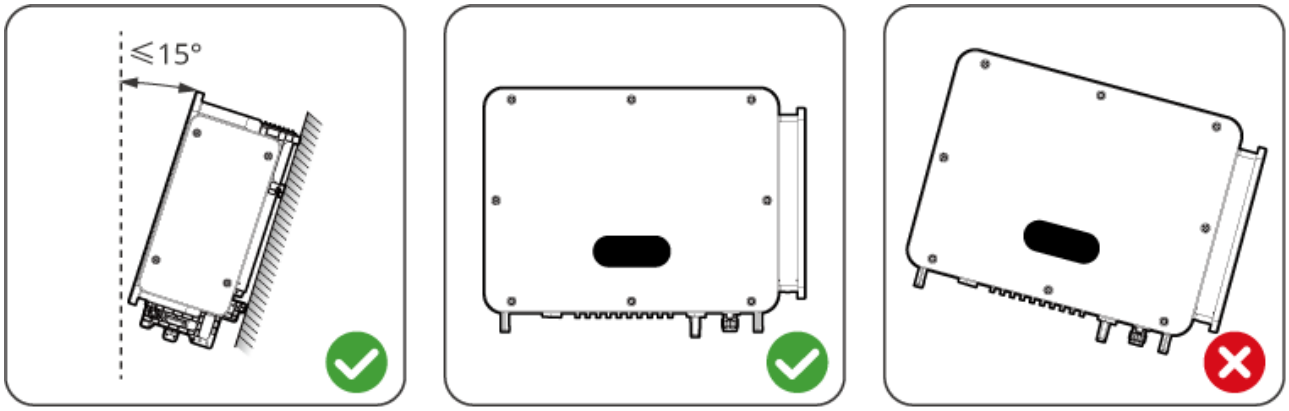
Installation Angle

- Recommended inverter installation angle: Vertical installation.
- The maximum backward tilt angle is 15 degrees. Avoid forward tilt, side tilt, or inversion.



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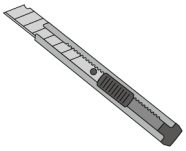
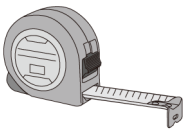
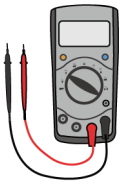
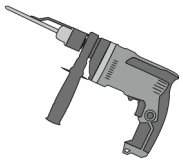
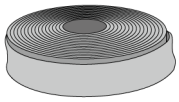
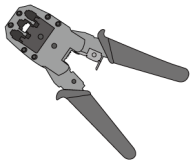
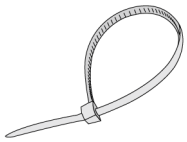
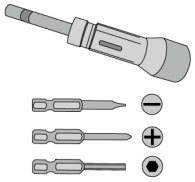
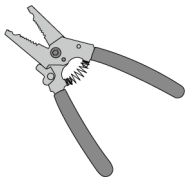
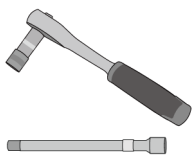
5.2 Tool Requirements

NOTICE

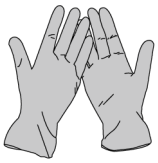
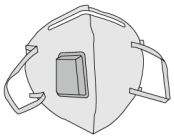
During installation, it is recommended to use the following installation tools. If necessary, other auxiliary tools may be used on-site.

Installation Tools

Tool Type	Description	Tool Type	Description
	Marker Pen		Spirit Level
	Utility Knife		Tape Measure

Tool Type	Description	Tool Type	Description
	Multimeter (Range ≥1100V)		Hammer Drill
	Heat Shrink Tubing		Heat Gun
	Diagonal Plier		RJ45 Crimping Tool
	PV Terminal Crimping Tool		Cable Tie
	Tubular Terminal Crimping Tool		Rubber Hammer
	Torque Screwdriver		Wire Stripper
	Socket Wrench		Vacuum Cleaner

personal protective equipment

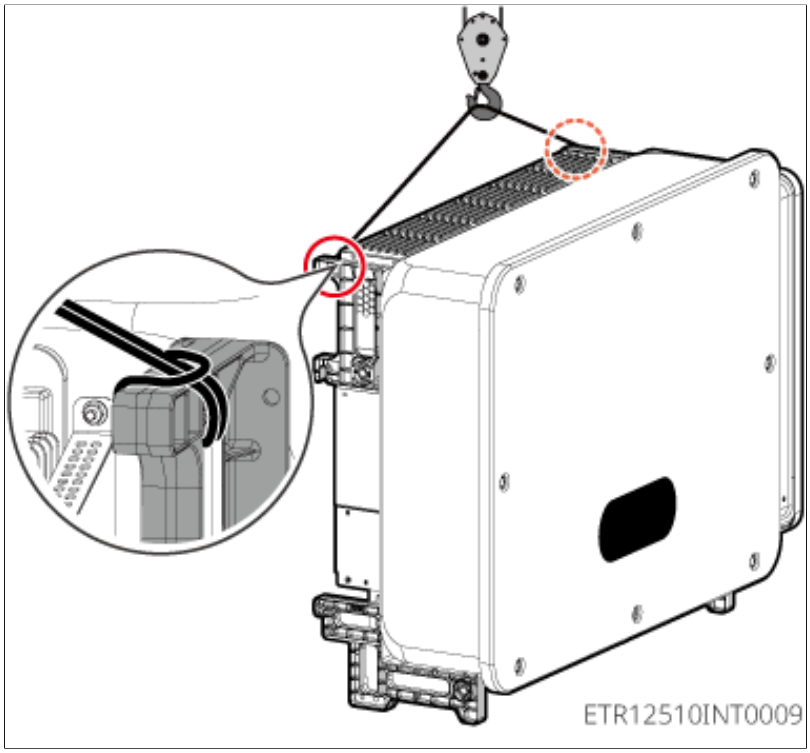
Tool Type	Description	Tool Type	Description
	Safety Shoes		goggle
	Insulating Gloves		Protective Clothing
	Dust Mask		Safety Helmet

5.3 Inverter Handling

⚠WARNING

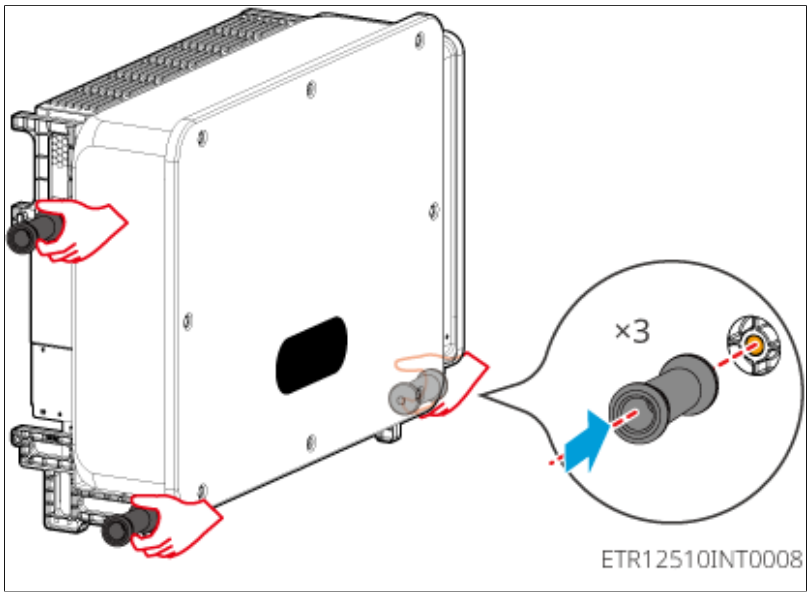
1. During operations such as transportation, handling, and installation, it is necessary to comply with the laws, regulations, and relevant standards of the country or region where the operation takes place.
2. Before installation, the equipment needs to be moved to the installation site. To avoid personal injury or equipment damage during the moving process, please note the following:
   - Please allocate personnel according to the weight of the equipment to prevent the equipment from exceeding the weight range that can be manually carried, causing injury to personnel.
   - Please wear safety gloves to avoid injury.
   - Please ensure that the equipment remains balanced during the moving process to avoid falling.
   - During equipment moving, please ensure that the cabinet doors are locked.
3. When using hoisting methods to move the equipment, please use flexible slings or straps, and the load-bearing capacity of a single strap must be ≥2t.
4. When using a forklift to move the equipment, the load-bearing capacity of the forklift must be ≥2t.

- **Lifting and Handling**



Step 1: Secure the sling to the inverter.
Step 2: Use a lifting device to hoist and move the inverter.

- **Manual Handling**



Step 1:Install the carrying rod.
Step 2: Hold the carrying rod to lift and carry the inverter.

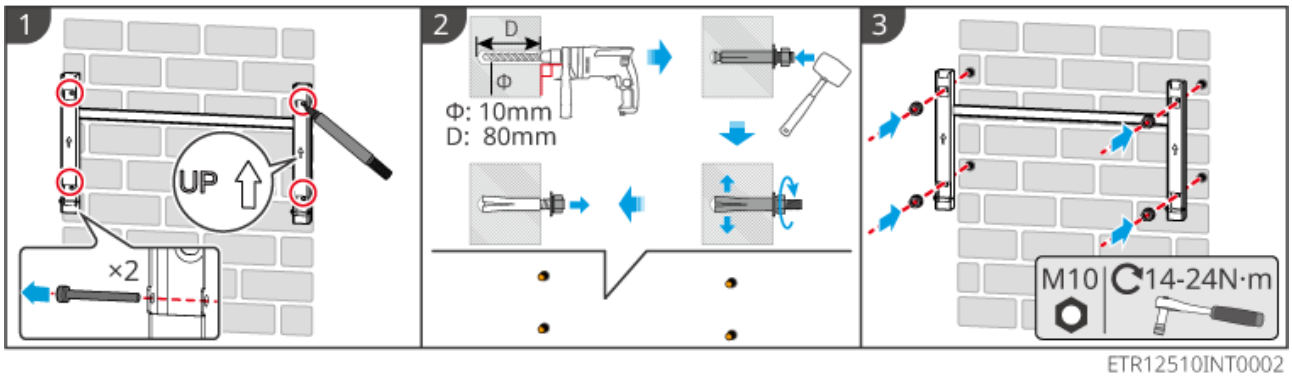
5.4 Installing the Inverter

⚠CAUTION

- The inverter supports two installation methods: wall-mounted and cabinet-mounted.
- When drilling holes, ensure that the drilling location avoids water pipes, cables, etc., inside the wall to prevent danger.
- When drilling holes, please wear safety goggles and a dust mask to avoid inhaling dust into the respiratory tract or getting it into the eyes.
- Ensure that the inverter is installed securely to prevent it from falling and injuring personnel.

5.4.1 Wall Mounting Installation

1. Place the backplate horizontally on the wall and use a marker to mark the drilling positions.
2. Use an impact drill to create the holes.
3. Secure the inverter backplate to the wall using expansion screws.
4. Move the inverter to the installation location.
5. Mount the inverter onto the backplate.
6. Tighten the inverter's securing screws.



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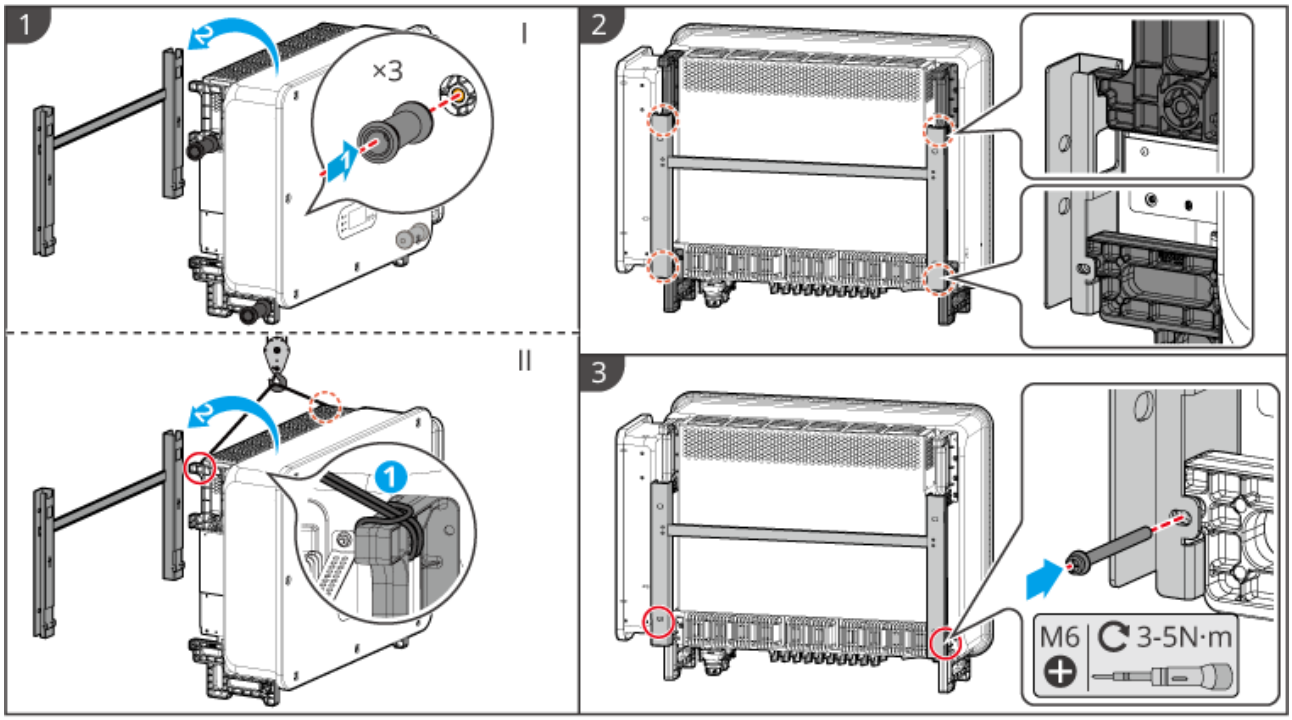

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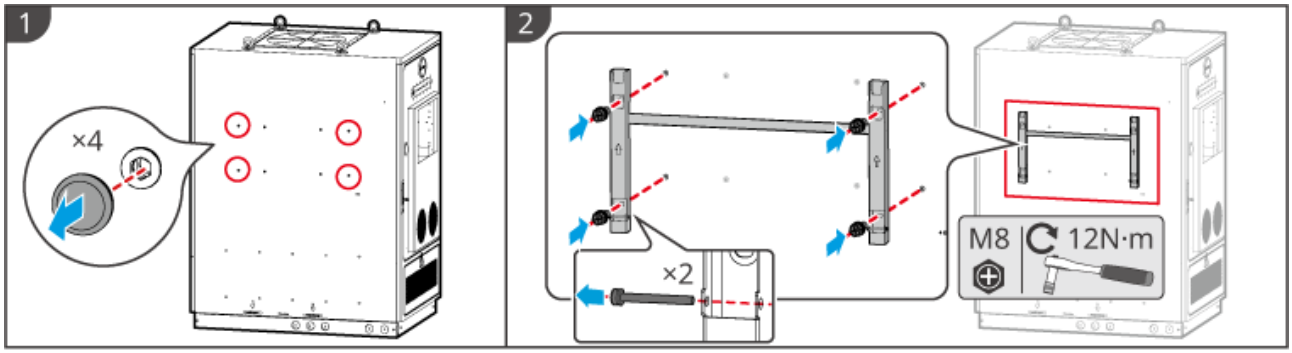
5.4.2 Cabinet Installation

1. Remove the rubber plugs from the side mounting holes of the cabinet.
2. Secure the backplate to the side of the cabinet using screws.
3. Move the inverter to the installation location.
4. Mount the inverter onto the backplate.
5. Tighten the fixing screws of the inverter.



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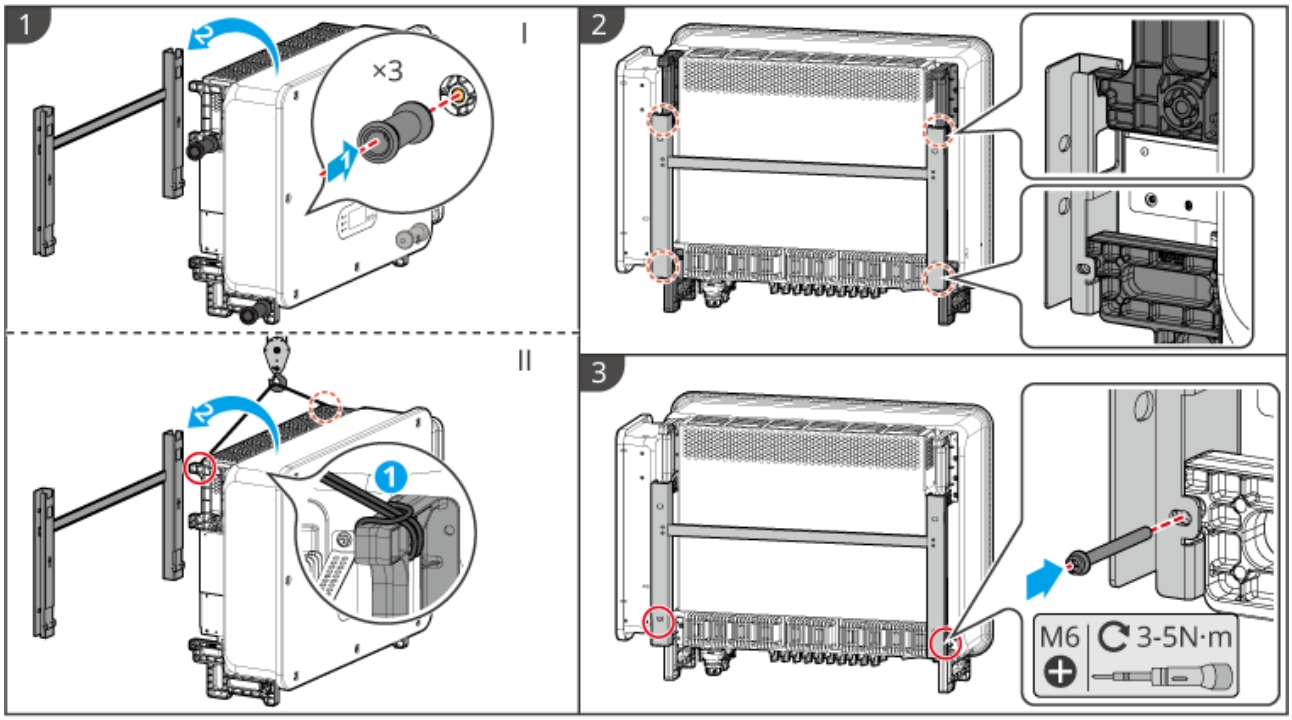

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6 Electrical Connections

⚠DANGER

- All operations during electrical connection, as well as the specifications of the cables and components used, must comply with local laws and regulations.
- Before connecting electrical cables, ensure all upstream circuit breakers for the equipment are switched off.
- Before performing electrical connections, ensure the equipment is completely powered off. Live working is strictly prohibited, otherwise dangers such as electric shock may occur.
- Cables of the same type should be bundled together and routed separately from different types of cables. Intertwining or crossing arrangements are prohibited.
- If a cable is subjected to excessive tension, poor connections may result. When connecting, leave a certain length of slack in the cable before connecting it to the equipment's terminal port.
- When crimping wire terminals, ensure the conductive part of the cable makes full contact with the terminal. Do not crimp the cable insulation together with the terminal, as this may cause the equipment to malfunction or, after operation, lead to damage of the equipment's terminal block due to unreliable connections causing heat generation.
- Using cables in high-temperature environments may cause insulation aging and damage. Maintain a distance of at least 30mm between cables and heat-generating components or the periphery of heat source areas.
- Before operating the equipment, ensure it is reliably grounded and appropriate protective measures are in place. Otherwise, there is a risk of electric shock.

NOTICE

- Before performing electrical connections, wear personal protective equipment such as safety shoes, protective gloves, and insulating gloves as required.
- Only trained professionals are allowed to perform electrical connections and related operations.
- The cable colors in the graphics of this document are for reference only; specific cable specifications must comply with local regulations.

6.1 System Wiring Electrical Block Diagram

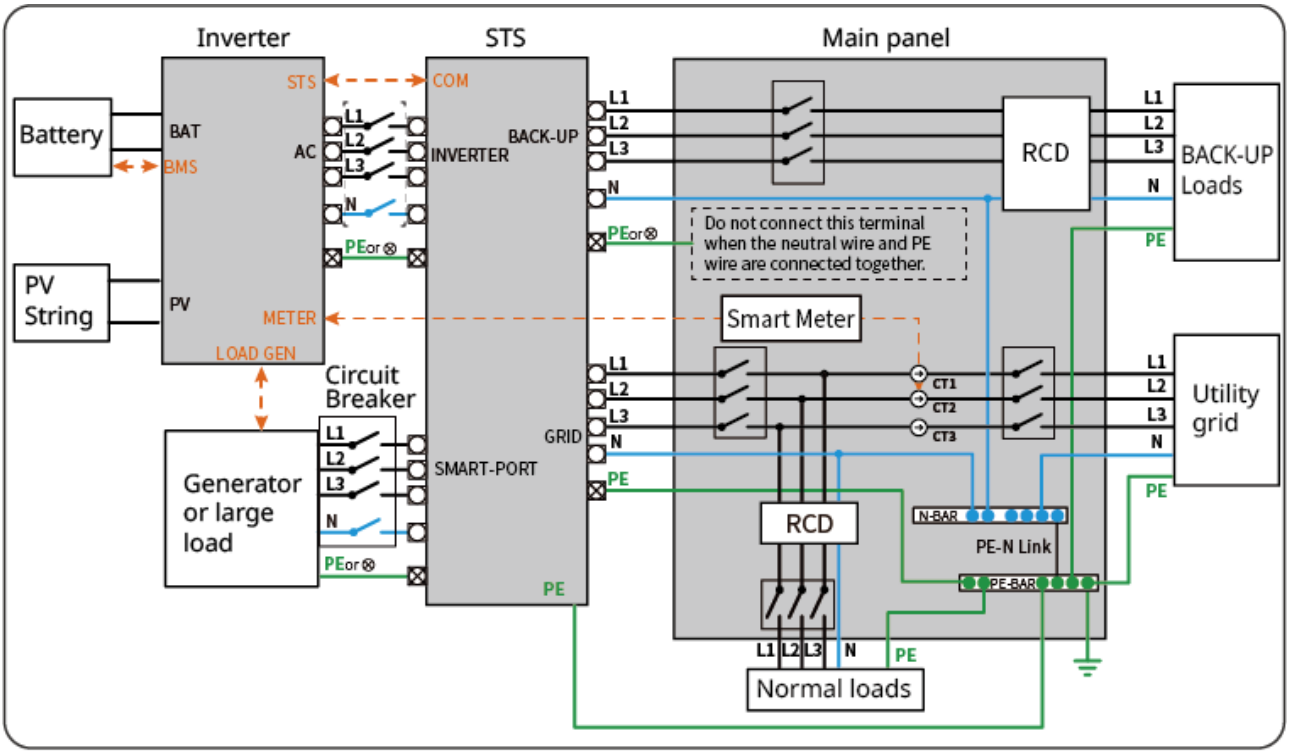
NOTICE

- Depending on the regulatory requirements of different regions, the wiring methods for the N and PE lines of the inverter GRID and BACK-UP ports vary. Please refer to local regulations.
- The inverter can only use the BACK-UP function when paired with STS.
- When the inverter is powered on, the BACK-UP AC port is live. If maintenance is required for the BACK-UP Loads, please power off the inverter; otherwise, it may cause electric shock.

N and PE lines are connected together in the distribution box

NOTICE

- To maintain neutral integrity, the neutral wires of the grid-tied side and the off-grid side must be connected together; otherwise, the off-grid function cannot operate normally.
- The diagram below is a schematic of the grid system for regions such as Australia and New Zealand. The internal N relay is in the open state during a grid fault:



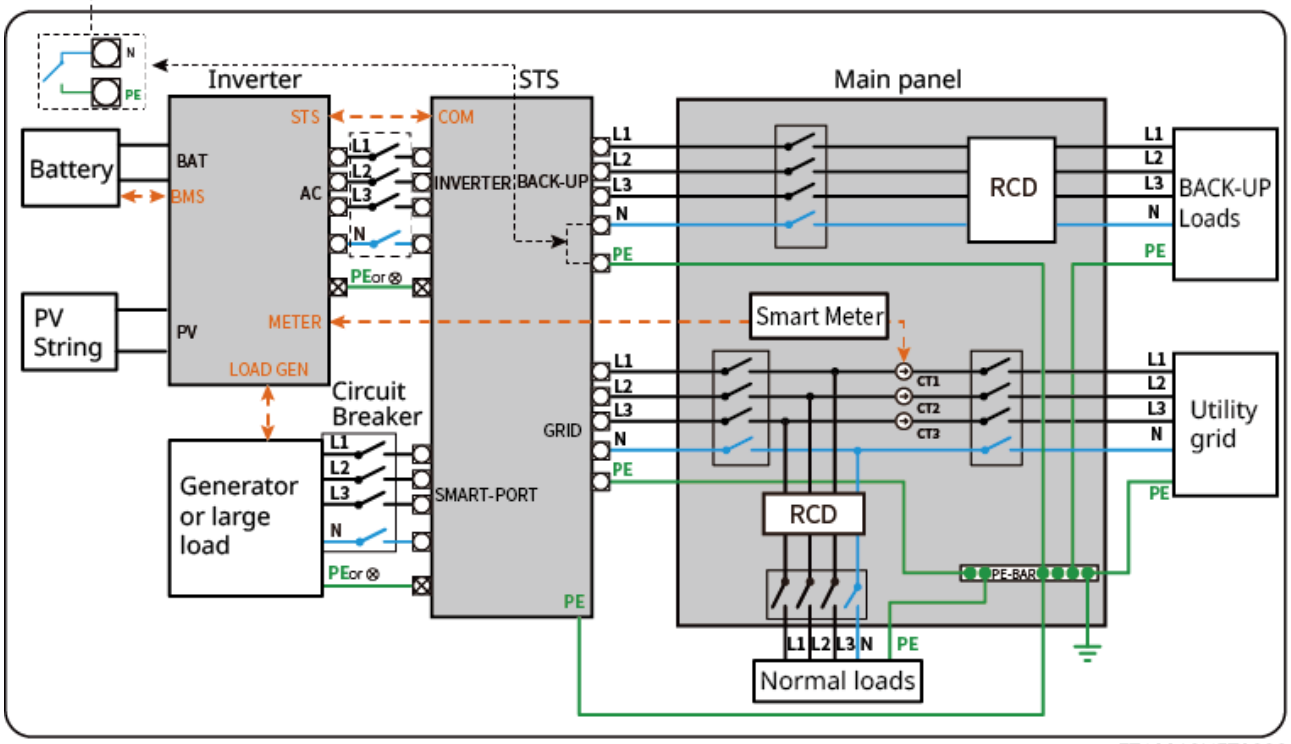
ET10010NET0009

N and PE lines are wired separately in the distribution box

NOTICE

When switching the inverter to off-grid mode without requiring a connection between the N and PE lines, this function can be set via the "Backup Power N and PE Relay Switch" in the "Advanced Settings" interface of the SEMS+ App. The following wiring method applies to regions other than Australia, New Zealand, etc.:

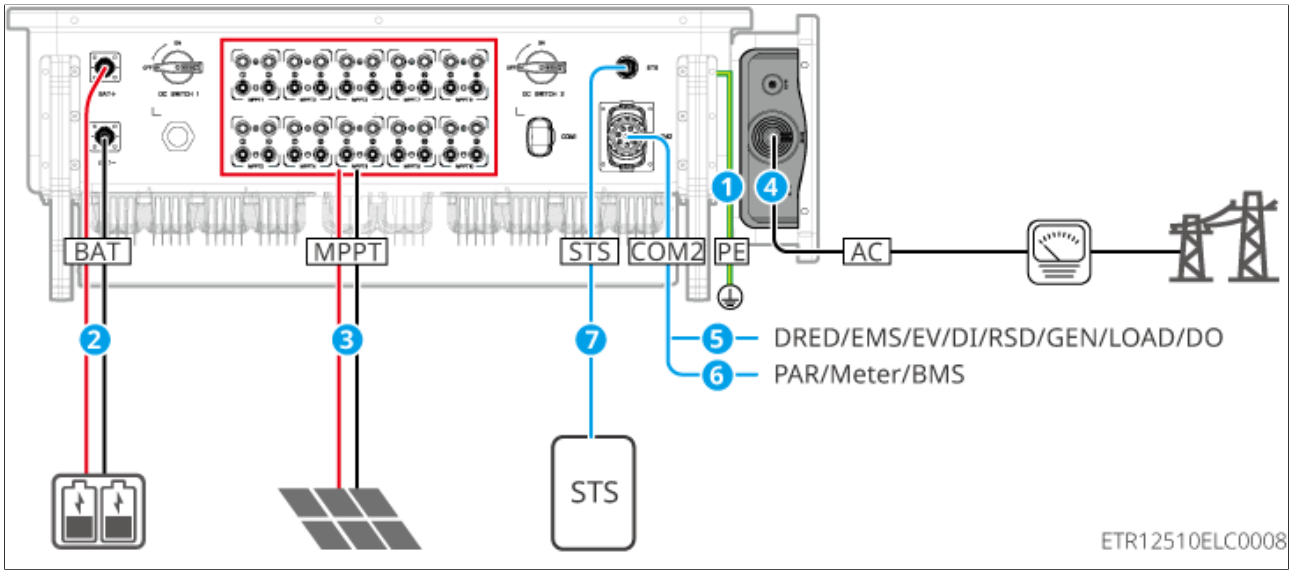
- When the inverter switches to off grid mode, the STS internal relay automatically connects, connecting the PE and N cables.
- When the inverter switches to grid connection mode, the STS internal relay automatically disconnects, disconnecting the PE and N cables.



ET10010NET0008

6.2 Pre-wiring Preparation

6.2.1 Preparing Cables



No.	Cable	Recommended Specification	Acquisition Method
1	Inverter Protective Grounding Cable	• Single-core outdoor copper cable • Conductor cross-sectional area: 25mm²-35mm²	User-provided
2	Battery DC Cable	• Single-core outdoor copper cable • Conductor cross-sectional area: 70mm² • Cable outer diameter: 14.5-15.5mm	Obtained from the battery system accessory kit
3	PV DC Cable	• Industry-standard outdoor photovoltaic cable • Conductor cross-sectional area: 4mm²-6mm² • Cable outer diameter: 5.9mm-8.8mm	User-provided

No.	Cable	Recommended Specification	Acquisition Method
4	Inverter AC Cable	Single-core outdoor copper cable • Conductor cross-sectional area: 50mm²-70mm² • Cable outer diameter: 14-34mm • $S_{PE} \geq 1/2 \times S_{AC}$	User-provided
		Multi-core outdoor copper cable • Conductor cross-sectional area: 50mm²-70mm² • Cable outer diameter: 22-43mm • $S_{PE} \geq 1/2 \times S_{AC}$	
5	RCR/DRED Signal Cable	• Shielded cable meeting local standards • Conductor cross-sectional area: 0.2mm²-0.5mm² • Cable outer diameter: 5mm-8mm	User-provided
	(Reserved) EMS RS485 Communication cable		
	(Reserved) EV Charger RS485 Communication cable		
	Remote Shutdown Communication cable		
	RSD Communication cable		
	Generator Control Communication cable		
	Load Control DO Communication cable		

No.	Cable	Recommended Specification	Acquisition Method
	(Reserved) DO Dry Contact		
6	Inverter Parallel Communication cable	Length: 5m	Shipped with the unit For off-grid parallel scenarios only
	Meter Communication cable	Length: 10m	Shipped with the unit
	BMS Communication cable	-	Obtained from the battery system accessory kit
7	Inverter to STS Communication cable	-	Shipped with the unit

6.2.2 Preparing Breakers

No.	breaker	Recommended Specifications	Acquisition Method
1	• GRID breaker (Inverter & STS) • BACK-UP Loads breaker (STS) • Smart-Port breaker STS (STS)	Selected according to local laws and regulations, requires overcurrent protection function, 4P AC switch Nominal Voltage ≥400V, Rated Current requirements are as follows: • GW125K-ETR-G10, GW124.99K-ETR-G10, GW110K-ETR-G10, GW75K-ETR-L-G10: Rated Current ≥250A • GW100K-ETR-G10, GW99.99K-ETR-G10: Rated Current ≥200A • GW80K-ETR-G10, GW75K-ETR-G10, GW50K-ETR-L-G10: Rated Current ≥160A	User-provided
2	Battery Switch	Selected according to local laws and regulations, requires overcurrent protection function, 2P DC switch Nominal Voltage ≥1100V, Rated Current requirements are as follows: • GW125K-ETR-G10, GW124.99K-ETR-G10, GW110K-ETR-G10, GW75K-ETR-L-G10: Rated Current ≥250A • GW100K-ETR-G10, GW99.99K-ETR-G10: Rated Current ≥200A • GW80K-ETR-G10, GW75K-ETR-G10, GW50K-ETR-L-G10: Rated Current ≥160A	User-provided
3	RCD	Selected according to local laws and regulations Type A • ON-GRID side: 1250mA • BACK-UP side: 500-1000mA	User-provided

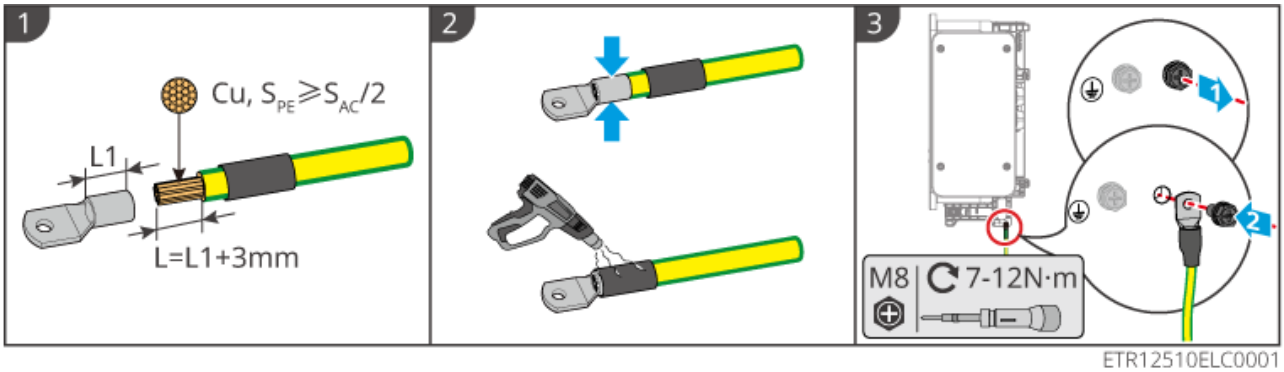
No.	breaker	Recommended Specifications	Acquisition Method
4	Meter Switch	• Nominal Voltage: 380V/400V • Rated Current: 0.5A	User-provided
5	Load breaker	Specification requirements must be determined based on the actual load used.	User-provided
6	(Optional) Single Pole Double Throw Switch		

6.3 Connecting the PE cable

⚠WARNING

- The protective grounding of the chassis cannot replace the grounding of the AC output port. When wiring, please ensure the ground wires at both grounding points are reliably connected.
- For multiple inverters, please ensure the protective grounding points on the chassis of all inverters are equipotentially connected.

1. Prepare the cables and terminals.
2. Crimp the terminals.
3. Connect the terminals to the inverter grounding point.



ETR12510ELC0001

6.4 Connecting DC Input Wires (PV)

⚠DANGER

- Do not connect the same PV string to multiple inverters, as this may cause inverter damage.
- Before connecting the PV string, ensure both the DC switch and AC circuit breaker are disconnected, and confirm the PV string maintains reliable isolation from ground.
- PV strings generate high-voltage direct current when exposed to sunlight. Exercise caution and take preventive measures during electrical connections.
- Before connecting the PV string to the inverter, verify the following information. Failure to do so may cause permanent inverter damage, potentially leading to fire and resulting in personal injury or property loss.
  1. Ensure the maximum short-circuit current and maximum input voltage for each MPPT are within the inverter's allowable range.
  2. Ensure the positive terminal of the PV string is connected to the inverter's PV+, and the negative terminal is connected to the inverter's PV-.

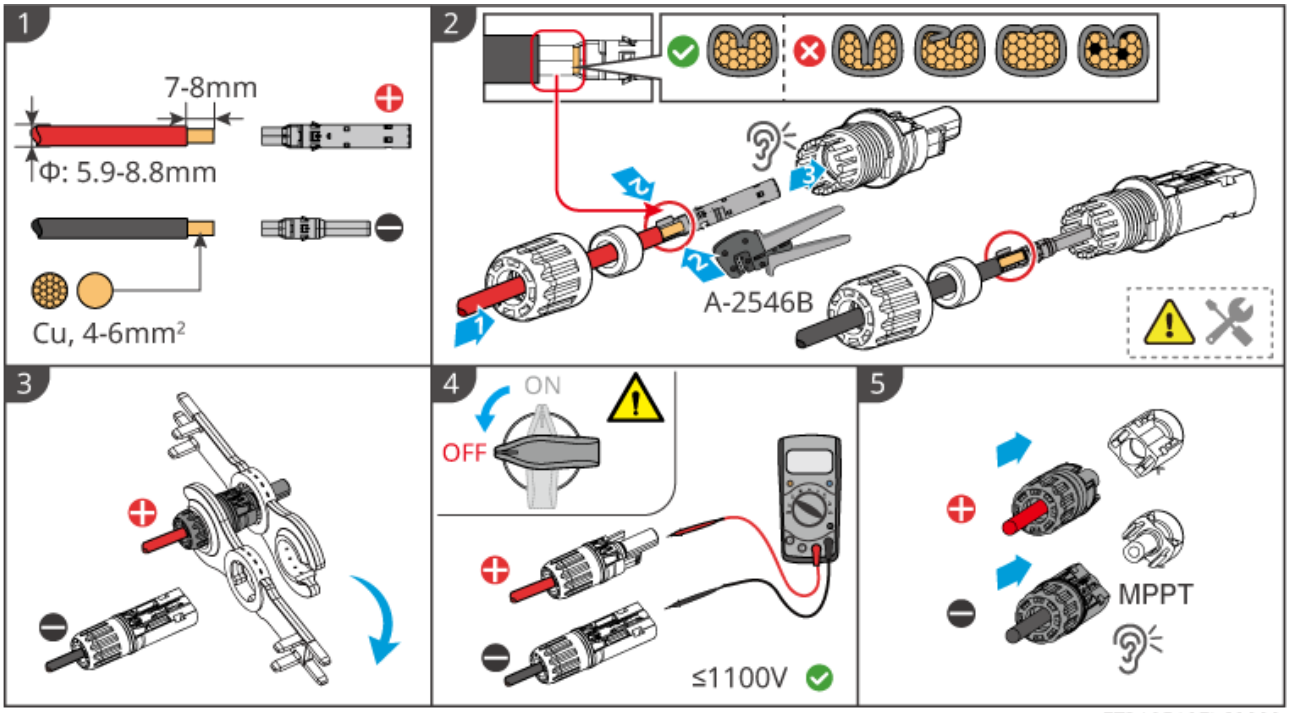
⚠WARNING

- PV string output must not be grounded. Before connecting the PV string to the inverter, ensure the minimum insulation resistance to ground of the PV string meets the minimum insulation resistance requirement (R=Max. Input Voltage/30mA).
- After completing the DC cable connection, ensure the cable connections are secure and not loose.
- Use a multimeter to measure the positive and negative poles of the DC cable to ensure correct polarity, no reverse connection, and that the open-circuit voltage of the PV string is within the allowable range.
- Parallel connection of MPPT strings must comply with local laws and regulations.
- Ensure the voltage difference between different MPPT circuits is less than or equal to 200V.
- The two PV strings within each MPPT circuit must use the same model, the same number of panels, the same tilt angle, and the same orientation to ensure maximum efficiency.

NOTICE

The operations in this section are only applicable to non-coupled inverters.

1. Prepare the DC cables and terminals (the terminals are located inside the DC connector).
2. Disassemble the DC connector, crimp the PV terminal, and reassemble the DC connector.
3. Tighten the DC connector.
4. Measure the DC open-circuit voltage. Ensure the open-circuit voltage is less than or equal to 1100V.
5. Connect the DC connector to the inverter.



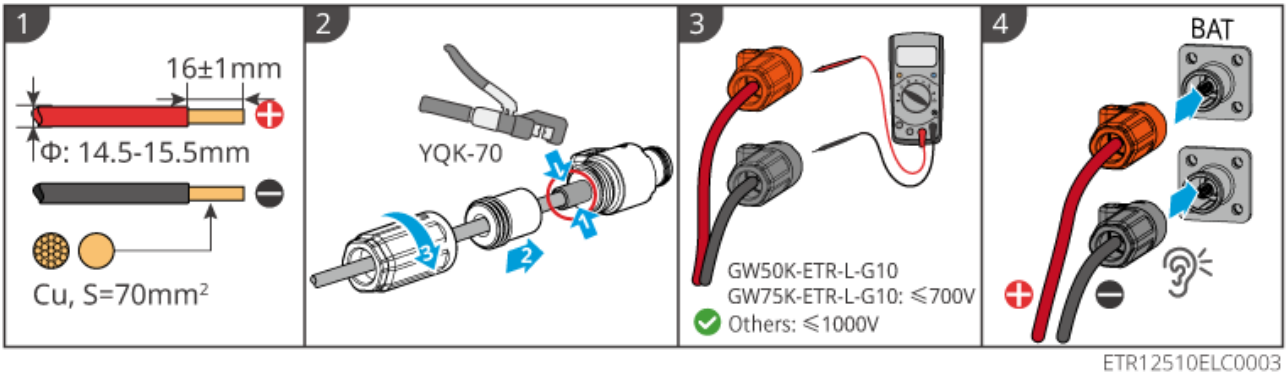
ETR12510ELC0002

6.5 Connecting the Battery Cable

⚠DANGER

- Before connecting battery cables, please confirm that the inverter and battery are powered off, and the front and rear switches of the equipment are disconnected.
- When the inverter is running, it is prohibited to connect or disconnect battery cables. Violation may lead to electric shock DANGER.
- In a single-unit system, do not connect the same battery bank to multiple inverters, as this may cause inverter damage.
- It is prohibited to connect loads between the inverter and the battery.
- When connecting battery lines, use insulated tools to prevent accidental electric shock or causing battery short circuit.
- Please ensure that the battery open-circuit voltage is within the allowable range of the inverter.
- Between the inverter and the battery, please choose whether to configure a DC switch according to local laws and regulations.

1. Prepare the battery cable.
2. Crimp the battery terminal.
3. Measure the open-circuit voltage between the positive and negative terminals of the battery cable.
4. Connect the battery cable to the BAT port of the inverter.



ETR12510ELC0003

6.6 Connecting AC Cables

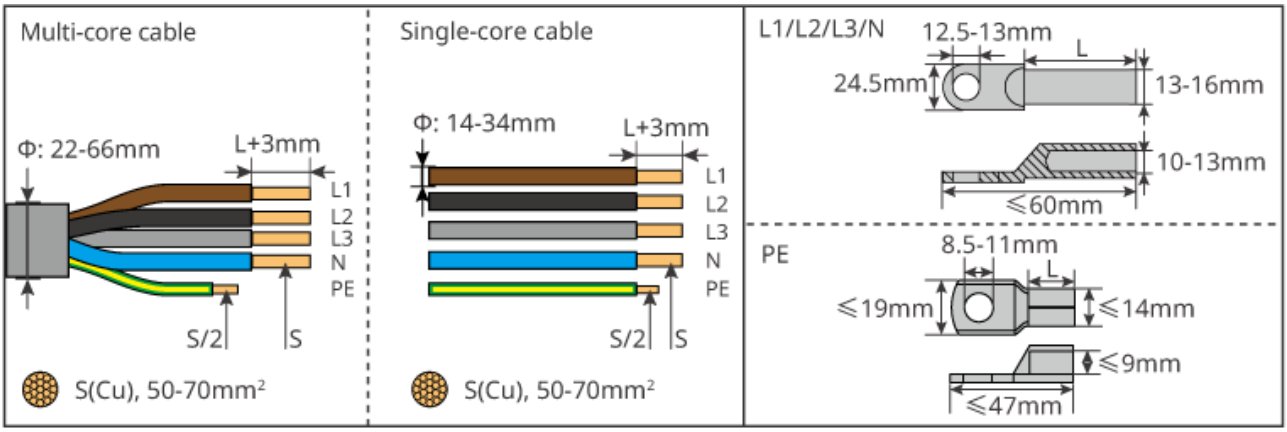
⚠WARNING

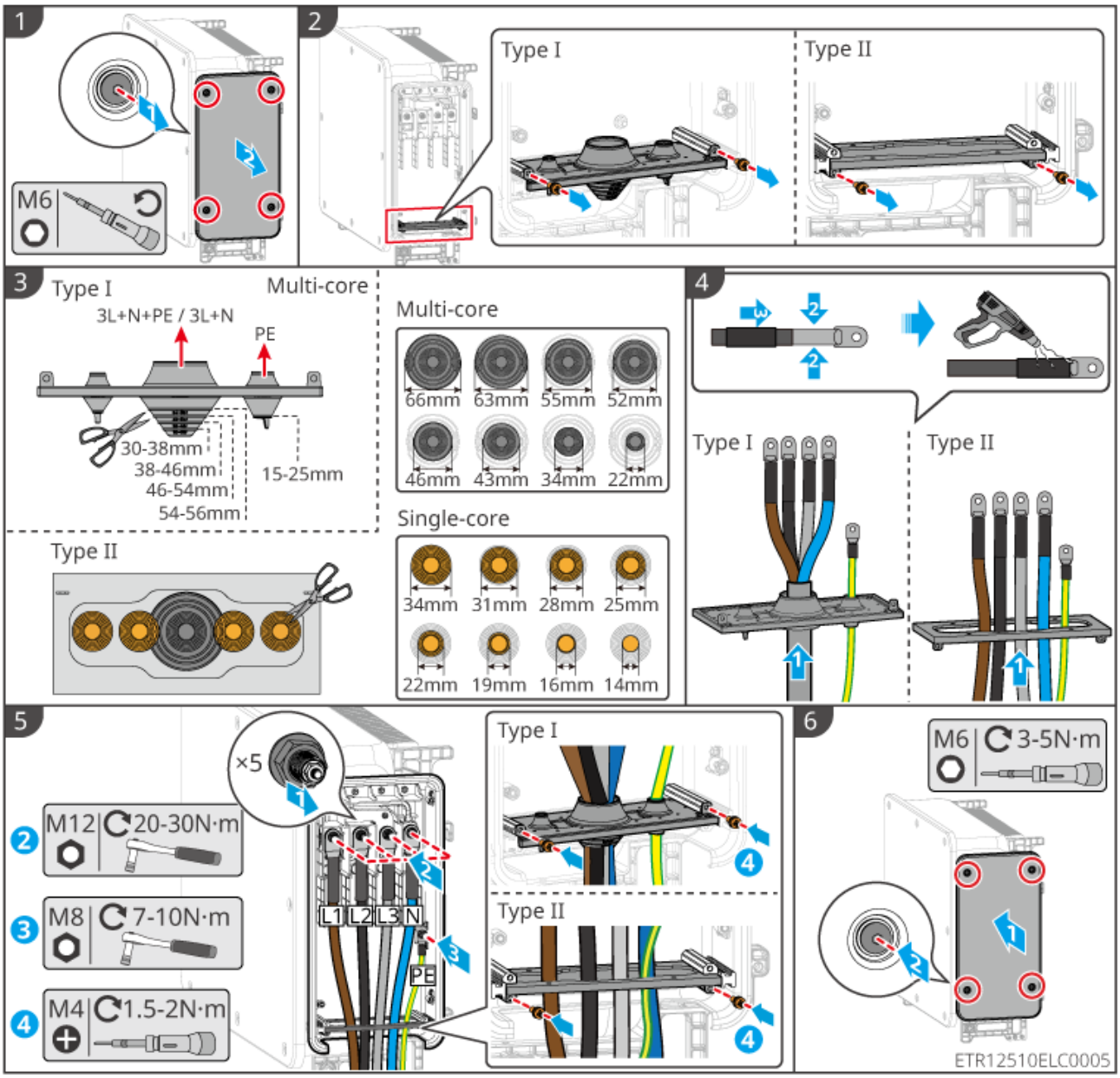
- To ensure the inverter can safely disconnect from the grid under abnormal conditions, please install an AC circuit breaker on its AC side. Select the circuit breaker specifications according to local regulations.
- Each inverter must be equipped with an independent AC circuit breaker. Do not connect any load between the inverter and the AC circuit breaker directly connected to it.
- The grid voltage and frequency must be within the allowable range and comply with local grid requirements.

NOTICE

- Ensure the cable connections are secure. Loose connections may cause the terminals to overheat during operation, resulting in equipment damage.
- The AC side supports both single-core wire and stranded wire connection schemes.

1. Prepare the cable and terminals.
2. Unscrew the fixing screws of the AC terminal box cover.
3. Unscrew the fixing screws of the bottom barrier.
4. Cut an appropriate cable entry hole according to the cable diameter.
5. Prepare the cable and pass it through the cable entry hole.
6. Connect the AC cable to the inverter and reinstall the bottom barrier.
7. Tighten the fixing screws of the AC terminal box cover.


Multi-core cable
Φ: 22-66mm
L+3mm
L1
L2
L3
N
PE
S/2
S
S(Cu), 50-70mm²
Single-core cable
Φ: 14-34mm
L+3mm
L1
L2
L3
N
PE
S/2
S
S(Cu), 50-70mm²
L1/L2/L3/N
12.5-13mm
L
24.5mm
13-16mm
10-13mm
≤60mm
PE
8.5-11mm
L
≤19mm
≤14mm
≤9mm
≤47mm
ETR12510ELC0004

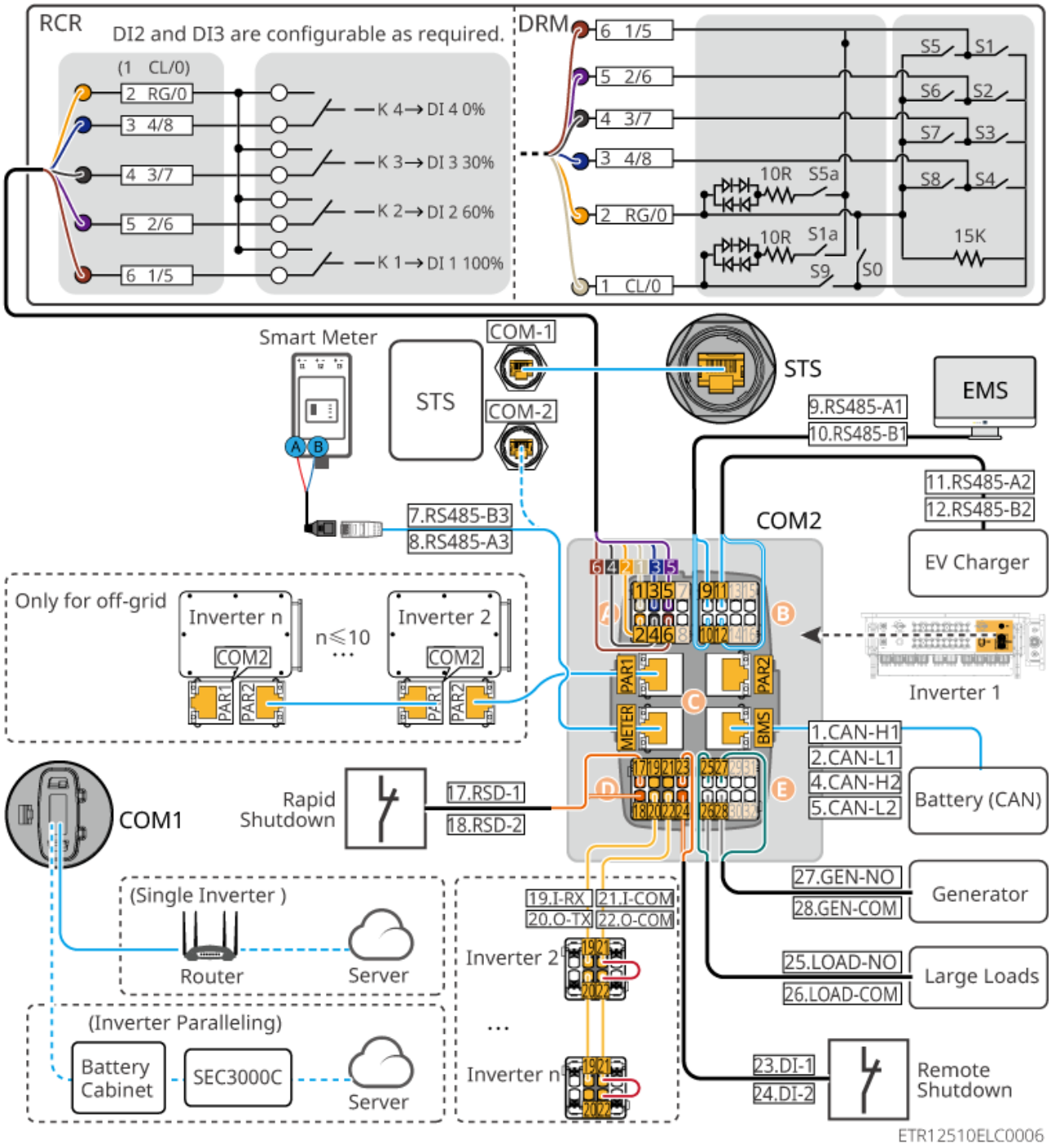

1
M6
2
Type I
Type II
3
Type I
Multi-core
3L+N+PE / 3L+N
PE
30-38mm
38-46mm
46-54mm
54-56mm
15-25mm
Type II
Multi-core
66mm
63mm
55mm
52mm
46mm
43mm
34mm
22mm
Single-core
34mm
31mm
28mm
25mm
22mm
19mm
16mm
14mm
4
Type I
Type II
5
×5
M12
20-30N·m
M8
7-10N·m
M4
1.5-2N·m
L1
L2
L3
N
PE
Type I
Type II
6
M6
3-5N·m
ETR12510ELC0005

6.7 Connecting the Communication Cable

NOTICE

- The inverter communication function is optional. Please select according to the actual usage scenario.
- If you need to use the DRM, RCR, or remote shutdown functions, please enable them in the SEMS+ APP or the SEC3000C Web interface after wiring is completed.
- Do not enable these functions in the SEMS+ APP or SEC3000C Web interface if the inverter is not connected to a DRED or remote shutdown device, otherwise the inverter will not be able to operate grid-connected.
- When using a 4G module for inverter communication, please note the following issues:
  - The 4G module is an LTE single-antenna device, suitable for application scenarios with lower requirements for data transmission rates.
  - To ensure 4G signal communication quality, do not install the device indoors or in areas with metal interference.
  - The built-in SIM card in the 4G module is a China Mobile communication card. Please confirm whether the device is installed in an area covered by China Mobile's 4G signal.

Communication Function Description

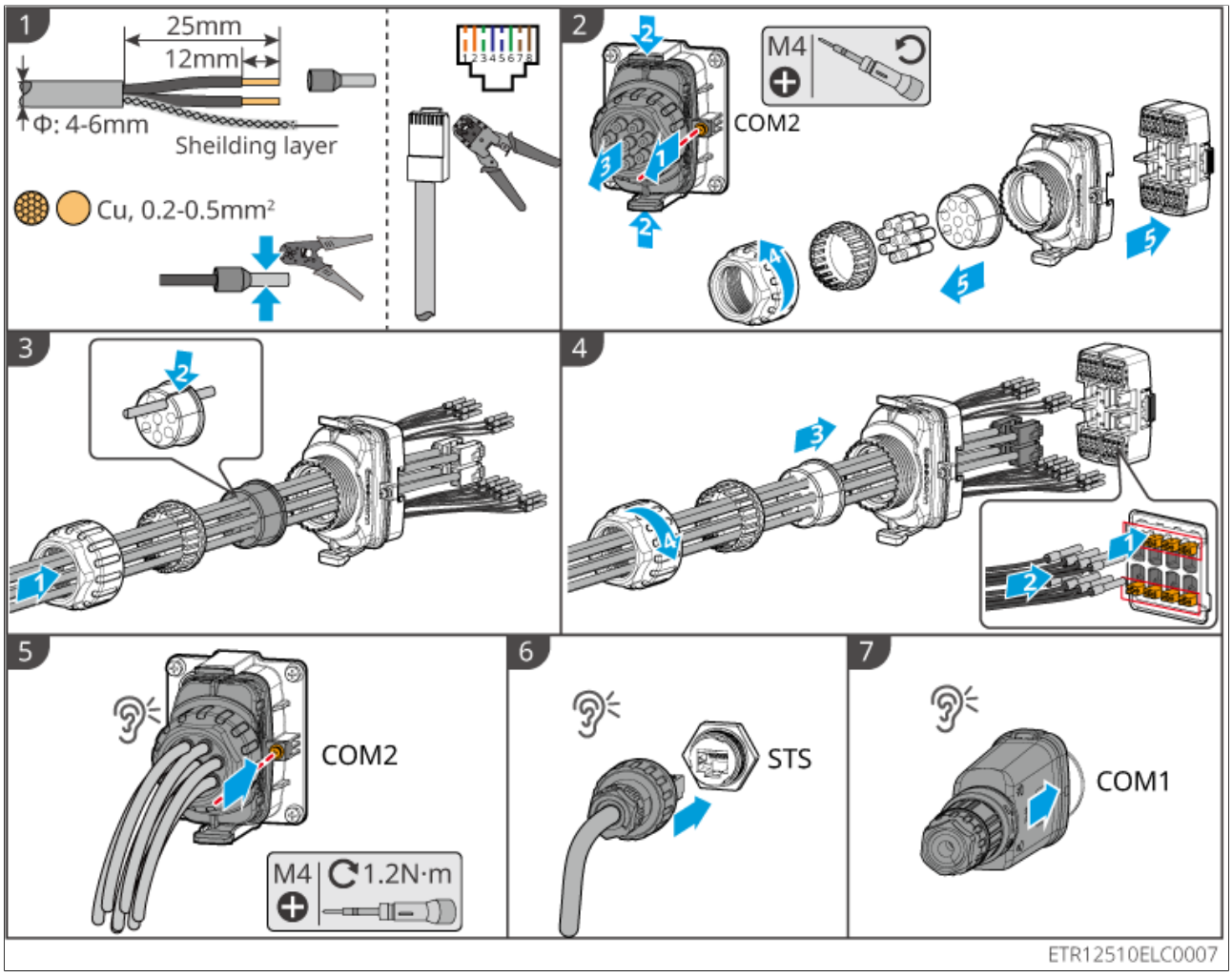


Wiring Steps

1. Prepare the cable and perform crimping.
2. Unscrew the fixing screw of the communication connector, then press the locks on both sides to pull out the connector. Next, disassemble the communication connector into the following parts: nut, seal claw, plug, seal, housing assembly,

and insert assembly.

3. Pass the cable through the communication connector's nut, seal claw, seal, and housing assembly in sequence. Remove the plug as needed.
4. Insert the cable into the corresponding spring-loaded terminal holes / RJ45 port according to the numbering marks on the insert assembly, then assemble the communication connector and tighten the nut.
   - Spring-loaded terminal holes: Press the spring clip, insert the crimped cable, and release the spring clip.
   - RJ45 port: Directly insert the network cable with an RJ45 connector.
5. Insert the communication connector into the inverter's COM2 port and tighten the fixing screw.
6. Insert the communication cable into the STS port.
7. Insert the communication module into the inverter's COM1 port.



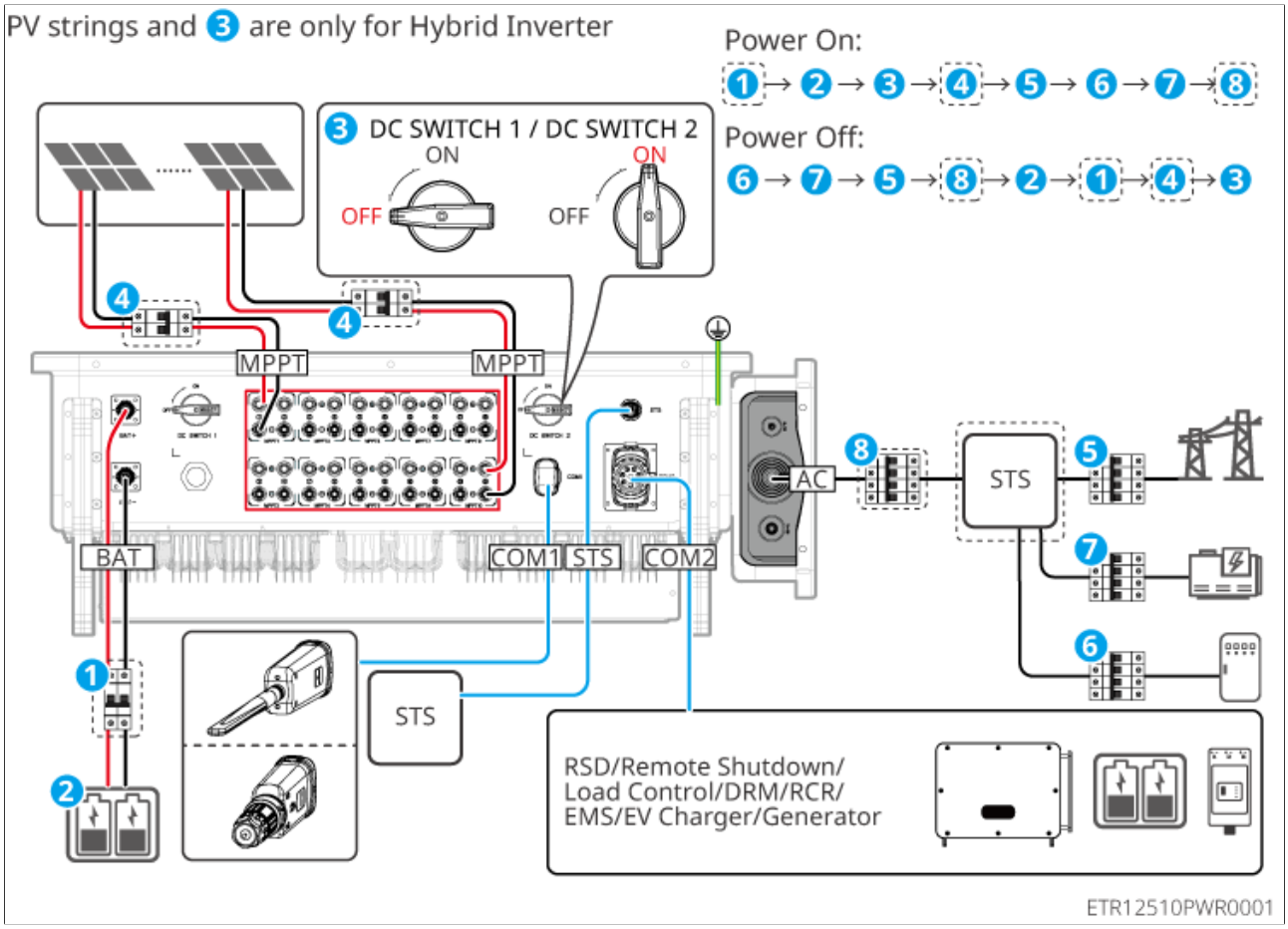
7 Equipment Trial Run

7.1 Pre-power-on Check

No.	Inspection Item
1	The equipment is installed securely, the installation location facilitates operation and maintenance, the installation space allows for ventilation and heat dissipation, and the installation environment is clean and tidy.
2	The PE cable, power cable, and communication cable are connected correctly and securely.
3	Cable bundling meets wiring requirements, is reasonably distributed, and shows no damage.
4	For unused cable entry holes and ports, please ensure they are reliably connected using the terminals provided with the accessories and have been sealed.
5	Ensure that used cable entry holes have been sealed.
6	The voltage and frequency at the equipment's grid connection point meet the grid connection requirements.

7.2 Powering On the Device

1. (Optional) Close the DC circuit breaker between the inverter and the battery system.
2. Power on the battery system.
3. Rotate the DC switch on the inverter to the "ON" position.
4. (Optional) Close the DC circuit breaker between the inverter and the PV.
5. Close the AC circuit breaker connected to the grid.
6. Close the AC circuit breaker connected to the loads.
7. Close the AC circuit breaker connected to the diesel generator.
8. (Optional) Close the AC circuit breaker between the inverter and the STS.


PV strings and 3 are only for Hybrid Inverter
Power On:
1 → 2 → 3 → 4 → 5 → 6 → 7 → 8
Power Off:
6 → 7 → 5 → 8 → 2 → 1 → 4 → 3
3 DC SWITCH 1 / DC SWITCH 2
ON
OFF
ON
OFF
4
4
MPPT
MPPT
AC
8
STS
5
7
6
BAT
COM1
STS
COM2
1
2
STS
RSD/Remote Shutdown/
Load Control/DRM/RCR/
EMS/EV Charger/Generator
ETR12510PWR0001

8 System Commissioning and Power Station Monitoring

8.1 Device Debugging Through SEC3000C Embedded Web

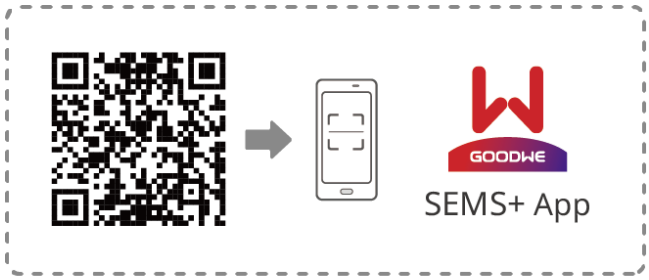
The SEC3000C Smart Energy Control Box is a dedicated device for the photovoltaic power generation system monitoring and management platform. It can be used to collect data from devices in the photovoltaic power generation system, such as grid-tied inverters, hybrid inverters, meters, etc., store logs, and send the data to the monitoring and management platform, enabling centralized monitoring, operation, and maintenance of the photovoltaic system.
For detailed functions, please refer to the SEC3000C User Manual.

8.2 Power Plant Monitoring via SEMS+

SEMS+ is a monitoring platform that communicates with devices via WiFi, LAN, or 4G. The following are common functions of SEMS+:

1. Manage organization or user information, etc.
2. Add and monitor power plant information, etc.
3. Perform device maintenance.

Scan the QR code below to download and install.



SEMS0164

For detailed functions, please refer to the "SEMS+ User Manual". The user manual can be obtained from the official website or by scanning the QR code below.

8.3 Device Debugging via LCD Screen

8.3.1 LCD Overview

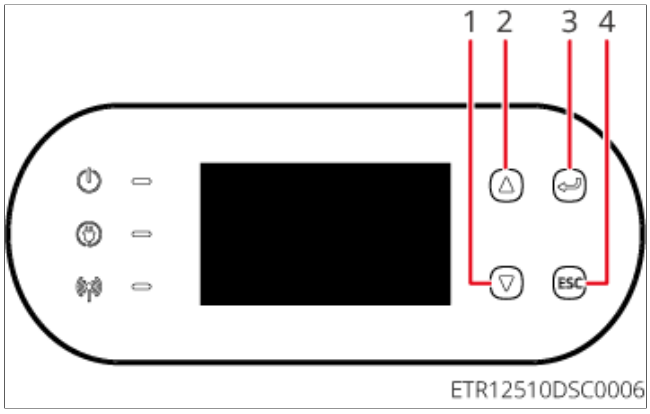
Users can perform the following operations through the LCD screen:

- View device operation data, software version, fault information, etc.
- Set parameters, safety regulation regions, anti-reverse flow, etc.

NOTICE

- The LCD interface may vary depending on the device model and the safety regulations of the country. Please refer to the actual display.
- Supports both touch screen and button operation methods.
- In touch screen mode, the child lock is enabled. Press and hold for 3 seconds to enter the settings page. If using button operation, you can enter directly.
- If there is no operation for 5 minutes, the screen will automatically turn off. Tap the screen or press any button to turn the screen back on.

Button Introduction



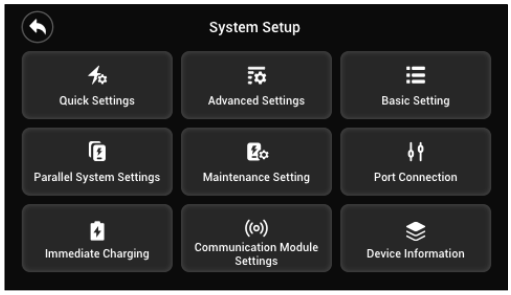
No.	Key	Definition
1	Down key	Move the cursor down or decrease the value.
2	Up key	Move the cursor up or increase the value.
3	Enter key	Enter the selected option or confirm the selection.
4	ESC key	Exit the current interface or cancel the settings.

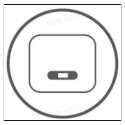
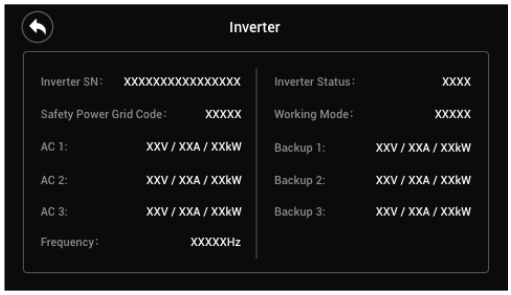
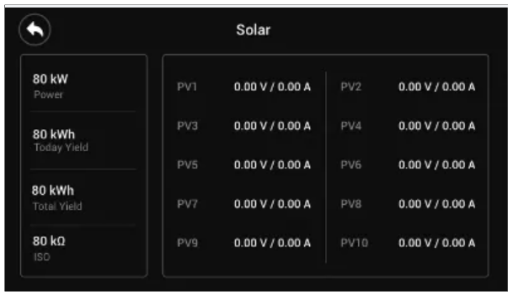
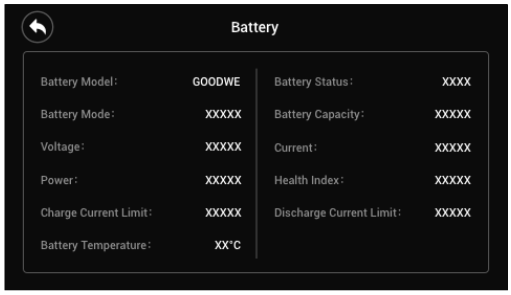
LCD Screen Buttons Introduction

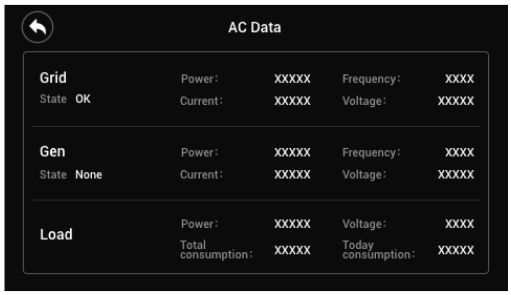
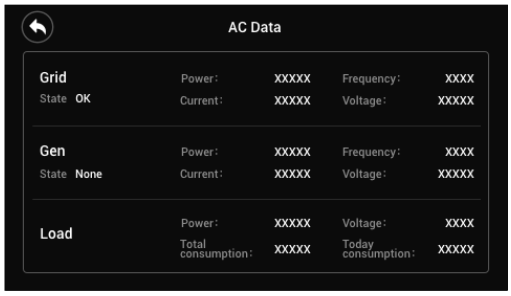
Button	Description
	Return to the main interface.
Cancel	Cancel.
Next	Proceed to the next setup page.
Back	Return to the previous setup page.
Confirm	Confirm.

Main Interface

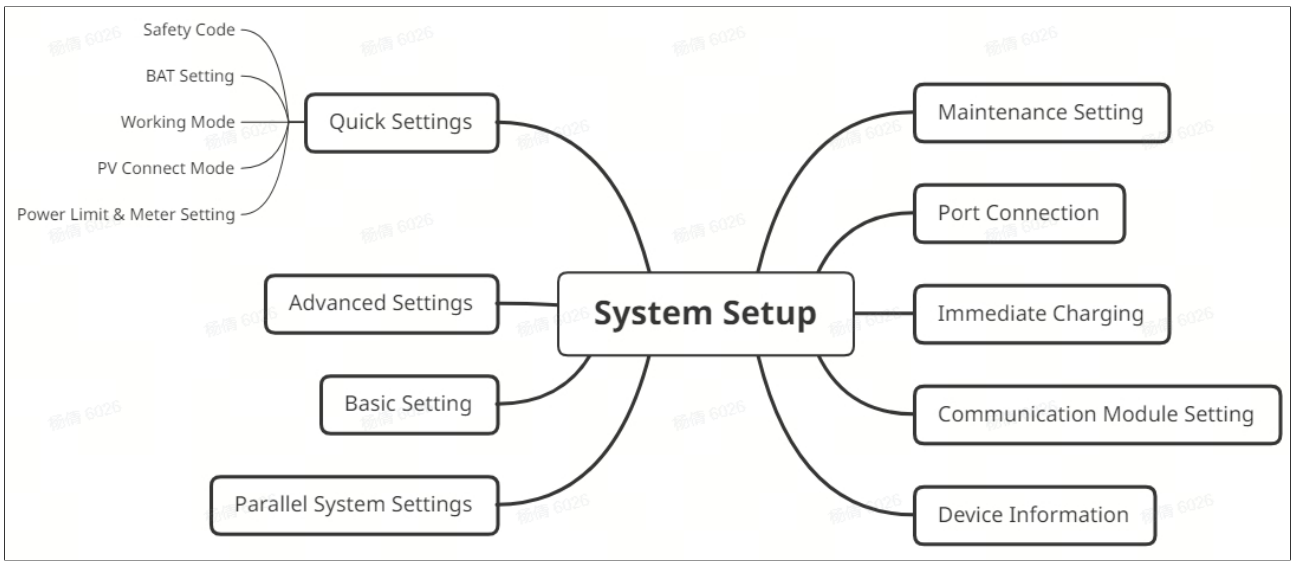
The main interface is the default interface. The inverter will automatically switch to this interface when the system starts successfully or after a period of inactivity. On the main interface, you can view the time, device status, fault information, etc. For details, please refer to the table below:

Icon	Description	Interface Example
	View the inverter's fault codes. The screen only displays the latest 8 faults. For troubleshooting methods, please refer to 9.2.2.Fault Information and Troubleshooting(Page 96).	
	Press and hold for 3 seconds to enter the inverter's settings interface.	

Icon	Description	Interface Example
	View inverter-related information. The color of the outer circle around the inverter represents its current status: • Black: Communication Disconnected • Green: Normal Operation • Yellow: Standby Status • Red: Fault Status	
	View PV current, voltage, power generation, and other information.	
	View battery model, status, and other information.	

Icon	Description	Interface Example
	View grid status information.	
	View the inverter's load information.	

System Settings Structure

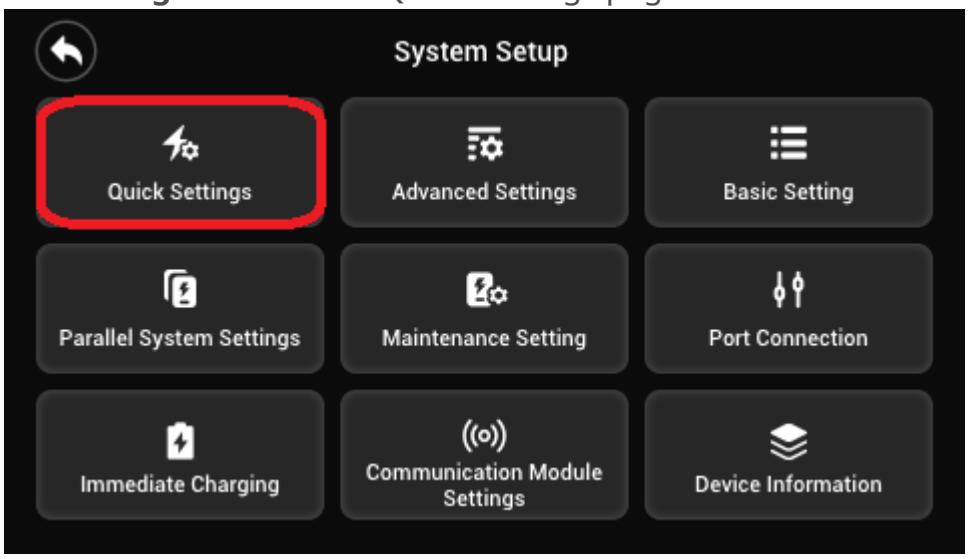


8.3.2 Quick Settings

1. Press and hold on the main interface for 3 seconds to enter the **System Setup**

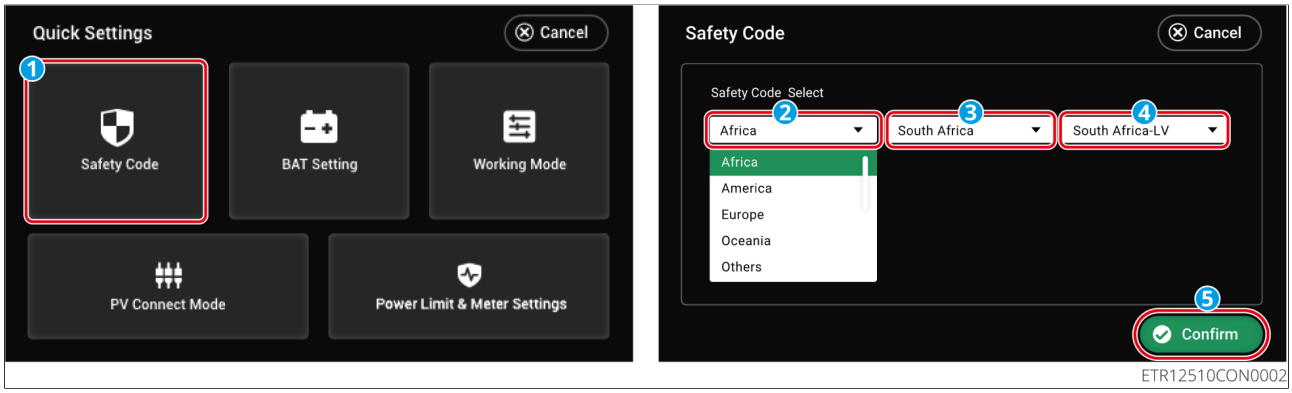
interface.

2. Select **Quick Settings** to enter the Quick Settings page.



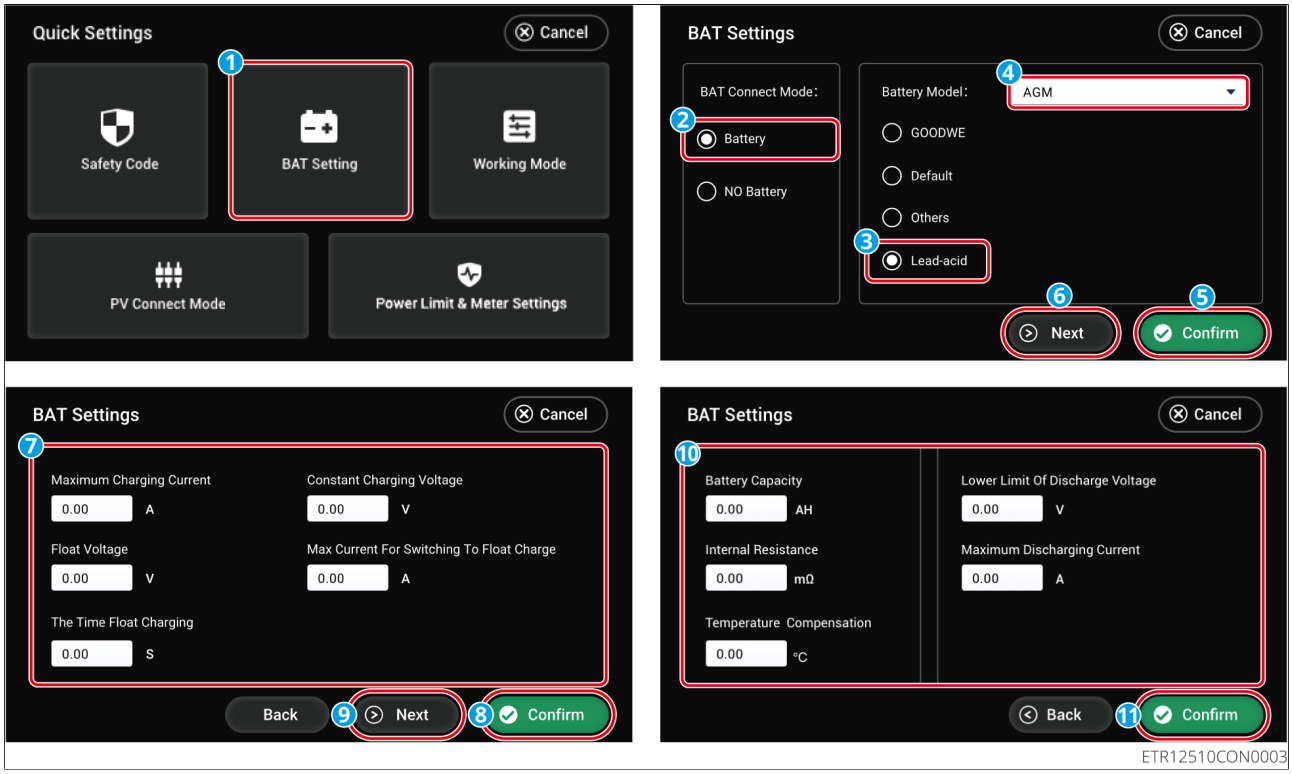
8.3.2.1 Setting Safety Code

1. Select **Safety Code**.
2. Choose the corresponding safety code based on the country or region where the device is located, then click **Confirm**.



8.3.2.2 Set Battery Parameters

1. Select **BAT Setting**.
2. Set parameters according to the actual situation, then click **Confirm**.



BAT Connection Mode	Battery Type	Description
Battery	GOODWE	If a GOODWE brand lithium battery is connected in the system, select GOODWE and choose the corresponding model. If the actual GOODWE battery model used is not in the options, please use the App for configuration.
	Default	If the third-party lithium battery model connected in the system is not in this list, please select according to the actual situation: • Lithium 50Ah • Lithium 100Ah
	Others	If the third-party lithium battery model connected in the system is within this list, please select the correct model according to the actual situation.
	Lead acid	If a lead-acid battery is connected in the system, select Lead acid and choose the correct lead-acid type. Currently supported types are GEL, AGM, and Flooded.
NO Battery	No battery is connected in the system.	

- **Lithium Battery Parameter Settings Description**

Parameter Name	Description
SOC Protection	Enable or disable the SOC protection function.
Depth Of Discharge (On-Grid)	The maximum depth of discharge protection point for the battery when the inverter is operating in on-grid mode.

Parameter Name	Description
Depth Of Discharge (Off-Grid)	The maximum depth of discharge protection point for the battery when the inverter is operating in off-grid mode.
Backup SOC Holding	To ensure the battery SOC is sufficient to maintain normal system operation during off-grid mode, the battery will be charged via the grid or PV to the set SOC protection value when the system is operating in on-grid mode.

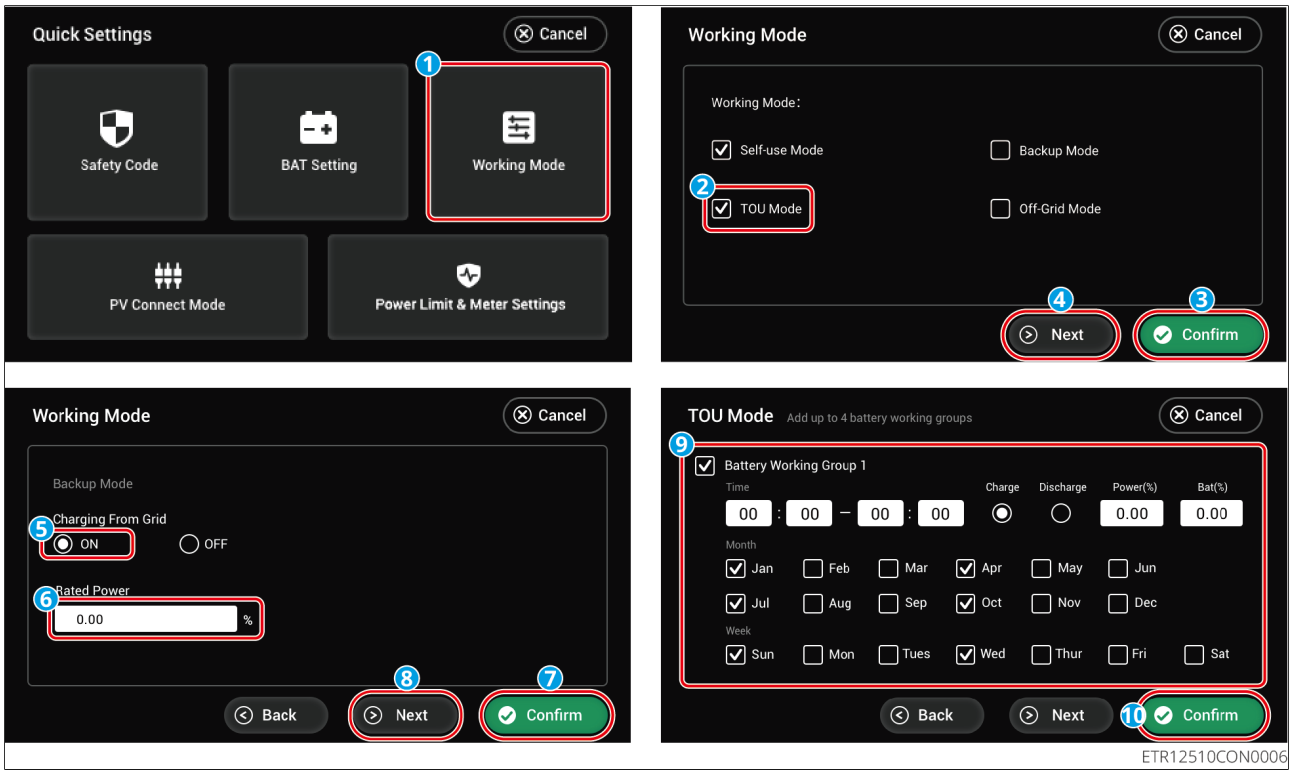
- **Lead-Acid Battery Parameter Settings**

Parameter Name	Description
Maximum Charging Current	The battery charging defaults to constant current charging mode; Set the maximum charging voltage and maximum charging current for this mode; please configure according to the battery technical specifications.
Constant Charging Voltage	
Float Voltage	When the battery charging current is less than the Maximum Current For Switch To Float Charge and this condition persists for the duration specified in The Time Float Charging, the battery charging status switches from constant current mode to float charging mode. Float Voltage is the maximum charging voltage for the battery in float charging mode. Please configure according to the battery technical specifications.
The Time Float Charging	
Maximum Current For Switch To Float Charge	
Battery Capacity	Set the battery capacity according to the parameters of the actually connected battery.
Internal Resistance	The internal resistance present within the battery. Please configure according to the battery technical specifications.

Parameter Name	Description
Temperature Compensation	The default setting reduces the upper charging voltage limit by 3mV for every 1°C increase above 25°C. In practice, please configure according to the battery technical specifications.
Lower Limit Of Discharge Voltage	Please configure according to the battery technical specifications.
Maximum Discharging Current	Please configure according to the battery technical specifications. A higher discharge current results in shorter battery operating time.

8.3.2.3 Set Working Mode

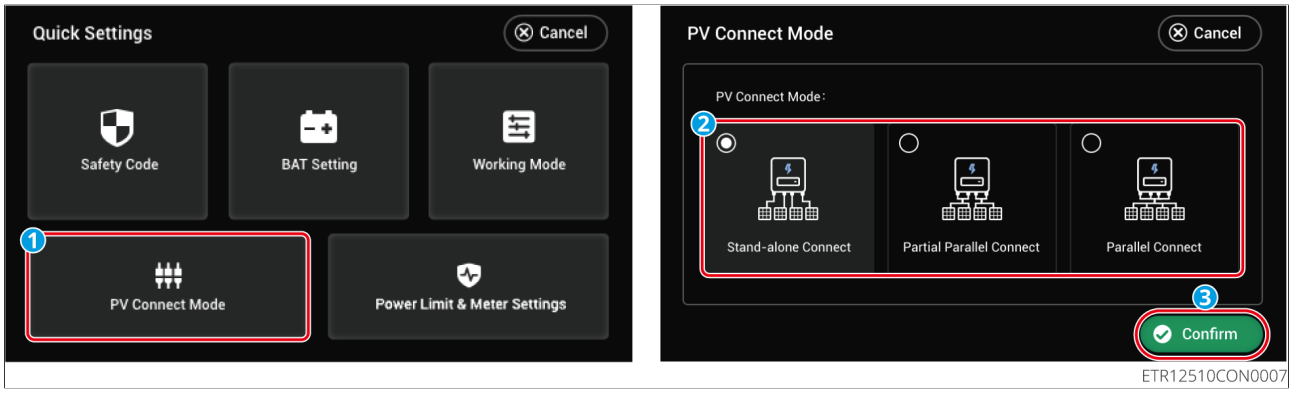
1. Select **Working Mode**.
2. Set the working mode according to your needs and click **Confirm**.



Parameter Name		Description
Self-use Mode		When the working mode is set to Self-use Mode, the Back-up Mode, TOU Mode, and Off-Grid Mode can be enabled simultaneously. Please select according to the actual situation. Working mode priority: Off-Grid Mode>Back-up Mode>TOU Mode >Self-use Mode.
Back-up Mode	Charging From Grid	Enable this function to allow the system to purchase electricity from the grid.
	Rated Power	The percentage of power relative to the inverter's rated power when purchasing electricity.
TOU Mode	Time	Within the set start and end time, the battery charges or discharges according to the configured charge/discharge mode and rated power.
	Charge/Discharge	Set to charge or discharge according to actual requirements.
	Power (%)	The percentage of power relative to the inverter's rated power during charging or discharging.
	Bat (%)	Charging stops after the battery reaches the set SOC. To set the stop SOC for battery discharge, configure Depth of Discharge (On-Grid) and Depth of Discharge (Off-Grid) via the LCD screen.
Off-Grid Mode		In Off-Grid Mode, the inverter disconnects from the grid. The output supplies power only to the BACK-UP Loads, with excess energy used to charge the battery.

8.3.2.4 Set PV Connection Mode

1. Select **PV Connect Mode**.
2. Set the PV connection mode according to the actual situation and click **Confirm**.

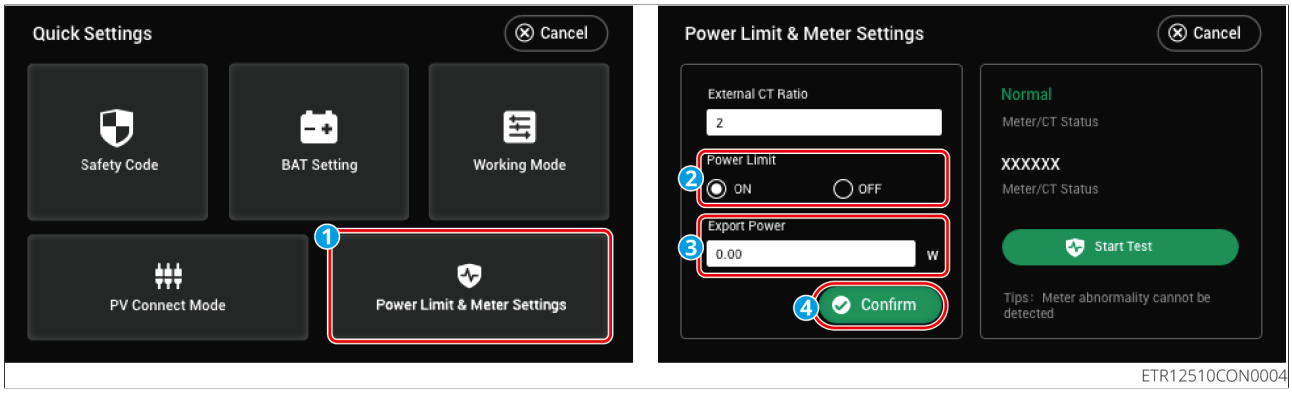


PV Connect Mode	Description
Stand-alone Connect	Each PV string is connected one-to-one with the corresponding MPPT port on the inverter side.
Partial Parallel Connect	When one PV string is connected to multiple MPPT ports on the inverter side, other PV modules are simultaneously connected to other MPPT ports on the inverter side. This mode is currently not supported by ETR series inverters.
Parallel Connect	When external PV strings are connected to the PV input ports on the inverter side, one PV string is connected to multiple PV input ports.

8.3.2.5 Set Grid-connected Power Limit & Meter

- **Set Grid-connected Power Limit**

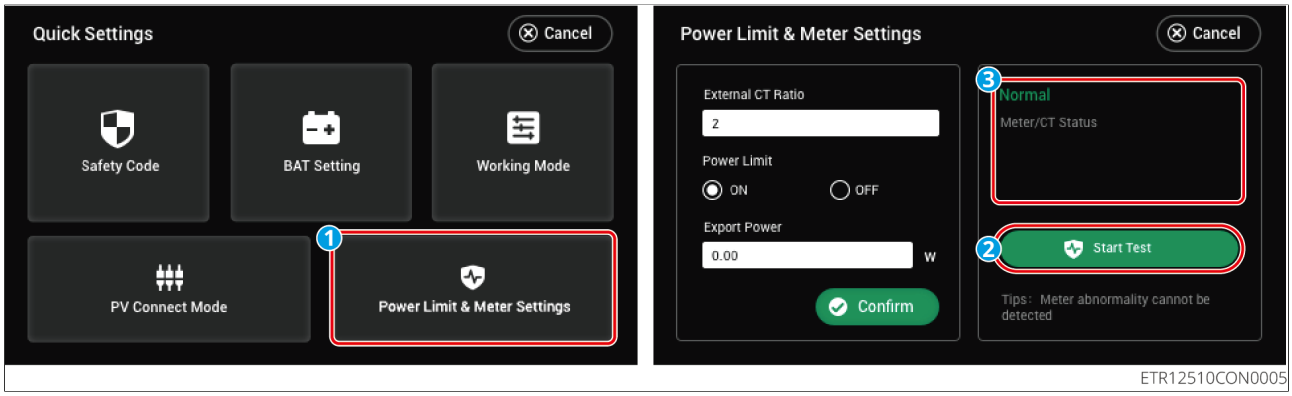
1. Select **Power Limit & Meter Settings**.
2. Set the grid-connected power parameters according to the actual situation.



Parameter Name	Description
External CT Ratio	Set as the ratio between the primary and secondary currents of the external CT. • Built-in meter: No need to set the CT ratio. The default CT ratio is 120A/40mA. • GM330: The CT can be purchased from GoodWe or separately. CT ratio requirement: nA/5A ◦ nA: CT primary input current, where n ranges from 200 to 5000. ◦ 5A: CT secondary output current.
Power Limit	Enable this function when output power needs to be limited according to grid standards in certain countries or regions.
Export Power	Set based on the actual maximum power that can be fed into the grid.

- **Meter Auxiliary Detection**

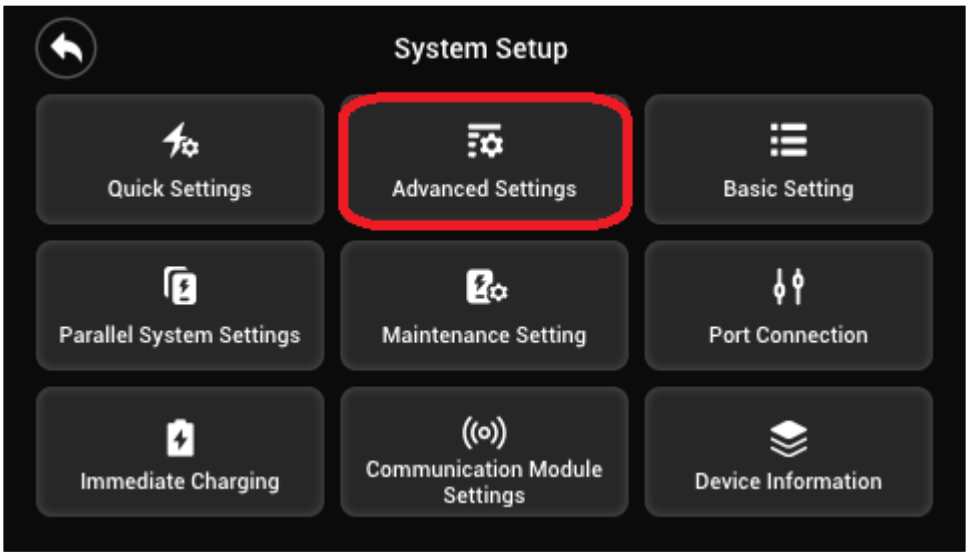
1. Select **Power Limit & Meter Settings**.
2. Click **Start Test** to begin detection.
3. View the detection results.



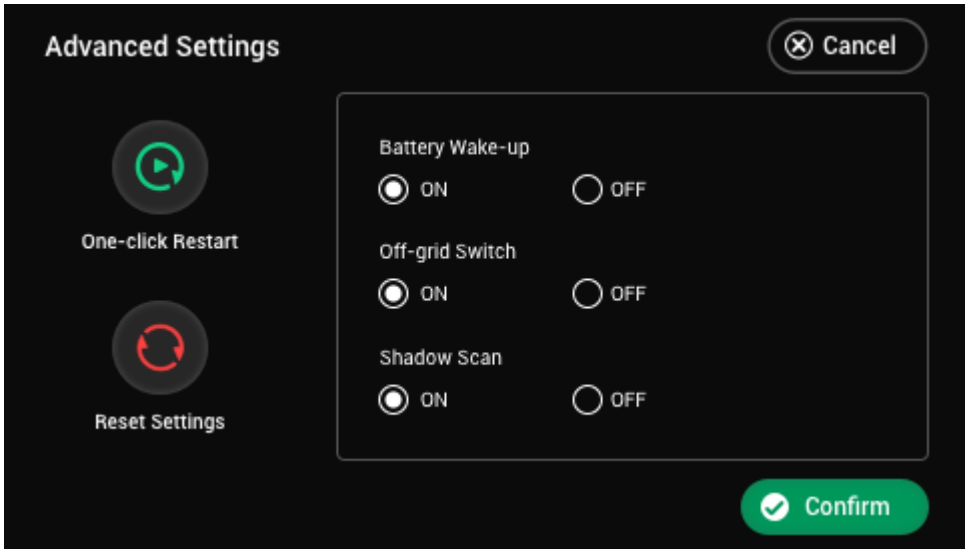
8.3.3 Setting Advanced Parameters

1. Press and hold on the main interface for 3 seconds to enter the **System Setup** interface.

2. Select **Advanced Settings**, enter the password: 1111, and enter the interface to set advanced parameters.



3. Select the required functions according to actual needs, and click **Confirm**.

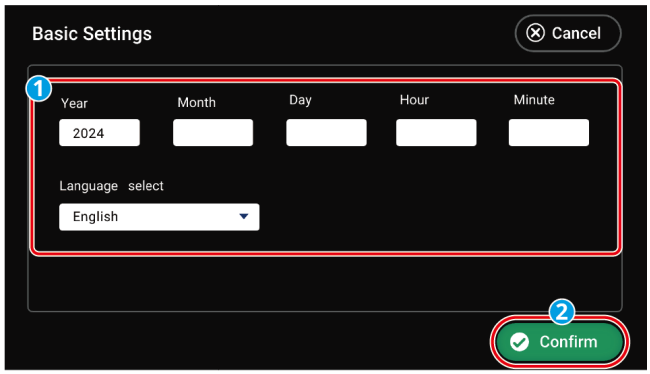


Function	Description	Remarks
One-click restart	One-click restart. Click the button to quickly restart the inverter.	After clicking the button, a confirmation dialog will pop up. Click "YES" to restart the device.
Reset Settings	Restore factory settings. Please operate with caution!	After clicking the button, a confirmation dialog will pop up. Click "YES" to restore factory settings.

Function	Description	Remarks
Battery Wake-up	Use this function to wake up the battery after it automatically shuts down due to undervoltage protection. After waking up, the battery port outputs approximately 60V. • ON：Enable battery wake-up function • OFF：Disable battery wake-up function	If there is a circuit breaker between the lithium battery and the inverter, ensure the circuit breaker is in the closed state.
Off-grid Switch	When enabled, the inverter will automatically start off-grid output after powering on. In off-grid state, turning the off-grid switch off and then on can clear the off-grid overload timer and restart off-grid output. • ON：Enable off-grid function • OFF：Disable off-grid function	Only effective in off-grid mode. This switch has no effect in grid-tied mode.
Shadow Scan	When PV panels are severely shaded, enabling the shadow scan function can optimize the inverter's power generation efficiency. • ON：Enable shadow scan function • OFF：Disable shadow scan function	-

8.3.4 Setting the Basic Information

1. From the main interface, click > Basic Settings to enter the parameter settings interface.
2. Please set the parameters according to the actual situation.
3. After setting is complete, please click Confirm. The interface will prompt Confirm OK, indicating that the parameter setting is successful.



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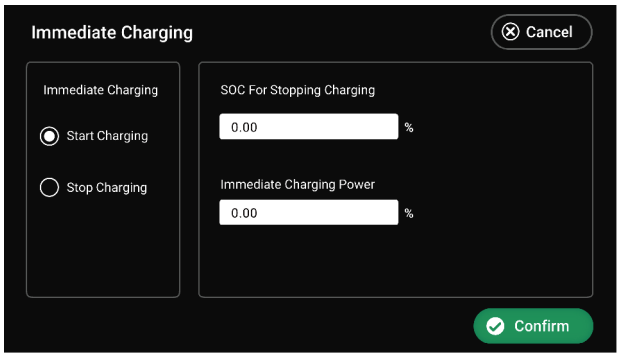
8.3.6 Setting Immediate Charging

1. From the main interface, click > Immediate Charging to enter the parameter setting interface.
2. Please set the parameters according to the actual situation.
3. After setting is completed, please click Confirm. When the interface prompts Confirm OK, the parameter setting is successful.



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Parameter Name	Description

Immediate Charging	When enabled, the battery is charged immediately from the grid. Takes effect only once. Please enable or stop it based on actual needs.
SOC For Stopping Charging	When Immediate Charging is enabled, charging stops when the battery SOC reaches the charging cutoff SOC.
Immediate Charging Power	The percentage of the charging power relative to the inverter's rated power when Immediate Charging is enabled. For example, for an inverter with a rated power of 10kW, setting this to 60 results in a charging power of 6kW.

8.3.7 Viewing Device Information

On the main interface, click ⚙ > Device Information to enter the parameter query interface.

- You can query the inverter serial number, DSP version, BMS version, LCD version, and ARM version.
- LCD Version: xx/xx indicates the MCU version/UI version.

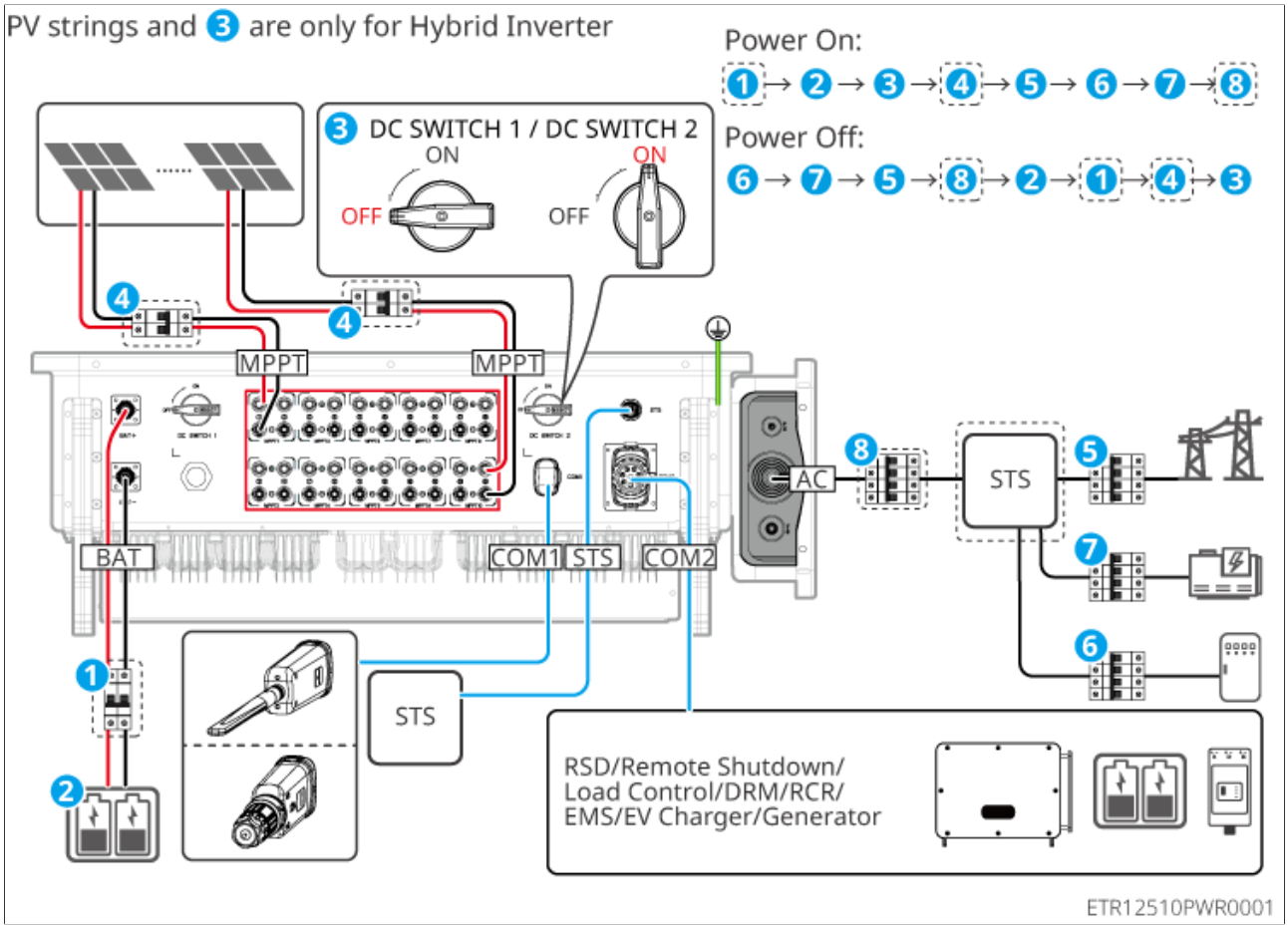
9 Maintenance

9.1 Inverter Shutdown

⚠DANGER

- When performing operation or maintenance on the inverter, please power it down. Operating equipment while energized may cause inverter damage or electric shock hazard.
- After the inverter is powered off, internal components require a certain amount of time to discharge. Please wait according to the label time requirement until the device is completely discharged.

1. Disconnect the AC circuit breaker connected to the load.
2. Disconnect the AC circuit breaker connected to the diesel generator.
3. Disconnect the AC circuit breaker connected to the grid.
4. (Optional) Disconnect the AC circuit breaker between the inverter and the STS.
5. Power down the battery system.
6. (Optional) Disconnect the DC circuit breaker between the inverter and the battery system.
7. (Optional) Disconnect the DC circuit breaker between the inverter and the PV system.
8. Rotate the DC switch on the inverter to the "OFF" position.



9.2 fault

NOTICE
The manual fault content is updated periodically, and there may be slight variations across different device models. Please refer to the real-time display on your device for specific information.

9.2.1 Viewing Fault/Alarms Information

All fault and alarm details of the energy storage system are displayed in the [SEMS+ App] and [SEMS+ WEB]. If your product is abnormal and you do not see related fault information in the [SEMS+ App] or [SEMS+ WEB], please contact the after-sales service center.

- SEMS+ App

1. Open the SEMS+ App and log in with any account.
2. Go to [power station] > [Alarms] to view all power station fault information.
3. Click on a specific fault name to view details such as the time of occurrence, possible causes, and solutions.

- SEMS+ WEB

1. Open SEMS+ WEB and log in with any account.
2. On the power station details interface, click [Alarms] to view all alarm information for the current power station.

9.2.2 Fault Information and Troubleshooting

Please perform troubleshooting according to the following methods. If the troubleshooting methods cannot help you, please contact the after-sales service center.
When contacting the after-sales service center, please collect the following information to facilitate a quick resolution.

1. Product information, such as: serial number, software version, device installation time, fault occurrence time, fault frequency, etc.
2. Device installation environment, such as: weather conditions, whether components are blocked, have shadows, etc. Providing photos, videos, and other files of the recommended installation environment can assist in problem analysis.
3. Grid conditions.

9.2.2.1 Troubleshooting (Fault Codes F01-F40)

Fault Code	Fault Name	Possible Causes	Recommended Actions
F01	Grid Power Outage	1. Grid power outage. 2. AC line or AC switch is disconnected.	1. The alarm will clear automatically after grid power is restored. 2. Check if the AC line or AC switch is disconnected.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F02	Grid Overvoltage Protection	Grid voltage is higher than the allowable range, or the duration of high voltage exceeds the HVRT setpoint.	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The Inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage is within the allowable range. If not, contact the local power operator. If it is, also modify the grid overvoltage protection point after obtaining consent from the local power operator. 3. If recovery is not possible for a long time, check if the AC-side circuit breaker and output cables are properly connected.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F03	Grid Undervoltage Protection	Grid voltage is lower than the allowable range, or the duration of low voltage exceeds the LVRT setpoint.	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The Inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage is within the allowable range. If not, contact the local power operator. If it is, also modify the grid undervoltage protection point after obtaining consent from the local power operator. 3. If recovery is not possible for a long time, check if the AC-side circuit breaker and output cables are properly connected.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F04	Grid Rapid Overvoltage Protection	Abnormal grid voltage detection or ultra-high voltage triggers the fault.	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The Inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage is within the allowable range. If not, contact the local power operator. If it is, also modify the grid undervoltage protection point after obtaining consent from the local power operator. 3. If recovery is not possible for a long time, check if the AC-side circuit breaker and output cables are properly connected.
F05	10min Overvoltage Protection	The moving average of grid voltage within 10min exceeds the range specified by safety regulations.	Check if the grid voltage has been operating at a high level for a long time. If it occurs frequently, check if the grid frequency is within the allowable range. If not, contact the local power operator. If it is, also modify the grid 10min overvoltage protection point after obtaining consent from the local power operator.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F06	Grid Overfrequency	Grid anomaly: The actual grid frequency is higher than the local grid standard requirement.	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The Inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, check if the grid frequency is within the allowable range. If not, contact the local power operator. If it is, also modify the grid overfrequency protection point after obtaining consent from the local power operator.
F07	Grid Underfrequency	Grid anomaly: The actual grid frequency is lower than the local grid standard requirement.	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The Inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, check if the grid frequency is within the allowable range. If not, contact the local power operator. If it is, also modify the grid overfrequency protection point after obtaining consent from the local power operator.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F08	Grid Frequency Instability	Grid anomaly: The rate of change of the actual grid frequency does not comply with the local grid standard.	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The Inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, check if the grid frequency is within the allowable range. If not, contact the local power operator.
F09	Anti-islanding Protection	The grid has been disconnected, but grid voltage is maintained due to the presence of loads. Grid connection is stopped according to safety regulation protection requirements.	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The Inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, check if the grid frequency is within the allowable range. If not, contact the local power operator.
F10	LVRT Undervoltage Fault	Grid anomaly: The duration of abnormal grid voltage exceeds the HVRT/LVRT specified time.	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The Inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage and frequency are within the allowable range and stable. If not, contact the local power operator.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F11	HVRT Overvoltage	Grid anomaly: The duration of abnormal grid voltage exceeds the HVRT/LVRT specified time.	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The Inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage and frequency are within the allowable range and stable. If not, contact the local power operator.
F12	30mA GFCI Protection	The insulation impedance of the input to ground becomes low during Inverter operation.	1. If it occurs occasionally, it may be caused by a temporary external line anomaly. It will resume normal operation after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or recovery is not possible for a long time, check if the PV string's impedance to ground is too low.
F13	60mA GFCI Protection	The insulation impedance of the input to ground becomes low during Inverter operation.	1. If it occurs occasionally, it may be caused by a temporary external line anomaly. It will resume normal operation after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or recovery is not possible for a long time, check if the PV string's impedance to ground is too low.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F14	150mA GFCI Protection	The insulation impedance of the input to ground becomes low during Inverter operation.	1. If it occurs occasionally, it may be caused by a temporary external line anomaly. It will resume normal operation after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or recovery is not possible for a long time, check if the PV string's impedance to ground is too low.
F15	GFCI Gradual Change Protection	The insulation impedance of the input to ground becomes low during Inverter operation.	1. If it occurs occasionally, it may be caused by a temporary external line anomaly. It will resume normal operation after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or recovery is not possible for a long time, check if the PV string's impedance to ground is too low.
F16	DCI Level 1 Protection	The DC component of the inverter output current is higher than the range allowed by safety regulations or the machine's default settings.	1. If it's caused by an external fault, the Inverter will automatically resume normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting normal power plant generation, contact the distributor or after-sales service center.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F17	DCI Level 2 Protection	The DC component of the inverter output current is higher than the range allowed by safety regulations or the machine's default settings.	1. If it's caused by an external fault, the Inverter will automatically resume normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting normal power plant generation, contact the distributor or after-sales service center.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F18	Low Insulation Resistance	1. PV string shorted to protective earth. 2. The PV string is installed in a consistently humid environment with poor line-to-ground insulation. 3. Low insulation impedance of the battery port lines to ground.	1. Check the impedance of the PV string/battery port to protective earth. A value greater than 80kΩ is normal. If the checked value is less than 80kΩ, locate and rectify the short circuit point. 2. Check if the Inverter's protective earth wire is correctly connected. 3. If it is confirmed that the impedance is indeed below the default value in rainy/overcast conditions, please reset the Inverter's "Insulation Impedance Protection Point" via the App. For Inverters in the Australian and New Zealand markets, the following additional alarm methods are available when an insulation impedance fault occurs: 1. The Inverter is equipped with a buzzer. When a fault occurs, the buzzer sounds continuously for 1 minute; if the fault is not resolved, the buzzer sounds again every 30 minutes. 2. If the Inverter is added to the monitoring platform and alarm notification methods are set, alarm information can be sent to the customer via email.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F19	Grounding Abnormal	1. The Inverter's protective earth wire is not connected. 2. When the PV string output is grounded, the Inverter output side is not connected to an isolation transformer.	1. Please confirm if the Inverter's protective earth wire is not properly connected. 2. In scenarios where the PV string output is grounded, please confirm if an isolation transformer is connected to the Inverter output side.
F20	Hard Anti-backfeed Protection	Abnormal load fluctuation	1. If it's caused by an external fault, the Inverter will automatically resume normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting normal power plant generation, contact the distributor or after-sales service center.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F21	Internal Comm Loss	Slave DSP1 communication timeout - Master DSP, Slave DSP2 communication timeout - Master DSP, Slave DSP2 communication timeout - Slave DSP1, Master DSP communication timeout - Slave DSP1, Master DSP communication timeout - Slave DSP2, or Slave DSP1 communication timeout - Slave DSP2: 1. Chip not powered on 2. Chip program version error	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the distributor or after-sales service center.

Fault Code	Fault Name	Possible Causes	Recommended Actions
		Master DSP can module error, Slave DSP1 can module error, or Slave DSP2 can module error: 1. Frame format error 2. Parity error 3. can bus offline 4. Hardware CRC error 5. Control bit is receive (transmit) during transmission (reception) 6. Transmission to a disallowed unit	
F22	Generator Waveform Detection Fault	1. This fault will be displayed continuously when no generator is connected; 2. When the generator is operating, this fault will be triggered if it does not meet generator safety regulations.	1. Ignore this fault if no generator is connected; 2. When this fault appears during a generator fault, it is normal. Wait for a while after the generator recovers, and the fault will clear automatically; 3. This fault does not affect the normal operation of off-grid mode. 4. When both generator and grid are connected and meet safety regulation requirements, the grid has priority for grid connection, and the system will operate in grid-connected state.
F23	Generator Abnormal Connection		
F24	Generator Low Voltage		
F25	Generator High Voltage		
F26	Generator Low Frequency		

Fault Code	Fault Name	Possible Causes	Recommended Actions
F27	Generator High Frequency		
F28	Parallel Unit I/O Self-check Abnormal	Parallel communication cable not securely connected or parallel unit IO chip damaged	Check if the parallel communication cable is securely connected, then check if the IO chip is damaged. If so, replace the IO chip.
F29	Paralell Grid Line Reversed	Grid lines of some units are reversed with others	Reconnect the grid lines correctly.
F30	AC HCT check Abnormal	AC sensor has sampling abnormality	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the distributor or after-sales service center.
F31	GFCI HCT Check Abnormal	Leakage current sensor has sampling abnormality	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the distributor or after-sales service center.
F32	Inverter Internal Failure	Inverter has a fault	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the distributor or after-sales service center.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F33	Flash Read/Write Error	Possible causes: flash content changed; flash end of life;	1. Upgrade to the latest firmware version. 2. Contact the distributor or after-sales service center.
F34	AFCI Check Failure	During the arc detection self-test, the arc detection module did not detect an arc fault as required.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the distributor or after-sales service center.
F35	Cabinet Overtemperature	Cabinet temperature is too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the ventilation at the Inverter installation location is good and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, improve its ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact the distributor or after-sales service center.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F36	Bus Overvoltage	BUS overvoltage, possible causes: 1. PV voltage too high; 2. Inverter BUS voltage sampling abnormal; 3. Poor isolation effect of the dual-split transformer at the Inverter output side, causing mutual interference when two inverters are connected in parallel, with one inverter reporting DC overvoltage during grid connection;	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the distributor or after-sales service center.
F37	PV Input Overvoltage	PV input voltage too high, possible cause: Incorrect PV array configuration, too many PV panels connected in series in a string, resulting in the string's open-circuit voltage being higher than the Inverter's maximum operating voltage	Check the series configuration of the corresponding PV array string to ensure the string's open-circuit voltage does not exceed the Inverter's maximum operating voltage. After the PV array configuration is corrected, the Inverter alarm will clear automatically.

Fault Code	Fault Name	Possible Causes	Recommended Actions
F38	PV Continuous Hardware Overcurrent	1. Unreasonable component configuration 2. Hardware damage	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the distributor or after-sales service center.
F39	PV Continuous Software Overcurrent	1. Unreasonable component configuration 2. Hardware damage	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the distributor or after-sales service center.
F40, F98	String Reverse Polarity (String 1-n) n: determined based on the actual number of Inverter strings	PV string reverse polarity	Check if the string is reverse connected.

9.2.2.2 Troubleshooting (Fault Codes F41-F80)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F41	Generator Port Overload	1. Off-grid side output exceeds specifications. 2. Off-grid side short circuit. 3. Off-grid terminal voltage is too low. 4. When used as a large load port, the large load exceeds specifications.	Confirm the off-grid side output voltage, current, power, and other data to identify the cause of the issue.
F42	DC Arcing Failure (String 1-n) n: Determined based on the actual number of inverter strings.	1. Loose DC side connection terminals. 2. Poor connection at DC side terminals. 3. Damaged DC cable core with poor connection.	1. After the unit reconnects to the grid, check if the voltage and current of each circuit abnormally decrease or drop to zero. 2. Check if the DC side terminals are securely connected.
F43	Grid Waveform Abnormal	Utility grid abnormality: Abnormal utility grid voltage detection triggers the fault.	1. If it occurs occasionally, it may be due to a short-term grid anomaly. The inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, please check if the utility grid voltage and frequency are within the allowable range and stable. If not, please contact the local power operator.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F44	Grid Phase Loss	Utility grid abnormality: Single-phase voltage dip in the utility grid.	1. If it occurs occasionally, it may be due to a short-term grid anomaly. The inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, please check if the utility grid voltage and frequency are within the allowable range and stable. If not, please contact the local power operator.
F45	Grid Voltage Imbalance	Excessive difference in grid phase voltages.	1. If it occurs occasionally, it may be due to a short-term grid anomaly. The inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, please check if the utility grid voltage and frequency are within the allowable range and stable. If not, please contact the local power operator.
F46	Grid Phase Sequence Failure	Inverter and grid wiring abnormality: Wiring is not in positive sequence.	1. Check if the inverter and grid wiring are in positive sequence. The fault will automatically disappear after correct wiring (e.g., swapping any two live wires). 2. If the fault persists despite correct wiring, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F47	Grid Rapid Shutdown Protection	Quickly shuts down output after detecting a grid power outage condition.	The fault automatically disappears after grid power supply is restored.
F48	Grid Neutral Wire Loss (Split grid)	Neutral wire loss in a split-phase grid.	1. The alarm automatically disappears after grid power supply is restored. 2. Check if the AC line or AC switch is disconnected.
F49	L-PE Short Circuit	Low impedance or short circuit between output phase line and PE.	Measure the impedance between the output phase line and PE, locate the point with low impedance and repair it.
F50	DCV Primary Protection	Abnormal load fluctuation.	1. If caused by an external fault, the inverter will automatically resume normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting normal power generation, please contact the dealer or after-sales service center.
F51	DCV Secondary Protection	Abnormal load fluctuation.	
F52	Leakage current (GFCI) Multiple Fault Shutdown	North American safety regulations require manual recovery or waiting 24h after multiple faults, no automatic recovery.	Please check if the PV string-to-ground impedance is too low.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F53	DC Arcing (AFCI) Multiple Fault Shutdown	North American safety regulations require manual recovery or waiting 24h after multiple faults, no automatic recovery.	1. After the unit reconnects to the grid, check if the voltage and current of each circuit abnormally decrease or drop to zero. 2. Check if the DC side terminals are securely connected.
F54	External Communication Link Broken	Inverter external device communication lost, possibly due to peripheral power supply issues, communication protocol mismatch, or not configured for the corresponding peripheral.	Determine based on the actual model and detection enable bits. Peripherals not supported by certain models will not be detected.
F55	Back-up Port Overload Fault	Prevents the inverter from continuously outputting overload.	Turn off some off-grid loads to reduce the inverter's off-grid output power.
F56	Back-up Port Overvoltage Fault	Prevents inverter output overvoltage from damaging loads.	1. If it occurs occasionally, it may be caused by load switching and requires no manual intervention. 2. If it occurs frequently, please contact the dealer or after-sales service center.
F57	External Box Fault	Waiting too long for the Box relay to switch during grid-to-off-grid transition.	1. Check if the Box is functioning normally. 2. Check if the Box communication wiring is correct.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F58	CT Loss Fault	CT connection wire disconnected (Japanese safety regulation requirement).	Check if the CT wiring is correct.
F59	Parallel CAN Communication Abnormal	Parallel communication cable not securely connected or some units are offline.	Check if all units are powered on and if the parallel communication cables are securely connected.
F60	Parallel Back-up Connection Reversed	Some units' backup lines are reversed with others.	Reconnect the backup lines.
F61	Inverter Soft Start Failure	Inverter soft start failure during off-grid cold start.	Check if the inverter module is damaged.
F62	AC HCT Failure	HCT sensor abnormality.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F63	GFCI HCT Failure	Leakage current sensor abnormality.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F64	Inverter Internal Failure	Inverter fault present.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F65	AC Terminal Overtemperature	AC terminal temperature too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature too high. 3. Internal fan operation abnormal.	1. Check if the inverter installation location has good ventilation and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are both normal, please contact the dealer or after-sales service center.
F66	INV Module Overtemperature	Inverter module temperature too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature too high. 3. Internal fan operation abnormal.	1. Check if the inverter installation location has good ventilation and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are both normal, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F67	Boost Module Overtemperature	Boost module temperature too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature too high. 3. Internal fan operation abnormal.	1. Check if the inverter installation location has good ventilation and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are both normal, please contact the dealer or after-sales service center.
F68	AC Capacitor Overtemperature	Output filter capacitor temperature too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature too high. 3. Internal fan operation abnormal.	1. Check if the inverter installation location has good ventilation and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are both normal, please contact the dealer or after-sales service center.
F69	PV IGBT Short Circuit Fault	Possible causes: 1. IGBT short circuit. 2. Inverter sampling circuit abnormal.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F70	PV IGBT Open Circuit Fault	1. Software issue causing no PWM generation. 2. Drive circuit abnormal. 3. IGBT open circuit.	
F71	NTC Abnormal	NTC temperature sensor abnormal.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F72	PWM Abnormal	PWM abnormal waveform present.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F73	CPU Interrupt Abnormal	CPU interrupt abnormal.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F74	Microelectronics Fault	Functional safety detection detected an abnormality.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F75	PV HCT Fault	boost current sensor abnormal.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F76	1.5V Reference Abnormal	Reference circuit fault.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F77	0.3V Reference Abnormal	Reference circuit fault.	
F78	CPLD Version Identification Error	CPLD version identification error.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F79	CPLD Communication Fault	CPLD and DSP communication content error or timeout.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F80	Model Identification Fault	Fault regarding model identification error.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

9.2.2.3 Troubleshooting (Fault Codes F81-F121)

Fault Code	Fault Name	Possible Cause	Troubleshooting Suggestion
F81	P-Bus Overvoltage	BUS overvoltage, possible causes: 1. PV voltage too high; 2. Inverter BUS voltage sampling abnormal; 3. Poor isolation effect of the dual-split transformer at the inverter output, causing mutual interference when two inverters are grid-tied, with one inverter reporting DC overvoltage during grid connection;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F82	N-Bus Overvoltage		
F83	Bus Overvoltage (Sub CPU1)		Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F84	P-Bus Overvoltage (Sub CPU1)		

Fault Code	Fault Name	Possible Cause	Troubleshooting Suggestion
F85	N-Bus Overvoltage (Sub CPU1)	BUS overvoltage, possible causes: 1. PV voltage too high; 2. Inverter BUS voltage sampling abnormal; 3. Poor isolation effect of the dual-split transformer at the inverter output, causing mutual interference when two inverters are grid-tied, with one inverter reporting DC overvoltage during grid connection;	
F86	Bus Overvoltage (Sub CPU2)		Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F87	P-Bus Overvoltage (Sub CPU2)		

Fault Code	Fault Name	Possible Cause	Troubleshooting Suggestion
F88	N-Bus Overvoltage (Sub CPU2)	BUS overvoltage, possible causes: 1. PV voltage too high; 2. Inverter BUS voltage sampling abnormal; 3. Poor isolation effect of the dual-split transformer at the inverter output, causing mutual interference when two inverters are grid-tied, with one inverter reporting DC overvoltage during grid connection;	
F89	P-Bus Overvoltage(CPLD)		Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Suggestion
F90	N-Bus Overvoltage(CPLD)	BUS overvoltage, possible causes: 1. PV voltage too high; 2. Inverter BUS voltage sampling abnormal; 3. Poor isolation effect of the dual-split transformer at the inverter output, causing mutual interference when two inverters are grid-tied, with one inverter reporting DC overvoltage during grid connection;	
F91	FlyCap Software Overvoltage	FlyCap overvoltage, possible causes: 1. PV voltage too high; 2. Inverter FlyCap voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F92	FlyCap Hardware Overvoltage		

Fault Code	Fault Name	Possible Cause	Troubleshooting Suggestion
F93	FlyCap Undervoltage	FlyCap undervoltage, possible causes: 1. PV energy insufficient; 2. Inverter FlyCap voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F94	FlyCap Precharge Failure	FlyCap precharge failure, possible causes: 1. PV energy insufficient; 2. Inverter FlyCap voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F95	FlyCap Precharge Abnormal	1. Control loop parameters unreasonable 2. Hardware damaged	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F96, F97	String Overcurrent(String1-n) n: Determined by the actual number of inverter strings	Possible causes: 1. String overcurrent; 2. String current sensor abnormal	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Suggestion
F99, F100	String Loss(String1-n) n: Determined by the actual number of inverter strings	String fuse blown (if present)	Check if the fuse is blown.
F101	Battery1 Precharge Fault	Battery1 precharge circuit fault (precharge resistor burnt, etc.)	Check if the precharge circuit is in good condition, check if the battery voltage matches the bus voltage after only the battery is powered on. If not consistent, please contact the dealer or after-sales service center.
F102	Battery1 Relay Failure	Battery1 relay cannot operate normally	After powering on the battery, check if the battery relay is working, listen for a closing sound. If it does not operate, please contact the dealer or after-sales service center.
F103	Battery1 Connection Overvoltage	Battery1 connection voltage exceeds the machine's rated range	Confirm if the battery voltage is within the machine's rated range.
F104	Battery2 Precharge Fault	Battery2 precharge circuit fault (precharge resistor burnt, etc.)	Check if the precharge circuit is in good condition, check if the battery voltage matches the bus voltage after only the battery is powered on. If not consistent, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Suggestion
F105	Battery2 Relay Failure	Battery2 relay cannot operate normally	After powering on the battery, check if the battery relay is working, listen for a closing sound. If it does not operate, please contact the dealer or after-sales service center.
F106	Battery2 Connection Overvoltage	Battery2 connection voltage exceeds the machine's rated range	Confirm if the battery voltage is within the machine's rated range.
F107	On-grid PWM Sync Failure	Abnormal during carrier synchronization grid connection	1. Check if the sync line connection is normal 2. Check if the master/slave settings are normal; 3. Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F108	DSP Communication Fault	-	-
F109	External STS Fault	Abnormal cable connection between inverter and STS	Check if the wiring sequence of the harness between the inverter and the STS is correctly matched one-to-one.

Fault Code	Fault Name	Possible Cause	Troubleshooting Suggestion
F110	Export Limit Protection	1. Inverter reports error and disconnects from grid 2. meter communication unstable 3. Reverse power flow condition occurs	1. Check if the inverter has other error messages. If yes, handle them accordingly; 2. Check if the meter connection is reliable; 3. If this alarm occurs frequently, affecting normal power plant generation, please contact the dealer or after-sales service center.
F111	Bypass Overload	-	-
F112	Black Start Failure	-	-
F113	Offgrid AC Ins Volt High	-	-
F114	Relay Failure2	Relay abnormal, causes: 1. Relay abnormal (relay short circuit) 2. Relay sampling circuit abnormal. 3. AC side wiring abnormal (possible loose connection or short circuit)	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F115	SVG Precharge Disabled	SVG precharge hardware failure	Contact the dealer or after-sales service center.
F116	Nighttime SVG PID Prevention Fault	PID prevention hardware abnormal	

Fault Code	Fault Name	Possible Cause	Troubleshooting Suggestion
F117	DSP Version Identification Error	DSP software version identification error	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F118	MOS Continuous Overvoltage	1. Software issue causing inverter drive to turn off earlier than flyback drive: 2. Inverter drive circuit abnormal causing failure to turn on: 3. PV voltage too high; 4. Mos voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F119	Bus Short Circuit Fault	Hardware damaged	If the BUS short circuit fault occurs and the inverter remains off-grid, please contact the dealer or after-sales service center.
F120	Bus Sampling Abnormal	1. BUS voltage sampling hardware fault	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Suggestion
F121	DC Side Sampling Abnormal	1. BUS voltage sampling hardware fault 2. Battery voltage sampling hardware fault 3. Dcrly relay failure	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

9.2.2.4 Troubleshooting (Fault Code F122-F163)

Fault Code	Fault Name	Fault Cause	Troubleshooting Suggestion
F122	PV Access Mode Setting Error	There are three modes for PV access. Taking four MPPTs as an example: 1. Parallel Mode: i.e., AAAA mode (same-source mode), PV1-PV4 are from the same source, the 4 PV strings are connected to the same solar panel. 2. Partial Parallel Mode: i.e., AACC mode, PV1 and PV2 are connected from the same source, PV3 and PV4 are connected from the same source. 3. Independent Mode: i.e., ABCD mode (non-same-source), PV1, PV2, PV3, PV4 are connected independently, each of the 4 PV strings is connected to one solar panel. This fault is reported if the actual PV	Check if the PV access mode is set correctly (ABCD, AACC, AAAA), and reset the PV access mode correctly. 1. Confirm that the actual connected PV strings are correctly wired. 2. If the PV strings are correctly connected, check via the APP or screen whether the currently set "PV Access Mode" corresponds to the actual connection mode. 3. If the currently set "PV Access Mode" does not match the actual connection mode, use the APP or screen to set the "PV Access Mode" to the mode consistent with the actual situation. After setting, disconnect the PV and AC power supply and restart. 4. After setting, if the current "PV Access Mode" matches the actual connection mode but this fault is still reported, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Suggestion
		connection mode does not match the PV access mode set on the device.	
F123	Multiple PV String Phase Error	PV Input Mode Setting Error	Check if the PV access mode is set correctly (ABCD, AACC, AAAA), and reset the PV access mode correctly. 1. Confirm that the actual connected PV strings are correctly wired. 2. If the PV strings are correctly connected, check via the APP or screen whether the currently set "PV Access Mode" corresponds to the actual connection mode. 3. If the currently set "PV Access Mode" does not match the actual connection mode, use the APP or screen to set the "PV Access Mode" to the mode consistent with the actual situation. After setting, disconnect the PV and AC power supply and restart. 4. After setting, if the current "PV Access Mode" matches the actual connection mode but this fault is still reported, please contact the dealer or after-sales service center.
F124	Battery 1 Reverse Polarity fault	Battery 1 positive and negative terminals are reversed	Check if the polarities of the battery and the machine's terminals are consistent.

Fault Code	Fault Name	Fault Cause	Troubleshooting Suggestion
F125	Battery 2 Reverse Polarity fault	Battery 2 positive and negative terminals are reversed	Check if the polarities of the battery and the machine's terminals are consistent.
F126	Abnormal Battery Connection	Abnormal Battery Connection	Check if the battery is working normally.
F127	BAT Overtemperature	Battery temperature is too high. Possible causes: 1. The inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	Disconnect the AC output side switch and the DC input side switch. After 5 minutes, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F128	Ref Voltage Abnormal	Reference circuit fault	Disconnect the AC output side switch and the DC input side switch. After 5 minutes, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F129	Cabinet Under Temperature	Cabinet temperature is too low. Possible cause: ambient temperature is too low.	Disconnect the AC output side switch and the DC input side switch. After 5 minutes, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Suggestion
F130	AC Side SPD fault	AC side surge protective device failure	Replace the AC side surge protective device.
F131	DC Side SPD fault	DC side surge protective device failure	Replace the DC side surge protective device.
F132	Internal Fan Abnormal	Internal fan abnormal. Possible causes: 1. Fan power supply abnormal. 2. Mechanical fault (stall). 3. Fan aging or damage.	Disconnect the AC output side switch and the DC input side switch. After 5 minutes, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F133	External Fan Abnormal	External fan abnormal. Possible causes: 1. Fan power supply abnormal. 2. Mechanical fault (stall). 3. Fan aging or damage.	
F134	PID Diagnosis Abnormal	PID hardware fault or PID paused due to high PV voltage	The warning caused by high PV voltage and PID pause requires no action. For PID hardware fault, clear the PID fault by turning the PID switch off and then on, and replace the PID device.

Fault Code	Fault Name	Fault Cause	Troubleshooting Suggestion
F135	Trip-Switch Trip Warning	Possible causes: Overcurrent or PV reverse polarity caused the trip-switch to trip.	Contact the dealer or after-sales service center. The tripping reason is PV short circuit or reverse connection. Check if there is a historical PV short circuit warning or historical PV reverse polarity warning. If present, maintenance personnel need to check the corresponding PV condition. After checking and confirming no fault, you can manually close the trip-switch and clear this warning via the APP interface's clear historical fault operation.
F136	Historical PV IGBT Short Circuit Warning	Possible causes: Overcurrent caused the trip-switch to trip.	Contact the dealer or after-sales service center. Maintenance personnel need to check the Boost hardware and the external string for faults according to the historical PV short circuit warning subcode. After checking and confirming no fault, you can clear this warning via the APP interface's clear historical fault operation.

Fault Code	Fault Name	Fault Cause	Troubleshooting Suggestion
F137, F138	Historical PV Reverse Polarity Warning (String 1-n) (n: determined by the actual number of inverter strings)	Possible causes: PV reverse polarity caused the trip-switch to trip.	Contact the dealer or after-sales service center. Maintenance personnel need to check the corresponding string for reverse connection and check for voltage difference in PV panel configuration according to the historical PV reverse polarity warning subcode. After checking and confirming no fault, you can clear this warning via the APP interface's clear historical fault operation.
F139	Flash Read/Write Error Warning	Possible causes: 1. Flash content changed. 2. Flash lifespan exhausted.	1. Upgrade to the latest firmware. 2. Contact the dealer or after-sales service center.
F140	Meter Comm Loss	This warning may only be reported after enabling the anti-backflow function. Possible causes: 1. Meter not connected. 2. Communication cable connection between the meter and the inverter is incorrect.	Check the meter wiring and connect the meter correctly. If the fault persists after checking, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Suggestion
F141	PV Panel Type Identification Failure	PV panel identification hardware abnormal	Contact the dealer or after-sales service center.
F142	PV String Mismatch	PV string mismatch, two strings under the same MPPT have different open-circuit voltage configurations	Check the open-circuit voltage of the two strings. Configure strings with the same open-circuit voltage under the same MPPT. Long-term string mismatch poses a safety risk.
F143	CT Not Connected	CT not connected	Check the CT wiring.
F144	CT Reverse Connection	CT reverse connection	Check the CT wiring.
F145	PE Loss	Ground wire not connected	Check the ground wire.
F146	String Terminal High Temperature (String 1~8)	Register 37176 PV terminal temperature alarm subcode 1 is set	-
F147	String Terminal High Temperature (String 9~16)	Register 37177 PV terminal temperature alarm subcode 2 is set	-
F148	String Terminal High Temperature (String 17~20)	Register 37178 PV terminal temperature alarm subcode 3 is set	-

Fault Code	Fault Name	Fault Cause	Troubleshooting Suggestion
F149	Historical PV Reverse Polarity Warning (String 33~48)	Possible causes: PV reverse polarity caused the trip-switch to trip.	Contact the dealer or after-sales service center. Maintenance personnel need to check the corresponding string for reverse connection and check for voltage difference in PV panel configuration according to the historical PV reverse polarity warning subcode. After checking and confirming no fault, you can clear this warning via the APP interface's clear historical fault operation.
F150	Battery 1 Low Voltage	Battery voltage is below the set value	-
F151	Battery 2 Low Voltage	Battery voltage is below the set value	-
F152	Low Voltage of Battery Power	Battery in non-charging mode, voltage below shutdown voltage	-
F153	Battery 1 High Voltage	-	-
F154	Battery 2 High Voltage	-	-

Fault Code	Fault Name	Fault Cause	Troubleshooting Suggestion
F155	Online Low Insulation Resistance	1. Photovoltaic string short-circuited to protective earth. 2. The photovoltaic string is installed in a long-term humid environment with poor line-to-ground insulation.	1. Check the impedance of the photovoltaic string to protective earth. If a short circuit is found, rectify the short circuit point. 2. Check if the inverter's protective earth wire is correctly connected. 3. If it is confirmed that the impedance is indeed below the default value in rainy weather conditions, please reset the "Insulation Resistance Protection Point".
F156	Micro-grid Overload Warning	backup terminal input current is too high	Occasional occurrence requires no action; if this alarm occurs frequently, please contact the dealer or after-sales service center.
F157	Manual Reset	-	-
F158	Generator Phase Sequence Abnormal	-	-
F159	Multiplexed Port Configuration Abnormal	Multiplexed (generator) port is configured as micro-grid or large load, but a generator is actually connected	Use the APP to change the multiplexed (generator) port configuration.
F160	EMS Forced Off-grid	EMS issued a forced off-grid command, but the off-grid function is not enabled	Enable the off-grid function.

Fault Code	Fault Name	Fault Cause	Troubleshooting Suggestion
F161	Passive Anti-islanding Protection	-	-
F162	Grid Type Fault	Actual grid type (two-phase or split-phase) does not match the set safety standard	Switch to the corresponding safety standard according to the actual grid type.
F163	Grid Phase Instability	Grid abnormal: The rate of change of grid voltage phase does not comply with local grid standards.	1. If it occurs occasionally, it may be a temporary grid abnormality. The inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid frequency is within the allowable range. If not, please contact the local power operator.

9.2.2.5 Fault Symptom Handling

Fault Name	Fault Cause	Troubleshooting Suggestion
Generator Failure	1. This fault will be displayed continuously when no generator is connected. 2. When the generator is operating, this fault will be triggered if generator safety regulations are not met.	1. If no generator is connected, ignore this fault; 2. If this fault appears when the generator malfunctions, it is normal. Wait for a period after the generator recovers, and the fault will clear automatically; 3. This fault does not affect the normal operation of off-grid mode. 4. When both the generator and the grid are connected and meet safety requirements, the grid has priority for grid-connection, and the system will operate in grid-tied mode.
BMS Status Bit Error	BMS module failure	Turn off the AC output side switch and DC input side switch, wait for 5 minutes, then turn them back on. If the fault persists, please contact the distributor or after-sales service center.
Ambient Overtemperature	1. Poor machine ventilation 2. Hot air flow back to the ambient temperature sampling point	Turn off the AC output side switch and DC input side switch, wait for 5 minutes, then turn them back on. If the fault persists, please contact the distributor or after-sales service center.
PV Terminal Overtemperature	PV terminal overtemperature, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the ventilation at the inverter installation location is adequate and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, please improve ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, please contact the distributor or after-sales service center.

Fault Name	Fault Cause	Troubleshooting Suggestion
BAT Terminal Overtemperature	BAT terminal overtemperature, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high.	1. Check if the ventilation at the inverter installation location is adequate and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, please improve ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, please contact the distributor or after-sales service center.
AC Terminal Overtemperature Warning	AC terminal overtemperature, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	
BAT Terminal Overtemperature Warning	BAT terminal overtemperature, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high.	1. Check if the ventilation at the inverter installation location is adequate and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, please improve ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, please contact the distributor or after-sales service center.
Three-phase on-grid fault	Three-phase external wiring error	Re-wire the connections.

Fault Name	Fault Cause	Troubleshooting Suggestion
External STS Failure	Abnormal cable connection between inverter and STS	Check if the wiring sequence of the harness between the inverter and the STS corresponds one-to-one in order.

Fault Name	Fault Cause	Troubleshooting Recommendation
Parallel Comm Timeout Shutdown	In parallel operation, if a slave unit has not communicated with the master for over 400 seconds	Check if the parallel communication harness is securely connected. Check for duplicate slave addresses.
Three-phase off-grid phase loss fault	Phase loss in a three-phase system group	1. Check if all inverters are powered on; 2. Check if each phase of the three-phase group is connected to an inverter;
EPO	External hardware EPO button triggered or remote EPO command triggered	1. If triggered remotely on purpose, it can be ignored; 2. If not triggered on purpose, please contact the dealer or after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendation
High Combustible Gas Concentration	Automatically triggered when the combustible gas device detects a concentration of 20% LEL or higher	1. After the fault occurs, the machine will automatically open the air damper to exhaust and reduce the concentration. The fault will automatically clear after the concentration remains below 5% LEL for 15 minutes. 2. If a cluster-level fire protection fault is triggered after this fault occurs, the air damper will automatically close. Confirm the damper status within 30s to ensure cluster-level fire protection operates in a sealed space. 3. Please contact the dealer or after-sales service center.
Combustible Gas Device Air Damper Open Signal Mismatch with Feedback	Mismatch between the control signal to open the air damper and the feedback signal	1. Check the harness signal connection for issues. 2. Please contact the dealer or after-sales service center.
One-Key Shutdown	Check via the App if the one-key shutdown function is enabled	Disable the one-key shutdown.
Offline Shutdown	-	-
Remote Shutdown	-	-

Fault Name	Fault Cause	Troubleshooting Recommendation
On-Grid SPD Fault	-	1. Try restarting the machine and observe if the fault clears; 2. If the fault persists after restarting, please contact the dealer or after-sales service center.
Off-Grid SPD Fault	-	1. Try restarting the machine and observe if the fault clears; 2. If the fault persists after restarting, please contact the dealer or after-sales service center.
Child Node Communication Failure	Internal Comm Abnormal	1. Try restarting the machine and observe if the fault clears; 2. If the fault persists after restarting, please contact the dealer or after-sales service center.
Dehumidifier Communication Fault	Abnormal communication link between the dehumidifier and the LC control box	1. Check the link communication harness and observe if the fault clears; 2. Try restarting the machine and observe if the fault clears; 3. If the fault persists after restarting, please contact the dealer or after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendation
Combustible Gas Detection Device Communication Fault	1. The combustible gas device was not properly configured with the 485 address set to 2 during factory setup. 2. Abnormal communication link between the combustible gas device and the LC control box	1. Check the link communication harness and observe if the fault clears; 2. Try restarting the machine and observe if the fault clears; 3. Use the method provided by the combustible gas manufacturer to check if the device address is 2. If not, modify it; 4. If the fault persists after restarting, please contact the dealer or after-sales service center.
DG Communication Failure	Abnormal communication link between the control board and the diesel generator (DG)	1. Check the link communication harness and observe if the fault clears; 2. Try restarting the machine and observe if the fault clears; 3. If the fault persists after restarting, please contact the dealer or after-sales service center.
Battery Over Voltage	1. Single cell voltage too high 2. Voltage sensing line abnormal	Record the fault phenomenon, restart the battery, wait a few minutes, and confirm if the fault disappears. If the problem persists after restarting, please contact the after-sales service center.
	1. Total battery voltage too high 2. Voltage sensing line abnormal	
Battery Undervoltage	1. Single cell voltage too low 2. Voltage sensing line abnormal	

Fault Name	Fault Cause	Troubleshooting Recommendation
	1. Total battery voltage too low 2. Voltage sensing line abnormal	
Battery Overcurrent	1. Charging current too high, battery current limiting abnormal: sudden change in temperature and voltage values 2. Inverter response abnormal	
	Battery discharge current too high	
Battery Overtemperature	1. Ambient Overtemperature 2. Temperature sensor abnormal	
Battery Undertemperature	1. Ambient temperature too low 2. Temperature sensor abnormal	
Battery Terminal Overtemperature	Terminal temperature too high	

Fault Name	Fault Cause	Troubleshooting Recommendation
Battery Imbalance	1. Large temperature difference. At different stages, the battery will limit its power, i.e., limit charge/discharge current. Therefore, this issue is generally difficult to occur. 2. Cell capacity degradation, leading to excessive internal resistance, causing large temperature rise during high current, resulting in large temperature difference. 3. Poor welding of cell tabs, causing rapid temperature rise during high current. 4. Temperature sampling issue; 5. Power line connection loose	

Fault Name	Fault Cause	Troubleshooting Recommendation
	1. Inconsistent cell aging levels 2. Slave board chip issues can also cause excessive cell voltage difference; 3. Slave board balancing issues can also cause excessive cell voltage difference 4. Caused by harness issues	
Insulation Resistance	Insulation resistance damaged	Check if the ground wire is properly connected, restart the battery. If the problem persists after restarting, please contact the after-sales service center.
Pre-charging Failure	Pre-charging Failure	Indicates that during pre-charging, the voltage across the pre-charge MOS always exceeds the specified threshold. After powering off and restarting, observe if the fault persists. Check if wiring is correct and if the pre-charge MOS is damaged.
Sensing Line Fault	Battery sensing line poor contact or disconnected	Check wiring, restart the battery. If the problem persists after restarting, please contact the after-sales service center.
	Cell voltage sensing line poor contact or disconnected	Check wiring, restart the battery. If the problem persists after restarting, please contact the after-sales service center.
	Cell temperature sensing line poor contact or disconnected	

Fault Name	Fault Cause	Troubleshooting Recommendation
	Dual-channel current comparison error too large, or current sensing line loop abnormal	
	Dual-channel voltage comparison error too large, or MCU and AFE voltage comparison error too large, or voltage sensing line loop abnormal	
	Temperature sensing line loop abnormal or poor contact/disconnected	
	Overvoltage level 5 or overtemperature level 5, tripping the three-terminal fuse	Three-terminal fuse tripped. Please contact the after-sales service center to replace the main control board.
Relay or MOS Overtemperature	Relay or MOS overtemperature	This fault indicates the MOS tube temperature exceeds the specified threshold. Power off and let it cool for 2 hours.
Shunt Overtemperature	Shunt overtemperature	This fault indicates the shunt temperature exceeds the specified threshold. Power off and let it cool for 2 hours.
BMS1 Other Fault 1 (Residential Storage)	Relay or MOS open circuit	1. Upgrade software, power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If it persists, replace the battery pack.

Fault Name	Fault Cause	Troubleshooting Recommendation
	Relay or MOS short circuit	1. Upgrade software, power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If it persists, replace the battery pack.
	Communication abnormal between master and slave racks, or cell inconsistency between racks	1. Check the slave battery information, software version, and if the communication cable connection to the master is normal. 2. Upgrade software.
	Battery system loop harness abnormal, causing the interlock signal not to form a loop	Check if the terminal resistor is installed correctly.
	BMS and PCS communication abnormal	1. Confirm if the communication cable interface definition between the inverter and the battery is correct; 2. Please contact the after-sales service center to check backend data and observe if the inverter and battery software match correctly.
	BMS master and slave control communication harness abnormal	1. Check wiring, restart the battery; 2. Upgrade the battery software. If the problem persists after restarting, please contact the after-sales service center.
	Communication loss between main and negative chips	

Fault Name	Fault Cause	Troubleshooting Recommendation
	Circuit breaker, shunt trip abnormal	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. Check if the communication pins on the PACK and PCU bottom blind-mate connectors are loose or misaligned;
	MCU self-test failure	Upgrade software, restart the battery. If the problem persists after restarting, please contact the after-sales service center.
	1. Software version too low or BMS board damaged 2. Large number of parallel inverters, causing excessive inrush current during battery pre-charge	1. Upgrade software, observe if the fault persists. 2. For parallel systems, black-start the battery first, then start the inverters.
	MCU internal fault	Upgrade software, restart the battery. This usually indicates MCU or external component damage. If the problem persists after restarting, please contact the after-sales service center.
	Total control current exceeds specified threshold	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. Check if the inverter power setting is too high, exceeding the bus load;
	Inconsistent cell types in parallel racks	Confirm if the cell types in the parallel battery racks are consistent.

Fault Name	Fault Cause	Troubleshooting Recommendation
	Reverse polarity connection of parallel racks	Check if the positive and negative terminals of the parallel battery racks are reversed.
	Severe overtemperature/overvoltage etc. triggering the fire protection system	Contact the after-sales service center.
Air Conditioner Failure	Air conditioner abnormal failure	Try restarting the system. If the fault is not resolved, please contact the after-sales service center.
	Cabinet door not closed	Check if the cabinet door is properly closed.
	Supply voltage too high	Confirm if the supply voltage meets the air conditioner input voltage requirements. Confirm compliance before reapplying power.
	Insufficient supply voltage	
	No voltage input	
	Unstable supply voltage	
	Compressor voltage unstable	Try restarting the system. If the fault is not resolved, please contact the after-sales service center.
	Sensor poor contact or damaged	
	Air conditioner fan abnormal	
	DCDC internal voltage or current abnormal	Refer to specific DC fault details.

Fault Name	Fault Cause	Troubleshooting Recommendation
BMS1 Other Fault 2 (Residential Storage)	DCDC overload or heatsink temperature too high, etc.	
	Cell sensing abnormal or inconsistent aging levels	Please contact the after-sales service center.
	Fan operation not executed normally	Please contact the after-sales service center.
	Output terminal screws loose or poor contact	1. Power off the battery, check wiring and output terminal screw condition. 2. After confirmation, restart the battery and observe if the fault persists. If it persists, please contact the after-sales service center.
	Battery used for too long or cells severely damaged	Please contact the after-sales service center to replace the pack.
	1. Software version too low or BMS board damaged 2. Large number of parallel inverters, causing excessive inrush current during battery pre-charge	1. Upgrade software, observe if the fault persists. 2. For parallel systems, black-start the battery first, then start the inverters.
	Heating film damaged	Please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendation
	Heating film three-terminal fuse blown, heating function unavailable	Please contact the after-sales service center.
	Software model, Cell Type, hardware model mismatch	Check if the software model, SN, Cell Type, and hardware model are consistent. If not, please contact the after-sales service center.
	Thermal management board communication line break	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If the fault does not recover, contact after-sales to replace the pack.
	Pack fan fault signal triggered	
DCDC Fault	Output port voltage too high	Check the output port voltage. If the output port voltage is normal and the fault does not clear itself after restarting the battery, please contact the after-sales service center.
	DCDC module detects battery voltage exceeding maximum charging voltage	Stop charging, discharge to below 90% SOC or let it sit for 2 hours. If ineffective and the fault persists after restarting, please contact the after-sales service center.
	Heatsink temperature too high	Let the battery sit for 1 hour for the heatsink temperature to drop. If ineffective and the fault persists after restarting, please contact the after-sales service center.
	Battery discharge current too high	Check if the load exceeds the battery's discharge capability. Turn off the load or stop PCS operation for 60s. If ineffective and the fault persists after restarting, please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendation
	Output port power harness positive/negative reversed with parallel racks or PCS	Turn off the battery manual switch, check if the output port wiring is correct, restart the battery.
	Output power relay cannot close	Check if the output port wiring is correct and if there is a short circuit. If ineffective and the fault persists after restarting, please contact the after-sales service center.
	Power device temperature too high	Let the battery sit for 1 hour for the internal power device temperature to drop. If ineffective and the fault persists after restarting, please contact the after-sales service center.
	Relay welded/stuck	If the fault persists after restarting, please contact the after-sales service center.
Battery Rack Circulating Current Failure	1. Cell imbalance 2. First power-on without full charge calibration	Record the fault phenomenon, restart the battery, wait a few minutes, and confirm if the fault disappears. If the problem persists after restarting, please contact the after-sales service center.
BMS1 Other Fault 3 (Utility Storage)	Communication abnormal with Linux module	1. Check if the communication cable link is normal. 2. Upgrade software, restart the battery and observe if the fault persists. If it persists, please contact the after-sales service center.
	Cell temperature rise too fast	Cell abnormal, contact after-sales to replace the pack.
	SOC below 10%	Charge the battery.
	SN writing does not comply with rules	Check if the SN digit count is normal. If abnormal, please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendation
	1. Communication abnormal within battery rack daisy chain 2. Inconsistent cell aging levels between battery racks	1. Check the pack contact condition within a single rack. 2. Confirm the usage of each rack, such as cumulative charge/discharge capacity, cycle count, etc. 3. Please contact the after-sales service center.
	High humidity inside pack	-
	Fuse blown	Contact after-sales to replace the pack.
	Battery low power	Charge the battery.
BMS1 Other Fault 4 (Utility Storage)	Circuit breaker abnormal	Contact after-sales to replace the pack.
	External device abnormal	Contact after-sales to replace the pack.
Contactor Failure 1	-	-
Contactor Failure 2	-	-
Overload Protection (Ksic)	Sustained overload (over 690KVA) for 10s	Please contact the after-sales service center.
Overload Protection (Smart Port)	Sustained overload (over 690KVA) for 10s	Please contact the after-sales service center.
Overcurrent Protection (Ksic)	-	-

Fault Name	Fault Cause	Troubleshooting Recommendation
Overcurrent Protection (Smart Port)	-	-
Master AC On Meter Comm Error	1. The meter may not be connected to the master. 2. The meter communication cable may be loose.	1. Check if the meter is connected to the master. 2. Check if the meter communication cable is loose.
Parallel Slave Meter Error	Meter connected to a slave unit	Set the machine with the meter connected as the master.
Slave AC On Timeout with Master	1. Slave address setting error 2. Slave communication cable loose	1. Check for duplicate slave addresses. 2. Check if the parallel communication cable is loose.

9.3 Routine Maintenance

⚠WARNING

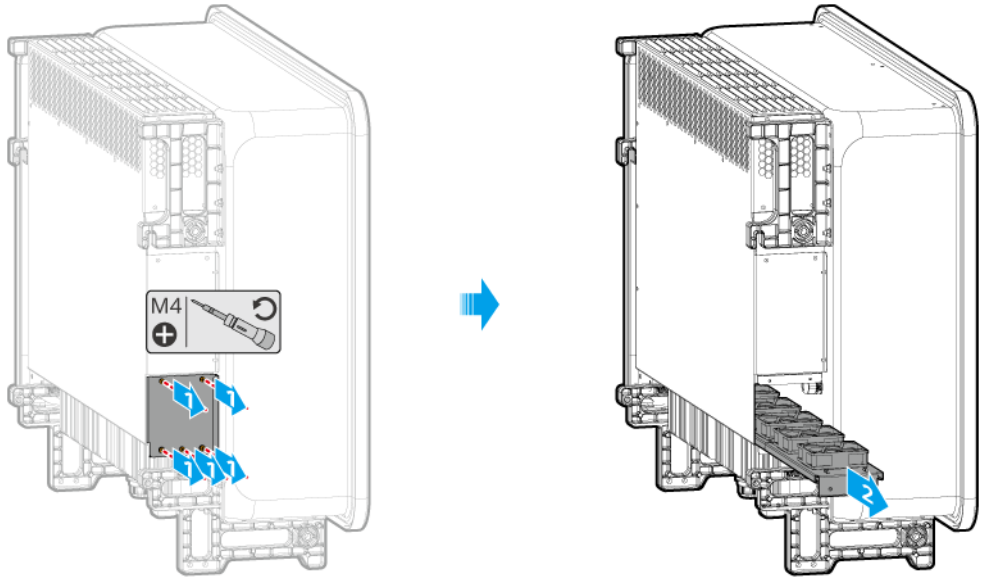
- If any issues that may affect the device are found, contact after-sales personnel. Disassembly by unauthorized personnel is prohibited.
- If exposed internal copper wires are found in the conductive lines, do not touch them due to high voltage danger. Contact after-sales personnel. Disassembly by unauthorized personnel is prohibited.
- In case of other emergencies, contact after-sales personnel immediately. Operate under their guidance or wait for them to perform on-site operations.

Maintenance Content	Maintenance Method	Maintenance Cycle	Maintenance Purpose
System Cleaning	Check for foreign objects or dust on heat sinks, fans, and air inlets/outlets. Check if the installation space meets requirements, and if there is any clutter accumulation around the equipment.	Once every six months	Prevent cooling failures.
System Installation	Check if the equipment installation is secure and if fastening screws are loose. Check the equipment exterior for damage or deformation.	Once every six months to one year	Confirm equipment installation stability.
Electrical Connections	Check if electrical connections are loose, if cable exteriors are damaged, or if there is exposed copper.	Once every six months to one year	Confirm electrical connection reliability.
Sealing	Check if the sealing of equipment cable entry holes meets requirements. If gaps are too large or unsealed, reseal them.	Once per year	Confirm machine sealing and intact waterproof performance.
Fan Maintenance	Check if fans have abnormal noise or are covered in dust. If so, clean the fans with a soft, dry cloth or brush. Replace the fan if necessary.	Once per year	Ensure cooling efficiency and prevent equipment overheating.

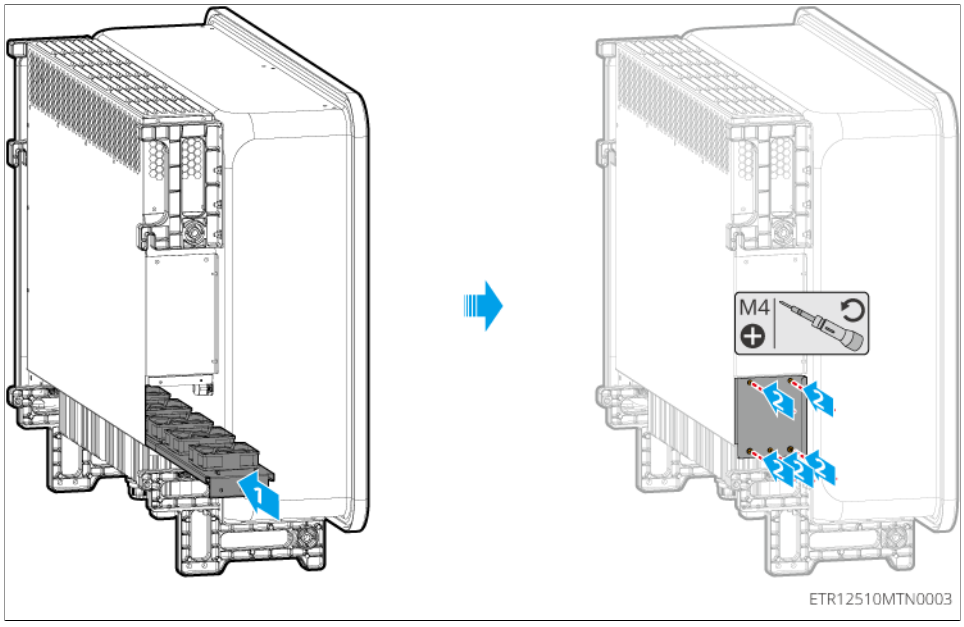
Fan Maintenance

1. Unscrew the fixing screws on the fan bracket.
2. Gently pull the fan bracket to extend it about 10 cm, then disconnect the fan's power cable.

3. Fully pull out the fan bracket to replace/clean the fan.
   - When cleaning the fan, use a soft fine brush, dry cloth, or vacuum cleaner.
   - If the fan needs to be replaced, please contact the after-sales service personnel.



4. Place the replaced/cleaned fan into the bracket and connect the fan power cable.
5. Push the fan bracket into the inverter and tighten the fixing screws.



9.4 Removing the Equipment

⚠DANGER

- Before removal, ensure the equipment is powered off.
- Wear personal protective equipment when operating the equipment.
- Use standard removal tools when disconnecting wiring terminals to avoid damaging the terminals or the equipment.
- Unless otherwise specified, the equipment removal procedure is the reverse of the installation procedure and will not be repeated in this document.

1. Power down the system.
2. Label the cables connected in the system to identify their types.
3. Disconnect the cables from the Inverter, Battery, and smart meter in the system, such as DC cables, AC cables, Communication cables, and PE cables.
4. Remove devices such as the smart communication stick, Inverter, Battery, and smart meter.
5. Store the equipment properly. If it will be put into use later, ensure the storage conditions meet the requirements.

9.5 Disposing of the Equipment

When the equipment can no longer be used and needs to be disposed of, please dispose of the equipment according to the electrical waste disposal requirements of the country/region where the equipment is located. Do not treat the equipment as general household waste.

10 Technical Parameters

Technical Data	GW50K-ETR-L-G10	GW75K-ETR-L-G10	GW75K-ETR-G10	GW80K-ETR-G10
Battery Side				
Battery Type	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)
Nominal Voltage (V)	480	480	750	750
Voltage Range (V)	440~700	440~700	700~1000	700~1000
Start-up Voltage (V)	440	440	700	700
Number of Battery Inputs	1	1	1	1
Max. Continuous Charging Current (A)	113.6	170.4	107.1	125.7
Max. Continuous Discharging Current (A)	113.6	170.4	107.1	125.7
Max. Charging Power (kW)	50	75	75	88
Max. Discharging Power (kW)	50	75	75	88
PV Side				
Max. Input Power (kW)	100	150	150	160
Max. Input Voltage (V)*1*6	850	850	1100	1100
MPPT Operating Voltage Range (V)*2	160 ~ 800	160 ~ 800	160 ~ 1000	160 ~ 1000

Technical Data	GW50K-ETR-L-G10	GW75K-ETR-L-G10	GW75K-ETR-G10	GW80K-ETR-G10
MPPT Operating Voltage Range at Nominal Power (V)	300 ~ 600	300 ~ 600	500 ~ 850	500 ~ 850
Start-up Voltage (V)	200	200	200	200
Nominal Input Voltage (V)	420	420	620	620
Max. MPPT Current (A)	42	42	42	42
Max. MPPT Short Circuit Current (A)	55	55	55	55
Max. Backfeed Current to the Array (A)	0	0	0	0
Number of MPPTs	8	10	8	8
Number of Strings per MPPT	2	2	2	2
AC Side (On-Grid)				
Rated Power (kW)	50	75	75	80
Max. Power (kW)	50	75	75	88*8
Rated Power at 40℃ (kW)	50	75	75	80
Max. Power at 40℃ (kW)	50	75	75	88
Rated Apparent Power from Grid (kVA)	50	75	75	80

Technical Data	GW50K-ETR-L-G10	GW75K-ETR-L-G10	GW75K-ETR-G10	GW80K-ETR-G10
Rated Apparent Power to Grid (kVA)	50	75	75	80
Max. Apparent Power to Grid (kVA)	50	75	75	88*9
Max. Apparent Power from Grid (kVA)	50	75	75	88*9
Nominal Voltage (V)	127/220,3L/N/PE	127/220,3L/N/PE	220/380,230/400,240/415,3L/N/PE	220/380,230/400,240/415,3L/N/PE
Voltage Range (V)	114~139 (according to local standard)	114~139 (according to local standard)	180~280 (according to local standard)	180~280 (according to local standard)
Nominal Frequency (Hz)	50/60*11	50/60*11	50/60	50/60
Frequency Range (Hz)	45~55 / 55~65*12	45~55 / 55~65*12	45~55 / 55~65	45~55 / 55~65
Rated Current from Grid (A)	131.3	196.9	114.0@380V 108.3@400V 104.4@415V	121.6@380V 115.5@400V 111.3@415V
Rated Current to Grid (A)	131.3	196.9	114.0@380V 108.3@400V 104.4@415V	121.6@380V 115.5@400V 111.3@415V
Max. Current from Grid (A)*10	131.3	196.9	114.0@380V 108.3@400V 104.4@415V	133.8@380V 127.1@400V 122.5@415V
Max. Current to Grid (A)*10	131.3	196.9	114.0@380V 108.3@400V 104.4@415V	133.8@380V 127.1@400V 122.5@415V

Technical Data	GW50K-ETR-L-G10	GW75K-ETR-L-G10	GW75K-ETR-G10	GW80K-ETR-G10
Max. Output Fault Current (Peak and Duration) (A)	373 @2.5us	525 @2.5us	373 @2.5us	373 @2.5us
Inrush Current (Peak and Duration) (A)	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)
THDi	<3%	<3%	<3%	<3%
Maximum Output Overcurrent Protection (A)	260	380	260	260
Type of Voltage	a.c.	a.c.	a.c.	a.c.
Backup Side*4				
Nominal Output Apparent Power (kVA)	50	75	75	80
Max. Output Apparent Power (kVA)	50	75	75	88
Peak Output Power without Grid (kW)	120% @60s 150% @10s	120% @60s 150% @10s	120% @60s 150% @10s	110% @continuous 120% @60s 150% @10s

Technical Data	GW50K-ETR-L-G10	GW75K-ETR-L-G10	GW75K-ETR-G10	GW80K-ETR-G10
Nominal Output Voltage (V)	127/220,3L/N/PE	127/220,3L/N/PE	220/380,230/400,240/415,3L/N/PE	220/380,230/400,240/415,3L/N/PE
Nominal Output Frequency (Hz)	50/60*11	50/60*11	50/60	50/60
Frequency Range (Hz)	45~55 / 55~65*12	45~55 / 55~65*12	45~55 / 55~65	45~55 / 55~65
Nominal Output Current (A)	131.3	196.9	114.0@380V 108.3@400V 104.4@415V	121.6@380V 115.5@400V 111.3@415V
Max. Output Current (A)	131.3	196.9	114	133.8
Max. Fault Current (Peak and Duration) (A)	373 @2.5us	525 @2.5us	373 @2.5us	373 @2.5us
Inrush Current (Peak and Duration) (A)	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms
Maximum Output Overcurrent Protection (A)	260	380	260	260
THDv (@Linear Load)	<3%	<3%	<3%	<3%
On/Off-grid Switching Time	<10ms	<10ms	<10ms	<10ms
Efficiency				
Max. Efficiency	97.4%	97.4%	98.1%	98.1%
European Efficiency	96.8%	96.8%	97.7%	97.7%

Technical Data	GW50K-ETR-L-G10	GW75K-ETR-L-G10	GW75K-ETR-G10	GW80K-ETR-G10
CEC Efficiency	\	\	\	\
Max. Battery to AC Efficiency*7	97.7%	97.7%	98.2%	98.2%
MPPT Efficiency	99.9%	99.9%	99.9%	99.9%
Protection				
PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated
Internal Humidity Monitoring	Integrated	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated	Integrated

Technical Data	GW50K-ETR-L-G10	GW75K-ETR-L-G10	GW75K-ETR-G10	GW80K-ETR-G10
AC Switch	\	\	\	\
DC Surge Protection	Type II (Type I+II Optional)	Type II (Type I+II Optional)	Type II (Type I+II Optional)	Type II (Type I+II Optional)
AC Surge Protection	Type II	Type II	Type II	Type II
AFCI	Optional	Optional	Optional	Optional
OVGR	\	\	\	\
Emergency Power Off	Optional	Optional	Optional	Optional
Rapid Shutdown	Optional	Optional	Optional	Optional
Remote Shutdown	Optional	Optional	Optional	Optional
Anti-PID	\	\	\	\
PID Recovery	\	\	\	\
I-V Curve Scan	\	\	\	\
I-V Curve Diagnosis	\	\	\	\
General Data				
Operating Temperature Range (℃)	-35~+60	-35~+60	-35~+60	-35~+60
Operating Environment	Outdoor	Outdoor	Outdoor	Outdoor
Storage Temperature (℃)	-40~+85	-40~+85	-40~+85	-40~+85
Relative Humidity	0 ~ 100%	0 ~ 100%	0 ~ 100%	0 ~ 100%

Technical Data	GW50K-ETR-L-G10	GW75K-ETR-L-G10	GW75K-ETR-G10	GW80K-ETR-G10
Max. Operating Altitude (m)	4000	4000	4000	4000
Cooling Method	Intelligent air cooling	Intelligent air cooling	Intelligent air cooling	Intelligent air cooling
User Interface	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP
Communication with BMS	CAN	CAN	CAN	CAN
Communication	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G
Communication Protocols	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）
Weight (kg)	82	98	82	82
Dimension (W×H×D mm)	995×758×358	995×758×358	995×758×358	995×758×358
Noise Emission (dB)	60	60	60	60
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Power Self-consumption at Night (W)	＜15	＜15	＜15	＜15
Ingress Protection Rating	IP66	IP66	IP66	IP66
Anti-corrosion Class	C4（C5 Optional）	C4（C5 Optional）	C4（C5 Optional）	C4（C5 Optional）

Technical Data	GW50K-ETR-L-G10	GW75K-ETR-L-G10	GW75K-ETR-G10	GW80K-ETR-G10
DC Connector	MC4 (4~6mm2)	MC4 (4~6mm2)	MC4 (4~6mm2)	MC4 (4~6mm2)
AC Connector	OT (max.240mm2)	OT (max.240mm2)	OT (max.240mm2)	OT (max.240mm2)
Environmental Category	4K4H	4K4H	4K4H	4K4H
Pollution Degree	III	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I	I
Decisive Voltage Classification (DVC)	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	AFDPF + AQDPF *5	AFDPF + AQDPF *5	AFDPF + AQDPF *5	AFDPF + AQDPF *5
Type of Electrical Supply System	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT
Country of Manufacture	China	China	China	China

Technical Data	GW50K-ETR-L-G10	GW75K-ETR-L-G10	GW75K-ETR-G10	GW80K-ETR-G10

Note:

1. For GW50K-ETR-L-G10/GW75K-ETR-L-G10 , when the input voltage ranges from 800V to 850V, the inverter will enter the standby mode, and the voltage returns to 800V to enter the normal operation state. For GW75K-ETR-G10/GW80K-ETR-G10/GW99.99K-ETR-G10/GW100K-ETR-G10/GW110K-ETR-G10/GW124.99K-ETR-G10/GW125K-ETR-G10, when the input voltage ranges from 1000V to 1100V, the inverter will enter the standby mode, and the voltage returns to 1000V to enter the normal operation state.
2. Please refer to the user manual for the MPPT Voltage Range at nominal Power.
3. For Australia is 110kW/kVA.
4. The STS Box or STS Cabinet is needed.
5. AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback.
6. When connecting the GW261.2-BAT-LCD-G10 battery, the open-circuit voltage input of the PV strings needs to be greater than 813V.
7. This efficiency refers to the efficiency from the battery port of the inverter to the AC output port of the inverter.
8. For Chile, Max. Power (kW): GW80K-ETR-G10: 80kW, GW100K-ETR-G10: 100kW, GW110K-ETR-G10: 110kW, GW125K-ETR-G10: 125kW.
9. For Chile, Max. Apparent Power to Grid (kVA)/Max. Apparent Power from Grid (kVA): GW80K-ETR-G10: 80kVA, GW100K-ETR-G10: 100kVA, GW110K-ETR-G10: 110kVA, GW125K-ETR-G10: 125kVA.
10. For Chile, Max. Current to Grid (A)/Max. Current from Grid (A): GW80K-ETR-G10: 121.6@380Vac, 115.5@400Vac, 111.3@415Vac; GW100K-ETR-G10: 152.0@380Vac, 144.4@400Vac, 139.2@415Vac; GW110K-ETR-G10: 167.2@380V, 158.8@400V, 153.1@415V; GW125K-ETR-G10: 190.0@380V, 180.5@400V, 174.0@415V.
11. For Mexico and Colombia, the Nominal Frequency of GW50K-ETR-L-G10 and GW75K-ETR-L-G10 is 60 Hz.
12. For Mexico and Colombia, the Frequency Range of GW50K-ETR-L-G10 and GW75K-ETR-L-G10 is 55~65 Hz.
13. For Australia, Max. Current from Grid/Max. Current to Grid is 158.8A@400V.

Technical Data	GW99.99 K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99 K-ETR-G10	GW125K-ETR-G10
Battery Side					
Battery Type	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)
Nominal Voltage (V)	750	750	750	750	750
Voltage Range (V)	700~1000	700~1000	700~1000	700~1000	700~1000
Start-up Voltage (V)	700	700	700	700	700
Number of Battery Inputs	1	1	1	1	1
Max. Continuous Charging Current (A)	142.8	157.1	172.8	178.5	180
Max. Continuous Discharging Current (A)	142.8	157.1	172.8	178.5	180
Max. Charging Power (kW)	99.99	110	121	124.99	137.5
Max. Discharging Power (kW)	99.99	110	121	124.99	137.5
PV Side					
Max. Input Power (kW)	200	200	220	250	250
Max. Input Voltage (V)*1*6	1100	1100	1100	1100	1100
MPPT Operating Voltage Range (V)*2	160 ~ 1000	160 ~ 1000	160 ~ 1000	160 ~ 1000	160 ~ 1000

Technical Data	GW99.99 K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99 K-ETR-G10	GW125K-ETR-G10
MPPT Operating Voltage Range at Nominal Power (V)	500 ~ 850	500 ~ 850	500 ~ 850	500 ~ 850	500 ~ 850
Start-up Voltage (V)	200	200	200	200	200
Nominal Input Voltage (V)	620	620	620	620	620
Max. MPPT Current (A)	42	42	42	42	42
Max. MPPT Short Circuit Current (A)	55	55	55	55	55
Max. Backfeed Current to the Array (A)	0	0	0	0	0
Number of MPPTs	10	10	10	10	10
Number of Strings per MPPT	2	2	2	2	2
AC Side (On-Grid)					
Rated Power (kW)	99.99	100	110	124.99	125
Max. Power (kW)	99.99	110*8	121 *3*8	124.99	137.5*8
Rated Power at 40℃ (kW)	99.99	100	110	124.99	125
Max. Power at 40℃ (kW)	99.99	110	121	124.99	137.5
Rated Apparent Power from Grid (kVA)	99.99	100	110	124.99	125

Technical Data	GW99.99 K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99 K-ETR-G10	GW125K-ETR-G10
Rated Apparent Power to Grid (kVA)	99.99	100	110	124.99	125
Max. Apparent Power to Grid (kVA)	99.99	110*9	121 *3*9	124.99	137.5*9
Max. Apparent Power from Grid (kVA)	99.99	110*9	121 *3*9	124.99	137.5*9
Nominal Voltage (V)	220/380,230/400,240/415,3L/N/PE	220/380,230/400,240/415,3L/N/PE	220/380,230/400,240/415,3L/N/PE	220/380,230/400,240/415,3L/N/PE	220/380,230/400,240/415,3L/N/PE
Voltage Range (V)	180~280 (according to local standard)	180~280 (according to local standard)	180~280 (according to local standard)	180~280 (according to local standard)	180~280 (according to local standard)
Nominal Frequency (Hz)	50/60	50/60	50/60	50/60	50/60
Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Rated Current from Grid (A)	152.0@380V 144.4@400V 139.2@415V	152.0@380V 144.4@400V 139.2@415V	167.2@380V 158.8@400V 153.1@415V	190.0@380V 180.5@400V 174.0@415V	190.0@380V 180.5@400V 174.0@415V

Technical Data	GW99.99K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99K-ETR-G10	GW125K-ETR-G10
Rated Current to Grid (A)	152.0@380V 144.4@400V 139.2@415V	152.0@380V 144.4@400V 139.2@415V	167.2@380V 158.8@400V 153.1@415V	190.0@380V 180.5@400V 174.0@415V	190.0@380V 180.5@400V 174.0@415V
Max. Current from Grid (A)*10	152.0@380V 144.4@400V 139.2@415V	167.2@380V 158.8@400V 153.1@415V	183.9@380V 174.7@400V*13 168.4@415V	190.0@380V 180.5@400V 174.0@415V	209.0@380V 198.5@400V 191.3@415V
Max. Current to Grid (A)*10	152.0@380V 144.4@400V 139.2@415V	167.2@380V 158.8@400V 153.1@415V	183.9@380V 174.7@400V*13 168.4@415V	190.0@380V 180.5@400V 174.0@415V	209.0@380V 198.5@400V 191.3@415V
Max. Output Fault Current (Peak and Duration) (A)	435 @2.5us	435 @2.5us	525 @2.5us	525 @2.5us	525 @2.5us
Inrush Current (Peak and Duration) (A)	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)
THDi	<3%	<3%	<3%	<3%	<3%

Technical Data	GW99.99 K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99 K-ETR-G10	GW125K-ETR-G10
Maximum Output Overcurrent Protection (A)	320	320	380	380	380
Type of Voltage	a.c.	a.c.	a.c.	a.c.	a.c.
Backup Side*4					
Nominal Output Apparent Power (kVA)	99.99	100	110	124.99	125
Max. Output Apparent Power (kVA)	99.99	110	121	124.99	137.5
Peak Output Power without Grid (kW)	120% @60s 150% @10s	110% @continuous 120% @60s 150% @10s	110% @continuous 120% @60s 150% @10s	120% @60s 150% @10s	110% @continuous 120% @60s 150% @10s
Nominal Output Voltage (V)	220/380,230/400,240/415,3L/N/PE	220/380,230/400,240/415,3L/N/PE	220/380,230/400,240/415,3L/N/PE	220/380,230/400,240/415,3L/N/PE	220/380,230/400,240/415,3L/N/PE
Nominal Output Frequency (Hz)	50/60	50/60	50/60	50/60	50/60
Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65

Technical Data	GW99.99K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99K-ETR-G10	GW125K-ETR-G10
Nominal Output Current (A)	152.0@380V 144.4@400V 139.2@415V	152.0@380V 144.4@400V 139.2@415V	167.2@380V 158.8@400V 153.1@415V	190.0@380V 180.5@400V 174.0@415V	190.0@380V 180.5@400V 174.0@415V
Max. Output Current (A)	152	167.2	183.9	190	209
Max. Fault Current (Peak and Duration) (A)	435 @2.5us	435 @2.5us	525 @2.5us	525 @2.5us	525 @2.5us
Inrush Current (Peak and Duration) (A)	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms
Maximum Output Overcurrent Protection (A)	320	320	380	380	380
THDv (@Linear Load)	<3%	<3%	<3%	<3%	<3%
On/Off-grid Switching Time	<10ms	<10ms	<10ms	<10ms	<10ms
Efficiency					
Max. Efficiency	98.1%	98.1%	98.1%	98.1%	98.1%
European Efficiency	97.7%	97.7%	97.7%	97.7%	97.7%
CEC Efficiency	\	\	\	\	\
Max. Battery to AC Efficiency*7	98.2%	98.2%	98.2%	98.2%	98.2%

Technical Data	GW99.99K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99K-ETR-G10	GW125K-ETR-G10
MPPT Efficiency	99.9%	99.9%	99.9%	99.9%	99.9%
Protection					
PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated	Integrated
Internal Humidity Monitoring	Integrated	Integrated	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated	Integrated	Integrated
AC Switch	\	\	\	\	\

Technical Data	GW99.99K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99K-ETR-G10	GW125K-ETR-G10
DC Surge Protection	Type II (Type I+II Optional)	Type II (Type I+II Optional)	Type II (Type I+II Optional)	Type II (Type I+II Optional)	Type II (Type I+II Optional)
AC Surge Protection	Type II	Type II	Type II	Type II	Type II
AFCI	Optional	Optional	Optional	Optional	Optional
OVGR	\	\	\	\	\
Emergency Power Off	Optional	Optional	Optional	Optional	Optional
Rapid Shutdown	Optional	Optional	Optional	Optional	Optional
Remote Shutdown	Optional	Optional	Optional	Optional	Optional
Anti-PID	\	\	\	\	\
PID Recovery	\	\	\	\	\
I-V Curve Scan	\	\	\	\	\
I-V Curve Diagnosis	\	\	\	\	\
General Data					
Operating Temperature Range (℃)	-35~+60	-35~+60	-35~+60	-35~+60	-35~+60
Operating Environment	Outdoor	Outdoor	Outdoor	Outdoor	Outdoor
Storage Temperature (℃)	-40~+85	-40~+85	-40~+85	-40~+85	-40~+85
Relative Humidity	0 ~ 100%	0 ~ 100%	0 ~ 100%	0 ~ 100%	0 ~ 100%
Max. Operating Altitude (m)	4000	4000	4000	4000	4000

Technical Data	GW99.99K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99K-ETR-G10	GW125K-ETR-G10
Cooling Method	Intelligent air cooling	Intelligent air cooling	Intelligent air cooling	Intelligent air cooling	Intelligent air cooling
User Interface	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP
Communication with BMS	CAN	CAN	CAN	CAN	CAN
Communication	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G
Communication Protocols	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）
Weight (kg)	96	96	96	98	98
Dimension (W×H×D mm)	995×758×358	995×758×358	995×758×358	995×758×358	995×758×358
Noise Emission (dB)	60	60	60	60	60
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Power Self-consumption at Night (W)	< 15	< 15	< 15	< 15	< 15

Technical Data	GW99.99K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99K-ETR-G10	GW125K-ETR-G10
Ingress Protection Rating	IP66	IP66	IP66	IP66	IP66
Anti-corrosion Class	C4（C5 Optional）	C4（C5 Optional）	C4（C5 Optional）	C4（C5 Optional）	C4（C5 Optional）
DC Connector	MC4 (4~6mm2)	MC4 (4~6mm2)	MC4 (4~6mm2)	MC4 (4~6mm2)	MC4 (4~6mm2)
AC Connector	OT (max.240 mm2)	OT (max.240 mm2)	OT (max.240 mm2)	OT (max.240mm2)	OT (max.240 mm2)
Environmental Category	4K4H	4K4H	4K4H	4K4H	4K4H
Pollution Degree	III	III	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I	I	I
Decisive Voltage Classification (DVC)	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	AFDPF + AQDPF *5	AFDPF + AQDPF *5	AFDPF + AQDPF *5	AFDPF + AQDPF *5	AFDPF + AQDPF *5
Type of Electrical Supply System	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT

Technical Data	GW99.99K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99K-ETR-G10	GW125K-ETR-G10
Country of Manufacture	China	China	China	China	China

Technical Data	GW99.99K-ETR-G10	GW100K-ETR-G10	GW110K-ETR-G10	GW124.99K-ETR-G10	GW125K-ETR-G10

Note:

1. For GW50K-ETR-L-G10/GW75K-ETR-L-G10 , when the input voltage ranges from 800V to 850V, the inverter will enter the standby mode, and the voltage returns to 800V to enter the normal operation state. For GW75K-ETR-G10/GW80K-ETR-G10/GW99.99K-ETR-G10/GW100K-ETR-G10/GW110K-ETR-G10/GW124.99K-ETR-G10/GW125K-ETR-G10, when the input voltage ranges from 1000V to 1100V, the inverter will enter the standby mode, and the voltage returns to 1000V to enter the normal operation state.
2. Please refer to the user manual for the MPPT Voltage Range at nominal Power.
3. For Australia is 110kW/kVA.
4. The STS Box or STS Cabinet is needed.
5. AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback.
6. When connecting the GW261.2-BAT-LCD-G10 battery, the open-circuit voltage input of the PV strings needs to be greater than 813V.
7. This efficiency refers to the efficiency from the battery port of the inverter to the AC output port of the inverter.
8. For Chile, Max. Power (kW): GW80K-ETR-G10: 80kW, GW100K-ETR-G10: 100kW, GW110K-ETR-G10: 110kW, GW125K-ETR-G10: 125kW.
9. For Chile, Max. Apparent Power to Grid (kVA)/Max. Apparent Power from Grid (kVA): GW80K-ETR-G10: 80kVA, GW100K-ETR-G10: 100kVA, GW110K-ETR-G10: 110kVA, GW125K-ETR-G10: 125kVA.
10. For Chile, Max. Current to Grid (A)/Max. Current from Grid (A): GW80K-ETR-G10: 121.6@380Vac, 115.5@400Vac, 111.3@415Vac; GW100K-ETR-G10: 152.0@380Vac, 144.4@400Vac, 139.2@415Vac; GW110K-ETR-G10: 167.2@380V, 158.8@400V, 153.1@415V; GW125K-ETR-G10: 190.0@380V, 180.5@400V, 174.0@415V.
11. For Mexico and Colombia, the Nominal Frequency of GW50K-ETR-L-G10 and GW75K-ETR-L-G10 is 60 Hz.
12. For Mexico and Colombia, the Frequency Range of GW50K-ETR-L-G10 and GW75K-ETR-L-G10 is 55~65 Hz.
13. For Australia, Max. Current from Grid/Max. Current to Grid is 158.8A@400V.

11 Technical Parameters

Technical Data	GW50K-BTR-L-G10	GW75K-BTR-L-G10	GW75K-BTR-G10	GW80K-BTR-G10
Battery Side				
Battery Type	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)
Nominal Voltage (V)	480	480	750	750
Voltage Range (V)	440~700	440~700	700~950	700~950
Start-up Voltage (V)	440	440	700	700
Number of Battery Inputs	1	1	1	1
Max. Continuous Charging Current (A)	113.6	170.4	107.1	125.7
Max. Continuous Discharging Current (A)	113.6	170.4	107.1	125.7
Max. Charging Power (kW)	50	75	75	88
Max. Discharging Power (kW)	50	75	75	88
AC Side (On-Grid)				

Technical Data	GW50K-BTR-L-G10	GW75K-BTR-L-G10	GW75K-BTR-G10	GW80K-BTR-G10
Rated Power (kW)	50	75	75	80
Max. Power (kW)	50	75	75	88*[5]
Rated Power at 40℃ (kW)	50	75	75	80
Max. Power at 40℃ (kW)	50	75	75	88
Rated Apparent Power from Grid (kVA)	50	75	75	80
Rated Apparent Power to Grid (kVA)	50	75	75	80
Max. Apparent Power to Grid (kVA)	50	75	75	88*[6]
Max. Apparent Power from Grid (kVA)	50	75	75	88*[6]
Nominal Voltage (V)	127/220, 3L/N/PE		220/380, 230/400, 240/415, 3L/N/PE	
Voltage Range (V)	114~139 (according to local standard)		180~280 (according to local standard)	

Technical Data	GW50K-BTR-L-G10	GW75K-BTR-L-G10	GW75K-BTR-G10	GW80K-BTR-G10
Nominal Frequency (Hz)	50/60*[8]	50/60*[8]	50/60	50/60
Frequency Range (Hz)	45~55 / 55~65*[9]	45~55 / 55~65*[9]	45~55 / 55~65	45~55 / 55~65
Rated Current from Grid (A)	131.3	196.9	114.0@380V 108.3@400V 104.4@415V	121.6@380V 115.5@400V 111.3@415V
Rated Current to Grid (A)	131.3	196.9	114.0@380V 108.3@400V 104.4@415V	121.6@380V 115.5@400V 111.3@415V
Max. Current from Grid (A)*[7]	131.3	196.9	114.0@380V 108.3@400V 104.4@415V	133.8@380V 127.1@400V 122.5@415V
Max. Current to Grid (A)*[7]	131.3	196.9	114.0@380V 108.3@400V 104.4@415V	133.8@380V 127.1@400V 122.5@415V
Max. Output Fault Current (Peak and Duration) (A)	373 @2.5us	373 @2.5us	373 @2.5us	373 @2.5us
Inrush Current (Peak and Duration) (A)	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms
Rated conditional short-circuit current (kA)	6	6	6	6
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)			
THDi	<3%	<3%	<3%	<3%

Technical Data	GW50K-BTR-L-G10	GW75K-BTR-L-G10	GW75K-BTR-G10	GW80K-BTR-G10
Maximum Output Overcurrent Protection (A)	260	380	260	260
Type of Voltage	a.c.	a.c.	a.c.	a.c.
Backup Side*2				
Nominal Output Apparent Power (kVA)	50	75	75	80
Max. Output Apparent Power (kVA)	50	75	75	88
Peak Output Power without Grid (kW)	120% @60s 150% @10s	120% @60s 150% @10s	120% @60s 150% @10s	110% @continuous 120% @60s 150% @10s
Nominal Output Voltage (V)	127/220, 3L/N/PE		220/380, 230/400, 240/415, 3L/N/PE	
Nominal Output Frequency (Hz)	50/60*8	50/60*8	50/60	50/60
Frequency Range (Hz)	45~55 / 55~65*9		45~55 / 55~65	

Technical Data	GW50K-BTR-L-G10	GW75K-BTR-L-G10	GW75K-BTR-G10	GW80K-BTR-G10
Nominal Output Current (A)	131.3	196.9	114.0@380V 108.3@400V 104.4@415V	121.6@380V 115.5@400V 111.3@415V
Max. Output Current (A)	131.3	196.9	114	133.8
Max. Fault Current (Peak and Duration) (A)	373 @2.5us	373 @2.5us	373 @2.5us	373 @2.5us
Inrush Current (Peak and Duration) (A)	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms
Maximum Output Overcurrent Protection (A)	260	380	260	260
THDv (@Linear Load)	<3%	<3%	<3%	<3%
On/Off-grid Switching Time	<10ms	<10ms	<10ms	<10ms
Efficiency				
Max. Efficiency	0.974	0.974	0.974	0.974
European Efficiency	0.968	0.968	0.968	0.968
CEC Efficiency	\	\	\	\

Technical Data	GW50K-BTR-L-G10	GW75K-BTR-L-G10	GW75K-BTR-G10	GW80K-BTR-G10
Max. Battery to AC Efficiency*[4]	0.977	0.977	0.977	0.977
Protection				
Internal Humidity Monitoring	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated
AC Switch	\	\	\	\
AC Surge Protection	Type II	Type II	Type II	Type II
OVGR	\	\	\	\

Technical Data	GW50K-BTR-L-G10	GW75K-BTR-L-G10	GW75K-BTR-G10	GW80K-BTR-G10
Emergency Power Off	Optional	Optional	Optional	Optional
Rapid Shutdown	Optional	Optional	Optional	Optional
Remote Shutdown	Optional	Optional	Optional	Optional
Anti-PID	\	\	\	\
PID Recovery	\	\	\	\
I-V Curve Scan	\	\	\	\
I-V Curve Diagnosis	\	\	\	\
General Data				
Operating Temperature Range (℃)	-35~+60	-35~+60	-35~+60	-35~+60
Operating Environment	Outdoor	Outdoor	Outdoor	Outdoor
Storage Temperature (℃)	-40~+85	-40~+85	-40~+85	-40~+85
Relative Humidity	0 ~ 100%	0 ~ 100%	0 ~ 100%	0 ~ 100%
Max. Operating Altitude (m)	4000	4000	4000	4000
Cooling Method	Intelligent air cooling	Intelligent air cooling	Intelligent air cooling	Intelligent air cooling

Technical Data	GW50K-BTR-L-G10	GW75K-BTR-L-G10	GW75K-BTR-G10	GW80K-BTR-G10
User Interface	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP
Communication with BMS	CAN	CAN	CAN	CAN
Communication	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G
Communication Protocols	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）
Weight (kg)	61.5	71.5	61.5	61.5
Dimension (W×H×D mm)	995×758×358	995×758×358	995×758×358	995×758×358
Noise Emission (dB)	60	60	60	60
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Power Self-consumption at Night (W)	＜15	＜15	＜15	＜15
Ingress Protection Rating	IP66	IP66	IP66	IP66
Anti-corrosion Class	C4（C5 Optional）	C4（C5 Optional）	C4（C5 Optional）	C4（C5 Optional）
AC Connector	OT (max.240mm2)	OT (max.240mm2)	OT (max.240mm2)	OT (max.240mm2)

Technical Data	GW50K-BTR-L-G10	GW75K-BTR-L-G10	GW75K-BTR-G10	GW80K-BTR-G10
Environmental Category	4K4H	4K4H	4K4H	4K4H
Pollution Degree	III	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I	I
Decisive Voltage Classification (DVC)	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	AFDPF + AQDPF *3	AFDPF + AQDPF *3	AFDPF + AQDPF *3	AFDPF + AQDPF *3
Type of Electrical Supply System	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT
Country of Manufacture	China	China	China	China

Technical Data	GW50K-BTR-L-G10	GW75K-BTR-L-G10	GW75K-BTR-G10	GW80K-BTR-G10

Note：

1. For Australia is 110kW/kVA.
2. The STS Box or STS Cabinet is needed.
3. AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback.
4. This efficiency refers to the efficiency from the battery port of the inverter to the AC output port of the inverter.
5. For Chile, Max. Power (kW): GW80K-BTR-G10: 80kW, GW100K-BTR-G10: 100kW.
6. For Chile, Max. Apparent Power to Grid (kVA)/Max. Apparent Power from Grid (kVA): GW80K-BTR-G10: 80kVA, GW100K-BTR-G10: 100kVA.
7. For Chile, Max. Current to Grid (A)/Max. Current from Grid (A): GW80K-BTR-G10: 121.6@380Vac, 115.5@400Vac, 111.3@415Vac; GW100K-BTR-G10: 152.0@380Vac, 144.4@400Vac, 139.2@415Vac.
8. For Mexico and Colombia, the Nominal Frequency of GW50K-BTR-L-G10 and GW75K-BTR-L-G10 is 60 Hz.
9. For Mexico and Colombia, Frequency Range of GW50K-BTR-L-G10 and GW75K-BTR-L-G10 is 55~65 Hz.

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Battery Side					
Battery Type	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)	LFP ($LiFePO_4$)
Nominal Voltage (V)	750	750	750	750	750
Voltage Range (V)	700~950	700~950	700~950	700~950	700~950
Start-up Voltage (V)	700	700	700	700	700

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Number of Battery Inputs	1	1	1	1	1
Max. Continuous Charging Current (A)	142.8	157.1	172.8	178.5	180
Max. Continuous Discharging Current (A)	142.8	157.1	172.8	178.5	180
Max. Charging Power (kW)	99.99	110	121	124.99	137.5
Max. Discharging Power (kW)	99.99	110	121	124.99	137.5
AC Side (On-Grid)					
Rated Power (kW)	99.99	100	110	124.99	125
Max. Power (kW)	99.99	110*[5]	121 *[1]	124.99	137.5
Rated Power at 40℃ (kW)	99.99	100	110	124.99	125
Max. Power at 40℃ (kW)	99.99	110	121 *[1]	124.99	137.5

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Rated Apparent Power from Grid (kVA)	99.99	100	110	124.99	125
Rated Apparent Power to Grid (kVA)	99.99	100	110	124.99	125
Max. Apparent Power to Grid (kVA)	99.99	110*[6]	121 *[1]	124.99	137.5
Max. Apparent Power from Grid (kVA)	99.99	110*[6]	121 *[1]	124.99	137.5
Nominal Voltage (V)	220/380, 230/400, 240/415, 3L/N/PE				
Voltage Range (V)	180~280 (according to local standard)				
Nominal Frequency (Hz)	50/60	50/60	50/60	50/60	50/60
Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Rated Current from Grid (A)	152.0@380V 144.4@400V 139.2@415V	152.0@380V 144.4@400V 139.2@415V	167.2@380V 158.8@400V 153.1@415V	190.0@380V 180.5@400V 174.0@415V	190.0@380V 180.5@400V 174.0@415V

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Rated Current to Grid (A)	152.0@380V 144.4@400V 139.2@415V	152.0@380V 144.4@400V 139.2@415V	167.2@380V 158.8@400V 153.1@415V	190.0@380V 180.5@400V 174.0@415V	190.0@380V 180.5@400V 174.0@415V
Max. Current from Grid (A)*[7]	152.0@380V 144.4@400V 139.2@415V	167.2@380V 158.8@400V 153.1@415V	183.9@380V 174.7@400V 168.4@415V	190.0@380V 180.5@400V 174.0@415V	209.0@380V 198.5@400V 191.3@415V
Max. Current to Grid (A)*[7]	152.0@380V 144.4@400V 139.2@415V	167.2@380V 158.8@400V 153.1@415V	183.9@380V 174.7@400V 168.4@415V	190.0@380V 180.5@400V 174.0@415V	209.0@380V 198.5@400V 191.3@415V
Max. Output Fault Current (Peak and Duration) (A)	373 @2.5us	373 @2.5us	373 @2.5us	373 @2.5us	373 @2.5us
Inrush Current (Peak and Duration) (A)	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Rated conditional short-circuit current (kA)	6	6	6	6	6
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)				
THDi	<3%	<3%	<3%	<3%	<3%
Maximum Output Overcurrent Protection (A)	320	320	380	380	380
Type of Voltage	a.c.	a.c.	a.c.	a.c.	a.c.
Backup Side*2					
Nominal Output Apparent Power (kVA)	99.99	100	110	124.99	125
Max. Output Apparent Power (kVA)	99.99	110	121 *3	124.99	137.5

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Peak Output Power without Grid (kW)	120% @60s 150% @10s	110% @continuous 120% @60s 150% @10s	110% @continuous 120% @60s 150% @10s	120% @60s 150% @10s	110% @continuous 120% @60s 150% @10s
Nominal Output Voltage (V)	220/380, 230/400, 240/415, 3L/N/PE				
Nominal Output Frequency (Hz)	50/60	50/60	50/60	50/60	50/60
Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Nominal Output Current (A)	152.0@380V 144.4@400V 139.2@415V	152.0@380V 144.4@400V 139.2@415V	167.2@380V 158.8@400V 153.1@415V	190.0@380V 180.5@400V 174.0@415V	190.0@380V 180.5@400V 174.0@415V
Max. Output Current (A)	152	167.2	183.9	190	209
Max. Fault Current (Peak and Duration) (A)	373 @2.5us	373 @2.5us	373 @2.5us	373 @2.5us	373 @2.5us

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Inrush Current (Peak and Duration) (A)	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms	63.5 @20ms
Maximum Output Overcurrent Protection (A)	320	320	380	380	380
THDv (@Linear Load)	<3%	<3%	<3%	<3%	<3%
On/Off-grid Switching Time	<10ms	<10ms	<10ms	<10ms	<10ms
Efficiency					
Max. Efficiency	0.974	0.974	0.974	0.974	0.974
European Efficiency	0.968	0.968	0.968	0.968	0.968
CEC Efficiency	\	\	\	\	\
Max. Battery to AC Efficiency*4	0.977	0.977	0.977	0.977	0.977
Protection					

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Internal Humidity Monitoring	Integrated	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated	Integrated
AC Switch	\	\	\	\	\
AC Surge Protection	Type II	Type II	Type II	Type II	Type II
OVGR	\	\	\	\	\
Emergency Power Off	Optional	Optional	Optional	Optional	Optional

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Rapid Shutdown	Optional	Optional	Optional	Optional	Optional
Remote Shutdown	Optional	Optional	Optional	Optional	Optional
Anti-PID	\	\	\	\	\
PID Recovery	\	\	\	\	\
I-V Curve Scan	\	\	\	\	\
I-V Curve Diagnosis	\	\	\	\	\
General Data					
Operating Temperature Range (℃)	-35~+60	-35~+60	-35~+60	-35~+60	-35~+60
Operating Environment	Outdoor	Outdoor	Outdoor	Outdoor	Outdoor
Storage Temperature (℃)	-40~+85	-40~+85	-40~+85	-40~+85	-40~+85
Relative Humidity	0 ~ 100%	0 ~ 100%	0 ~ 100%	0 ~ 100%	0 ~ 100%
Max. Operating Altitude (m)	4000	4000	4000	4000	4000

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Cooling Method	Intelligent air cooling	Intelligent air cooling	Intelligent air cooling	Intelligent air cooling	Intelligent air cooling
User Interface	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP	LED, LCD (Optional), WLAN+APP
Communication with BMS	CAN	CAN	CAN	CAN	CAN
Communication	RS485, WIFI, LAN, Bluetooth, 4G	RS485, WIFI, LAN, Bluetooth, 4G	RS485, WIFI, LAN, Bluetooth, 4G	RS485, WIFI, LAN, Bluetooth, 4G	RS485, WIFI, LAN, Bluetooth, 4G
Communication Protocols	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）	Modbus TCP（sunspec compatible）
Weight (kg)	71.5	71.5	71.5	71.5	71.5
Dimension (W×H×D mm)	995×758×358	995×758×358	995×758×358	995×758×358	995×758×358
Noise Emission (dB)	60	60	60	60	60
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Power Self-consumption at Night (W)	< 15	< 15	< 15	< 15	< 15

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Ingress Protection Rating	IP66	IP66	IP66	IP66	IP66
Anti-corrosion Class	C4（C5 Optional）	C4（C5 Optional）	C4（C5 Optional）	C4（C5 Optional）	C4（C5 Optional）
AC Connector	OT (max.240mm2)	OT (max.240mm2)	OT (max.240mm2)	OT (max.240mm2)	OT (max.240mm2)
Environmental Category	4K4H	4K4H	4K4H	4K4H	4K4H
Pollution Degree	III	III	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I	I	I
Decisive Voltage Classification (DVC)	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A	Battery: C PV: C AC: C Com: A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	AFDPF + AQDPF *3	AFDPF + AQDPF *3	AFDPF + AQDPF *3	AFDPF + AQDPF *3	AFDPF + AQDPF *3

Technical Data	GW99.99K-BTR-G10	GW100K-BTR-G10	GW110K-BTR-G10	GW124.99K-BTR-G10	GW125K-BTR-G10
Type of Electrical Supply System	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT
Country of Manufacture	China	China	China	China	China

Note：

1. For Australia is 110kW/kVA.
2. The STS Box or STS Cabinet is needed.
3. AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback.
4. This efficiency refers to the efficiency from the battery port of the inverter to the AC output port of the inverter.
5. For Chile, Max. Power (kW): GW80K-BTR-G10: 80kW, GW100K-BTR-G10: 100kW.
6. For Chile, Max. Apparent Power to Grid (kVA)/Max. Apparent Power from Grid (kVA): GW80K-BTR-G10: 80kVA, GW100K-BTR-G10: 100kVA.
7. For Chile, Max. Current to Grid (A)/Max. Current from Grid (A): GW80K-BTR-G10: 121.6@380Vac, 115.5@400Vac, 111.3@415Vac; GW100K-BTR-G10: 152.0@380Vac, 144.4@400Vac, 139.2@415Vac.
8. For Mexico and Colombia, the Nominal Frequency of GW50K-BTR-L-G10 and GW75K-BTR-L-G10 is 60 Hz.
9. For Mexico and Colombia, Frequency Range of GW50K-BTR-L-G10 and GW75K-BTR-L-G10 is 55~65 Hz.

12 Appendix

12.1 Explanation of Terms

- **Explanation of Overvoltage Categories**
  - **Overvoltage Category I**: Equipment connected to circuits with measures to limit transient overvoltages to a relatively low level.
  - **Overvoltage Category II**: Energy-consuming equipment supplied from fixed electrical installations. This category includes appliances, portable tools, and other household and similar loads. If special requirements for reliability and suitability apply to such equipment, Overvoltage Category III is adopted.
  - **Overvoltage Category III**: Equipment in fixed electrical installations where reliability and suitability must meet special requirements. This includes switching devices in fixed electrical installations and industrial equipment permanently connected to fixed electrical installations.
  - **Overvoltage Category IV**: Equipment used at the origin of electrical installations, including meters and upstream overcurrent protection devices.
- **Explanation of Damp Location Categories**

Environmental Parameters	Level		
	3K3	4K2	4K4H
Temperature Range	0~+40°C	-33~+40°C	-33~+40°C
Humidity Range	5% to 85%	15% to 100%	4% to 100%

- **Explanation of Environmental Categories:**
  - **Outdoor Type Inverter**: Ambient air temperature range is -25 to +60°C, suitable for pollution degree 3 environment;
  - **Indoor Type II Inverter**: Ambient air temperature range is -25 to +40°C, suitable for pollution degree 3 environment;
  - **Indoor Type I Inverter**: Ambient air temperature range is 0 to +40°C, suitable for pollution degree 2 environment;
- **Explanation of Pollution Degree Categories**
  - **Pollution Degree 1**: No pollution or only dry non-conductive pollution;
  - **Pollution Degree 2**: Generally only non-conductive pollution, but temporary conductive pollution due to condensation must be considered;

- **Pollution Degree 3**: Conductive pollution occurs, or non-conductive pollution becomes conductive due to condensation;
- **Pollution Degree 4**: Persistent conductive pollution, such as that caused by conductive dust or rain/snow.

12.2 Safety Regulation Countries

No.	Safety Regulation Name	No.	Safety Regulation Name
Europe			
1	IT-CEI 0-21	56	IE-LV-72A
2	IT-CEI 0-16	57	IE-ESB-C&D(< 110kV)
3	DE LV with PV	58	IE-EirGrid-110kV
4	DE LV without PV	59	PT-D
5	DE-MV	60	EE
6	ES-A	61	NO
7	ES-B	62	FI-A
8	ES-C	63	FI-B
9	ES-D	64	FI-C
10	ES-island	65	FI-D
11	BE	66	UA-A1
12	FR-LV	67	UA-A2
13	FR-island-50Hz	68	EN 50549-1
14	FR-island-60Hz	69	EN 50549-2
15	type A-PL_V.1.1	70	DK-West-B-MVHV
16	type B-LV-PL_V.1.1	71	DK-East-B-MVHV
17	type C-PL_V.1.1	72	DK-West-C-MVHV
18	type D-PL_V.1.1	73	DK-East-C-MVHV

No.	Safety Regulation Name	No.	Safety Regulation Name
19	NL-16/20A	74	DK-West-D-MVHV
20	NL-A	75	DK-East-D-MVHV
21	NL-B	76	FR-Reunion
22	NL-C	77	BE-LV（>30kVA）
23	NL-D	78	BE-HV
24	SE-A	79	CH-B
25	SE MV	80	NI-G99-A
26	SK-A	81	NI-G99-B
27	SK-B	82	NI-G99-C
28	SK-C	83	NI-G99-D
29	HU	84	IE-LV-170kVA
30	CH-A	85	IE-MV&HV-200kVA
31	CY	86	DE-HV
32	GR	87	FR-MV
33	DK-West-A	88	CZ-A1/A2-09
34	DK-East-A	89	DE-EHV
35	DK-West-B	90	IE-EirGrid-400KV
36	DK-East-B	91	IE-EirGrid-220KV
37	AT < 1kV	92	IE-EirGrid-66KV
38	AT > 1kV	93	IE-ESB-B
39	BG	94	IE-ESB-D(≥110kV)
40	Czech	95	type B-MV-PL_V.1.1
41	CZ-A1-09	96	GB-G99-A HV

No.	Safety Regulation Name	No.	Safety Regulation Name
42	CZ-A2-09	97	GB-G99-B LV
43	CZ-B1/B2-09	98	GB-G99-C LV
44	CZ-C	99	UA-B
45	CZ-D	100	UA-C
46	RO-A	101	UA-D
47	RO-B	102	UK-G98
48	RO-D	103	UK-G99-A LV
49	GB-G98	104	UK-G99-B LV
50	GB-G99-A LV	105	UK-G99-C LV
51	GB-G99-B HV	106	CZ-A1
52	GB-G99-C HV	107	UK-A-MV
53	GB-G99-D	108	UK-B-MV
54	NI-G98	109	UK-C-MV
55	IE-LV-16/25A	-	-
Global			
1	60Hz-Default	6	IEC 61727-60Hz
2	50Hz-Default	7	Warehouse
3	127Vac-60Hz-Default	8	IEC61727-480Vac-60Hz
4	127Vac-50Hz-Default	9	IEC61727-480Vac-50Hz
5	IEC 61727-50Hz		
Americas			
1	Argentina-220V-LV	38	LUMAPR-2024-220Vac-3P
2	US-208Vac	39	LUMAPR-2024-240Vac-3P
3	US-240Vac	40	Cayman

No.	Safety Regulation Name	No.	Safety Regulation Name
4	Mexico-220Vac	41	Brazil-220Vac
5	Mexico-440Vac	42	Brazil-208Vac
6	US-480Vac	43	Brazil-230Vac
7	US-208Vac-3P	44	Brazil-240Vac
8	US-220Vac-3P	45	Brazil-254Vac
9	US-240Vac-3P	46	Brazil-127Vac
10	US-CA-208Vac	47	Brazil-ONS
11	US-CA-240Vac	48	Barbados
12	US-CA-480Vac	49	Chile-BT
13	US-CA-208Vac-3P	50	Chile-MT-A
14	US-CA-220Vac-3P	51	Chile MT-B
15	US-CA-240Vac-3P	52	Colombia
16	US-HI-208Vac	53	Colombia<0.25MW-208Vac-1P
17	US-HI-240Vac	54	Colombia<0.25MW-120Vac-3P
18	US-HI-480Vac	55	IEEE 1547-208Vac
19	US-HI-208Vac-3P	56	IEEE 1547-220Vac
20	US-HI-220Vac-3P	57	IEEE 1547-240Vac
21	US-HI-240Vac-3P	58	IEEE 1547-230Vac
22	US-Kauai-208Vac	59	Colombia<0.25MW-127Vac-3P
23	US-Kauai-240Vac	60	Colombia>5MW
24	US-Kauai-480Vac	61	Mexico-127V
25	US-Kauai-208Vac-3P	62	Mexico-240V
26	US-Kauai-220Vac-3P	63	US-O&R-208Vac

No.	Safety Regulation Name	No.	Safety Regulation Name
27	US-Kauai-240Vac-3P	64	US-O&R-240Vac
28	US-ISO-NE-208Vac	65	US-O&R-480Vac
29	US-ISO-NE-240Vac	66	US-O&R-208Vac-3P
30	US-ISO-NE-480Vac	67	US-O&R-220Vac-3P
31	US-ISO-NE-208Vac-3P	68	US-O&R-240Vac-3P
32	US-ISO-NE-220Vac-3P	69	Brazil-277Vac
33	US-ISO-NE-240Vac-3P	70	Chile-BT ≤9MW
34	LUMAPR-2024-208Vac	71	Chile-MT ≤9MW
35	LUMAPR-2024-240Vac	72	Chile > 9MW
36	LUMAPR-2024-480Vac	73	Mexico-277Vac
37	LUMAPR-2024-208Vac-3P		
Oceania			
1	Australia-A	4	Newzealand
2	Australia-B	5	Newzealand:2015
3	Australia-C	6	NZ-GreenGrid
Asia			
1	China A	33	Israel-MV
2	China B	34	Israel-HV
3	China Higher Voltage	35	Vietnam
4	China Highest Voltage	36	Malaysia-LV
5	China Power Station	37	Malaysia-MV
6	China Shandong	38	DEWA-LV
7	China Hebei	39	DEWA-MV
8	China PCS	40	Saudi Arabia-220V-LV

No.	Safety Regulation Name	No.	Safety Regulation Name
9	Taiwan	41	JP-690Vac-50Hz
10	Hong Kong	42	JP-690Vac-60Hz
11	China Northeast	43	Srilanka-MV/HV
12	Thailand-MEA	44	IEC 61727-127Vac-50Hz
13	Thailand-PEA	45	IEC 61727-127Vac-60Hz
14	Mauritius	46	JP-550Vac-50Hz
15	Korea	47	JP-550Vac-60Hz
16	India	48	India-Higher
17	India-CEA	49	JP-220Vac-50Hz
18	Pakistan	50	JP-220Vac-60Hz
19	Philippines	51	Saudi Arabia-127V-LV
20	Philippines-127Vac	52	Srilanka-LV >1MW
21	JP-200Vac-50Hz	53	China-YN
22	JP-200Vac-60Hz	54	GB/T 29319-LV
23	JP-440Vac-50Hz	55	GB/T 29319-MV
24	JP-440Vac-60Hz	56	Philippines-277Vac
25	JP-420Vac-50Hz	57	JP-360Vac-50Hz
26	JP-420Vac-60Hz	58	JP-360Vac-60Hz
27	JP-480Vac-50Hz	59	JP-320Vac-50Hz
28	JP-480Vac-60Hz	60	JP-320Vac-60Hz
29	Srilanka-LV<1MW	61	JP-340Vac-50Hz
30	Singapore	62	JP-340Vac-60Hz
31	Israel-OG	63	JP-380Vac-50Hz

No.	Safety Regulation Name	No.	Safety Regulation Name
32	Israel-LV	64	JP-380Vac-60Hz
Africa			
1	Mauritius	5	Ghana-LV
2	South Africa-LV	6	Ghana-HV
3	South Africa-B-MV	7	South Africa-A3-LV
4	South Africa-C-MV	8	Nigeria

13 Contact Details

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