Residential Smart Inverter Solutions

ES Uniq 8.0-12kW

LX A5.0-10

LX A5.0-30

LX U5.4-10

LX U5.0-30

User Manual

Copyright Statement:

Copyright © GoodWe Technologies Co., Ltd. 2024. All rights reserved.

No part of this manual can be reproduced or transmitted to the public platform in any form or by any means without the prior written authorization of GoodWe Technologies Co.,Ltd.

Trademarks

GOODWE and other GOODWE trademarks are trademarks of GoodWe Technologies Co., Ltd. All other trademarks or registered trademarks mentioned in this manual are owned by the company.

NOTICE

The information in this user manual is subject to change due to product updates or other reasons. This manual cannot replace the product safety labels unless otherwise specified. All descriptions in the manual are for guidance only.

1 About This Manual 9
1.1 Overview 9
1.2 Applicable Model 9
1.3 Symbol Definition 10
2 Safety Precautions 11
2.1 General Safety 11
2.2 Personnel Requirements 11
2.3 System Installation 12
2.3.1 PV String Safety 14
2.3.2 Inverter Safety 14
2.3.3 Battery Safety 15
2.3.4 Smart Meter Safety 16
2.4 Safety Symbols and Certification Marks 16
2.5 EU Declaration of Conformity 18
2.5.1 Equipment with Wireless Communication Modules 18
2.5.2 Equipment without Wireless Communication Modules (Except Battery) 18
2.5.3 Battery 19
3 System Introduction 20
3.1 System Overview 20
3.2 Product Overview 23
3.2.1 Inverter 23
3.2.3 Smart Meter 25
3.2.4 Smart Dongle 26
3.3 Supported Grid Types 26
3.4 System Working Mode 27
4 Check and Storage 30

4.1 Check before Acceptance 30
4.2 Package Content 30
4.2.1 Inverter deliverables (ES Uniq) 30
4.2.2 Battery deliverables (LX A5.0-10) 31
4.2.3 Battery deliverables (LX A5.0-30) 33
4.2.4 Battery deliverables (LX U5.4-20) 34
4.2.5 Battery deliverables (LX U5.0-30) 35
4.2.6 Smart Meter Deliverables (GMK110) 37
4.2.7 Smart Meter (GM330) 37
4.2.8 Smart Dongle (WiFi/LAN Kit-20) 37
4.2.9 Smart Dongle (Ezlink3000) 38
4.3 Storage 38
5 Installation 40
5.1 System Installation and Commissioning Procedure 40
5.2 Installation Requirements 40
5.2.1 Installation Environment Requirements 40
5.2.2 Installation Space Requirements 42
5.2.3 Tool Requirements 43
5.3 Equipment Handling 45
5.4 Installing the Inverter 45
5.5 Installing the Battery System 46
5.6 Installing the Smart Meter 53
6 System Wirings 55
6.1 System Wiring Diagram 55
6.2 Detailed System Wiring Diagram 56
6.2.1 Detailed System Wiring Diagram For Single Inverter 56

6.2.2 Detailed System Wiring Diagram for Parallel System 58
6.3 Preparing Materials 59
6.3.1 Preparing Breakers 60
6.3.2 Preparing Cables 60
6.4 Connecting the PE cable 63
6.5 Connecting the PV Cable 64
6.6 Connecting the Battery Cable 65
6.6.1 Connecting the Power Cable between the Inverter and Battery 77
6.6.2 Connecting the Communication Cable between the Inverter and Battery 80
6.7 Connecting the AC Cable 82
6.8 Connecting the Meter Cable 83
6.9 Connecting the Inverter Communication Cable 85
6.10 Connect the smart dongle 87
7 System Commissioning 88
7.1 Check before Power ON 88
7.2 Power ON 88
7.2.1 Power on a single inverter system 89
7.2.2 Power on a parallel system 90
7.3 Indicators 90
7.3.1 Inverter Indicators 90
7.3.2 Battery Indicators 92
7.3.3 Smart Meter Indicator 96
7.3.4 Smart Dongle Indicator 97
8 Quick System Commissioning 99
8.1 Downloading the App 99
8.2 Connecting the Inverter 100

8.3 Communication Settings 102
8.4 Quick Settings 102
8.5 Creating Power Plants 112
9 System Commissioning 113
9.1 SolarGo Overview 113
9.1.1 App Interface Structure 115
9.1.2 Introduction to the SolarGo App Login Interface 116
9.1.3 Introduction to the Main Interface of SolarGo App 117
9.2 Connecting the Inverter 118
9.3 Quick Settings 120
9.4 Communication Settings 123
9.5 Setting the Basic Information 131
9.5.1 Setting the Basic Information 131
9.5.2 Setting Advanced Parameters 133
9.5.3 Setting Power Limit Parameters 133
9.5.4 Setting the Battery Parameters 137
9.5.5 Setting Generator Parameters 144
9.5.6 Setting Load Control 147
9.6 Setting Safety Parameters 150
9.6.1 Setting the Basic Safety Parameters 150
9.6.2 Setting Customized Safety Parameters 150
10 Monitoring Power Plant 157
10.1 SEMS Portal Overview 157
10.2 Manage power plant or equipment 159
10.2.1 Power plant creation 159
10.2.2 Power plant management 160

10.2.3 Managing the equipment in the power plant 161
10.3 Power plant monitoring 162
10.3.1 Viewing power plant information 162
10.3.2 Viewing Alarm Information 163
11 Maintenance 165
11.1 Power OFF the System 165
11.2 Removing the Equipment 167
11.3 Disposing of the Equipment 168
11.4 Routine Maintenance 168
11.5 Troubleshooting 169
11.5.1 System Troubleshooting 170
11.5.2 Inverter Troubleshooting 172
11.5.3 Battery fault (LX A5.0-30) 184
11.5.4 Battery fault (LX A5.0-10) 186
11.5.5 Battery fault (LX U5.4-20) 189
11.5.6 Battery fault (LX U5.0-30) 191
12 Parameters 193
12.1 Inverter Parameters 193
12.2 Battery Technical Data 199
12.3 Smart Meter Technical Data 205
12.4 Smart Dongle Technical Data 206
13 Appendix 209
13.1 FAQ 209
13.1.1 How to conduct auxiliary detection for smart meters/CT? 209
13.1.2 How to Upgrade the Device Version 209
13.2 Abbreviations 210

1 About This Manual

1.1 Overview

The energy storage system consists of inverter, battery system, and smart meter. This manual describes the product information, installation, electrical connection, commissioning, troubleshooting and maintenance of the system. Read through this manual before installing and operating the products. This manual is subject to update without notice. For more product details and latest documents, visit https://en.goodwe.com/.

1.2 Applicable Model

The energy storage system consists the following products:

Product type	Product information	Description
Inverter	ES Uniq Series	Rated output power: 8kW-12kW
Battery system	LX A5.0-10	Useable energy of 5.0kWh, supports a maximum of 15 batteries connected in parallel.
	LX A5.0-30	Useable energy of 5.12kWh, supports a maximum of 30 batteries connected in parallel.
	LX U5.4-20	Useable energy of 5.4kWh, supports a maximum of 6 batteries connected in parallel.
	LX U5.0-30	Useable energy of 5.12kWh, supports a maximum of 30 batteries connected in parallel.
Smart meter	GMK110	The monitoring module in the energy storage system can detect information such as operating voltage, current, and other data in the system.
	GM330	
Smart dongle	WiFi/LAN Kit-20	In single inverter scenario, system operation information can be uploaded to monitoring platform through WiFi or LAN signals.

	Ezlink3000	In parallel system with multi inverters, it is installed on the master inverter, uploads the system running information to monitoring platform through WiFi or LAN signals.

1.3 Symbol Definition

DANGER
Indicates a high-level hazard that, if not avoided, will result in death or serious injury.
WARNING
Indicates a medium-level hazard that, if not avoided, could result in death or serious injury.
CAUTION
Indicates a low-level hazard that, if not avoided, could result in minor or moderate injury.
NOTICE
Highlights key information and supplements the texts. Or some skills and methods to solve product-related problems to save time.

2 Safety Precautions

Please strictly follow these safety instructions in the user manual during the operation.

WARNING

The products are designed and tested strictly to comply with related safety rules. Read and follow all the safety instructions and cautions before any operations. Improper operation might cause personal injury or property damage as the products are electrical equipment.

2.1 General Safety

NOTICE

- The information in this user manual is subject to change due to product updates or other reasons. This manual cannot replace the product safety labels unless otherwise specified. All descriptions in the manual are for guidance only.
- Before installations, read through the user manual to learn about the product and the precautions.
- All operations should be performed by trained and knowledgeable technicians who are familiar with local standards and safety regulations.
- Use insulating tools and wear personal protective equipment (PPE) when operating the equipment to ensure personal safety. Wear anti-static gloves, cloths, and wrist strips when touching electronic devices to protect the equipment from damage.
- Unauthorized dismantling or modification may damage the equipment, the damage is not covered under the warranty.
- Strictly follow the installation, operation, and configuration instructions in this manual. The manufacturer shall not be liable for equipment damage or personal injury if you do not follow the instructions. For more warranty details, please visit https://en.goodwe.com/warranty.

2.2 Personnel Requirements

NOTICE

- Personnel who install or maintain the equipment must be strictly trained, learn about safety precautions and correct operations.
- Only qualified professionals or trained personnel are allowed to install, operate, maintain, and replace the equipment or parts.

2.3 System Installation

DANGER

- Disconnect the upstream and downstream switches to power off the equipment before any electrical connections. Do not work with power on. Otherwise, an electric shock may occur.
- Install a breaker at the voltage input side of the equipment to prevent personal injury or equipment damage caused by energized electrical work.
- All operations such as transportation, storage, installation, use and maintenance shall comply with applicable laws, regulations, standards and specifications.
- Perform electrical connections in compliance with local laws, regulations, standards and specifications. Including operations, cables, and component specifications.
- Connect cables using the connectors included in the package. The manufacturer shall not be liable for equipment damage if other connectors are used.
- Ensure all cables are connected tightly, securely, and correctly. Inappropriate wiring may cause poor contacts and damage the equipment.
- The PE cables must be connected and secured properly.
- To protect the equipment and components from damage during transportation, ensure that the transportation personnel are professionally trained. All operations during the transportation have to be recorded. The equipment shall be kept in balance, thus avoiding falling down.
- The equipment is heavy. Please equip the corresponding personnel according to its weight, so that the equipment does not exceed the weight range of the human body can carry, and cause personnel injury.
- Keep the equipment stable to avoid dumping, which can result in equipment damage and personal injuries.

WARNING

- Do not apply mechanical load to terminals, otherwise the terminals may be damaged.
- If the cable bears too much tension, the connection may be poor. Reserve a certain length of the cable before connecting it to corresponding ports.
- Tie the cables of the same type together, and place cables of different types at least 30mm apart. Do not place the cables entangled or crossed.
- Place the cables at least 30mm away from the heating components or heat sources,

otherwise the insulation layer of the cables may be aging or broken due to high temperature.

2.3.1 PV String Safety

WARNING

- Ensure the component frames and the bracket system are securely grounded.
- Ensure the DC cables are connected tightly, securely and correctly. Inappropriate wiring may cause poor contacts or high impedances, and damage the inverter.
- Measure the DC cable using a multimeter to avoid reverse polarity connection. Also, the voltage should be within the permissible range.
- Measure the DC cable using a multimeter to avoid reverse polarity connection. Also, the voltage should be under the max DC input voltage. The manufacturer shall not be liable for the damage caused by reverse connection and overvoltage.
- The PV strings cannot be grounded. Ensure the minimum insulation resistance of PV string to the ground meets the minimum insulation resistance requirements before connecting the PV string to the inverter (R=maximum input voltage (V)/ 30mA).
- Do not connect one PV string to more than one inverter at the same time. Otherwise, it may cause damage to the inverter.
- Photovoltaic modules used with inverters must comply with IEC 61730 Class A standard.

2.3.2 Inverter Safety

WARNING

- The voltage and frequency at the connecting point should meet the on-grid requirements.
- Additional protective devices like circuit breakers or fuses are recommended on the AC side. Specification of the protective device should be at least 1.25 times the maximum AC output current.
- The arc fault alarms will be cleared automatically if the alarms are triggered less than 5 times in 24 hours. The inverter will shutdown for protection after the 5th electric arc fault. The inverter can operate normally after the fault is solved.
- BACK-UP is not recommended if the PV system is not configured with batteries. Otherwise, there may be a risk of system power outage.

2.3.3 Battery Safety

DANGER

- Keep Power Off before any operations to avoid danger. Strictly follow all safety precautions outlined in this manual and safety labels on the equipment during the operation.
- Do not disassemble, modify, or replace any part of the battery or the power control unit without official authorization from the manufacturer. Otherwise, it will cause electrical shock or damages to the equipment, which shall not be borne by the manufacturer.
- Do not hit, pull, drag, squeeze or step on the equipment or put the battery into fire. Otherwise, the battery may explode.
- Do not place the battery in a high temperature environment. Make sure that there is no direct sunlight and no heat source near the battery. When the ambient temperature exceeds 60 ℃, it will cause fire.
- Do not use the battery or the power control unit if it is defective, broken, or damaged. Damaged battery may leak electrolyte.
- Do not move the battery system while it is working. Contact after-sales service if the battery shall be replaced or added.
- A short circuit in the battery may cause personal injury. The instantaneous high current caused by a short circuit can release a large amount of energy and may cause a fire.

WARNING

- Factors such as: temperature, humidity, weather conditions, etc. may limit the battery's current and affect its load.
- Contact after-sale service immediately if the battery is not able to be started. Otherwise, the battery might be damaged permanently.
- Inspect and maintain the battery regularly according to the maintenance requirements of the battery.

Emergency Measures

- **Battery Electrolyte Leakage**

  If the battery module leaks electrolyte, avoid contact with the leaking liquid or gas. The electrolyte is corrosive. It will cause skin irritation or chemical burn to the operator. Anyone contact the leaked substance accidentally has to do as following:

  - **Breath in the leaked substance: Evacuate from the polluted area, and seek immediate medical assistance.**
  - **Eye contact**: Rinse your eyes for at least 15 minutes with clean water and seek immediate

medical assistance.

- **Skin contact**: Thoroughly wash the touch area with soap and clean water, and seek immediate medical assistance.
- **Ingestion**: Induce vomiting, and seek immediate medical assistance.

- **Fire**
  - The battery may explode when the ambient temperature exceeds 150℃. Poisonous and hazardous gas may be released if the battery is on fire.
  - In the event of a fire, please make sure that the carbon dioxide extinguisher or Novec1230 or FM-200 is nearby.
  - The fire cannot be put out by ABC dry powder extinguisher. Firefighters are required to wear full protective clothing and self-contained breathing apparatus.
- **Battery triggers fire protection**

  For batteries with fire protection functions, perform the following operations after the fire protection function is triggered:
  - Immediately cut off the main power switch to ensure that no current passes through the battery system.
  - Conduct a preliminary inspection of the appearance of the battery to determine if there is any damage, deformation, leakage, or odor. Check the battery casing, connectors, and cables.
  - Use temperature sensors to detect the temperature of the battery and its environment, ensuring there is no risk of overheating.
  - Isolate and label damaged batteries, and handle them properly in accordance with local regulations.

2.3.4 Smart Meter Safety

⚠ WARNING
If the voltage of the power grid fluctuates, resulting in the voltage to exceed 265V, in this case, long-term overvoltage operation may cause damage to the meter. It is recommended to add a fuse with a rated current of 0.5A on the voltage input side of the meter to protect it.

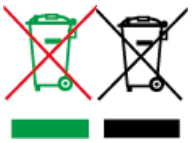
2.4 Safety Symbols and Certification Marks

⚠ DANGER
● All labels and warning marks should be visible after the installation. Do not cover, scrawl,

or damage any label on the equipment.

- The following descriptions are for reference only.

Number	Symbol	Descriptions
1		Potential risks exist. Wear proper personnel protective equipment before any operations.
2		HIGH VOLTAGE HAZARD. Disconnect all incoming power and turn off the product before working on it.
3		High-temperature hazard. Do not touch the product under operation to avoid being burnt.
4		Operate the equipment properly to avoid explosion.
5		Batteries contain flammable materials, beware of fire.
6		The equipment contains corrosive electrolytes. In case of a leak in the equipment, avoid contact the leaked liquid or gas.
7		Delayed discharge. Wait 5 minutes after power off until the components are completely discharged.
8		Install the equipment away from fire sources.
9		Keep the equipment away from children.
10		Do not pour with water.
11		Read through the user manual before any operations.

12		Wear personal protective equipment during installation, operation and maintaining.
13		Do not dispose of the System as household waste. Deal with it in compliance with local laws and regulations, or send it back to the manufacturer.
14		Grounding point.
15		Recycle regeneration mark.
16		CE mark
17		TUV mark
18		RCM mark

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 sold in the European market meets the requirements of the following directives:

- 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 Equipment without Wireless Communication Modules (Except Battery)

GoodWe Technologies Co., Ltd. hereby declares that the equipment without wireless communication

modules sold in the European market meets 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)

2.5.3 Battery

GoodWe Technologies Co., Ltd. hereby declares that batteries sold in the European market meets the requirements of the following directives:

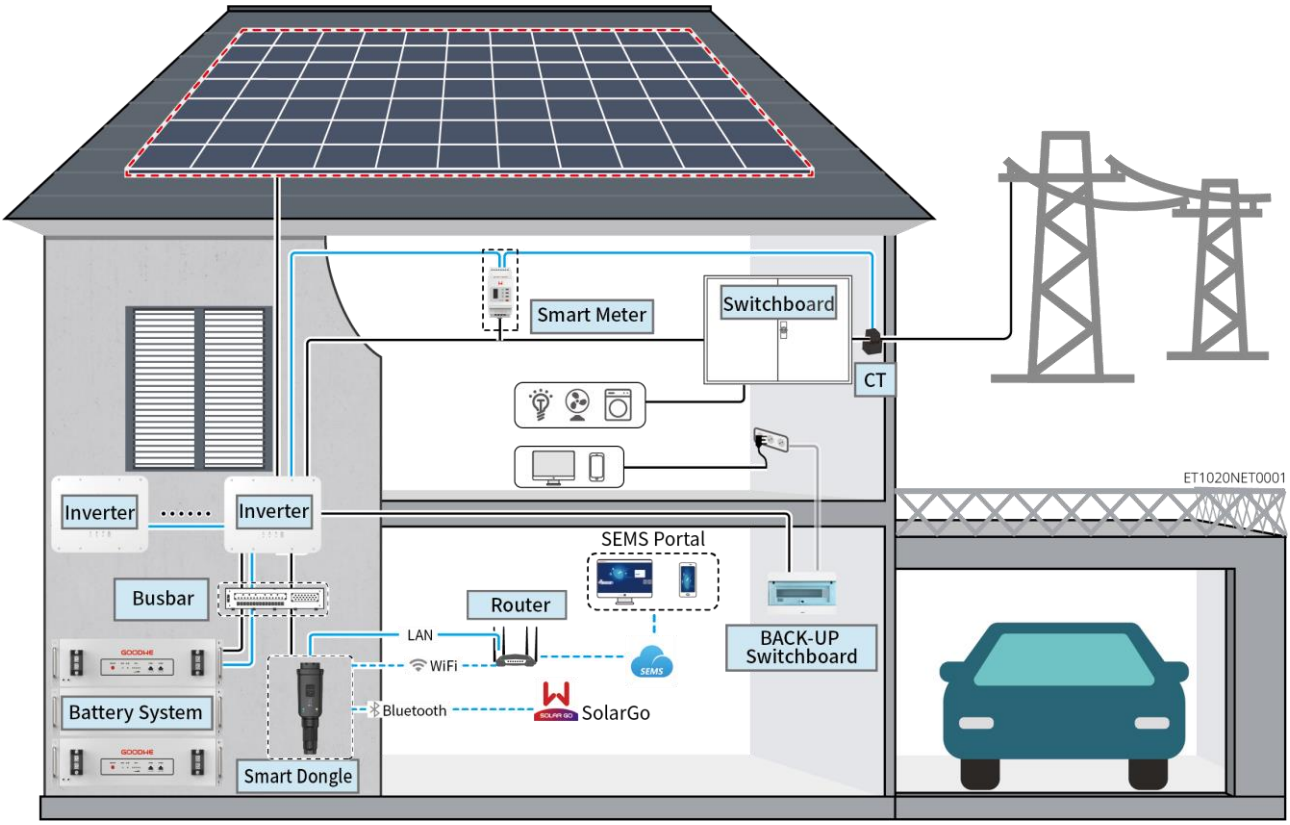
- Electromagnetic compatibility Directive 2014/30/EU (EMC)
- Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
- Battery Directive 2006/66/EC and Amending Directive 2013/56/EU
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

You can download the EU Declaration of Conformity on the official website: https://en.goodwe.com.

3 System Introduction

3.1 System Overview

The residential smart inverter solution consists of inverter, battery system, smart meter, smart dongle, etc.. In the PV system, solar energy can be convert to electric energy for household needs. The IoT devices in the system controls the electrical equipment by recognizing the overall power consumption situation. So that the power will be managed in a smart way, deciding whether the power is to be used by the loads, stored in batteries, or exported to the grid, etc.



Product Type	Model	Description
Inverter	GW8000-ES-C10 GW10K-ES-C10 GW12K-ES-C10	• When only one inverter is used in the system, it is supported to connect generator. • When multiple inverters are used in the system, it is not supported to connect generator; a maximum of 16 inverters are supported to form a parallel system, and the Ezlink3000 is required in the parallel system. • The complexity of the parallel system increases with the number of parallel inverters. When the number of parallel inverters in the system is ≥ 6, please contact

		the after-sales service center to confirm the installation and application environment of the inverters to ensure stable operation of the system. ● Requirements for parallel system: ○ The software version of all inverters in the system is the same. ○ The ARM software version of the inverter is 08 (415) and above. ○ The DSP software version of the inverter is 00(2525) and above.
Battery system	LX A5.0-10	Battery of different models cannot be mix used. ● LX A5.0-10: The nominal charging and discharging current of a single battery is 60A; a maximum of 15 batteries can be connected in parallel in one system. ● LX A5.0-30: The nominal charging current of a single battery is 60A, and the discharging current is 100A; the maximum continuous charging current is 90A; the maximum continuous discharging current is 150A. A maximum of 30 batteries can be connected in parallel in one system.
	LX A5.0-30	
	LX U5.4-20	The maximum discharge current of a single battery is 50A; A maximum of 6 batteries can be connected in parallel in one system.
	LX U5.0-30	The nominal charging current of a single battery is 60A, and the discharging current is 100A; the maximum continuous charging current is 90A; the maximum continuous discharging current is 100A. A maximum of 30 batteries can be connected in parallel in one system.
	Lead Acid Battery	● Supports connection to lead-acid batteries of AGM, GEL, and Flooded types. ● The number of batteries that can be connected in series is calculated based on the voltage of lead-acid batteries, and the total voltage of batteries connected in series is not allowed to exceed 60V.
Busbar	BCB-11-WW-0 BCB-22-WW-0 BCB-32-WW-0 BCB-33-WW-0	● When the charging and discharging current between the battery and the inverter is less than 160A, it supports direct connection between battery and inverter without using a busbar. For example: It supports connecting GW8000-ES-C10 to LX A5.0-30

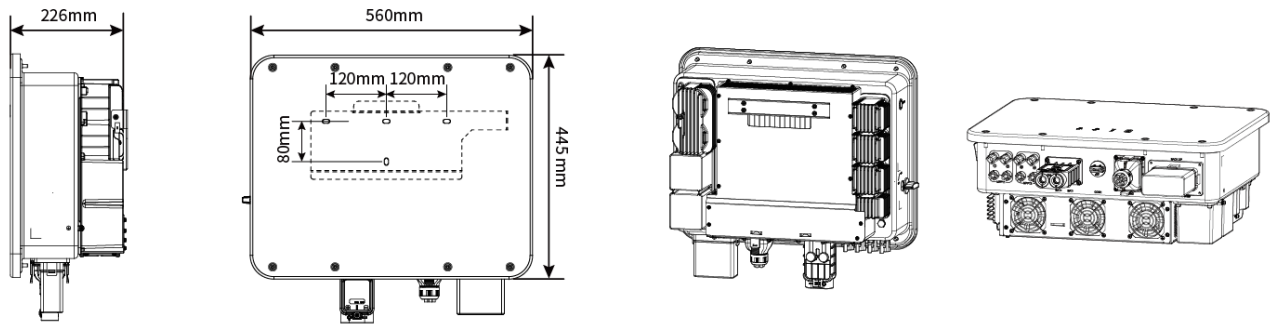
	(Purchase from GoodWe)	without using a busbar. For detailed battery wiring methods, please refer to **6.6 Connecting Battery Cables**. ● When the charging and discharging current between battery and inverter is ≥160A, a busbar or busbar box must be used to connect the inverter. (Current ≥ M x IBat rated. (M: The quantity of batteries connected in parallel in the system, IBat rated: The rated current of the battery). ○ BCB-11-WW-0: ■ Used with LX A5.0-10, the battery system supports a maximum working current of 360A, working power of 18kW, and can connect to a maximum of 3 inverters, and 6 batteries. ○ BCB-22-WW-0: ■ Used with LX A5.0-10, the battery system supports a maximum working current of 720A, working power of 36kW, and can connect to a maximum of 6 inverters, and 12 batteries. ■ Used with LX A5.0-30, the battery system supports a maximum working current of 720A, working power of 36kW, and can connect to a maximum of 6 inverters, and 6 batteries. ○ BCB-32-WW-0: ■ Used with LX A5.0-10, the battery system supports a maximum working current of 720A, working power of 36kW, and can connect to a maximum of 6 inverters, and 15 batteries. ■ Used with LX A5.0-30, the battery system supports a maximum working current of 720A, working power of 36kW, and can connect to a maximum of 6 inverters, and 15 batteries. ■ Used with LX U5.0-30, the battery system supports a maximum working current of 720A, working power of 36kW, and can connect to a maximum of 6 inverters, and 8 batteries. ○ BCB-33-WW-0 ■ Used with LX U5.0-30, the battery system supports a maximum working current of 720A, working power of 36kW, and can connect to a

		maximum of 6 inverters, and 15 batteries. When the number of batteries exceeds 8, two 600A fuses need to be connected in parallel. ○ Others: Please prepare busbar based on actual system power and current.
Smart meter	● Built-in Smart Meter (Standard) ● GMK110 (Optional) ● GM330 (purchase from GoodWe)	● Built-in smart meter: 10-meter wire CT, default CT ratio: 120A/40mA ● GMK110: When the length of the built-in CT cable of the inverter is not enough for connection to the switchboard, it can be extended through an external GMK110 smart meter. CT is not supported for changing to other type, CT ratio: 120A/40mA ● CM330: order the CT for GM330 from GoodWe or other suppliers. CT ratio: nA/5A. ➢ nA: CT primary input current, n ranges from 200 to 5000. ➢ 5A: CT Secondary input current.
Smart dongle	● WiFi/LAN Kit-20 (Standard) ● Ezlink3000 (purchase from GoodWe)	● Please use the WiFi/LAN Kit-20 in single inverter system. ● In parallel scenarios, the EzLink3000 must be connected to the master inverter. Do not connect any smart dongle to slave inverter. Ezlink3000 requires a firmware version of 04 or above.

3.2 Product Overview

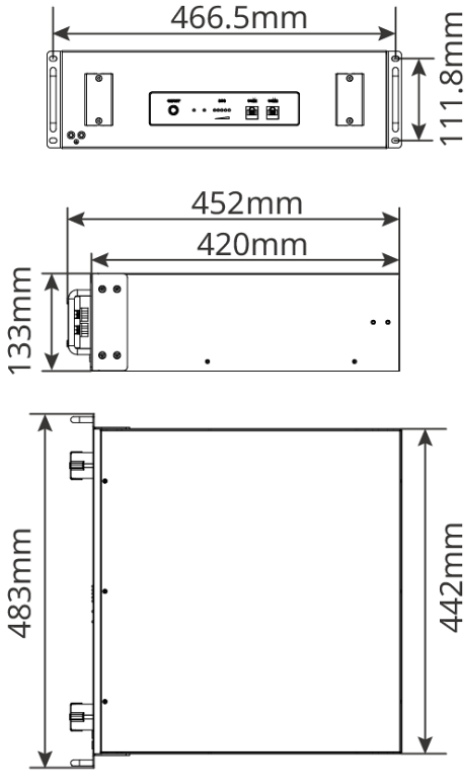
3.2.1 Inverter

Inverters control and optimize the power in PV systems through an integrated energy management system. The power generated in the PV system can be used, stored in the battery, output to the utility grid, etc.

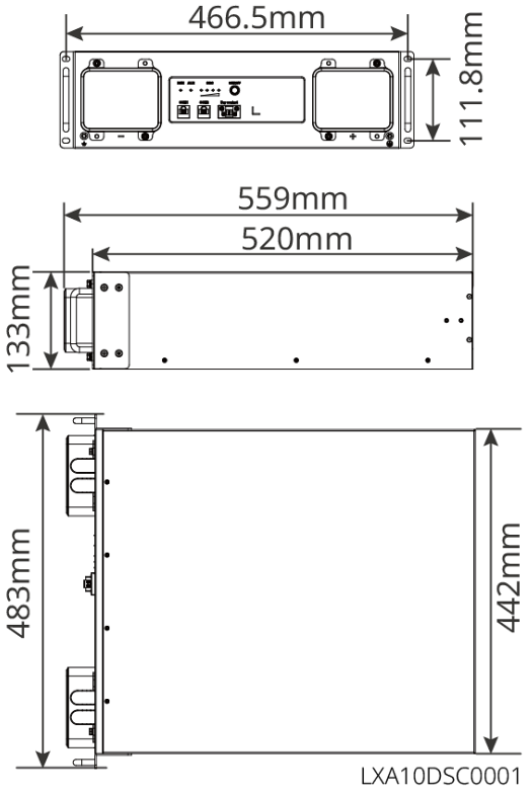


Number	Model	Nominal output power	Nominal output voltage
1	GW8000-ES-C10	8kW	220/230/240
2	GW10K-ES-C10	10kW	220/230/240
3	GW12K-ES-C10	12kW	220/230/240

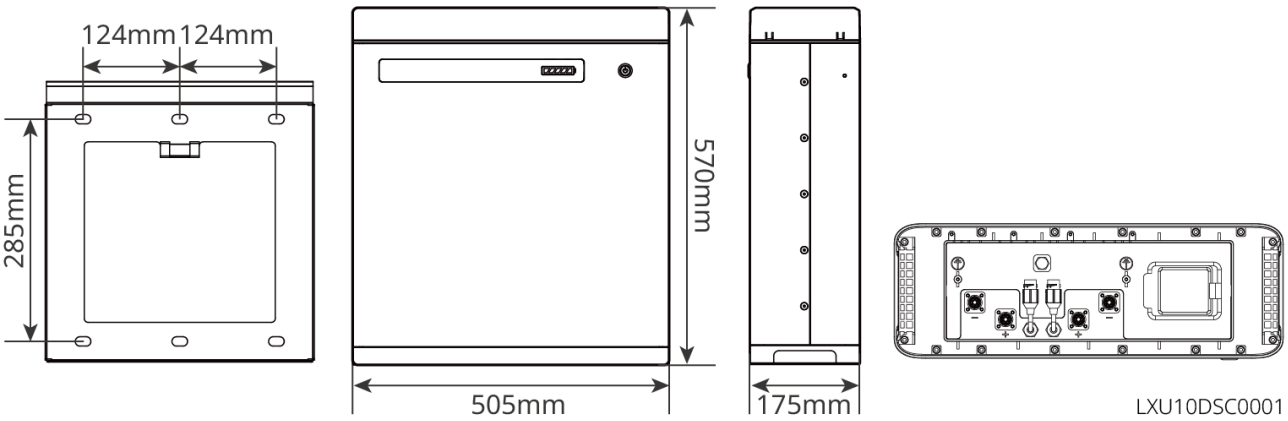
Lynx A 5.0-10



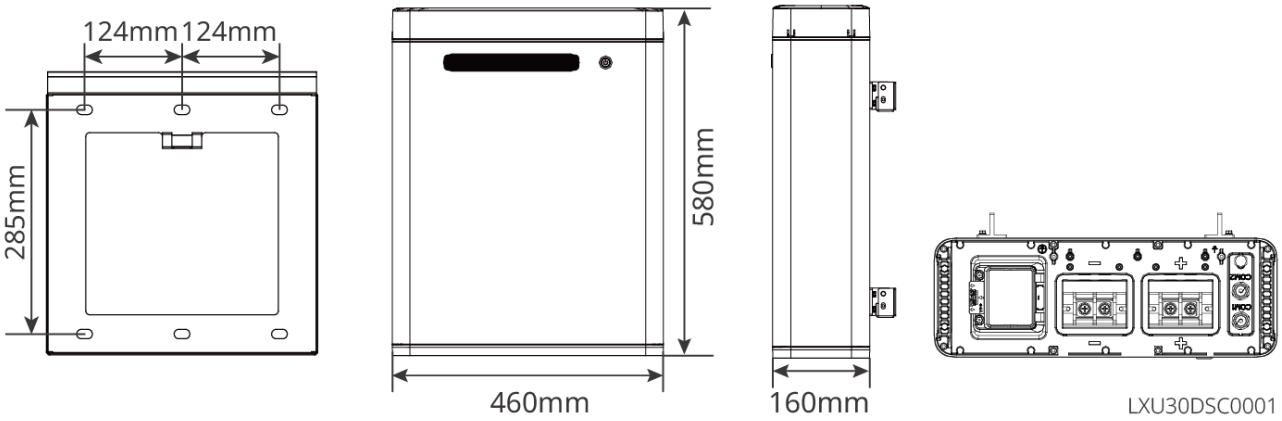
Lynx A 5.0-30



Lynx U5.4-20

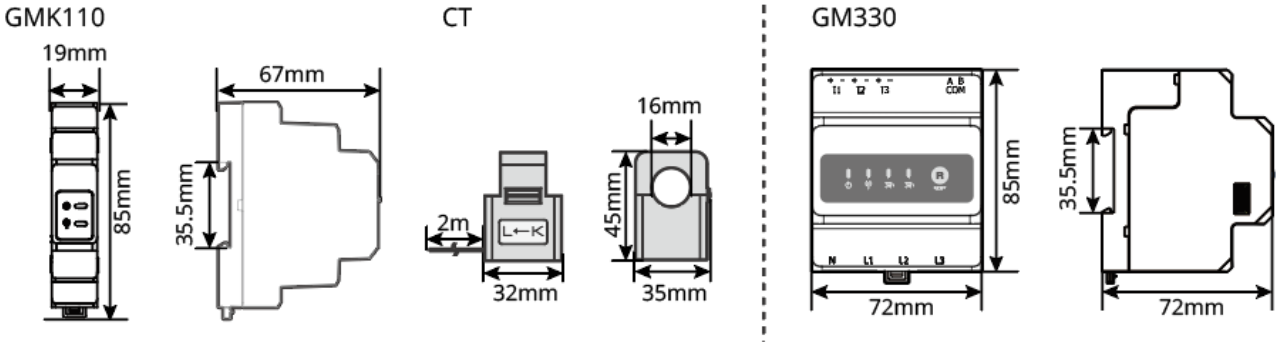


Lynx U5.0-30



3.2.3 Smart Meter

The smart meter can measure and monitor the data in the photovoltaic energy storage system, such as voltage, current, frequency, power factor, and power.

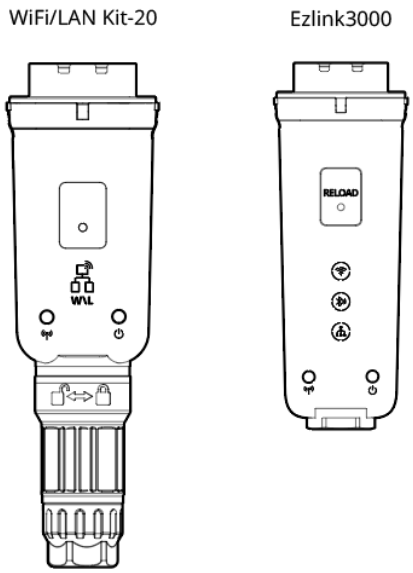


Number	Model	Applicable scenarios
1	GMK110	CT is not supported for changing to other type, CT ratio: 120A/40mA
2	GM330	Order the CT for GM330 from GoodWe or other suppliers. CT

		ratio: nA/5A. ● nA: CT primary input current, n ranges from 200 to 5000. ● 5A: CT secondary input current.

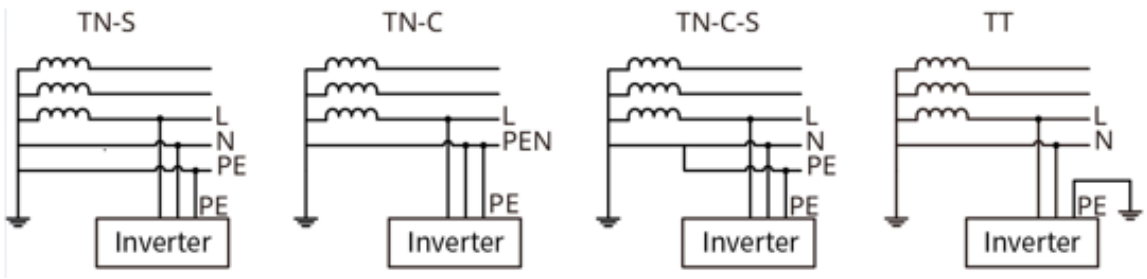
3.2.4 Smart Dongle

The smart dongle can transmit various power generation data to SEMS Portal, the remote monitoring platform, in real time. And connect to the SolarGo App to complete local equipment commissioning.



Number	Model	Signal	Applicable scenarios
1	WiFi/LAN Kit-20	Bluetooth, WiFi, LAN	Single inverter scenario
2	Ezlink3000	Bluetooth, WiFi, LAN	Master inverter of a parallel system

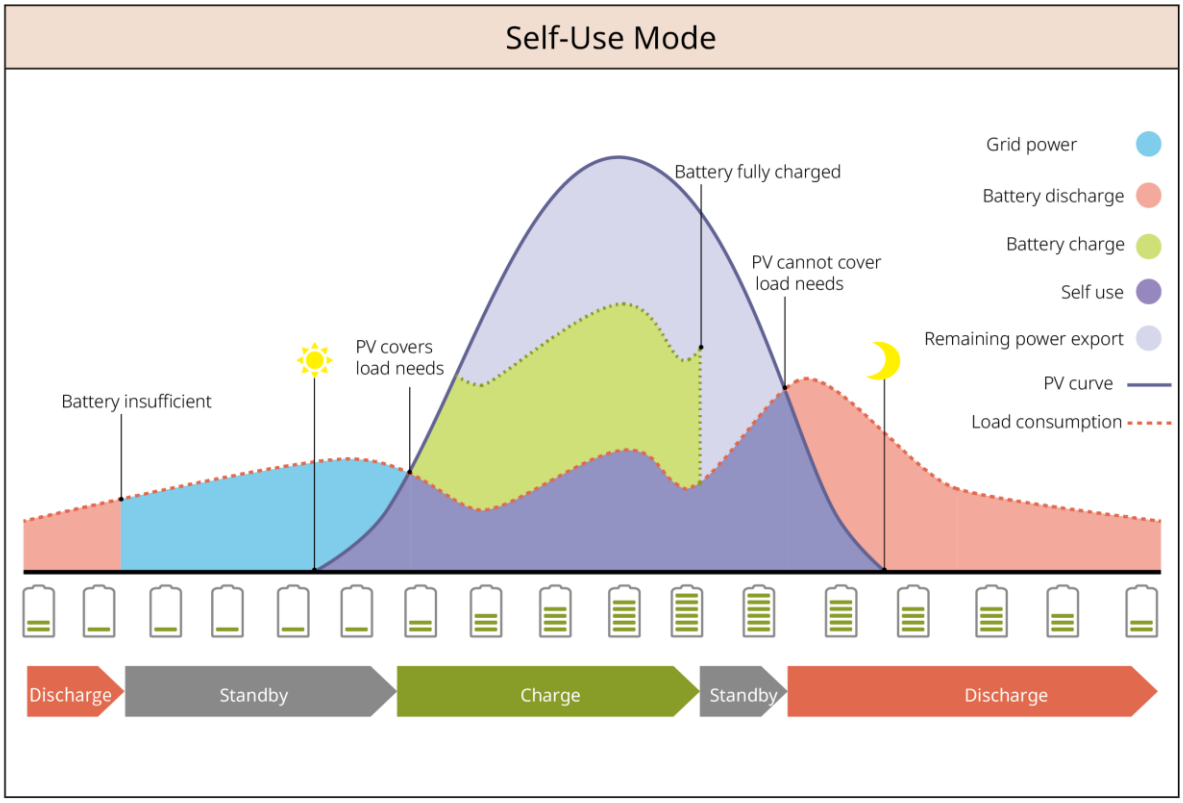
3.3 Supported Grid Types



3.4 System Working Mode

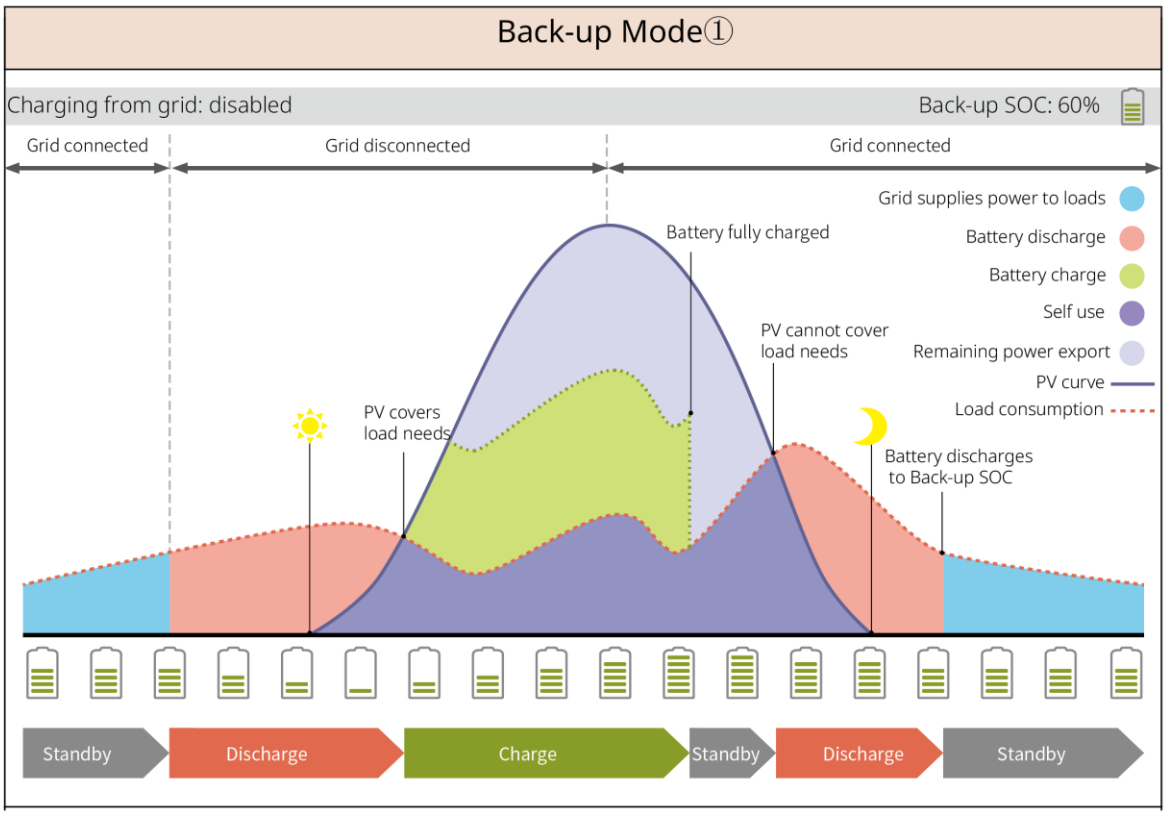
Self-Use Mode

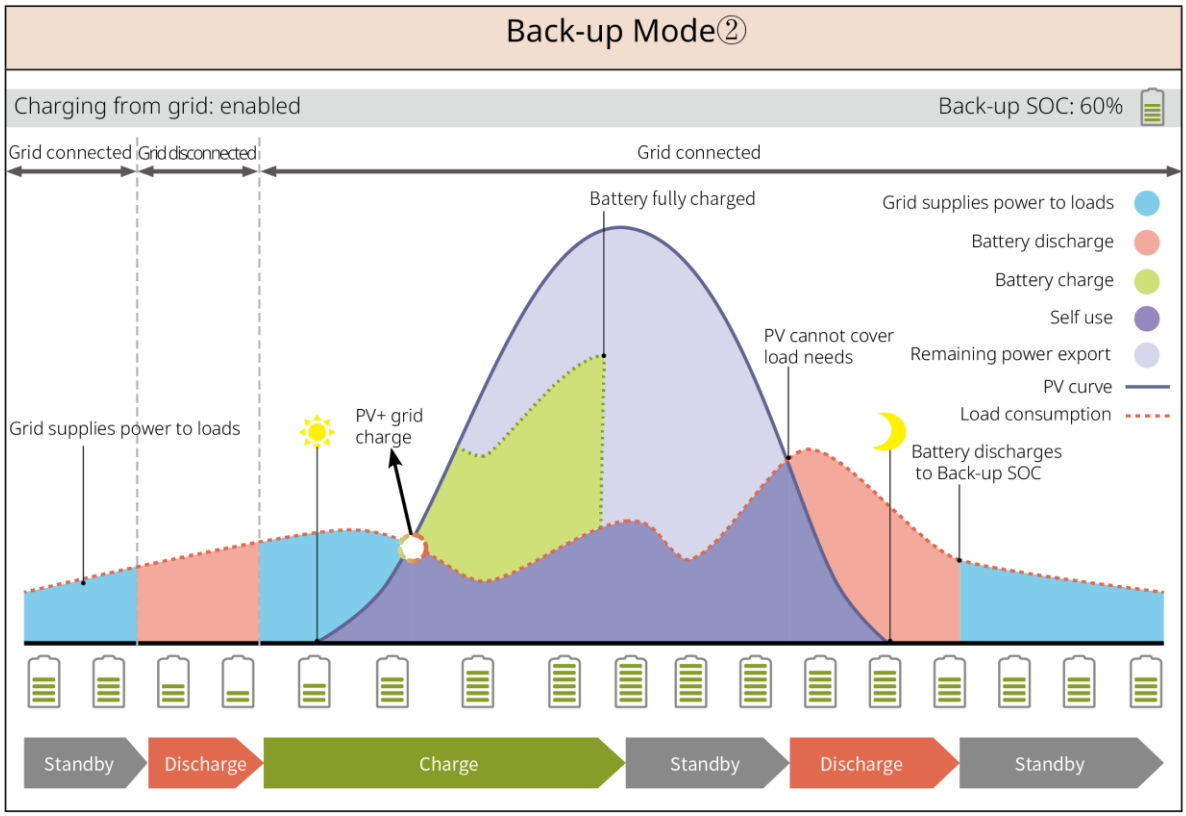
- Self-use mode is the basic working mode of the system.
- When the power generated in the PV system is sufficient, it will supply the loads in priority. The excess power will charge the batteries first, then the remaining power will be sold to the utility grid. When the power generated in the PV system is insufficient, the battery will supply the loads in priority. If the battery power is insufficient, the load will be powered by the utility grid.



BACK-UP Mode

- The BACK-UP mode is mainly applied to the scenario where the grid is unstable.
- When the grid is disconnected, the inverter turns to off-grid mode and the battery will supply power to the BACK-UP loads; when the grid is restored, the inverter switches to grid-tied mode.
- The battery will be charged to preset SOC protection value by utility grid or PV when the system is running on-grid. So that the battery SOC is sufficient to maintain normal working when the system is off-grid. The purchase of electricity from the power grid to charge the battery must comply with local laws and regulations.



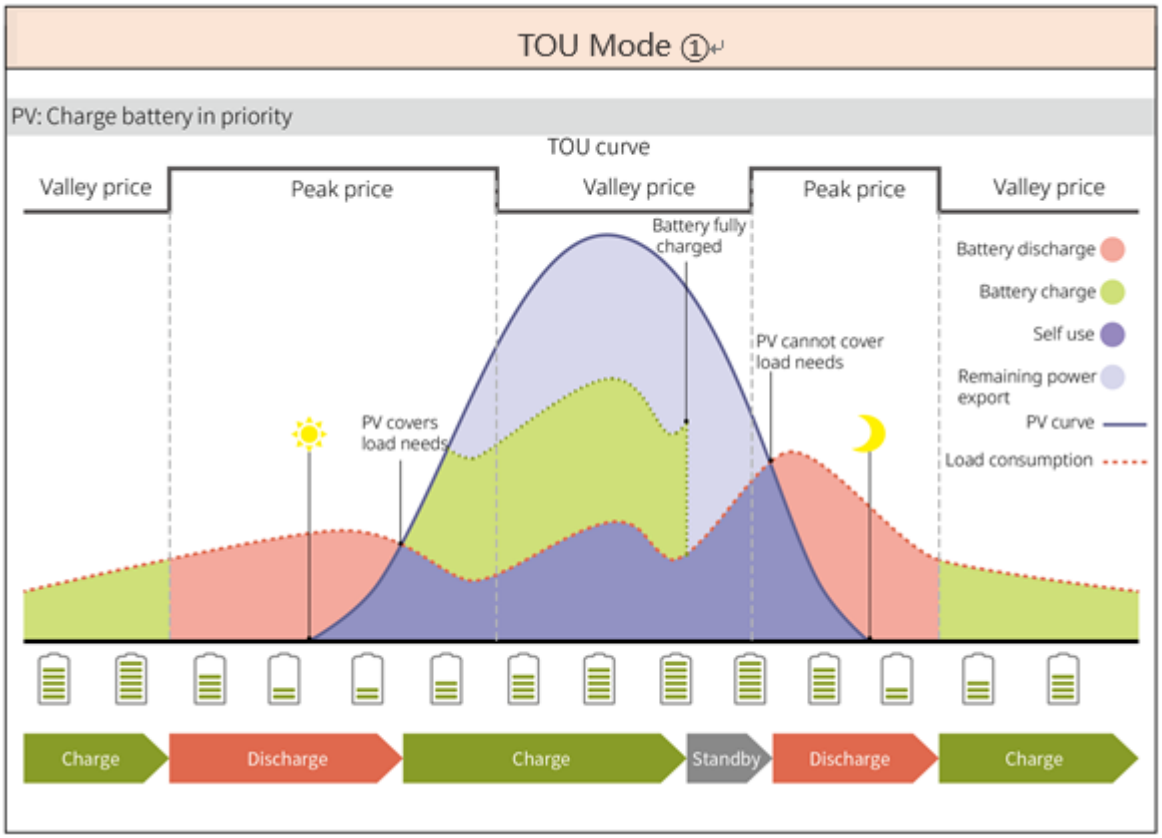


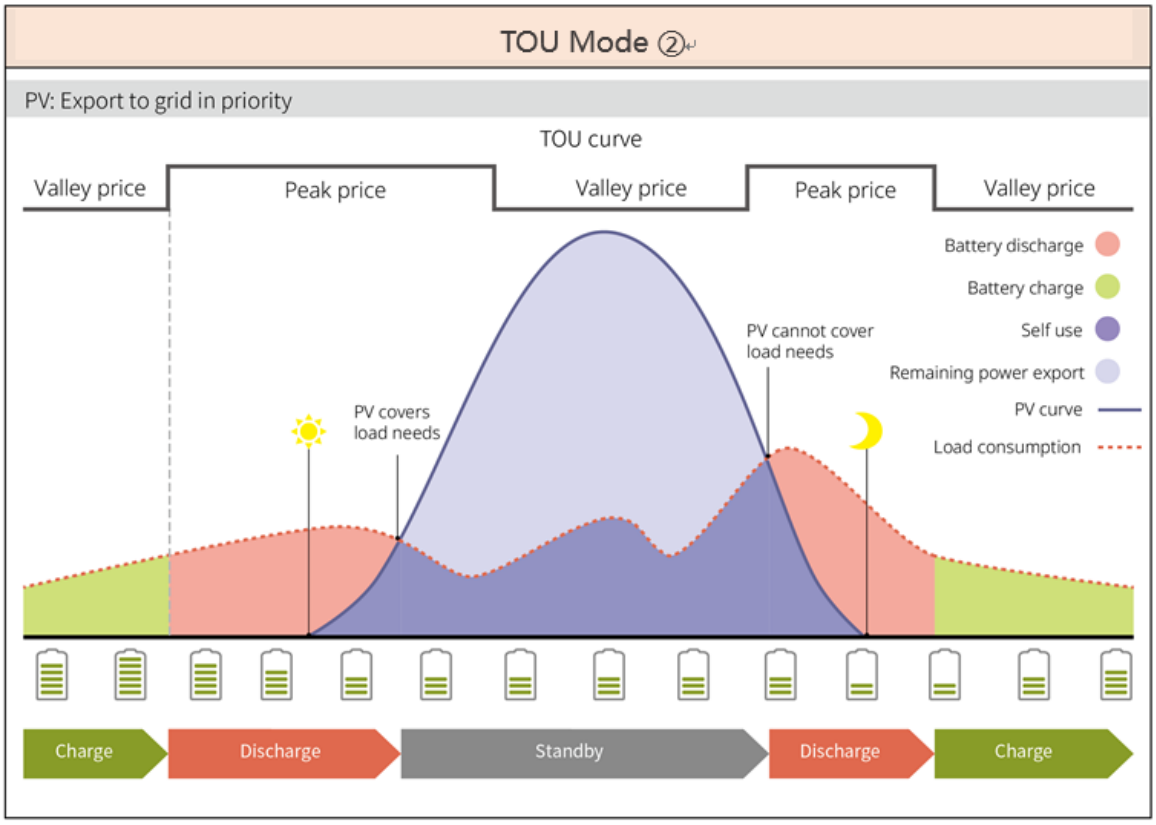
Economic mode

It is recommended to use economic mode in scenarios when the peak-valley electricity price varies a

lot. Select economic mode only when it meets the local laws and regulations.

For example, set the battery to charge mode during Valley period to charge battery with grid power. And set the battery to discharge mode during Peak period to power the load with the battery.





4 Check and Storage

4.1 Check before Acceptance

Check the following items before accept the product.

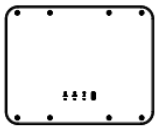
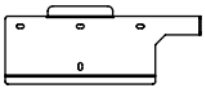
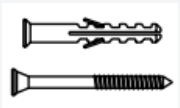
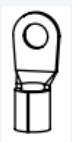
1. Check the outer packing box for damage, such as holes, cracks, deformation, and other signs of equipment damage. Do not unpack the package and contact the supplier as soon as possible if any damage is found.
2. Check the product model. If the product model is not what you requested, do not unpack the product and contact the supplier.

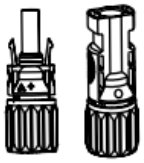
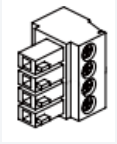
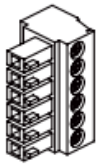
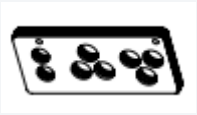
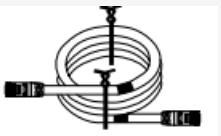
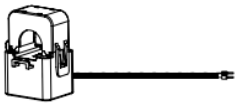
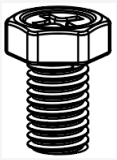
4.2 Package Content

WARNING

Check the deliverables for correct model, complete contents, and intact appearance. Contact the supplier as soon as possible if any damage is found.

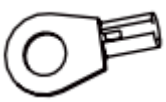
4.2.1 Inverter deliverables (ES Uniq)

Component	Description	Component	Description
	Inverter x1		Mounting plate x1
	Expansion screws x4		Screw x1
	Nut x8		Battery power connection terminal x 2
	AC terminal x 6		PE terminal x 1

	PV DC terminal ● GW8000-ES-C10 x 3 ● GW10K-ES-C10、GW12K-ES-C10 x 4		Smart dongle x 1
	2PIN terminal x 2		2PIN terminal x 2
	2PIN terminal x 2		AC protection cover x1
	Waterproof rubber seal x 1		BMS communication cable x 1
	CT connection cable x 1		Documents x 1
	PIN terminal x 14		Battery screw x 2
	Lead-acid battery temperature sensor cable x 1		Magnet x 1

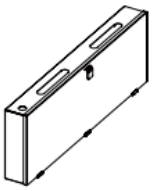
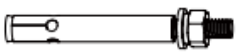
4.2.2 Battery deliverables (LX A5.0-10)

- **Battery**

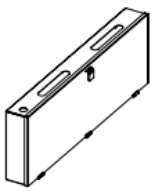
Component	Description	Component	Description
	Battery module x 1		M5 OT terminal x 2 M8 OT terminal x 4

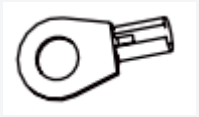
	M5 grounding screw x 2		Warning label x 1
	Terminal resistor x 1		Electrical Label x 1
	Documents x 1		Battery bracket x 2 (optional)
	M4*8 screw x 8 (optional)		
When selecting stacking way to install the battery, the battery bracket, support column, and M4*8 screw are included in the package.			

- **Busbar box (BCB-11-WW-0) (optional)**

Component	Description	Component	Description
	360A busbar box x 1		M6 expansion bolt x 4
	M8 OT terminal x 18 M10 OT terminal x 2	-	-

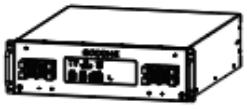
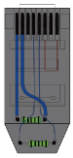
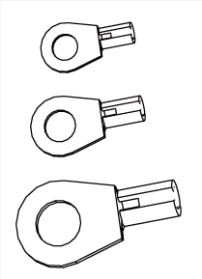
- **Busbar box (BCB-22-WW-0) (optional)**

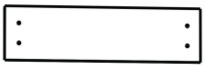
Component	Description	Component	Description
	720A busbar box x 1		M6 expansion bolt x 4

	M8 OT terminal x 36 M10 OT terminal x 6	-	-

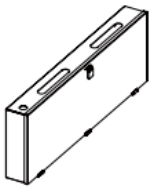
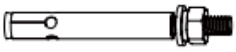
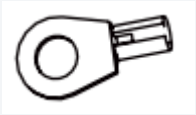
4.2.3 Battery deliverables (LX A5.0-30)

- **Battery**

Component	Description	Component	Description
	Battery module x 1		Terminal resistor x 1 When connecting to a third-party busbar, the battery needs to be equipped with this terminal resistor.
	• M5 OT terminal x 2: Recommended for connecting 70mm² cables • M8 OT terminal x 2: Recommended for connecting 70mm² cables • M10 OT terminal x 2: Recommended for connecting 70mm² cables		M5*12 grounding screw x 2
	Documents x 1	-	-
	Wall mounting rack x 2 For wall-mounted installation		M6*70 expansion bolt x 4 For wall-mounted installation

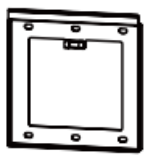
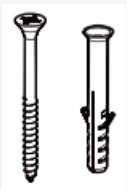
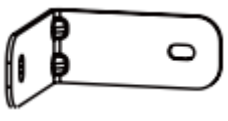
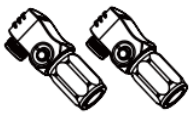
	M5*12 grounding screw x 2 For wall-mounted installation		Installation positioning cardboard x 1 For wall-mounted installation
	Battery bracket x 2 (optional) For floor-mounted installation		M4*8 screw x 8 For floor-mounted installation

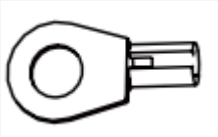
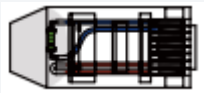
- **Busbar box (BCB-32-WW-0) (optional)**

Component	Description	Component	Description
	720A busbar box x 1		M6 expansion bolt x 4
	• M8 OT terminal x 30 • M10 OT terminal x 6	-	-

4.2.4 Battery deliverables (LX U5.4-20)

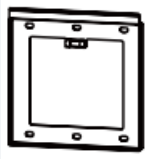
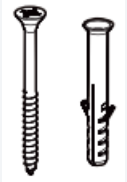
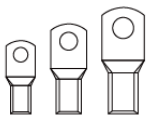
- **Battery**

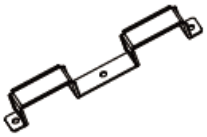
Component	Description	Component	Description
	Battery module x 1		Cover x 1
	Mounting plate x 1		Expansion bolt x 2
	Unlocking bracket x 1		Power connector x 2

	Grounding terminal x 4		M5 screw x 8
	M10 Expansion bolt x 6		Cable harness fixing plate x 1
	Terminal resistor x 1		Documents x 1

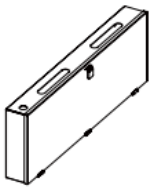
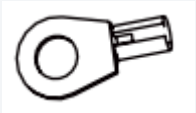
4.2.5 Battery deliverables (LX U5.0-30)

- **Battery**

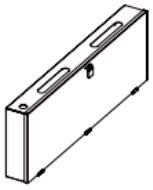
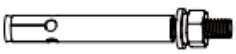
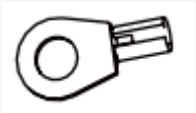
Component	Description	Component	Description
	Battery module x 1		Cover x 1
	Mounting plate x 1		Expansion bolt x 2
	Unlocking bracket x 1		• 35-8 OT terminal x 4: Recommended for connecting 25mm² or 35mm² cables • 50-8 OT terminal x 2: Recommended for connecting 50mm² cables • 70-10 OT terminal x 2: Recommended for connecting 70mm² cables
	14-5 Grounding terminal x 4		M5 Screw x 8

	M10 Expansion bolt x 6		Cable harness fixing plate x 1
	Power connector protect cover x 2		Documents x 1
	Terminal resistor x 1		

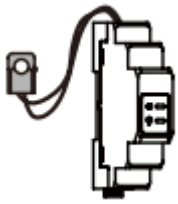
- **Busbar box (BCB-32-WW-0) (optional)**

Component	Description	Component	Description
	720A busbar box x 1		M6 expansion bolt x 4
	• M8 OT terminal x 30 • M10 OT terminal x 6	-	-

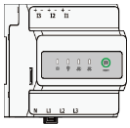
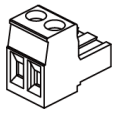
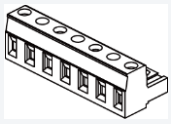
- **Busbar box (BCB-33-WW-0) (optional)**

Component	Description	Component	Description
	720A busbar box x 1		M6 expansion bolt x 4
	• M8 OT terminal x 30 • M10 OT terminal x 6	-	-

4.2.6 Smart Meter Deliverables (GMK110)

Component	Description	Component	Description
	Smart meter and CT x 1		RS485 communication terminal x 1
	Voltage input side terminal x 1		PIN terminal x 4
	Screw driver x 1		Documents x 1

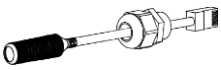
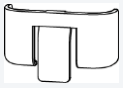
4.2.7 Smart Meter (GM330)

Component	Description	Component	Description
	Smart meter and CT x 1		2PIN terminal x 1
	PIN terminal x 6		7PIN terminal x 1
	Screw driver x 1		Documents x 1

4.2.8 Smart Dongle (WiFi/LAN Kit-20)

Component	Description	Component	Description
	Smart dongle x 1		Documents x 1

4.2.9 Smart Dongle (Ezlink3000)

Component	Description	Component	Description
	Smart dongle x 1		LAN cable connector x 1
	Documents x 1		Unlock tool x 1 Remove the module using the removing tool if it is included. If the tool is not provided, remove the module by pressing the unlock button on the module.

4.3 Storage

If the equipment is not to be installed or used immediately, please ensure that the storage environment meets the following requirements: If the equipment has been long term stored, it should be checked by professionals before being put into use.

Packing requirements:

Do not unpack the outer package or throw the desiccant away.

Installation environment requirements:

1. Place the equipment in a cool place where away from direct sunlight.
2. Store the equipment in a clean place. Make sure the temperature and humidity are appropriate and no condensation. Do not install the equipment if the ports or terminals are condensed.

   Battery storage temperature range (T):

   LX A5.0-10/LX A5.0-30:

   - When -20℃≤T < 0℃ or 35℃ < T≤45℃, the storage period cannot exceed 1 month.
   - When 0℃≤T≤35℃, the storage period cannot exceed 1 year.

   LX U5.4-20:

   - When -20℃≤T < 0℃ or 35℃ < T≤40℃, the storage period cannot exceed 1 month.
   - When 0℃≤T≤35℃, the storage period cannot exceed 1 year.

LX U5.0-30：

- When 35℃≤T≤45℃, the storage period cannot exceed 1 month.
- When -20℃≤T≤35℃, the storage period cannot exceed 1 year.

3. Keep the equipment away from flammable, explosive, and corrosive matters.

Stacking requirements:

1. The height and direction of the stacking inverter should follow the instructions on the packing box.
2. The inverter must be stacked with caution to prevent them from falling.

Battery Dis-/Charge Requirements:

Storage SOC: 25%-50% SOC. Circle the charge-discharge every 6 months.

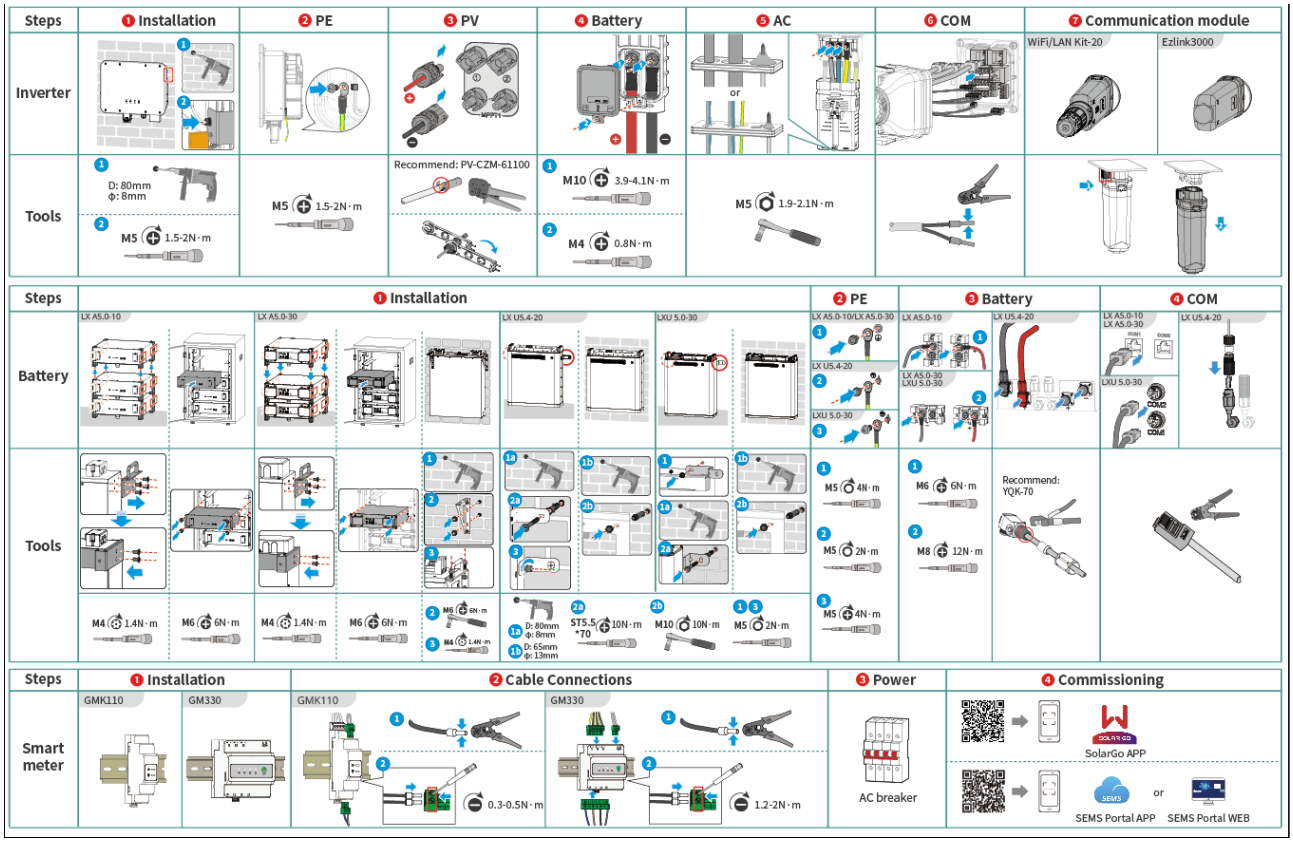
5 Installation

DANGER

Install and connect the equipment using the deliverables included in the package.

Otherwise, the manufacturer shall not be liable for the damage.

5.1 System Installation and Commissioning Procedure

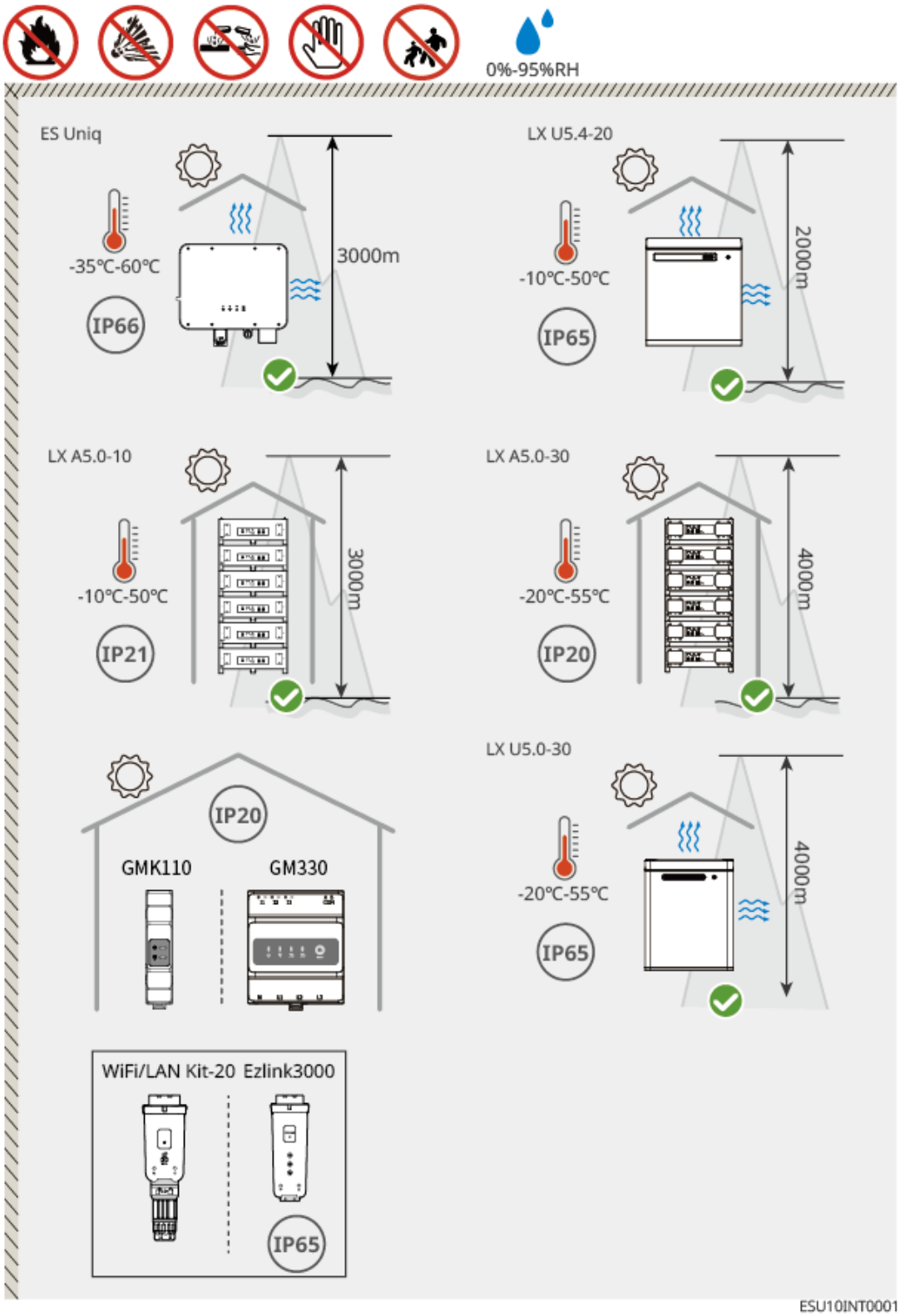


5.2 Installation Requirements

5.2.1 Installation Environment Requirements

1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. The temperature and humidity at the installation site should be within the appropriate range.
3. Do not install the equipment in a place that is easy to touch, especially within children’ s reach.
4. 60℃ high temperature exists when the equipment is working. Do not touch the surface to avoid burning.
5. Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. Build a sunshade if it is needed.

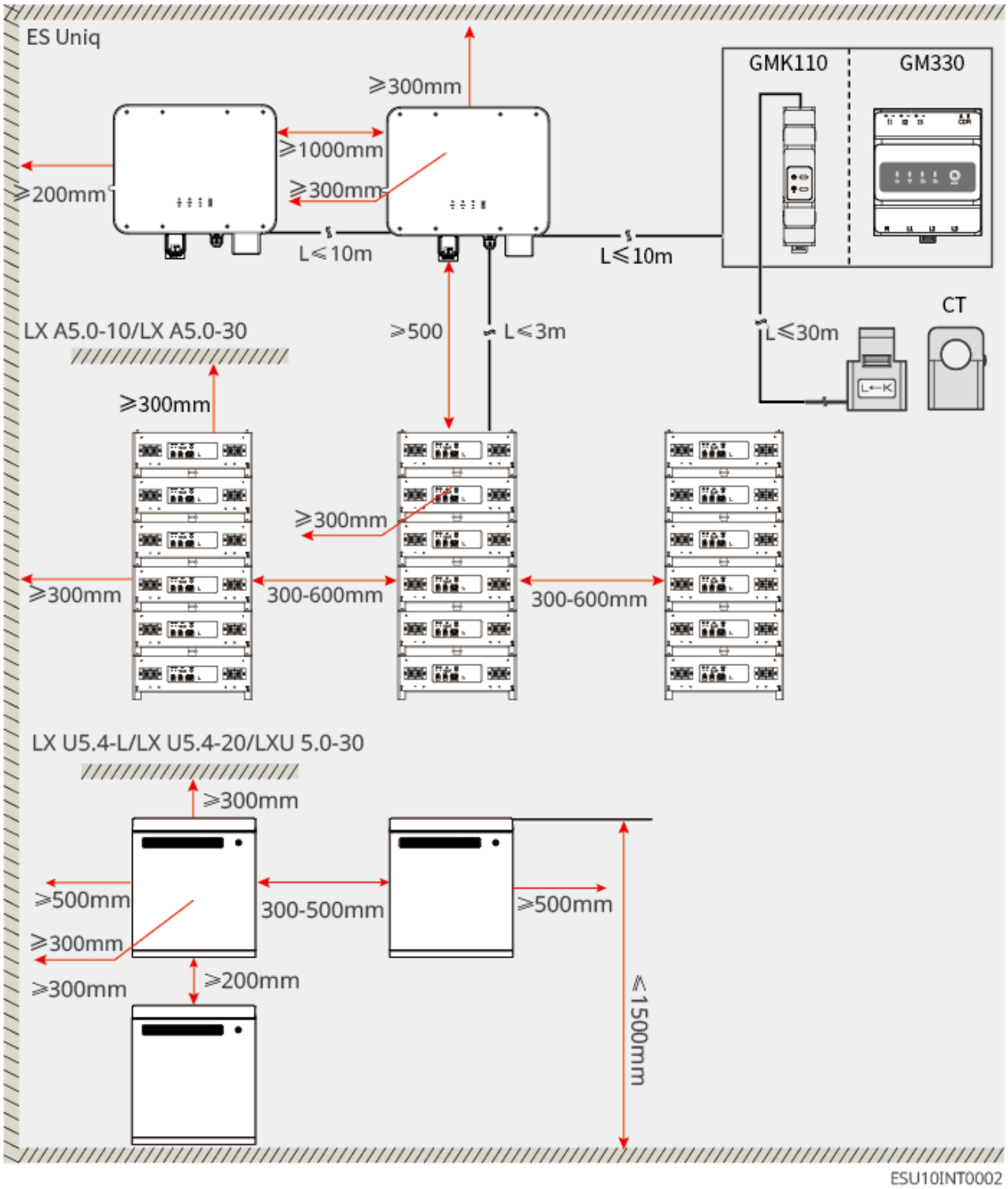
6. The place to install the equipment shall be well-ventilated for heat radiation and large enough for operations.
7. Check the protection rating of the equipment and ensure that the installation environment meets the requirements. The inverter, battery system, and smart dongle can be installed both indoors and outdoors. But the smart meter can only be installed indoors.
8. Install the equipment at a height that is convenient for operation and maintenance, electrical connections, and checking indicators and labels.
9. The altitude to install the equipment shall be lower than the maximum working altitude of the system.
10. Consult the manufacturer before installing the equipment outdoors in salt affected areas. A salt affected area refers to the region within 500 meters offshore, and will be related to the sea wind, precipitation and topography.
11. Install the equipment away from electromagnetic interference. If there is any radio or wireless communication equipment below 30MHz near the equipment, you have to:
    - Inverter: add a multi-turn winding ferrite core at the AC output cable of the inverter, or add a low-pass EMI filter.
    - Other equipment: the distance between the equipment and the wireless EMI equipment should be more than 30m.



5.2.2 Installation Space Requirements

Reserve enough space for operations and heat dissipation when installing the system. When using CAT7 communication cables among inverters, the maximum distance can reach 10 meters, while using CAT5 communication cables, the maximum distance can reach

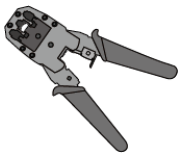
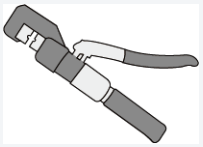
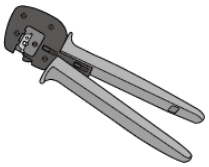
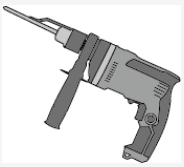
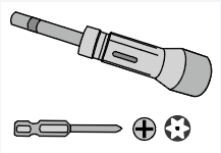
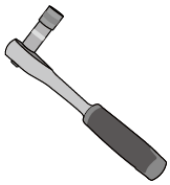
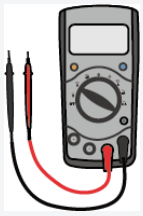
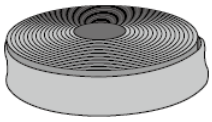
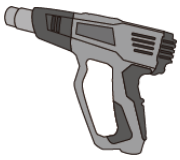
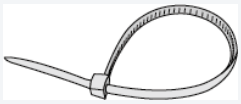
5 meters.



5.2.3 Tool Requirements

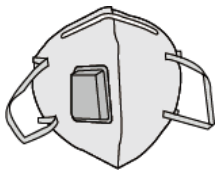
NOTICE
The following tools are recommended when installing the equipment. Use other auxiliary tools on site if necessary.

Installation Tools

Tool	Description	Tool	Description
	Diagonal pliers		RJ45 crimping tool
	Wire stripper		YQK-70 hydraulic pliers
	Adjustable wrench		PV connector tool PV-CZM-61100
	Impact drill (drill bits Φ8mm, 10mm)		Torque wrench M4、M5、M6、M8、M10
	Rubber hammer		Socket wrench set
	Marker		Multimeter Range≤600V
	Heat shrink tube		Heat gun
	Cable tie		Vacuum cleaner
	Level	-	-

Personal Protective Equipment

Tool	Description	Tool	Description

	Insulation gloves and safety gloves		Dust mask
	Goggles		Safety shoes

5.3 Equipment Handling

CAUTION

- Operations such as transportation, turnover, installing and so on must meet the requirements of local laws and regulations.
- Move the equipment to the site before installation. Follow the instructions below to avoid personal injury or equipment damage.
  1. Consider the weight of the equipment before moving it. Assign enough personnel to move the equipment to avoid personal injury.
  2. Wear safety gloves to avoid personal injury.
  3. Keep balance to avoid falling down when moving the equipment.

5.4 Installing the Inverter

CAUTION

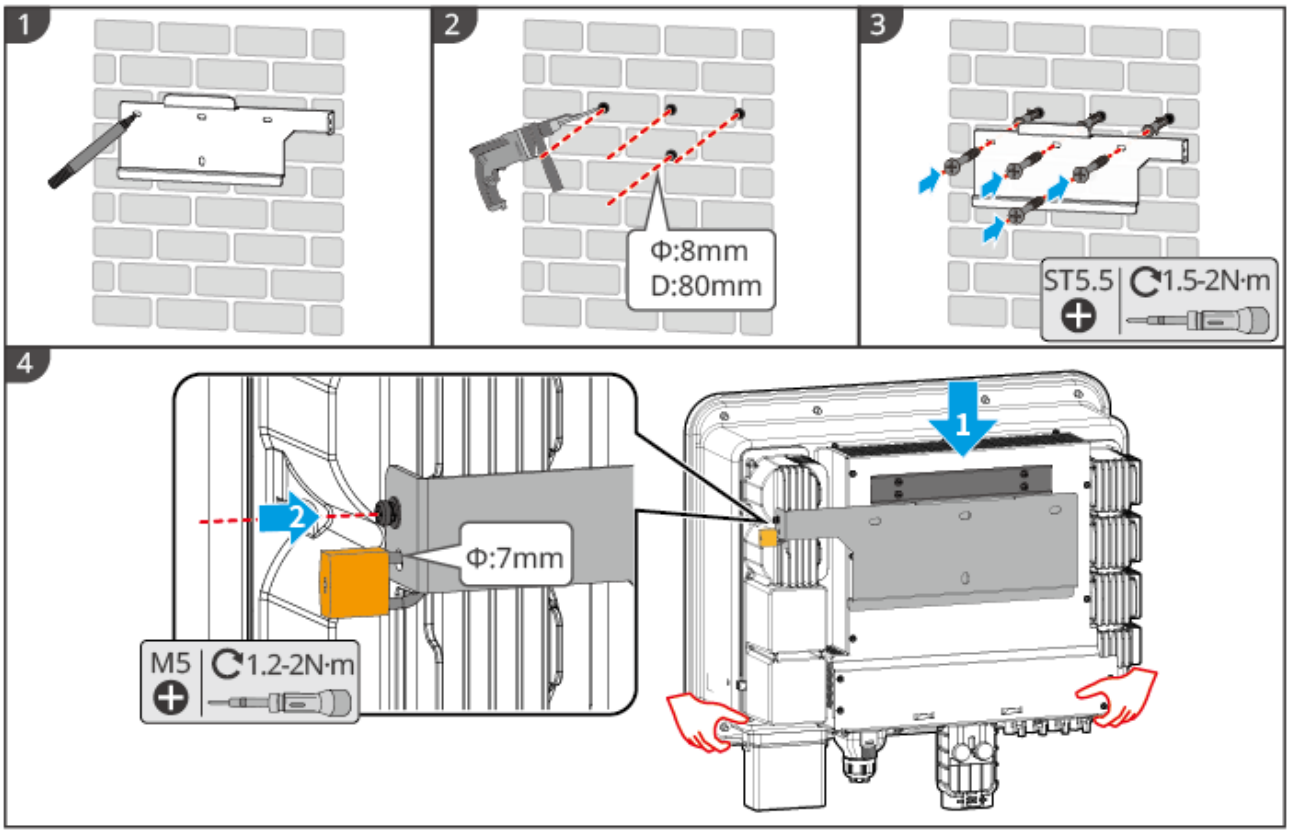
- Avoid the water pipes and cables buried in the wall when drilling holes.
- Wear goggles and a dust mask to prevent the dust from being inhaled or contacting eyes when drilling holes.
- Make sure the inverter is firmly installed in case of falling down.

Step 1: Put the mounting plate on the wall horizontally and mark positions for drilling holes.

Step 2: Drill holes with hammer drill.

Step 3: Use expansion bolts to fix the mounting plate on the wall.

Step 5: Install the inverter on the mounting plate. Tighten the nuts to secure the mounting plate and the inverter.



5.5 Installing the Battery System

WARNING

- Ensure that the battery system is installed vertically and securely. When using the locking bracket, the bracket should be vertically attached to the wall and the surface of the battery system.
- Cover the equipment with a cardboard to prevent foreign matters when drilling holes. Otherwise, the system may be damaged.
- After marking the drilling position with a marker pen, the battery system needs to be moved away to avoid equipment damage caused by the impact drill when drilling.
- Cover the equipment with a cardboard to prevent foreign matters when drilling holes. Otherwise, the system may be damaged.

LX A5.0-30: Floor-mounted installation

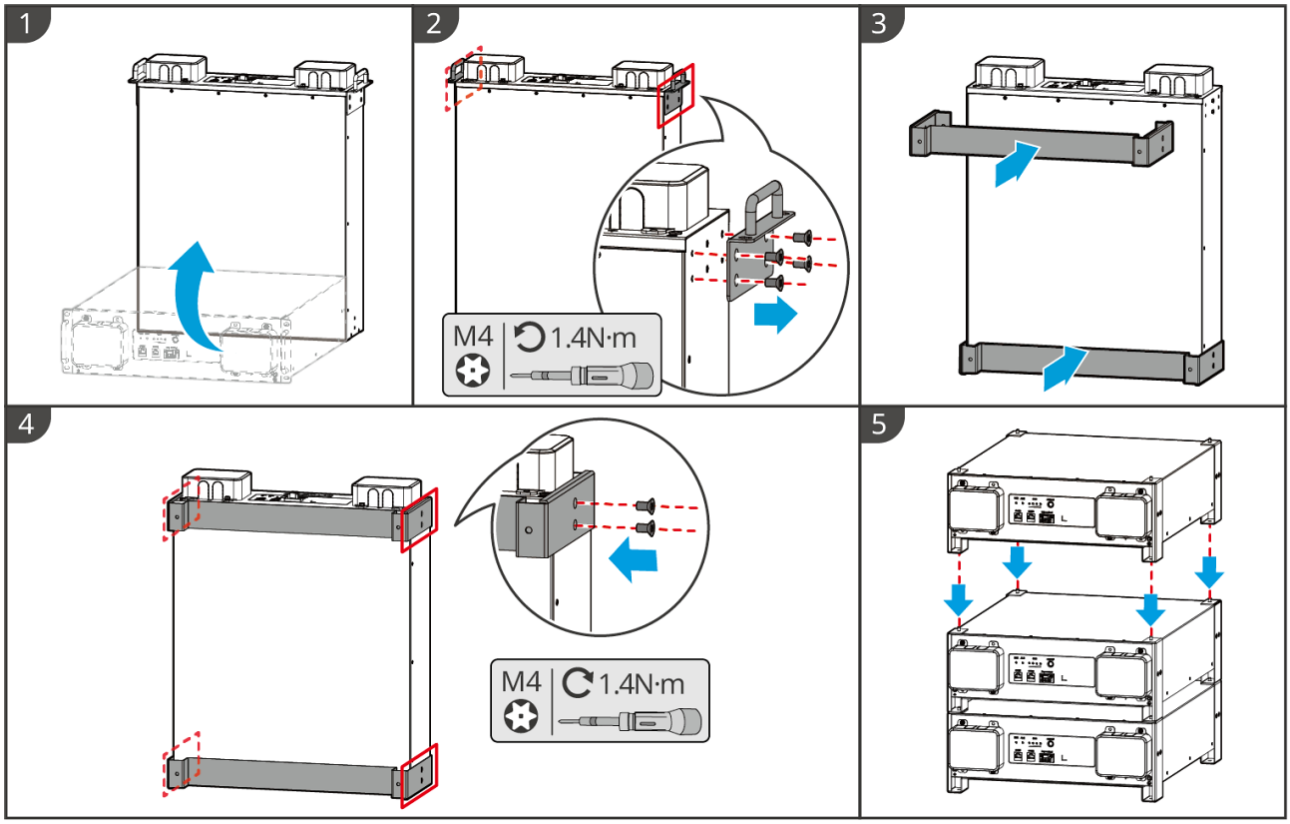
NOTICE

Up to 6 batteries can be stacked for floor-mounted installation.

Step 1: Place the battery vertically, and remove the battery handles.

Step 2: Install brackets on the battery, and secure them with screws.

Step 3: Place the battery flat and stack multiple batteries. Ensure that the locating pin is inserted into the locating hole.

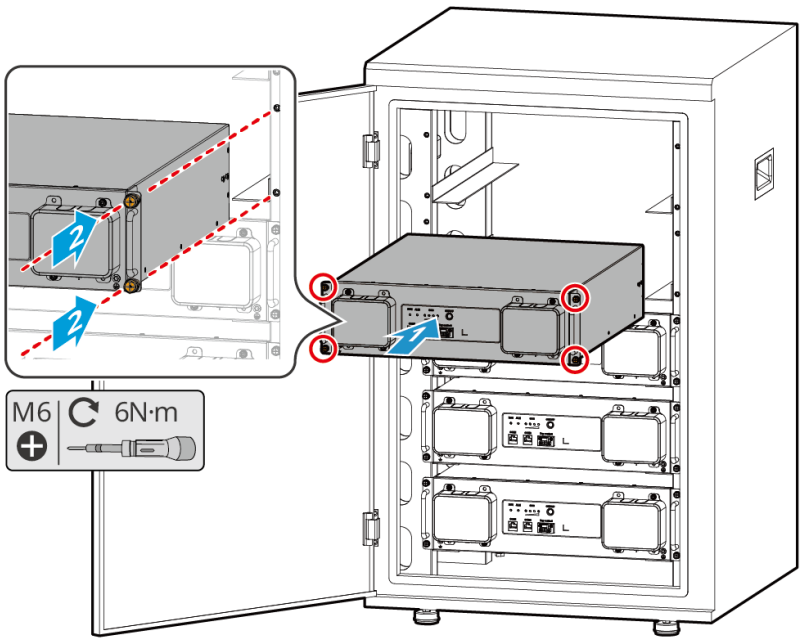


LXA30INT0001

LX A5.0-30: Rack-mounted Installation

NOTICE
• It is recommended to install it in a 19-inch standard rack with a length * width of 600*800mm and above, and the height should be determined based on the thickness of the battery (133mm) and above. • For rack-mounted installation, electrical labels and warning labels need to be attached to any position of the front panel of the battery (these labels are shipped as additional accessories).

Step 2: Place the battery on the guide rail of the rack and secure the battery to the rack with screws from the handle.



LXA30INT0002

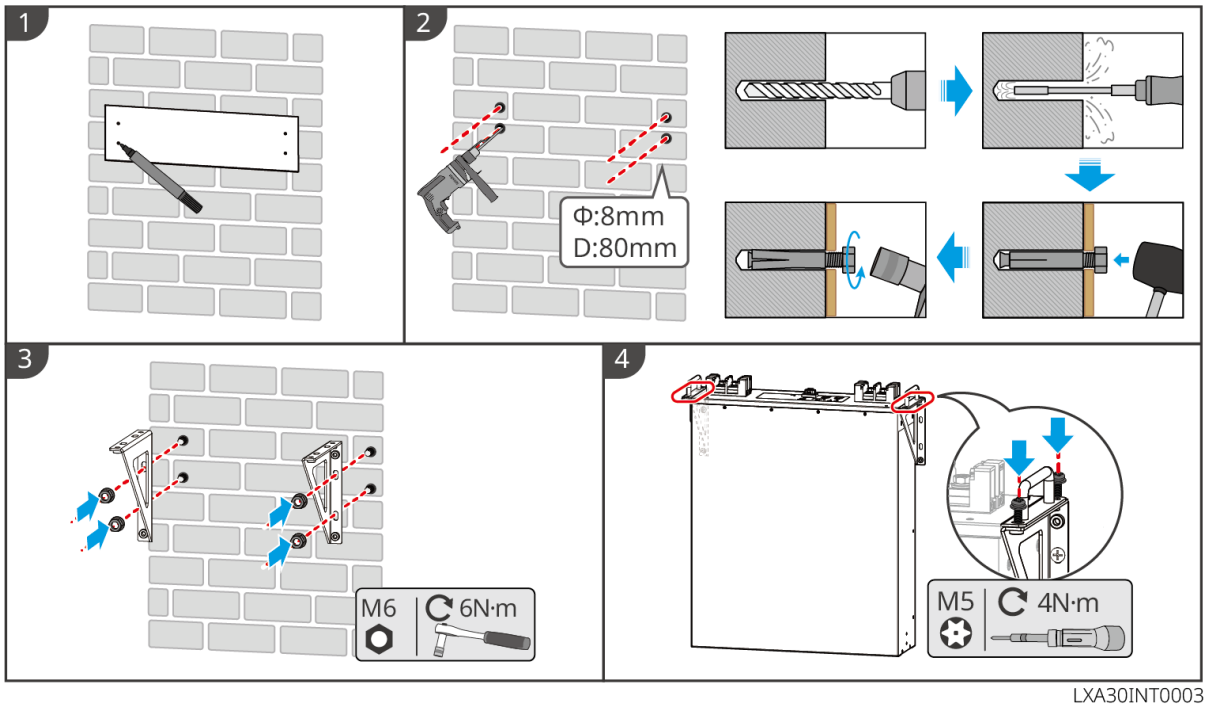
LX A5.0-30: Wall-mounted Installation

Step 1: Determine the drilling position with installation positioning cardboard and marker pen.

Step 2: Use an impact drill to drill holes.

Step 3: Install the battery brackets.

Step 4: Install the battery on the brackets and use screws to secure the battery.



LXA30INT0003

LX A5.0-10: Floor-mounted Installation

NOTICE
Up to 6 batteries can be stacked for floor-mounted installation.

Step 1: Place the battery vertically.

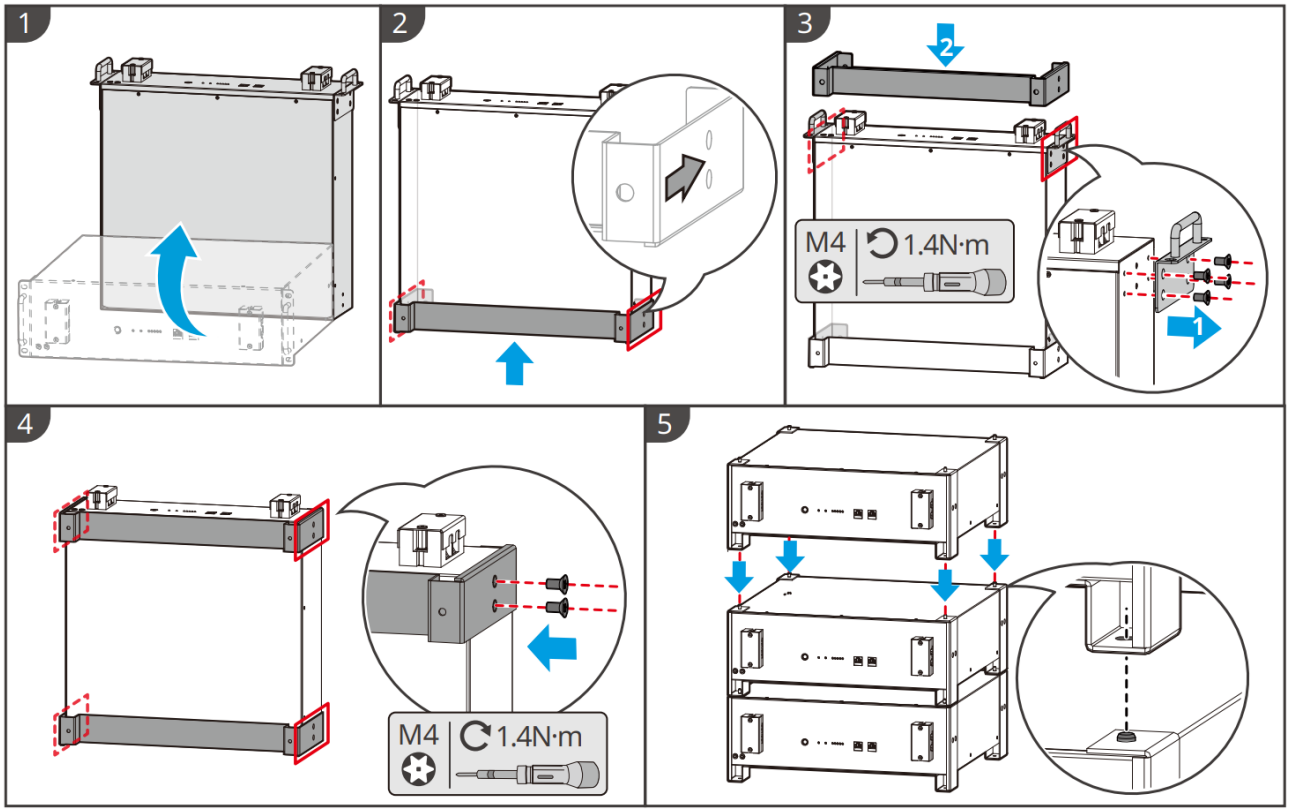
Step 2: Install the bracket on the bottom of the battery, and then remove the handles from the battery.

Step 3: Install another bracket on the battery.

Step 4: Use screws to tight the brackets, then place the battery flatly.

Step 5: Stack multiple batteries.

- Insert locating pin on the bracket into locating hole.

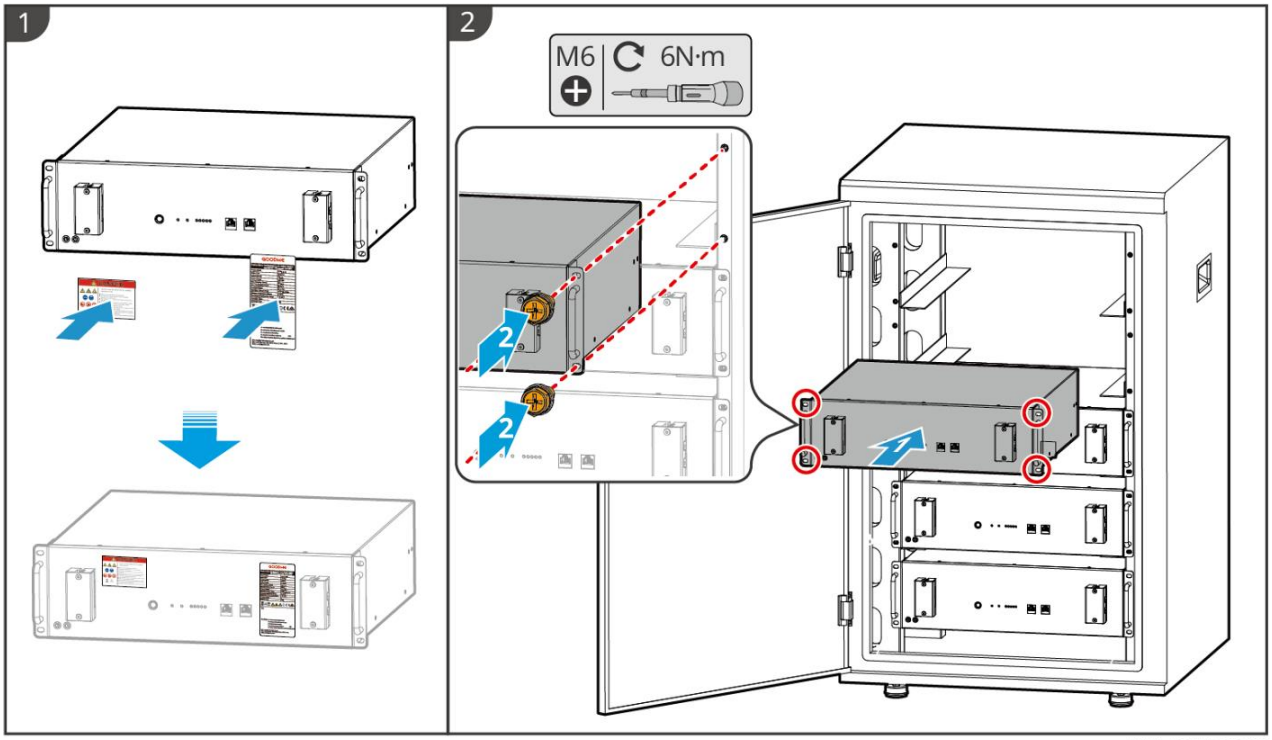


LX A5.0-10: Rack-mounted Installation

NOTICE
• It is recommended to use a 19-inch standard rack with physical length and width of 600*800mm and above. The height can be chosen according to the number of batteries in parallel. • For rack-mounted installation, electrical labels and warning labels need to be attached to any position of the front panel of the battery (these labels are shipped as additional accessories).

Step 1: Stick the electrical label and warning label to the position of the front panel of any battery.

Step 2: Place the battery on the guide rail of the rack and secure the battery to the rack with screws from the handle.



LXA10INT0002

LX U5.4-20: Floor-mounted Installation

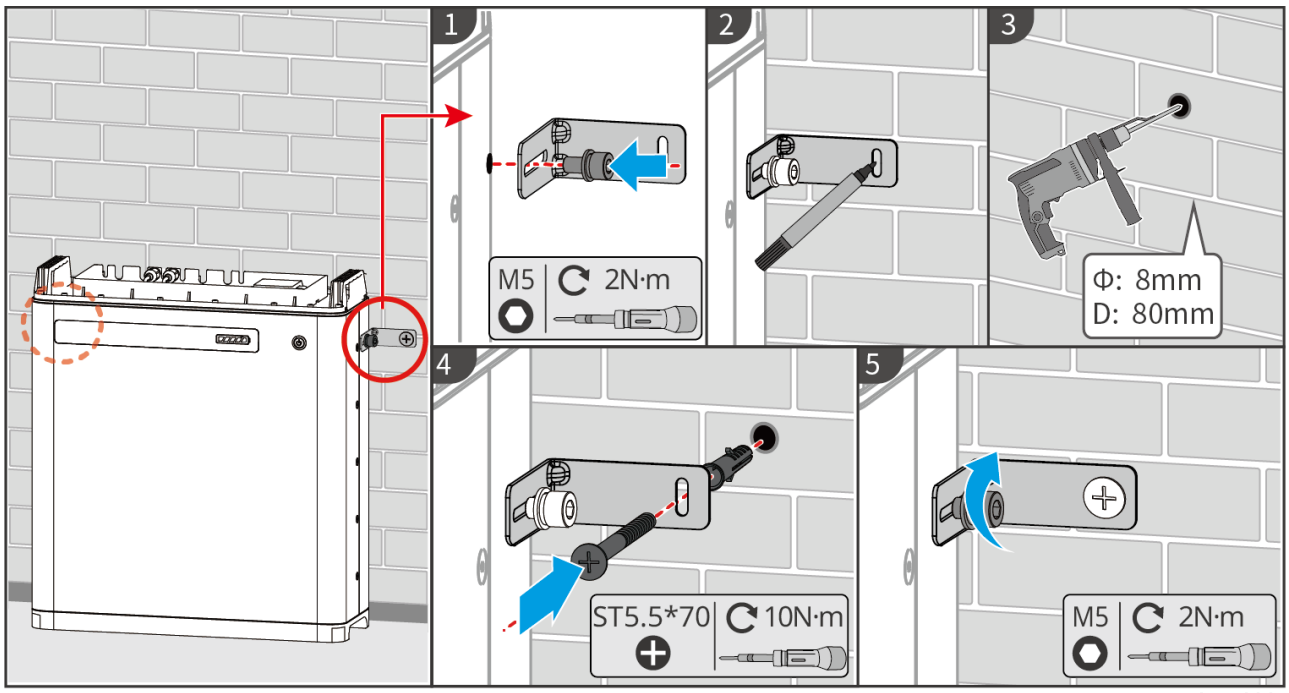
NOTICE
• If parallel use is required, check and select batteries with similar production dates and numbers to use together.

Step 1: Secure the unlocking bracket to the battery.

Step 2: Keep the battery parallel to the wall and ensure that the unlocking bracket is tightly attached to the wall. Ensure secure placement, mark the drilling position with a marker pen, and remove the battery.

Step 3: Use an impact drill to drill holes in the wall.

Step 4: Tighten the expansion screw.



LXU10INT0001

LX U5.4-20: Wall-mounted Installation

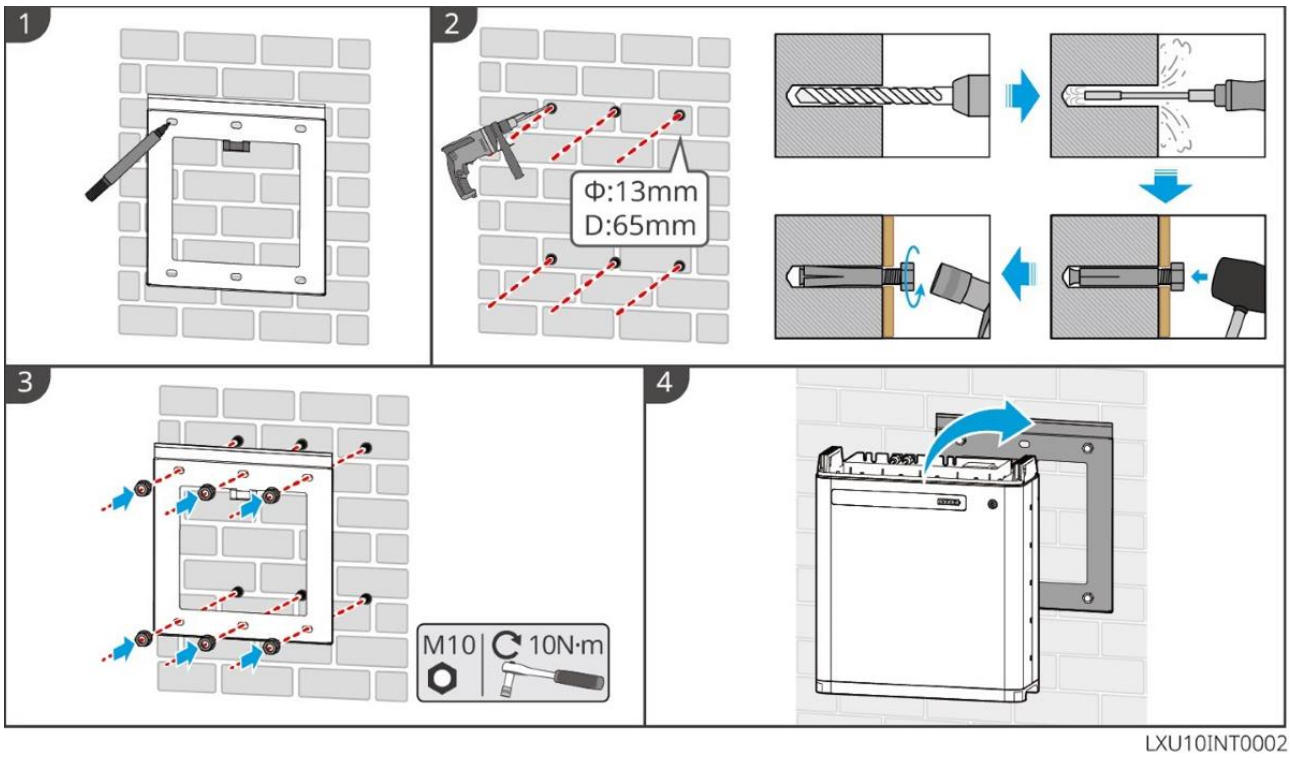
NOTICE
Wall-mounted installation need to people work together

Step 1: Make the mounting plate tightly adhere to the wall and mark the drilling position with a marker pen.

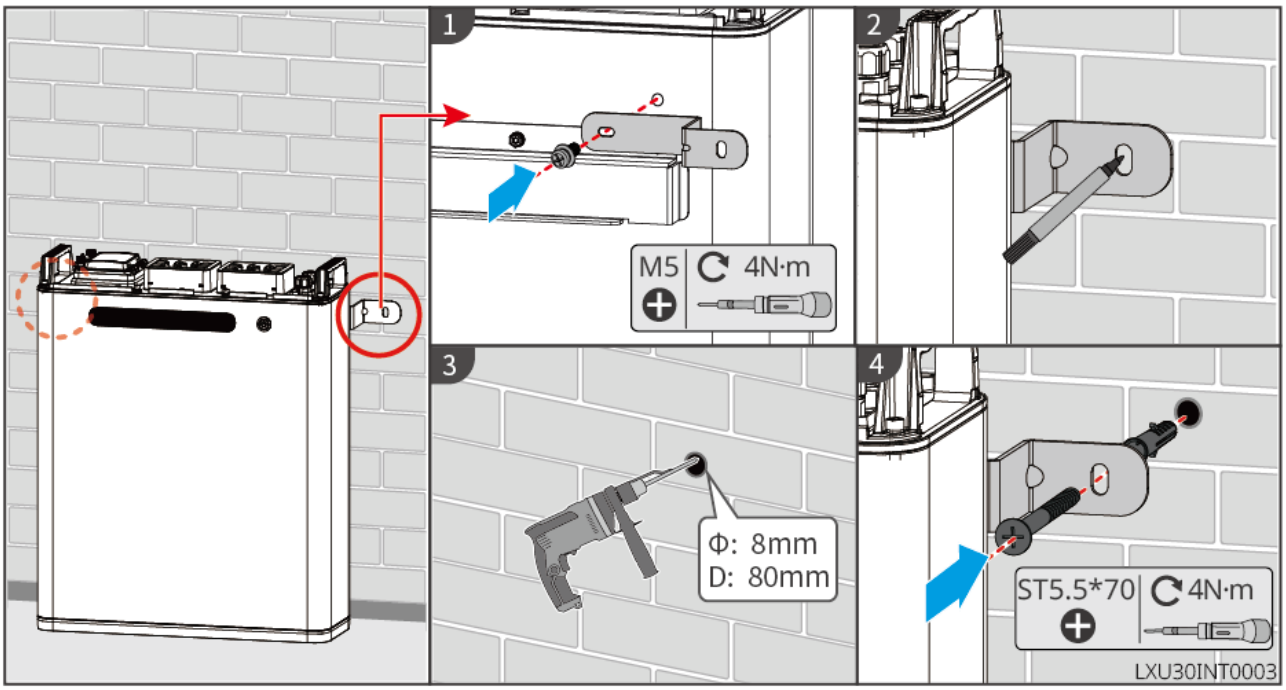
Step 2: Use an impact drill to drill holes in the wall.

Step 3: Tighten the mounting plate.

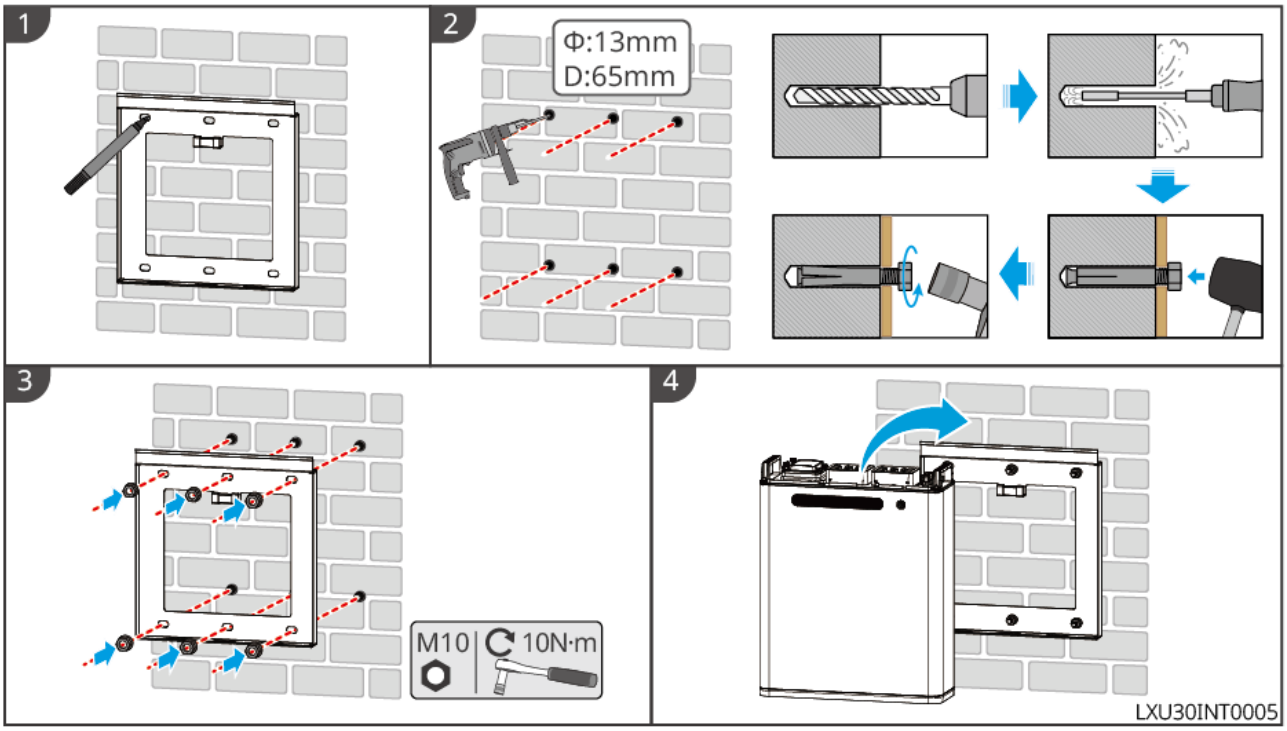
Step 4: Install the battery onto the mounting plate.



LX U5.0-30: Floor-mounted Installation



LX U5.0-30: Wall-mounted Installation

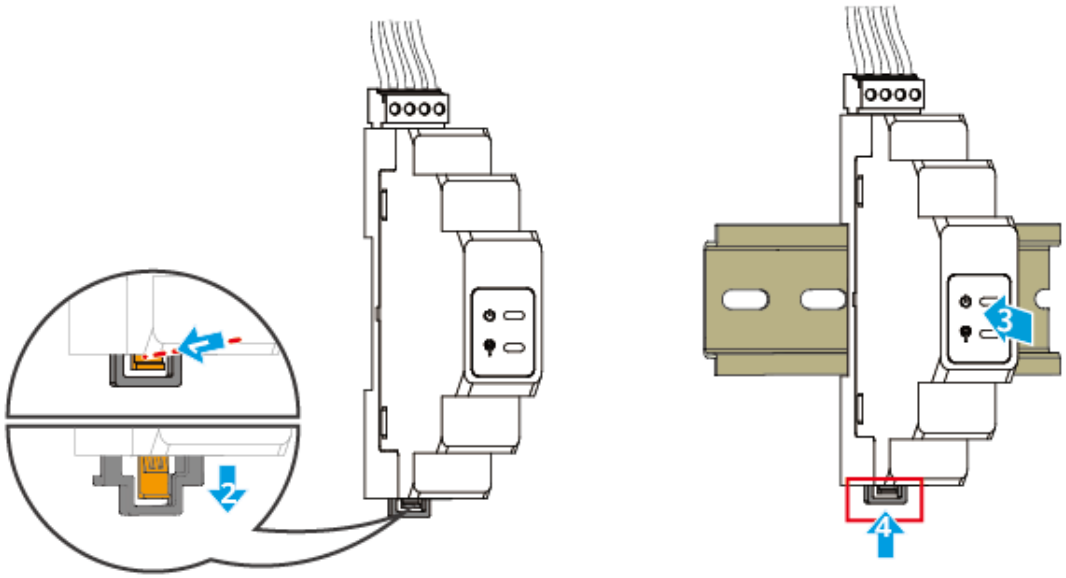


5.6 Installing the Smart Meter

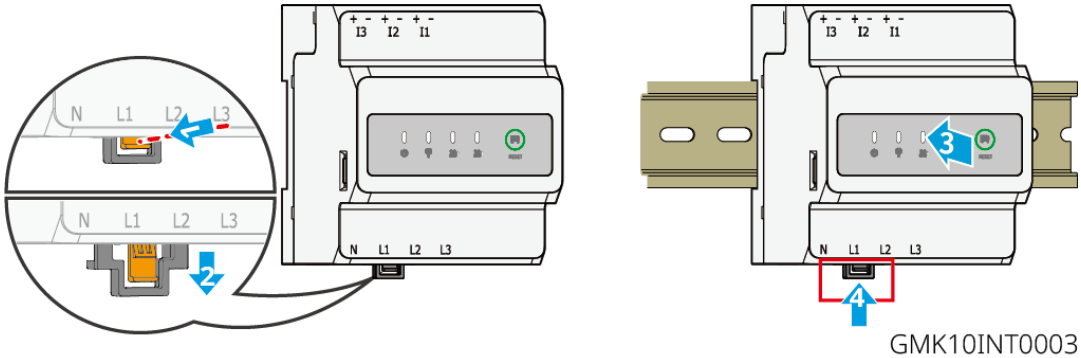
WARNING

In areas at risk of lightning, if the meter cable exceeds 10m and the cables are not wired with grounded metal conduits, you are recommended to use an external lightning protection device.

GMK110



GM330



GMK10INT0003

6 System Wirings

DANGER

- Perform electrical connections in compliance with local laws and regulations. Including operations, cables, and component specifications.
- Disconnect the DC switches and the AC output switches to power off the equipment before any electrical connections. Do not work with power on. Otherwise, an electric shock may occur.
- Tie the same type cables together, and place them separately from cables of different types. Do not place the cables entangled or crossed.
- If the cable bears too much tension, the connection may be poor. Reserve a certain length of the cable before connecting it to the Inverter cable port.
- Make sure that the cable conductor is in full contact with the terminal and the cable insulation; part is not crimped with the terminal when crimping the terminal. Otherwise, the device may; not be able to work properly, or the connection may be unreliable during working, which; may cause terminal block damage, etc.

NOTICE

- Wear personal protective equipment like safety shoes, safety gloves, and insulating gloves during electrical connections.
- All electrical connections should be performed by qualified professionals.
- Cable colors in this document are for reference only. The cable specifications shall meet local laws and regulations.
- For parallel systems, follow the safety precautions in the user manuals of related products in the system.

6.1 System Wiring Diagram

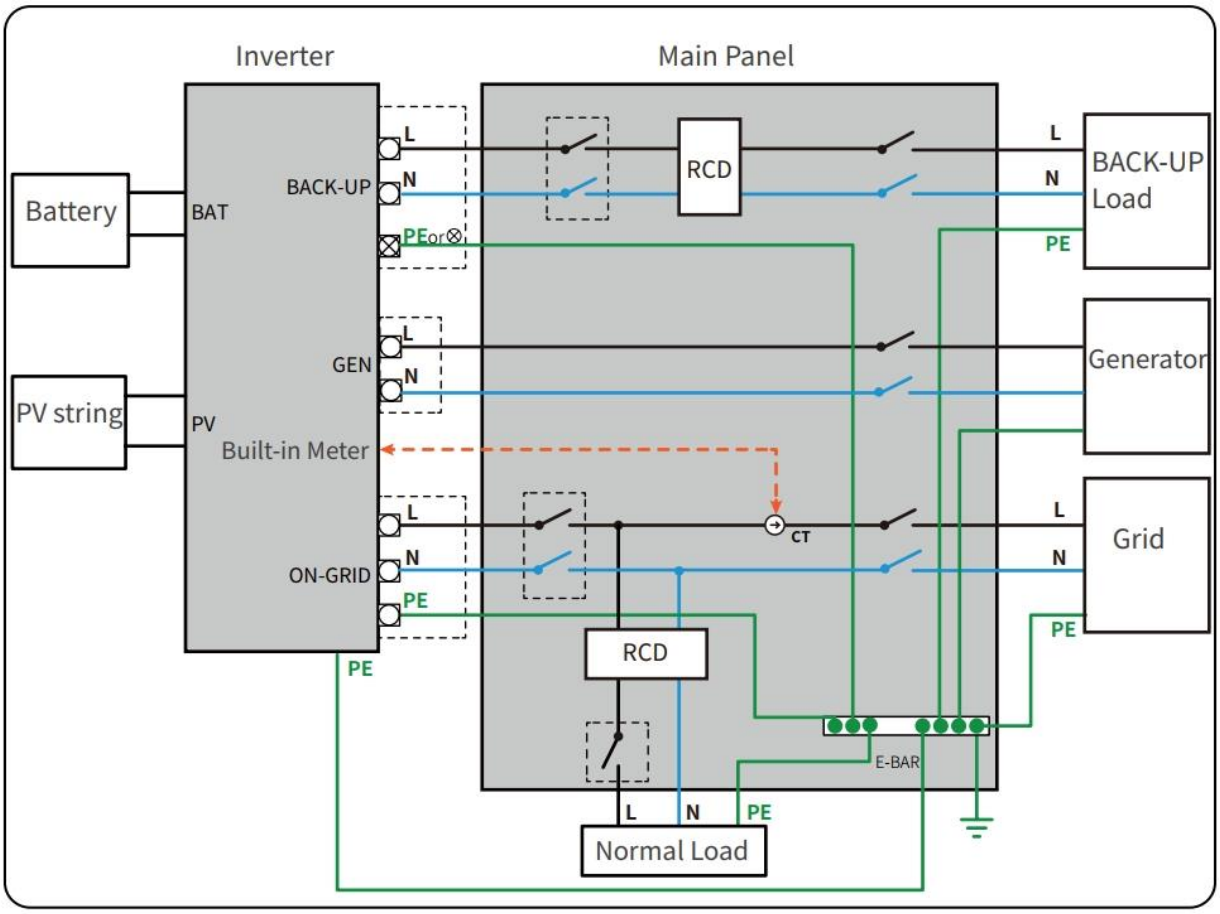
NOTICE

- N and PE wiring ON-GRID and BACK-UP of the inverter are different based on the regulation requirements of different regions. Refer to the specific requirements of local regulations.
- There are built-in relays inside of the inverter’ s ON-GRID and BACK-UP AC ports. When the inverter is in the off-grid mode, the built-in ON-GRID relay is open; while when the inverter is in grid-tied mode, it is closed.

- When the inverter is powered on, the BACK-UP AC port is energized. Power off the inverter first if maintenance is required on the BACK-UP loads. Otherwise, it may cause electric shock.

N and PE cables are separately wired in the Main Panel

NOTICE
• Ensure that the grounding of BACK-UP is correctly and tightened. Otherwise, the BACK-UP function may be abnormal in case of grid failure. • The following diagram is applicable to areas except Australia or New Zealand.

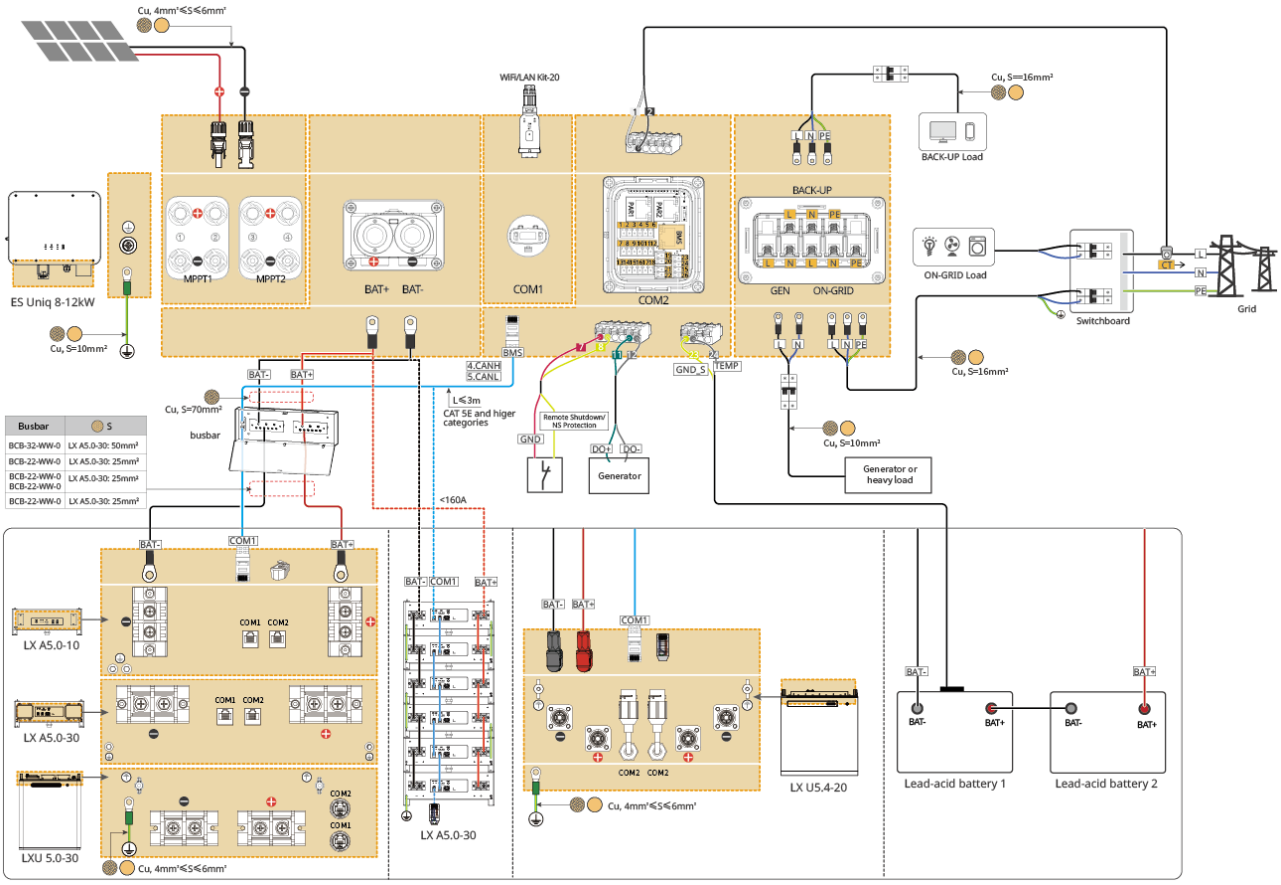


6.2 Detailed System Wiring Diagram

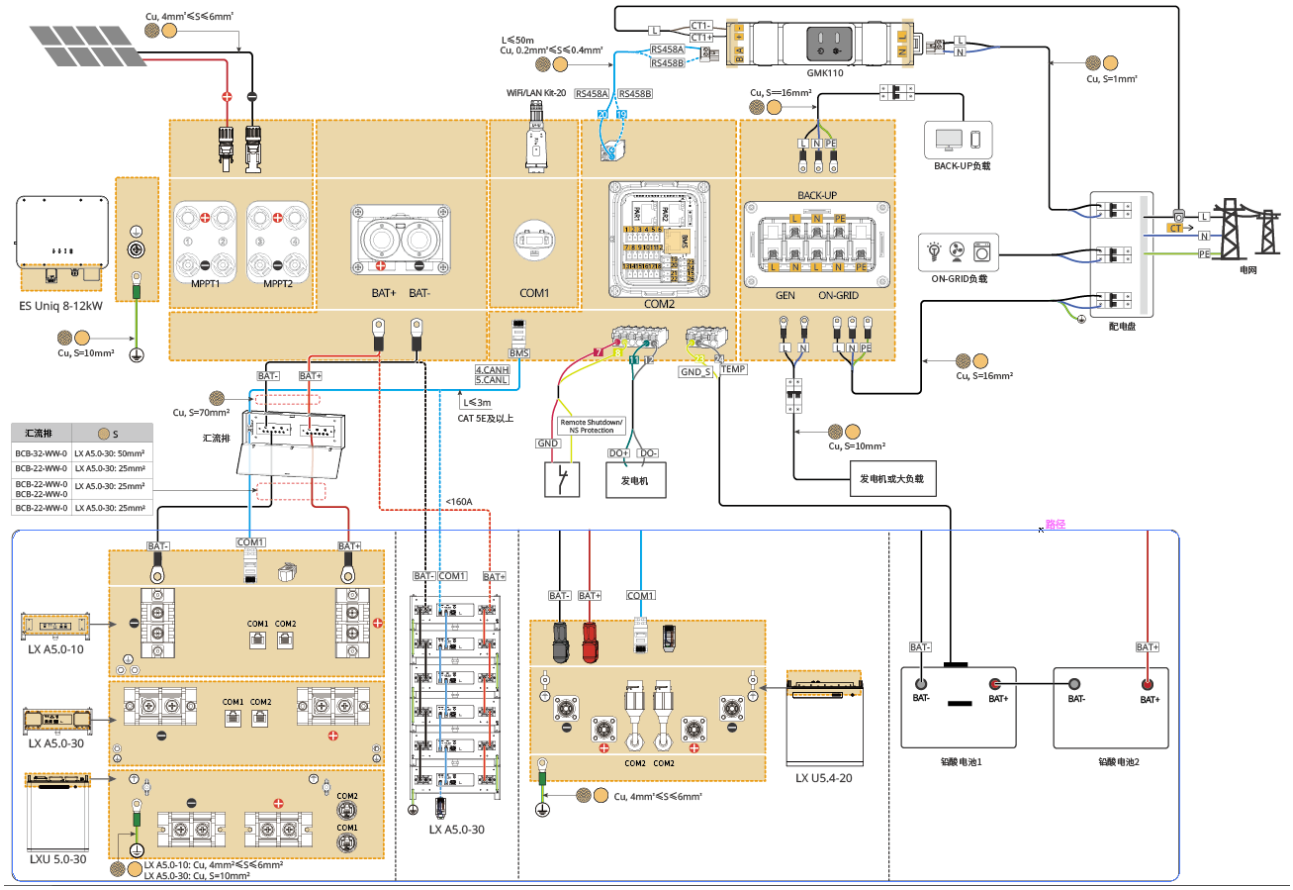
6.2.1 Detailed System Wiring Diagram for Single Inverter

GM330 and other meters that meet the requirements can also be used in single inverter scenarios. Here only the recommended types are shown.

With built-in smart meter



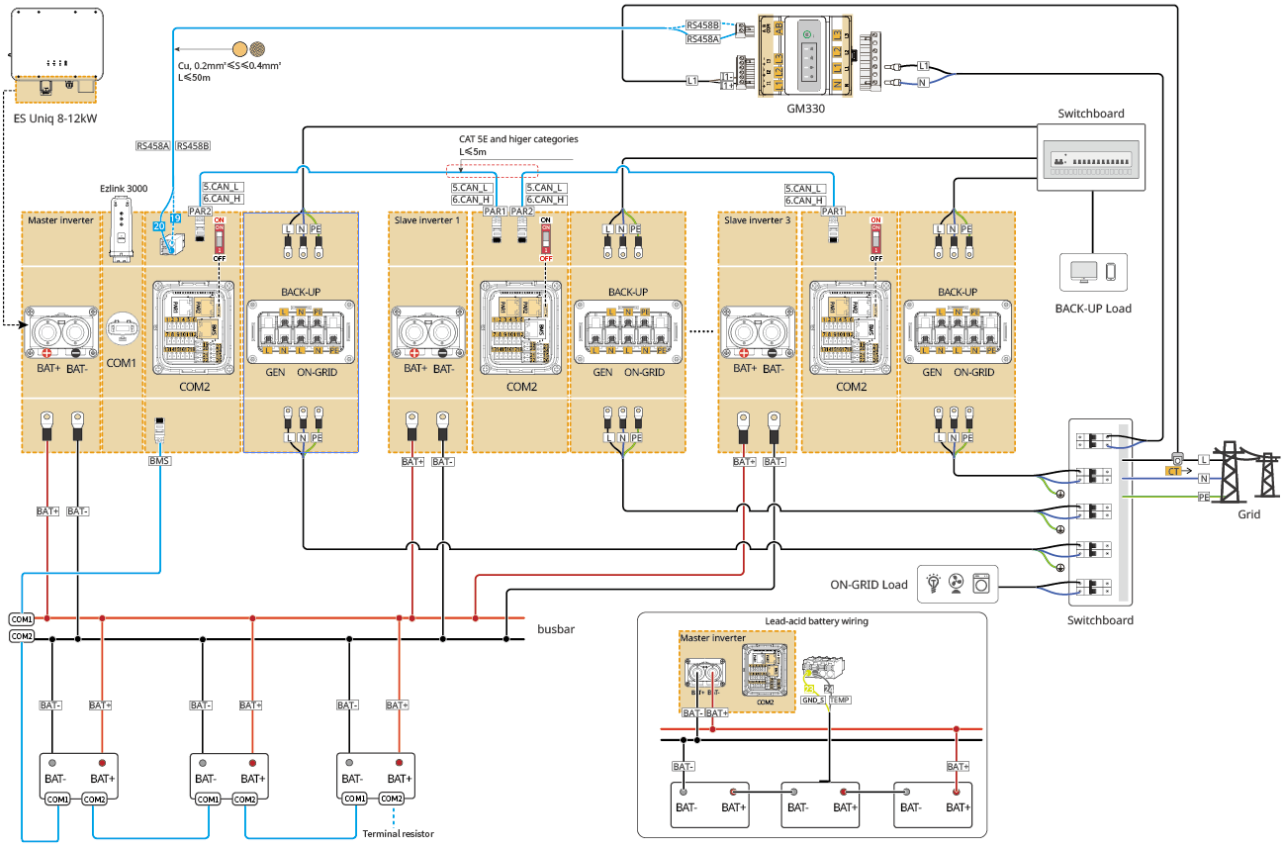
With GMK110 smart meter



6.2.2 Detailed System Wiring Diagram for Parallel System

- In parallel scenarios, the inverter connecting to Ezlink and smart meter is considered as the master inverter, while all the others are slave inverters. Do not connect any smart dongle to the slave inverters.
- Generator is not supported in parallel system.
- The following diagram mainly introduces parallel connections. For other port connections, refer to the single system.

Use GM330 in the system



6.3 Preparing Materials

WARNING

- Do not connect loads between the inverter and the AC switch directly connected to the inverter.
- Install one AC output circuit breaker for each inverter. Multiple inverters cannot share one AC circuit breaker.
- An AC circuit breaker shall be installed on the AC side to make sure that the inverter can safely disconnect the grid when an exception happens. Select the appropriate AC circuit breaker in compliance with local laws and regulations.
- When the inverter is powered on, the BACK-UP AC port is energized. Power off the inverter first if maintenance is required on the BACK-UP loads. Otherwise, it may cause electric shock.
- For cables used in the same system, it is recommended that the conductor material, cross sectional area, length, etc. of the cables should be consistent.
  - The AC cable for BACK-UP port of each inverter
  - The AC cable for ON-GRID port of each inverter
  - The power cable between inverter and battery

- The power cable between batteries
- The power cable between inverter and busbar
- The power cable between battery and busbar

6.3.1 Preparing Breakers

Number	Circuit breaker	Recommended specifications	Comment
1	ON-GRID circuit breaker	Nominal current ≥ 90A, nominal voltage ≥ 230V	Prepared by customers.
2	Battery breaker	Optional in compliance with local laws and regulations ● GW8000-ES-C10: nominal current ≥200A, nominal voltage ≥60V ● GW12K-ES-C10: nominal current ≥ 250A, rated voltage ≥ 60V ● GW12K-ES-C10: nominal current ≥ 300A, rated voltage ≥ 60V	Prepared by customers.
3	GEN breaker	● GW8000-ES-C10: nominal current ≥63A, nominal voltage ≥230V ● GW10K-ES-C10, GW12K-ES-C10: nominal current ≥ 75A, nominal voltage ≥ 230V	Prepared by customers.
4	Off-grid load breaker	Nominal current ≥ 90A, nominal voltage ≥ 230V	Prepared by customers.
5	RCD	Optional in compliance with local laws and regulations ● Type A ● ON-GRID RCD: 300mA ● BACK-UP RCD: 30mA	Prepared by customers.

6.3.2 Preparing Cables

Number	Cable	Recommended specifications	Obtain method
1	Inverter PE cable	● Single-core outdoor copper cable	Prepared by

		• Conductor cross-sectional area: S=6mm²	customers.

2	Battery PE cable	• Single-core outdoor copper cable
		• cross sectional area of conductor
		  ○ LX A5.0-10：4mm²-6mm²
		  ○ LX A5.0-30：10mm²
		  ○ LX U5.4-20：4mm²-6mm²
		  ○ LX U5.0-30：10mm²
			Prepared by customers.
			LX A5.0-30: Supports purchase from GoodWe

3	PV DC cable	• Commonly used outdoor photovoltaic cable • Conductor cross-sectional area: 4mm²-6mm² • Outer diameter: 5.9mm-8.8mm	Prepared by customers.

4	Battery DC cable	• Single-core outdoor copper cable
		• Wiring requirements for inverter battery ports:
		  ○ Conductor cross-sectional area: 70mm²
		  ○ Outer diameter: 15.7mm-16.7mm
		• Requirements for cables between battery and busbar:
		  ○ LX A5.0-10, cross sectional area of conductor: 25mm²
		  ○ LX A5.0-30, cross sectional area of conductor: 50mm²
		  ○ LX U5.0-30, cross sectional area of conductor: 25mm²
		• Requirements for cables between battery and battery:
		  ○ LX A5.0-10, cross sectional area of conductor: 25mm²
		  ○ LX A5.0-30, cross sectional area of conductor: 50mm²
		  ○ LX U5.4-20, cross sectional area
			Prepared by customers.
			LX A5.0-30, LX U5.0-30: Supports purchase from GoodWe

		of conductor: 25mm² ○ LX U5.0-30, cross sectional area of conductor: 25mm²	
5	AC cable	● AC input and output cables of inverter (BACKUP/GRID): ○ Cross sectional area of conductor: 16mm² or 4AWG ○ Outer diameter of multi-core outdoor copper cable: 23.3mm-24.8mm ○ Outer diameter of single-core outdoor copper cable: 9.5mm-9.9mm ● Generator power cable (GEN): ○ Cross sectional area of conductor: 10mm² or 6AWG ○ Multi-core outdoor copper cable outer diameter: 20mm-21mm ○ Outer diameter of single-core outdoor copper cable: 8.3mm-8.7mm	Prepared by customers.
6	Smart meter power cable	● Outdoor copper cable ● Conductor cross-sectional area: 1mm²	Prepared by customers.
7	Battery communication cable	Communication between batteries and inverters as well as between batteries requires the use of CAT 5E or above standard shielded network cables and RJ45 shielded connector.	Prepared by customers. LX A5.0-30: Supports purchase from GoodWe
8	Smart meter RS485	● Shielded twisted pair cable	Prepared by

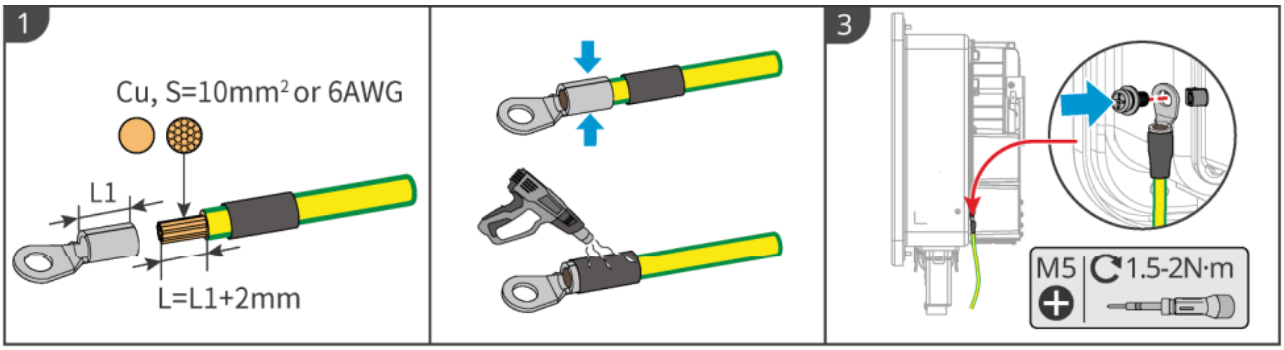
	communication cable	• Conductor cross-sectional area: 0.2mm²- 0.4mm²	customers.
9	Communication cable for parallel connected inverters	CAT 5E and above standard shielded network cable and RJ45 shielded connector	Prepared by customers.
10	Remote shutdown and NS Protection communication line	• Copper core twisted pair cable • Conductor cross-sectional area: 0.2mm²-0.4mm²	Prepared by customers.

6.4 Connecting the PE cable

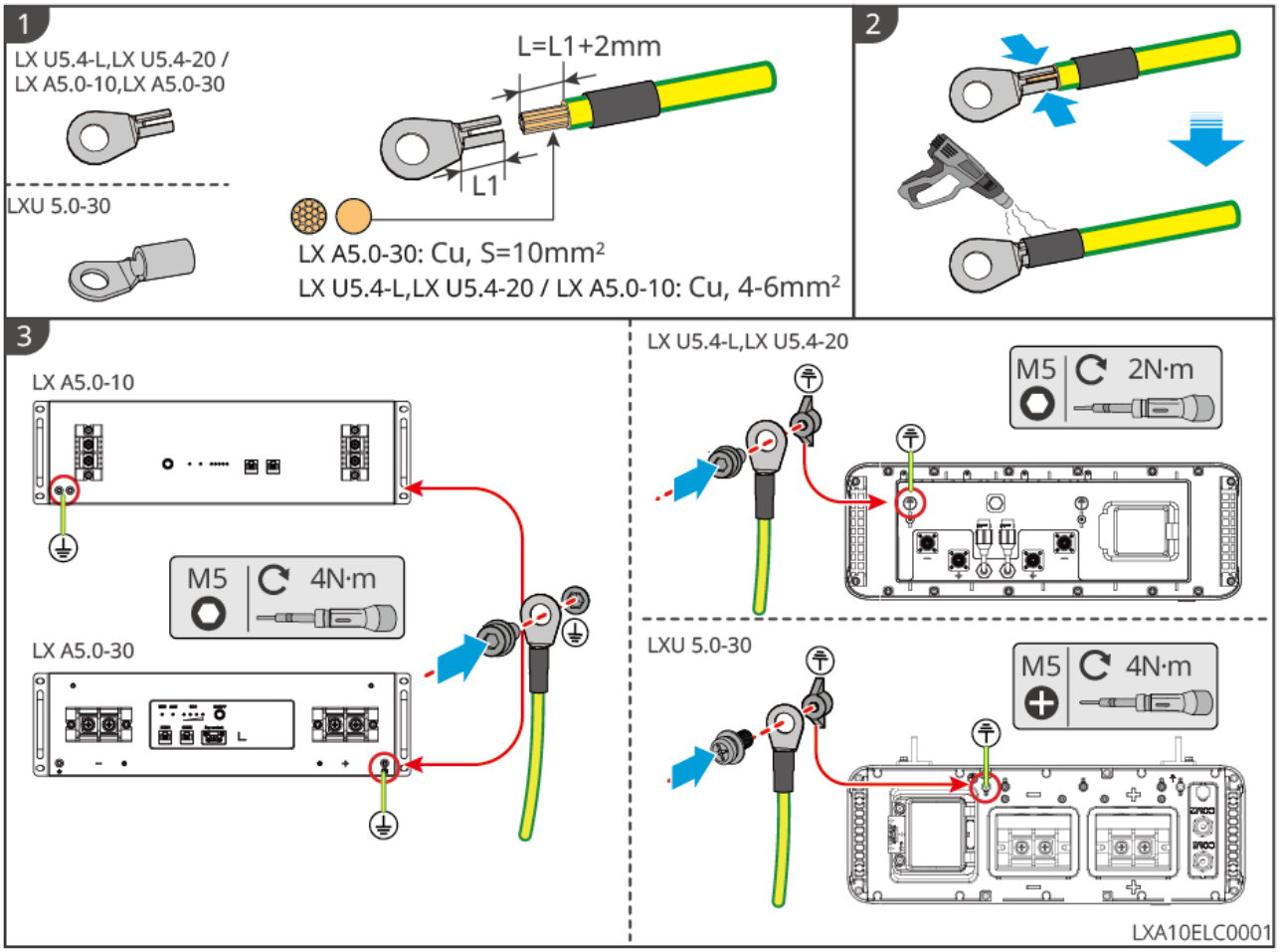
WARNING

- The PE cable connected to the enclosure of the inverter cannot replace the PE cable connected to the AC output port. Make sure that both of the two PE cables are securely connected.
- Make sure that all the grounding points on the enclosures are equipotentially connected when there are multiple inverters.
- To improve the corrosion resistance of the terminal, you are recommended to apply silica gel or paint on the ground terminal after installing the PE cable.
- Connect the PE cable first before installing the equipment. Disconnect the PE cable before dismantling the equipment.

Inverter



Battery



6.5 Connecting the PV Cable

DANGER

- Do not connect one PV string to more than one inverter at the same time. Otherwise, it may cause damage to the inverter.
- Confirm the following information before connecting the PV string to the inverter. Otherwise, the inverter may be damaged permanently or even cause fire and cause personal and property losses.
  1. Make sure that the max short circuit current and the max input voltage per MPPT are within the permissible range.
  2. Make sure that the positive pole of the PV string connects to the PV+ of the inverter. And the negative pole of the PV string connects to the PV- of the inverter.

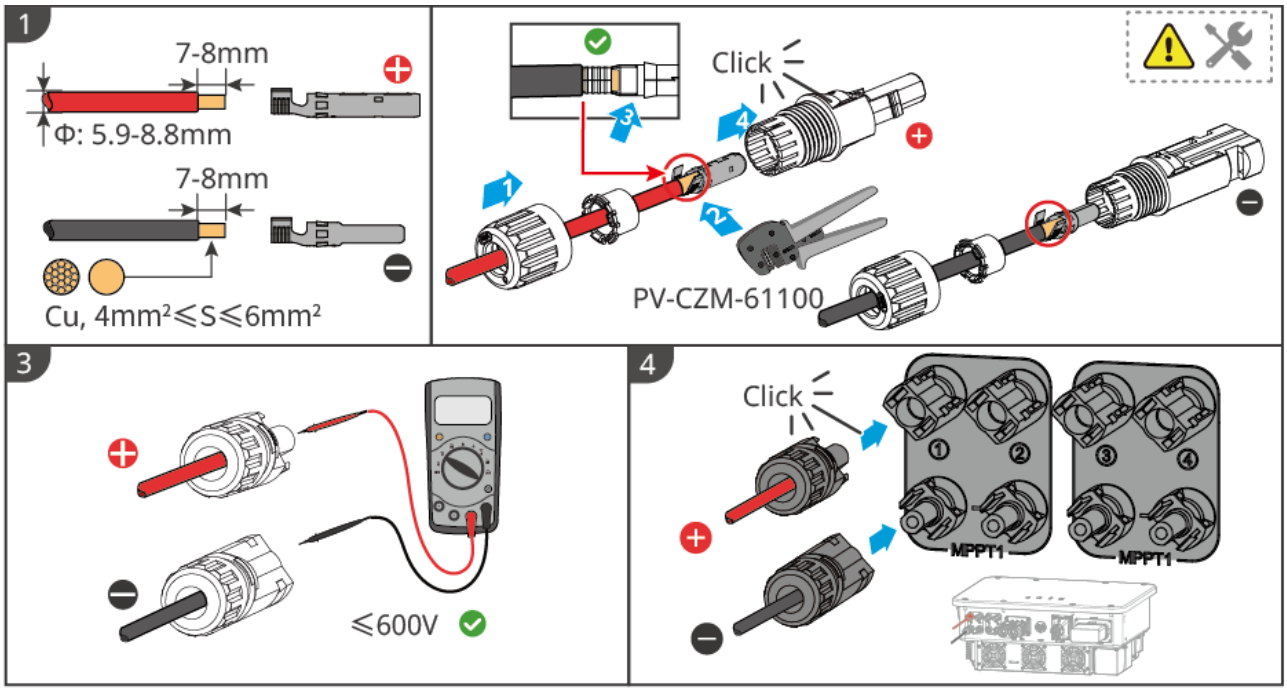
WARNING

- The PV strings cannot be grounded. Ensure the minimum insulation resistance of the PV string to the ground meets the minimum insulation resistance requirements before connecting the PV string to the inverter (R=maximum input voltage/ 30mA).

- Ensure the DC cables are connected tightly, securely and correctly.
- Measure the DC cable using the multimeter to avoid reverse polarity connection. Also, the voltage should be within the permissible range.

NOTICE

The two input strings per MPPT should be of the same type, the same number of modules, the same tilt and angle to ensure the best efficiency.

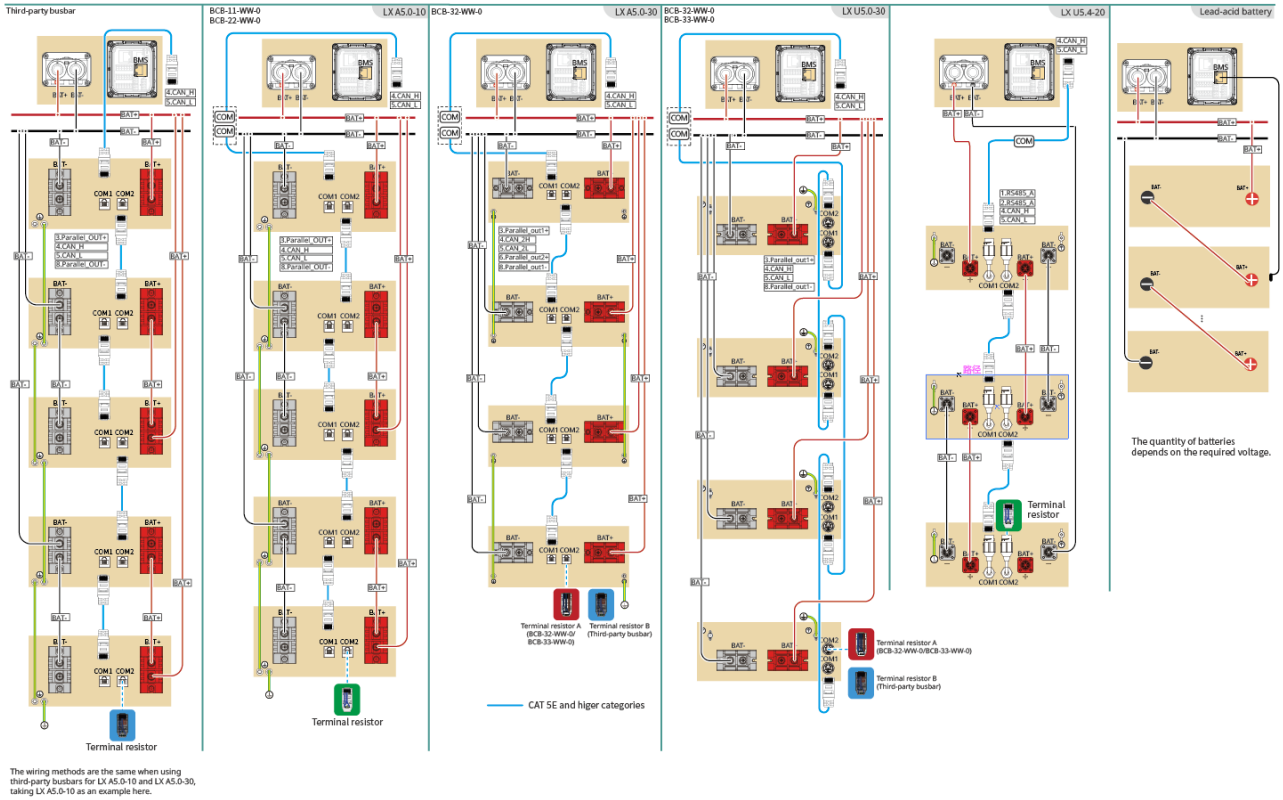


6.6 Connecting the Battery Cable

DANGER

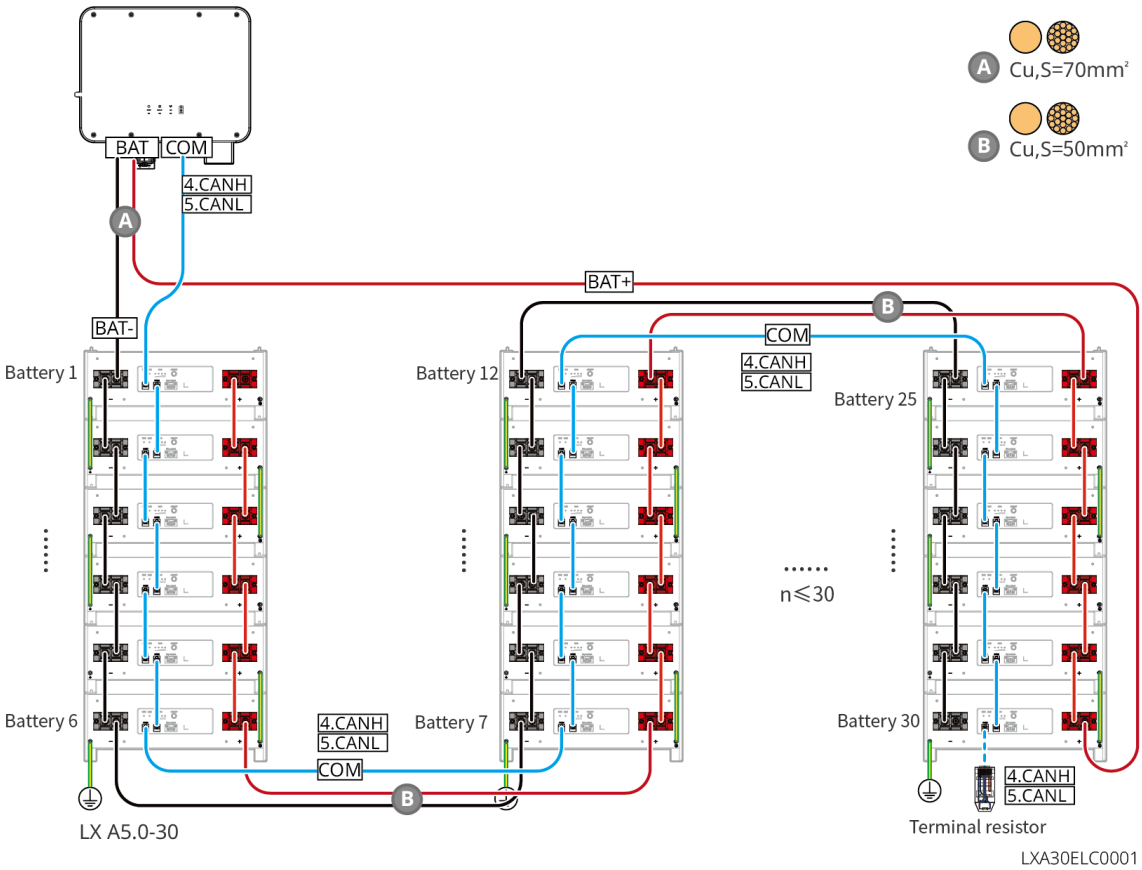
- In a single inverter system, do not connect the same battery pack to multiple inverters, which may cause inverter damage.
- It is forbidden to connect loads between the inverter and batteries.
- When connecting battery cables, use insulated tools to prevent accidental electric shock or short circuit to the batteries.
- Ensure that the open circuit voltage of the battery is within the permissible range of the inverter.
- Install a DC breaker between the inverter and the battery in compliance with local local laws and regulations.

Battery system wiring diagram



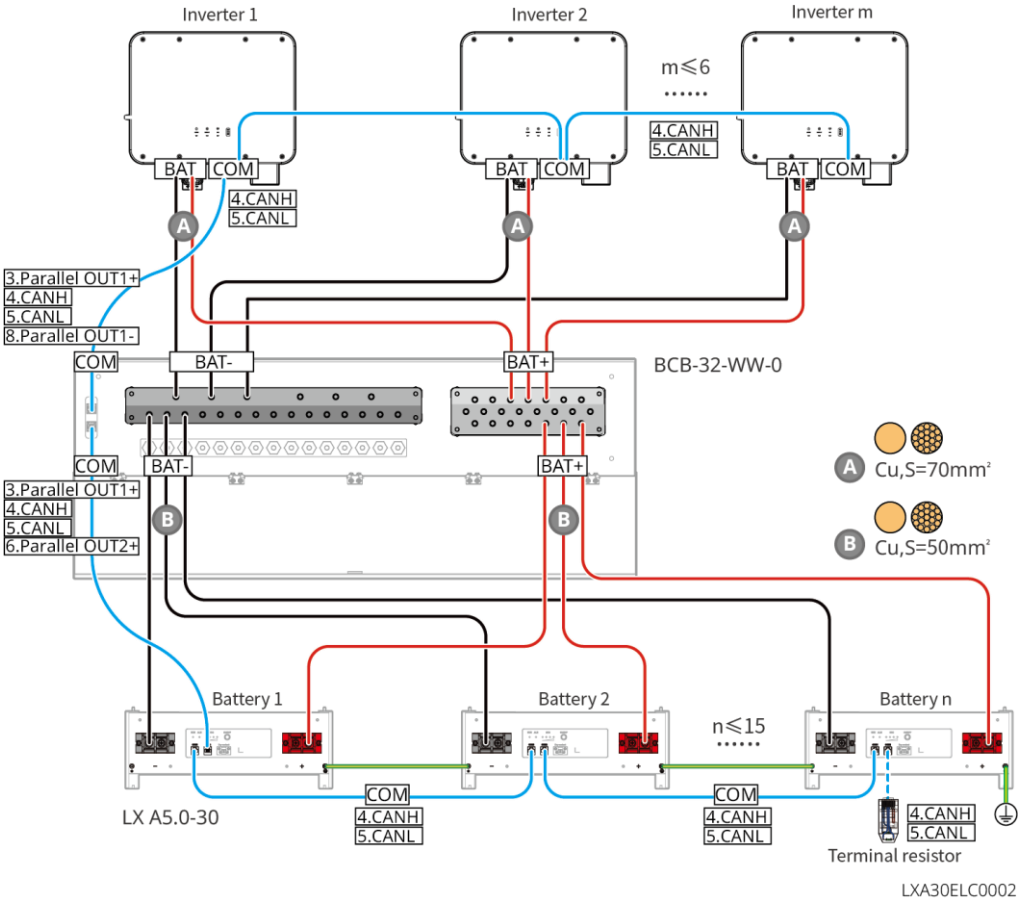
LXA5.0-30: Hand-to-hand connection

- The battery system supports a maximum working current of 160A, working power of 8kW, and can connect to a maximum of 1 inverter, and 30 batteries



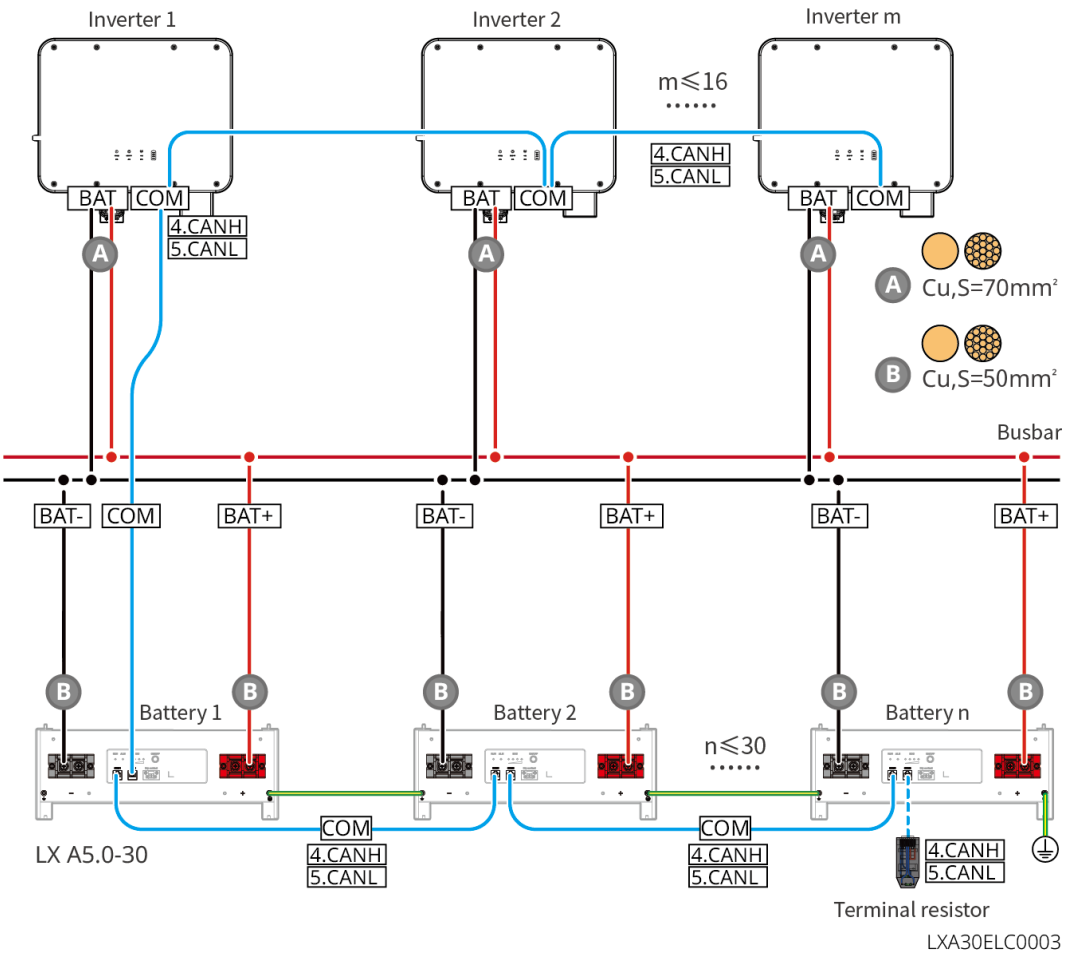
LXA5.0-30: Use with busbar BCB-32-WW-0

- The battery system supports a maximum working current of 720A, working power of 36kW, and can connect to a maximum of 6 inverters, and 15 batteries.



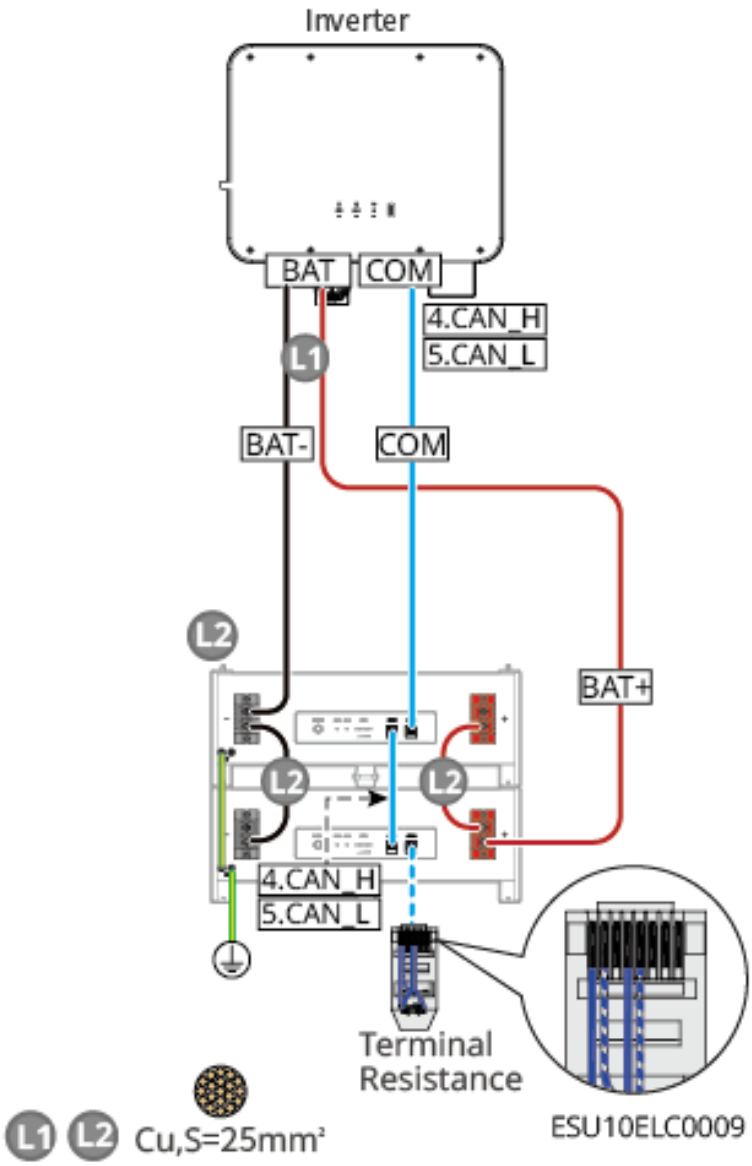
LXA5.0-30: Use with third-party busbar

- The complexity of the parallel system increases with the increase in the number of inverters. When the number of inverters in parallel system is ≥ 6, please contact the after-sales service to confirm the installation and application environment of the inverter to ensure stable operation of the system.
- The nominal charging current of a single battery is 60A; the nominal discharging current is 100A; the maximum continuous charging current is 90A; The maximum continuous discharging current is 150A, and a maximum of 30 batteries can be paralleled in the same system.



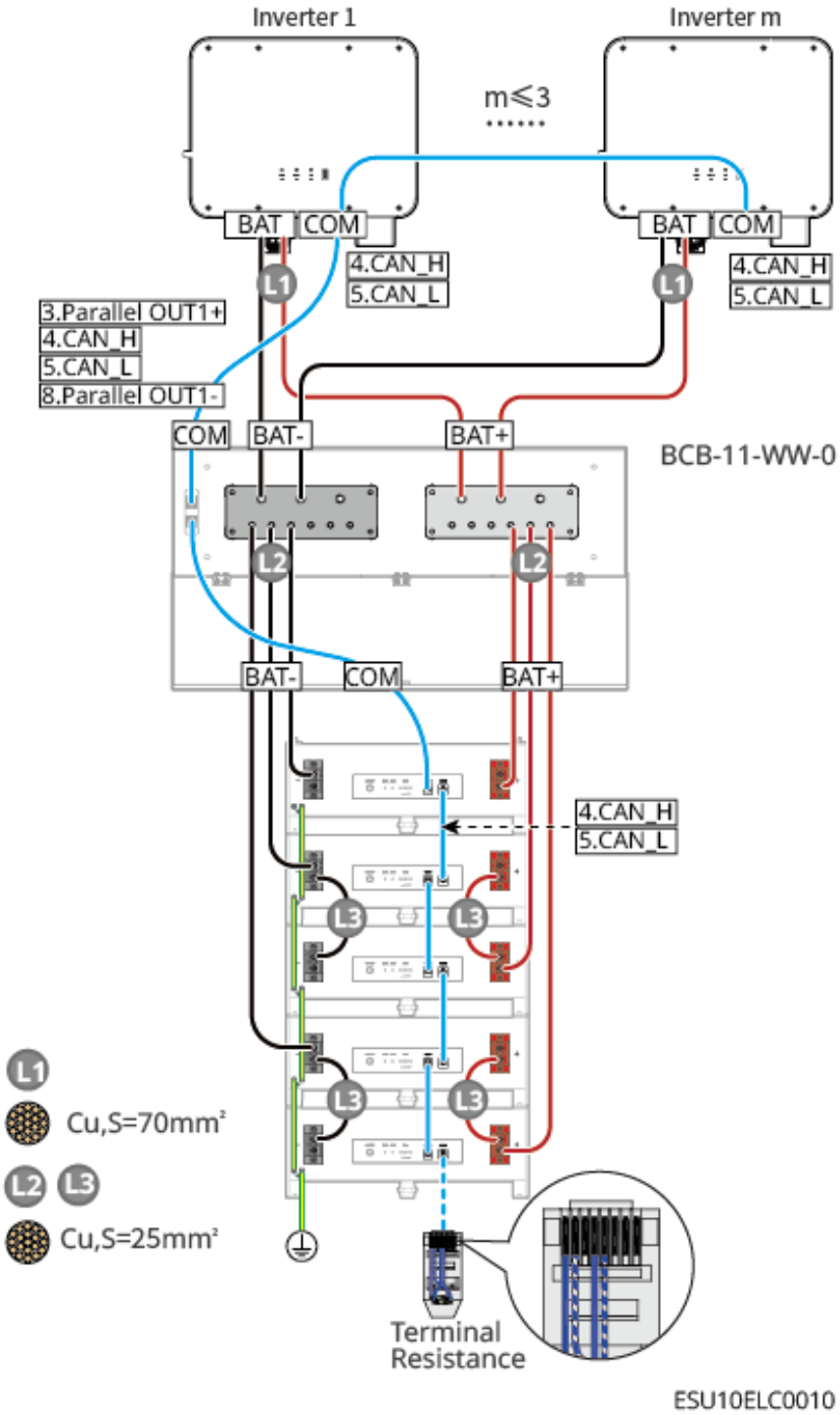
LX A5.0-10: Hand-to-Hand Connection

- The nominal charging and discharging current of a single battery is 60A.
- The battery system supports a maximum working current of 120A, working power of 8kW, a maximum of 1 inverter, and 2 batteries.



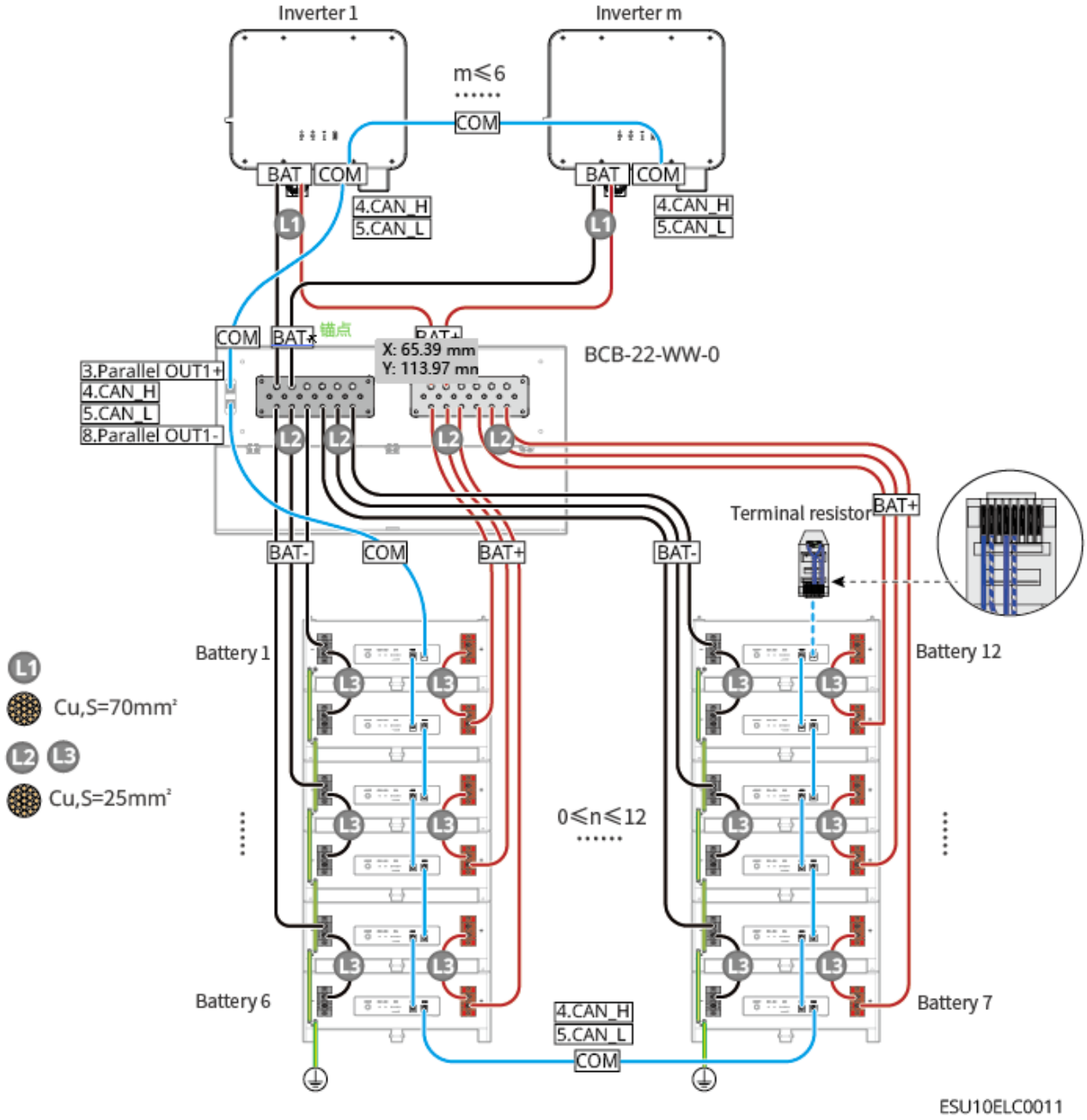
LX A5.0-10: Use with busbar BCB-11-WW-0

- The nominal charging and discharging current of a single battery is 60A.
- The battery system supports a maximum working current of 360A, working power of 18kW, a maximum of 3 inverters, and 6 batteries.



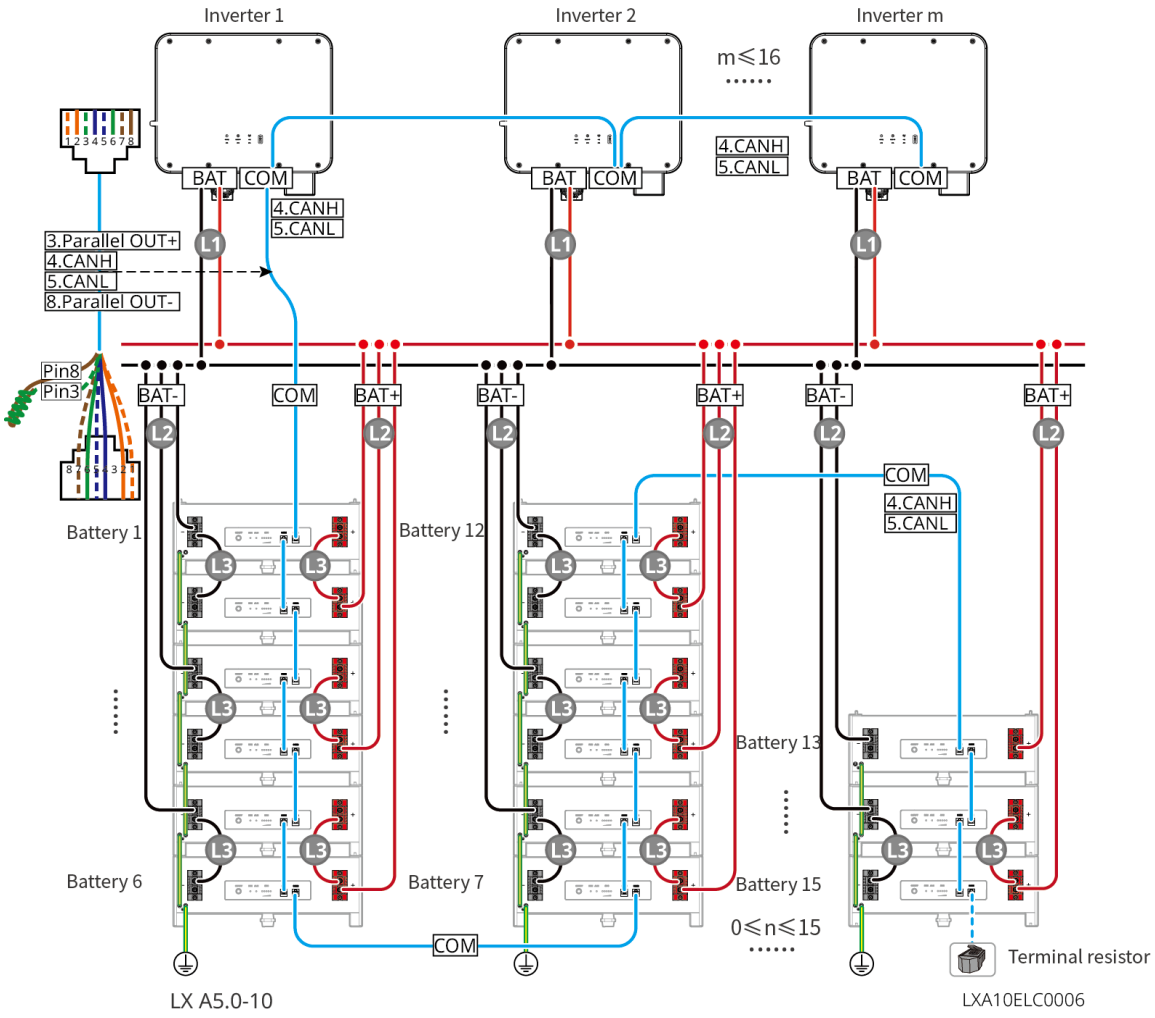
LX A5.0-10: Use with busbar BCB-22-WW-0

- The nominal charging and discharging current of a single battery is 60A.
- The battery system can support a maximum working current of 720A, working power of 36kW, a maximum of 6 inverters, and 12 batteries.

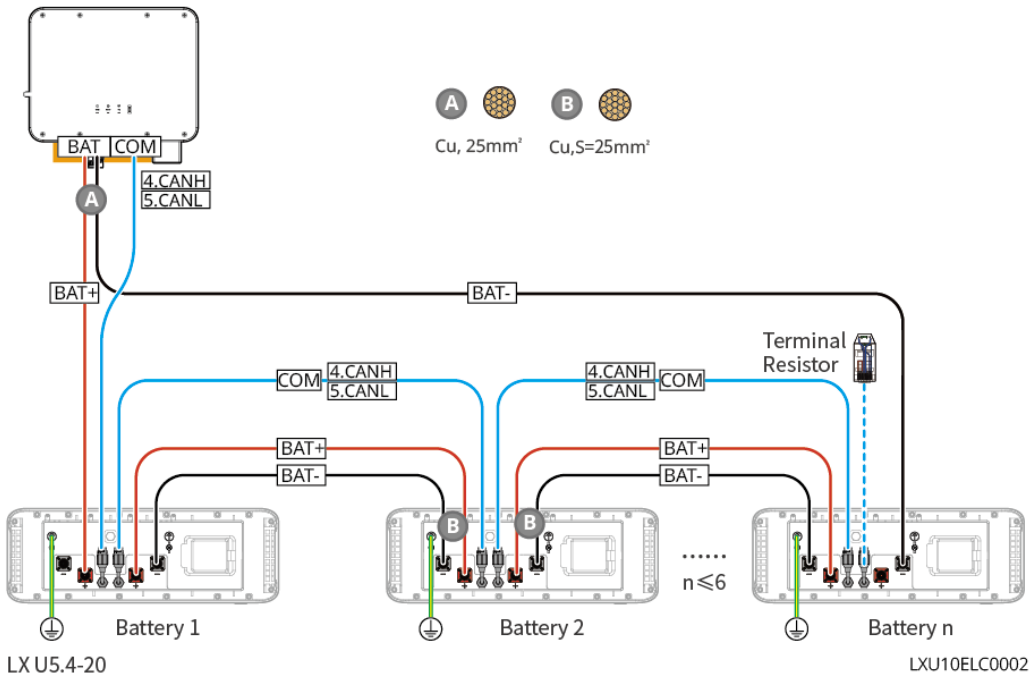


LX A5.0-10: Use with third-party busbar

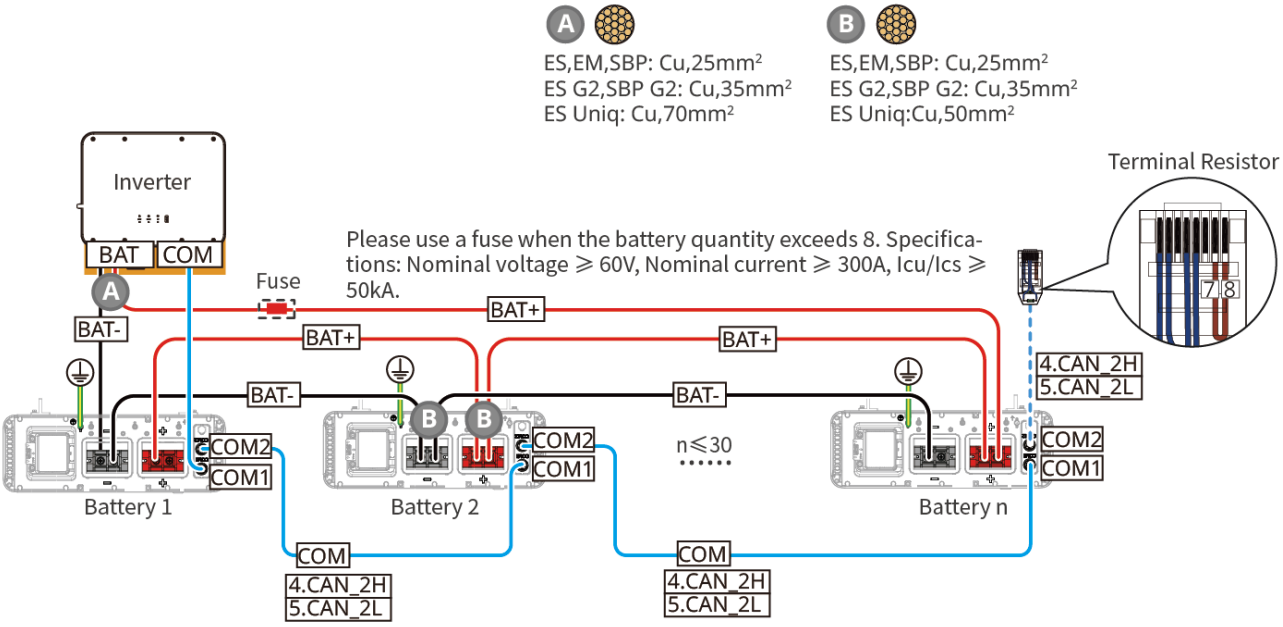
- The nominal charging and discharging current of a single battery is 60A.
- The complexity of the parallel system increases with the increase in the number of inverters. When the number of inverters in parallel system is ≥ 6, please contact the after-sales service to confirm the installation and application environment of the inverter to ensure stable operation of the system.
- The battery system supports a maximum working current of 900A, working power of 45kW, and 15 batteries.



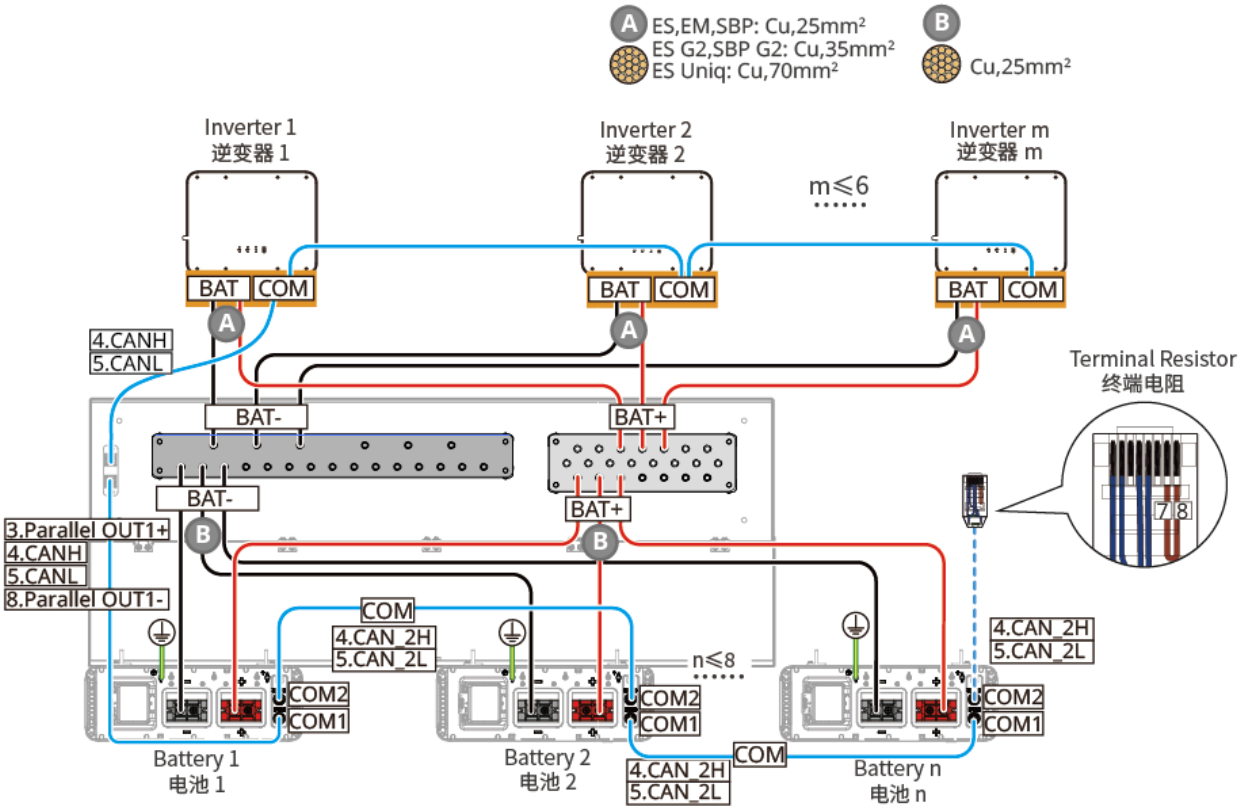
LX U5.4-20: Hand to hand Connection



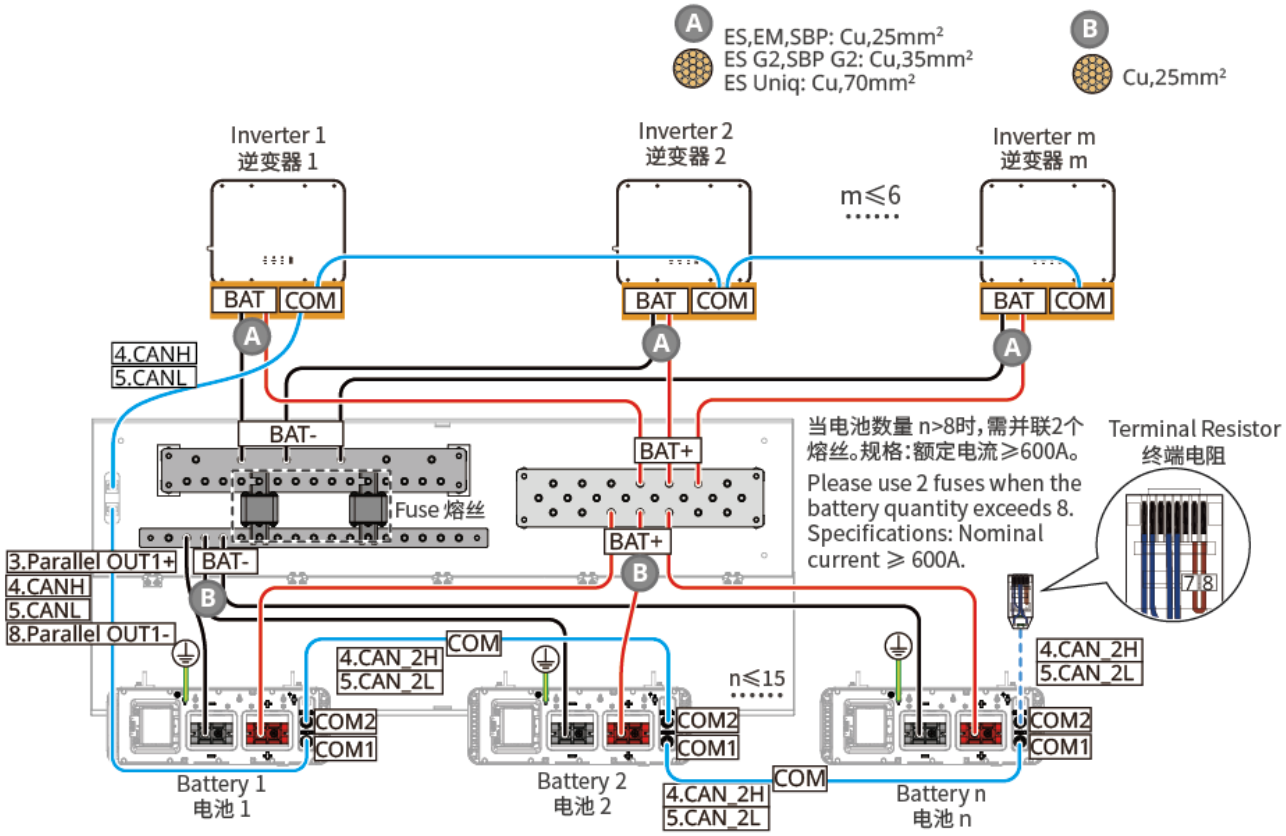
LX U5.0-30: Hand to hand Connection



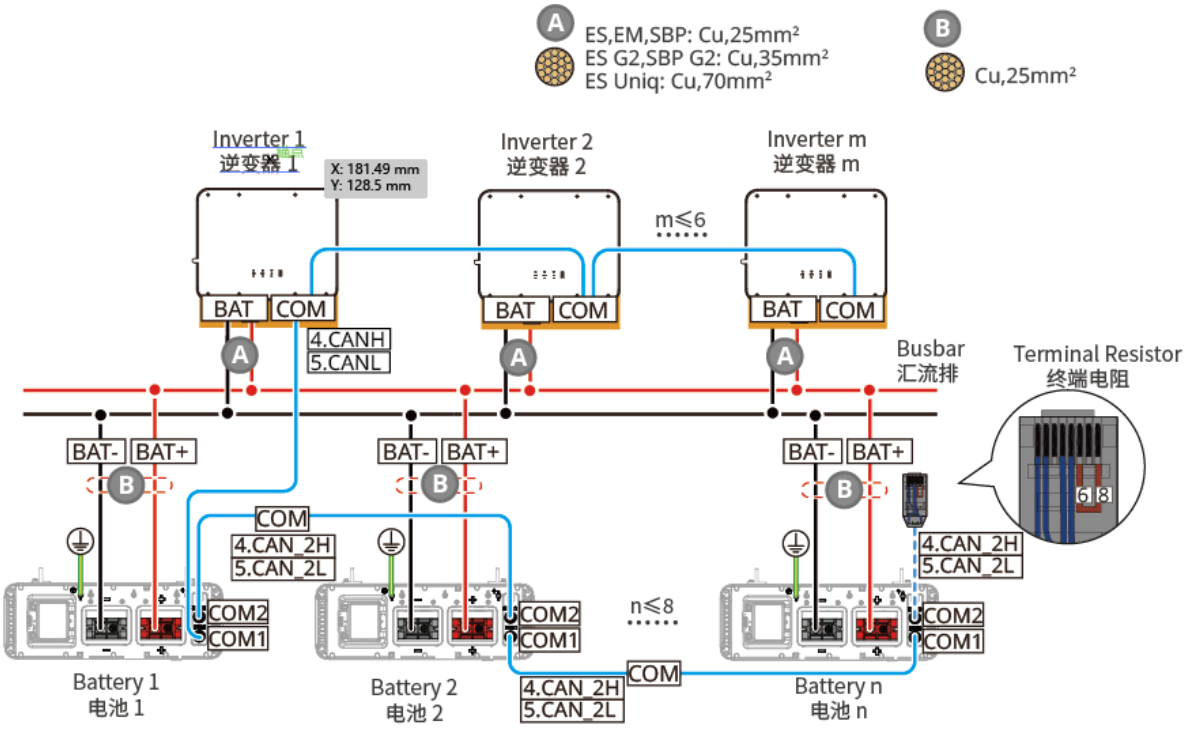
LX U5.0-30: When the battery quantity is less than or equal to 8, and the busbar BCB-32-WW-0 is used, the wiring diagram is as follows:



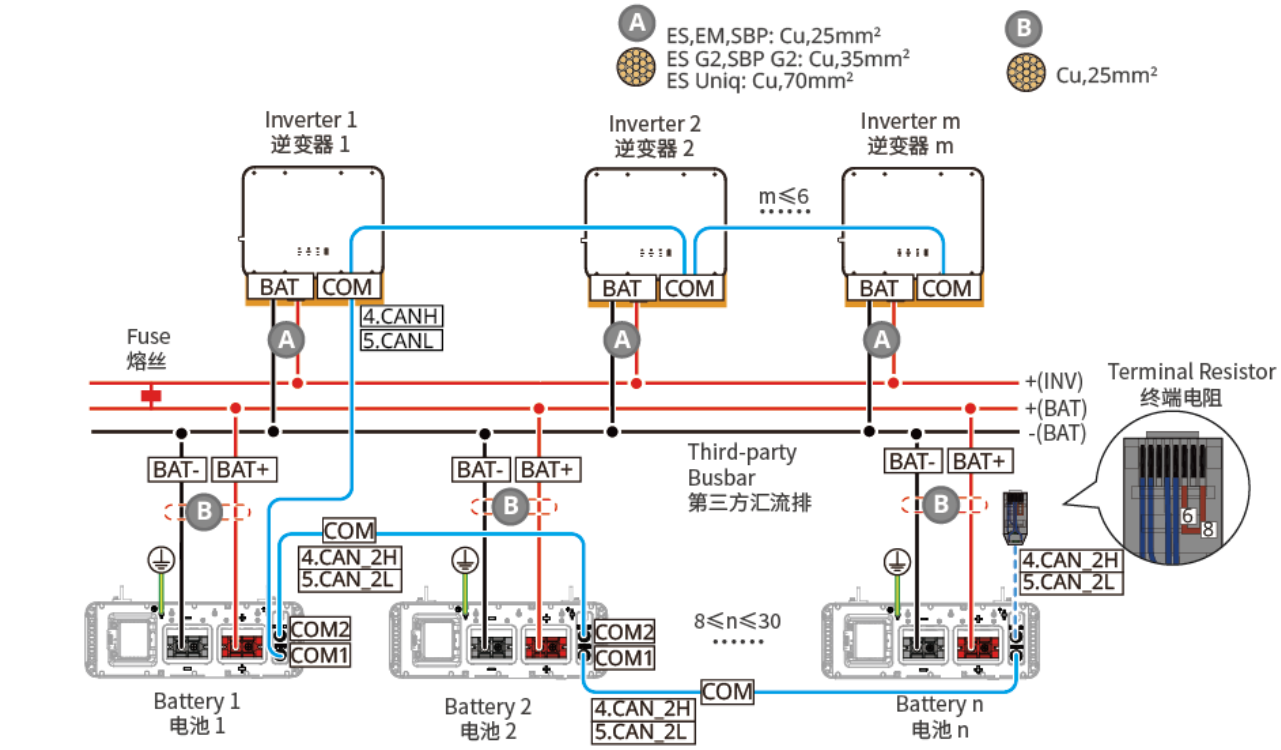
LX U5.0-30: When the battery quantity is less than or equal to 15, and the busbar BCB-33-WW-0 is used, the wiring diagram is as follows:



LX U5.0-30: When the battery quantity is less than or equal to 8, and a third-party busbar is used, the wiring diagram is as follows:



LX U5.0-30: When the battery quantity is larger than 8, and a third-party busbar is used, the wiring diagram is as follows:



当电池数量 n>8时，需使用熔丝。推荐规格：额定电压≥80V，额定电流≥1.6倍系统额定电流，极限/运行分断能力≥50kA。

Please use a fuse when the battery quantity exceeds 8. Specifications: Nominal voltage ≥ 80V, Nominal current ≥ 1.6*nominal current of the system, Icu/Ics ≥ 50kA.

LX A5.0-30 communication port definition:

PIN	COM1	COM2	Description
1	-	-	Reserved
2	-	-	
3	Parallel OUT+	Parallel OUT+	Parallel communication port
4	CAN_1H	CAN_1H	Connect the inverter communication port or battery parallel communication port
5	CAN_1L	CAN_1L	
6	Parallel OUT2+	Parallel OUT2+	Parallel interlock communication port
7	-	-	Reserved
8	Parallel OUT-	Parallel OUT-	Communication port for parallel system

LX A5.0-10 Communication Port Definition

PIN	COM1	COM2	Description
1	-	-	Reserved
2	-	-	
3	Parallel OUT+	Parallel OUT+	Parallel communication port
4	CAN_1H	CAN_1H	Connect the inverter communication port or battery parallel communication port
5	CAN_1L	CAN_1L	
6			Reserved
7			
8	Parallel OUT-	Parallel OUT-	Communication port for parallel system

LX U5.4-20 Communication Port Definition

PIN	COM1	COM2	Description
1	RS485A	RS485A	RS485 communication
2	RS485B	RS485B	
3	CAN_H	CAN_H	Parallel communication port
4	CAN_L	CAN_L	Connect the inverter communication port or battery parallel communication port
5	-	-	Reserved
6	-	-	Reserved
7	-	-	Reserved
8	-	-	Reserved

LX U5.0-30 Communication Port Definition

PIN	COM1	COM2	Description
1	RS485A	RS485A	Reserved

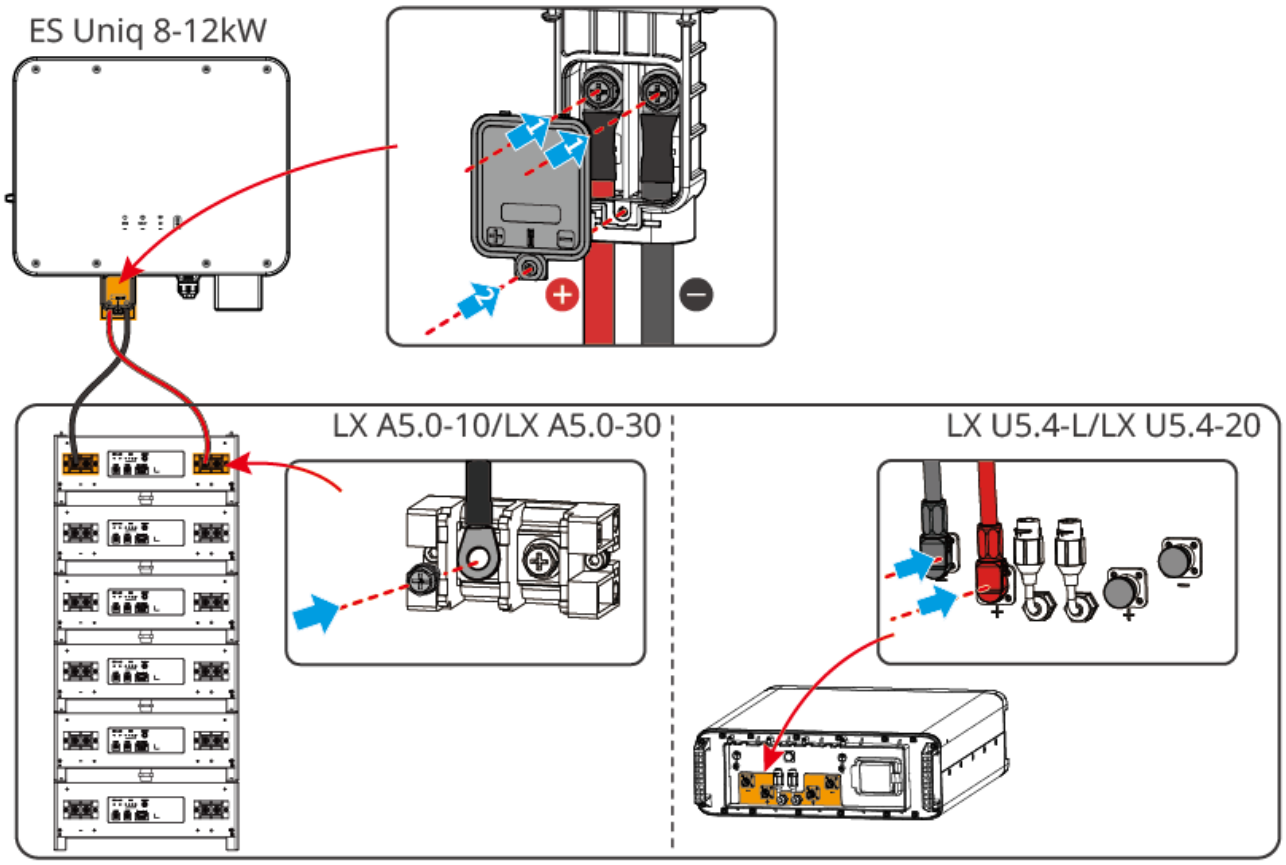
2	RS485B	RS485B	
3	Parallel OUT+	Parallel OUT+	Parallel communication port
4	CAN_H	CAN_H	Connect the inverter communication port or battery parallel communication port
5	CAN_L	CAN_L	
6	Parallel OUT 2	Parallel OUT 2	Communication port for parallel system
7	-	-	Reserved
8	Parallel OUT-	Parallel OUT-	Communication port for parallel system

6.6.1 Connecting the Power Cable between the Inverter and Battery

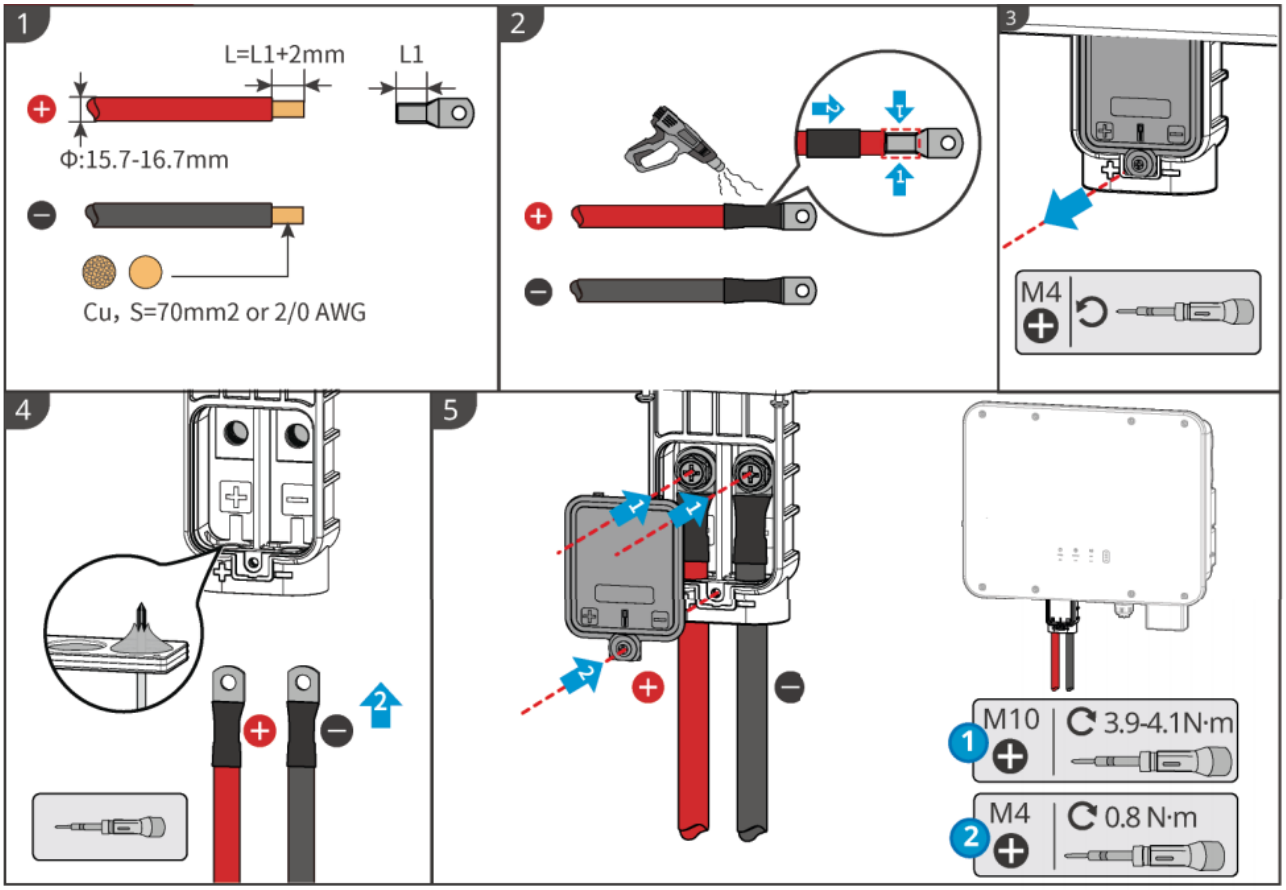
WARNING

- Measure the DC cable using the multimeter to avoid reverse polarity connection. Also, the voltage should be within the permissible range.
- Connect the battery cables to the corresponding terminals such BAT+, BAT- and grounding ports correctly. Otherwise it will cause damage to the inverter.
- Ensure that the whole cable cores are inserted into the terminal holes. No part of the cable core can be exposed.
- Ensure that the cables are connected securely. Otherwise it will cause damage to the inverter due to overheat during its operation.
- Do not connect one battery pack to more than one inverter at the same time. Otherwise, it may cause damage to the inverter.

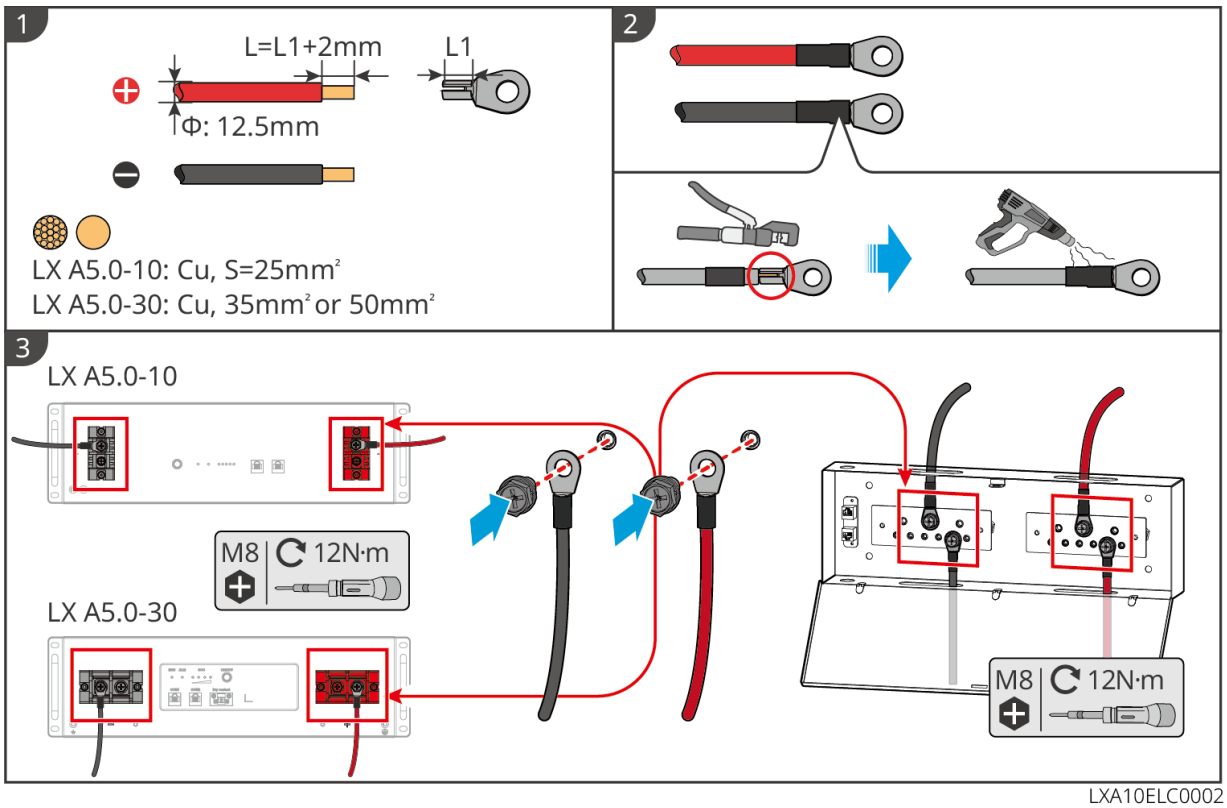
Overview of inverter and battery power cable



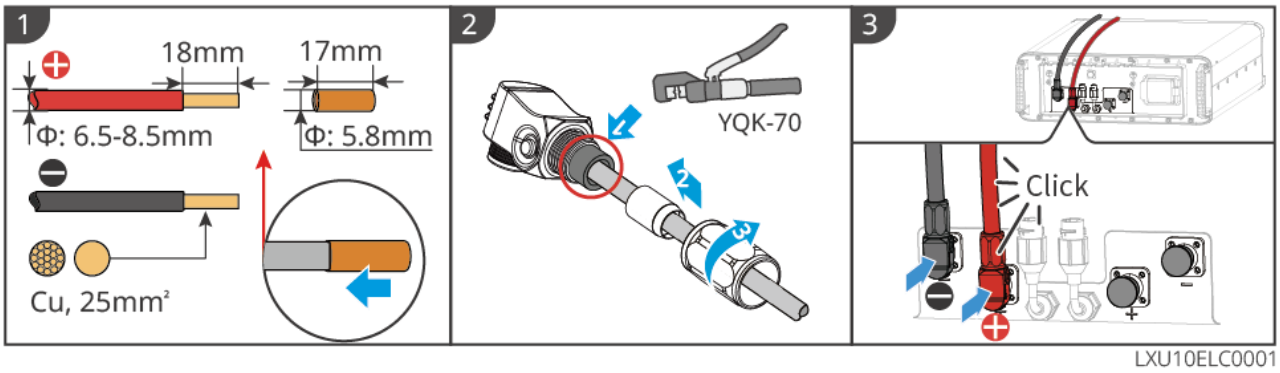
Make the inverter power cable



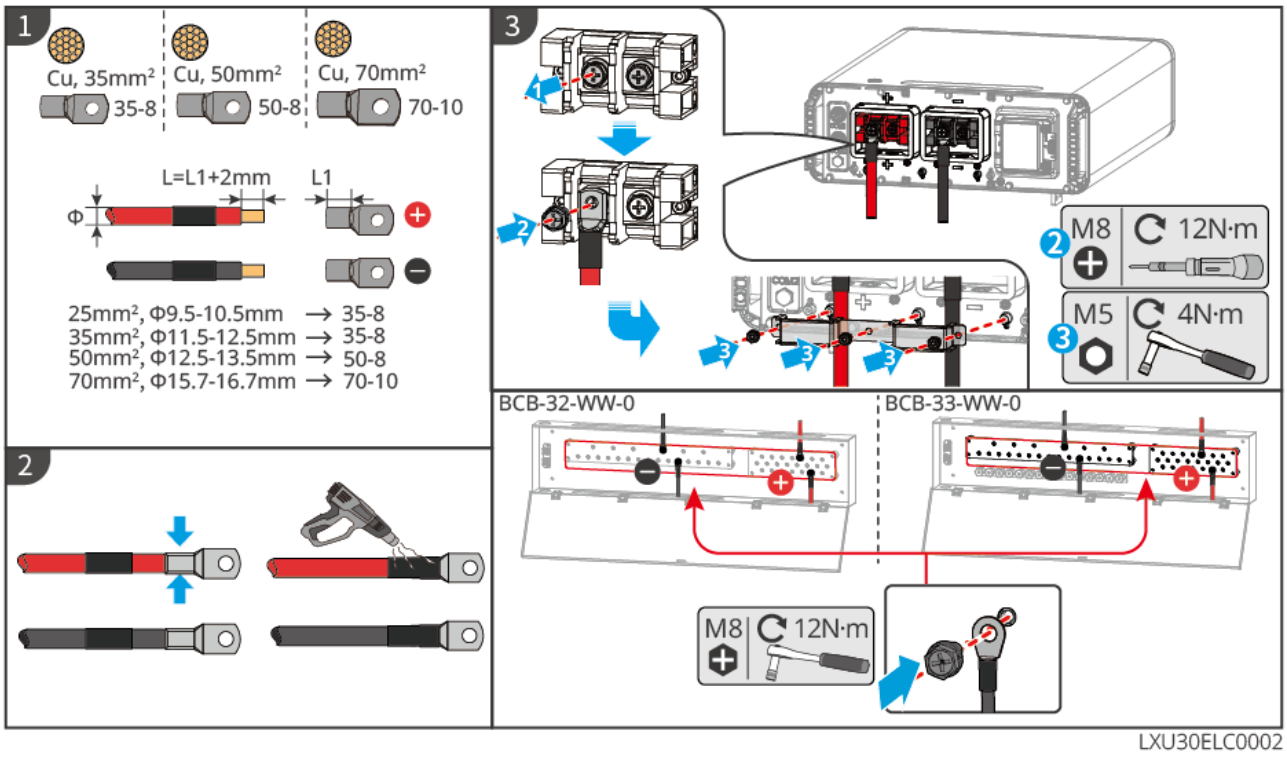
Battery power cable manufacturing (LX A5.0-10 and LX A5.0-30)



Battery power cable manufacturing LX U5.4-20



Battery power cable manufacturing LX U5.0-30

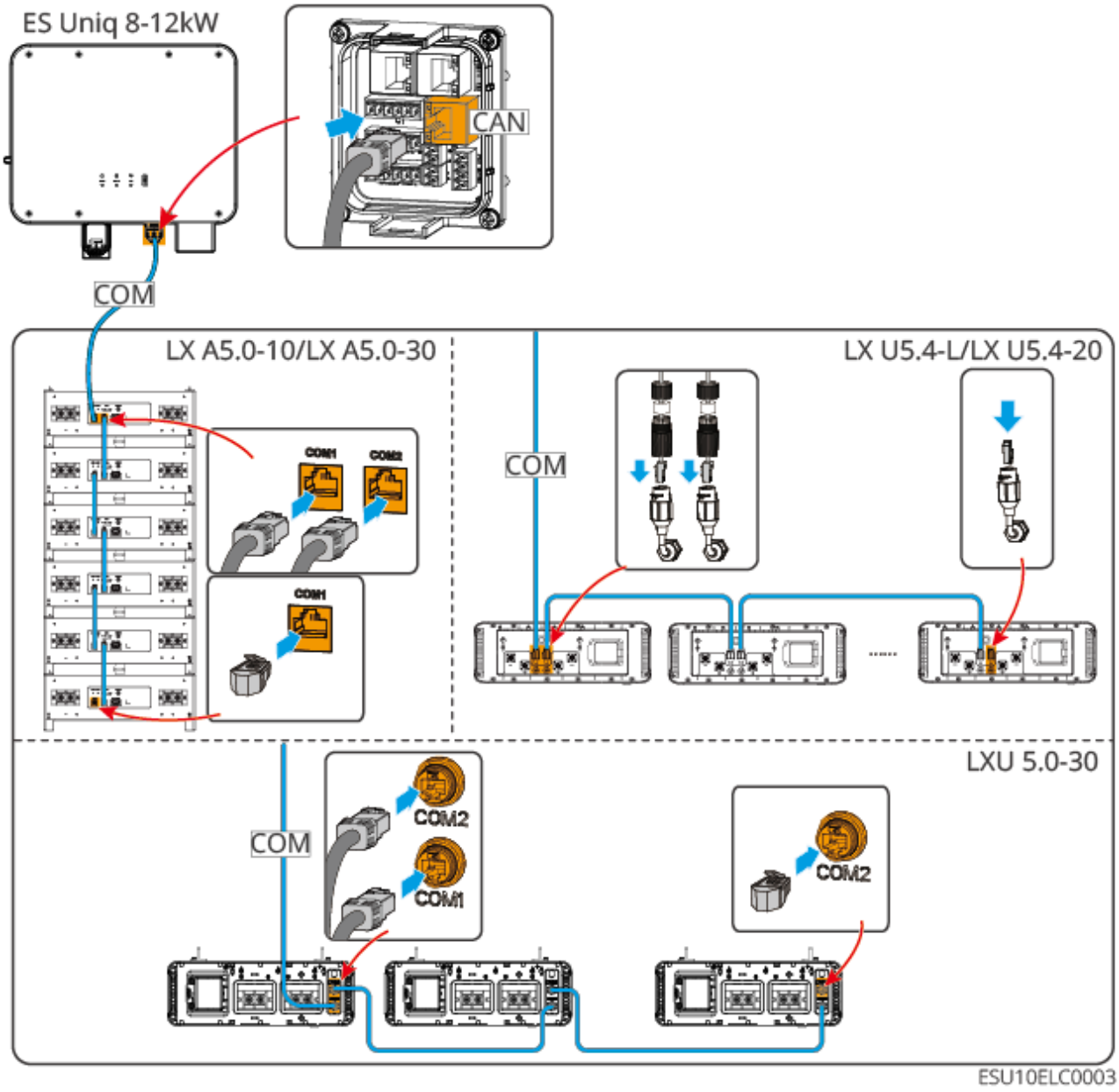


6.6.2 Connecting the Communication Cable between the Inverter and Battery

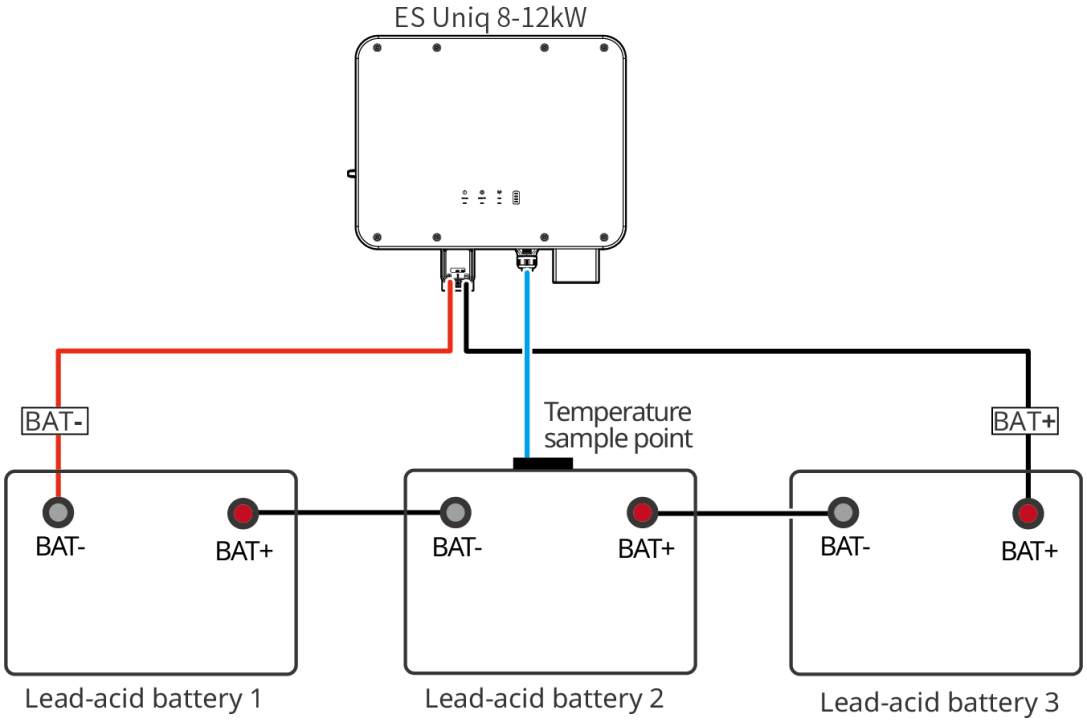
NOTICE
The BMS cable is included in the package of the inverter, the included BMS communication cable is recommended. If more communication cables are needed, prepare shielded network cables and RJ connectors by yourself to make the cable. Only crimp PIN4 and PIN5 of the connector when making the cable, otherwise the communication may fail.

Instructions for BMS communication connection between inverter and battery

Inverter port	Connected to the battery port	Port definition	Description
BMS(CAN)	COM1	4: CAN_H 5: CAN_L	• The inverter communicates with the battery through CAN. • Connect the BMS1 port of the inverter to the COM1 port of the battery.



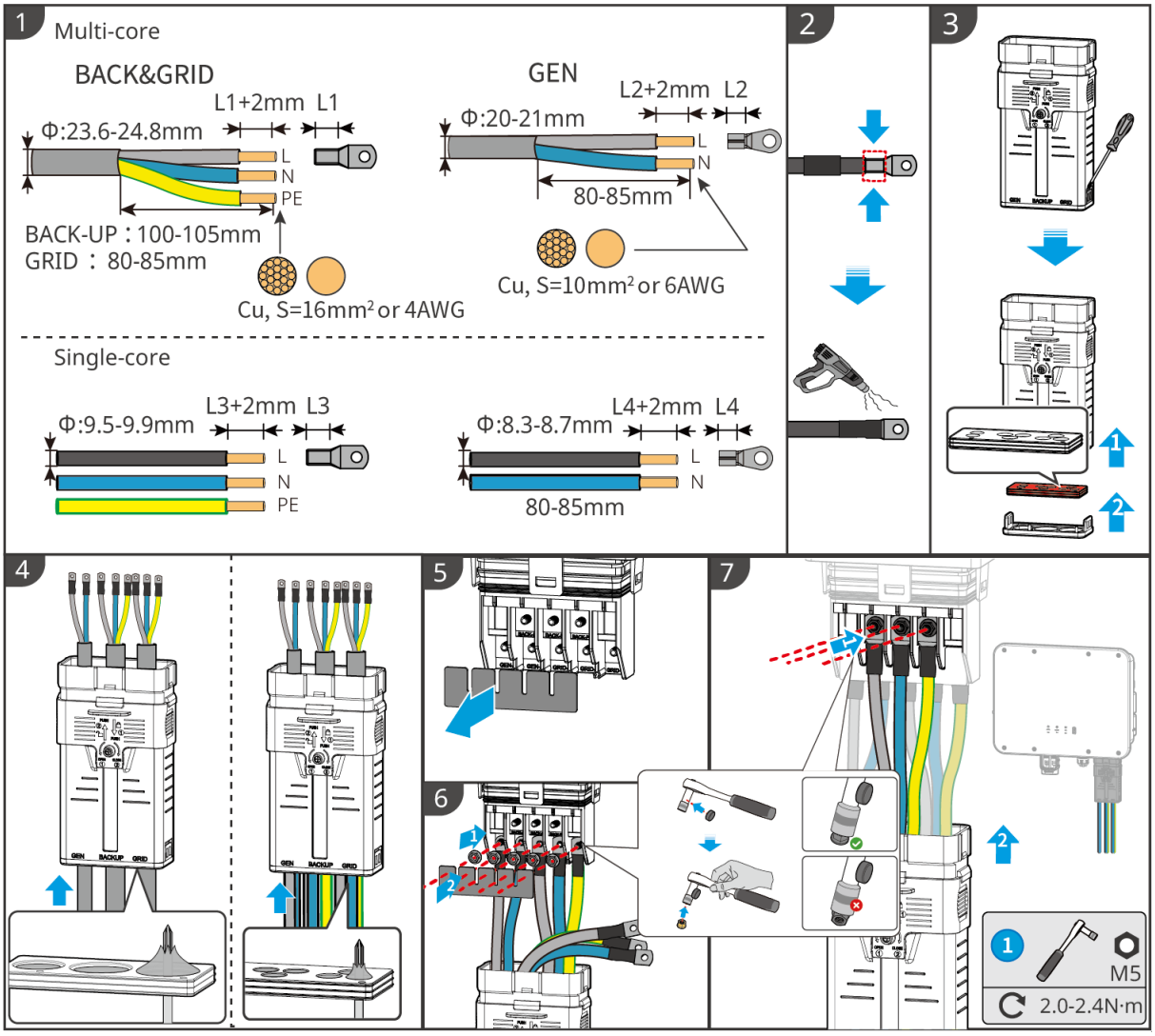
NOTICE
● When connecting the lead-acid battery temperature sensor cable, it is recommended to connect the temperature sensor cable at a location with poor heat dissipation. For example, when lead-acid batteries are placed side by side, the sensor should be fixed on the lead-acid battery located in the middle. ● To better protect the battery cell, a temperature sampling cable must be installed, and it is recommended to place the battery in a well-ventilated environment.



6.7 Connecting the AC Cable

WARNING

- The residual current monitoring unit (RCMU) is integrated into the inverter to avoid the residual current exceeds the limit. The inverter will disconnect the utility grid quickly once it found the residual current exceeds the limit.
- When wiring, ensure that the AC cable is completely matched with the "BACKUP", "ON-GRID", "GEN", and grounding ports of the AC terminal. Incorrect cable connection will lead to equipment damage.
- Ensure that the whole cable cores are inserted into the terminal holes. No part of the cable core can be exposed.
- Ensure that the insulation board is inserted into the AC terminal tightly.
- Ensure that the cables are connected securely. Otherwise it will cause damage to the inverter due to overheat during its operation.



6.8 Connecting the Meter Cable

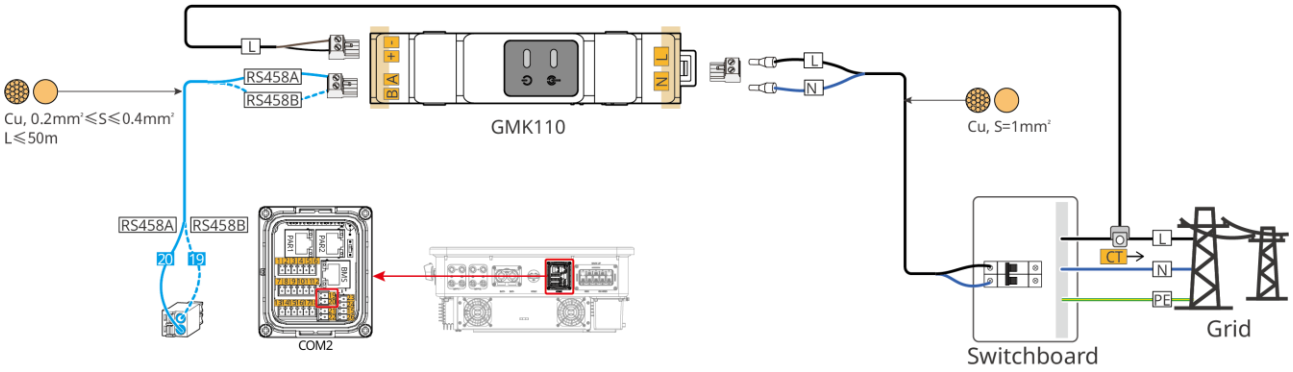
NOTICE

- Contact the manufacturer for additional smart meters if multiple inverters are connected.
- Ensure that the CT is connected in the correct direction and phase sequences, otherwise the monitoring data will be incorrect.
- Ensure the cables are connected tightly, securely and correctly. Inappropriate wiring may cause poor contacts and damage the equipment.
- In areas at risk of lightning, if the meter cable exceeds 10m and the cables are not wired with grounded metal conduits, you are recommended to use an external lightning protection device.

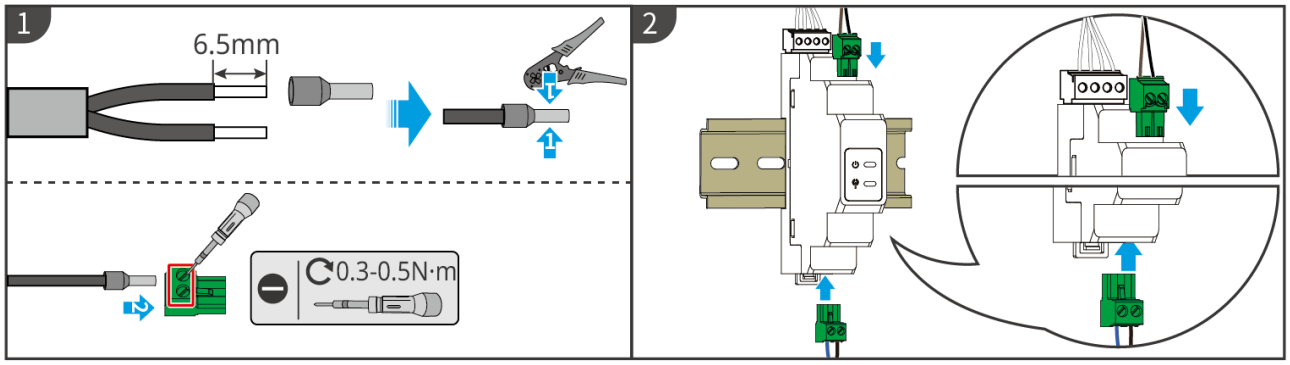
Wiring of GMK110

NOTICE

- Outer diameter of the AC cable should be smaller than the holes diameter of the CT, so that the AC cable can be routed through the CT.
- To ensure accurate current detection, the CT cable is recommended to be shorter than 30m.
- Do not use network cable as the CT cable, otherwise the smart meter may be damaged due to high current.
- The CTs vary slightly in dimensions and appearance depending on the model, but they are installed and connected in the same way.



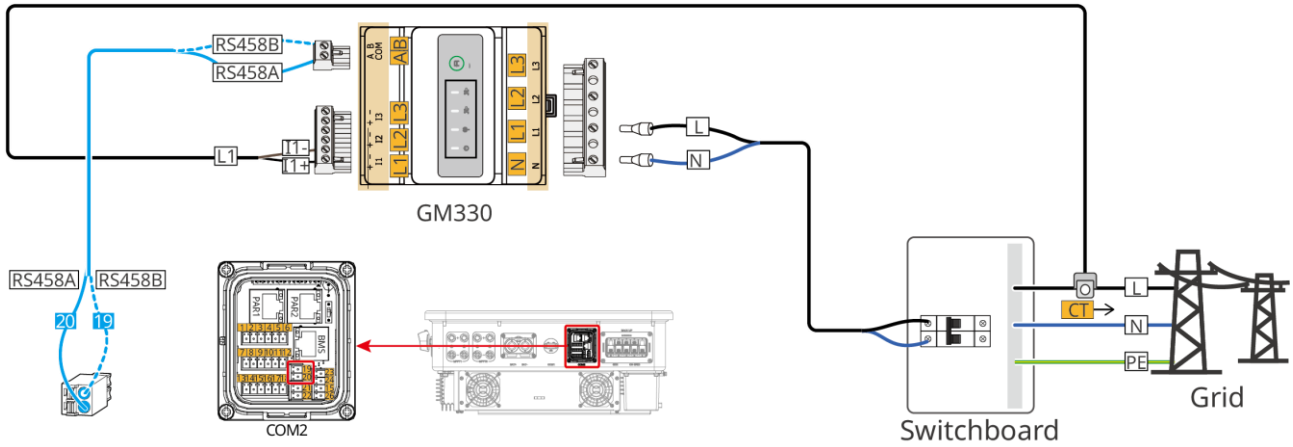
Connection steps



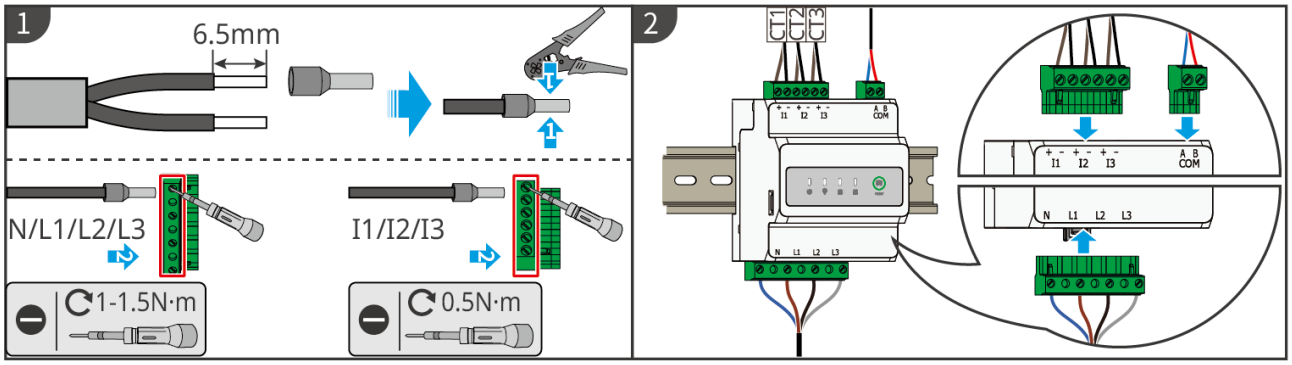
▶ GMK110: CT x 1; GMK110D: CT x 2

GMK10ELC0002

Wiring of GM330

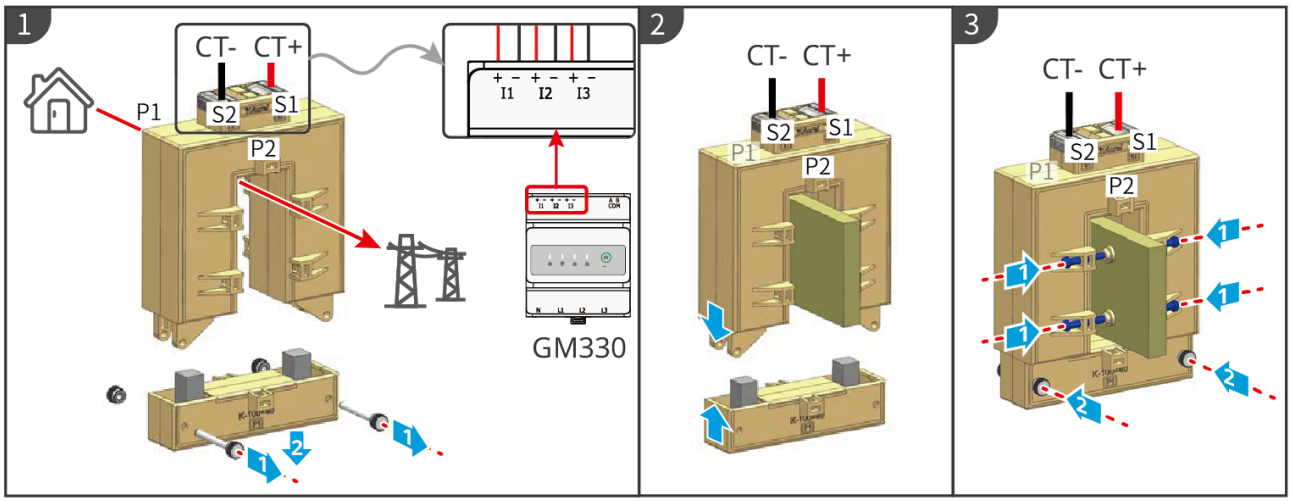


Connection steps



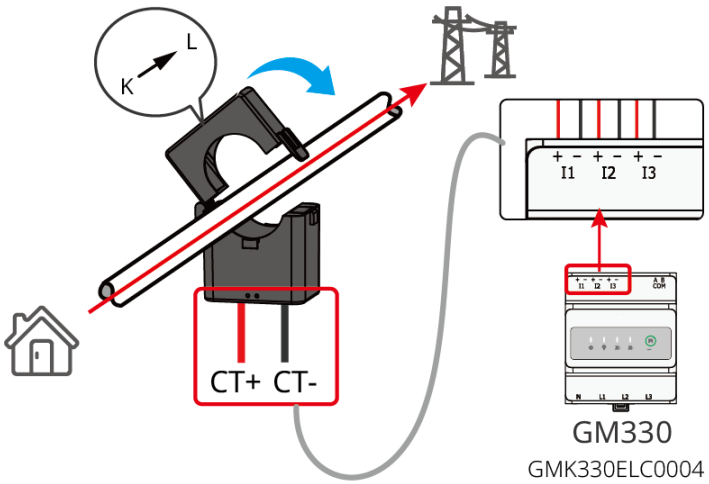
GMK330ELC0002

Installing the CT (Type I)



GMK330ELC0003

Installing the CT (Type II)



GMK330ELC0004

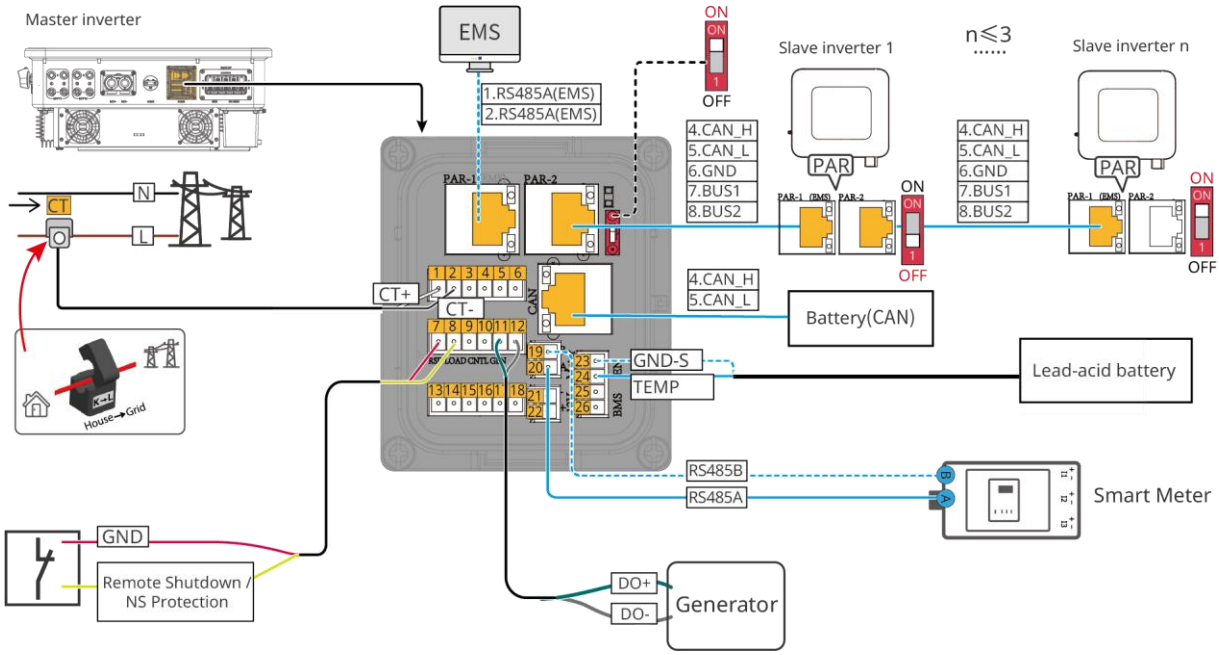
6.9 Connecting the Inverter Communication Cable

NOTICE
• The communication functions are optional. Connect the cables based on actual needs. • If you need to use the remote shutdown function, please turn it on in the SolarGo App

after wiring is completed.

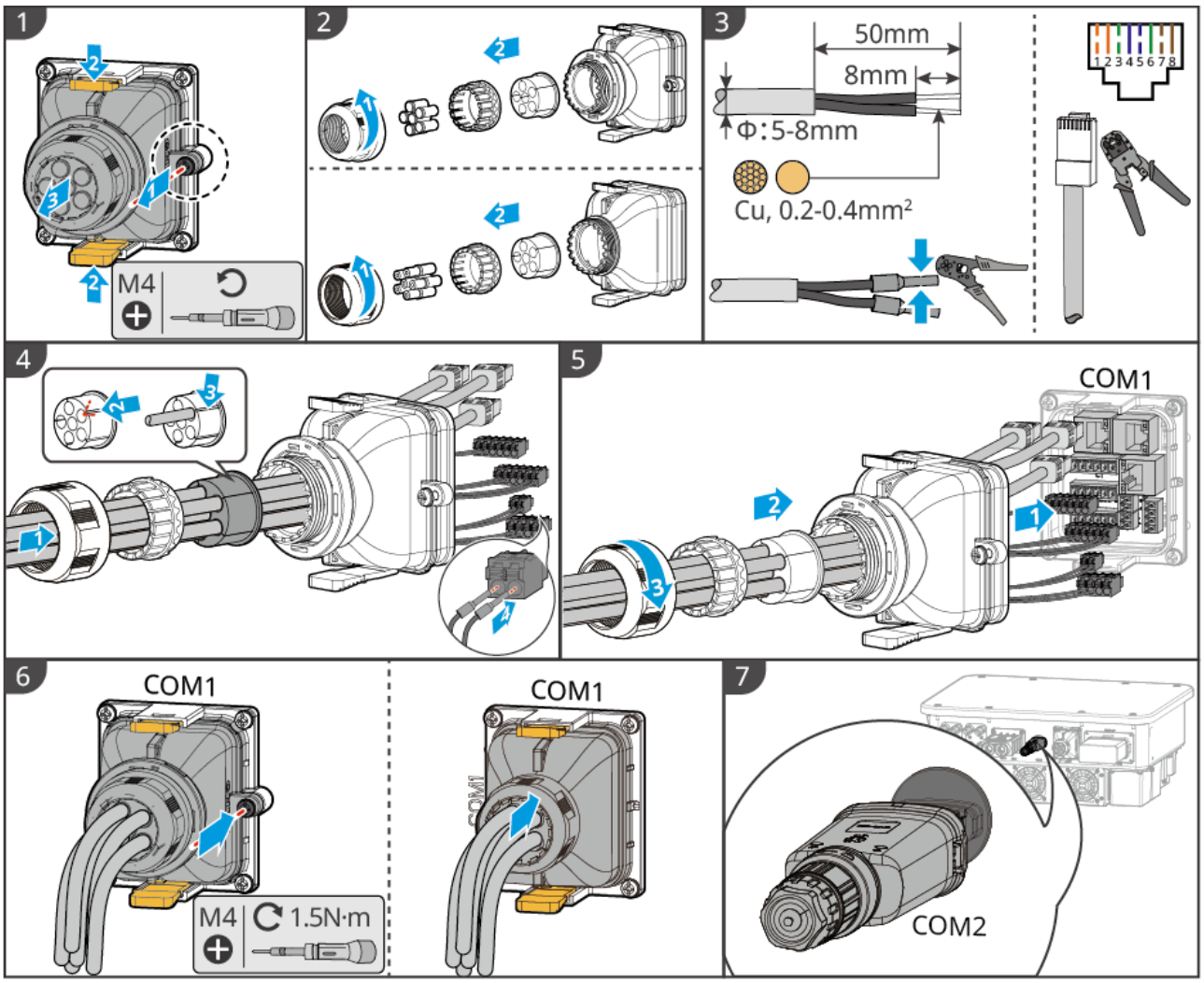
- Do not turn on the function in the SolarGo App if the inverter is not connected to a remote shutdown device, otherwise the inverter will be unable to operate on-grid.
- In a parallel system, please connect the communication cable to the master inverter to achieve the remote shutdown function, otherwise, the function will not work.

Communication Descriptions



Number	Function	Description
1	CT	Connecting the CT communication cable.
2	PAR1/PAR2	The communication port for parallel operation of inverters.
3	BMS(CAN)	For communication between the inverter and the battery.
4	Lead-acid battery temperature measurement port.	For connecting lead-acid battery temperature measurement cable.
5	Remote shutdown/NS Protection	Provides signal control port to control equipment remote shutdown or realize NS protection function.
5	GEN port	Used to control the generator. It can only be used in a single inverter scenario.

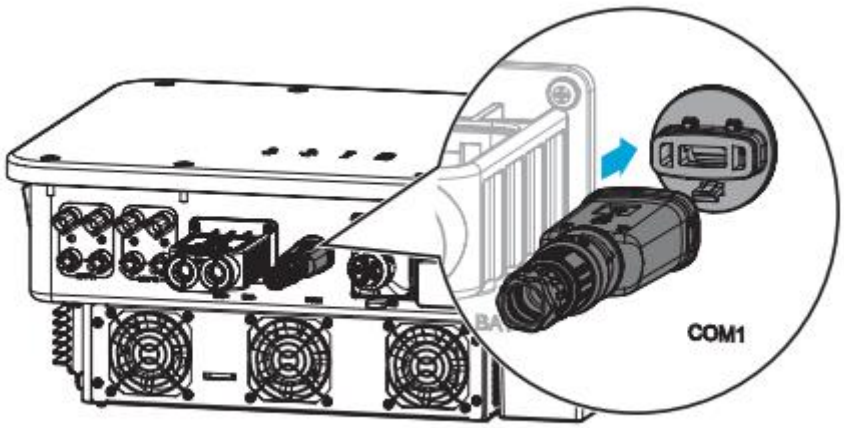
Connecting the communication cable



6.10 Connect the smart dongle

NOTICE

- The inverter supports connecting to mobile phones or WEB interfaces via Bluetooth, WiFi, LAN, and 4G smart dongle (China version) to set device-related parameters, view equipment operation information and error messages, and promptly understand the system status.
- In single inverter system, install the WiFi/LAN Kit-20 smart dongle. When using multiple inverters to form a parallel system, the master inverter needs to be equipped with an Ezlink module for networking.



7 System Commissioning

7.1 Check before Power ON

Number	Check Item
1	The inverter is firmly installed in a clean place where is well-ventilated and easy to operate.
2	The PE, DC input, AC output, communication cables, and terminal resistors are connected correctly and securely.
3	Cable ties are intact, routed properly and evenly.
4	Unused wire holes and ports should be sealed up.
5	The used cable holes are sealed.
6	The voltage and frequency at the connection point meet the inverter grid connection requirements.

7.2 Power ON

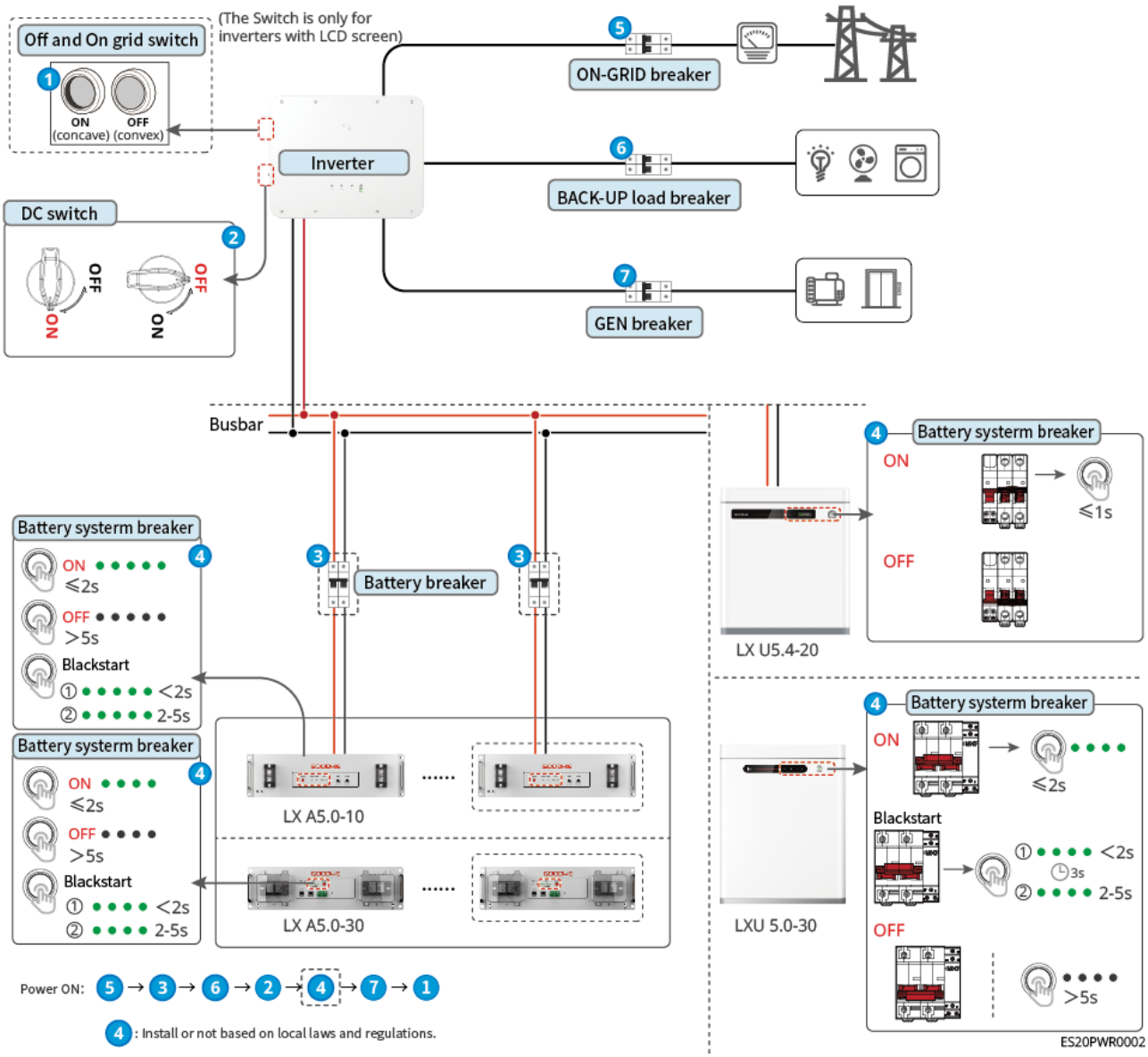
⚠WARNING

- When there are multiple inverters in the system, please ensure that all slave inverter AC sides are powered on within one minute after the master inverter AC side is powered on.
- Battery black start scenarios:

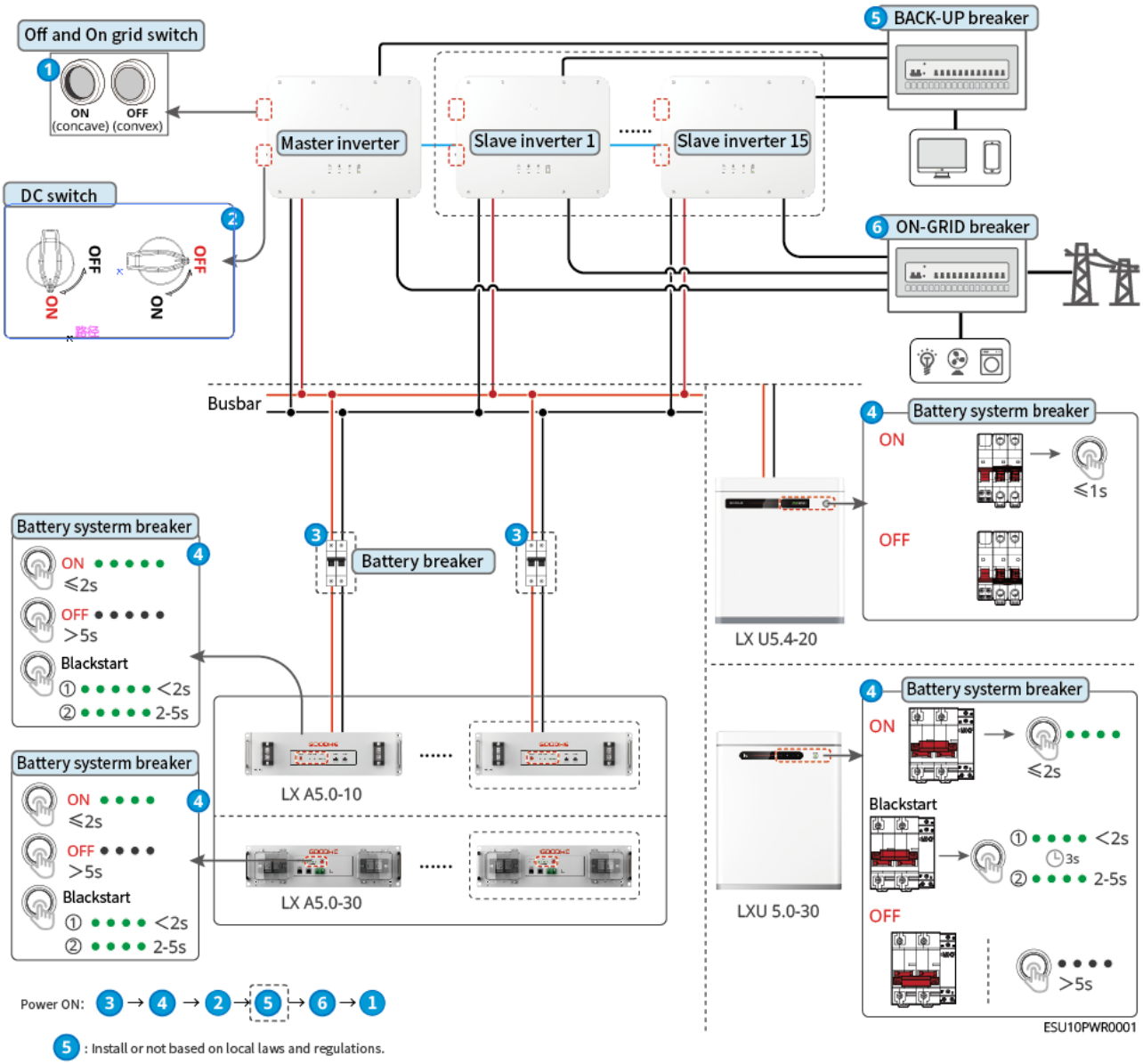
- The inverter needs to be activated by battery.
- If there is no inverter, it is necessary to manage the charging and discharging of battery, etc.

- After the battery system is started, please ensure that the communication between the inverter and the battery system is normal within 15 minutes. If the inverter cannot communicate normally with the battery system, the battery system switch will be automatically disconnected, and the battery system will be powered off.
- When there are multiple batteries in the system, starting any one of them can start all the batteries.

7.2.1 Power on a single inverter system



7.2.2 Power on a parallel system



7.3 Indicators

7.3.1 Inverter Indicators

Indicator	Status	Description
		The inverter is power on and in the standby mode.
		The inverter is starting up and in the self-check mode.
		The inverter is in normal operation under grid-tied

		or off-grid mode.
		BACK-UP output overload.
		System fault.
		The inverter is powered off.
		The grid is abnormal, and the power supply to the BACK-UP port of the inverter is normal.
		The grid is normal, and the power supply to the BACK-UP port of the inverter is normal.
		The BACK-UP port has no power supply.
		The monitoring module of the inverter is resetting.
		The inverter fails to connect with the communication Termination.
		Communication fault between the communication Termination and Server.
		The monitoring of the inverter operates well.
		The monitoring module of the inverter has not been started yet.

Indicator	Description
	75% < SOC≤100%
	50% < SOC≤75%
	25% < SOC≤50%
	0% < SOC≤25%

	No battery connected.
Indicator light blinking during battery discharging: for example, when the battery SOC is between 25% and 50%, the light at the 50% position blinks.	

7.3.2 Battery Indicators

LX A5.0-30

Indicator		System Status
	No green displayed on the SOC indicator	SOC=0%
	The first SOC indicator shows green	0% < SOC≤25%
	The first two SOC indicators are green	25% < SOC≤50%
	The first three SOC indicators are green	50% < SOC≤75%
	The four SOC indicators are green	75% < SOC≤100%
 RUN light	Green light steady on	The battery system is working properly.
	Green light flashes 1 time/s	The battery system is in standby mode.
	Green light blinks 3 time/s	The PCS communication is lost
	Green flashes slowly flash	After the battery system gives an alarm, it will conduct a self-check and wait until the self-check is over, then it will change to normal working status or fault status.

ALM Light	Red light steady on	Check both the button indicator and the SOC indicator status to determine the fault that has occurred and handle the problem follow the methods recommended in the Troubleshooting section.

LX A5.0-10

Normal status

SOC indicator	RUN light	Battery system status
The SOC indicator represents the battery system's useable energy. SOC<5% 5%≤SOC<25% 25%≤SOC<50% 50%≤SOC<75% 75%≤SOC<95% 95%≤SOC≤100%	Green flashes 1 time/s	The battery system is in standby mode.
	Green light blinks 1 time/s	The battery system is in an idle state.
	Green light steady on	The battery system is in the charging state.
The last SOC indicator blinks 1 time/s. ● When 5%≤SOC<25%, SOC 1 blinks. ● When 25% ≤ SOC < 50%, SOC2 flashes ● When 50% ≤ SOC < 75%, SOC3 flashes ● When 75% ≤ SOC < 95%, SOC4 flashes. ● When 95% ≤ SOC ≤ 100%, SOC5 flashes	Green light steady on	The battery system is in discharging status.

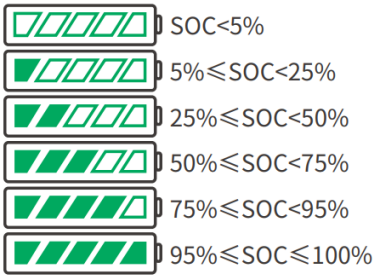
Abnormal state

ALM Light	Battery system status	Description
Red light blink 1 time/s	Battery system alarm	Once an alarm occurs, the battery system will perform a self-check. After the battery

		system self-check is complete, the battery system enters operation or fault mode.
Red light steady on	The battery system has malfunctioned.	Check both the button indicator and the SOC indicator status to determine the fault that has occurred and handle the problem follow the methods recommended in the Troubleshooting section.

LX U5.4-20

Normal Status

SOC Indicator	Button Indicator	Battery Status
SOC indicates the battery level  	Green flashes 1 time/s	The battery system is in standby mode.
	Green flashes 2 time/s	The battery system is in an idle state.
	Green light steady on	The battery system is in charging state.
最高 SOC 指示灯闪烁 1 次/s ● 当 5%≤SOC<25%时，SOC1 闪烁 ● 当 25%≤SOC<50%时，SOC2 闪烁 ● 当 50%≤SOC<75%时，SOC3 闪烁 ● 当 75%≤SOC<95%时，SOC4 闪烁 ● 当 95%≤SOC≤100%时，SOC5 闪烁	The last light flashes, and the rest steady on	The battery system is in discharging state.

Abnormal Status

Button Indicator 	Battery Status	Description
Red light blink 1 time/s	Battery system alarm	Check both the button indicator and the SOC indicator status to determine the fault that has occurred and handle the problem follow the methods recommended in the Troubleshooting section.
Red light steady on	The battery system has malfunctioned	Check both the button indicator and the SOC indicator status to determine the fault that has occurred and handle the problem follow the methods recommended in the Troubleshooting section.

LX U5.0-30

Indicator		System Status
	No green displayed on the SOC indicator	SOC=0%
	The first SOC indicator shows green	0% < SOC≤25%
	The first two SOC indicators are green	25% < SOC≤50%
	The first three SOC indicators are green	50% < SOC≤75%
	The four SOC indicators are green	75% < SOC≤100%
 RUN light	Green light steady on	The battery system is working properly.
	Green flashes 1 time/s	The battery system is in standby mode.

	Green light flashes 3 time/s	The PCS communication is lost
	Green light slowly flashes	After the battery system gives an alarm, it will conduct a self-check and wait until the self-check is over, then it will change to normal working status or fault status.
 ALM Light	Red light steady on	Check both the button indicator and the SOC indicator status to determine the fault that has occurred and handle the problem follow the methods recommended in the Troubleshooting section.

7.3.3 Smart Meter Indicator

GMK110

Type	Status	Description
Power indicator light 	Steady on	The smart meter is power on.
	Off	The smart meter has been powered off.
Communication indicator 	Blinks	Meter communication is normal
	Off	Meter communication is abnormal or has no communication

GM330

Type	Status	Description
Power indicator light 	Steady on	Power on, no RS485 communication.
	Blinks	Power on, RS485 communication works properly.
	Off	The smart meter has been powered off.
Communication	Off	Reserved

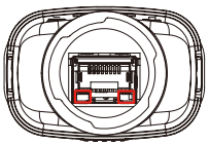
indicator 	Blinks	Press the Reset button for more than 5 seconds, power light, buying or selling electricity indicator light flash: Reset the meter.
Importing or exporting indicator 	Steady on	Importing from the grid.
	Blinks	Exporting to the grid.
	Off	Exporting to the grid.
	Reserved	

7.3.4 Smart Dongle Indicator

WiFi/LAN Kit-20

Indicator	Status	Description
Power light 		Constantly on: The smart dongle has been powered on.
		Power Off: The smart dongle is not powered on.
Communication indicator 		Steady on: Communication in WiFi mode or LAN mode is normal.
		Blinks 2 times: The smart dongle is not connected to the router.
		Blinks 4 times: The smart dongle is communicating normally with the router, but has not connected to the server.
		Off: The software of the smart dongle is resetting or is not powered on.

Indicator	Color	Status	Description
Communication indicator in LAN Port	Green	Steady on	The connection of the wired network at 100Mbps is normal.
		Off	• The Ethernet cable is not connected. • The connection of the wired

			network at 100Mbps is abnormal. ● The connection of the wired network at 100Mbps is normal.
	Yellow	Steady on	The connection of the wired network at 10Mbps is normal, but no communication data is received or transmitted.
		Blinks	The communication data is being transmitted or received.
		Off	The Ethernet cable is not connected.

Button	Description
Reload	Press and hold for 0.5 to 3 seconds to reset the Smart Dongle.
	Press and hold for 6 to 20 seconds to restore the Smart Dongle to factory settings.

Ezlink3000

Indicator/ silkscreen	Color	Status	Description
Power light	Blue		Blink = The Ezlink is working properly.
			OFF = The Ezlink is powered off.
Communication indicator	Green		ON = The Ezlink is connected to the server.
			Blink 2 = The Ezlink is not connected to the router.
			Blink 4 = The Ezlink is connected to the router, but not connected to the server.
RELOAD	-	-	● Short press for 3s to restart the Ezlink. ● Long press for 3-10s to restore factory settings.

8 Quick System Commissioning

8.1 Commissioning Method Introduction

This series of inverters includes both those with LCD screens and those without screens. The inverter without LCD screen only supports setting the inverter through SolarGo APP. The inverter with LCD screen supports setting the inverter through LCD screen and SolarGo APP.

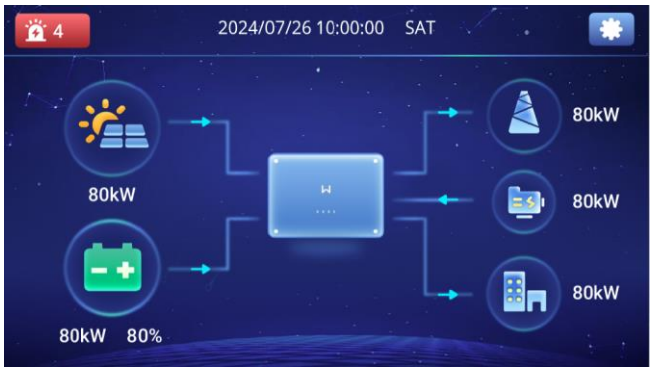
8.1.1 Introduction to LCD Screen

Through the LCD screen, users can:

1. Check the operating data, software version, alarm information, etc. of the device.

2. Set parameters, safety code, power limit, etc.

Inverter LCD screen interface



For inverters with screen, users can quickly configure them through the LCD screen. This screen is a touch screen, and users can directly click on the  (Settings) icon in the upper right corner of the screen to enter the system settings interface and complete the inverter function settings according to actual needs. You can also complete the inverter function settings by pressing the buttons  (UP),  (DOWN),  (ENTER),  (EXIT) on the inverter.

8.1.2 Introduction to SolarGo APP

8.1.2.1 Downloading the App

Make sure that the mobile phone meets the following requirements:

- Mobile phone operating system: Android 4.3 or later, iOS 9.0 or later.
- The mobile phone can access the Internet.
- The mobile phone supports WLAN or Bluetooth.

Method 1: Search SolarGo in Google Play (Android) or App Store (iOS) to download and install the app.



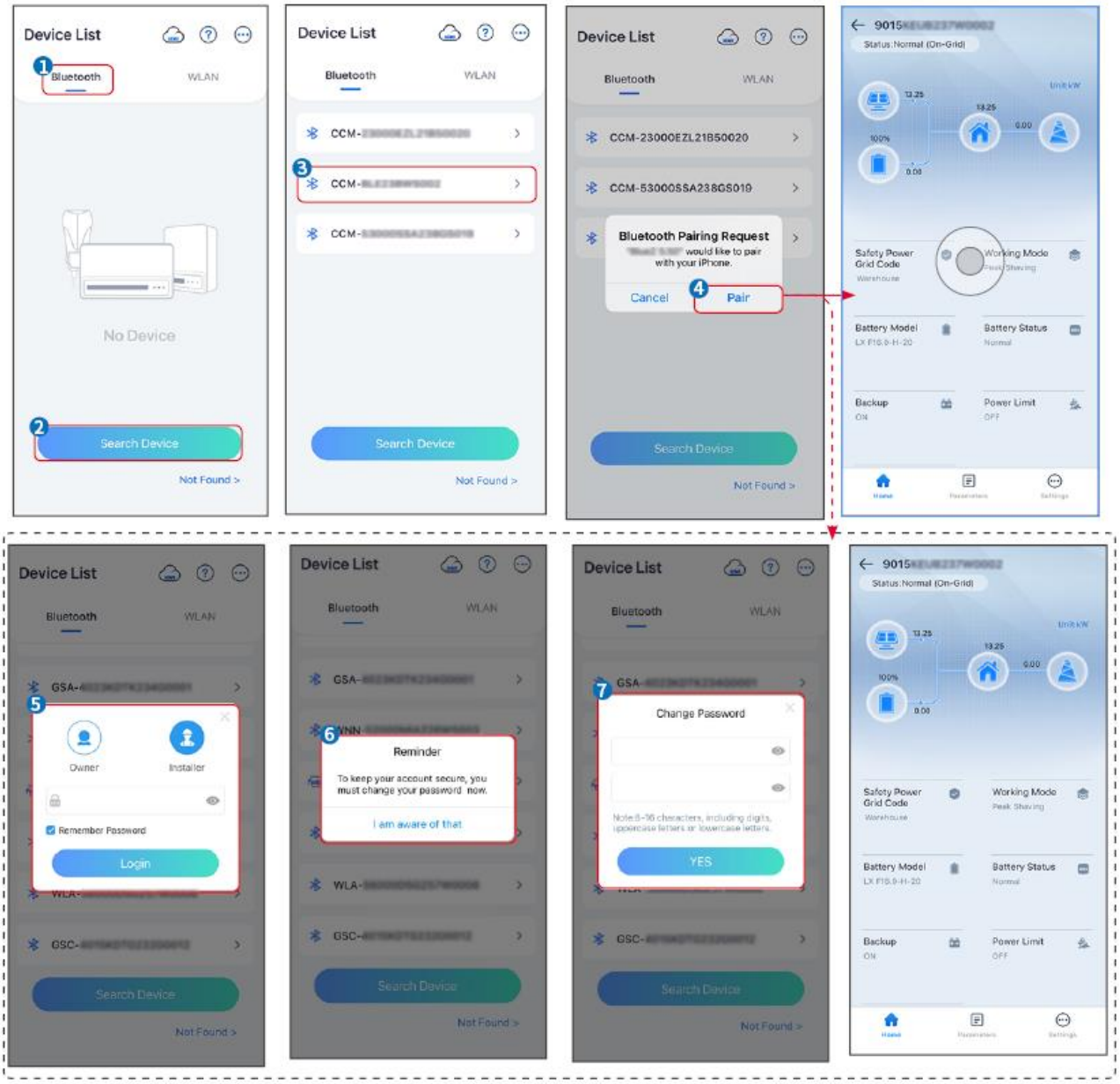
Method 2: Scan the QR code below to download and install the app.



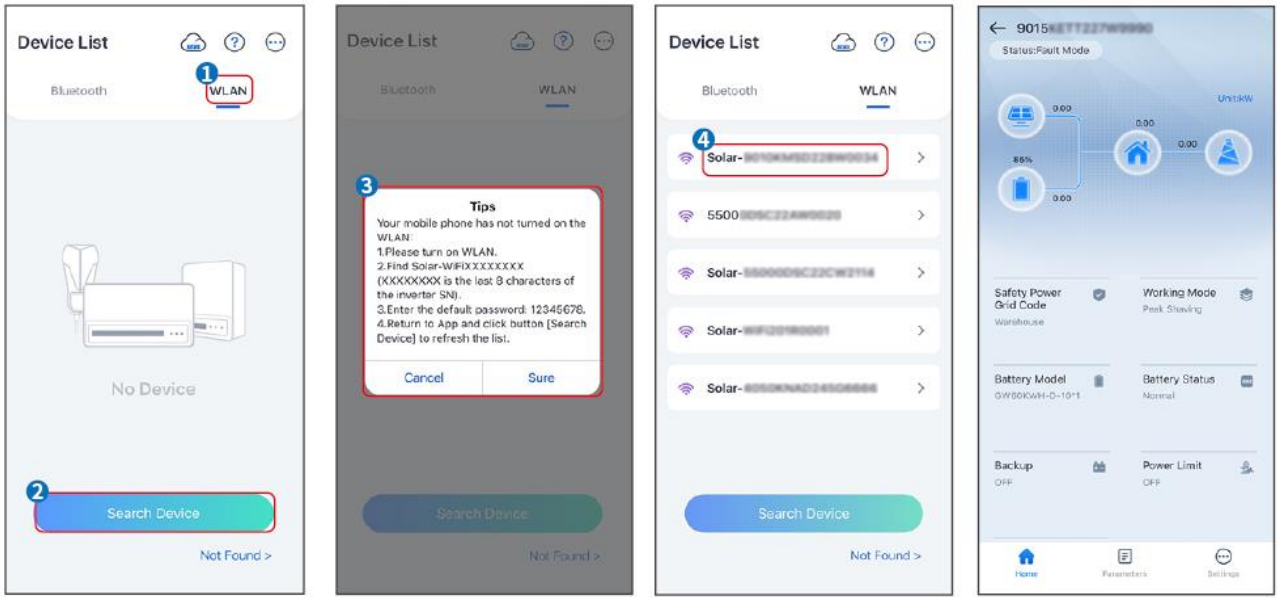
8.1.2.2 Connecting the Inverter

NOTICE
The device name varies depending on the inverter model or smart dongle type: ● Wi-Fi Kit：Solar-WiFi*** ● Bluetooth Module: Solar-BLE*** ● WiFi/LAN Kit-20：WLA-*** ● Ezlink3000：CCM-BLE***；CCM-***；***

Connect to the inverter via Bluetooth



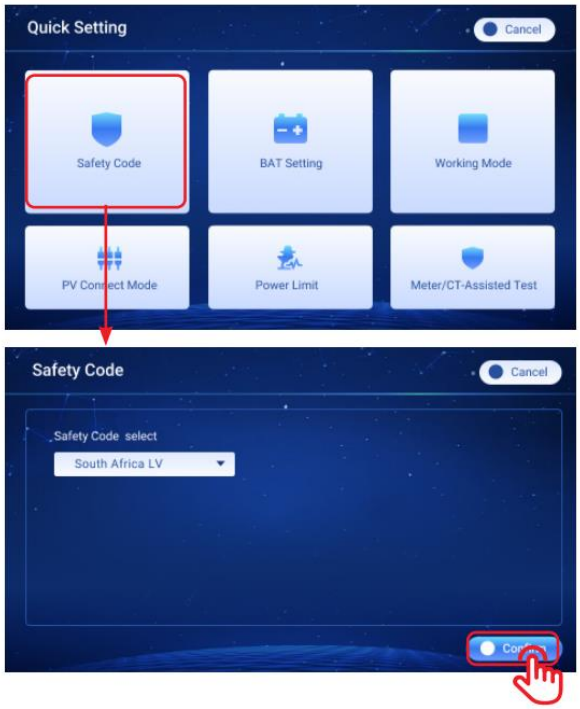
Connecting the inverter via WiFi



8.2 Quick Settings

8.2.1 LCD Screen Settings

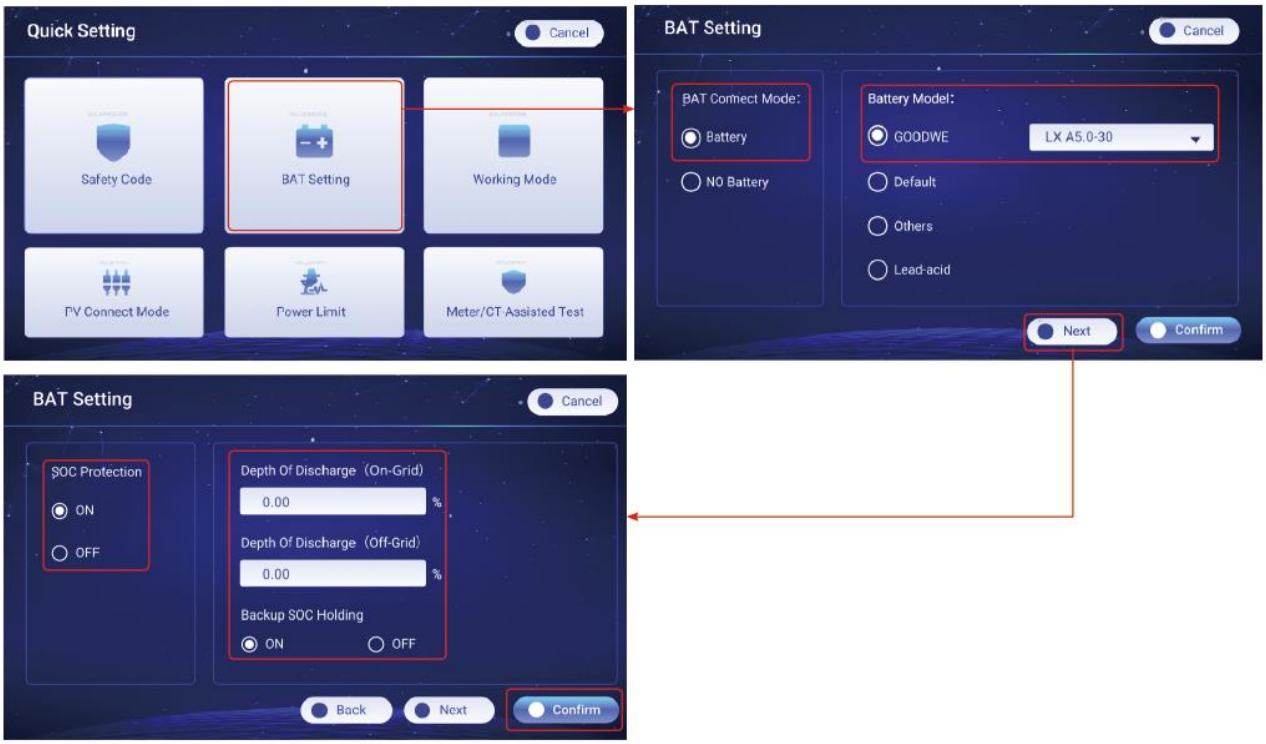
Setting Safety Code



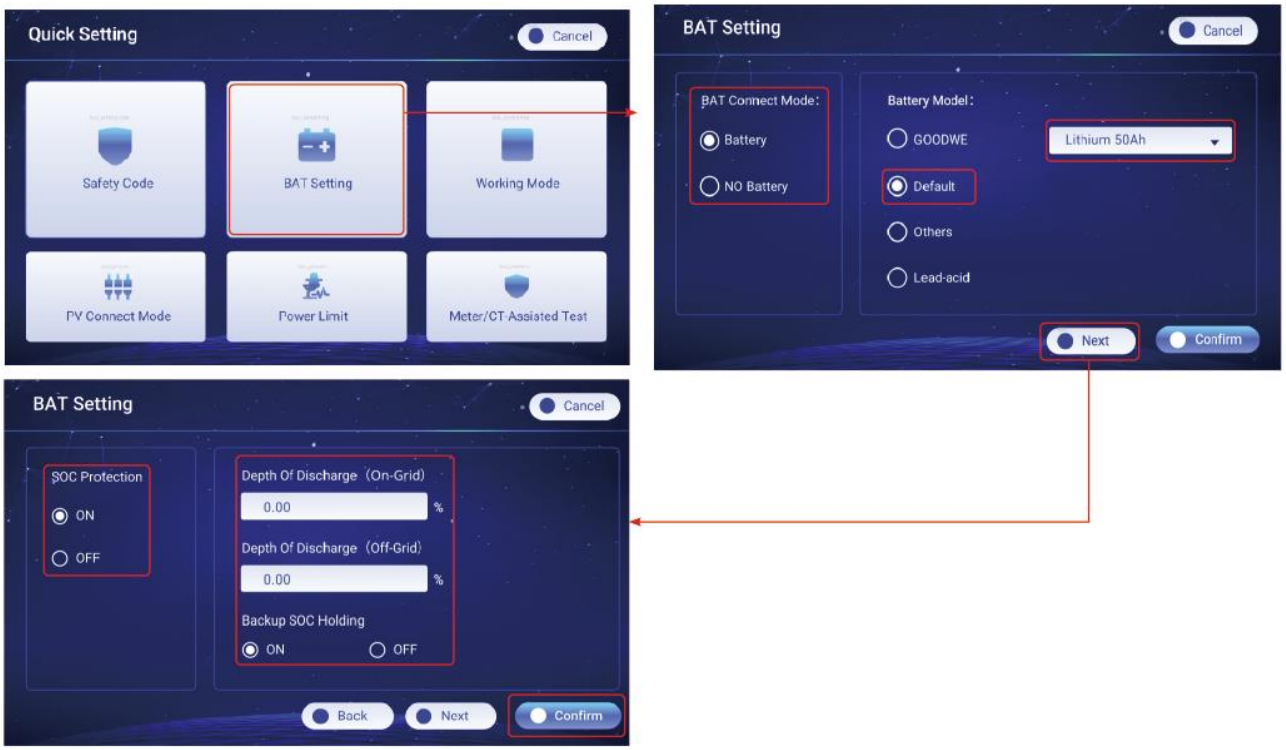
Parameter	Description
Safety Code select	Select the corresponding safety code based on the country or region.

BAT Setting

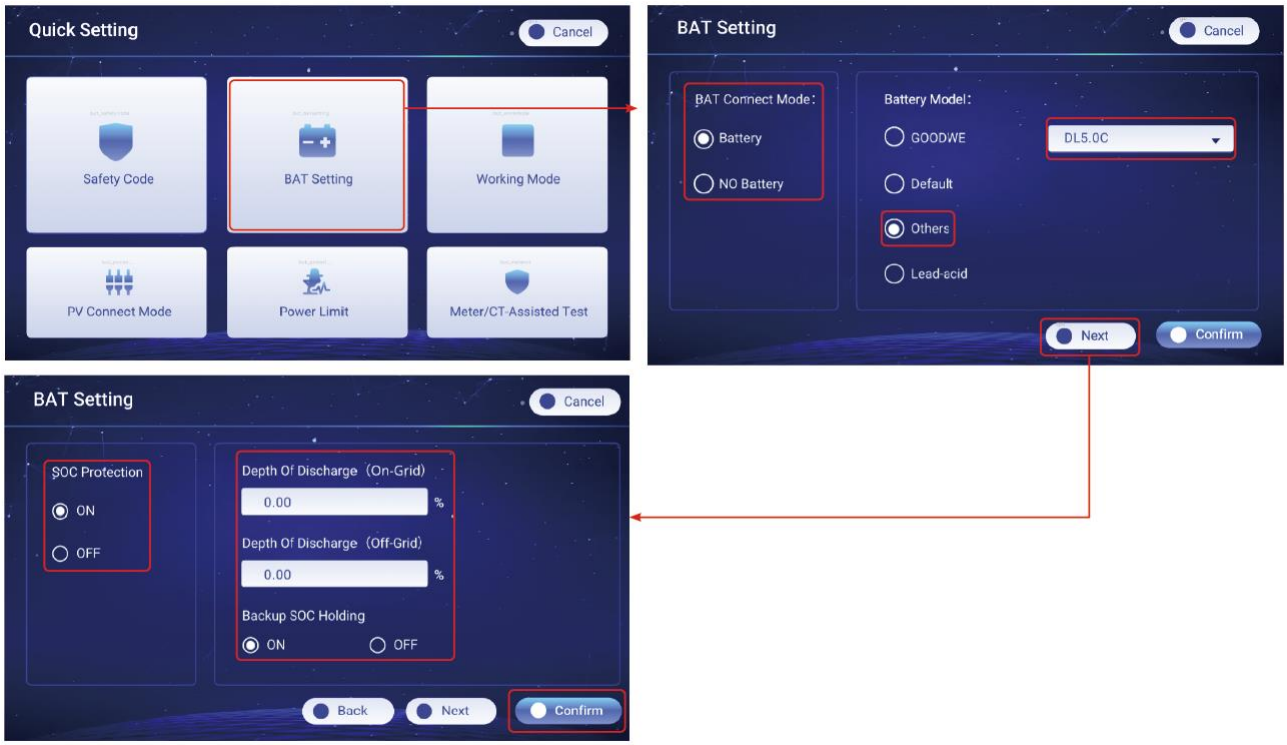
Lithium Battery (GOODWE battery)



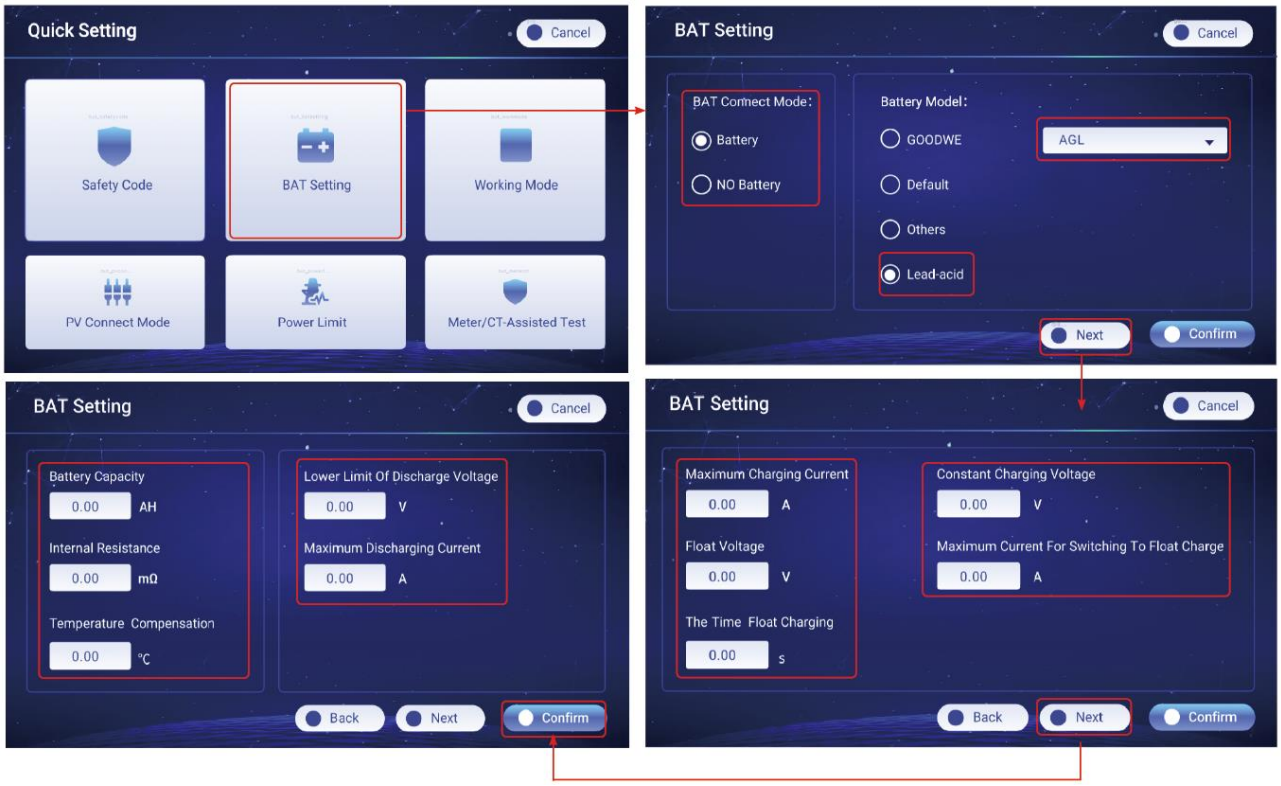
Lithium Battery (Third party lithium battery model not in the optional list)



Lithium Battery (Third party lithium battery model in the optional list)



Lead-acid Battery



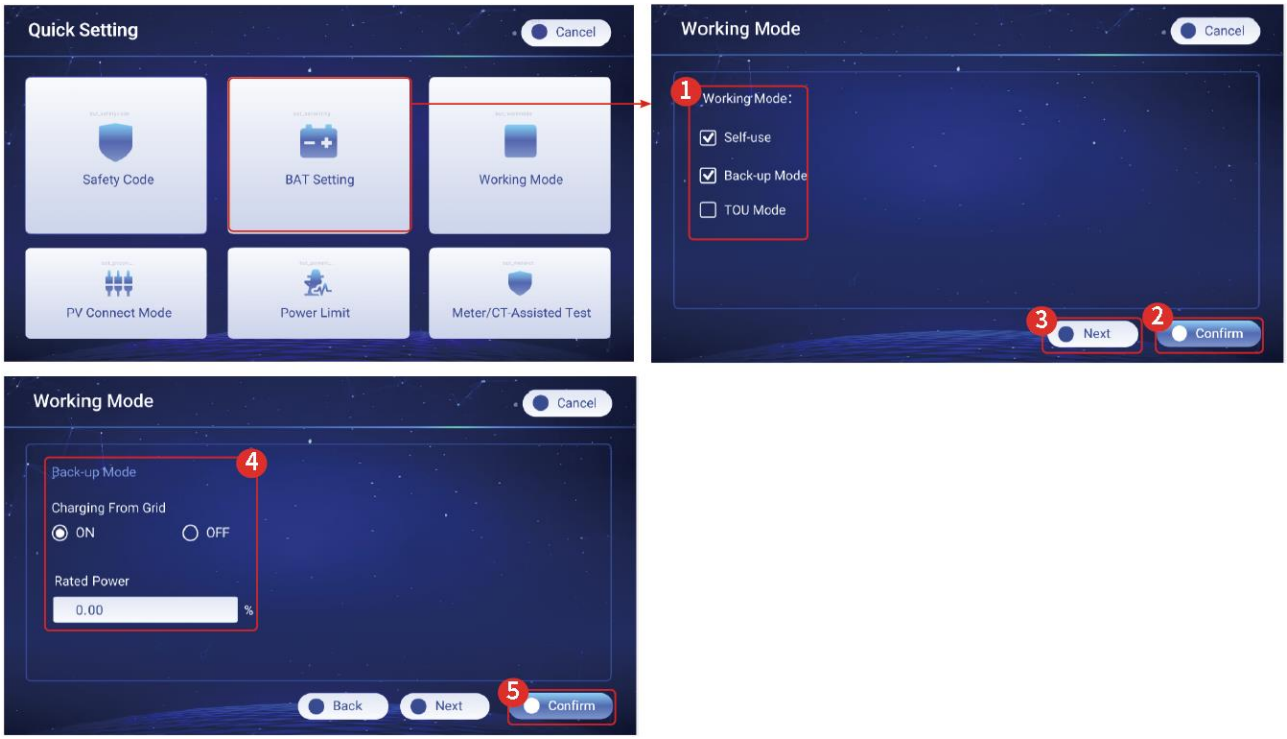
Parameter	Description
BAT General Settings	
BAT Setting	Set parameters for the battery connected to the inverter.

BAT Connect Mode	Select the actual mode for connecting the battery to the inverter. If there is no battery connected in the system, it is unnecessary to configure the battery model and working mode, and the equipment will operate in the self-use mode by default.
Battery Model	Select the actual battery model. Battery Type only supports: AGM/GEL/Wet Battery (Flooded).
Set parameters for lithium battery (GOODWE and third party battery)	
SOC Protection	Enable or disable SOC protection.
Depth Of Discharge (On-Grid)	The maximum depth of discharge of the battery when the system is working on-grid.
Depth Of Discharge (Off-Grid)	The maximum depth of discharge of the battery when the system is working off-grid.
Backup SOC Holding	The battery will be charged to preset SOC protection value by utility grid or PV when the system is running on-grid. So that the battery SOC is sufficient to maintain normal working when the system is off-grid.
Set parameters for lead-acid battery	
Battery Capacity	Please set it according to the battery technical parameters.
Internal Resistance	The internal resistance of the battery. Please set it according to the battery technical parameters.
Temperature Compensation	By default, when the temperature is higher than 25℃, the upper limit of charging voltage will decrease by 3mV for every 1℃ increase. The actual settings should be based on the technical parameter of the battery.
Lower Limit Of Discharge Voltage	Please set it according to the battery technical parameters.
Maximum Discharging Current	Please set it according to the battery technical parameters. The greater the discharge current is, the shorter the working time of the battery is.
Maximum Charging Current	The maximum current during charging, used to limit the charging current. Please set it according to the battery technical parameters.

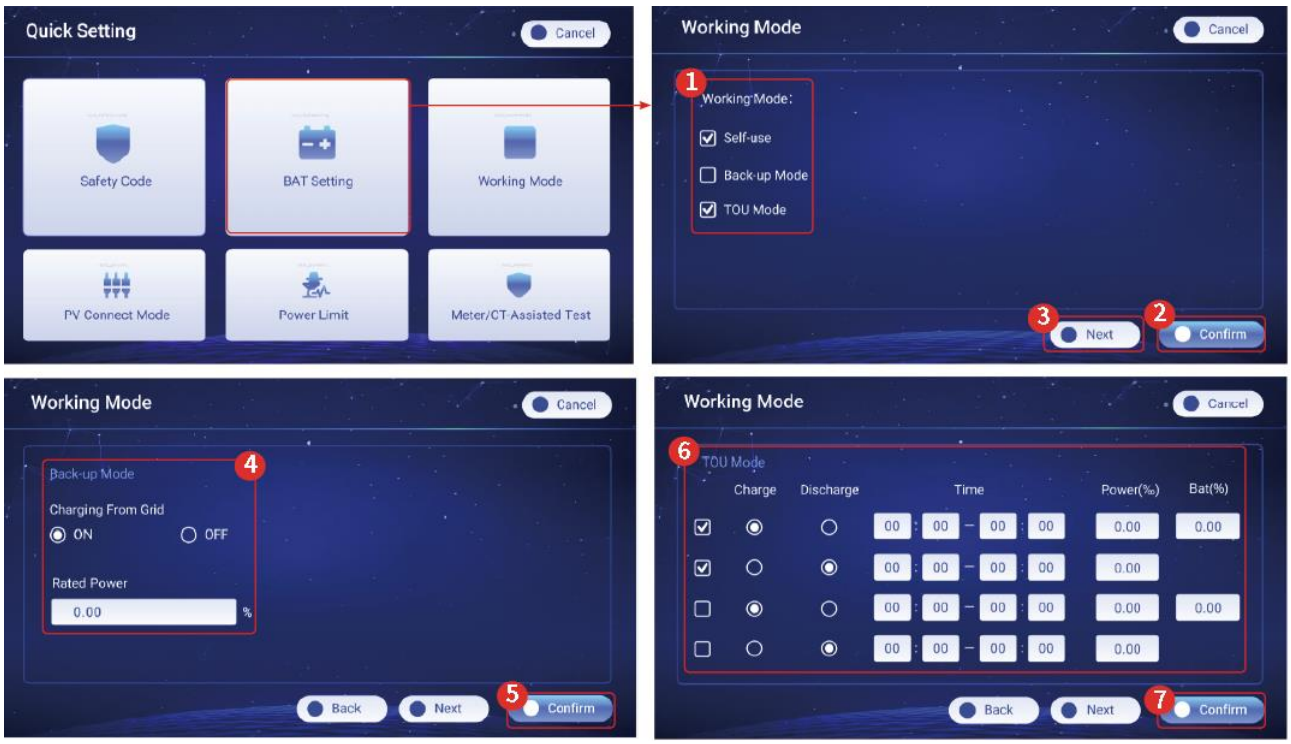
Float Voltage	When the battery is approaching full charge, it will switch to float charging mode. This value is the upper limit of charging voltage in this mode. Please set it according to the battery technical parameters.
The Time Float Charging	When the battery charging status changes from constant charging to float charging, and the duration reaches the set value, the battery charging mode will switch to float charging mode. The default duration is 180s.
Constant Charging Voltage	The battery charging mode is set to constant voltage charging by default; this value is the upper limit of charging voltage in this mode. Please set it according to the battery technical parameters.
Maximum Current For Switch To Float Charge	The maximum charging current in the floating charge state. Please set it according to the battery technical parameters. When the battery is nearly fully charged, it will enter the floating charge state. Please refer to the technical parameters of the corresponding battery model for specific definitions.

Setting Working Mode

Back-up mode



TOU Mode



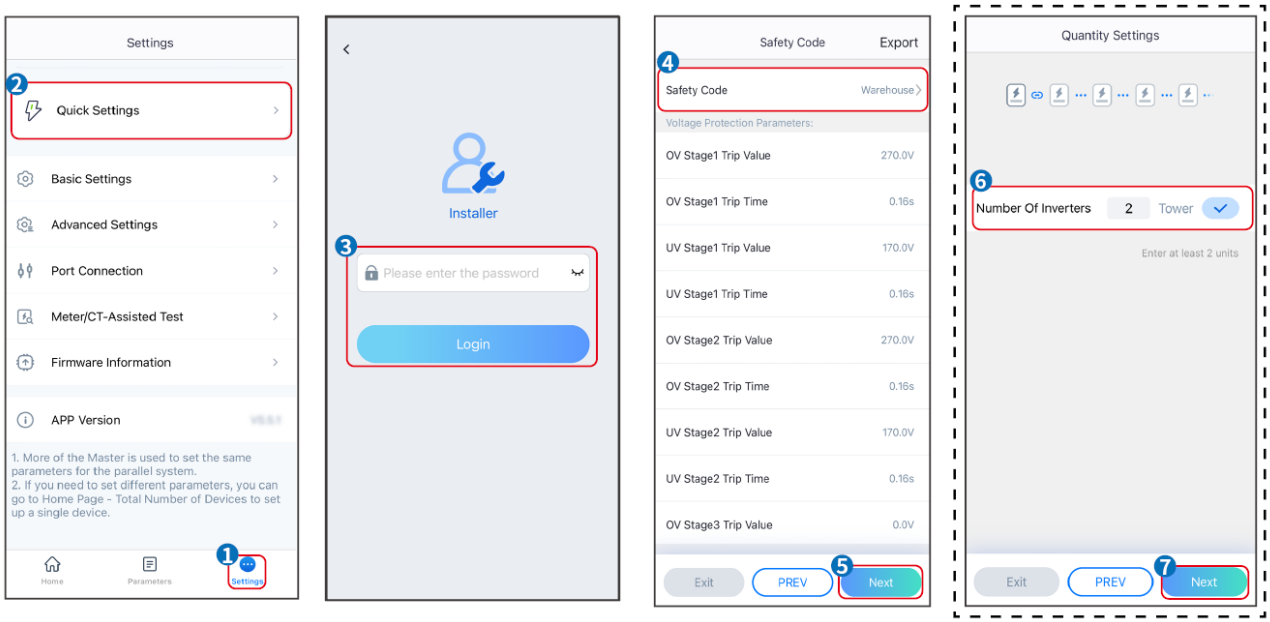
Parameter	Description
Working Mode	Set the working mode according to actual needs.
Self-use Mode: Based on Self-use Mode, Back-up Mode and TOU Mode can be enabled at the same time, and the inverter will automatically select the working mode. Operation priority: Back-up Mode>TOU Mode >Self-use Mode。	
Back-up Mode	
Charging From Grid	Enabling this function allows the system to purchase electricity from power grid.
Rated Power	The percentage of power purchased compared to the rated power of the inverter.
TOU Mode	
Time	Within the start and end time, the battery will charge or discharge based on the set charge-discharge mode and rated power.
Charge/Discharge	Set to charge or discharge based on actual needs.
Power (%)	The percentage of power during charging or discharging compared to the rated power of the inverter.

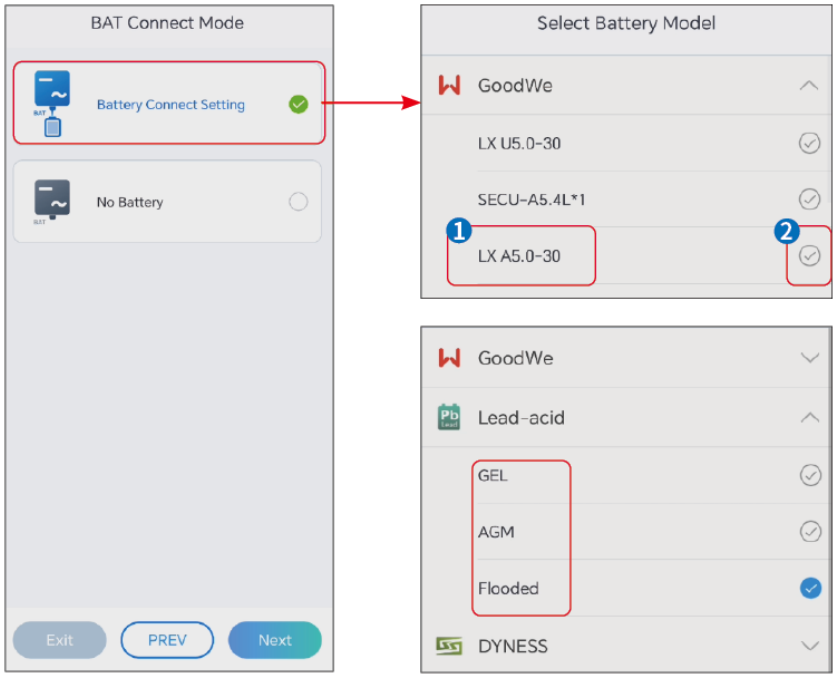
Bat (%)	The battery stop charging once the battery SOC reaches Charge Cut-off SOC. To set the stop SOC for battery discharge, please refer to section **9.4.4 Setting the Battery Parameters** and set the **Depth of Discharge (On Grid)** and **Depth of Discharge (Off Grid)** through the LCD screen.

8.2.2 SolarGo APP Settings

NOTICE

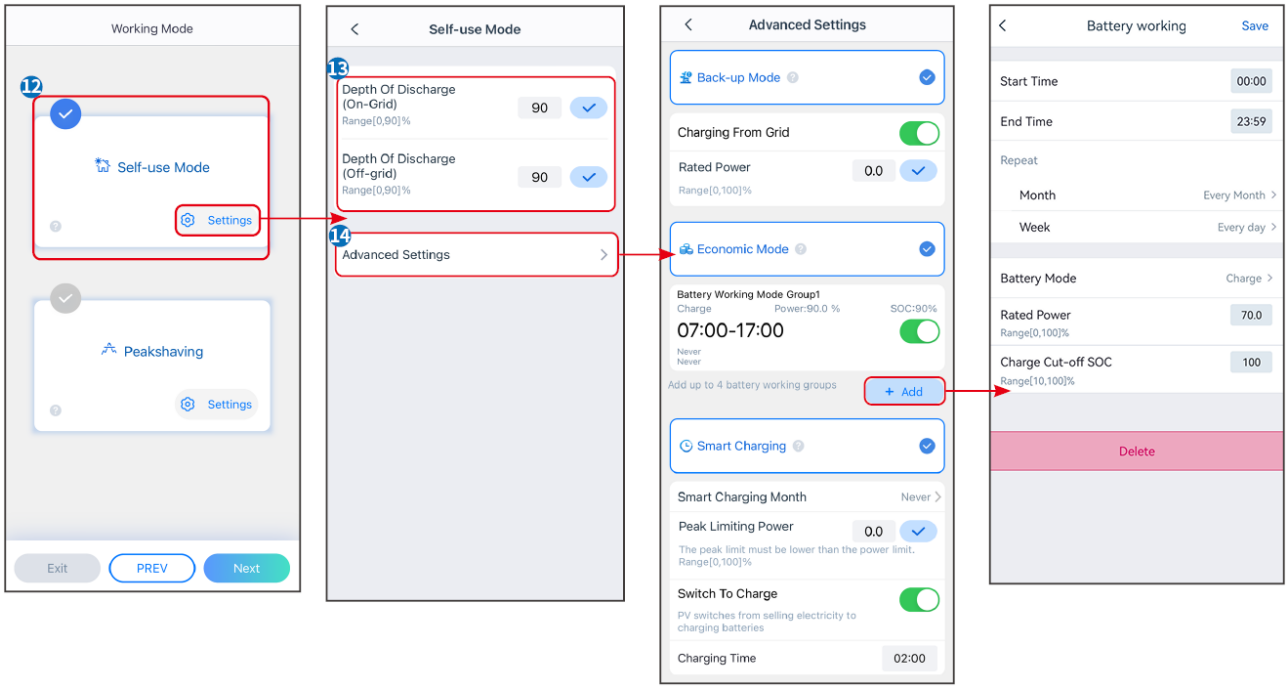
- When selecting the safety regulation country/region, the system will automatically configure the overvoltage and undervoltage protection, overfrequency and underfrequency protection, inverter on-grid voltage/frequency, connection slope, Cosφ curve, Q(U) curve, P(U) curve, FP curve, high and low voltage ride-through, etc. according to the safety regulation requirements of different regions.
- The generation efficiency of inverter differs in different working modes. Please set according to the local actual electricity consumption.





Parameter	Description
Safety Code	Select the corresponding safety code based on the country or region where the equipment is located.
BAT Access Mode	Select the actual mode for connecting the battery to the inverter. If there is no battery connected in the system, it is unnecessary to configure the battery model and working mode, and the equipment will operate in the self-use mode by default.
Select Battery Model	Select the battery type and model based on actual situation.
Working Mode	Set the working mode of the device during operation. Supports: Self-use mode and back-up mode.

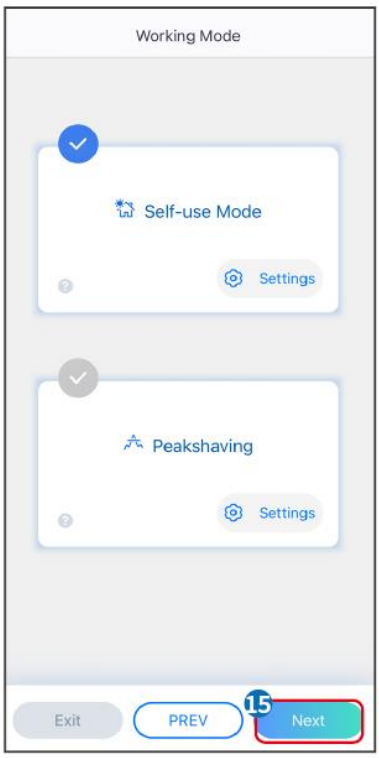
When the self-use mode is selected, the interface will be displayed as follows. You need to enter the advanced mode to choose the specific working mode and set the corresponding parameter values.

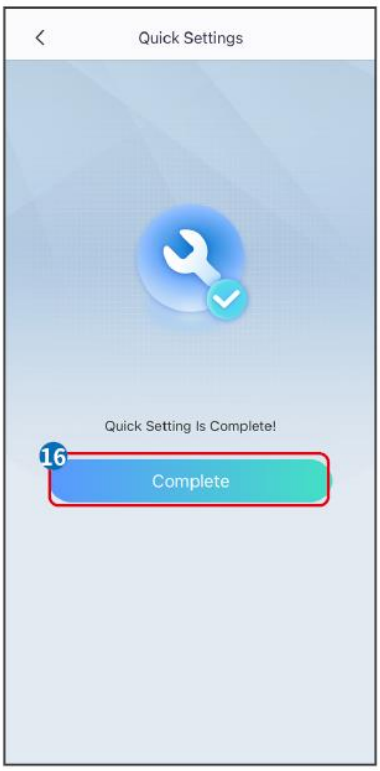


Parameter	Description
Self-use mode: based on the self-use mode, Back-up mode, Economic mode, and Smart charging can be enabled at the same time, and the inverter will automatically select the working mode. Operation priority: **BACK-UP mode** > **Economic mode** > **Smart Charging mode** > **Self-use mode**.	
Depth of discharge(on-grid)	The maximum depth of discharge of the battery when the system is working on-grid.
Depth of discharge(off-grid)	The maximum depth of discharge of the battery when the system is working off-grid.
BACK-UP Mode	
Charging From Grid	Enabling this function allows the system to purchase electricity from power grid.
Rated power	The percentage of power purchased compared to the rated power of the inverter.
Economic mode	
Start time	Within the start and end time, the battery will charge or discharge based on the set charge-discharge mode and rated power.
End time	
Charge and discharge	Set to charge or discharge based on actual needs.

mode	
Rated power	The percentage of power during charging or discharging compared to the rated power of the inverter.
Charge/Discharge Cut-off SOC	The battery stop charging/discharging once the battery SOC reaches Charge Cut-off SOC.

After setting the parameters, click Complete to restart.





8.3 Communication Settings

Communication settings can only be set through SolarGo APP.

NOTICE
The communication configuration interface may vary depending on the type of smart dongle connected to the inverter. Please refer to the actual interface for accurate information.

Step 1: Enter the setting page through "**Home**" > "**Settings**" > "**Communication Configuration**" > "**Network Settings**".

Step 2: Configure the WLAN or LAN network based on the actual situation.

Number	Name/Icon	Description
1	Network Name	Applicable to WLAN. Please select the corresponding network based on your actual situation and communicate the device with the router or switch.
2	Password	Applicable to WLAN. Enter the password for the network you actually selected.
3	DHCP	● When the router is using the dynamic IP mode, turn on the DHCP function. ● When using the router in static IP mode or using a switch, turn off the DHCP function.
4	IP address	● When DHCP is enabled, there is no need to configure this parameter. ● When DHCP is turned off, please configure this parameter according to the information of the router or switch.
5	Subnet mask	
6	Gateway address	
7	DNS Server	

8.4 Creating Power Plants

NOTICE
Login to the SEMS Portal app using the account and password before creating power plants. If you have any questions, refer to the Plant Monitoring section.

Step 1: Enter the interface for creating a power plant.

Step 2: Carefully read the prompts on the interface and fill in the power plant information based on actual conditions. (* refers to the mandatory items)

Step 3: Add devices according to the interface prompts to complete the creation of the power plant.

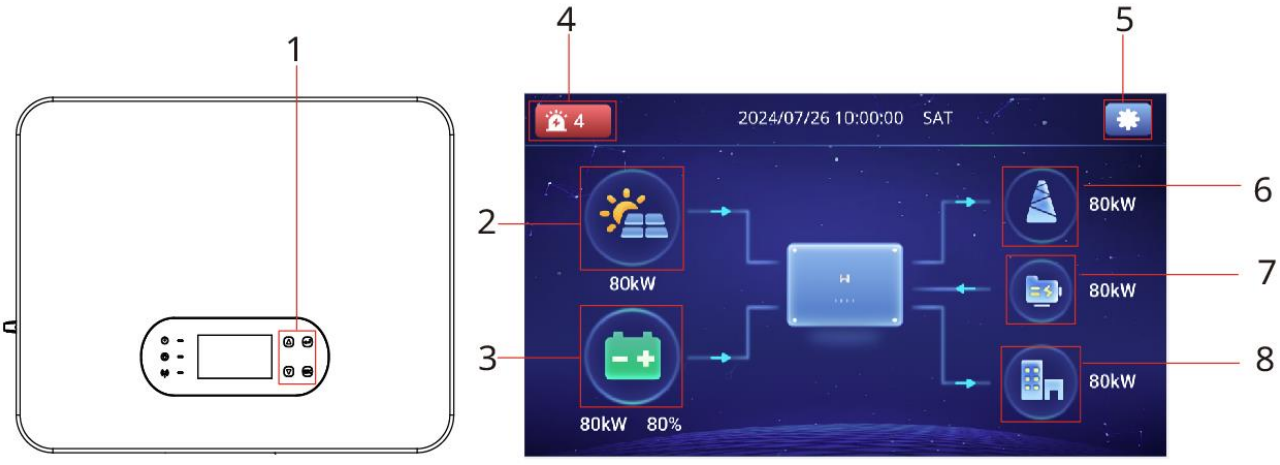


9 System Commissioning

9.1 Commissioning Method Overview

This series of inverters includes both those with LCD screens and those without screens. The inverter without LCD screen only supports setting the inverter through SolarGo APP. The inverter with LCD screen supports setting the inverter through LCD screen and SolarGo APP.

9.1.1 LCD



序号	名称/图标	说明
1		Up button.
		Down button.
		Enter button.
		Exit button.
2		Used to view information such as PV current, voltage, and power generation.
3		Used to view information such as battery model and status.
4		Used to view the alarm and fault information of the inverter.
5		Used to enter the settings interface of the inverter.
6		Used to view the status of the power grid and information.
7		Used to check the status of the generator.
8		Used to view the load information of the inverter.

9.1.2 SolarGo APP

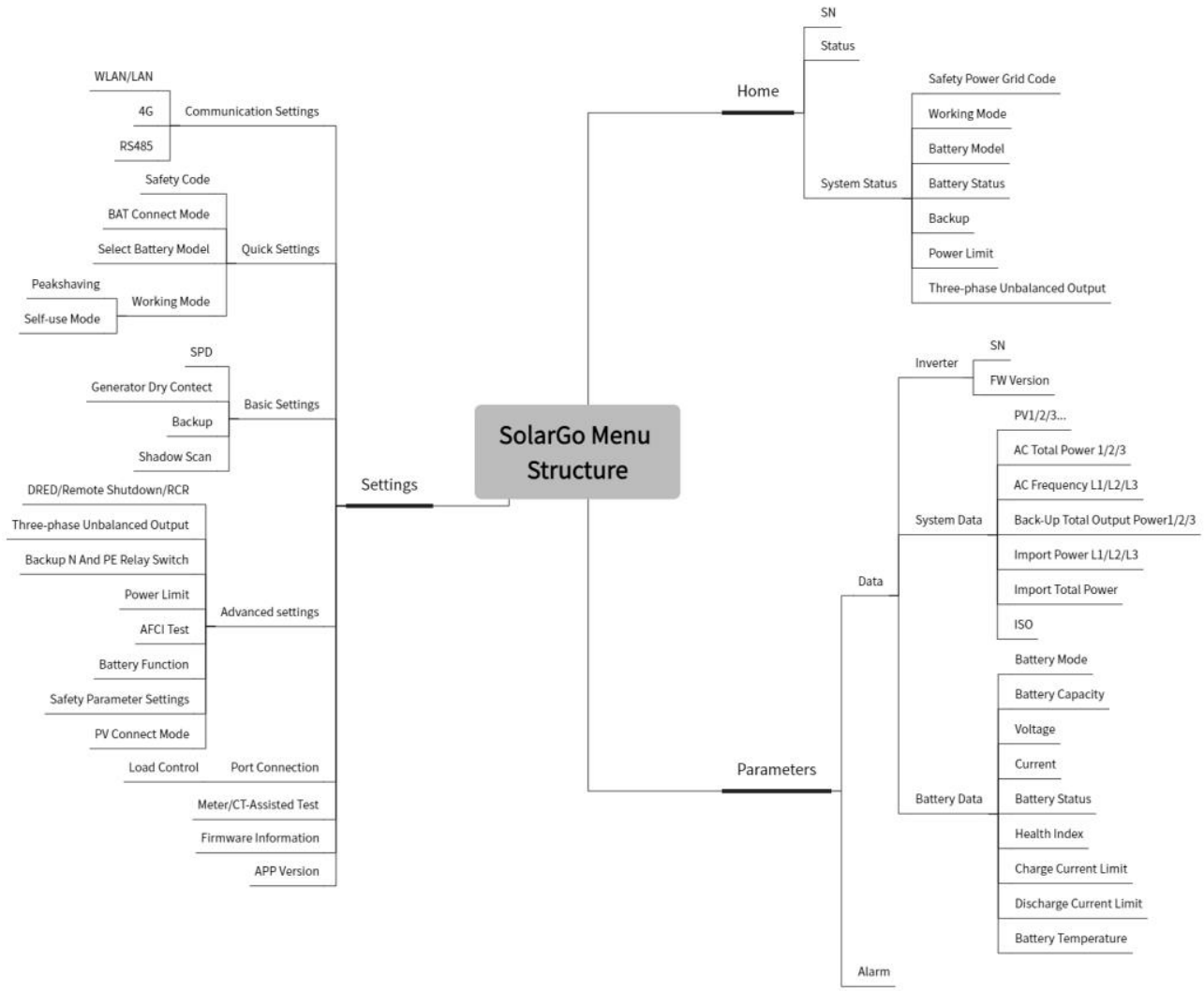
SolarGo App is a mobile application that communicates with the inverter through bluetooth or WiFi modules. Commonly used functions are as follows:

1. Check the operating data, software version, alarms, etc.
2. Set grid parameters, communication parameters, safety countries, power limitation,

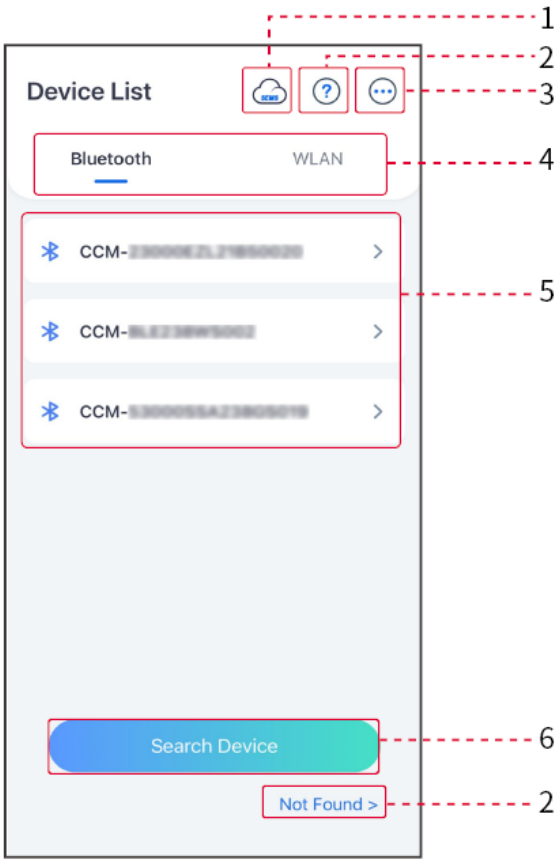
etc.

3. Equipment maintenance.
4. Upgrade the firmware version of the equipment.

9.1.2.1 App Interface Structure



9.1.2.2 Introduction to the SolarGo App Login Interface

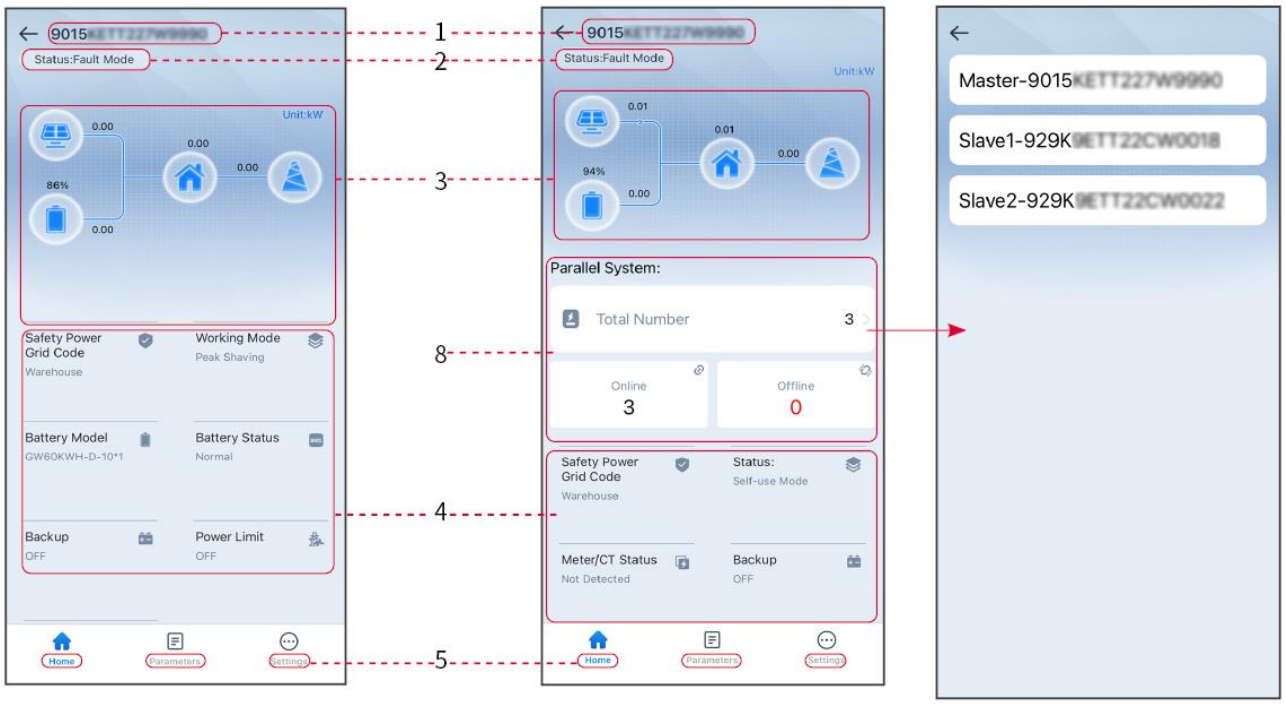


Number	Name/Icon	Description
1	SEMS	Tap the icon to open the page downloading the SEMS Portal app.
2	? Not found	Tap to read the connection guide.
3	•••	● Check information such as app version, local contacts, etc. ● Other settings, such as update date, switch language, set temperature unit, etc.
4	Bluetooth/ WiFi	Select based on actual communication method. If you have any problems, tap or NOT Found to read the connection guides.
5	Device List	● The list of all devices. The last digits of the device name are normally the serial number of the device. ● Select the device by checking the serial number of the master

		inverter when multi inverters are parallel connected. ● The device name varies depending on the inverter model or communication module.
6	Search Device	Tap Search Device if the device is not found.

9.1.2.3 Introduction to the Main Interface of SolarGo App

Single inverter and multiple inverters



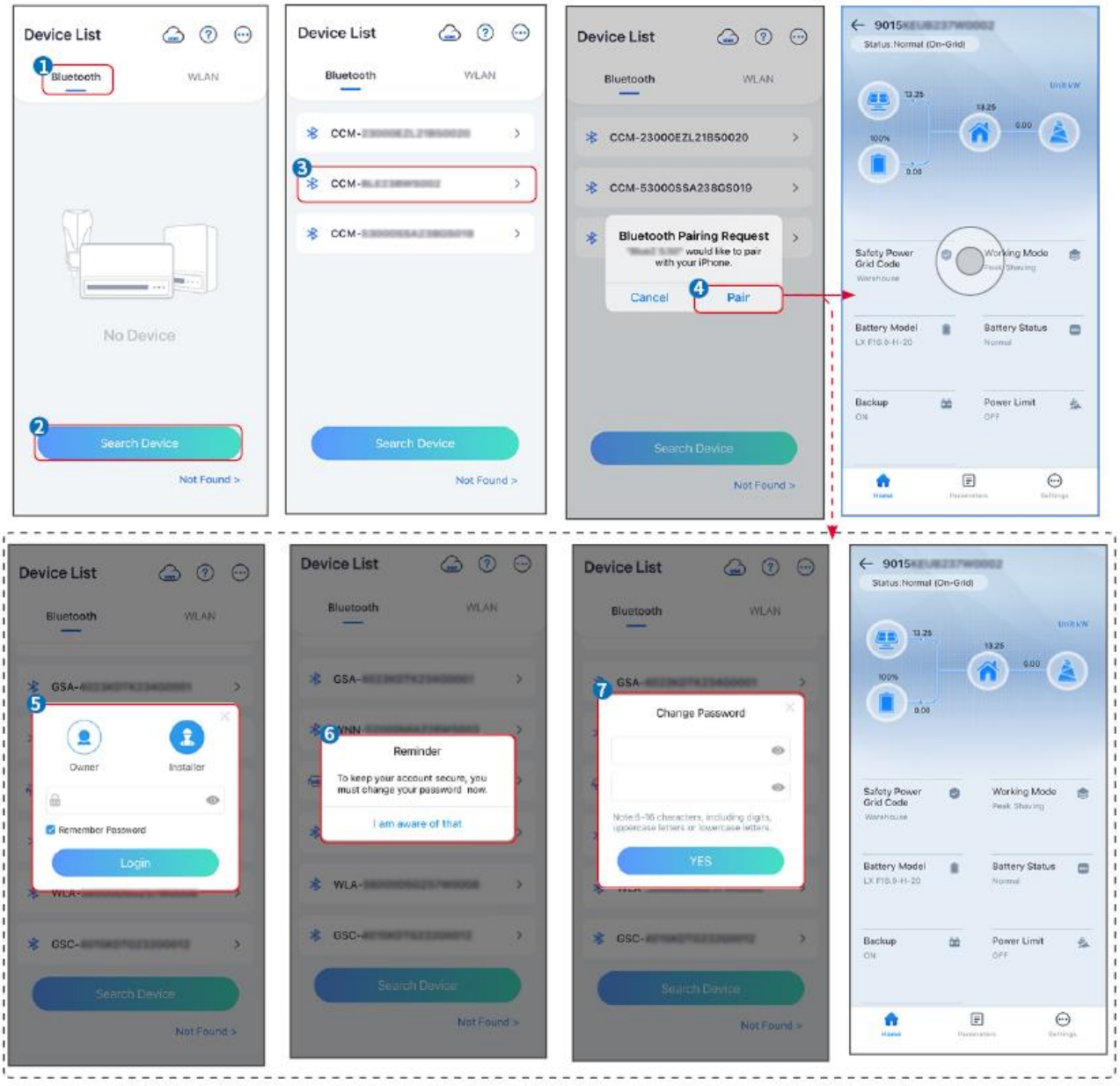
Number	Name/Icon	Description
1	Serial Number	Serial number of the connected inverter or serial number of the master inverter in the parallel system.
2	Device Status	Indicates the status of the inverter, such as Working, Fault, etc.
3	Energy Flow Chart	Indicates the energy flow chart of the PV system. The actual page prevails.
4	System Status	Indicates the system status, such as Safety Code, Working Mode, Battery Model, Battery Status, Power Limit, Three-Phase Unbalanced Output, etc.

5	 Home	Home. Tap Home to check Serial Number, Device Status, Energy Flow Chart, System Status, etc.
6		Parameters. Tap Parameters to check the running parameters of the system.
7		Settings. Log in before entering Quick Settings and Advanced Settings. Initial password: goodwe2010 or 1111.
8	Parallel	Tap Total Number to check serial number of all inverters. Tap the serial number to enter the setting page of the single inverter.

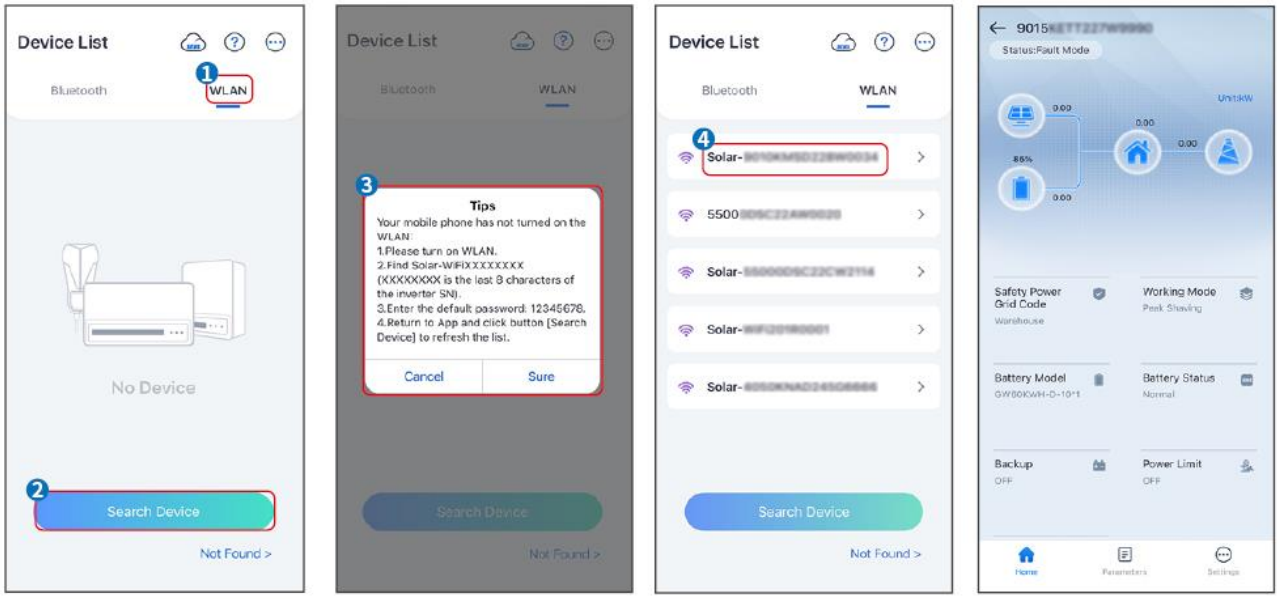
9.1.2.4 Connecting the Inverter

NOTICE
The device name varies depending on the inverter model or communication module: ● Wi-Fi Kit：Solar-WiFi*** ● Bluetooth Module: Solar-BLE*** ● WiFi/LAN Kit-20：WLA-*** ● Ezlink3000：CCM-BLE***；CCM-***；***

Connect to the inverter via Bluetooth



Connecting the inverter via WiFi

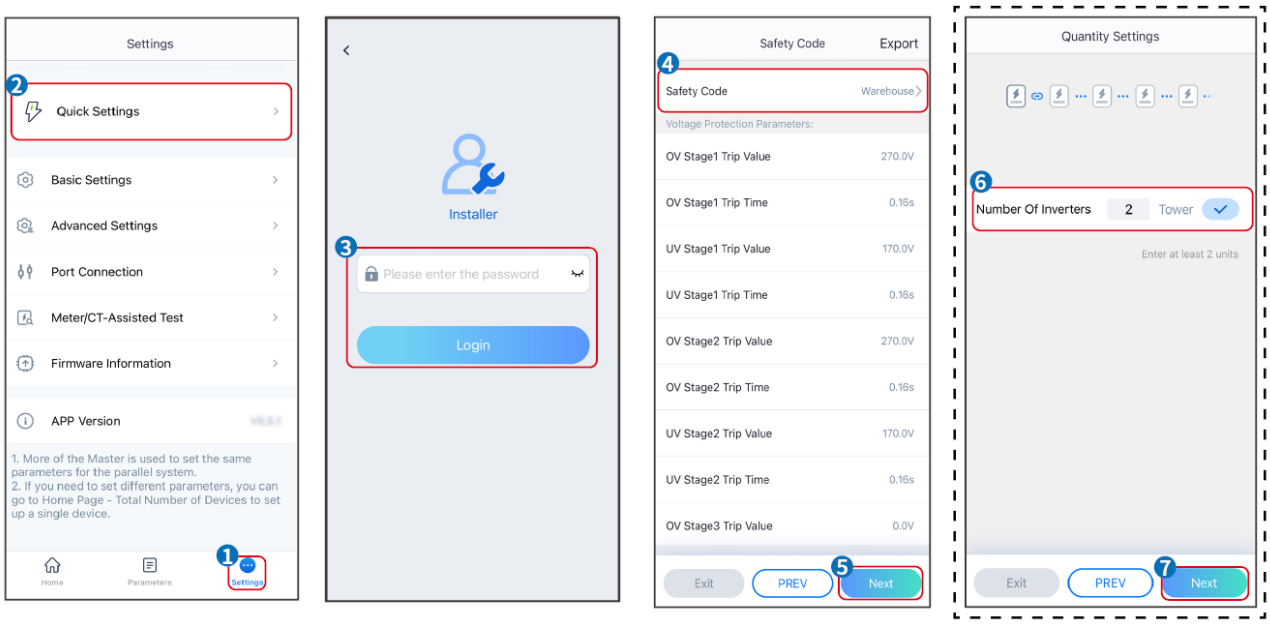


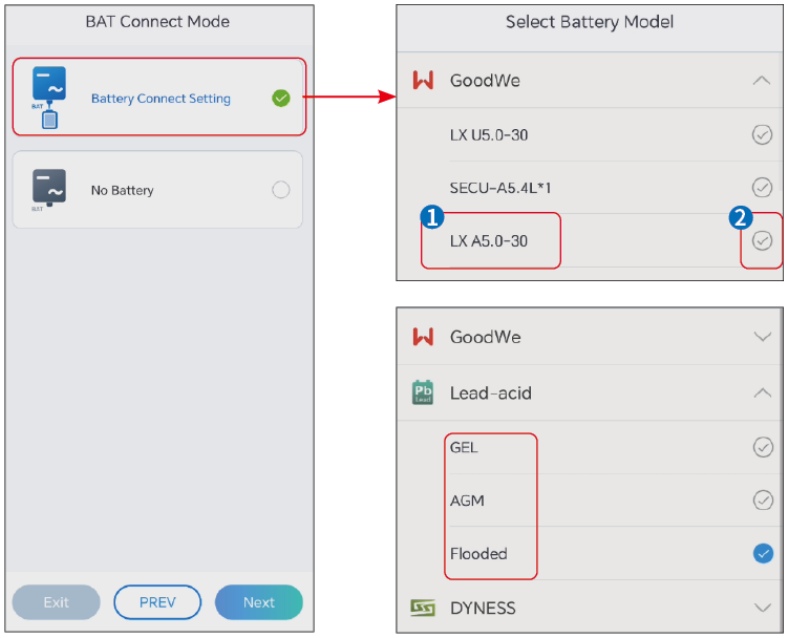
9.2 Quick Settings

9.2.1 SolarGo APP Settings

NOTICE
• When selecting the safety regulation country/region, the system will automatically configure the overvoltage and undervoltage protection, overfrequency and underfrequency protection, inverter on-grid voltage/frequency, connection slope, Cosφ curve, Q(U) curve, P(U) curve, FP curve, high and low voltage ride-through, etc. according to the safety regulation requirements of different regions. • The generation efficiency of inverter differs in different working modes. Please set according to the local actual electricity consumption.

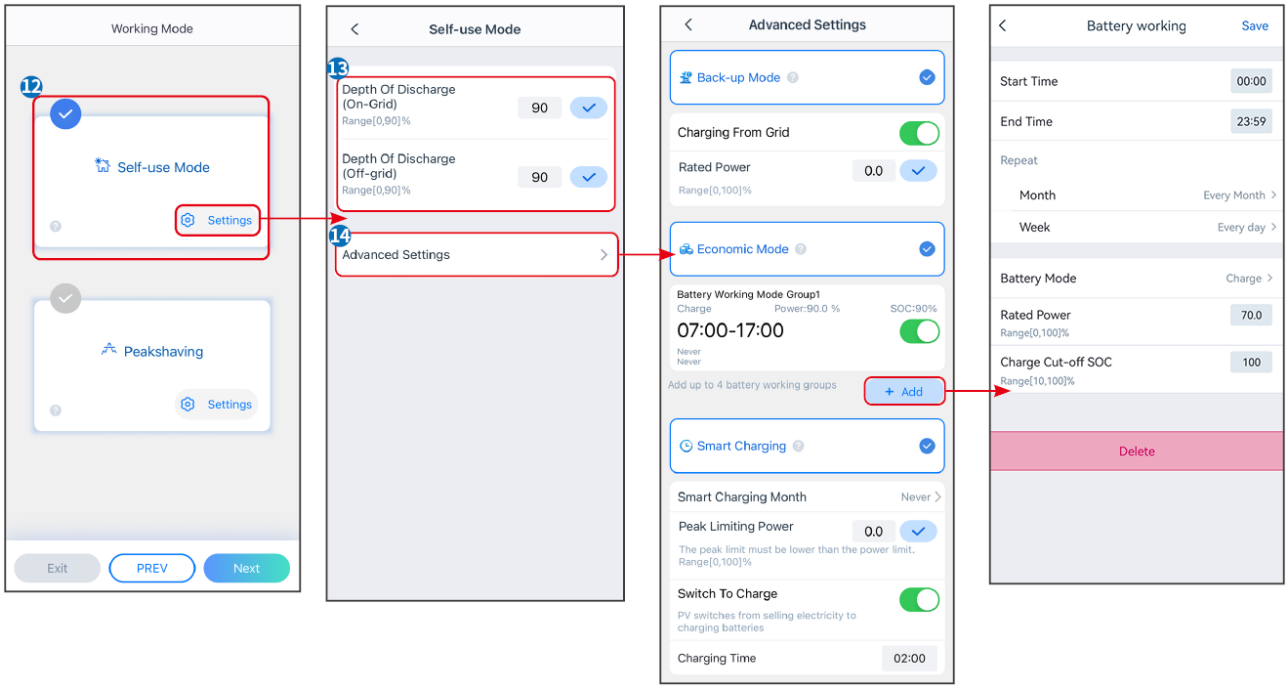
Setting safety code





Parameter	Description
Safety code	Select the corresponding safety code based on the country or region where the equipment is located.
BAT Access Mode	Select the actual mode for connecting the battery to the inverter. If there is no battery connected in the system, it is unnecessary to configure the battery model and working mode, and the equipment will operate in the self-use mode by default.
Select Battery Model	Select the actual battery model. Battery Type only supports: AGM/GEL/Wet Battery (Flooded).
Working Mode	Set the working mode of the device during operation. Supports: self-use mode and back-up mode.

When the self-use mode is selected, the interface will be displayed as follows. You need to enter the advanced mode to choose the specific working mode and set the corresponding parameter values.



Parameter	Description
Self-use mode: Based on the self-use mode, Back-up mode, Economic mode, and Smart charging can be enabled at the same time, and the inverter will automatically select the working mode. Operation priority: BACK-UP mode > Economic mode > Smart Charging mode > Self-use mode.	
Depth of discharge(on-grid)	The maximum depth of discharge of the battery when the system is working on-grid.
Depth of discharge(off-grid)	The maximum depth of discharge of the battery when the system is working off-grid.
BACK-UP Mode	
Charging From Grid	Enabling this function allows the system to purchase electricity from power grid.
Rated power	The percentage of power purchased compared to the rated power of the inverter.
TOU mode	
Start time	Within the start and end time, the battery will charge or discharge based on the set charge-discharge mode and rated power.
End time	

Charge and discharge mode	Set to charge or discharge based on actual needs.
Rated power	The percentage of power during charging or discharging compared to the rated power of the inverter.
Charge/Discharge Cut-off SOC	The battery stop charging/discharging once the battery SOC reaches Charge Cut-off SOC.

选择需量管理模式时界面如下。（需量管理模式仅支持通过 SolarGo APP 设置）

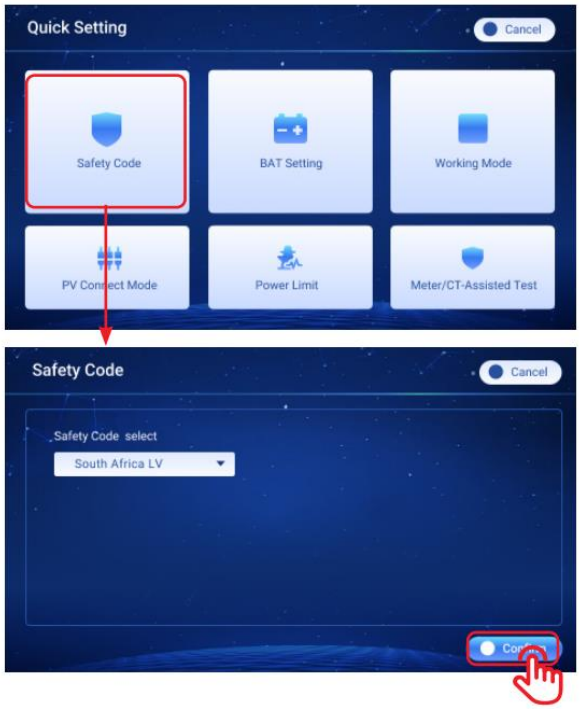


参数名称	说明
需量电费管理	
开始时间	在开启时间和结束时间之内，负载用电不超过买电配额时，可以通过电网给电池充电。时间范围外，只能利用光伏发电功率给电池充电。
结束时间	
买电峰值限制	设置允许从电网买电的最大功率限值。负载使用功率值超出光伏系统中产生的电量以及此限值之和时，由电池放电补足多余功率。
预留 SOC 用于需量管理	需量管理模式下，电池 SOC 低于预留 SOC 用于需量管理。当电池 SOC 高

	于预留 SOC 用于需量管理，需量管理功能失效。

9.2.2 LCD Settings

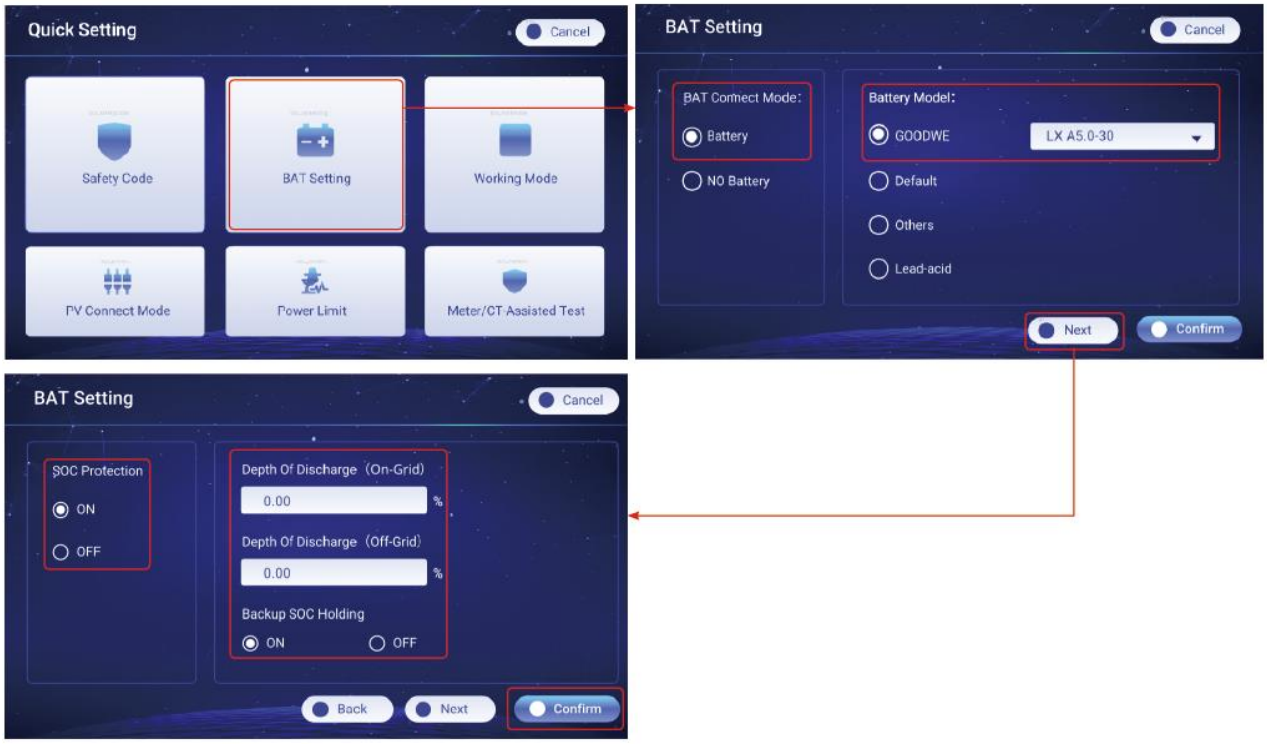
Setting Safety Code



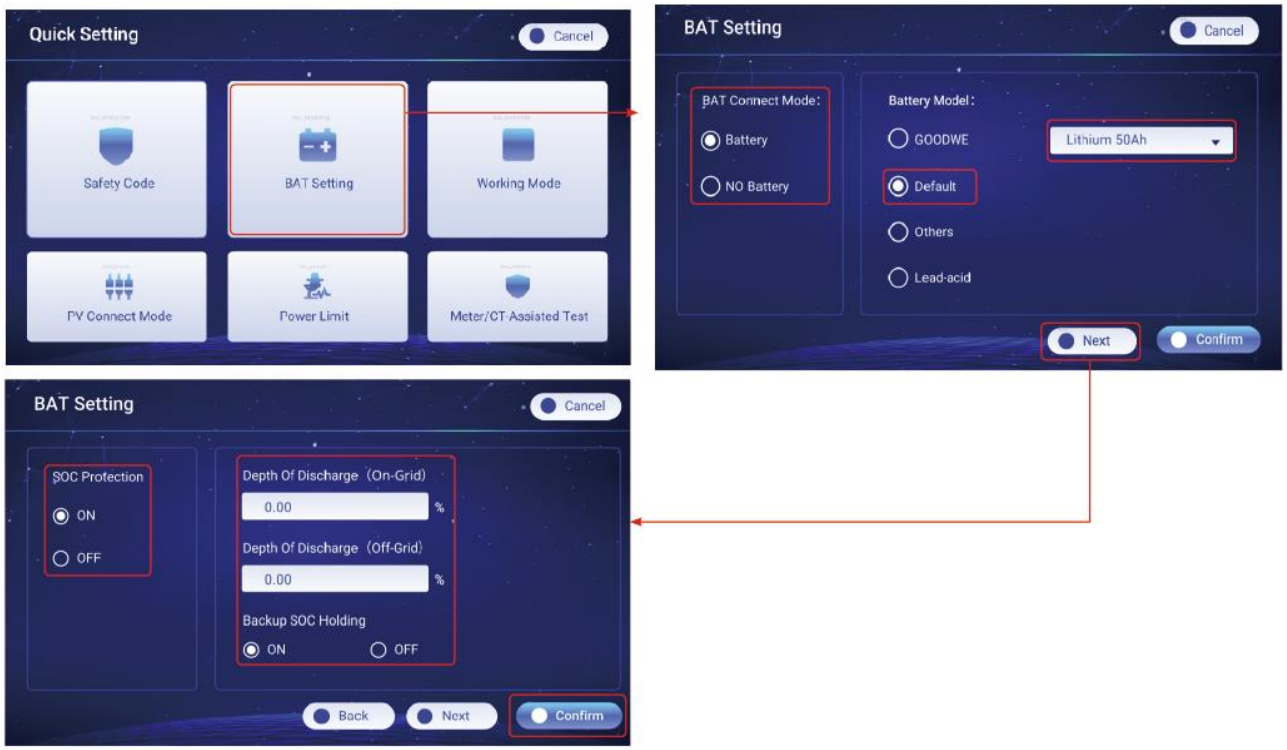
Parameter	Description
Safety Code select	Select the corresponding safety code based on the country or region.

BAT Setting

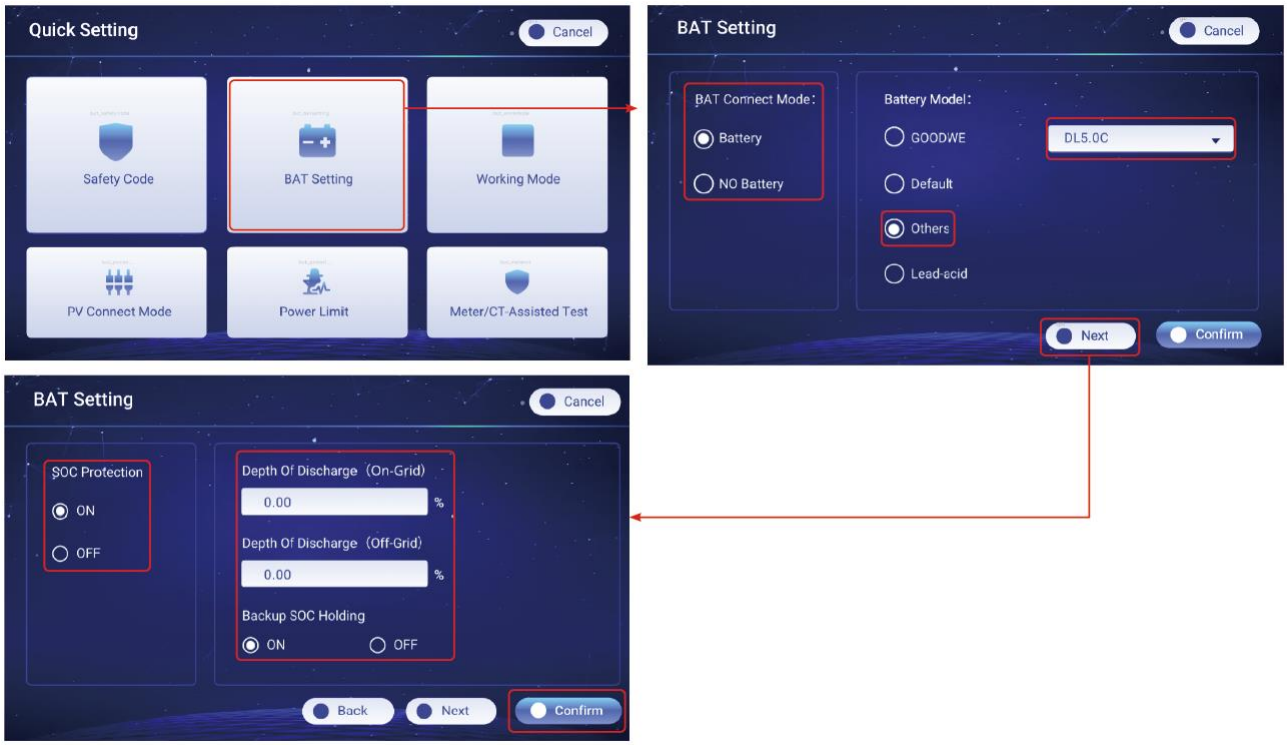
Lithium Battery (GOODWE battery)



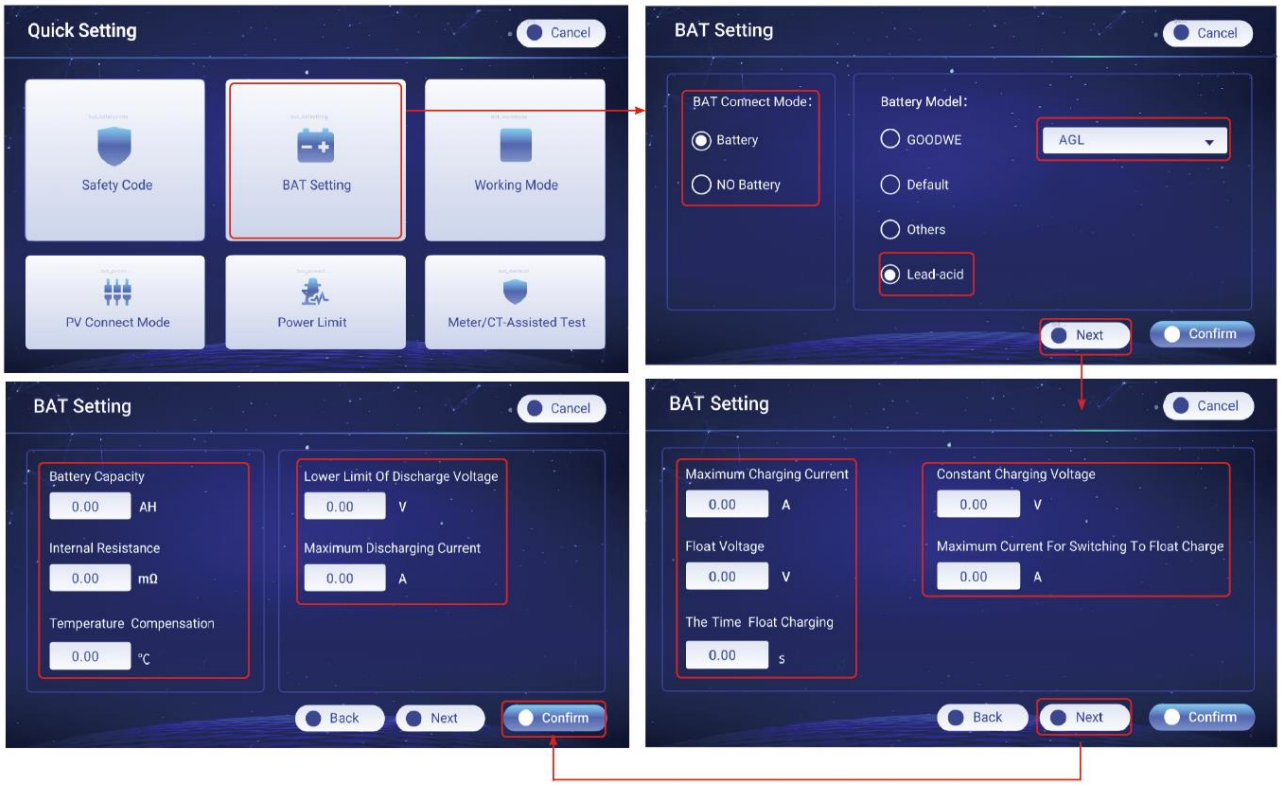
Lithium Battery (Third party lithium battery model not in the optional list)



Lithium Battery (Third party lithium battery model not in the optional list)



Lead-acid Battery



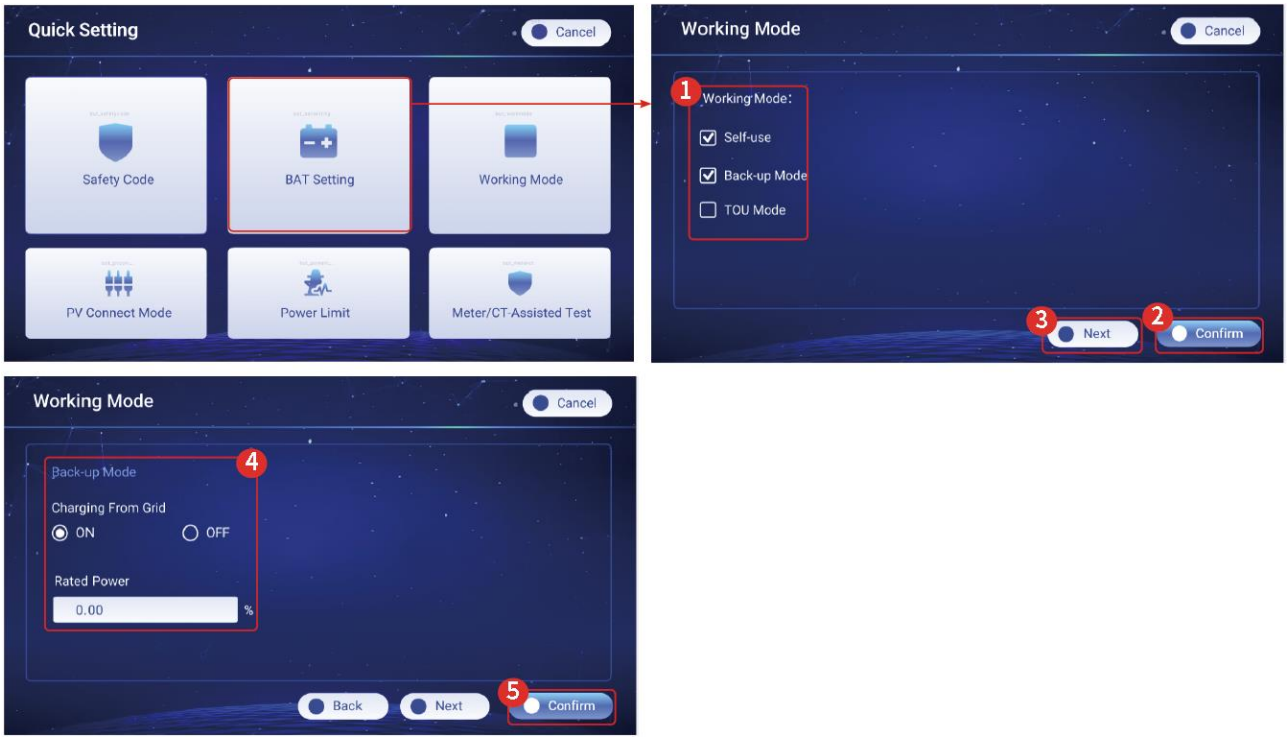
Parameter	Description
BAT General Settings	
BAT Setting	Set parameters for the battery connected to the inverter.

BAT Connect Mode	Select the actual mode for connecting the battery to the inverter. If there is no battery connected in the system, it is unnecessary to configure the battery model and working mode, and the equipment will operate in the self-use mode by default.
Battery Model	Select the actual battery model. Battery Type only supports: AGM/GEL/Wet Battery (Flooded).
Set parameters for lithium battery (GOODWE and third party battery)	
SOC Protection	Enable or disable SOC protection.
Depth Of Discharge (On-Grid)	The maximum depth of discharge of the battery when the system is working on-grid.
Depth Of Discharge (Off-Grid)	The maximum depth of discharge of the battery when the system is working off-grid.
Backup SOC Holding	The battery will be charged to preset SOC protection value by utility grid or PV when the system is running on-grid. So that the battery SOC is sufficient to maintain normal working when the system is off-grid.
Set parameters for lead-acid battery	
Battery Capacity	Please set it according to the battery technical parameters.
Internal Resistance	The internal resistance of the battery. Please set it according to the battery technical parameters.
Temperature Compensation	By default, when the temperature is higher than 25℃, the upper limit of charging voltage will decrease by 3mV for every 1℃ increase. The actual settings should be based on the technical parameter of the battery.
Lower Limit Of Discharge Voltage	Please set it according to the battery technical parameters.
Maximum Discharging Current	Please set it according to the battery technical parameters. The greater the discharge current is, the shorter the working time of the battery is.
Maximum Charging Current	The maximum current during charging, used to limit the charging current. Please set it according to the battery technical parameters.

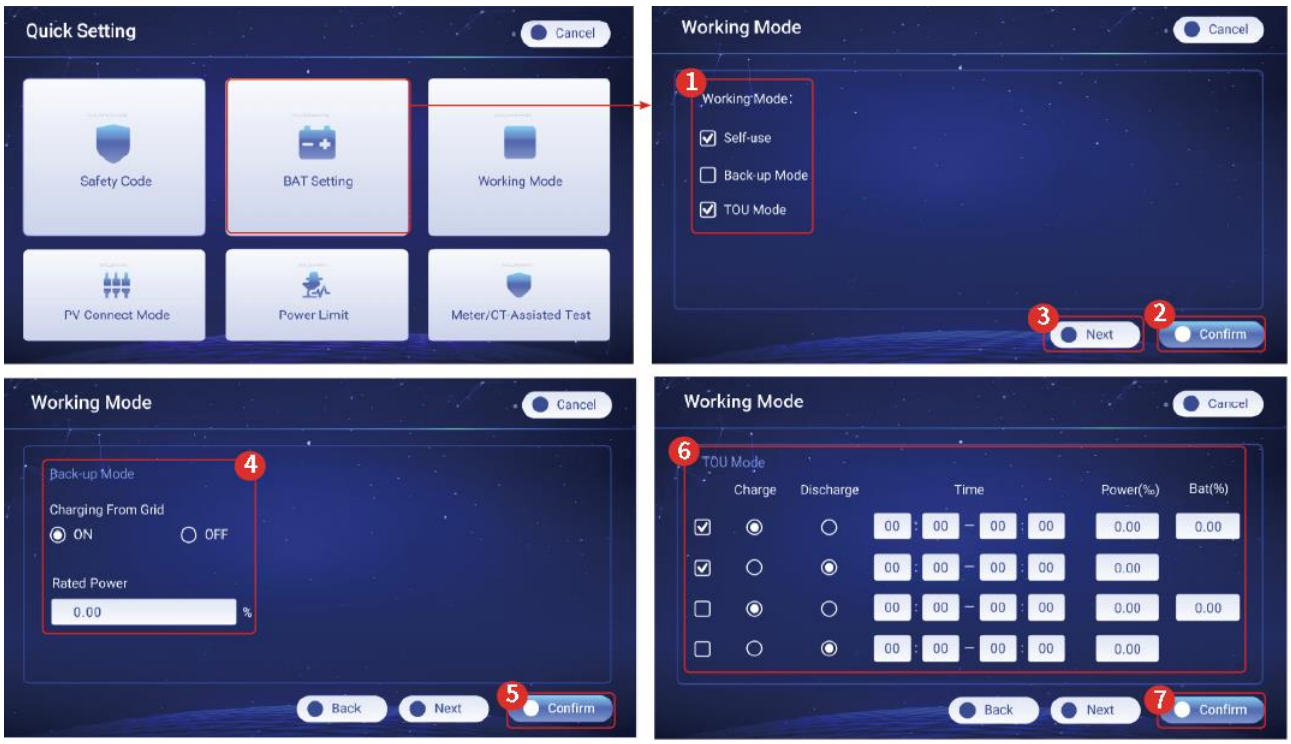
Float Voltage	When the battery is approaching full charge, it will switch to float charging mode. This value is the upper limit of charging voltage in this mode. Please set it according to the battery technical parameters.
The Time Float Charging	When the battery charging status changes from constant charging to float charging, and the duration reaches the set value, the battery charging mode will switch to float charging mode. The default duration is 180s.
Constant Charging Voltage	The battery charging mode is set to constant voltage charging by default; this value is the upper limit of charging voltage in this mode. Please set it according to the battery technical parameters.
Maximum Current For Switch To Float Charge	The maximum charging current in the floating charge state. Please set it according to the battery technical parameters. When the battery is nearly fully charged, it will enter the floating charge state. Please refer to the technical parameters of the corresponding battery model for specific definitions.

Setting Working Mode

Back-up mode



TOU Mode



Parameter	Description
Working Mode	Set the working mode according to actual needs.
Self-use Mode: Based on Self-use Mode, Back-up Mode and TOU Mode can be enabled at the same time, and the inverter will automatically select the working mode. Operation priority: Back-up Mode>TOU Mode >Self-use Mode。	
Back-up Mode	
Charging From Grid	Enabling this function allows the system to purchase electricity from power grid.
Rated Power	The percentage of power purchased compared to the rated power of the inverter.
TOU Mode	
Time	Within the start and end time, the battery will charge or discharge based on the set charge-discharge mode and rated power.
Charge/Discharge	Set to charge or discharge based on actual needs.
Power (%)	The percentage of power during charging or discharging compared to the rated power of the inverter.

Bat (%)	The battery stop charging once the battery SOC reaches Charge Cut-off SOC. To set the stop SOC for battery discharge, please refer to section **9.4.4 on setting battery parameters** and set the **Depth of Discharge (On Grid)** and **Depth of Discharge (Off Grid)** through the LCD screen.

9.3 Communication Settings

Communication settings can only be set through SolarGo APP.

NOTICE
The communication configuration interface may vary depending on the type of smart dongle connected to the inverter. Please refer to the actual interface for accurate information.

Step 1: Enter the setting page through "Home" > "Settings" > "Communication Configuration" > "Network Settings".

Step 2: Configure the WLAN or LAN network based on the actual situation.

Number	Name/Icon	Description
1	Network Name	Applicable to WLAN. Please select the corresponding network based on your actual situation and communicate the device with the router or switch.
2	Password	Applicable to WLAN. Enter the password for the network you actually selected.
3	DHCP	● When the router is using the dynamic IP mode, turn on the DHCP function. ● When using the router in static IP mode or using a switch, turn off the DHCP function.
4	IP address	● When DHCP is enabled, there is no need to configure this parameter. ● When DHCP is turned off, please configure this parameter
5	Subnet mask	
6	Gateway address	

7	DNS Server	according to the information of the router or switch.

9.4 Setting the Basic Information

9.4.1 Setting the Basic Information

9.4.1.1 Shadow Scan

This function supports settings through the SolarGo app or LCD screen.

Method I: Setting via SolarGo APP

Step 1: Tap **Home**> **Settings** > **Basic Settings**, to set the parameters.

Step 2: Set the function based on actual needs.

Number	Parameter	Description
1	Shadow Scan	Enable Shadow Scan when the PV panels are severely shadowed to optimize the power generation efficiency.

Method II: Setting via LCD

Step 1: Click on the screen or select the settings icon  >**System Setup**>**Advanced Function** through the button to enter the settings page. (Advanced Function initial password: 123456)

Step 2: Set the function based on actual needs.



Number	Parameter	Description
1	Shadow Scan	Enable Shadow Scan when the PV panels are severely shadowed to optimize the power generation efficiency.

9.4.1.2 SPD

This function supports settings through the SolarGo APP only.

Number	Parameter	Description
1	SPD	After enabling SPD, when the SPD module is abnormal, there will be SPD module abnormal alarm prompt.

9.4.1.3 Backup Function

This function supports settings through the SolarGo APP only.

After enabling Backup, the battery will power the load connected to the backup port of the inverter to ensure Uninterrupted Power Supply when the power grid fails.

Number	Parameter	Description
1	UPS Mode - Full Wave Detection	Check whether the utility grid voltage is too high or too low.
2	UPS Mode - Half Wave Detection	Check whether the utility grid voltage is too low.
3	EPS Mode - Supports LVRT	Stop detecting utility grid voltage.
4	Clear Overload History	Once the power of loads connected to the inverter BACK-UP ports exceeds the rated load

		power, the inverter will restart and detect the power again. The inverter will perform restart and detection several times until the overloading problem is solved. Tap Clear Overload History to reset the restart time interval after the power of the loads connected to the BACK-UP ports meets the requirements. The inverter will restart immediately

9.4.2 Setting Advanced Parameters

9.4.2.1 AFCI

This function supports settings through the SolarGo APP only.

Step 1: Tap **Home > Settings > Advanced Settings** to set the parameters.

Step 2: Set the parameters based on actual needs. Tap ‘√’ or Save to save the settings. The parameters are set successfully.

Number	Parameter		Description
1	AFCI Test	AFCI Test	Enable or disable AFCI accordingly.
		AFCI Test Status	The test status, like Not Self-checking, self-check succeeded, etc.
		Clear AFCI Alarm	Clear ARC Faulty alarm records.
		Self-check	Tap to check whether the AFCI function works normally.

9.4.2.2 PV Access Mode

This function supports settings through the SolarGo app or LCD screen.

Method I: Setting via SolarGo APP

Step 1: Tap **Home > Settings > Advanced Settings** to set the parameters.

Step 2: Set the parameters based on actual needs. Tap ‘√’ or Save to save the settings.

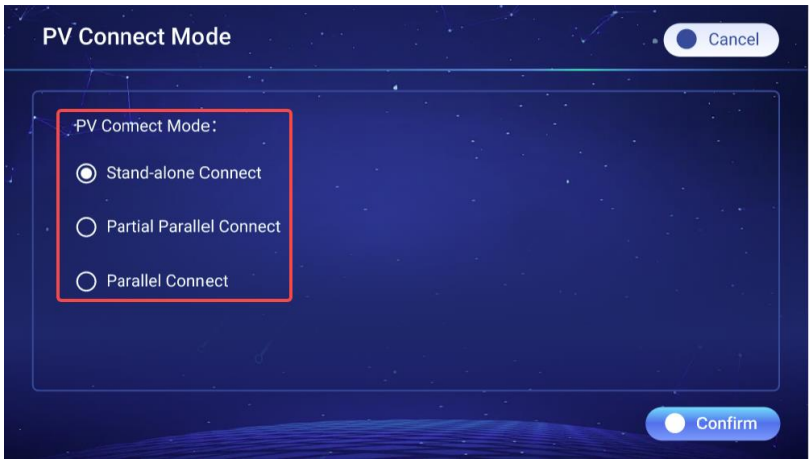
The parameters are set successfully.

Number	Parameter		Description
1	PV Access Mode	Stand-alone Connect	The PV strings are connected to the MPPT terminals one by one.
		Partial Parallel Connect	The PV strings are connected to the inverter in both stand-alone and parallel connection. For example, one PV string connect to MPPT1 and MPPT2, another PV string connect to MPPT3.
		Parallel Connect	The external PV string is connected to multi MPPT terminals of the inverter.

Method II: Setting via LCD

Step 1: Click on the screen or select the settings icon  >**System Setup**>**Quick Setting**>**PV Connect Mode** through the button to enter the settings page.

Step 2: Set up functions according to actual needs.



Number	Parameter		Description
1	PV Connect Mode	Stand-alone Connect	The PV strings are connected to the MPPT terminals one by one.
		Partial Parallel Connect	The PV strings are connected to the inverter in both stand-alone and parallel connection.

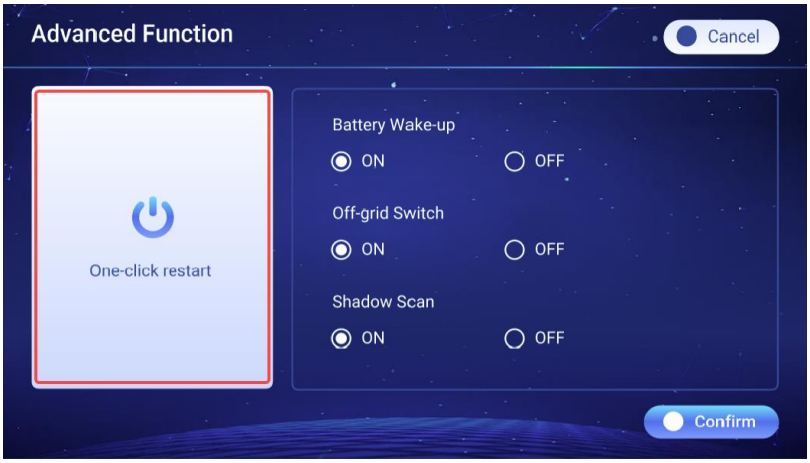
			For example, one PV string connect to MPPT1 and MPPT2, another PV string connect to MPPT3.
		Parallel Connect	The external PV string is connected to multi MPPT terminals of the inverter.

9.4.2.3 One-click Restart

This function supports settings through the LCD screen only.

Step 1: Click on the screen or select the settings icon  >**System Setup**>**Advanced Function** through the button to enter the settings page. (**Advanced Function** initial password: 123456)

Step 2: Set the function based on actual needs.



Number	Parameter	Description
1	One-click restart	By using this function, the inverter can be quickly restarted.

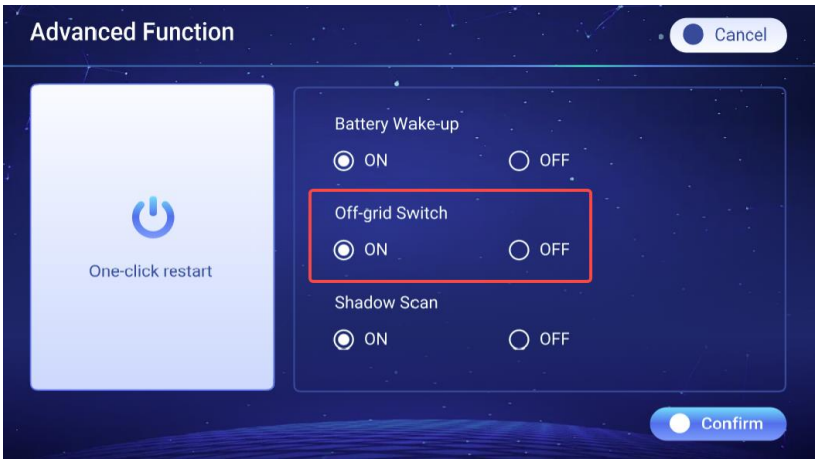
9.4.2.4 Off-grid Switch

For the inverter without LCD screen, the off-grid switch on the side of the inverter can be used directly to turn on or off the off-grid function.

For the inverter with LCD screen, off-grid switch can only be controlled through LCD screens.

Step 1: Click on the screen or select the settings icon >**System Setup**>**Advanced Function** through the button to enter the settings page. (**Advanced Function** initial password: 123456)

Step 2: Set the function based on actual needs.



Number	Parameter	Description
1	Off-grid Switch	In off-grid mode, the switch controls the on/off of the inverter's off-grid function. In on-grid mode, this function does not take effect. The switch is initially in the ON state, and the off-grid function is enabled. After the inverter is powered on, the inverter has the off-grid output ability. In the off-grid state, turning off and then turning on the off-grid switch, the off-grid overload time can be cleared and the off-grid output can be restarted.

9.4.3 Setting Power Limit Parameters

This function supports settings through the SolarGo app or LCD screen.

Method I: Setting via SolarGo APP

Step 1 Tap **Home** > **Settings**> **Advanced Settings** > **Power Limit** to set the parameters.

Step 2: Enable or disable the power limit function based on actual needs.

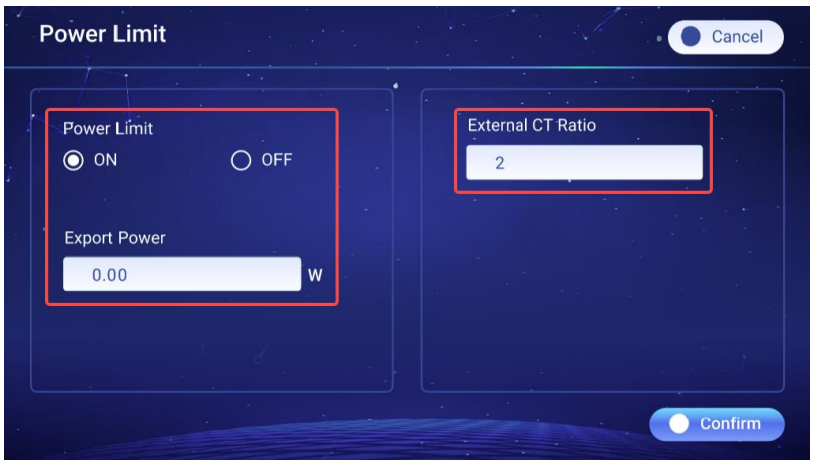
Step 3: Enter the parameters and tap √. The parameters are set successfully.

Number	Parameter	Description
1	Power Limit	Enable Power Limit when power limiting is required by local grid standards and requirements.
2	Export Power	Set the value based on the actual maximum power feed into the utility grid.
3	External CT Ratio	Set the ratio of the primary current to the secondary current of the external CT.

Method II: Setting via LCD

Step 1: Click on the screen or select the settings icon  >**System Setup**>**Quick Setting**>**Power Limit** through the button to enter the settings page.

Step 2: Set up the function according to actual needs.



Number	Parameter	Description
1	Power Limit	Enable Power Limit when power limiting is required by local grid standards and requirements.
2	Export Power	Set the value based on the actual maximum power feed into the utility grid.
3	External CT Ratio	Set the ratio of the primary current to the

		secondary current of the external CT. ● Built in electric meter or GMK110: No need to set CT ratio. The default CT ratio is 120A/40mA. ● GM330: Supports purchasing from GOODWE or third-party, CT ratio requirement: nA/5A ➢ nA: For the primary input current of CT, n ranges from 200 to 5000. ➢ 5A：Secondary output current of CT.

9.4.4 Setting the Battery Parameters

9.4.4.1 Setting Lithium Ion Battery Parameters

This function supports settings through the SolarGo app or LCD screen.

Method I: Setting via SolarGo APP

Step 1: Enter the parameter setting interface through **Home > Settings > Advanced Settings > Battery Function Settings**.

Step 2: Enter the parameters and tap √. The parameters are set successfully.

Number	Parameter	Description
1	Max. Charging Current	Set the maximum charging current based on actual needs.
2	Max. Discharging Current	Set the maximum discharging current based on actual needs.
3	SOC Protection	Start battery protection when the battery capacity is lower than the Depth of Discharge.
4	Depth of discharge(on-grid)	Indicates the depth of discharge of the battery when the inverter is on-grid or off-grid.
5	Depth of discharge(off-grid)	
6	Backup SOC Holding	The battery will be charged to preset SOC protection

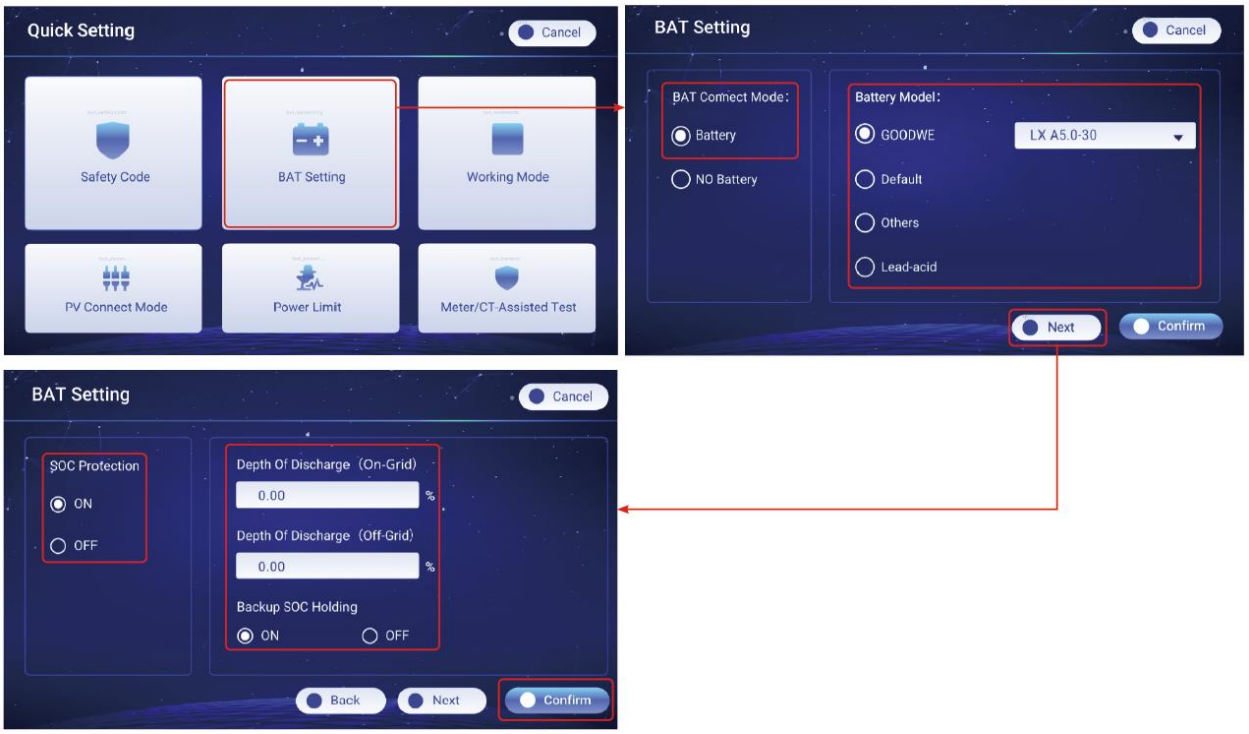
		value by utility grid or PV when the system is running on-grid. So that the battery SOC is sufficient to maintain normal working when the system is off-grid.
7	Immediate Charging	Enable to charge the battery by the grid immediately. Take effect once. Enable or Disable based on actual needs.
8	SOC For Stopping Charging	Stop charging the battery once the battery SOC reaches SOC For Stopping Charging.
9	Immediate Charging Power	Indicates the percentage of the charging power to the inverter rated power when enabling Immediate Charging. For example, setting the Immediate Charging Power of a 10kW inverter to 60 means the charging power of the inverter is 10kW*60%=6kW.

Method II: Setting via LCD

Setting SOC Protection, Depth of discharge (On-grid), Depth of discharge (Off-grid), Backup SOC Holding

Step 1: Click on the screen or select the settings icon  > **Quick Setting** > **BAT Setting**>**GOODWE/Default/Others** through the button, select the model from the optional list, and enter the settings page.

Step 2: Set parameters according to actual needs.

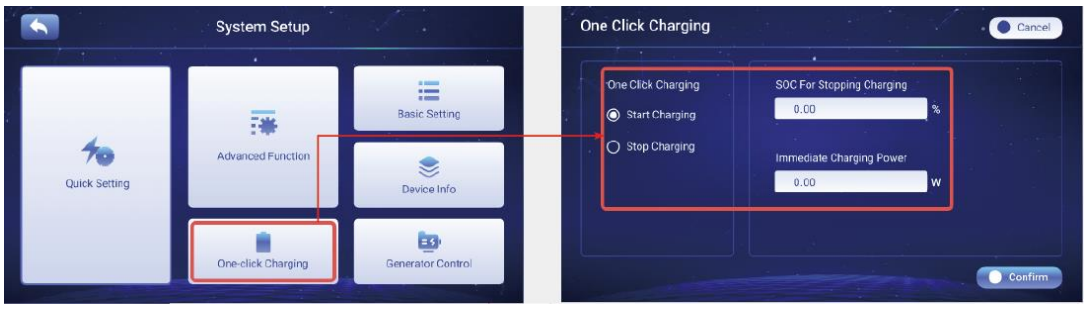


Number	Parameter	Description
1	SOC Protection	Start battery protection when the battery capacity is lower than the Depth of Discharge.
2	Depth of Discharge (On-Grid)	Indicates the depth of discharge of the battery when the inverter is on-grid or off-grid.
3	Depth of Discharge (Off-Grid)	
4	Backup SOC Holding	The battery will be charged to preset SOC protection value by utility grid or PV when the system is running on-grid. So that the battery SOC is sufficient to maintain normal working when the system is off-grid.

Setting One Click Charging, SOC for Stopping Charging, Immediate Charging Power

Step 1: Click on the screen or select the settings icon  >**System Setup**>**One Click Charging**, through the button to enter the settings page.

Step 2: Set up functions according to actual needs.

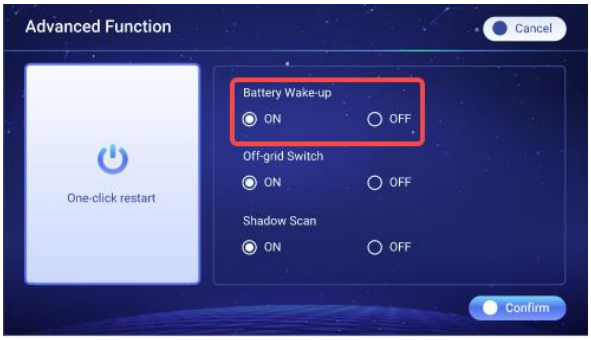


Number	Parameter	Description
1	One Click Charging	After the function is enabled, the battery is immediately charged by the power grid. Only effective once. Please choose to start or stop according to actual needs.
2	SOC For Stopping Charging	Stop charging the battery once the battery SOC reaches SOC For Stopping Charging.
3	Immediate Charging Power	Indicates the percentage of the charging power to the inverter rated power when enabling Immediate Charging. For example, setting the Immediate Charging Power of a 10kW inverter to 60 means the charging power of the inverter is 10kW*60%=6kW.

Setting Battery Wake-up

Step 1: Click on the screen or select the settings icon  >**System Setup**>**Advanced Function** through the button to enter the settings page. (Advanced Function initial password: 123456)

Step 2: Set the function based on actual needs.



Number	Parameter	Description

1	Battery Wake-up	After the function is enabled, the battery can be awakened when it shuts down due to under-voltage protection. Only applicable to lithium batteries without circuit breakers. After being enabled, the output voltage of the battery port is around 60V.

9.4.4.2 Setting Lead-acid Battery Parameters

NOTICE
1. Before setting the parameters of lead-acid batteries, it is necessary to read the user manual, technical parameters and other related materials of lead-acid batteries. To ensure the safety of batteries, please strictly follow the relevant materials of lead-acid battery manufacturers to set the battery parameters. Otherwise, the risks caused thereby shall not be within the scope of the responsibility of the inverter manufacturer. 2. The voltage range of lead-acid batteries needs to match the inverter, and the recommended voltage of lead-acid batteries connected to the inverter is ≤60V, otherwise the inverter may not operate properly. 3. The SOC of lead-acid batteries is calculated by the inverter BMS, not the actual battery capacity, which may result in SOC value deviation or jump. SOC is only used as a reference for battery capacity. Performing SOC value calibration after the battery is fully charged can improve the accuracy of the SOC value.

This function supports settings through the SolarGo app or LCD screen.

Method I: Setting via SolarGo APP

Step 1: Enter the parameter settings interface through **Home > Settings > Advanced Settings > Battery Function**.

Step 2: Enter the parameters and tap √. The parameters are set successfully.

Number	Parameter	Description
1	Battery Capacity	Please set it according to the battery technical parameters.
2	Floating Voltage	When the battery is approaching full charge, it will switch to float charging mode. This value is the upper limit of charging voltage in this mode.

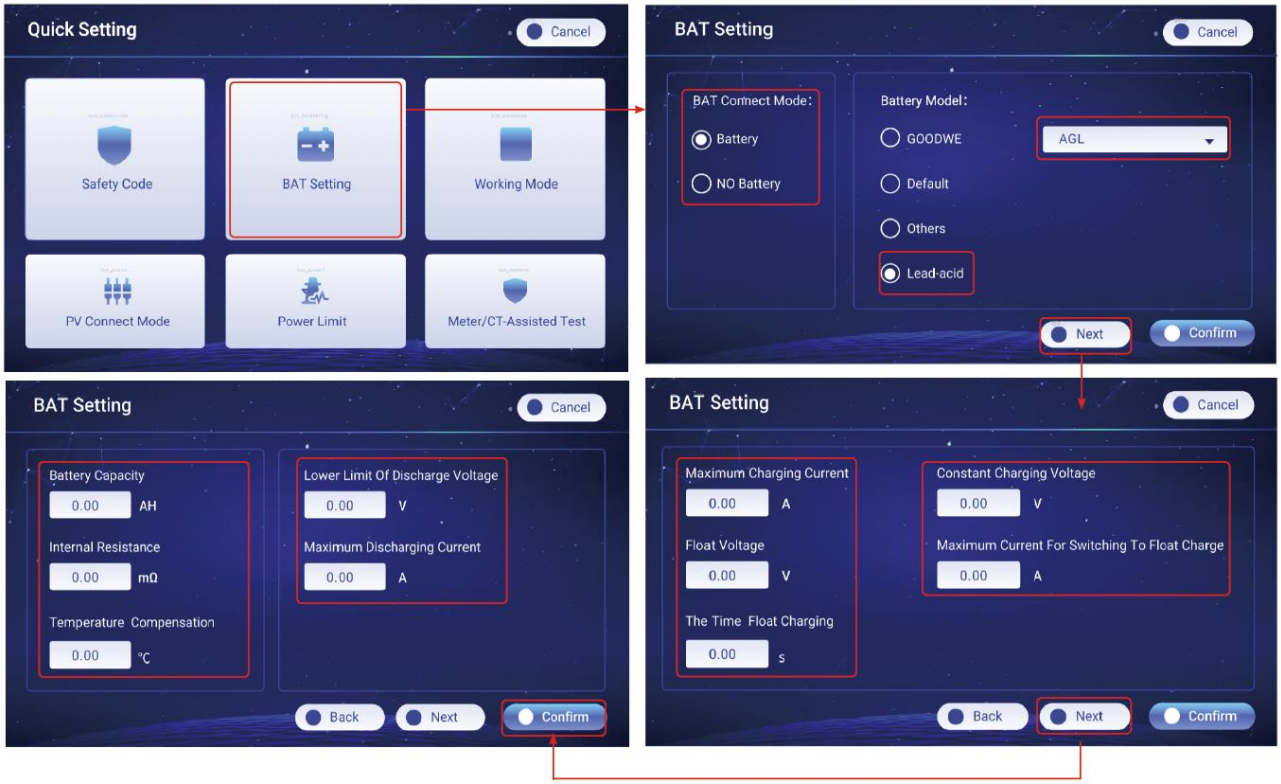
		Please set it according to the battery technical parameters.
3	Constant Charging Voltage	The battery charging mode is set to constant voltage charging by default; this value is the upper limit of charging voltage in this mode. Please set it according to the battery technical parameters.
4	Minimum discharge voltage	Please set it according to the battery technical parameters. To protect the battery performance and life, this parameter should not be set too low.
5	Max. Charging Current	The maximum current during charging, used to limit the charging current. Please set it according to the battery technical parameters.
6	Max. Discharging Current	Please set it according to the battery technical parameters. The greater the discharge current is, the shorter the working time of the battery is.
7	Maximum floating charge current	The maximum charging current in the floating charge state. Please set it according to the battery technical parameters. When the battery is nearly fully charged, it will enter the floating charge state. Please refer to the technical parameters of the corresponding battery model for specific definitions.
8	Battery Internal Resistance	The internal resistance of the battery. Please set it according to the battery technical parameters.
9	Time to switch to float charging mode	When the battery charging status changes from constant charging to float charging, and the duration reaches the set value, the battery charging mode will switch to float charging mode. The default duration is 180s.
10	Charge temperature compensation	By default, when the temperature is higher than 25℃, the upper limit of charging voltage will decrease by 3mV for every 1℃ increase. The actual settings should be based on the technical

		parameter of the battery.

Method II: Setting via LCD

Step 1: Click on the screen or select the settings icon > **Quick Setting** > **BAT Setting**>**Lead-acid** through the button, select the model from the optional list, and enter the settings page.

Step 2: Set parameters according to actual needs.



Number	Parameter	Description
1	Battery Capacity	Please set it according to the battery technical parameters.
2	Internal Resistance	The internal resistance of the battery. Please set it according to the battery technical parameters.
3	Temperature Compensation	By default, when the temperature is higher than 25℃, the upper limit of charging voltage will decrease by 3mV for every 1℃ increase. The actual settings should be based on the technical parameter of the battery.
4	Lower Limit Of Discharge Voltage	Please set it according to the battery technical parameters.

5	Maximum Discharging Current	Please set it according to the battery technical parameters. The greater the discharge current is, the shorter the working time of the battery is.
6	Maximum Charging Current	The maximum current during charging, used to limit the charging current. Please set it according to the battery technical parameters.
7	Float Voltage	When the battery is approaching full charge, it will switch to float charging mode. This value is the upper limit of charging voltage in this mode. Please set it according to the battery technical parameters.
8	The Time Float Charging	When the battery charging status changes from constant charging to float charging, and the duration reaches the set value, the battery charging mode will switch to float charging mode. The default duration is 180s.
9	Constant Charging Voltage	The battery charging mode is set to constant voltage charging by default; this value is the upper limit of charging voltage in this mode. Please set it according to the battery technical parameters.
10	Maximum Current For Switching To Float Charge	The maximum charging current in the floating charge state. Please set it according to the battery technical parameters. When the battery is nearly fully charged, it will enter the floating charge state. Please refer to the technical parameters of the corresponding battery model for specific definitions.

9.4.5 Setting Generator Parameters

This function supports settings through the SolarGo app or LCD screen.

Method I: Setting via SolarGo APP

Step 1: After connecting to the SolarGo APP, go to **Home > Settings > Port Connection > Generator Connection**. After selecting the generator type, enter the parameter setting

interface.

Step 2: Enter the parameters and tap √. The parameters are set successfully.

Manual control generator (Does not support dry contact connection): This type of generator only supports manual start and stop.

Automatic control generator (Supporting dry contact connection): This type of generator supports automatic start and stop.

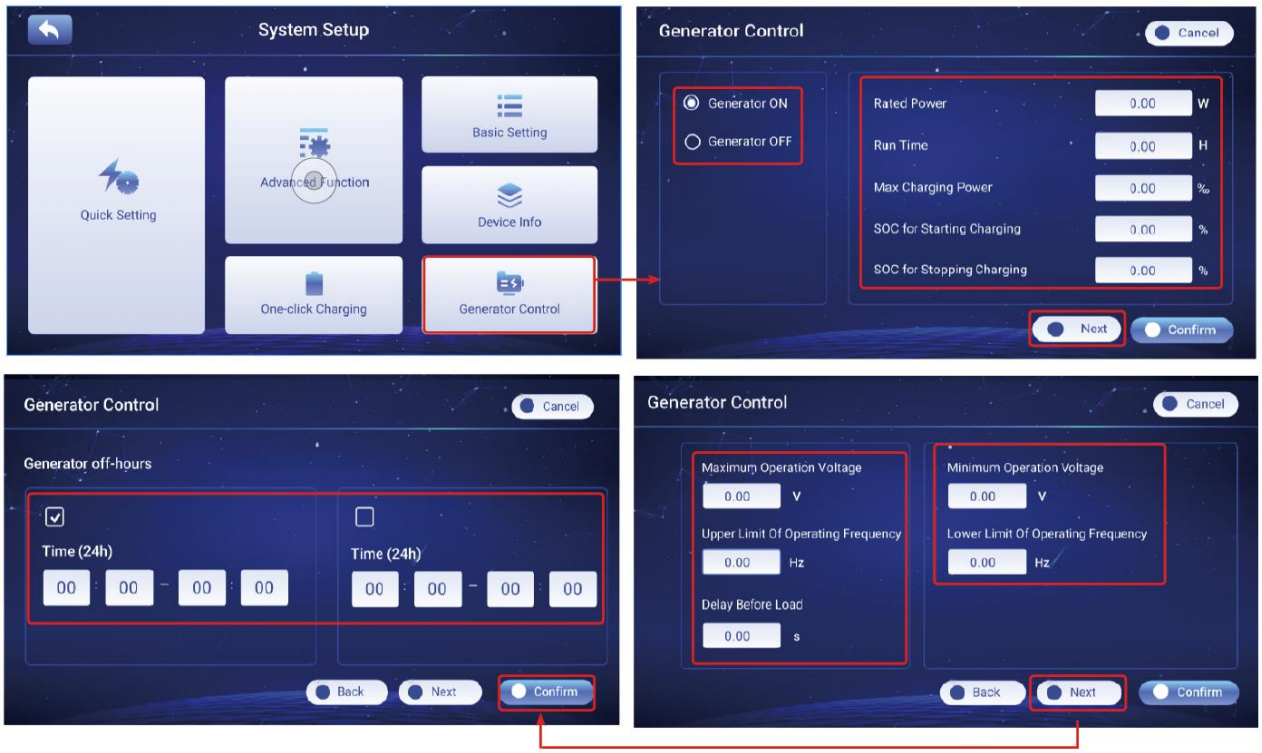
Number	Parameter	Description
1	Dry contact control mode	Set the switch control mode and automatic control mode. In the switch control mode, the start and stop of the generator can be remotely controlled. In automatic control mode, the generator automatically starts and stops based on preset parameters. This feature only applies to generators that support dry contact connection.
2	No working time	Set a prohibited working time. During this period, the generator will stop working. This feature only applies to generators that support dry contact connection.
3	Rated power	Rated power of the generator.
4	Running time	The duration of continuous operation of a generator. When the working time exceeds the set value, the generator will automatically shut down. This feature only applies to generators that support dry contact connection.
5	Upper Voltage	Set the upper limit of operating frequency for the generator.
6	Lower Voltage	The time mode will be on between the Start Time and End Time. Set the upper limit of operating frequency for the generator.
7	Upper frequency	Set the upper limit of operating frequency for the

	limit	generator.
8	Lower Frequency	Set the lower limit of the generator's operating frequency.
9	Preheating time	The no-load preheating time before the generator is loaded.
10	Switch	Turn on or off the function of the generator to charge the battery.
11	Maximum charging power	Set the maximum charge power for the generator battery.
12	starting voltage	Set the start voltage for generator to charge battery. When the voltage of the battery is lower than the set value, the generator will charge the battery.
13	stop voltage	Set the stop voltage for generator to charge battery. When the voltage of the battery is higher than the set value, the generator will stop charging the battery.

Method II: Setting via LCD

Step 1: Click on the screen or select the settings icon  > **System Setup** > **Generator Control** through the button to enter the settings page.

Step 2: Set up the function according to actual needs.



Number	Parameter	Description
1	Generator ON/OFF	Controls the start and stop of the generator. Only applicable to generators that support dry contact.
2	Rated power	Rated power of the generator.
3	Run time	The duration of continuous operation of a generator. When the working time exceeds the set value, the generator will automatically shut down. This feature only applies to generators that support dry contact connection.
4	Max Charging Power	Set the maximum charge power for the generator battery.
5	SOC for Starting Charging	Set the starting SOC for the generator to charge the battery. When the SOC of the battery is lower than the set value, the generator will charge the battery.
6	SOC for Stopping Charging	Set the stopping SOC for the generator stopping charging the battery. When the SOC of the battery reaches the set value, the generator will stop charging the battery.

7	Maximum Operation Voltage	Set the upper limit of operating voltage for the generator.
8	Minimum Operation Voltage	Set the lower limit of operating voltage for the generator.
9	Upper Limit Of Operating Frequency	Set the upper limit of operating frequency for the generator.
10	Lower Limit Of Operating Frequency	Set the lower limit of operating frequency for the generator.
11	Delay Before Load	The no-load preheating time before the generator is loaded.

9.4.6 Setting Load Control

This function supports settings through the SolarGo APP only.

Step 1: After connecting to the SolarGo APP, enter the parameter setting interface through **Home > Settings > Port Connection > Load Control**.

Step 2: Enter the parameters and tap √. The parameters are set successfully.

Number	Parameter	Description
1	Dry Contact Mode	The loads will be powered within the setting time period. when the switch is ON, the loads will be powered; when the switch is OFF, the power will be cut off. Turn the switch on or off based on actual needs.
2	Time Mode	set the time to enable the load, and the load will be powered automatically within the setting time period.
3	SOC mode	the inverter has an integrated relay controlling port, which can control the loads off or on. In off-grid mode, the load connected to the port will not be powered if the BACKUP overload is detected or the battery SOC value is lower than the Off-grid battery protection value.

9.5 Setting Safety Parameters

This function supports settings through the SolarGo APP only.

9.5.1 Setting the Basic Safety Parameters

NOTICE
The grid standards of some countries/regions require that inverters shall set functions to meet local requirements.

Step 1: Tap **Home > Settings > Advanced Settings**, to set the parameters.

Number	Parameter	Description
1	DRED/Remote Shutdown/RCR	Enable DRED/Remote Shutdown/RCR before connecting the third party DRED, remote shutdown, or RCR device to comply with local laws and regulations.
2	Three-phase Unbalanced Output	Enable Three-phase Unbalanced Output when the utility grid company adopts phase separate billing.
3	Backup N and PE Relay Switch	To comply with local laws and regulations, ensure that the relay inside the back-up port remains closed and the N and PE wires are connected when the inverter is working off-grid.
4	Auto Test	Enable AUTO TEST to set auto test for grid tying in compliance with local grid standards and requirements.

9.5.2 Setting Customized Safety Parameters

NOTICE
Set the custom safety parameters in compliance with local requirements. Do not

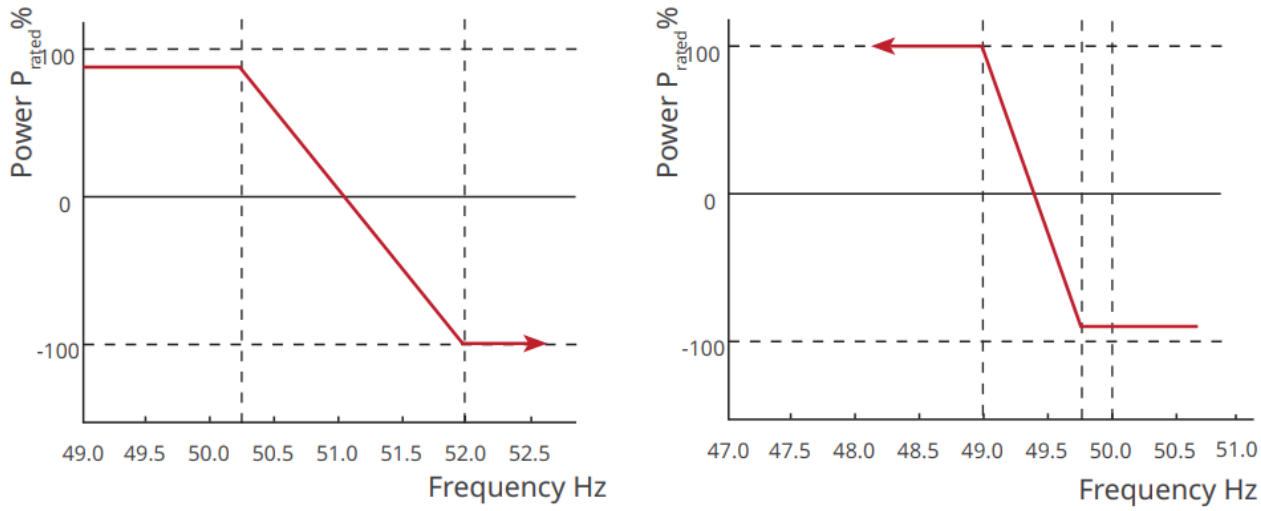
change the parameters without the prior consent of the grid company.

9.5.2.1 Setting the Active Power Mode

Setting the P(F) Curve

Step 1: Tap **Home > Settings > Advanced Settings > Safety Parameters > Active Power Mode Settings** to set the parameters.

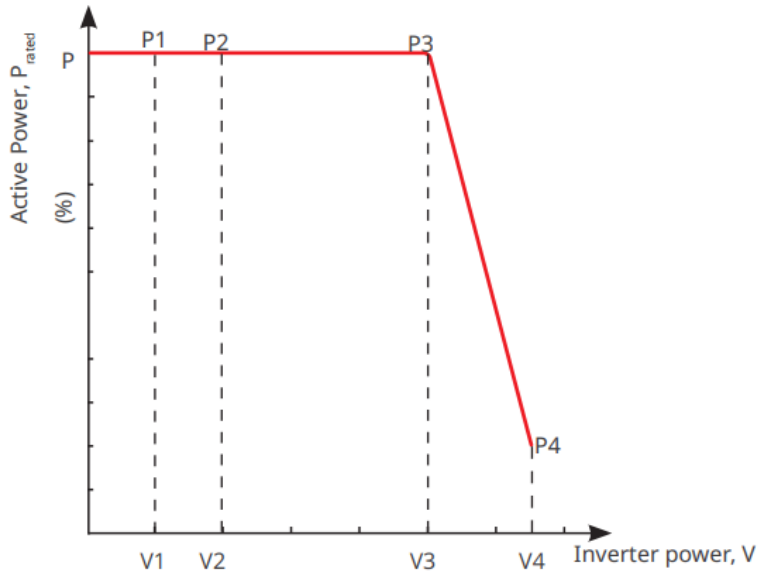
Step 2: Set the parameters based on actual needs.



Setting the P(U) Curve

Step 1: Tap **Home > Settings > Advanced Settings > Safety Parameters > Active Power Mode Settings** to set the parameters.

Step 2: Enter the parameters. The inverter will adjust the active output power to the apparent power ratio in real-time according to the actual grid voltage to the rated voltage ratio.



9.6.2.2 Setting the Reactive Power Mode

Setting the Fix PF

Step 1: Tap **Home > Settings > Advanced Settings > Safety Parameter Settings > Reactive Power Mode** to set the parameters.

Step 2: Set the parameter based on actual needs. The power factor remains fixed during the inverter working process.

Number	Parameter	Description
1	Fix PF	Enable Fix PF when it is required by local grid standards and requirements.
2	Under-excited	Set the power factor as lagging or leading based on actual needs and local grid standards and requirements.
3	Over excitation	
4	Power Factor	Set the power factor based on actual needs. Range: 0-~-0.8, or +0.8~+1.

Setting the Fix Q

Step 1: Tap **Home > Settings > Advanced Settings > Safety Parameter Settings > Reactive Power Mode** to set the parameters.

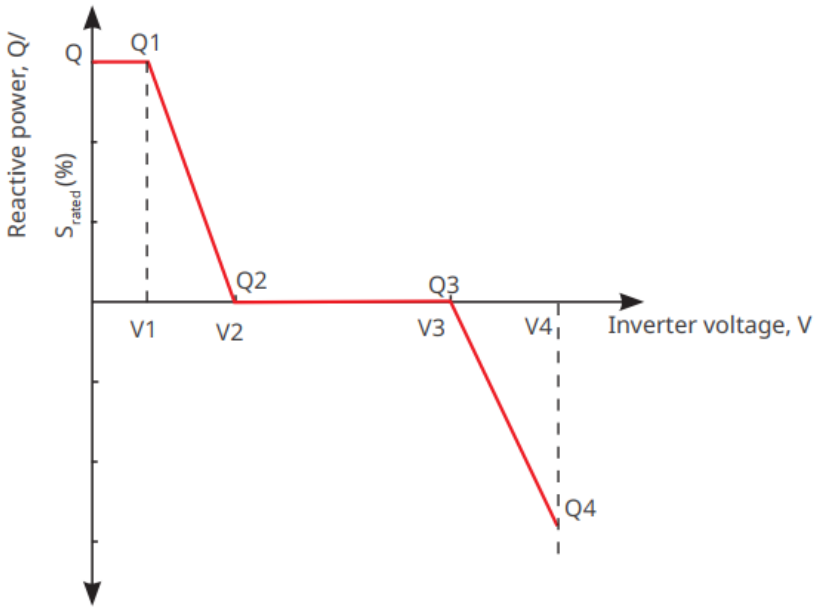
Step 2: Set the parameter based on actual needs. The output reactive power remains fixed during the inverter working process.

Number	Parameter	Description
1	Fix Q	Enable Fix Q when it is required by local grid standards and requirements.
2	Under-excited	Set the reactive power as inductive or capacitive reactive power based on actual needs and local grid standards and requirements.
3	Over excitation	
4	Power Factor	The percentage of reactive output power to apparent power.

Setting the Q(U) Curve

Step 1: Tap **Home > Settings > Advanced Settings > Safety Parameter Settings > Reactive Power Mode** to set the parameters.

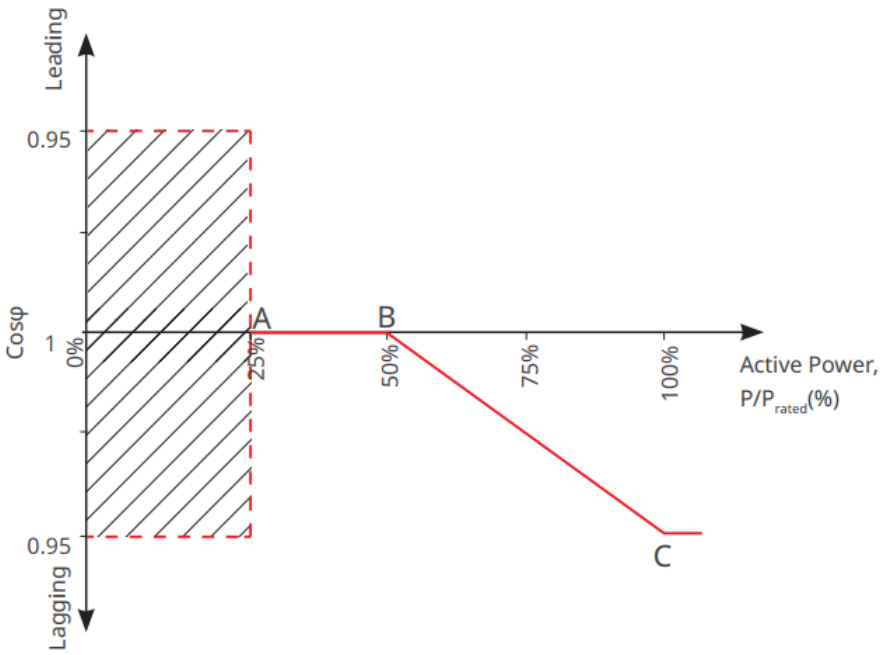
Step 2: Enter the parameters. The inverter will adjust the reactive power to the apparent power ratio in real-time according to the actual grid voltage to the rated voltage ratio.



Setting the Cosφ Curve

Step 1: Tap **Home > Settings > Advanced Settings > Safety Parameter Settings > Reactive Power Mode** to set the parameters.

Step 2: Enter the parameters. The inverter will adjust the active output power to the apparent power ratio in real-time according to the actual grid voltage to the rated voltage ratio.



Setting Protection Parameters

Step 1: Tap **Home > Settings > Advanced Settings > Safety Parameters > Protection Parameters** to set the parameters.

Step 2: Set the parameters based on actual needs.

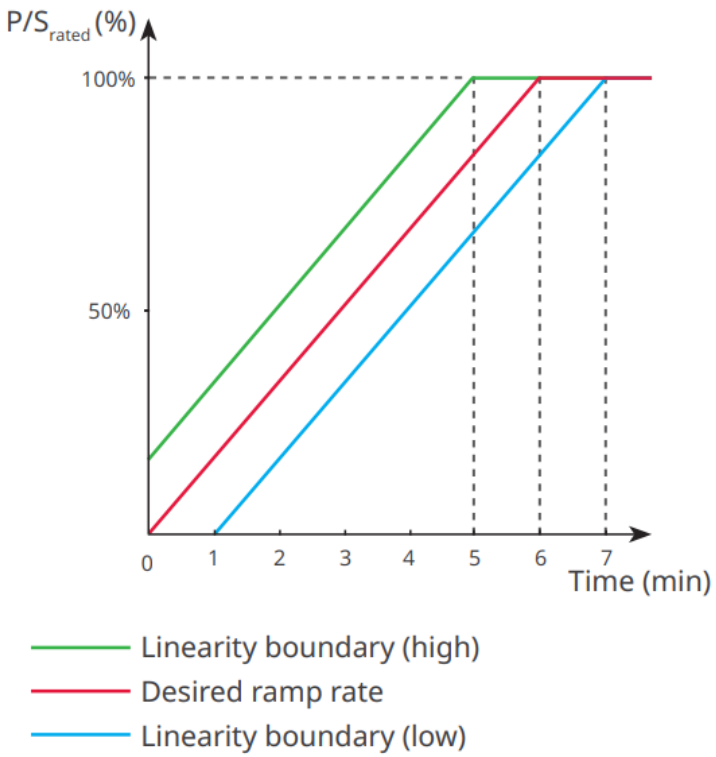
Number	Parameter	Description
Voltage Protection Parameters		
1	OV Stage n Trip Value	Set the grid overvoltage protection threshold value, n = 1, 2, 3.
2	OV Stage n Trip Time	Set the grid overvoltage protection tripping time, n = 1, 2, 3.
3	UV Stage n Trip Value	Set the grid undervoltage protection threshold value, n= 1, 2, 3.
4	UV Stage n Trip Time	Set the grid undervoltage protection tripping time, n = 1, 2, 3.
5	Grid 10min Overvoltage	Set the 10min overvoltage protection threshold value.
Frequency Protection Parameters		

6	OF Stage n Trip Value	Set the grid overfrequency protection threshold value, n = 1, 2.
7	OF Stage n Trip Time	Set the grid overfrequency protection tripping time, n = 1, 2.
8	UF Stage n Trip Value	Set the grid underfrequency protection threshold value, n = 1, 2.
9	UF Stage n Trip Time	Set the grid underfrequency protection tripping time, n = 1, 2.

Setting Connection Parameters

Step 1: Tap **Home > Settings > Advanced Settings > Safety Parameters > Protection Parameters** to set the parameters.

Step 2: Set the parameters based on actual needs.



Setting Voltage Ride through Parameters

Step 1: Enter the parameter setting page through **Home > Settings > Advanced Settings > Safety Parameter Settings > Voltage Fault Ride-Through**.

Step 2: Set the parameters based on actual needs.

Number	Parameter	Description
LVRT		
1	Ride Through Voltage Start Point	The inverter will not be disconnected from the utility grid immediately when the grid voltage is between Ride Through Voltage Start Point and Ride Through Voltage End Point.
2	Ride Through Voltage End Point	
3	Ride Through Time Start Point	Indicates the longest duration the inverter can remain connected to the grid when the grid voltage is at the Ride Through Voltage Start Point.
4	Ride Through Time End Point	Indicates the longest duration the inverter can remain connected to the grid when the grid voltage is at the Ride Through Voltage End Point.
5	Ride Through Trip Threshold	LVRT is allowed when the grid voltage is lower than Ride Through Trip Threshold
HVRT		
6	Ride Through Voltage Start Point	The inverter will not be disconnected from the utility grid immediately when the grid voltage is between Ride Through Voltage Start Point and Ride Through Voltage End Point.
7	Ride Through Voltage End Point	
8	Ride Through Time Start Point	Indicates the longest duration the inverter can remain connected to the grid when the grid voltage is at the Ride Through Voltage Start Point.
9	Ride Through Time End Point	Indicates the longest duration the inverter can remain connected to the grid when the grid voltage is at the Ride Through Voltage End Point.
10	Ride Through Trip Threshold	HVRT is allowed when the grid voltage is higher than Ride Through Trip Threshold

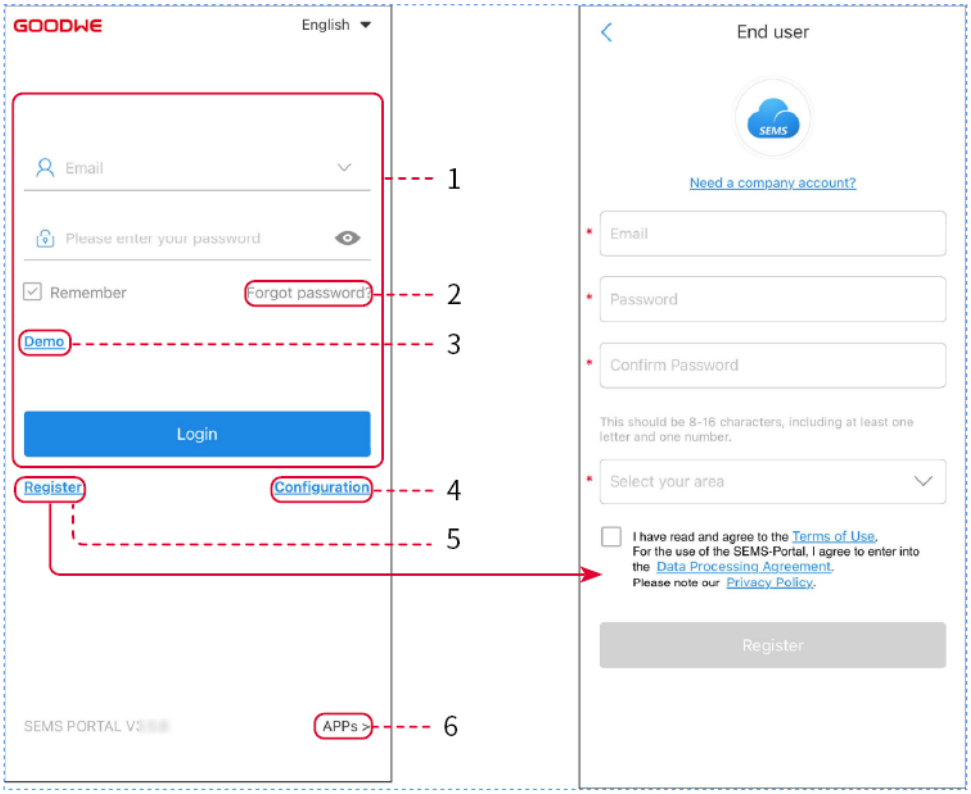
10 Monitoring Power Plant

10.1 SEMS Portal Overview

SEMS Portal App is a monitoring platform. Commonly used functions are as follows:

1. Manage the organization or User information;
2. Add and monitor the power plant information;
3. Equipment maintenance.

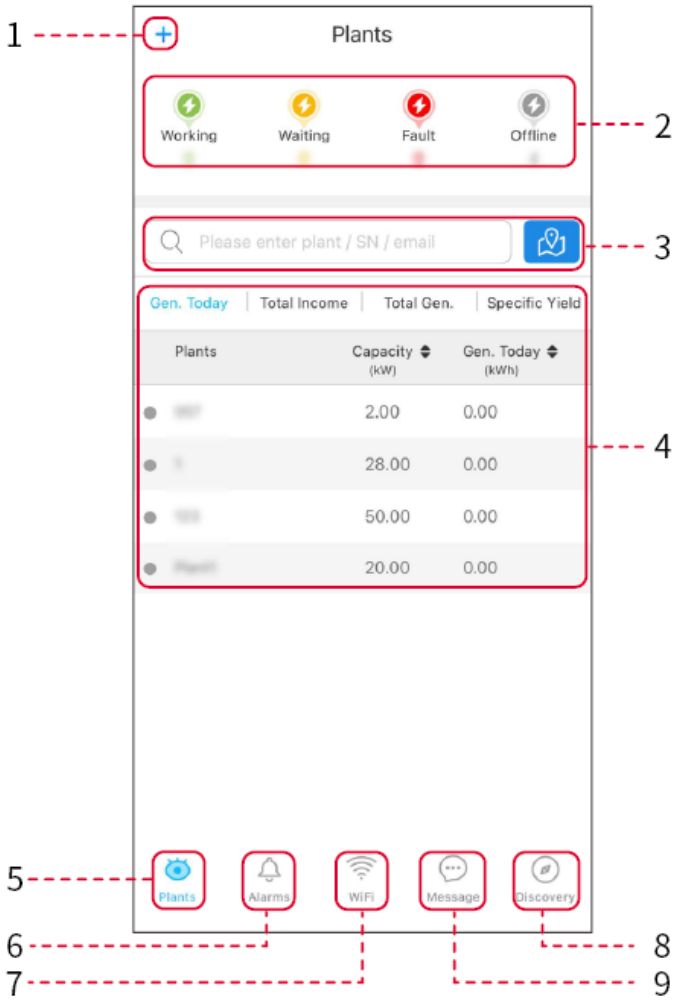
Login Page of SEMS Portal App



Number	Name	Description
1	Login Area	Enter the user name, password to login to the app.
2	Forget Password	Tap to reset the password by verifying the account.
3	Register	Tap to register an end-user account. Contact the manufacturer or the company as prompted if you need a company account.

4	APPs	Tap to download SolarGo app.
5	Configuration	Configure WiFi parameters to establish communication between the inverter and the server and realize remote monitoring and managing.
6	Power plant for demonstration	Click to enter the power plant for demonstration interface, where the content displayed is based on the account permissions of the viewer. The page is for reference only.

Introduction to the Home Page Interface of SEMS Portal App



Number	Name	Description
1	+	Create power plant.
2	Power plant	Display the current operating status of the power plant.

	operation status	
3	Search for power plant	Search for power stations by selecting their name, equipment SN number, email, or on the map.
4	Power generation statistics	Click to switch between today, this month, total generated power and cumulative earnings.
5	 Plants	Home of power plant monitoring.
6	 Alarms	Alarms Check all alarms, happening alarms, and recovered alarms.
7	 WiFi	When using Wi Fi Kit on the device, this button can be used to set up WiFi related settings.
8	 Message	Message Set and check system messages.
9	 Discovery	Discovery To **Edit** the account, create My QR Code, set **Income Settings**, etc.

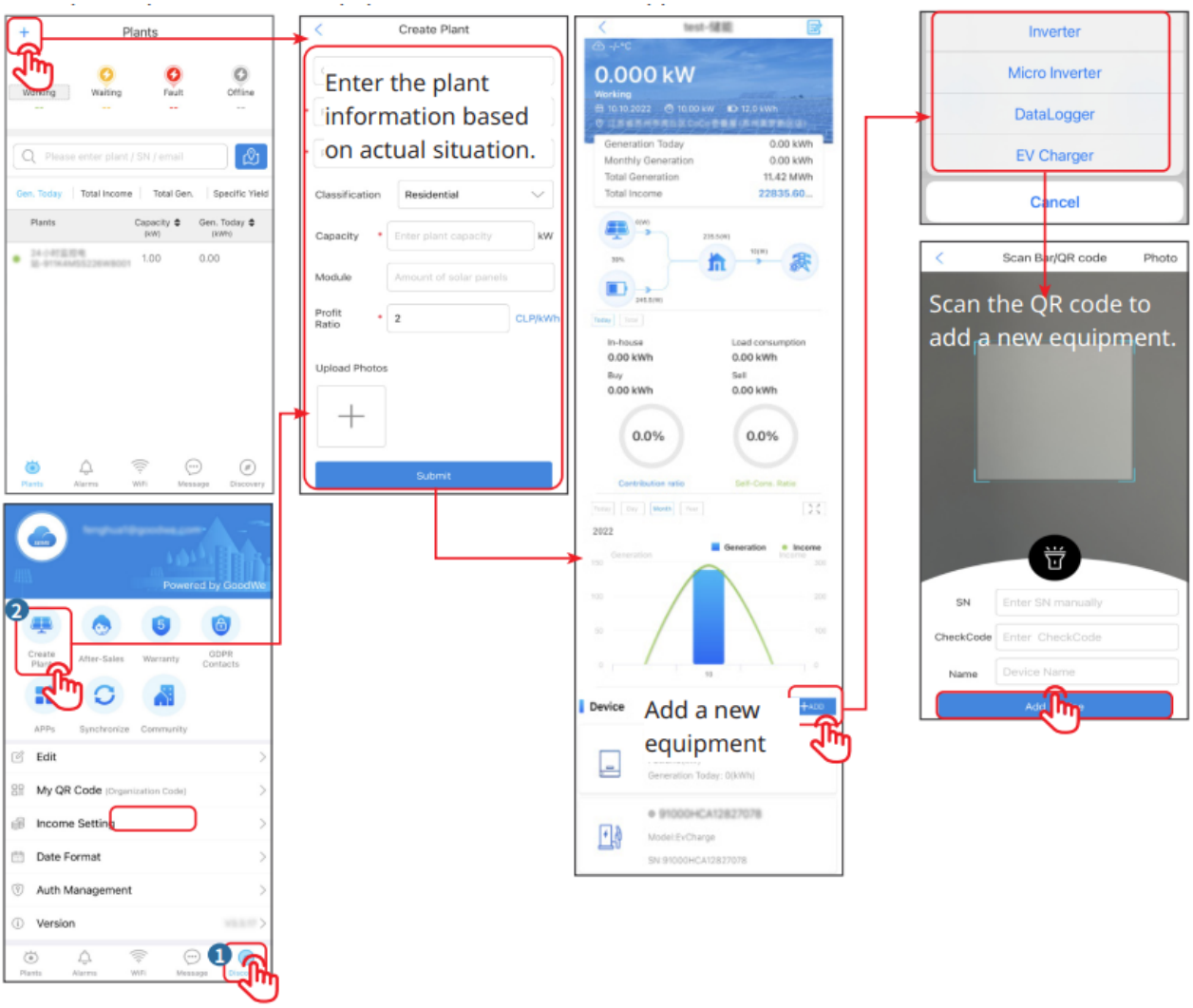
10.2 Manage power plant or equipment

10.2.1 Power plant creation

Step 1: Enter the interface for creating a power plant.

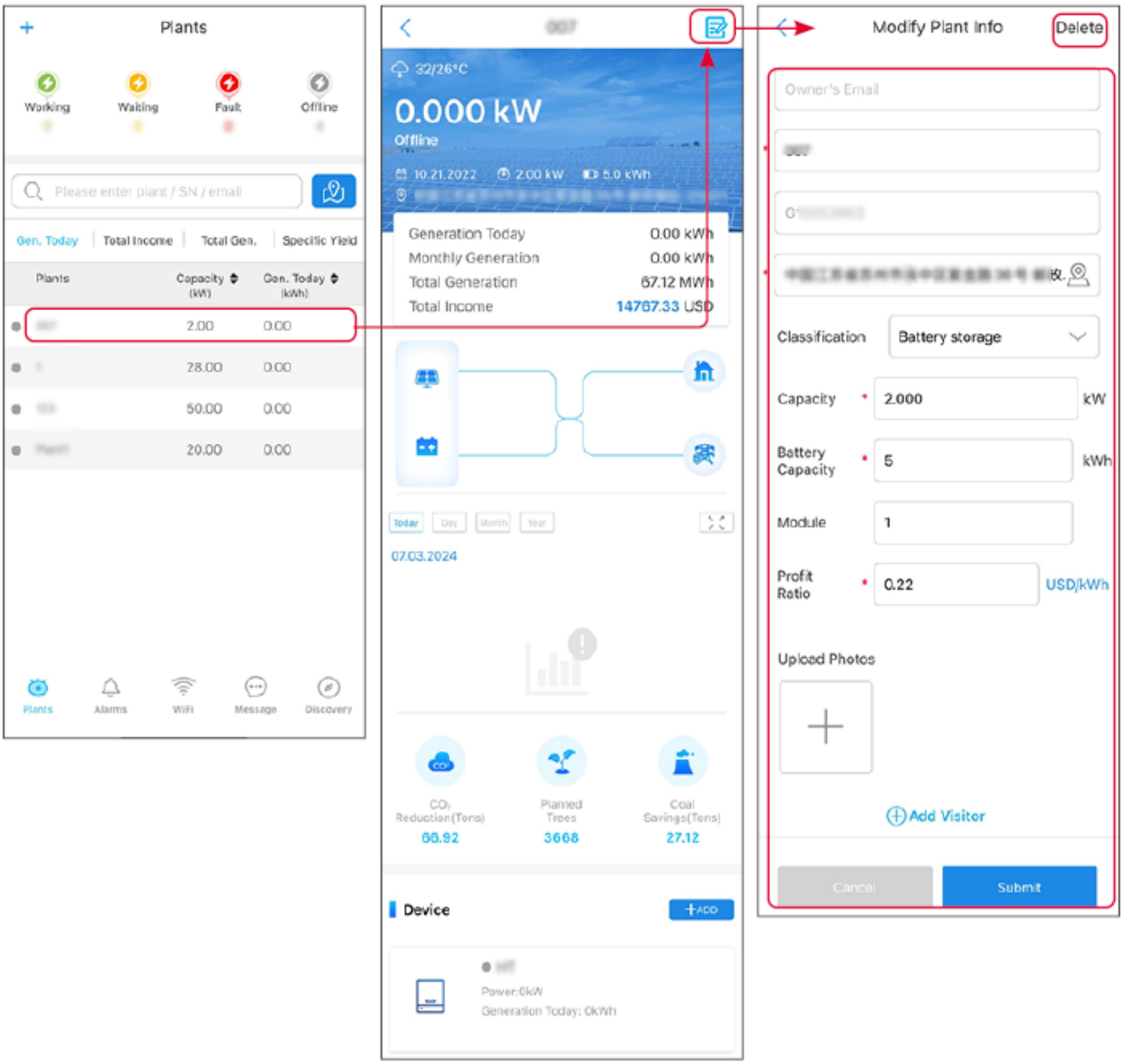
Step 2: Carefully read the prompts on the interface and fill in the power plant information based on actual conditions. (* refers to the mandatory items)

Step 3: Add devices according to the interface prompts to complete the creation of the power plant.



10.2.2 Power plant management

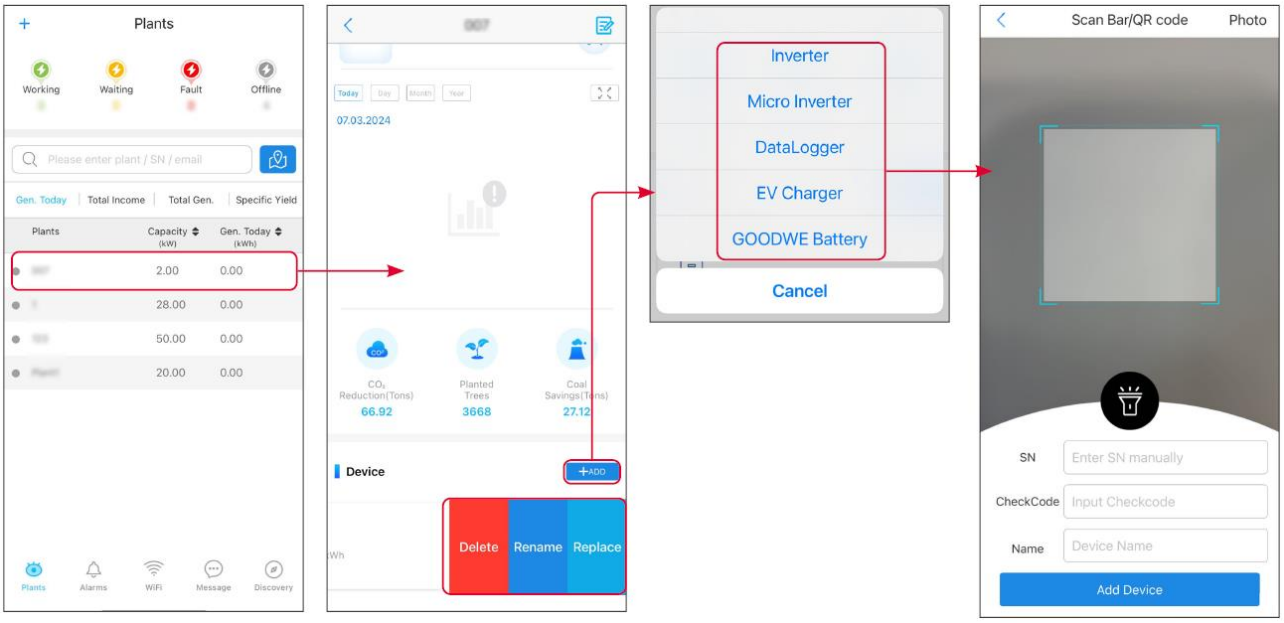
Step 1: Enter the power plant monitoring page and delete or modify the power plant information based on actual needs.



10.2.3 Managing the equipment in the power plant

Step 1: Click on the power plant in the power plant monitoring interface to enter the power plant details page.

Step 2: Click the serial number of the device to enter the device details page, and add, delete, or replace the device based on actual needs.



10.3 Power plant monitoring

10.3.1 Viewing power plant information

After logging into SEMS Portal App with the account and password, you will enter the home page of the power plant, where the overall operation status of all power plants under the account will be displayed. Click Monitoring to enter the power plant monitoring interface to view all power plant information.

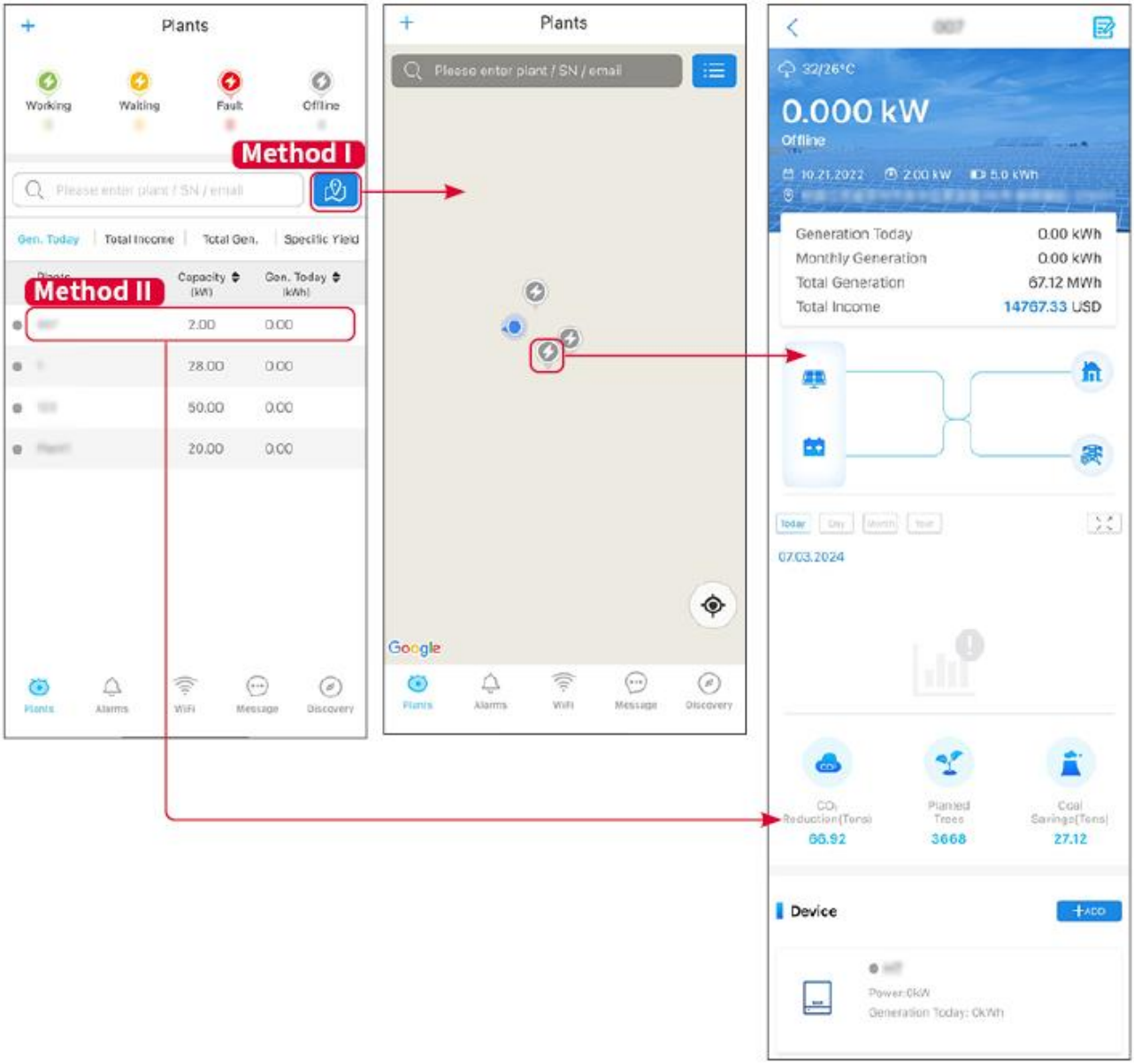
The displayed content of different interfaces of power plant equipment varies, please refer to the actual situation.

Step 1: (Optional) if there are multiple power plants, you can search for information such as the power plant name, inverter SN number, or the owner's phone number to quickly locate the power plant.

Or click the map sign to search for power plant information and quickly locate the power plant.

Step 2: Click on the power plant name in the power plant list or the power plant icon on the map to view the detailed information of the power plant.

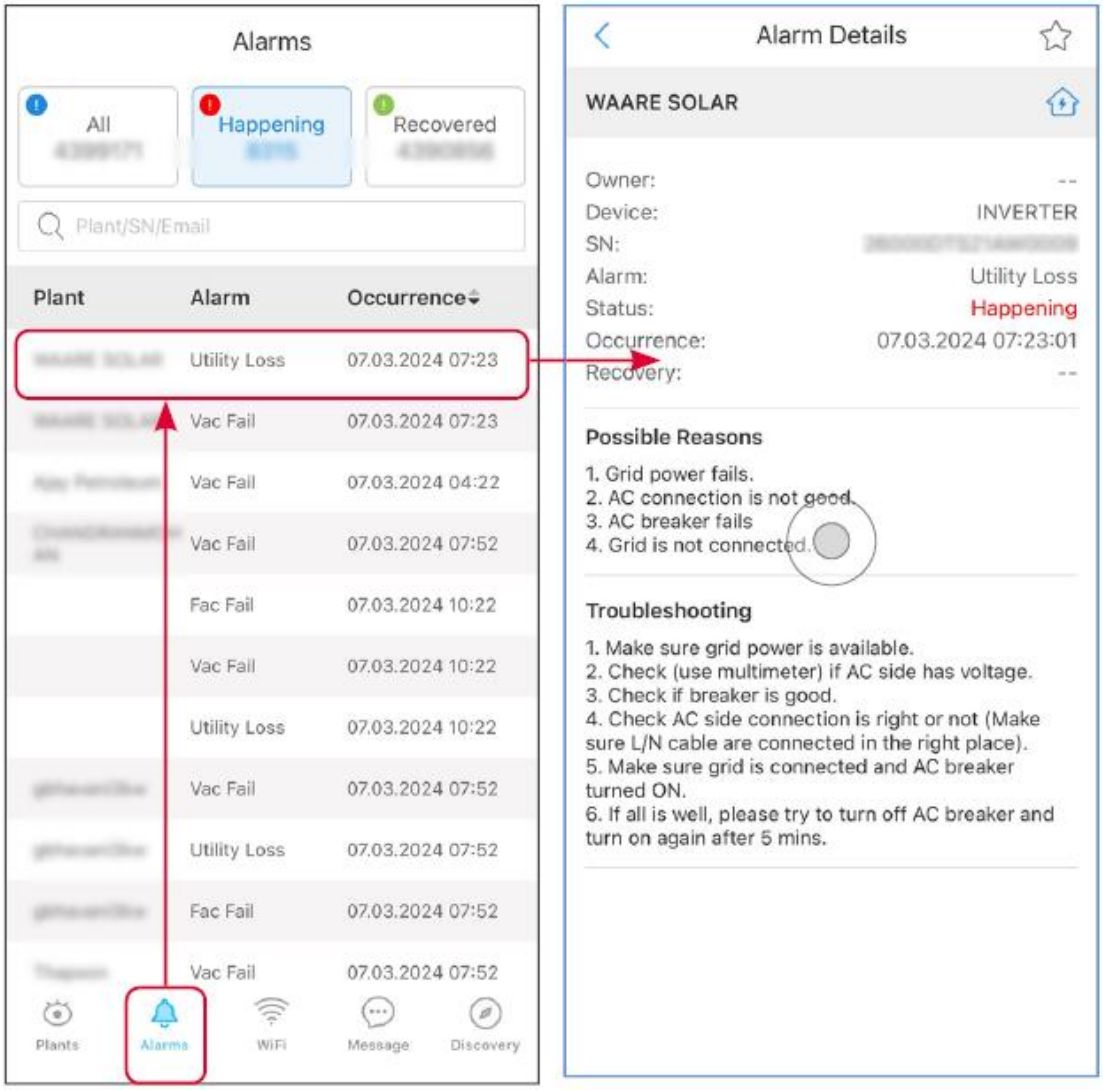
Step 3: On the power plant details interface, check the power plant information, power generation details, equipment information, faults, and other conditions according to the prompts on the interface.



10.3.2 Viewing Alarm Information

Step 1: Click the Fault tab on the power plant details page to enter the alarm query page.

Step 2: Click on the alarm name to view detailed alarm information.


Alarms
All
Happening
Recovered
Plant/SN/Email
Plant
Alarm
Occurrence
Utility Loss 07.03.2024 07:23
Vac Fail 07.03.2024 07:23
Vac Fail 07.03.2024 04:22
Vac Fail 07.03.2024 07:52
Fac Fail 07.03.2024 10:22
Vac Fail 07.03.2024 10:22
Utility Loss 07.03.2024 10:22
Vac Fail 07.03.2024 07:52
Utility Loss 07.03.2024 07:52
Fac Fail 07.03.2024 07:52
Vac Fail 07.03.2024 07:52
Plants
Alarms
WiFi
Message
Discovery
Alarm Details
WAARE SOLAR
Owner: --
Device: INVERTER
SN:
Alarm: Utility Loss
Status: Happening
Occurrence: 07.03.2024 07:23:01
Recovery: --
Possible Reasons
1. Grid power fails.
2. AC connection is not good.
3. AC breaker fails
4. Grid is not connected.
Troubleshooting
1. Make sure grid power is available.
2. Check (use multimeter) if AC side has voltage.
3. Check if breaker is good.
4. Check AC side connection is right or not (Make sure L/N cable are connected in the right place).
5. Make sure grid is connected and AC breaker turned ON.
6. If all is well, please try to turn off AC breaker and turn on again after 5 mins.

11 Maintenance

11.1 Power OFF the System

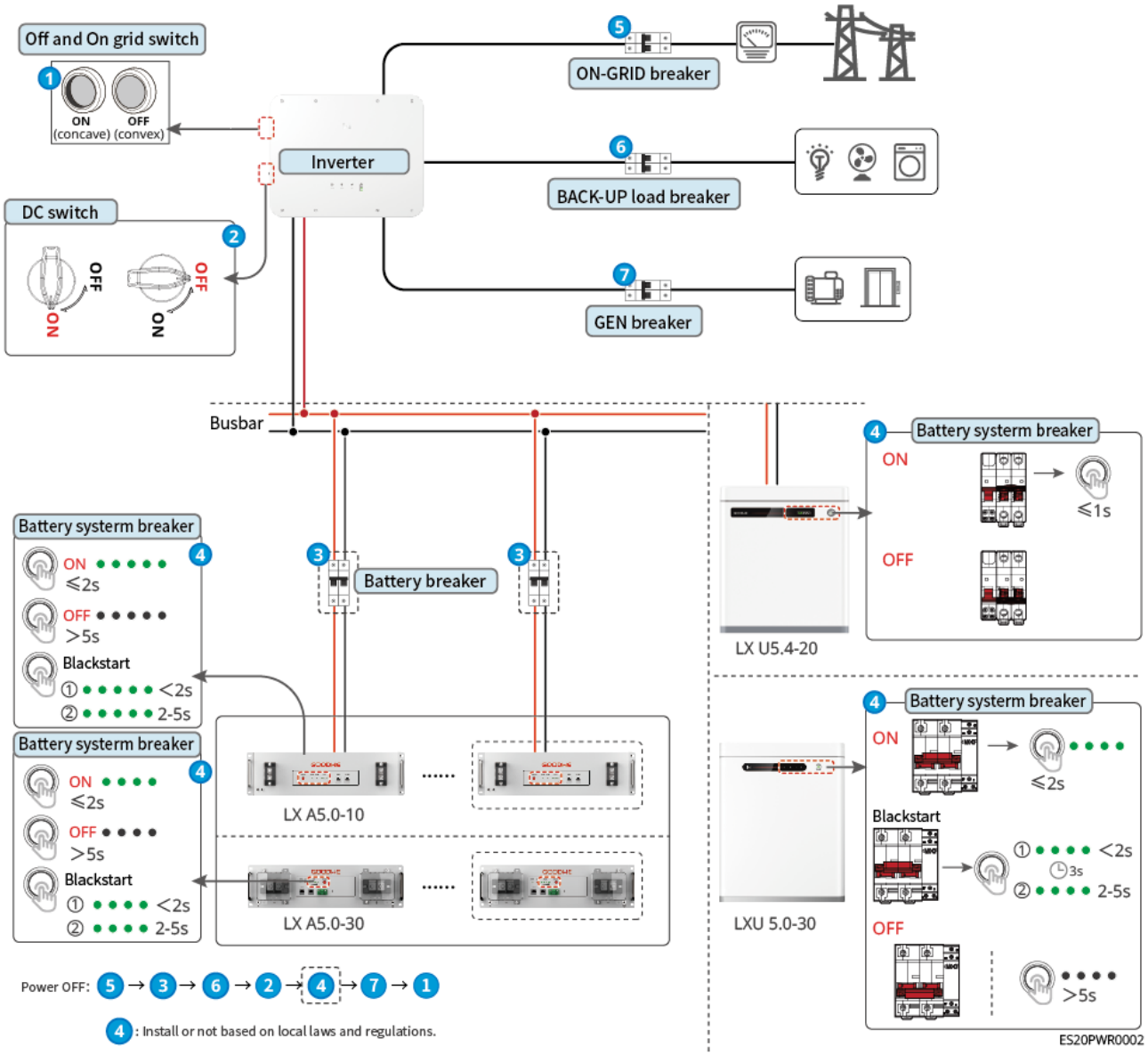
DANGER

- Power off the equipment before operations and maintenance. Otherwise, the equipment may be damaged or electric shocks may occur.
- Delayed discharge. Wait until the components are discharged after power off.
- Push the air switch to restart the battery.
- Strictly follow the power off requirements to avoid damaging the system
- When there are multiple batteries in the system, powering off any one of the batteries can power off all the batteries.

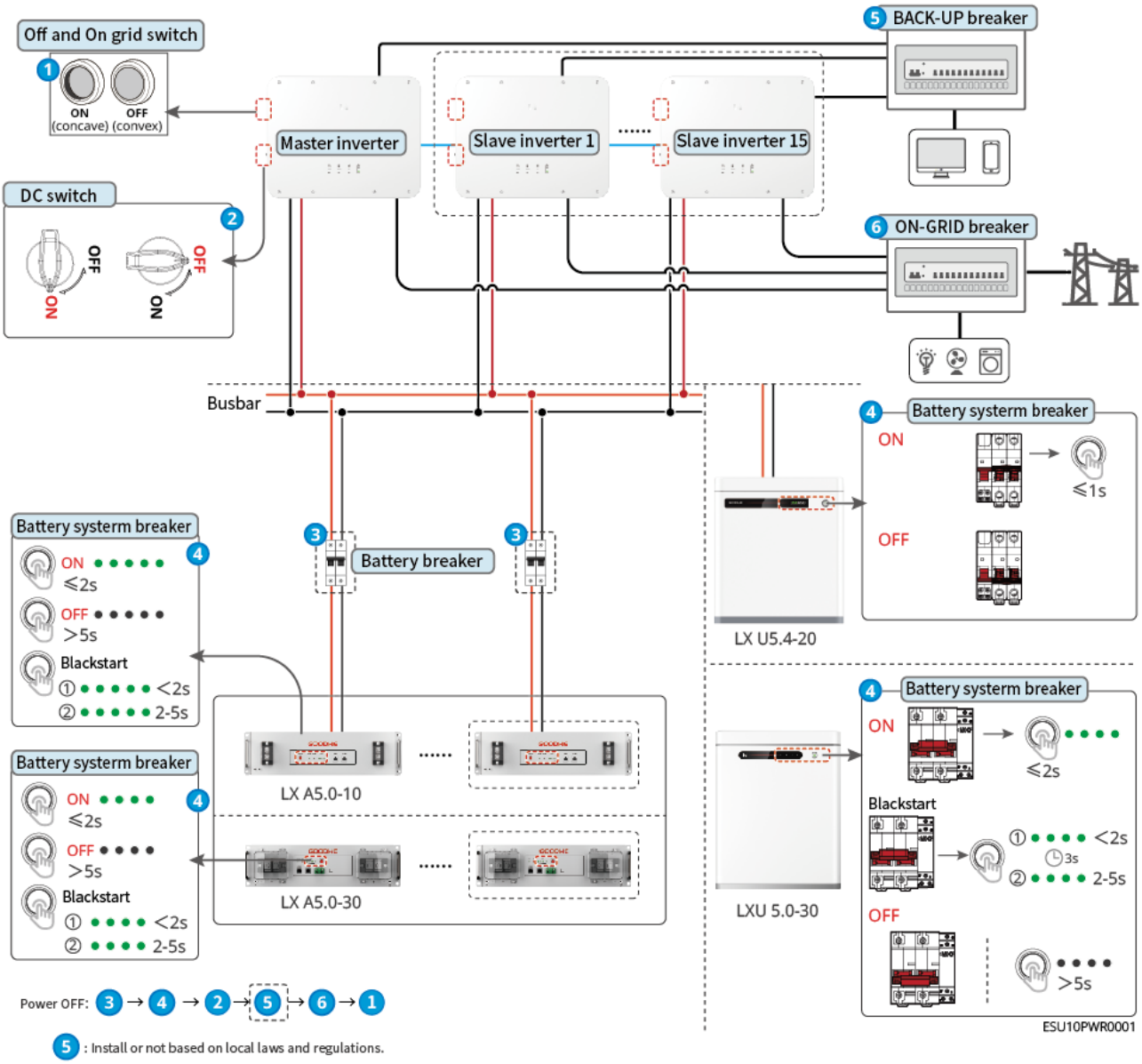
NOTICE

- Install the circuit breaker between the inverter and the battery or between the two batteries in compliance with local laws and regulations.
- To ensure effective protection, the cover of the battery system switch should remain closed. The cover can be closed automatically after being opened. Fasten the cover with screws if the switch is not to be used for a long-term period.

Single inverter system power off



Parallel system power off



11.2 Removing the Equipment

DANGER

- Make sure that the equipment is powered off.
- Wear proper personal protective equipment during operations.
- Please use standard disassembly tools when removing wiring terminals to avoid damaging the terminals or equipment.
- Unless otherwise specified, the dismantling process of the equipment is in reverse order to the installation process, and it will not be further elaborated in this document.

Step 1: Power off the system.

Step 2: Label the cables connected in the system with tags indicating the cable type.

Step 3: Disconnect the connecting cables of the inverter, battery, and smart meter in the system, such as DC cables, AC cables, communication cables, and PE cables.

Step 4: Remove equipment such as the smart dongle, inverter, battery, and smart meter.

Step 5: Properly store the equipment and ensure that the storage conditions meet the requirements if it needs to be put into use later.

11.3 Disposing of the Equipment

If the equipment cannot work anymore, dispose of it according to the local disposal requirements for electrical equipment waste. The equipment cannot be disposed of together with household waste.

11.4 Routine Maintenance

⚠WARNING

- Contact after-sales service for help if you find any problems that may influence the battery or the hybrid inverter. Disassemble without permission is strictly forbidden.
- Contact after-sales service for help if the copper conductor is exposed. Do not touch or disassemble privately because high voltage danger exists.
- In case of other emergencies, contact the after-sales service as soon as possible. Operate following the instructions or wait for the after-sales service personnel.

Maintaining Item	Maintaining method	Maintaining Period	Maintaining purpose
System clean	Check the heat sink, air intake, and air outlet for foreign matter or dust. Check whether the installation space meets requirements and whether there is any debris around the device.	Once half a year	Prevent heat dissipation failures.
System installation	Check whether the equipment are installed securely and whether the	Once 6-12 months	Ensure that the

	screws are installed tightly. Check whether the equipment is damaged or deformed.		equipment is installed securely.
Electrical connection	Check whether the cables are securely connected. Check whether the cables are broken or whether there is any exposed copper core.	Once 6-12 months	Confirm the reliability of electrical connections.
Sealing	Check whether all the terminals and ports are properly sealed. Reseal the cable hole if it is not sealed or too big.	Once a year	Confirm that the machine seal and waterproof performance are intact.
Battery maintenance	If the battery is not used for a long time or is not fully charged, it is recommended to charge the battery regularly.	Once/15 days	Protect the battery's lifespan.

11.5 Troubleshooting

11.5.1 Viewing fault/alarms information

All detailed information about faults/alarms in the energy storage system is displayed on the SolarGo App, SEMS Portal App, and LCD display screen. If your product has any abnormalities and no relevant fault information is seen on the SolarGo App, SEMS Portal App, or LCD display screen, please contact the after-sales service center.

Viewing method one: LCD screen

Click or select the fault information icon on the screen to view energy storage system alarms or fault information.

Viewing Method 2: SolarGo App

View energy storage system alarm information through **Home**>**Parameters**>**Alarms**.

Viewing Method 3: SEMS Portal App

1. Open the SEMS Portal App and log in with any account.

2. All power station fault information can be viewed through the **Power Plant** >**Alarm**.

3. Click on the specific fault name to view detailed information about the fault: [time of occurrence], [possible cause], and [solution].

11.5.2 Fault information and troubleshooting

Perform troubleshooting according to the following methods. Contact the after-sales service if these methods do not work.

Collect the information below before contacting the after-sales service, so that the problems can be solved quickly.

1. Product information like serial number, software version, installation date, fault time, fault frequency, etc.
2. Installation environment, including weather conditions, whether the PV modules are sheltered or shadowed, etc. It is recommended to provide some photos and videos to assist in analyzing the problem.
3. Utility grid situation.

11.5.2.1 System Troubleshooting

NO.	Cause	Solutions/measures to address the issue
1	Unable to search for the wireless signal of the smart dongle.	1. Please ensure that no other devices are connected to the smart dongle's wireless signal. 2. Please ensure that the SolarGo app has been updated to the latest version. 3. Please ensure that the smart dongle is powered on properly, and the blue indicator light is blinking or steady on. 4. Ensure that the smart device is within the communication range of the smart dongle. 5. Refresh the device list in the app. 6. Restart the inverter
2	Unable to connect to the wireless signal of the smart dongle.	1. Please ensure that no other devices are connected to the smart dongle's wireless signal. 2. Restart the inverter or smart dongle, and try to

		reconnect to the wireless signal of the smart dongle again. 3. Ensure successful pairing of Bluetooth.
3	 The Ezlink indicator flashes twice.	1. Make sure that the router is powered on. 2. When communicating via LAN, make sure that both LAN cable connection and LAN configuration are proper. Enable or disable DHCP based on actual needs. 3. When communicating via WiFi, make sure that the wireless network connection is OK and the wireless signal strength meets the requirements. Enable or disable DHCP based on actual needs.
4	 The Ezlink indicator flashes four times.	1. Make sure that the smart dongle is connected to the router via WiFi or LAN properly, and the router can access the Internet. 2. If the problem persists, contact the after sales service.
5	 The Ezlink indicator is off.	Make sure that the inverter is powered on. If the problem persists, contact the after sales service.
6	 The Ezlink indicator is off.	Make sure that the inverter is powered on.
7	Cannot find router SSID	1. Put the router nearer to the Smart Dongle. Or add a WiFi relay device to enhance the WiFi signal. 2. Reduce the number of devices connected to router.
8	After completing all configurations, the Smart Dongle fails connecting to the router.	1. Restart the inverter 2. Check if the SSID, encryption method and password on WiFi configuration page are the same with that of Router. 3. Restart the router. 4. Put the router nearer to the Smart Dongle. Or add a WiFi relay device to enhance the WiFi signal.
9	After completing all	Restart the router and the inverter.

	configurations, the Smart Dongle fails connecting to the router.	

11.5.2.2 Inverter Troubleshooting

No.	Fault	Cause	Solutions/measures to address the issue
1	Utility Loss/ F01:Grid outage	1. Utility grid power fails. 2. The AC cable is disconnected, or the AC breaker is off.	1. The alarm is automatically cleared after the grid power supply is restored. 2. Check whether the AC cable is connected and the AC breaker is on.
2	Grid Overvoltage/ F02:Grid overvoltage protection	The grid voltage exceeds the permissible range, or the duration of high voltage exceeds the requirement of HVRT.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If it occurs frequently, please check if the grid voltage is within the allowable range. ● Contact the local power company if the grid voltage exceeds the permissible range. ● Modify the overvoltage protection threshold, HVRT or disable the overvoltage protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range. 3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists.
3	Grid Undervoltage/ F03:Grid	The grid voltage is lower than the permissible range, or	1. If the problem occurs occasionally, the utility grid may be abnormal

	undervoltage protection	the duration of low voltage exceeds the requirement of LVRT.	temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If it occurs frequently, please check if the grid voltage is within the allowable range. ● Contact the local power company if the grid voltage exceeds the permissible range. ● Modify the undervoltage protection threshold, LVRT or disable the undervoltage protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range. 3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists.
4	Grid Rapid Overvoltage/ F04:Grid overvoltage quick protection	The grid voltage is abnormal or ultrahigh.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. Check if the grid voltage is running at a high voltage for a long time. If it occurs frequently, please check if the grid voltage is within the allowable range. ● Contact the local power company if the grid voltage exceeds the permissible range. ● Modify the grid overvoltage rapid protection threshold after obtaining the consent of the local power company if the grid voltage is within the permissible range.
5	Grid 10min Overvoltage/	The moving average of grid voltage in 10min exceeds the	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover

	F05:Grid 10 minutes overvoltage protection	range of safety requirements.	automatically after detecting that the utility grid is normal. 2. Check if the grid voltage is running at a high voltage for a long time. If it occurs frequently, please check if the grid voltage is within the allowable range. ● Contact the local power company if the grid voltage exceeds the permissible range. ● Modify the grid overvoltage rapid protection threshold after obtaining the consent of the local power company if the grid voltage is within the permissible range.
6	Grid Overfrequency/ F06:Grid overfrequency protection	Utility grid exception. The actual grid frequency exceeds the requirement of the local grid standard.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid frequency is within the permissible range. ● Contact the local power company if the grid frequency exceeds the permissible range. ● Modify the overfrequency protection threshold or disable the overfrequency protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range.
7	Grid Underfrequency/ F07:Grid underfrequency protection	Utility grid exception. The actual grid frequency is lower than the requirement of the local grid standard.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently,

			check whether the grid frequency is within the permissible range. ● Contact the local power company if the grid frequency exceeds the permissible range. ● Modify the underfrequency protection threshold or disable the underfrequency protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range. Or close Grid Underfrequency function.Grid Underfrequency
8	Grid Frequency Instability/ F08:Grid frequency shift protection	Utility grid exception. The actual grid frequency change rate does not meet the requirement of the local grid standard.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid frequency is within the permissible range. ● Contact the local power company if the grid frequency exceeds the permissible range. ● Contact the dealer or the after-sales service if the grid frequency is within the permissible range.
9	Anti-islanding/ F09:Anti-islanding protection	The utility grid is disconnected. The utility grid is disconnected according to the safety regulations, but the grid voltage is maintained due to the loads.	1. Check whether the utility grid is disconnected. 2. Contact the dealer or the after-sales service.
10	LVRT Undervoltage/ F10:LVRT	Utility grid exception. The duration of the utility grid exception	1. If the problem occurs occasionally, the utility grid may be abnormal

	undervoltage	exceeds the set time of LVRT.	temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid frequency is within the permissible range. If not, contact the local power company. If yes, contact the dealer or the after-sales service.
11	HVRT Overvoltage/ F11:HVRT Overvoltage	Utility grid exception. The duration of utility grid exception exceeds the set time of HVRT.	
12	Abnormal GFCI 30mA/ F12:Abnormal GFCI 30mA (internal)	The input insulation impedance becomes low when the inverter is working.	1. If the problem occurs occasionally, it may be caused by a cable exception. The inverter will recover automatically after the problem is solved. 2. Check whether the impedance between the PV string and PE is too low if the problem occurs frequently or persists.
	Abnormal GFCI 60mA/ F13:Abnormal GFCI 60mA (internal)		
	Abnormal GFCI 150mA/ F14:Abnormal GFCI 150mA (internal)		
	Abnormal GFCI/ F15:Abnormal GFCI		
13	Large DC of AC current L1/ F16:DCI protection L1	The DC component of the output current exceeds the safety range or default range.	1. If the problem is caused by an external fault like a utility grid exception or frequency exception, the inverter will recover automatically after solving the problem. 2. If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.
	Large DC of AC current L2/ F17:DCI protection L2		
14	Isolation Fail/ F18:Low insulation resistance	The PV string is short-circuited to PE. The PV system is in a moist environment and the cable is not well insulated to the ground.	1. Check whether the resistance of the PV string to PE exceeds 50kΩ. If no, check the short circuit point. 2. Check whether the PE cable is connected correctly. 3. If it is confirmed that the insulation resistance is indeed lower than the default value in rainy weather, please

			reset the "Insulation Resistance Protection Point". Inverters for the Australian and New Zealand markets can also be alerted in the following ways in the event of insulation impedance failure: 1. The inverter is equipped with the buzzer: the buzzer sounds continuously for 1 minute in case of failure; if the fault is not resolved, the buzzer sounds every 30 minutes. 2. Add the inverter to the monitoring platform, and set the alarm reminder, the alarm information can be sent to the customer by emails.
15	Abnormal system grounding/ F19:System grounding abnormal	1. The PE cable of the inverter is not connected. 2. When the output of the photovoltaic string is grounded, the AC output cables L and N of the inverter are connected reversely.	1. Please confirm if the PE cable of the inverter is properly connected. 2. If the output of the photovoltaic string is grounded, please confirm whether the AC output cables L and N of the inverter are reversely connected.
16	Anti-reverse power Failure/ F20:Hardware Reverse Current Protection	Abnormal fluctuation of load	1. If the exception is caused by an external fault, the inverter will recover automatically after solving the problem. 2. If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.
17	Internal Comm Loss/ F21:Internal comm loss	1. Frame format error 2. Parity checking error 3. Can bus offline 4. Hardware CRC	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.

		error 5. Send (receive) control bit is receive (send). 6. Transmit to the unit that is not allowed.	
18	Generator waveform detection fault/ F22:Generator waveform detection fault	1. Generator is not connected. 2. The generator is faulty. 3. The parameter settings of the generator exceed the requirements of the specification.	In case of no generator connection, ignore this fault. If a generator is connected, immediately stop the generator operation. Check if the generator has any fault and whether the parameter settings meet the requirements. If there is no fault with the generator and the parameter settings do not exceed the requirements, and the fault still exists after restarting the generator, please contact your dealer or after-sales service center.
19	Abnormal connection of generator/ F23:Generator abnormal connection	1. Generator is not connected. 2. The generator is faulty. 3. The parameter settings of the generator exceed the requirements of the specification.	In case of no generator connection, ignore this fault. If a generator is connected, immediately stop the generator operation. Check if the generator has any fault and whether the parameter settings meet the requirements. If there is no fault with the generator and the parameter settings do not exceed the requirements, and the fault still exists after restarting the generator, please contact your dealer or after-sales service center.
20	Generator low voltage/ F24:Generator low voltage	1. Generator is not connected. 2. The generator is faulty. 3. The voltage setting of the generator is lower than the requirements of the specification.	In case the generator is not connected, ignore this fault. If a generator is connected, immediately stop the generator operation. Check if the generator has any fault and if the voltage setting meets the requirements. If the generator is in good condition and the voltage setting does not lower than the requirements, but the fault still exists

			after restarting the generator, please contact your dealer or after-sales service center.
21	Generator high voltage/ F25:Generator high voltage	1. Generator is not connected. 2. The generator is faulty. 3. The voltage setting of the generator exceeds the requirements of the specification.	In case the generator is not connected, ignore this fault. If a generator is connected, immediately stop the generator operation. Check if the generator has any fault and if the voltage setting meets the requirements. If the generator is in good condition and the voltage setting does not exceed the requirements, but the fault still exists after restarting the generator, please contact your dealer or after-sales service center.
22	Generator low frequency/ F26:Generator low frequency	1. Generator is not connected. 2. The generator is faulty. 3. The generator frequency setting is lower than the requirements of the specification.	In case the generator is not connected, ignore this fault. If a generator is connected, immediately stop the generator operation. Check if the generator has any fault and if the frequency setting meets the requirements. If the generator is in good condition, the frequency setting is within the requirements, but the malfunction still persists after restarting the generator, please contact your dealer or after-sales service center.
23	Generator high frequency/ F27:Generator high frequency	1. Generator is not connected. 2. The generator is faulty. 3. The generator frequency setting exceeds the requirements of the specification.	In case the generator is not connected, ignore this fault. If a generator is connected, immediately stop the generator operation. Check if the generator has any fault and if the frequency setting meets the requirements. If the generator is in good condition, the frequency setting is within the requirements, but the malfunction still persists after restarting the generator, please contact your dealer or after-sales service center.
24	Parallel IO check fail/	Communication of	1. Check whether the parallel

	F28:Parallel connection I/O check abnormal	parallel inverters in error	communication cable is connected correctly and firmly. 2. If the communication cable connection is normal, it may be an internal communication failure. Please contact the dealer or After Sale Service.
25	Parallel Grid line reversed/ F29:Parallel connection grid connection reversed	AC L and N cables are connected reversely.	1. Check the grid wiring. Reconnect the ON-GRID AC cable to make sure the grid is wired correctly.
26	AC HCT Check abnormal/ F30:AC HCT check abnormal	The sampling of the AC HCT is abnormal.	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
27	GFCI HCT Check abnormal/ F31:GFCI sensor check abnormal	The sampling of the GFCI HCT is abnormal.	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
28	Relay Chk Fail/ F32:Relay check abnormal	1. Relay Dev Fail 2. The control circuit is abnormal. 3. The AC cable is connected improperly, like a virtual connection or short circuit.	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
29	Flash Fault/ F33:Flash read/write error	The internal Flash storage is abnormal	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
30	AFCI Self-test Fault/ F34:AFCI check fault	AFCI detection equipment is abnormal.	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
31	Cavity Overtemperature/	1. The installation location of the	1. Check whether the ventilation of the inverter installation location is good

	F35:Cavity overtemperature	inverter is not ventilated. 2. The ambient temperature is too high, exceeding 60℃. 3. Internal fan working abnormally	and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If the ventilation is poor or the ambient temperature is too high, please improve the ventilation and heat dissipation conditions. 3. Contact the dealer or after-sales service if both the ventilation and the ambient temperature are normal.
32	BUS Overvoltage/ F36:BUS overvoltage	1. The PV voltage is too high. 2. The sampling of the inverter BUS voltage is abnormal.	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
33	PV Input Overvoltage/ F37:PV input overvoltage	The PV array configuration is not correct. Too many PV panels are connected in series in the PV string.	Check the serial connection of the PV array. Make sure that the open circuit voltage of the PV string is not higher than the maximum operating voltage of the inverter.
34	PV Continuous Hardware Overcurrent/ F38:PV continuous hardware overcurrent	1. The PV configuration is not proper. 2. The hardware is damaged.	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
35	PV Continuous Software Overcurrent/ F39:PV continuous software overcurrent	1. The PV configuration is not proper. 2. The hardware is damaged.	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
36	PV String Reversed/ F40:PV string reversed (string 1 - string 16)	The PV strings are connected reversely.	Check whether the PV1 and PV2 strings are connected reversely.
37	GEN port overload/	1. The load	1. When a generator is connected to the

	F41:Generator multiplexing port overload	connected to the generator is too large, and the current or power of the GEN port exceeds the requirements specified in the specification. 2. The short circuit on the back-up side leads to the current of the generator port exceeding the requirements specified in the specifications. 3. When used as a high-load port, the high load exceeds the requirements specified in the specifications.	port, immediately stop the operation of the generator, check whether the line is properly connected, and confirm whether the parameters such as output voltage, current, and power on the back-up side exceed the parameter requirements of the specification. If the cable is not properly connected, check and reconnect it. If the parameters exceed the requirements of the specifications, reset the parameters according to the requirements. If the circuit is intact and the parameter settings are within the specified range, but the problem persists, please contact your dealer or after-sales service center. 2. When the port is connected to a heavy load, turn off the heavy load, check if the line is properly connected, and confirm if the load exceeds the requirements of the specification. If the cable is not properly connected, check and reconnect it. If the load exceeds the requirements in the specification, reduce the load. If the cables are well connected and the load does not exceed the specifications, and the fault still exists, please contact your dealer or after-sales service center.
38	AFCI Fault/ F42:DC Arc Fault	1. The connection of DC string terminals is not firm. 2. The DC cable wiring is damaged.	Please check if the component connection cables are correctly connected according to the wiring requirements in the quick installation manual.
39	Communication indicator of the inverter and Ezlink indicator in error	Ezlink connection failed	1. Check whether the WiFi signal is normal. If it is not, check whether the router works well. 2. Check whether Ezlink obtains IP

			successfully via APP. Execute the following actions if IP is not obtained: 3. Reset the communication parameters via APP. 4. Check whether the server connection is correct. 5. Log in to the website mqtt.goodwe-power.com via a computer to view the resolved IP address and obtain the server connection information.
40	Unable to log in to the parallel system interface in APP	Parallel networking failed	1. Incorrect communication cable connection or unreliable cable connection cause communication failure. 2. Connect the smart meter and Ezlink module to the same master inverter to ensure the success rate of networking. 3. Check whether the inverter communication indicator is normal. If it is not, please check the individual inverter according to its own troubleshooting method. 4. If the above methods cannot solve the problem, please try to restart the inverter and get networking again.
41	Battery indicator abnormal	Battery failure	1. Check the BMS communication cable connection, and make sure it is reliable. Check whether the battery type is matched via APP. If you can't solve it, please refer to the user manual of the corresponding battery for troubleshooting.
42	Device offline displayed on APP	Communication failure or equipment failure	1. Check whether the quantity of parallel machines in the system is the same with the actual connected ones. 2. If it is, get the SN of the corresponding offline inverter from the equipment list, and troubleshoot

			the corresponding inverter according to its user manual. 3. Check whether the communication connection of the equipment is normal, with no loose, aging or wrong connection, etc.

11.5.2.3 Battery fault (LX A5.0-30)

Alarm state

When the battery ALM indicator turns red, troubleshoot the issue by referring to the SOC indicator's display status.

NO.	SOC indicator	Fault	Solutions
1		Battery abnormality	Power off and wait for 2 hours. If the problem persists, please contact the after-sales service.
2		Abnormal temperature	Turn off the device to wait for the temperature to return to normal. If the problem persists after restarting, please contact the after-sales service center.
3		Abnormal current	Restart the battery. If the problem persists, please contact the after-sales service.
4		Balancing fault	Power off and wait for 2 hours. If the problem persists, please contact the after-sales service.
5		Wire harness exception	Restart the battery. If the problem persists, please contact the after-sales service.
6		Relay open-circuit fault	Restart the battery. If the problem persists, please contact the after-sales service.

7		Relay adhesion fault	Restart the battery. If the problem persists, please contact the after-sales service.
8		Cluster Fault	Please check if the battery model matches. If not, please contact the after-sales service center.
9		Communication failure	Restart the battery. If the problem persists, please contact the after-sales service.
10		Open contact sticking fault	Contact the after-sales service.
11		Pre-charge Failure	Restart the battery. If the problem persists, please contact the after-sales service.
12		Component temperature fault	Power off and wait for 2 hours. If the problem persists, please contact the after-sales service.
13		Software fault	Restart the battery. If the problem persists, please contact the after-sales service.
14		Hardware overcurrent fault	Restart the battery. If the problem persists, please contact the after-sales service.
15		Microelectronic Fault	Restart the battery. If the problem persists, please contact the after-sales service.
16		Inconsistency of software and hardware versions	Please check if the battery model, SN number, and software version number match. If they do not match, contact the after-sale service.

11.5.2.4 Battery fault (LX A5.0-10)

When the battery ALM indicator turns red, troubleshoot the issue by referring to the SOC indicator's display status.

NO.	SOC indicator	Fault	Solutions
1	○○○○●	Battery Overvoltage	Power off and wait for 2 hours. If the problem persists, please contact the after-sales service.
2	○○○●○	Battery Undervoltage	Contact the after-sales service.
3	○○○●●	High Cell Temperature	Power off and wait for 2 hours. If the problem persists, please contact the after-sales service.
4	○○●○○	Low Charging Temperature	Turn off the device to wait for the temperature to return to normal. If the problem persists after restarting, please contact the after-sales service center.
5	○○●○●	Low Discharging Temperature	Turn off the device to wait for the temperature to return to normal. If the problem persists after restarting, please contact the after-sales service center.
6	○○●●○	Overcurrent Charging	Restart the battery. If the problem persists, please contact the after-sales service.
7	○○●●●	Overcurrent Discharging	Restart the battery. If the problem persists, please contact the after-sales service.
8	○●○○○	Low Insulation Resistance	Contact the after-sales service.
9	○●○○●	Excessive temperature difference	Power off and wait for 2 hours. If the problem persists, please contact the after-sales service.

10	○●○●●	Voltage Difference Exception	Leave the battery alone for 12h after restarting. If the problem persists, please contact the after-sales service center.
11	○●●○○	Inconsistency of battery cells	Contact the after-sales service.
12	○●●○●	Wire harness exception	Restart the battery. If the problem persists, please contact the after-sales service.
13	○●●●○	MOS Open-Circuit Fault	Restart the battery. If the problem persists, please contact the after-sales service.
14	○●●●●	MOS Open-Circuit Fault	Restart the battery. If the problem persists, please contact the after-sales service.
15	●○○○○	Cluster Fault	Please check if the battery model matches. If not, please contact the after-sales service center.
16	●○○○●	Interlock failure	Check whether the termination resistor is installed properly and restart the battery. Contact the after-sale service if the problem persists.
17	●○○●○	BMU communication fault	Restart the battery. If the problem persists, please contact the after-sales service.
18	●○○●●	MCU Communication Fault	Restart the battery. If the problem persists, please contact the after-sales service.
19	●○●○○	Open contact sticking fault	Contact the after-sales service.
20	●○●○●	Pre-charge Failure	Restart the battery. If the problem persists, please contact the after-sales service.
21	●○●●○	MOS over-	Power off and wait for 2 hours. If the

		temperature fault	problem persists, please contact the after-sales service.
22	●○●●●	Current Diverter Over temperature	Power off and wait for 2 hours. If the problem persists, please contact the after-sales service.
23	●●○○○	Reverse Connection Fault	Contact the after-sales service.
24	●●●●●	Microelectronic Fault	Contact the after-sales service.

11.5.2.5 Battery fault (LX U5.4-20)

LX U5.4-20:

Alerting

 When the battery button indicator light displays red and flashes 1time/s, combine with the SOC indicator light to locate and troubleshoot the alarm.

NO.	SOC indicator	Description
1		The alerting is dealt by the battery system itself. For more detailed information, you can check via SolarGo App
2		
3		
4		
5		
6		

Fault Status

 When the battery button indicator light is red and constantly on, locate and troubleshoot the fault based on the SOC indicator light display status.

Button indicator	SOC indicator	Fault	Solutions
Steady red		Overvoltage	Power off for 2 hours. If the problem persists, please contact GoodWe. Please contact GoodWe.
Red light blink 1 time in 1 second		Under voltage	Contact GoodWe for help.

Steady red		Cell High Temperature	Power off for 2 hours. If the problem persists, please contact GoodWe.
		Low Temperature Charging	Power off the equipment and wait until the temperature recovers. If the problem persists after restarting, please contact GoodWe.
		Low Temperature Discharging	
		Overcurrent When Charging	Restart the battery. If the problem persists, please contact GoodWe for help.
		Overcurrent When Discharging	
		Temperature Exception	Power off for 2 hours. If the problem persists, please contact GoodWe.
		The cell voltage difference is extremely high	Power off for 12 hours. If the problem persists, please contact GoodWe.
		Harness Abnormal	Restart the battery. If the problem persists, please contact GoodWe for help.
		MOS Open-Circuit Fault	
		MOS Short-Circuit Fault	

		Parallelized Connection Fault	Check the battery model. If the battery model is not correct, please contact GoodWe.
		BMU Communication Fault	Restart the battery. If the problem persists, please contact GoodWe for help.
		MCU Internal communication fault	
		Air Switch Short Circuit Fault	Contact GoodWe for help.
		Precharge Failure	Restart the battery. If the problem persists, please contact GoodWe for help.
		MOS Over temperature Fault	Power off for 2 hours. If the problem persists, please contact GoodWe.
		Current Sensor Over temperature Fault	Power off for 2 hours. If the problem persists, please contact GoodWe.
		Microelectronic Fault	Contact GoodWe for help.

11.5.2.6 Battery fault (LX U5.0-30)

Alerting Status

 When the battery **ALM** indicator light is red and constantly on, locate and

troubleshoot the fault based on the SOC indicator light display status.

NO.	SOC indicator	Fault	Solutions
1		Abnormal voltage	Power off for 2 hours and restart it. If the problem persists, please contact the after-sales service center
2		Abnormal current	Restart the battery. If the problem persists, please contact the after-sales service center
3		Abnormal temperature	Power off and wait for the temperature to recover. If the problem persists, please contact the after-sales service center
4		Imbalance fault	Power off for 2 hours and restart it. If the problem persists, please contact the after-sales service center
5		Pre-charge Failure	Restart the battery. If the problem persists, please contact the after-sales service center
6		Harness Abnormal	Restart the battery. If the problem persists, please contact the after-sales service center
7		Component temperature fault	Power off for 2 hours and restart it. If the problem persists, please contact the after-sales service center
8		MOS open circuit fault	Power off for 2 hours and restart it. If the problem persists, please contact the after-sales service center
9		MOS adhesion fault	Restart the battery. If the problem persists, please contact the after-sales service center
10		Parallelized Connection Fault	Please check if the battery model matches. If not, please contact the after-sales service center

11		Communication fault	Restart the battery. If the problem persists, please contact the after-sales service center
12		Air Switch Short Circuit Fault	Contact the after-sales service center for help
13		Software fault	Restart the battery. If the problem persists, please contact the after-sales service center
14		Hardware overcurrent fault	Restart the battery. If the problem persists, please contact the after-sales service center
15		Heating film Fault	Restart the battery. If the problem persists, please contact the after-sales service center
16		Inconsistent software and hardware versions	Please check if the battery model, SN number, and software version number match. If they do not match, please contact the after-sales service center

12 Parameters

12.1 Inverter Parameters

Technical Parameters	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Battery Input Data			
Type	Li-Ion/Lead-acid	Li-Ion/Lead-acid	Li-Ion/Lead-acid
Rated Voltage (V)	48	48	48
Voltage Range (V)	40~60	40~60	40~60
Max. Continuous	160	200	240

Charging Current (A)			
Max. Continuous Discharging Current (A)*1	160（176 at 10min）	200（220 at 10min）	240（264 at 10min）
Maximum Charge power (W)	8,000	10,000	12,000
Maximum Discharge Power (W)	8,800	11,000	13,200
PV Input Data			
Maximum Input power (W) *2	16,000	20,000	24,000
Max. Input Voltage (V)	600	600	600
MPPT Operating Voltage Range (V)	60~550	60~550	60~550
MPPT Voltage Range at Nominal Power (V)	180~500	170~500	200~500
Start-up Voltage (V)	58	58	58
Nominal Input Voltage (V)	360	360	360
Max. Input Current per MPPT (A) *4	32/16	32/32	32/32
Max. Short Circuit Current per MPPT (A)	48/24	48/48	48/48
Max. Backfeed Current to The Array (A)	0	0	0
Number of MPPT	2	2	3
Number of Strings per MPPT	2/2	2/2	2/2
AC Output Data (On-grid)			
Nominal Apparent Power Output to Utility Grid (VA)	8,000	10,000	12,000
Max. Apparent Power	8,800	11,000	13,200

Output to Utility Grid (VA)			
Nominal Apparent Power from Utility Grid (VA)	8,000	10,000	12,000
Max. Apparent Power from Utility Grid (VA)	16,500	16,500	16,500
Nominal Output Voltage (V)	220/230/240	220/230/240	220/230/240
Output Voltage Range (V)	170~280	170~280	170~280
Nominal AC Grid Frequency (Hz)	50/60	50/60	50/60
Maximum on-grid output current (A)	40.0	50.0	60.0
Maximum input current (A)	75.0	75.0	75.0
Nominal Output Current (A)	36.4/34.8/33.3	45.5/43.5/41.7	54.5/52.2/50.0
Power Factor	~1 (Adjustable from 0.8 lead...0.8 lag)	~1 (Adjustable from 0.8 lead...0.8 lag) }	~1 (Adjustable from 0.8 lead...0.8 lag)
Total Harmonic Current Distortion	<3%	<3%	<3%
Voltage Type (a.c. or d.c.)	a.c	a.c	a.c
AC Output Data (Back-up)			
Back-up Nominal Apparent Power (VA)	8,000	10,000	12,000
Max. Output Apparent Power (VA) *4	8,800 (16,000 @10s)	11,000 (20,000 @10s)	13,200 (24,000 @10s)
Nominal Output Current (A)	36.4/34.8/33.3	45.5/43.5/41.7	54.5/52.2/50.0
Maximum output current (A)	40.0	50.0	60.0
Nominal Output Voltage	220/230/240	220/230/240	220/230/240

(V)			
Nominal Output Frequency (Hz)	50/60	50/60	50/60
Total Harmonic Voltage Distortion(@ linear load)	<3%	<3%	<3%
Generator Port Parameters			
Nominal Input Apparent Power (VA)	8,000	10,000	12,000
Max. Input Apparent Power (VA)	11,000	12,000	12,000
Nominal Input Voltage (V)	220/230/240	220/230/240	220/230/240
Input voltage range (V)	170~280	170~280	170~280
Input Voltage Frequency (Hz)	50/60	50/60	50/60
Voltage Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Max. Input Current (A)	50	54.5	54.5
Nominal Input Current (A)	36.4/34.8/33.3	45.5/43.5/41.7	54.5/52.2/50.0
Efficiency			
Max. Efficiency	97.6%		
European Efficiency	96.2%		
CEC Efficiency	96.2%		
Max. Battery to AC Efficiency	95.5%		
MPPT Efficiency	99.9%		
Protection			
PV String Current Monitoring	Integrated	Integrated	Integrated
Insulation Resistance Detection	Integrated	Integrated	Integrated

Residual Current Monitoring	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection*2	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated
DC switch	Integrated	Integrated	Integrated
DC Surge Protection*3	Type III (optional for Type II)	Type III (optional for Type II)	Type III (optional for Type II)
AC Surge Protection	Type III	Type III	Type III
AFCI	Optional	Optional	Optional
Remote Shutdown	Integrated	Integrated	Integrated
General Data			
Operating Temperature Range (℃)	-35~+60	-35~+60	-35~+60
Relative Humidity	0～95%	0～95%	0～95%
Maximum Operating Altitude (m)	3000	3000	3000
Cooling Method	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling
User Interface	LED, WLAN+APP	LED, WLAN+APP	LED, WLAN+APP
BMS Communication	CAN	CAN	CAN

Communication with Meter	RS485	RS485	RS485
Monitoring	LAN+WiFi	LAN+WiFi	LAN+WiFi
Weight (Kg)	27	29	29
Dimension (W x H x D mm)	560*445*226	560*445*226	560*445*226
Noise Emission (dB)	<50	<55	<55
Topology	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W)	<10	<10	<10
Ingress Protection Rating	IP66	IP66	IP66
DC connector	MC4,VACONN Terminal	MC4,VACONN Terminal	MC4,VACONN Terminal
AC Connector	VACONN Terminal	VACONN Terminal	VACONN Terminal
Environmental Category	4K4H	4K4H	4K4H
Pollution Degree	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III
Ingress Protection Rating	I	I	I
Storage Temperature (℃)	-40~+85	-40~+85	-40~+85
The Decisive Voltage Class (DVC)	Battery: A PV：C AC: C COM：A	Battery: A PV：C AC: C COM：A	Battery: A PV：C AC: C COM：A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted
Certification			
Safety Regulation	IEC62109-1&2		
EMC	EN61000-6-1,EN61000-6-2,EN61000-6-3,EN61000-6-4,		

12.2 Battery Technical Data

LX A5.0-10

Technical Parameters		LX A5.0-10	2*LX A5.0-10	n*LX A5.0-10
usable energy (kWh) *1		5	10	n×5
Battery Module		LX A5.0-10：51.2V 5.0kWh		
Number of Modules		1	2	n
Cell Type		LFP（$LiFePO_4$）		
Nominal Voltage (V)		51.2		
Operating Voltage Range (V)		47.5~57.6		
Nominal Charge/Discharge Current (A) *2		60	120	n×60*3
Nominal Charge/Discharge Power (kW) *2		3	6	n×3*3
Operating Temperature Range (℃)		Charge: 0 ~ +50; Discharge: -10 ~ +50		
Relative Humidity		0~95%		
Max. Operating Altitude (m)		3000		
Communication		CAN		
Weight (Kg)		40	80	n×40
Dimensions (W x H x D mm)		Single LX A5.0-10 module: 442×133×420 (without handle); 483×133×452 (with handle)		
Ingress Protection Rating		IP21		
Storage Temperature (℃)		0 ~ +35 (≤ 1 year); -20 ~ 0 (≤ 1 month); -40 ~ 45 (≤ 1 month)		
Mounting Method		Rack mounted/Ground mounted		
Round-trip Efficiency		95%		
Standard and Certification	Safety	IEC62619，IEC 63056，IEC62040-1，INmetro		
	EMC	EN IEC61000-6-1，EN IEC61000-6-2，EN IEC61000-6-3，EN IEC61000-6-4		
	Transportation	UN38.3，ADR		

*1: Test conditions, 100% DOD, 0.2℃ charge & discharge at +25±2 °C for battery system at beginning life. System Usable Energy may vary with different Inverter.
*2: The nominal charge and discharge current and power are affected by temperature and SOC status.
*3: Under the condition of using busbar box to achieve parallel connection of batteries.
*4: New battery, within the range of 2.5~3.65V, at the temperature range of 25+2℃, under the condition of 0.2C/0.2C charge and discharge. The efficiency is 94%~95% under the charging and discharging condition of 0.6C/0.6C.
n：n≤15。

LX A5.0-30

Technical Parameters	LX A5.0-30
Nominal Capacity (kWh)	5.12
usable energy (kWh) * 1	5
Cell Type	LFP (LiFePO4)
Operating Voltage Range (V)	43.2~58.24
Nominal Charge Current (A) *3	60
Max. Continuous Charge Current (A) *2*3	90
Nominal Discharge Current (A) *3	100
Max. Continuous Discharge Current (A) *2*3	150
Max. Pulse Discharge Current (A)	200A（30s）
Max. Continuous Discharge Power (W)	7200
Communication	CAN
Ambient Temperature	0＜T≤40℃ (Recommended 10＜T≤30℃)
Operating Temperature Range (℃)	Charge: 0＜T≤55℃; Discharge: -20＜T≤55℃
Max. Storage Time	12 Months (maintenance-free)
Maximum Operating Altitude (m)	4000
Weight (Kg)	44
Dimensions (W x H x D mm)	442*133*520 (core part), 483*133*559 (max. dimensions)
Ingress Protection Rating	IP20

Application Method		On-grid/On-grid + Back-up/Back-up
Scalability		Supports up to 30 in parallel connection(150kWh) (Hand-in-hand/Busbar connection)
Mounting Method		19-inch standard rack/floor mounted, wall-mounted
Cycle Efficiency*1		≥96%
Cycle Life		6000（25℃±2℃，0.2C，70%EOL）
Warranty*4		10 years
Standard and Certification	Safety	IEC62619、IEC63056、N140
	EMC	EN IEC61000-6-1、EN IEC61000-6-2、EN IEC61000-6-3、EN IEC61000-6-4
	Transportation	UN38.3、ADR
	Environment	ROHS、REACH

*1: Test conditions: 100% DOD, 0.2C charge & discharge at 25°C± 2 ℃，at the beginning of life.
*2: Max. charge / discharge current may be variant with different inverter models
3: Recommend/Max. Charging/Discharging Current/ Nominal/Max. Power derating will occur related to temperature and SOC.
*4: The warranty is due whichever reached first of warranty period or energy throughput.

LX U5.4-20

Technical Parameters	LX U5.4-20	2* LX U5.4-20	3* LX U5.4-20
Usable energy (kWh) *1	5.4	10.8	16.2
Cell Type	LFP（$LiFePO_4$）		
Nominal Voltage (V)	51.2		
Cell Configuration	16S1P	16S2P	16S3P
Nominal Voltage	51.2		
Operating Voltage Range (V)	47.5~57.6		
Nominal Charge/Discharge Current (A) *2	50	100	
Nominal Power (kW) *2	2.56	5.12	
Short-Circuit Current	2.323kA@1.0ms		
Communication	CAN, RS485		

Weight (Kg)		57	114	171
Dimensions (W x H x D mm)		505 x 570 x 175 (LX U5.4-20)		
Operating Temperature Range (℃)		Charge: 0 ~ +50; Discharge: -10 ~ +50		
Storage Temperature (℃)		-20 ~ 40 (≤ 1 month) ; 0 ~ +35 (≤ 1 year)		
Relative Humidity		0~95%		
Max. Operating Altitude (m)		2000		
Ingress Protection Rating		IP65		
Mounting Method		Wall-Mounted/Ground Mounted		
Round-trip Efficiency		95%		
Cycle Life*3		≥ 4000 @0.5C/0.5C		
Standard and Certification	Safety	IEC62619，IEC 63056，IEC62040，CEC		
	EMC	CE, RCM		
	Transportation	UN38.3		

*1: Test conditions, Cell Voltage 2.5~3.65V, 0.5C charge & discharge at +25±3 °C for battery system at
beginning life. System Usable Energy may vary with different Inverter.
*2: Nominal Dis-/Charge Current and power derating will occur related to Temperature and SOC.
*3: Based on Cell under 0.5C/0.5C @ 25±2℃ test condition and 80% EOL.

LX U5.4-20

Technical Parameters	4*LX U5.4-20	5* LX U5.4-20	6* LX U5.4-20
Usable energy (kWh) *1	21.6	27	32..4
Cell Type	LFP（$LiFePO_4$）		
Nominal Voltage (V)	51.2		
Cell Configuration	16S4P	16S5P	16S6P
Nominal Voltage	51.2		
Operating Voltage Range (V)	47.5~57.6		
Nominal Charge/Discharge Current (A) *2	100		
Nominal Power (kW) *2	5.12		
Short-Circuit Current	2.323kA@1.0ms		

Communication		CAN, RS485		
Weight (Kg)		228	285	342
Dimensions (W x H x D mm)		505 x 570 x 175 (LX U5.4-20)		
Operating Temperature Range (℃)		Charge: 0 ~ +50; Discharge: -10 ~ +50		
Storage Temperature (℃)		-20 ~ 40 (≤ 1 month) ; 0 ~ +35 (≤ 1 year)		
Relative Humidity		0~95%		
Max. Operating Altitude (m)		2000		
Ingress Protection Rating		IP65		
Mounting Method		Wall-Mounted/Ground Mounted		
Round-trip Efficiency		95%		
Cycle Life*3		≥ 4000 @0.5C/0.5C		
Standard and Certification	Safety	IEC62619，IEC 63056，IEC62040，CEC		
	EMC	CE, RCM		
	Transportation	UN38.3		

*1: Test conditions, Cell Voltage 2.5~3.65V, 0.5C charge & discharge at +25±3 °C for battery system at
beginning life. System Usable Energy may vary with different Inverter.
*2: Nominal Dis-/Charge Current and power derating will occur related to Temperature and SOC.
*3: Based on Cell under 0.5C/0.5C @ 25±2℃ test condition and 80% EOL.

LX U5.0-30

Technical Parameters	LXU 5.0-30
Nominal Battery Energy (kWh)	5.12
Usable Energy (kWh)*1	5
Cell Type	LiFePO4
Nominal Voltage (V)	51.2
Operating Voltage Range (V)	43.2~58.24
Nominal Charge Current (A)	60
Max Charge Current (A)*2*3	90
Nominal Discharge Current (A)	100
Max Discharge Current (A)*2*3	100

Pulse Discharging current (A)*2*3	< 200A（30S）
Max. Charging/Discharging Power (kW)	4.95
Communication	CAN
T_{Chg} (Charging Temperature Range) (℃)	0<T≤55
T_{Dsch} (Discharging Temperature Range) (℃)	-20<T≤55
Ambient Temperature（℃）	0 < T≤40（Recommend 10 < T≤30）
	Optional heating：-20 < T≤40（Recommend 10 < T≤30）
Relative Humidity	5~95%
Maximum Storage Time	12 Months（maintenance-free）
Max. Operating Altitude (m)	4000
Heating	Optional
Fire Suppression	Optional, Aerosol
Unit Weight (kg)	50
Unit Dimensions（W*H*D mm）	460*580*160
Enclosure Protection Rating	IP65
Applications	On Grid / On Grid + Backup / off Grid
Scalability	30P
Mounting Method	Wall Mounted / Grounded
Round-trip Efficiency*1	≥96%
Cycle Life	> 6000 @25±2℃ 0.5C 70%SOH 90%DOD
Safety	VDE2510-50、IEC62619、IEC62040、N140、IEC63056
EMC	EN IEC61000-6-1, EN IEC61000-6-2, EN IEC61000-6-3, EN IEC61000-6-4
Transportation	UN38.3、ADR
Environment	ROHS
*1 Test conditions: 100% DOD, 0.2C charge & discharge at 25°C±2℃，at the beginning of life.	

*2 The system's working current and power values will be related to temperature and State of Charge (SOC).

*3 Max charge / discharge current values may be variant with different inverter models.

12.3 Smart Meter Technical Data

Technical Parameters			GMK110
	Application		Single phase
Input Data	Voltage	Nominal Voltage (V)	220
		Voltage Range (V)	85~288
		Nominal Voltage Frequency (Hz)	50/60
	Current	CT Ratio	120A/40mA
		CT Quantity	1
Communication			RS485
Communication distance (m)			1000
User Interface			2LED
Accuracy	Voltage/Current		Class I
	Active Energy		Class I
	Reactive Energy		Class II
Power Consumption (w)			< 5
Mechanical Parameters	Dimensions (W x H x D mm)		19*85*67
	Weight (g)		50
	Mounting Method		Rail Installation
Environmental Parameters	Ingress Protection Rating		IP20
	Operating Temperature Range (℃)		-30 ~ 60
	Storage Temperature Range (℃)		-30 ~ 60
	Relative Humidity (Non-Condensing)		0~95%
	Max. Operating Altitude (m)		3000

Technical Parameters			GM330
Input Data	Type of Electrical Supply System		Three-phase
	Voltage	Nominal Voltage L-N (V)	220/230
		Nominal Voltage L-L (V)	380/400
		Voltage Range	0.88Un-1.1Un
		Nominal Voltage Frequency (Hz)	50/60
	Current	CT Ratio	nA:5A
Communication			RS485
Communication distance (m)			1000
User Interface			4 LEDs, Reset Button
Accuracy	Voltage/Current		Class 0.5
	Active Energy		Class 0.5
	Reactive Energy		Class 1
Power Consumption (w)			<5
Mechanical Parameters	Dimensions (W * H * D)		72*85*72
	Weight (g)		240
	Mounting Method		Rail Installation
Environmental Parameters	Ingress Protection Rating		IP20
	Operating Temperature Range (℃)		-30~70
	Storage Temperature Range (℃)		-30~70
	Relative Humidity (No Condensing)		0~95%
	Max. Operating Altitude (m)		3000

12.4 Smart Dongle Technical Data

Technical Parameters	WiFi/LAN Kit-20

Output Voltage (V)		5
Power Consumption (W)		≤2
Communication Interface		USB
Communication Parameters	Ethernet	10M/100Mbps Self-adaption
	Wireless	IEEE 802.11 b/g/n @2.4 GHz
	Bluetooth	Bluetooth V4.2 BR/EDR and Bluetooth LE standard
Mechanical Parameters	Dimensions (W x H x D mm)	48.3*159.5*32.1
	Weight (g)	82
	Ingress Protection Rating	IP65
	Mounting Method	USB port insertion and removal
Operating Temperature Range (℃)		-30~+60
Storage Temperature Range (℃)		-40~+70
Relative Humidity		0-95%
Max. Operating Altitude (m)		4000

Technical Parameters	Ezlink3000
General Data	
Connection Interface	USB
Ethernet interface (optional)	10/100Mbps self-adaption, communication distance ≤100m
Mounting Method	Plug-and-play
Indicator	LED indicator status
Dimensions (W * H * D mm)	49*153*32
Weight (gram)	130
Ingress Protection Rating	IP65
Power Consumption (W)	≤2W (typical value)
Working Mode	STA

Wireless Parameters	
Bluetooth Communication	Bluetooth 5.1
WiFi Communication	802.11 b/g/n（2.412GHz-2.484GHz）
Environmental Parameters	
Operating Temperature Range (℃)	-30 ~ +60
Storage Temperature Range (℃)	-30 ~ +70
Relative Humidity	0-100% (no condensing)
Max. Working Altitude (m)	4000

13 Appendix

13.1 FAQ

13.1.1 How to conduct auxiliary detection for smart meters/CT?

Meter detection function, which can detect whether the CT of the meter is connected correctly and the current operation status of the meter and CT.

Step 1: Access the detection page through Home > Settings > Electricity Meter/CT Auxiliary Detection.

Step 2: Click "Start Detection" and wait for the detection to complete. Then, view the detection results.

13.1.2 How to Upgrade the Device Version

Through the firmware information, you can view or upgrade the DSP version, ARM version, BMS version, and communication module software version of the inverter. Some smart dongles do not support software version upgrade via SolarGo App, and the actual situation shall prevail.

Upgrade prompt:

When the user opens the APP, an upgrade prompt will pop up on the homepage, and the user can choose whether to upgrade or not. If you choose to upgrade, you can complete the upgrade by following the prompts on the interface.

Regular upgrade:

Step 1: Access the firmware information viewing interface through "Home" > "Settings" > "Firmware Information".

Step 2: Click "Check for Updates". If there is a new version, complete the upgrade according to the prompts on the interface.

Forced Upgrade:

The APP will push upgrade information, and users need to upgrade according to the

prompts; otherwise, they will not be able to use the APP. You can complete the upgrade by following the prompts on the interface.

13.2 Abbreviations

Abbreviation	English Description
U_{batt}	Battery Voltage Range
$U_{batt,r}$	Nominal Battery Voltage
$I_{batt,max\ (C/D)}$	Max. Continuous Charging Current Max. Continuous Discharging Current
$E_{C,R}$	Rated Energy
U_{DCmax}	Max. Input Voltage
U_{MPP}	MPPT Operating Voltage Range
$I_{DC,max}$	Max. Input Current per MPPT
$I_{SC\ PV}$	Max. Short Circuit Current per MPPT
$P_{AC,r}$	Nominal Output Power
$S_{r\ (to\ grid)}$	Nominal Apparent Power Output to Utility Grid
$S_{max\ (to\ grid)}$	Max. Apparent Power Output to Utility Grid
$S_{r\ (from\ grid)}$	Nominal Apparent Power from Utility Grid
$S_{max\ (from\ grid)}$	Max. Apparent Power from Utility Grid
$U_{AC,r}$	Nominal Output Voltage
$f_{AC,r}$	Nominal AC Grid Frequency
$I_{AC,max(to\ grid)}$	Max. AC Current Output to Utility Grid
$I_{AC,max(from\ grid)}$	Max. AC Current From Utility Grid
P.F.	Power Factor
S_r	Back-up Nominal apparent power
S_{max}	Max. Output Apparent Power (VA) Max. Output Apparent Power without Grid
$I_{AC,max}$	Max. Output Current
$U_{AC,r}$	Nominal Output Voltage
$f_{AC,r}$	Nominal Output Frequency

$T_{operating}$	Operating Temperature Range
$I_{DC,max}$	Max. Input Current
U_{DC}	Input Voltage
$U_{DC,r}$	DC Power Supply
U_{AC}	Power Supply/AC Power Supply
$U_{AC,r}$	Power Supply/Input Voltage Range
$T_{operating}$	Operating Temperature Range
P_{max}	Max Output Power
P_{RF}	TX Power
P_D	Power Consumption
$P_{AC,r}$	Power Consumption
$F_{(Hz)}$	Frequency
$I_{SC\ PV}$	Max. Input Short Circuit Current
U_{dcmin}-U_{dcmax}	Range of input Operating Voltage
$U_{AC,rang(L-N)}$	Power Supply Input Voltage
$U_{sys,max}$	Max System Voltage
$H_{altitude,max}$	Max. Operating Altitude
PF	Power Factor
THDi	Total Harmonic Distortion of Current
THDv	Total Harmonic Distortion of Voltage
C&I	Commercial & Industrial
SEMS	Smart Energy Management System
MPPT	Maximum Power Point Tracking
PID	Potential-Induced Degradation
Voc	Open-Circuit Voltage
Anti PID	Anti-PID
PID Recovery	PID Recovery
PLC	Power-line Communication
Modbus TCP/IP	Modbus Transmission Control / Internet Protocol
Modbus RTU	Modbus Remote Terminal Unit
SCR	Short-Circuit Ratio
UPS	Uninterruptable Power Supply

ECO mode	Economical Mode
TOU	Time of Use
ESS	Energy Storage System
PCS	Power Conversion System
RSD	Remote shutdown
EPO	Emergency Power Off
SPD	Surge Protection Device
ARC	zero injection/zero export Power Limit / Export Power Limit
DRED	Demand Response Enabling Device
RCR	Ripple Control Receiver
AFCI	AFCI
GFCI	Ground Fault Circuit Interrupter
RCMU	Residual Current Monitoring Unit
FRT	Fault Ride Through
HVRT	High Voltage Ride Through
LVRT	Low Voltage Ride Through
EMS	Energy Management System
BMS	Battery Management System
BMU	Battery Measure Unit
BCU	Battery Control Unit
SOC	State of Charge
SOH	State of Health
SOE	State Of Energy
SOP	State Of Power
SOF	State Of Function
SOS	State Of Safety
DOD	Depth of discharge