V1.7 2026-10-20

Residential Smart Inverter

ET LV 5.0-20kW

LX A5.0-30
GW14.3-BAT-LV-G10
LX U5.0-30
GW16.1-BAT-LV-G10

Solutions Manual

GOODWE

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NOTICE

Due to product version upgrades or other reasons, the content of this document may be updated from time to time. Unless otherwise agreed, the content of this document does not replace the safety precautions on the product labels. All descriptions in this document are for guidance only.

Preface

Overview

This document mainly introduces the product information, installation and wiring, configuration and commissioning, troubleshooting, and maintenance of the energy storage system consisting of an inverter, battery system, and smart meter. Before installing and using the product, please read this manual carefully to understand product safety information and become familiar with product functions and features. The document may be updated periodically; please obtain the latest version of the materials and more product information from the official website.

Applicable Products

The energy storage system includes the following products:

Product Type	Product Information	Description
Inverter	GW5K-ET-L-G10	Rated output power: 5.0 kW
	GW6K-ET-L-G10	Rated output power: 6.0 kW
	GW8K-ET-L-G10	Rated output power: 8.0 kW
	GW10K-ET-L-G10	Rated output power: 10 kW
	GW12K-ET-L-G10	Rated output power: 12 kW
	GW15K-ET-L-G10	Rated output power: 15 kW
	GW20K-ET-L-G10	Rated output power: 20 kW
	GW12K-ET-LL-G10	Rated output power: 12 kW
Battery System	LX A5.0-30	Rated energy: 5.12 kWh, with support for up to 30 parallel clusters
	GW14.3-BAT-LV-G10	Rated energy: 14.3 kWh, with support for up to 30 parallel clusters

Product Type	Product Information	Description
	LX U5.0-30	Rated energy: 5.12 kWh, with support for up to 30 parallel clusters
	GW16.1-BAT-LV-G10	Rated capacity: 16.1 kWh, with support for up to 30 parallel clusters
Battery Mix Parallel Unit	GW12/2-MPU-LVO-G10	Supports parallel-cluster expansion among batteries of different models, with support for up to 30 batteries in parallel clusters
Smart Meter	GM330	Monitoring module in the energy storage system; can detect operating voltage, current, and other information of the system
Smart Communication Dongle	WiFi/LAN Kit-20	Can upload system operating information to the monitoring platform via WiFi or LAN signals
	4G Kit-G20	Can upload system operating information to the monitoring platform via 4G
	4G Kit-CN-G20 (China only)	Can upload system operating information to the monitoring platform via 4G

Symbol Definitions

⚠DANGER
Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
⚠WARNING
Indicates a medium potential hazard which, if not avoided, could result in death or serious injury.
⚠CAUTION

Indicates a low potential hazard which, if not avoided, could result in moderate or minor injury.
NOTICE
Emphasizes and supplements the content, and may also provide tips or tricks for optimized use of the product that can help you solve a problem or save time.

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1 Safety Precautions

Always observe the safety precautions contained in this document when operating the equipment.

⚠WARNING
The equipment has been designed and tested in strict accordance with safety regulations. However, as electrical equipment, relevant safety instructions must be observed before any operation on the equipment. Improper operation may cause serious injury or property damage.

1.1 General Safety

NOTICE

- Due to product version upgrades or other reasons, the content of this document may be updated from time to time. Unless otherwise agreed, the content of this document does not replace the safety precautions on the product labels. All descriptions in this document are for guidance only.
- Read this document carefully before installing the equipment to understand the product and precautions.
- All operations on the equipment must be performed by professional and qualified electrical technicians, who must be familiar with the relevant standards and safety regulations of the project location.
- When operating the equipment, use insulated tools and wear personal protective equipment to ensure personal safety. When touching electronic components, wear antistatic gloves, antistatic wrist straps, antistatic clothing, etc., and ensure Protection of the equipment from electrostatic damage.
- Unauthorized disassembly or modification may cause equipment damage, which is not covered by the warranty.
- Any equipment damage or personal injury resulting from failure to install, use, or configure the equipment in accordance with this document or the corresponding user manual shall not fall within the responsibility of the equipment manufacturer.
- For more product warranty information, please visit the official website:https://emea.goodwe.com/warranty。

1.2 Personnel Requirements

NOTICE

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

1. Professional or qualified personnel include:
   - Personnel who have mastered the equipment working principles, system structure, and knowledge of risks and hazards, and have received professional operation training or possess extensive practical experience.
   - Personnel who have received relevant technical and safety training, possess certain operating experience, are able to recognize dangers that specific operations may cause to themselves, and can take protective measures to minimize risks to themselves and others.
   - Qualified electrical technicians meeting the regulatory requirements of the country/region where they are located.
   - Possess an electrical engineering degree / an advanced diploma in an electrical discipline or equivalent / a professional qualification in the electrical field, and have at least 2/3/4 years of experience in testing and supervision work using electrical equipment safety standards.
2. Personnel involved in special tasks such as electrical work, work at heights, and special equipment operation must hold valid qualification certificates required by the location of the equipment.
3. Medium-voltage equipment operations must be performed by certified high-voltage electricians.
4. Equipment and component replacement is only permitted to be performed by authorized personnel.

1.3 System Safety

DANGER

- Before making electrical connections, disconnect all upstream switches of the equipment to ensure that the equipment is de-energized. Live-line operation is strictly prohibited; otherwise, hazards such as electric shock may occur.
- For equipment that supports PV string connection, the PV input terminals have weak surge current withstand capability. It is strictly prohibited to use a DC voltage source to directly energize the device through the PV port. If energization from the PV port is required, follow the steps below. Any equipment damage caused by non-compliant operation is considered human-caused damage and is not covered by the product warranty.
  1. First, limit the output current of the DC voltage source within the Max. Current from Grid range permitted by the PV port
  2. Then close the inverter's DC Switch
  3. Finally, slowly raise the DC source output voltage from zero to the target value at a rate of ≤50V/s
- To prevent personal injury or equipment damage caused by live operation, a circuit breaker must be installed on the voltage input side of the equipment.
- Applicable laws, regulations, standards, and specifications shall be observed during all operations such as transportation, storage, installation, operation, use, and maintenance.
- The specifications of cables and components used for electrical connections shall comply with local laws, regulations, standards, and specifications.
- Use the cable connectors delivered with the equipment to connect the equipment cables. If connectors of other models are used, any resulting equipment damage is not the responsibility of the equipment manufacturer.
- Ensure that all equipment cables are correctly connected, tightened, and not loose. Improper wiring may cause poor contact or damage to the equipment.
- The equipment's Protection ground wire must be securely connected.
- To ensure Protection of the equipment and its components from damage during transportation, ensure that transportation personnel are professionally trained. Record the operating steps during transportation, and keep the equipment balanced to prevent it from falling.
- The equipment is relatively heavy. Please assign personnel in accordance with the equipment Weight to prevent the equipment from exceeding the Weight range that can be handled manually and causing personnel injury.
- Ensure that the equipment is placed securely and not tilted. Equipment tipping over may cause equipment damage and personal injury.

⚠WARNING

- During equipment installation, avoid placing load on the wiring terminals; otherwise, the terminals may be damaged.
- Avoid excessive tension on cables; otherwise, poor connections may result. During wiring, reserve an appropriate cable length to avoid cables being in a taut state.
- Correctly secure and support cables to prevent the cable's own weight, tension, bending force, torsional force, or other external mechanical stress from acting on terminals or connectors over the long term.
- Ensure that the Protection ground wire is reliably connected and reserve appropriate slack. Under unexpected tensile force or other external mechanical stress, ensure that the Protection ground wire does not break before other conductors.
- Cables of the same type should be bound together. Cables of different types should be laid at least 30 mm apart. Do not intertwine or cross them.
- Using cables in high-temperature environments may cause insulation aging and damage. The distance between cables and heat-generating components or the periphery of heat source areas must be at least 30 mm.

1.3.1 PV String Safety

⚠WARNING

- Ensure that the module frames and mounting system are properly grounded.
- After the DC cables are connected, ensure that the cable connections are tightened and not loose. Improper wiring may cause poor contact or high impedance and damage the inverter.
- Use a multimeter to measure the positive and negative poles of the DC cable to ensure that the positive and negative poles are correct and not reversed, and that the voltage is within the permitted range.
- Use a multimeter to measure the DC cables to ensure correct polarity and no reverse connection; the voltage should be lower than the maximum DC input voltage. Damage caused by reverse connection and Overvoltage is not the responsibility of the equipment manufacturer.
- The PV string output does not support grounding. Before connecting the PV string to the inverter, ensure that the minimum insulation resistance to ground of the PV string meets the minimum insulation impedance requirement (R = Max. Input Voltage (V)/30 mA).
- Do not connect the same PV string to multiple inverters; otherwise, the inverters may be damaged.
- The photovoltaic modules used with the inverter must comply with IEC 61730 Class A standards.
- When the PV string input voltage or input current is high, the inverter output power may be derated.

1.3.2 Inverter Safety

⚠WARNING

- Ensure that the voltage and frequency at the grid-connection point comply with the inverter's grid-connection specifications.
- It is recommended to install Protection devices such as circuit breakers or fuses on the AC side of the inverter. The specifications of the Protection devices must be greater than 1.25 times the Max. Current of the inverter AC output.
- If the inverter triggers fewer than 5 Arc Failure alarms within 24 hours, the alarm can be automatically cleared. After the fifth Arc Failure alarm, the inverter will shut down for Protection, and the inverter can operate normally only after the fault is cleared.
- In a PV system, if no battery is configured, using the BACK-UP function is not recommended; otherwise, it may cause a risk of system power outage.
- Changes in grid voltage and frequency may cause derating of the inverter output power.

1.3.3 Battery Safety

⚠DANGER

- Before operating equipment in the system, ensure that the equipment is powered off to avoid electric shock hazards. During equipment operation, strictly follow all safety precautions in this manual and the safety labels on the equipment.
- Without official authorization from the equipment manufacturer, do not disassemble, modify, or repair the battery or control box; otherwise, electric shock hazards or equipment damage may occur, and losses caused thereby are not within the scope of the equipment manufacturer's responsibility.
- Do not impact, pull, drag, squeeze, or step on the equipment, and do not place the battery in fire; otherwise, the battery has a risk of explosion.
- Do not place the battery in a high-temperature environment. Ensure there is no heat source near the battery and that it is not exposed to direct sunlight. If the ambient temperature exceeds 60°C, a fire may occur.
- If the battery or control box has obvious defects, cracks, damage, or other conditions, do not use it. Battery damage may cause electrolyte leakage.
- Do not move the battery system while the battery is operating. If you need to replace or add batteries, please contact the after-sales service center.
- A Battery Short Circuit 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.
- The battery DC circuit breaker shall comply with the requirements of AS/NZS 5139.
- The same battery is only allowed to be connected to one energy storage inverter. It is prohibited to connect the same battery directly to multiple energy storage inverters. Multiple inverters sharing one battery may cause abnormal return current or circulating current, and cause GFCI leakage Protection and battery overcurrent; in severe cases, it may cause damage to the battery and inverter.

⚠WARNING

- Battery Current may be affected by factors such as temperature, humidity, weather conditions, etc., which may cause battery current limiting and affect the load-carrying capability.
- If the battery cannot start, please contact the after-sales service center as soon as possible. Otherwise, the battery may be permanently damaged.
- Please inspect and maintain the battery periodically according to the battery maintenance requirements.

Emergency Measures for Emergency Situations

- Battery Electrolyte Leakage
  If the battery module leaks electrolyte, avoid contact with the leaked liquid or gas. The electrolyte is corrosive, and contact may cause skin irritation and chemical burns. If you accidentally come into contact with the leaked substance, perform the following operations:
  - Inhalation: Evacuate from the contaminated area and seek medical help immediately.
  - Eye contact: Flush with clean water for at least 15 minutes and seek medical help immediately.
  - Skin contact: Thoroughly wash the contacted area with soap and water and seek medical help immediately.
  - Ingestion: Induce vomiting and seek medical assistance immediately.
- Fire
  - When the battery temperature exceeds 150°C, there is a risk of battery fire; after the battery catches fire, it may release toxic and harmful gases.
  - To avoid fire, ensure that carbon dioxide, Novec 1230, or FM-200 fire extinguishers are available near the equipment.
  - When extinguishing a fire, do not use ABC dry powder fire extinguishers. Firefighters must wear protective clothing and self-contained breathing apparatus.
- Battery Fire Suppression Function Triggered
  For batteries equipped with the optional fire suppression function, perform the following operations after the fire suppression function is triggered:
  - Immediately cut off the main power switch to ensure that no current flows

through the battery system.
- Perform a preliminary visual inspection of the battery for damage, deformation, leakage, or odor, and inspect the battery enclosure, connectors, and cables.
- Use temperature sensors to monitor the battery and ambient temperature, ensuring there is no risk of overheating.
- Isolate and mark damaged batteries, and dispose of them properly in accordance with local regulatory requirements.

1.3.4 Meter Safety

⚠WARNING

If the grid voltage fluctuation exceeds 265 V, long-term overvoltage operation may damage the meter. It is recommended to add a fuse with a Rated Current of 0.5 A on the voltage input side of the meter to provide Protection for the meter.

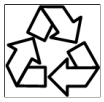
1.4 Explanation of Safety Symbols and Certification Marks

⚠DANGER

- After the equipment is installed, the labels and warning signs on the enclosure must be clearly visible. Do not cover, alter, or damage them.
- The following descriptions of enclosure warning labels are for reference only. The labels actually used on the equipment shall prevail.

No.	Symbol	Meaning
1		Potential hazards exist during equipment operation. Take proper protective measures when operating the equipment.

No.	Symbol	Meaning
2		High voltage hazard. High voltage is present during equipment operation. Before operating the equipment, ensure that the equipment is powered off.
3		The inverter surface may be hot. Do not touch it during equipment operation; otherwise, burns may result.
4		Use the equipment properly; use under extreme conditions may result in an explosion risk.
5		The battery contains flammable materials. Fire hazard.
6		The equipment contains corrosive electrolyte. Avoid contact with leaking electrolyte or vapors.
7		Delayed discharge. After the equipment is powered off, wait 5 minutes for the equipment to fully discharge.
8		Keep the equipment away from open flames or ignition sources.
9		Keep the equipment out of areas accessible to children.
10		Do not extinguish with water.
11		Do not lift the equipment after the battery system wiring is completed or while the battery system is operating.

No.	Symbol	Meaning
12		Do not disassemble
13		Before operating the equipment, please read the product manual carefully.
14		Do not directly disconnect or plug/unplug the DC terminals while the equipment is operating.
15		Wear personal protective equipment during installation, operation, and maintenance.
16	 	The equipment must not be disposed of as household waste. Please dispose of the equipment in accordance with local laws and regulations, or return it to the equipment manufacturer.
17		Protection grounding conductor connection point.
18		Recycling symbol.
19		CE Certification mark.
20		TUV mark.

No.	Symbol	Meaning
21		RCM mark.

1.5 EU Declaration of Conformity

1.5.1 Equipment with Wireless Communication Function

Equipment with wireless communication function that can be sold in the European market meets the following directive requirements:

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

1.5.2 Equipment Without Wireless Communication Capability (Excluding Batteries)

Equipment without wireless communication function that can be sold in the European market meets the following directive requirements:

- 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)

1.5.3 Battery

Batteries that can be sold on the European market meet the following directive requirements:

- 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)*1
- Regulation (EU) 2023/1542 Article 12 - Safety of stationary battery energy storage systems
- Regulation (EU) 2023/1542 Article 10 - Performance and durability requirements for rechargeable industrial batteries, LMT batteries and electric vehicle batteries
- Regulation (EU) 2023/1542 Article 14 - Information on the state of health and expected lifetime of batteries
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)
  *1: Our battery products comply with the hazardous substance limit requirements stipulated by this regulation.

More EU declarations of conformity are available fromthe official website.

2 System Overview

2.1 System Overview

The residential smart inverter solution integrates devices such as inverters, batteries, smart meters, and smart communication sticks. In a PV system, it converts solar energy into electrical energy to meet household electricity demand. The energy IoT devices in the system control electrical loads by identifying the overall power condition in the system, thereby enabling intelligent management of power for load use, battery storage, or grid export.

⚠WARNING

- The energy storage system is not suitable for connecting equipment that relies on a stable power supply, such as life-sustaining medical devices, etc. Please ensure that when the system is powered off，it cannot cause personal injury.
- Select the battery model according to the inverter and battery compatibility list. For battery requirements within the same system, such as whether models can be mixed and whether capacities must be consistent, refer to the battery user manual for the corresponding model or contact the battery manufacturer for relevant requirements. Inverter and battery compatibility list:https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_Battery%20Compatibility%20Overview-EN.pdf。
- Due to product version upgrades or other reasons, the document content may be updated periodically. For the compatibility between inverters and IoT products, refer to:https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_Compatibility-list-of-GoodWe-inverters-and-IoT-products-EN.pdf。
- In a fully off-grid inverter system, if the battery is exposed to low light or rainy weather for an extended period and is not recharged in time, over-discharge may occur, causing battery performance degradation or damage. To ensure long-term stable operation of the system, avoid completely discharging the battery. Recommended measures are as follows:
  1. During off-grid operation, set the minimum SOC Protection threshold. It is recommended to set the lower limit of the off-grid battery SOC to 30%.

⚠WARNING

2. When the SOC approaches the Protection threshold, the system will automatically enter load-limiting or Protection mode.
3. If there is insufficient sunlight for several consecutive days and the battery SOC is too low, recharge the battery in time through external energy sources (such as a generator or grid-assisted charging).
4. Regularly check the battery status to ensure it is within the safe operating range.
5. It is recommended to fully charge and fully discharge the battery once every six months to calibrate SOC accuracy.

- For detailed networking and wiring schemes for each scenario, refer to:5.2.System Wiring Diagram(Page 112)。
- In microgrid scenarios, the PV open-circuit voltage of the PV-storage hybrid inverter is recommended to be < 0.85*PV Max. Input Voltage, to prevent the system voltage from being too high and triggering overvoltage Protection under harsh operating conditions.
- If the system is under high temperature or BMS current limiting, the battery charging power may be limited, which may cause the system voltage to be too high and trigger overvoltage Protection.

When the energy storage system is in the off-grid state, the following loads can be used normally:

Description of the Off-Grid Load Capability of the BACK-UP Port				
Inverter Model	GW5K-ET-L-G10 GW6K-ET-L-G10 GW8K-ET-L-G10 GW10K-ET-L-G10 GW12K-ET-L-G10 GW12K-ET-LL-G10		GW15K-ET-L-G10 GW20K-ET-L-G10	
Load Type	Single-phase	Three-phase	Single-phase	Three-phase
Rated Power of a single inductive load (kVA)	1.1	3.3	2.2	6.6

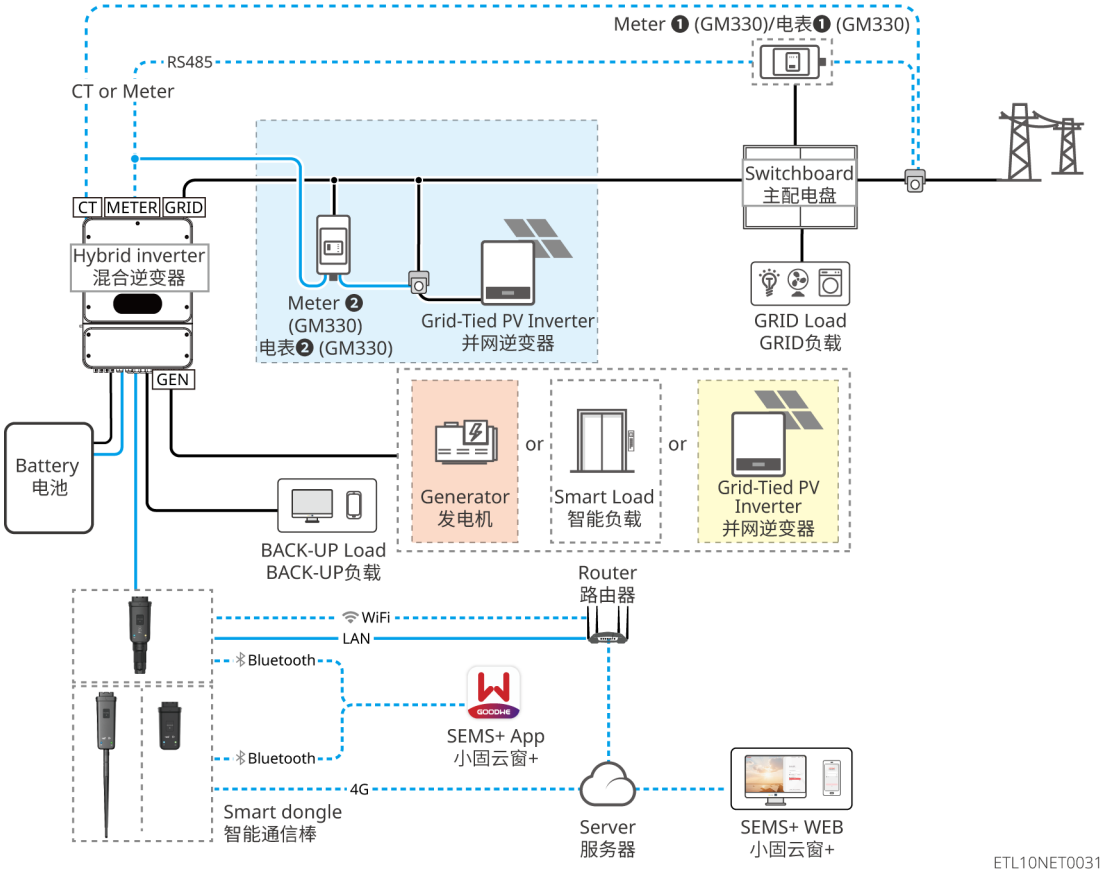
Description of the Off-Grid Load Capability of the BACK-UP Port				
Total Rated Power of multiple inductive load (kVA)	0.4*Pn/3	0.4*Pn	0.5*Pn/3	0.5*Pn
Capacitive Load (kVA)	0.33Pn/3	0.33Pn	0.33Pn/3	0.33Pn
Half-wave Load (kW)	3	-	3	-

Note:

- Pn: Rated output power of the inverter.
- When two or more units are connected in parallel, the allowable total Rated Power of inductive load = Rated Power of a single inductive load * number of parallel units * 80%.
- Half-wave load: some old or non-EMC-compliant household appliances (such as hair dryers and small heaters using half-wave rectification).
- If the total power of multiple inductive load calculated based on Rated Power is less than the Rated Power of a single inductive load, the total Rated Power of multiple inductive load = Rated Power of a single inductive load.
- When driving inductive loads, it is recommended to use a frequency converter.

NOTICE

- Devices of different types can be connected in combinations at different ports.
- If output power limit is required for the grid-tied inverter, please connect a separate meter or CT device.
- The figure below only indicates the categories of devices that can be connected to each port and does not serve as the basis for final configuration. For specific port combination schemes, refer to the Inverter Port Device Matching Table below.



Inverter Port Device Matching Table						
Scenario	GRID port	GEN port	BACK-UP port	Meter Configuration[1]	Detailed Wiring Diagram	
					Three-phase four-wire	Three-phase three-wire
Single inverter	-	Generator	BACK-UP load	Built-in meter/GM330	5.2.1.1.Single-Device Connection at GEN Port (Smart Load/Grid-Tied Inverter/Generator)(Page 113)	5.2.2.2.Single-Device Connection at GEN Port (Smart Load/Generator)(Page 115)
	-	Smart load				
	-	Grid-tied inverter[2]				-

Inverter Port Device Matching Table						
	Grid-tied inverter	-		Built-in meter/GM330❶+GM330❷	5.2.1.3.Smart Load/Generator at GEN Port + Grid-Tied Inverter Connected to GRID Port(Page 114)	5.2.2.3.Smart Load/Generator at GEN Port + Grid-Tied Inverter Connected to GRID Port(Page 116)
	Grid-tied inverter	Smart load				
	Grid-tied inverter	Generator				
Parallel[3]	-	Generator		Built-in meter/GM330	5.2.3.1.Single-Device Connection to a Generator at GEN Port(Page 119)	-
	-	Grid-tied inverter			5.2.3.2.Smart Load/Grid-Tied Inverter Connected to GEN Port(Page 119)	
	-	Smart load				
	Grid-tied inverter	-		Built-in meter/GM330❶+GM330❷		-

Inverter Port Device Matching Table						
	Grid-tied inverter	Smart load			5.2.3.4.Smart Load Connected to GEN Port + Grid-Tied Inverter Connected to GRID Port(Page 120)	
[1]: The built-in meter is not supported in a three-phase three-wire grid. Built-in meter: use the CT supplied with the unit to connect to the inverter. When the inverter's built-in meter is not used, do not connect the inverter's CT port. If the built-in meter does not meet the application requirements, contact your dealer to purchase a meter separately. If meter❷ is required, contact your dealer to purchase it. [2]: Connecting a grid-tied inverter to the GEN port is not supported in a three-phase three-wire grid. [3]: Parallel operation scenarios are not supported in a three-phase three-wire grid.						

Device	Model	Description
Inverter	GW5K-ET-L-G10 GW6K-ET-L-G10 GW8K-ET-L-G10 GW10K-ET-L-G10 GW12K-ET-L-G10 GW15K-ET-L-G10 GW20K-ET-L-G10 GW12K-ET-LL-G10	• The inverter supports connection to a generator、smart load, and grid-tied inverter. • GW5K-ET-L-G10, GW6K-ET-L-G10, GW8K-ET-L-G10, GW10K-ET-L-G10, GW12K-ET-L-G10, and GW12K-ET-LL-G10 only support connection to a single battery input. • GW15K-ET-L-G10 and GW20K-ET-L-G10 support connection to dual battery inputs. • The GW12K-ET-LL-G10 is available in two models: one compatible with a

Device	Model	Description
		three-phase three-wire grid and one not compatible. Check the unit's parameter label to confirm the model configuration. • Each battery input of the inverter supports up to 15 batteries connected in parallel as a cluster. If more batteries need to be connected in parallel, contact GoodWe After-sales Service Center. • System Parallel Quantity Requirements: ◦ The system supports parallel operation of up to 10 inverters. ◦ If a GW combiner box is used, the maximum number of inverters in parallel is 6. ◦ If 10 inverters need to be paralleled, please provide your own busbar based on the system power and the number of battery clusters connected in parallel. • In a parallel Microgrid Scenario, only inverters of the same power class are supported for parallel operation. In a parallel system, if models of different power ratings are mixed, set the higher-power model as the master inverter. • In a parallel system, each inverter must be equipped with a WiFi/LAN Kit-20 or 4G Kit-CN-G20. The WiFi/LAN Kit-20 software version must be V2.5 or later, and the 4G Kit-CN-G20 software version must be 08 or later. • Supports mixed parallel connection of different screens; software version

Device	Model	Description
		requirements for Parallel Networking: ◦ The inverter ARM software version must be 03.225 or later. ◦ The inverter DSP software version must be 04.4050 or later. • Version requirements for supporting the Mix Parallel Unit: . The inverter ARM software version must be 04.220 or later . The inverter DSP software version must be 04.4046 or later
Battery System	LX A5.0-30	Up to 30 battery clusters can be connected in parallel in the same system. When a daisy-chain connection is used, the battery system supports a maximum operating current of 160 A.
	GW14.3-BAT-LV-G10	Up to 30 clusters can be paralleled in the same system: • Products with SN code 25C and later support 30 clusters in parallel by default. • For products prior to 25C, if 30-cluster paralleling is required, please contact GoodWe after-sales service center for Upgrade Firmware. • To view the product SN code, refer to11.4.SN code meaning(Page 377)。

Device	Model	Description
	LX U5.0-30	• Up to 30 clusters can be paralleled in the same system. • Parallel cluster expansion is not currently supported between different models. For the same model, customers are allowed to perform parallel cluster expansion within one year of purchase and use; after one year, parallel cluster expansion is not allowed.
	GW16.1-BAT-LV-G10	Up to 30 battery clusters can be paralleled in the same system.
	Lead-acid battery	• Supports connection of AGM, GEL, and Flooded lead-acid batteries. • Calculate the Battery Qty that can be connected in series according to the Battery Voltage; the total voltage of the series-connected batteries must not exceed 60 V.
Combiner Box	BCB-22-WW-0 BCB-32-WW-0 BCB-33-WW-0 (Purchased from GoodWe) Third-party busbar	Select the combiner box based on the inverter charge/discharge capability, load level, and battery charge/discharge capability in the system. • BCB-22-WW-0: ◦ When used with LX A5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, and connection of up to 6 inverters and 6 batteries.

Device	Model	Description
		◦ When used with LX U5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, and connection of up to 6 inverters and 6 batteries. • BCB-32-WW-0: ◦ When used with LX A5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, and connection of up to 6 inverters and 15 batteries. ◦ When used with LX U5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, and connection of up to 6 inverters and 8 batteries. ◦ When used with GW14.3-BAT-LV-G10, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, and connection of up to 6 inverters and 15 batteries. ◦ When used with GW16.1-BAT-LV-G10, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, and connection of up to 6 inverters and 15 batteries. • BCB-33-WW-0: ◦ When used with LX U5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, and

Device	Model	Description
		connection of up to 6 inverters and 15 batteries. When the Battery Qty exceeds 8, two fuses rated at 600 A must be connected in parallel. • Third-party busbar: Please configure it yourself according to the system power and current.
Mix Parallel Unit	GW12/2-MPU-LVO-G10	• The Mix Parallel Unit supports the following functions: ◦ Capacity Expansion: The Mix Parallel Unit supports capacity expansion. If a customer requires capacity expansion more than one year after purchasing the battery, be sure to use the second channel of the Mix Parallel Unit for capacity expansion with the same battery model. ◦ Mix Parallel: The two battery ports of the Mix Parallel Unit can connect batteries of different GW models. • It has two independent battery connection ports, and each port is compatible with the following battery models: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10. • Battery clusters are connected to the Mix Parallel Unit via two branches; only the same battery model is allowed on a single branch. • The total number of batteries connected to the two ports must not exceed 30 units (i.e., number of

Device	Model	Description
		batteries on BAT1 port + number of batteries on BAT2 port ≤ 30). • After the system is connected to the Mix Parallel Unit, the Max. Current to Grid of the Mix Parallel Unit's INV port is limited by the battery with the lower Max. Current from Grid among the two battery branches. • After the system is connected to the Mix Parallel Unit, the battery Max. Current from Grid at a single port is limited by the Max. Current from Grid of the BAT port on the Mix Parallel Unit.

Device	Model	Description
Smart Meter	• Built-in meter (shipped with the inverter) • GM330 (purchased from GoodWe)	• Built-in meter: Use the CT shipped with the box to connect to the inverter. ◦ CT transformation ratio is 120 A:40 mA. ◦ If the inverter's built-in meter does not meet the application requirements, contact your dealer or other channels to purchase a GM330 smart meter. • GM330: CTs can be sourced from GoodWe or purchased independently; CT ratio requirement: nA/5A ◦ nA: CT primary-side input current, where n ranges from 200 to 5000. ◦ 5A: CT secondary-side output current ◦ If more than two inverters are connected in parallel, or the wire diameter or range of the standard CT does not meet the on-site total parallel current requirements, use a GM330 smart meter.

Device	Model	Description
Smart Communication Dongle	WiFi/LAN Kit-20	• Applicable to single-inverter networking and Parallel Networking scenarios. • Use Bluetooth signals for near-end configuration of device parameters and viewing device operating information; upload system operating information to the monitoring platform via WiFi or LAN. • If the inverter needs to use functions such as one-click upgrade, operation log export, and parallel operation, ensure that the WiFi/LAN Kit-20 software version is V2.5 or later.
	4G Kit-CN-G20 (China only)	• Applicable to single-inverter networking and Parallel Networking scenarios. • Use Bluetooth signals for near-end configuration of device parameters and viewing device operating information; upload system operating information to the monitoring platform via 4G. • If the inverter needs to use functions such as one-click upgrade, operation log export, and parallel operation, ensure that the 4G Kit-CN-G20 version is 08 or later.

Device	Model	Description
	4G Kit-G20	• Applicable to single-inverter networking scenarios. • Use Bluetooth signals for near-end configuration of device parameters and viewing device operating information; upload system operating information to the monitoring platform via 4G.
Smart load	-	1. Total smart load power < maximum output power of the GEN port. 2. Smart load power + BACK-UP power < AC Max. Input Power (grid).
Generator	-	The generator power must be greater than the total power of all loads connected to the BACKUP port.

Device	Model	Description
Grid-tied inverter	-	• GoodWe-brand grid-tied inverters are recommended; third-party grid-tied inverters are supported. • Ensure the rated output power of the grid-tied inverter ≤ the rated output power of the hybrid inverter. • When the microgrid/coupled system is grid-connected, if power limiting is required, ensure: ◦ The PV-storage hybrid inverter must be configured via the App**Grid Power Limit**screen; for the grid-tied inverter, configure it according to the actual tool used. ◦ To ensure that the grid-tied inverter can continue generating power, it is necessary to use the App**Micro-grid Control**screen to adjust the output power of the hybrid inverter. Note: The accuracy of output Power Control differs among grid-tied inverters; set the grid power limit parameter value according to the actual conditions.

2.2 Product Overview

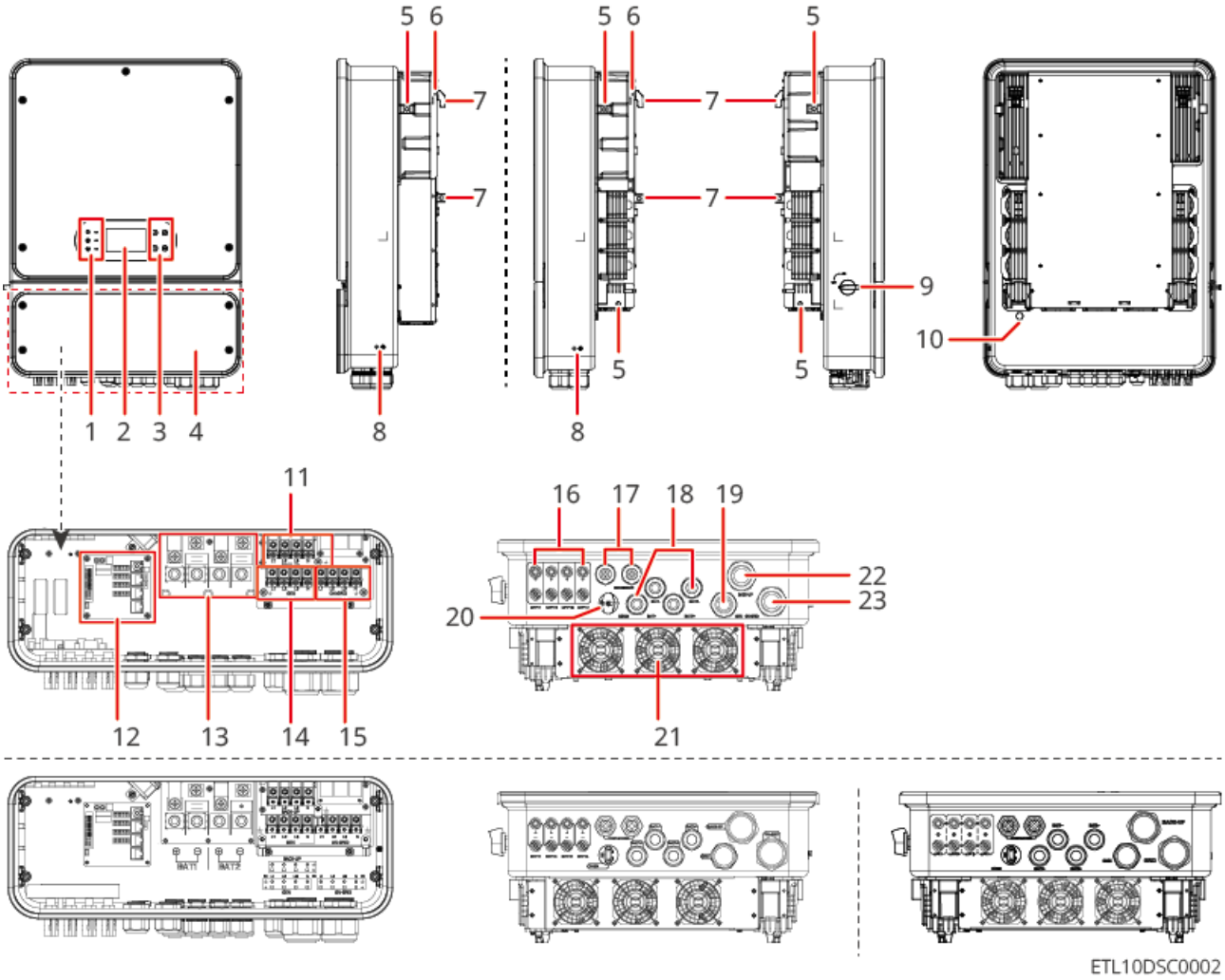
2.2.1 Inverter

The inverter controls and optimizes energy flow in the PV system through the integrated energy management system. The power generated in the PV system can be supplied to loads, stored in batteries, or exported to the grid.

NOTICE

The appearance of inverters in different power ranges may vary. The actual product shall prevail.

No.	Model	Rated Output Power	Rated Output Voltage
1	GW5K-ET-L-G10	5kW	400/380, 3L/N/PE
2	GW6K-ET-L-G10	6kW	400/380, 3L/N/PE
3	GW8K-ET-L-G10	8kW	400/380, 3L/N/PE
4	GW10K-ET-L-G10	10kW	400/380, 3L/N/PE
5	GW12K-ET-L-G10	12kW	400/380, 3L/N/PE
6	GW15K-ET-L-G10	15kW	400/380, 3L/N/PE
7	GW20K-ET-L-G10	20kW	400/380, 3L/N/PE
8	GW12K-ET-LL-G10	12kW	220, 3L/N/PE, 3L/PE



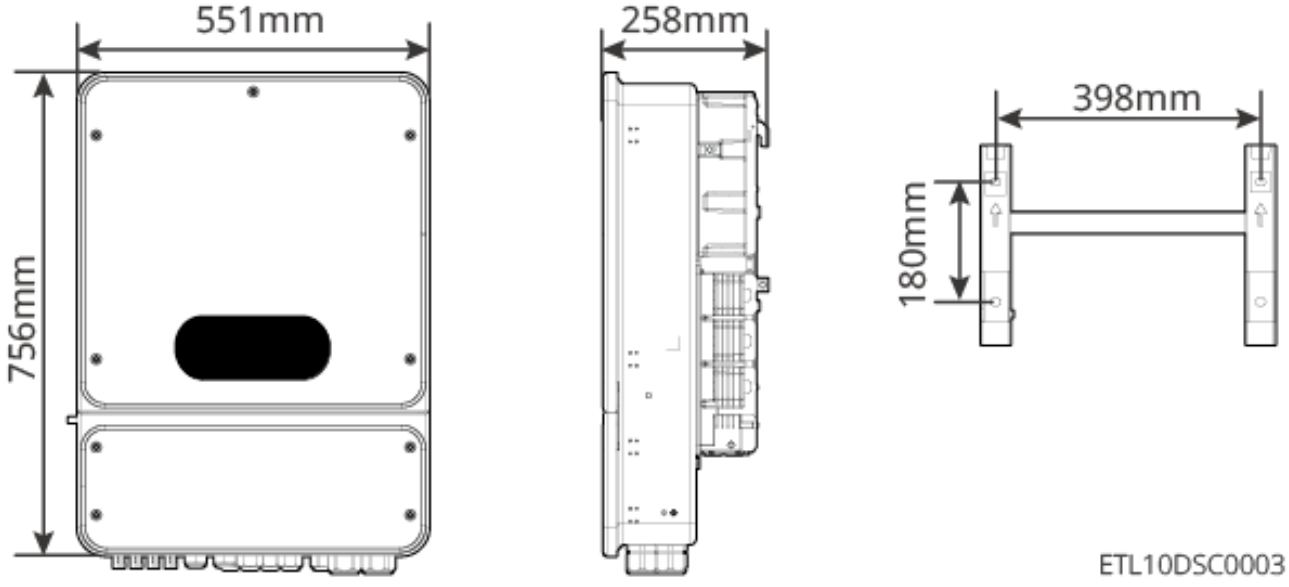
Component introduction

No.	Component/Silkscreen	Description
1	Indicator	Indicates the operating status of the inverter.
2	Display	View inverter data.
3	Button	Used with the display to configure the inverter.
4	Inverter enclosure lower cover	-

No.	Component/Silkscreen	Description
5	Inverter lifting handle mounting holes	(Optional) Used to install the lifting handles. • GW5K-ET-L-G10，GW6K-ET-L-G10，GW8K-ET-L-G10，GW10K-ET-L-G10，GW12K-ET-L-G10，GW12K-ET-LL-G10 x 3 • GW15K-ET-L-G10，GW20K-ET-L-G10 x 4
6	Anti-theft lock mounting hole	(Optional) Used to install the anti-theft lock between the bracket and the inverter.
7	Inverter mounting slot	Used for hanging the inverter during installation.
8	Grounding terminal	Connect the ground wire for Protection.
9	DC Switch	Controls the connection or disconnection of the DC input.
10	Pressure relief valve	-
11，22	BACK-UP port	Connect the AC cable to connect critical loads to the inverter.
12，17	Communication port	Supports connection to load control,CT、RS485, Remote Shutdown/Rapid Shutdown、DRED(Australia)/RCR(Europe), and other communication cables.
13，18	Battery input port	Can connect battery DC input cables. • GW5K-ET-L-G10，GW6K-ET-L-G10，GW8K-ET-L-G10，GW10K-ET-L-G10，GW12K-ET-L-G10，GW12K-ET-LL-G10 x 1 • GW15K-ET-L-G10，GW20K-ET-L-G10 x 2
14，19	GEN port	Used to connect a generator, large loads, or a grid-tied inverter.

No.	Component/Silkscreen	Description
15，23	GRID port	Connect the AC cable to connect the inverter to the grid.
16	PVinput terminals	Can connectPVmodule DC input cables. • GW5K-ET-L-G10，GW6K-ET-L-G10，GW8K-ET-L-G10 x 2 • GW10K-ET-L-G10，GW12K-ET-L-G10，GW12K-ET-LL-G10 x 3 • GW15K-ET-L-G10，GW20K-ET-L-G10 x 4
20	Communication module port	• Can connect communication modules, such asWiFi/LANcommunication modules. • Supports connecting aUdisk to perform Local Upgrade of the inverter software version. • In the Brazilian market, aUSB-RS485adapter cable can be connected.
21	Cooling fan	Used for inverter heat dissipation.

Dimensions description

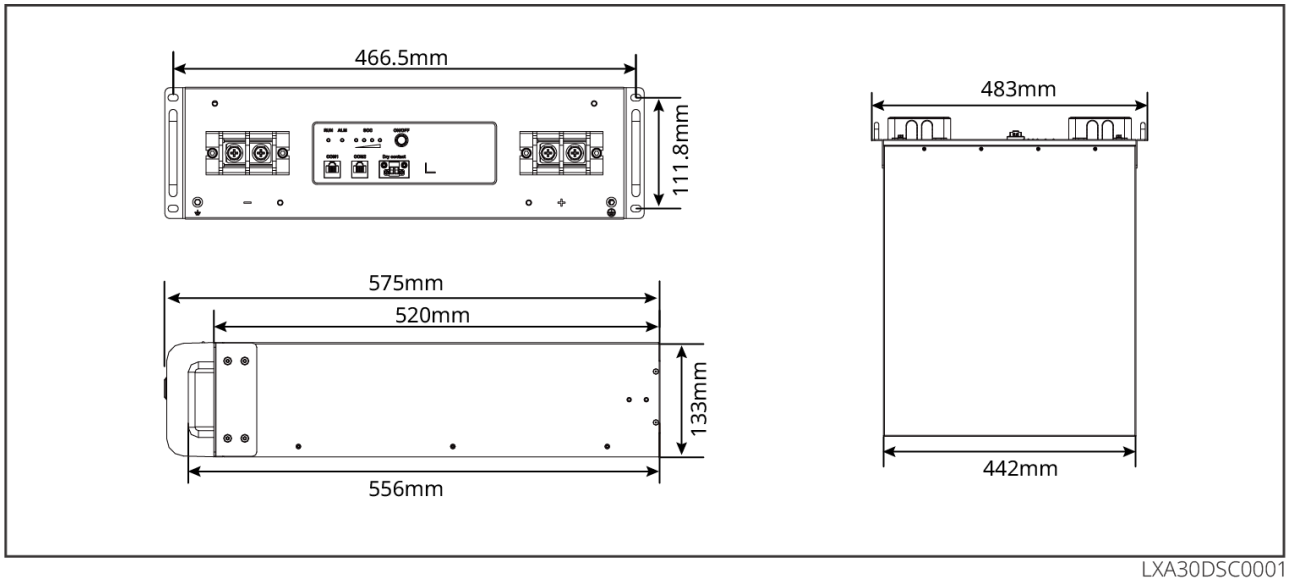


2.2.2 Battery

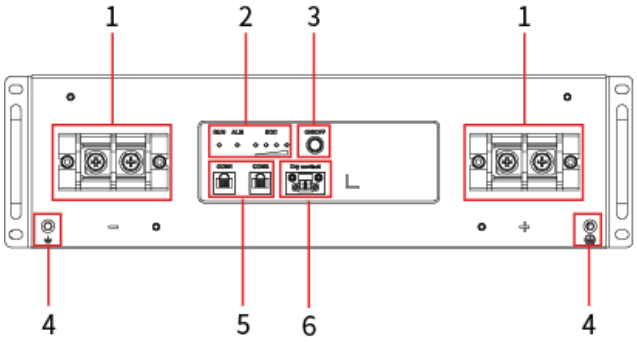
The battery system can store and release power as required by the PV energy

storage system. Both the input and output ports of the energy storage system are high-voltage DC. The inverter supports use with lead-acid batteries. For lead-acid battery product information, please obtain it from the lead-acid battery manufacturer.

2.2.2.1 LX A5.0-30



LXA30DSC0001

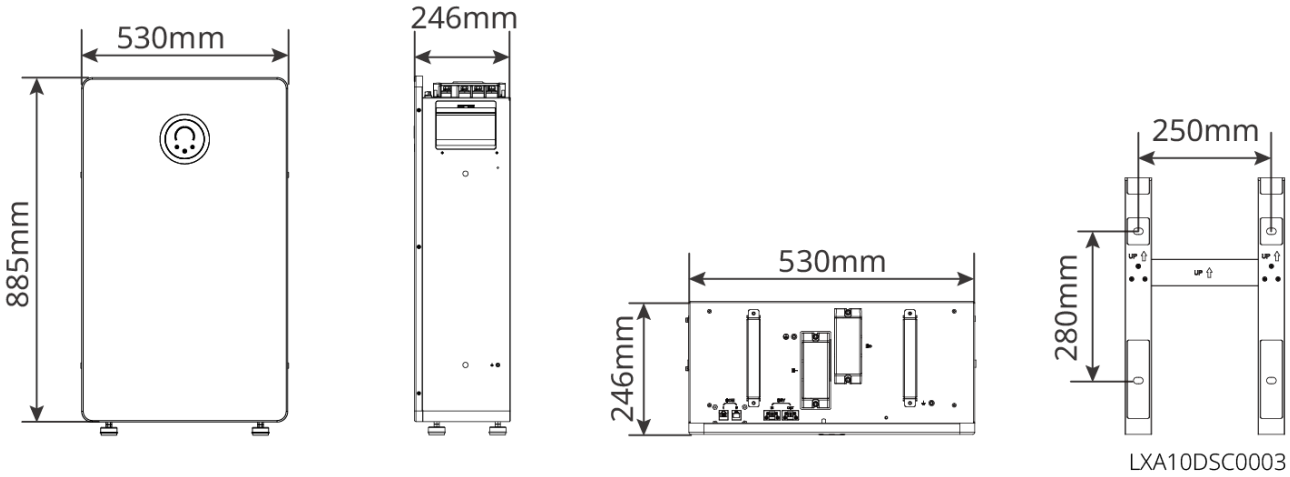


LXA30DSC0002

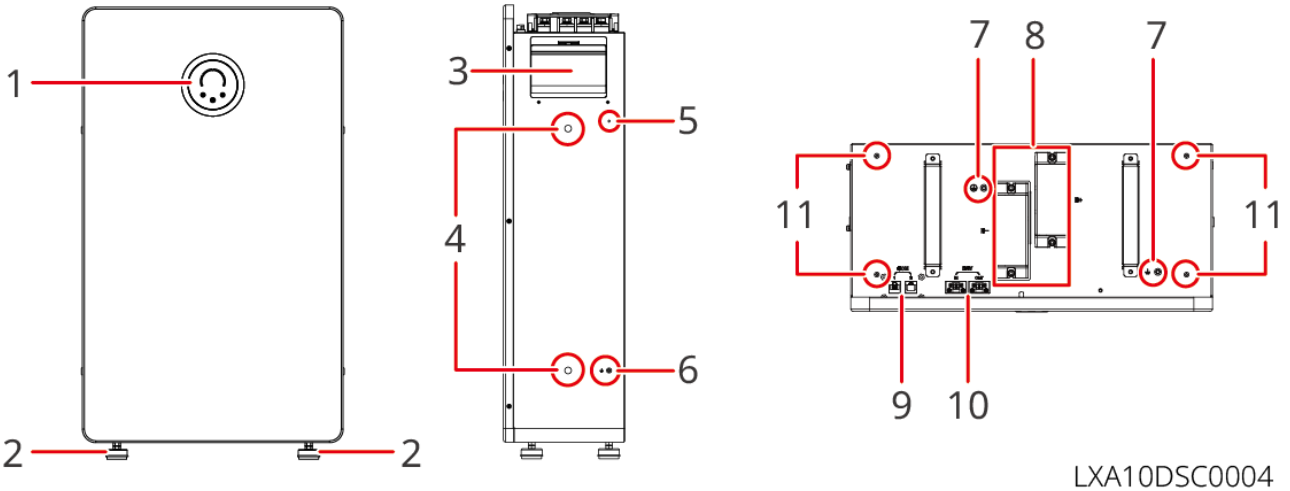
No.	Component/Silk screen	Description
1	Battery DC port	Connect the battery DC input cable.
2	Indicator	Indicates the battery operating status.
3	Battery system button	Used for battery power-on/off and black start.

No.	Component/Silk screen	Description
4	Protection ground terminal	Connect the enclosure Protection ground cable.
5	Communication port	Connect the battery communication cable.
6	Dry contact	Reserved.

2.2.2.2 GW14.3-BAT-LV-G10



LXA10DSC0003

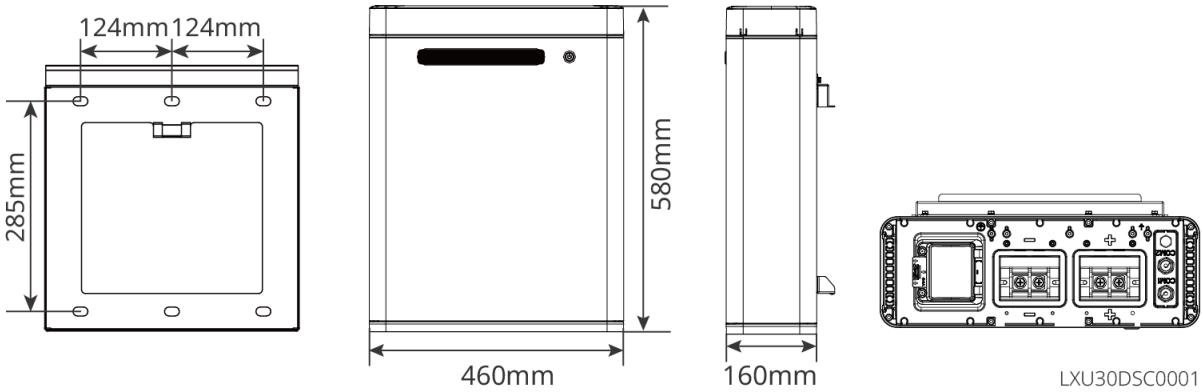


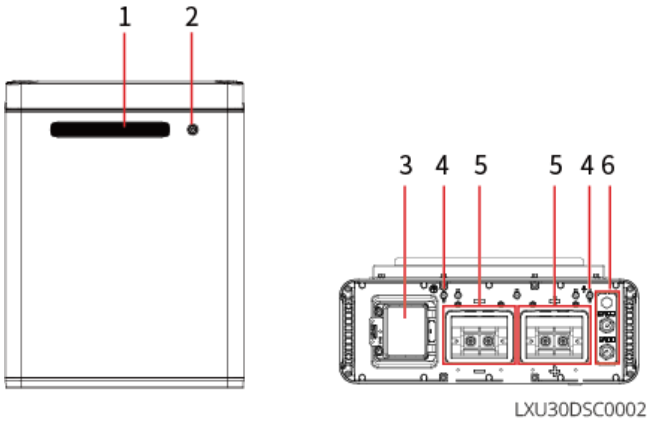
LXA10DSC0004

No.	Component/Silk screen	Description
1	Indicator	Indicates the battery operating status.

No.	Component/Silk screen	Description
2	Feet	Supports the battery.
3	Battery circuit breaker	Used for battery power-on and power-off.
4	Lifting handle mounting hole	Used to install the lifting handle. Used when manually moving the battery.
5	L-shaped bracket mounting hole	Used to secure the battery to the wall.
6	Protection ground terminal	Connect the enclosure Protection ground cable, reserved.
7	Protection ground terminal	Connect the battery system Protection ground cable.
8	Battery DC port	Connect the battery DC input cable.
9	Communication port	Connect the battery communication cable.
10	Dry contact	Reserved.
11	Decorative cover mounting hole	Used to secure the battery decorative cover.

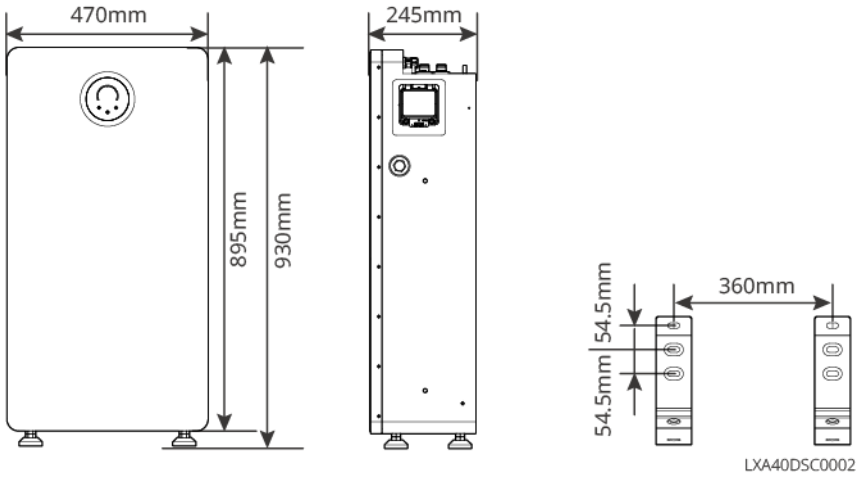
2.2.2.3 LX U5.0-30

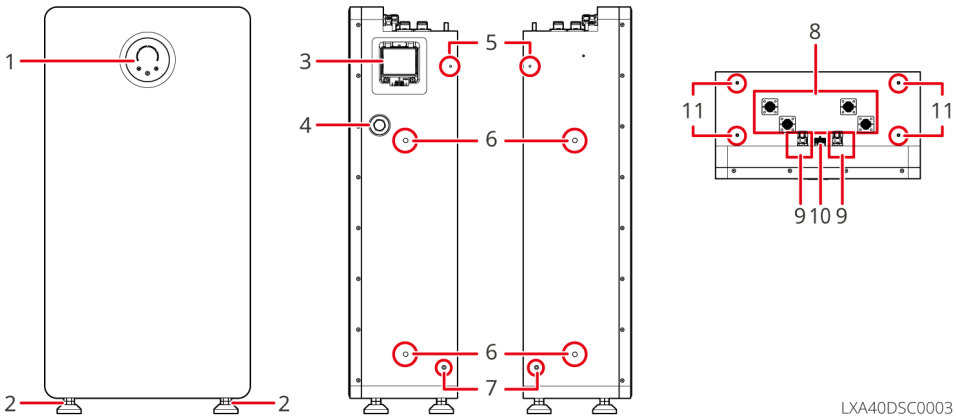




No.	Component/Silk screen	Description
1	Indicator	Indicates the battery operating status.
2	Battery system button	Used for battery power-on/off and black start.
3	Battery circuit breaker	Used for battery power-on and power-off.
4	Protection ground terminal	Connect the enclosure Protection ground cable.
5	Battery DC port	Connect the battery DC input cable.
6	Communication port	Connect the battery communication cable.

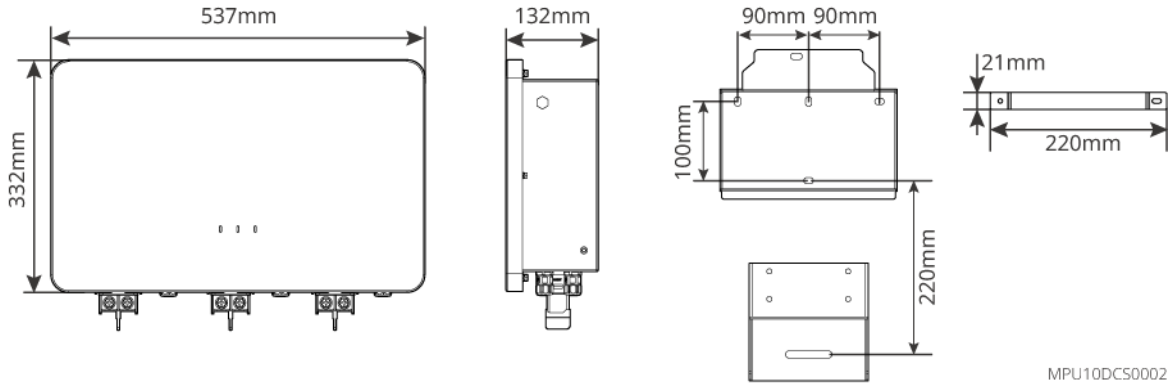
2.2.2.4 GW16.1-BAT-LV-G10

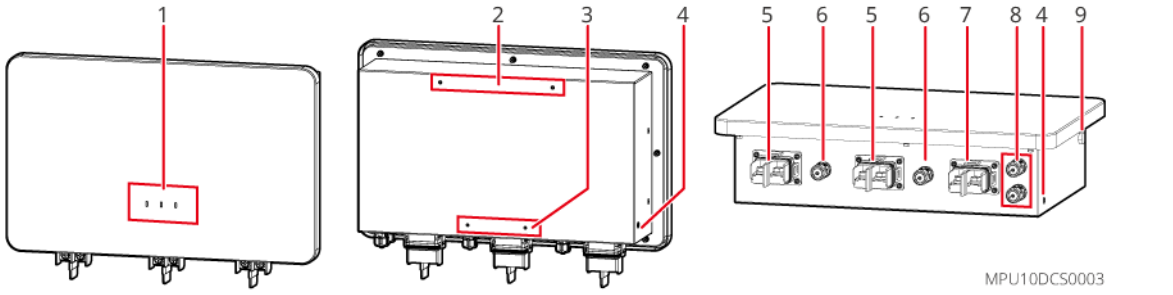




No.	Component/Silk screen	Description
1	Indicator	Indicates the battery operating status.
2	Feet	Supports the battery.
3	Battery circuit breaker	Used for battery power-on and power-off.
4	Explosion-proof breather valve	Equalizes the internal and external air pressure of the battery to prevent explosion.
5	Anti-tip bracket mounting hole	Used to secure the battery to the wall.
6	Lifting handle mounting hole	Used to install the lifting handle. Used when manually moving the battery.
7	Protection ground terminal	Connect the enclosure Protection ground cable.
8	Battery DC port	Connect the battery DC input cable.
9	Communication port	Connect the BMS communication cable between the inverter and battery
10	DRY port	Connect the battery dry contact signal cable. It can be connected to external fire protection devices, etc.
11	Decorative cover mounting hole	Used to secure the battery decorative cover.

2.2.3 Mix Parallel Unit

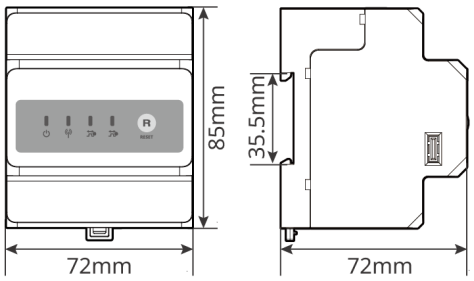




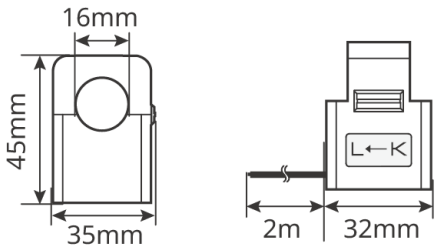
No.	Component/Silkscreen	Description
1	Indicator	Indicates the operating status of the Mix Parallel Unit.
2	Mounting hole positions for the mounting bracket	Mounting bracket for securing the Mix Parallel Unit.
3	Mounting hole positions for the enclosure fixing bracket	Fixed-end mounting plate of the wall-mount bracket for securing the Mix Parallel Unit.
4	Protection ground terminal	Connect the enclosure Protection ground cable.
5	DC port BAT1 DC port BAT2	DC cable connecting the battery to the Mix Parallel Unit.
6	Communication port	Communication cable connecting the battery to the Mix Parallel Unit.
7	DC port INV	DC cable connecting the inverter to the Mix Parallel Unit.
8	Communication port	Communication cable connecting the inverter to the Mix Parallel Unit.
9	Breather valve	Balance internal and external air pressure.

2.2.4 Smart Meter

The smart meter can measure and monitor electrical data in the PV energy storage system, such as voltage, current, frequency, Power Factor, power, etc.



GMK10DSC0003



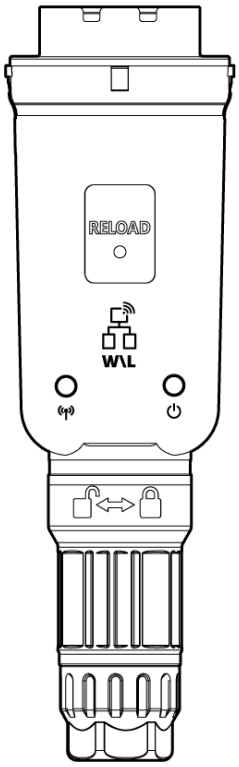
GMK10DSC0022

No.	Model	Applicable scenarios
1	GM330	The CT can be purchased from GoodWe or independently. CT ratio requirement: nA: 5A • nA: CT primary-side input current; n ranges from 200 to 5000 • 5A: CT secondary-side output current

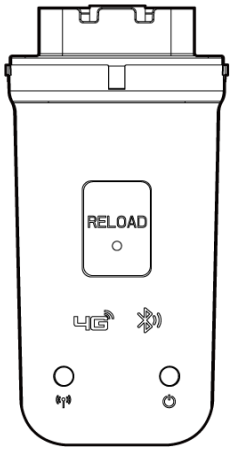
2.2.5 Smart Dongle

The Smart Dongle is mainly used to transmit various types of inverter power generation data to the remote monitoring platform in real time, and to connect to the Smart Dongle via the App for local device commissioning.

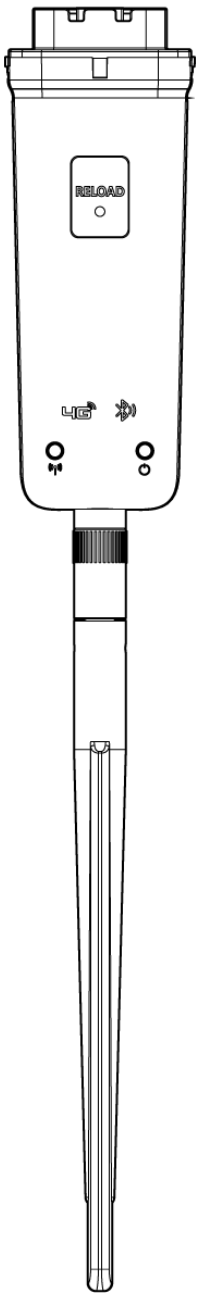
WiFi/LAN Kit-20



4G Kit-CN-G20

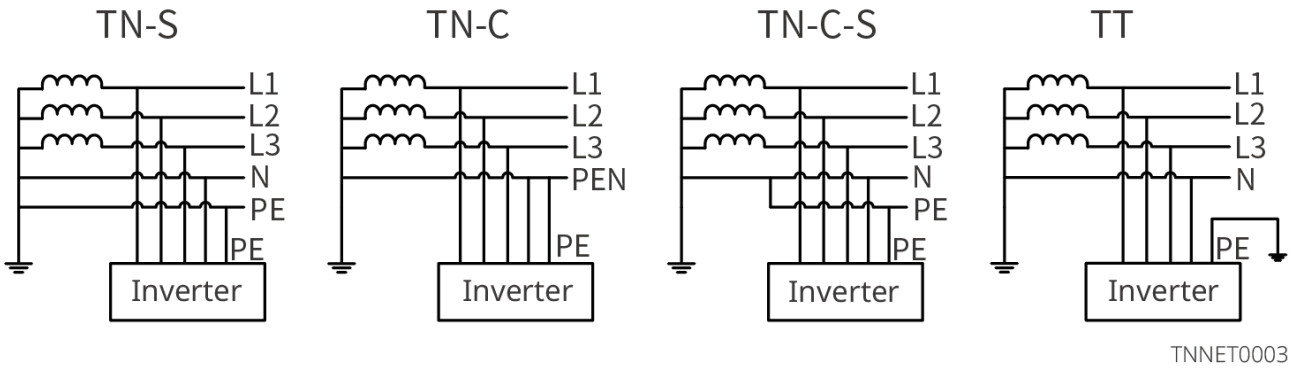


4G Kit-G20

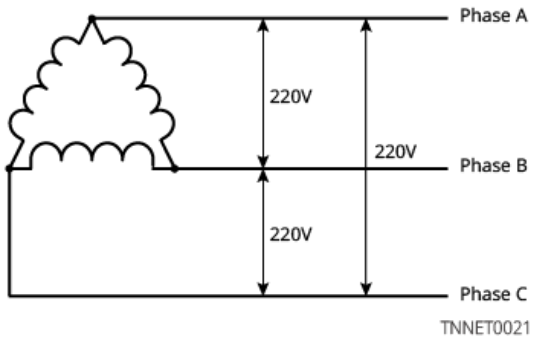


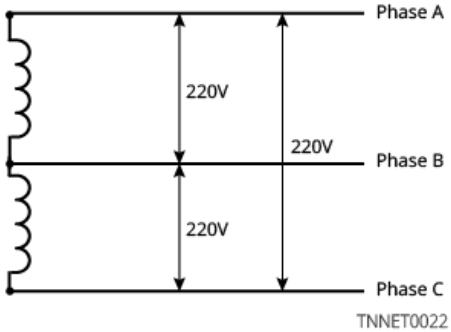
No.	Model	Signal Type	Applicable scenarios
1	WiFi/LAN Kit-20	WiFi, LAN, Bluetooth	Invertersingle-unit,multi-unit scenarios
2	4G Kit-CN-G20 (China only)	4G, Bluetooth	Invertersingle-unit,multi-unit scenarios
3	4G Kit-G20	4G, Bluetooth	Inverter single-unit scenario.

2.3 Supported Grid Types



Only GW12K-ET-LL-G10 is supported





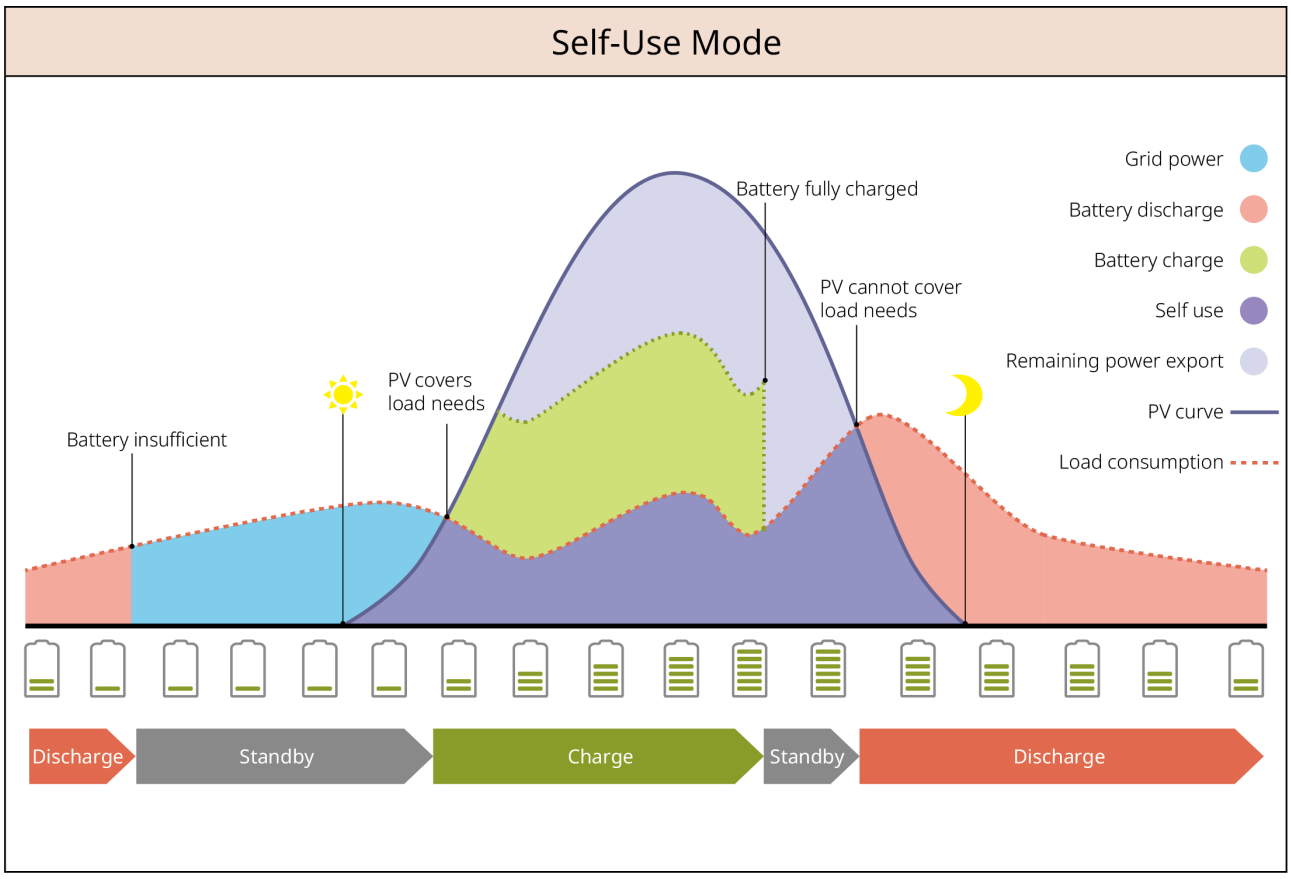
2.4 System Mode

NOTICE

After the First-time Installation of the GW14.3-BAT-LV-G10 and GW16.1-BAT-LV-G10 battery systems, the system will automatically perform a one-time full battery charge; once completed, it will switch to the configured operating mode.

Self-consumption Mode

- The basic mode of system operation.
- PV power preferentially supplies the load; excess power charges the battery, and any remaining power is exported to the grid. When PV power cannot meet the load demand, the battery supplies the load; when the battery energy also cannot meet the load demand, the grid supplies the load.



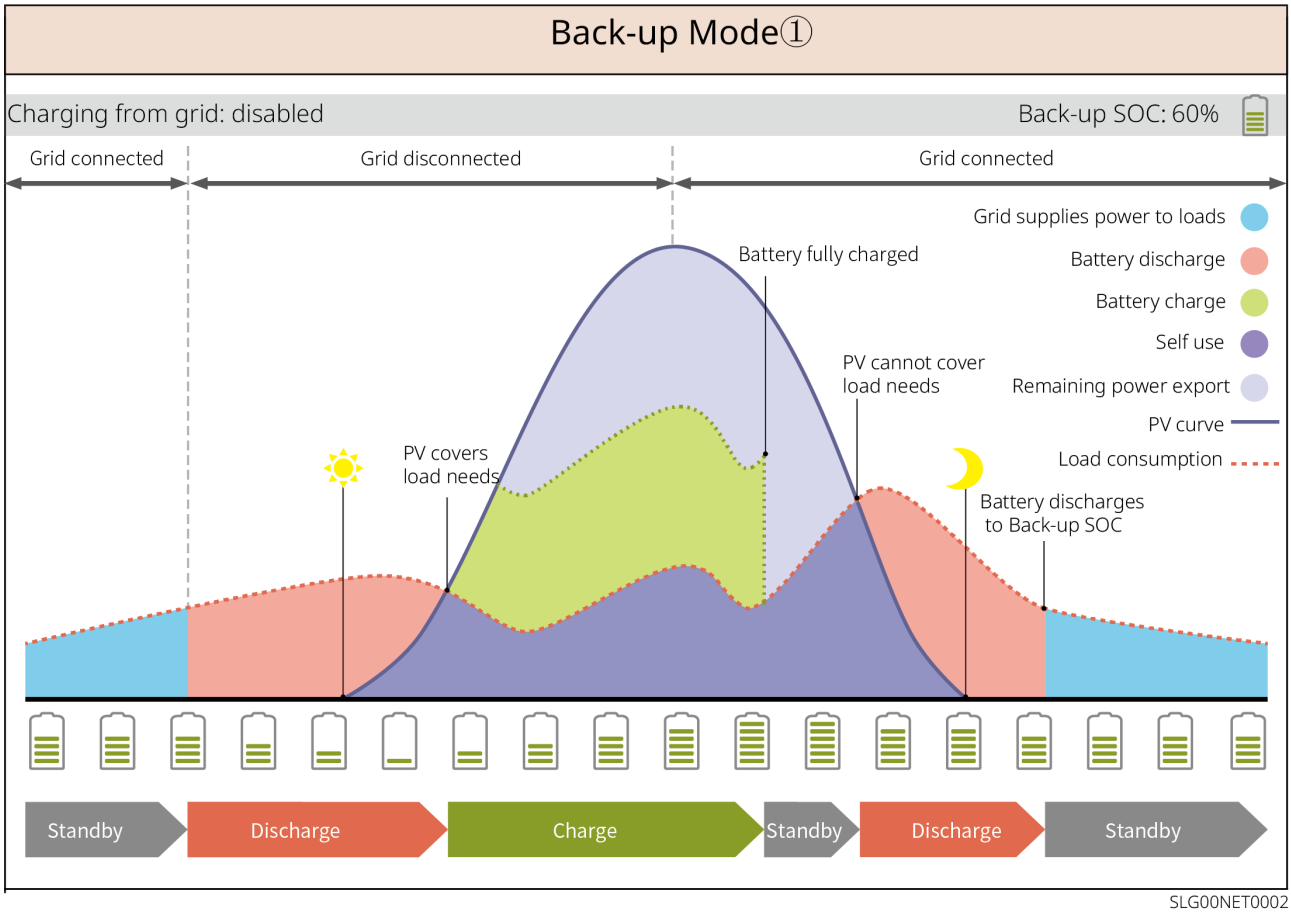
SLG00NET0009

Backup Mode

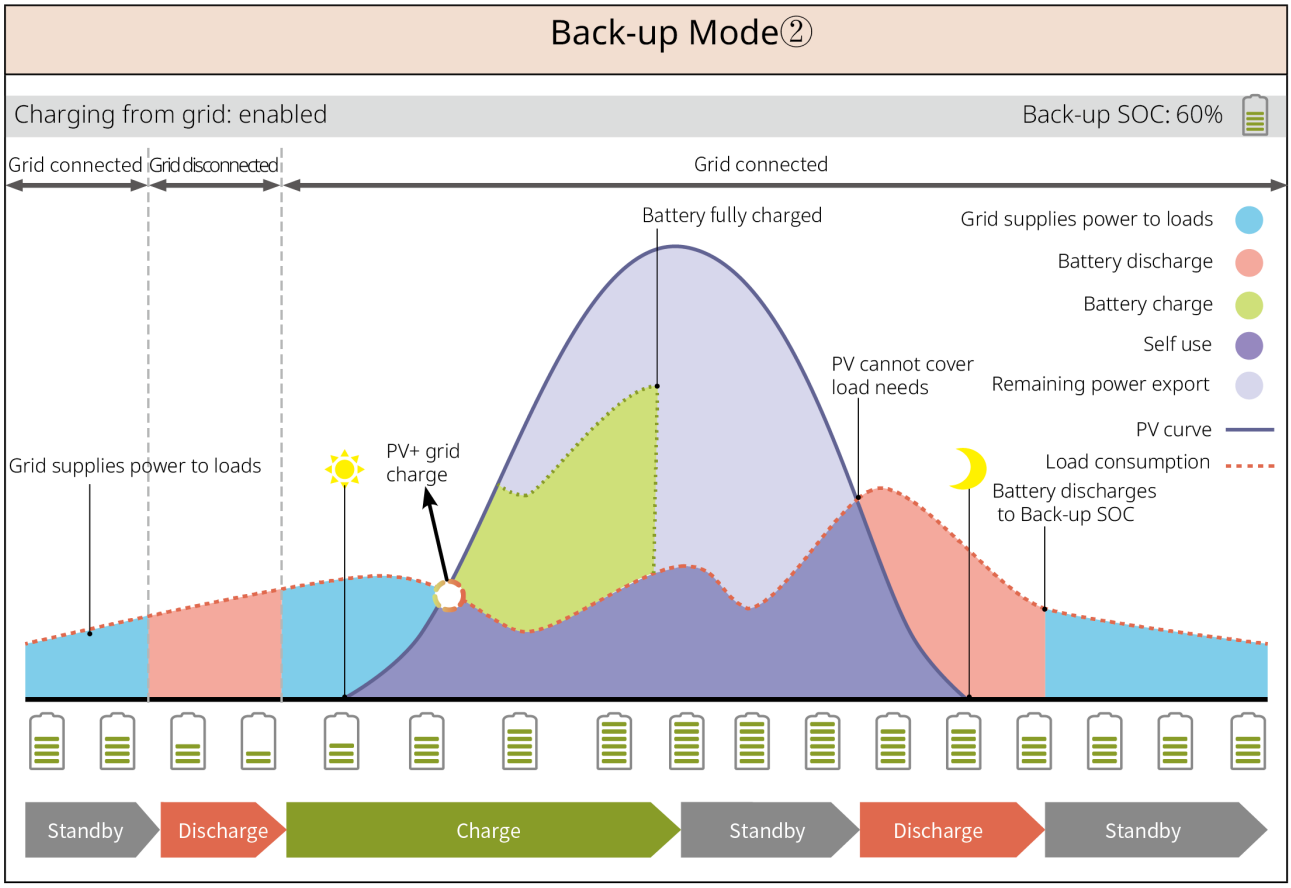
- Recommended for areas with unstable grid.
- When a Grid Power Outage occurs, the inverter switches to off-grid operating mode, and the battery discharges to supply the load, ensuring that the BACK-UP

load remains powered; when the grid recovers, the inverter operating mode switches to grid-connected operation.

- To ensure that the battery SOC is sufficient to maintain normal system operation during off-grid operation, when the system is grid-connected, the battery will be charged to the backup power SOC using PV or grid-purchased electricity. If the battery needs to be charged by purchasing electricity from the grid, confirm that local grid laws and regulations are met.



SLG00NET0002



SLG00NET0003

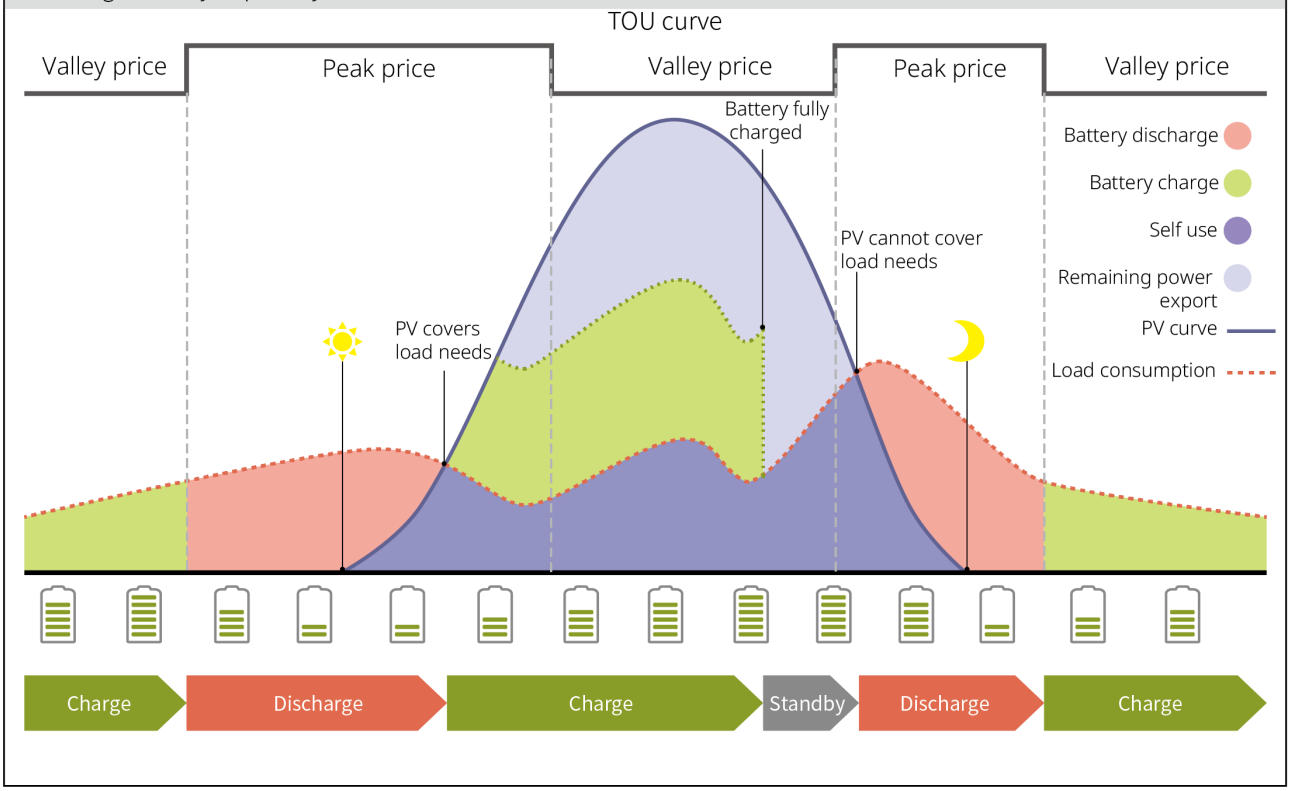
TOU Mode

Where local laws and regulations are met, set different time periods for purchasing energy and Export Energy based on grid peak-valley Tariff differences.

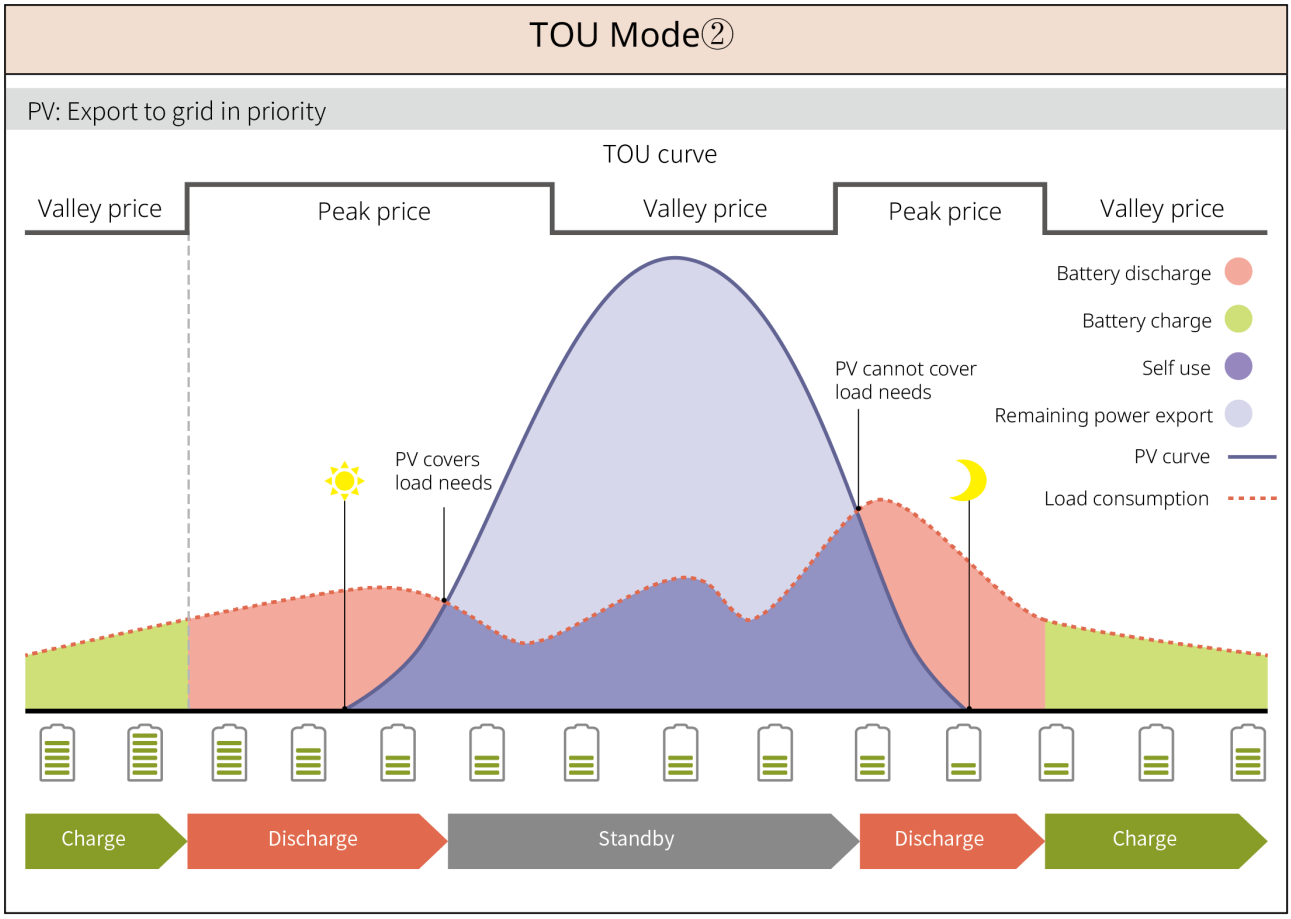
For example, during the valley Tariff period, set the battery to charging mode to purchase electricity from the grid for charging; during the peak Tariff period, set the battery to discharging mode to supply the load via the battery.

TOU Mode①

PV: Charge battery in priority



SLG00NET0004

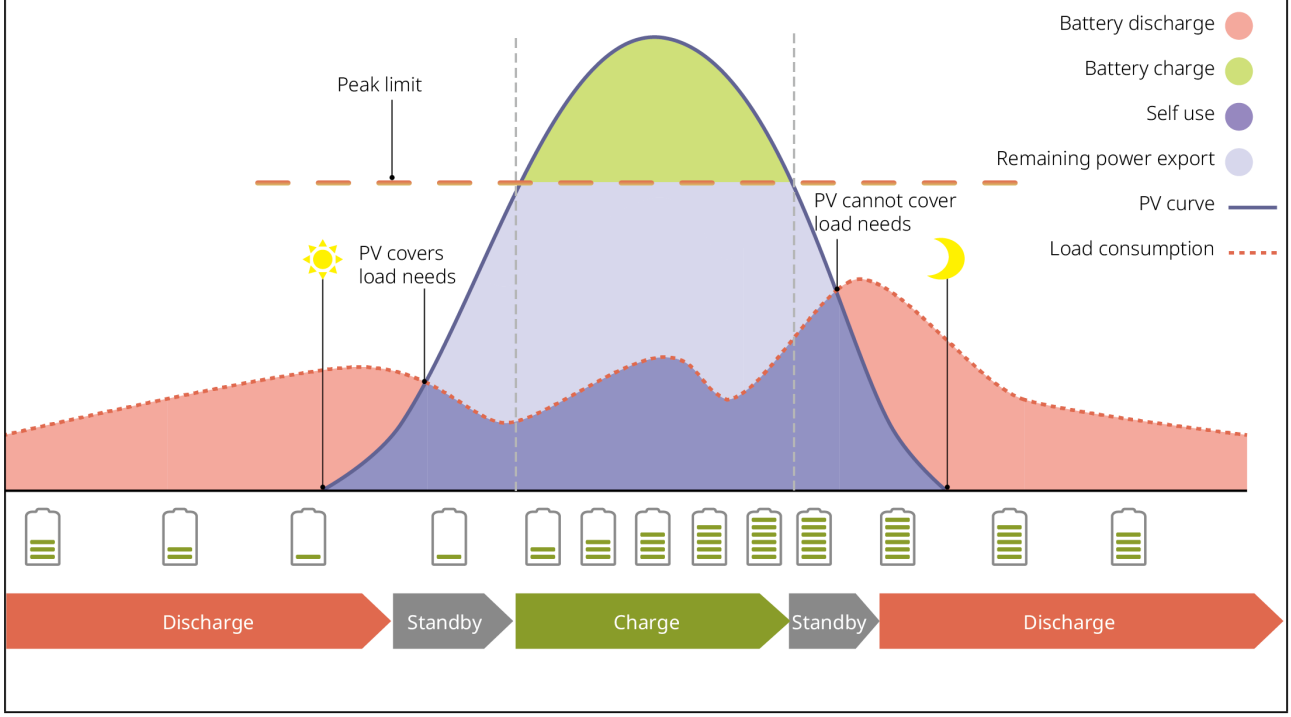


SLG00NET0005

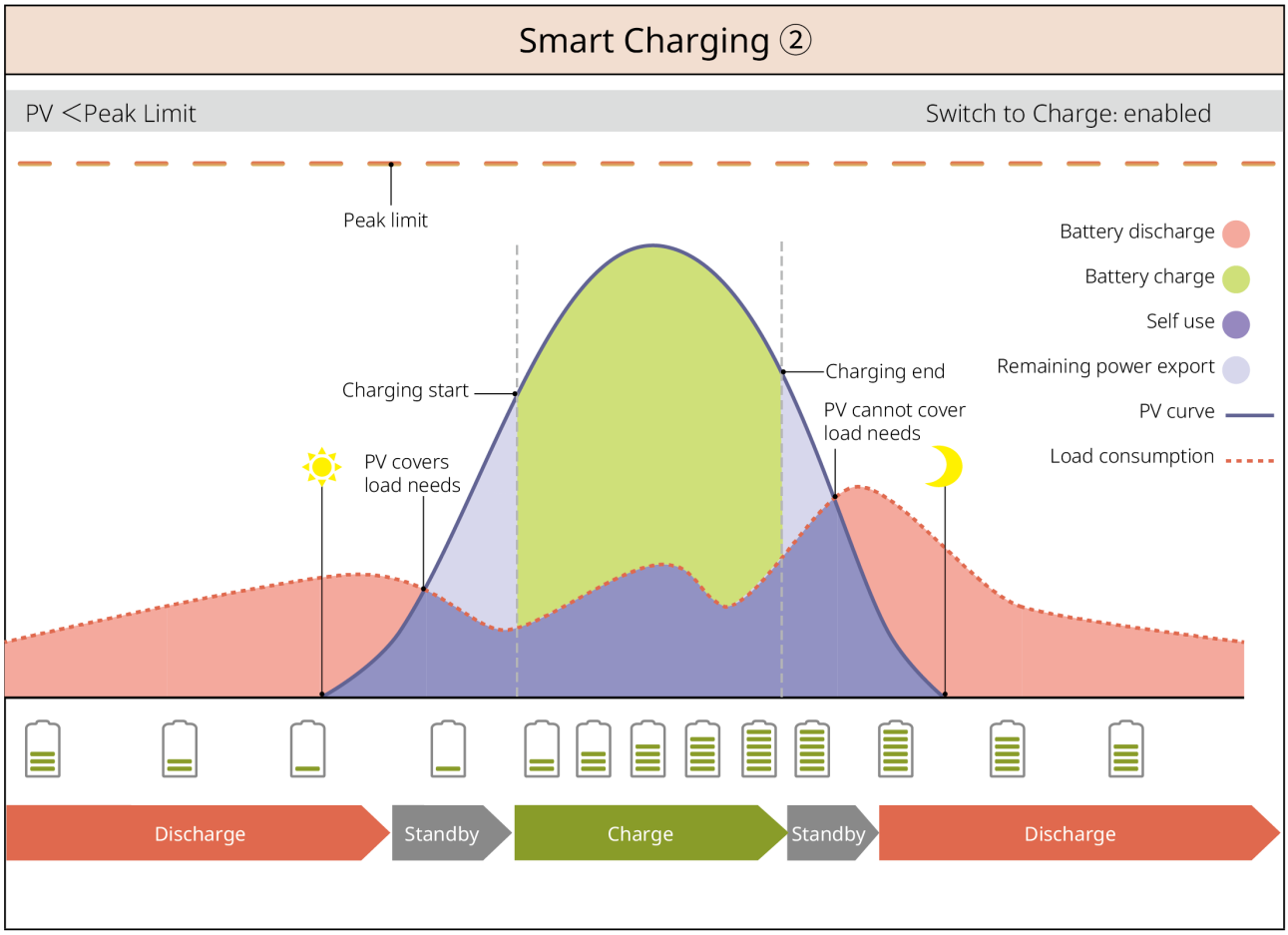
Smart Charging (Delayed Charging) Mode

- Applicable to areas with grid-connected power output limits.
- Setting a peak power limit allows PV power generation exceeding the grid-connected limit to be used to charge the battery; alternatively, set a PV charging period to use PV power generation to charge the battery during that period.

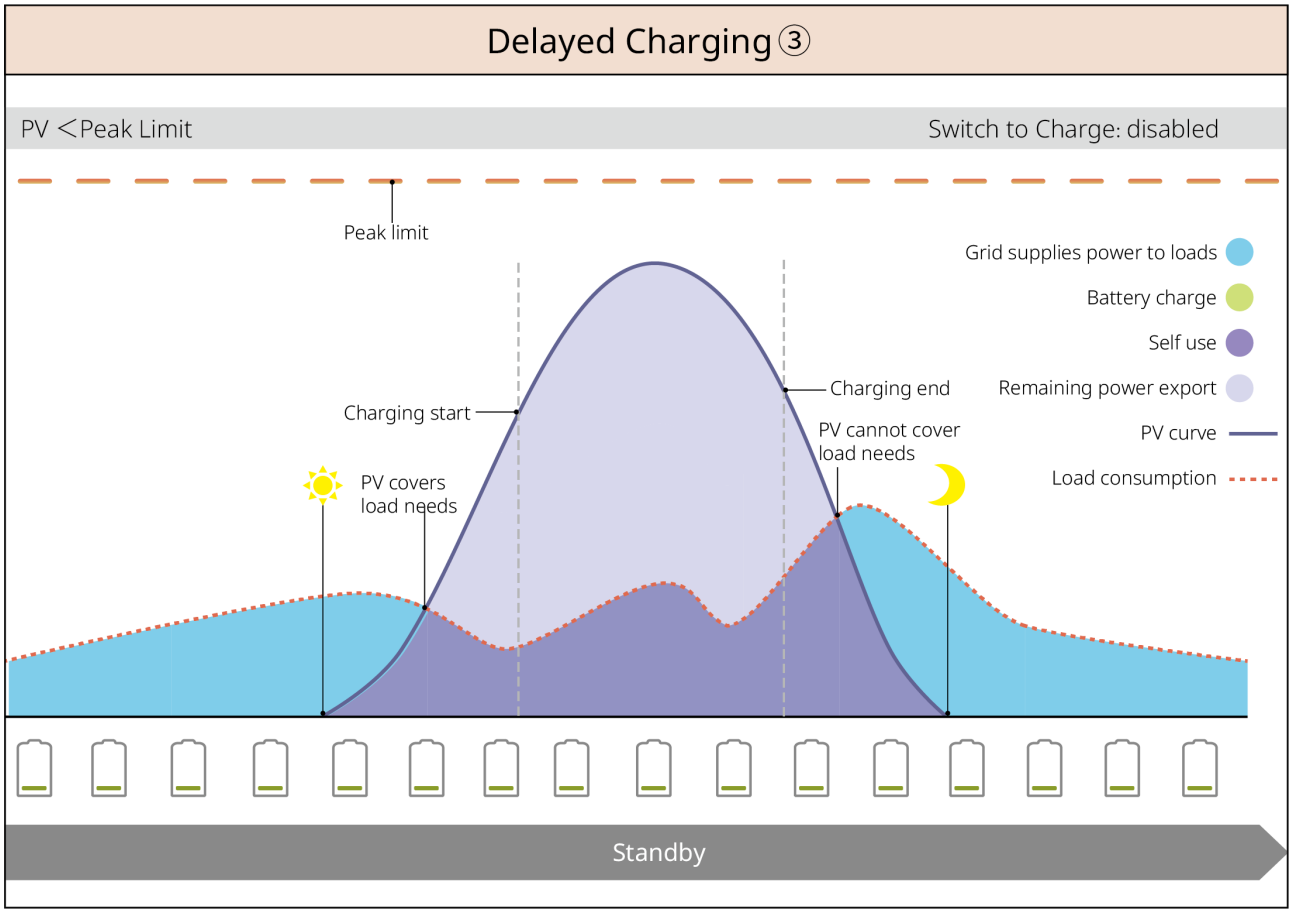
Smart Charging ①



SLG00NET0006

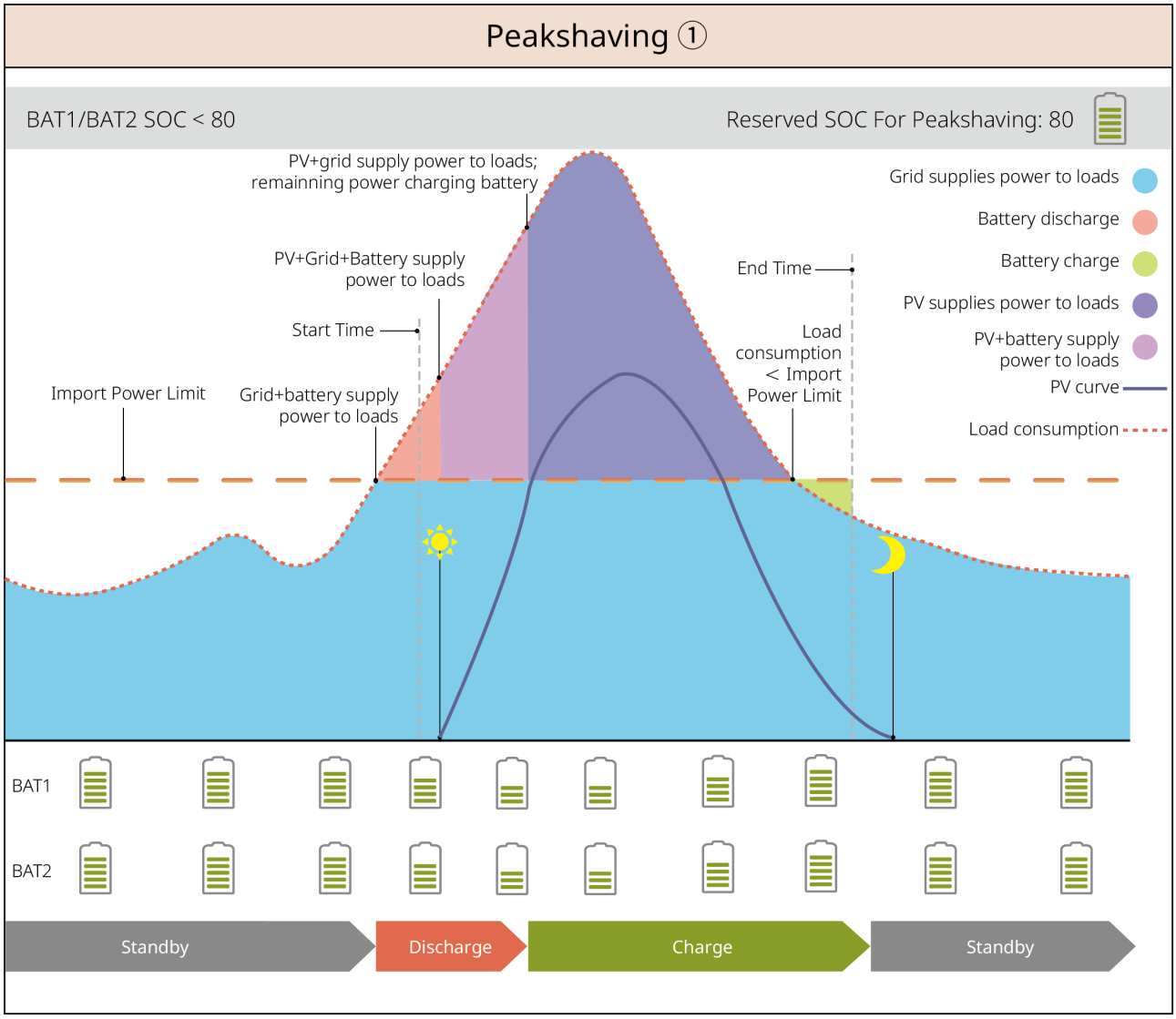


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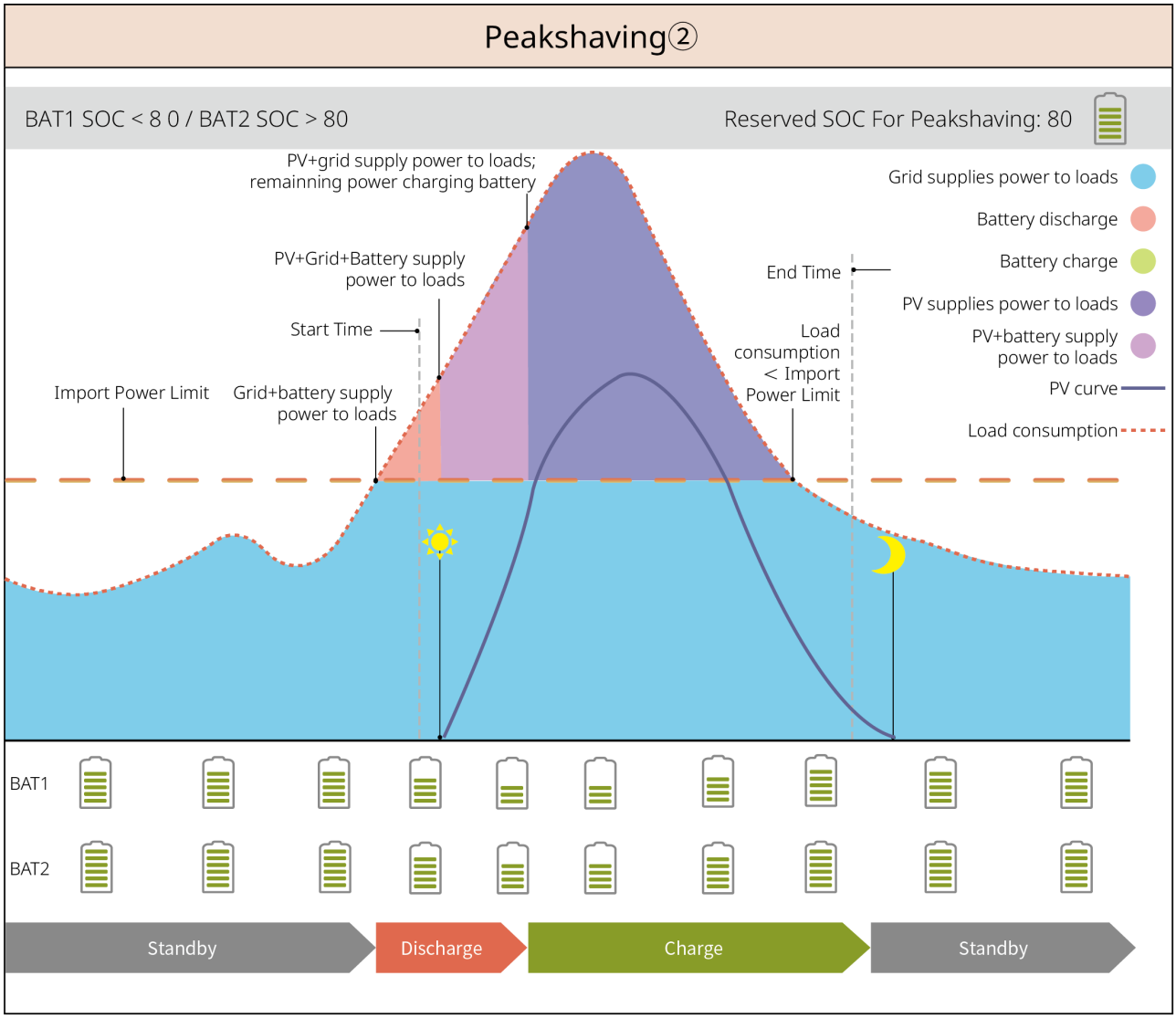


Demand Control Mode

- Mainly applicable to commercial and industrial scenarios.
- When the total load power exceeds the power quota within a short period, battery discharge can be used to reduce the electricity consumption exceeding the quota.
- When the two battery circuits of the inverterSOCare both below the reservedSOCfor demand control, the system purchases electricity from the grid according to the time period, load consumption, and peak purchase limit; when only one battery circuit of the inverterSOCare both below the reservedSOCfor demand control, the system purchases electricity from the grid according to the load consumption and peak purchase limit.



SLG00NET0010



SLG00NET0011

Off-grid Mode

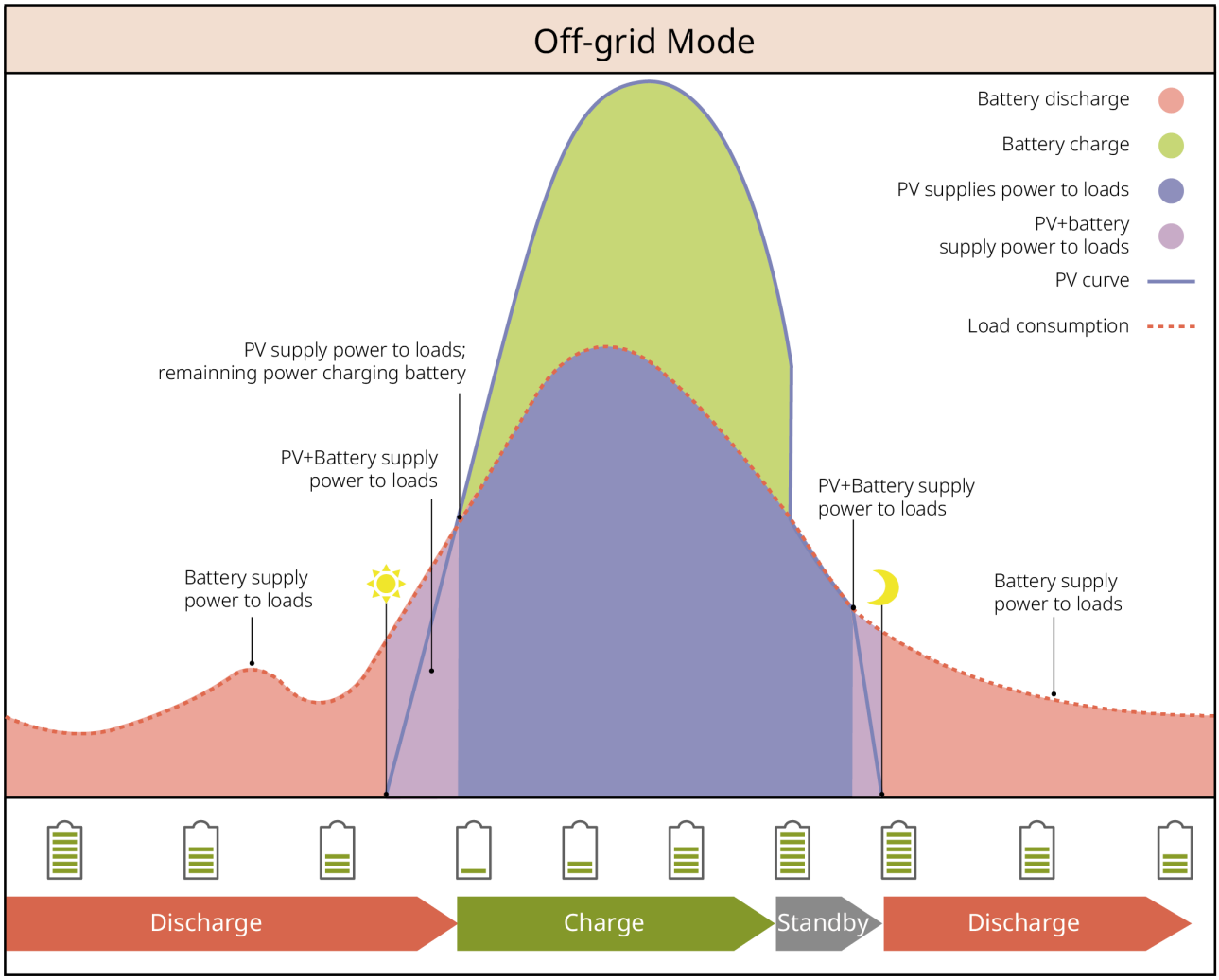
NOTICE

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

When a Grid Power Outage occurs, the inverter switches to off-grid operating mode.

- During the day, PV power prioritizes supplying the load, and excess power charges the battery.
- At night, the battery discharges to supply the load, ensuring that BACK-UP loads remain powered.
- Off-grid SOC recovery: After the system operates off-grid, the battery gradually

recovers to the minimum SOC through PV generation or other generation methods.



SLG00NET0012

2.5 Functional Features

NOTICE
For specific functional features, refer to the actual product configuration.

AFCI

The inverter integrates an AFCI circuit Protection device to detect Arc Fault (arc fault) and quickly cut off the circuit when detected, thereby preventing electrical fires.

Causes of Arc Faults:

- Connector connections in the PV system are damaged.
- Incorrect or damaged cable connections.
- Aging of connectors and cables.

Troubleshooting methods:

1. When the inverter detects an arc fault, the fault type can be viewed on the inverter display or in the App.
2. If the inverter triggers faults fewer than 5 times within 24 hours, the unit will automatically restore grid-tied Protection after 5 minutes. After the 5th Arc Fault, the fault must be cleared before the inverter can operate normally. For specific operations, please refer to the App user manual.

Model	Label	Description
GW5K-ET-L-G10 GW6K-ET-L-G10 GW8K-ET-L-G10	AFCI：F-I-AFPE-1-2-1	F (Full coverage): Full coverage of the inverter PV input ports I (Integrated): Integrated inside the inverter AFPE (arc fault protection equipment): Combines AFD and AFI two AFCI Detection functions 1: A pair of PV input ports (PV+, PV-) connects one PV input string 2: The number of PV input ports detected by one AFCI Detection sensor 1: The number of AFCI Detection sensors

Model	Label	Description
GW10K-ET-L-G10 GW12K-ET-L-G10 GW12K-ET-LL-G10	AFCI：F-I-AFPE-1-2/1-2	F (Full coverage): Full coverage of the inverter PV input ports I (Integrated): Integrated inside the inverter AFPE (arc fault protection equipment): Combines AFD and AFI two AFCI Detection functions 1: A pair of PV input ports (PV+, PV-) connects one PV input string 2/1: The number of PV input ports detected by one AFCI Detection sensor 2: The number of AFCI Detection sensors
GW15K-ET-L-G10 GW20K-ET-L-G10	AFCI：F-I-AFPE-1-2-2	F (Full coverage): Full coverage of the inverter PV input ports I (Integrated): Integrated inside the inverter AFPE (arc fault protection equipment): Combines AFD and AFI two AFCI Detection functions 1: A pair of PV input ports (PV+, PV-) connects one PV input string 2: The number of PV input ports detected by one AFCI Detection sensor 2: The number of AFCI Detection sensors

Three-phase unbalanced output

The inverter grid-tied terminal andBACK-UPterminals both support three-phase unbalanced output, and each phase can connect loads of different power. The maximum output power per phase for different models is shown in the following table:

No.	Model	Maximum output power per phase
1	GW5K-ET-L-G10	4kW
2	GW6K-ET-L-G10	4kW
3	GW8K-ET-L-G10	4kW
4	GW10K-ET-L-G10	6kW
5	GW12K-ET-L-G10	6kW
6	GW15K-ET-L-G10	10kW
7	GW20K-ET-L-G10	10kW
8	GW12K-ET-LL-G10	6kW

Load control

The inverter dry contact control port supports connection of additional contactors to control load on/off. It supports household loads, heat pumps, etc.
The load control methods are as follows:

- Time control: Set the time to turn the load on or off. The load will automatically turn on or off within the set time period.
- Switch control: When the control method is selected as ON, the load will turn on; when the control method is set to OFF, the load will turn off.
- BACK-UP load control: The inverter has a built-in relay dry contact control port, through which the relay can control whether the load is turned off. In off-grid mode, if a BACK-UP terminal Overload is detected and the battery SOC value is lower than the battery off-grid Protection setting value, the load connected to the relay port can be turned off.

Rapid Shutdown (RSD)

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

- If the inverter cannot be connected to an external synchronization signal and multiple inverters need to be paralleled, ensure that the PV cables of different

inverters are routed in independent cable trays, and maintain a spacing of at least 20 cm between the cable trays.

- When the inverter can be connected to an external synchronization signal, ensure that no more than 5 transmitters are connected in the same synchronization group.

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

3 Equipment Inspection and Storage

3.1 Equipment Inspection

Before signing for receipt of the product, carefully check the following:

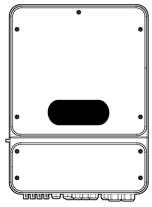
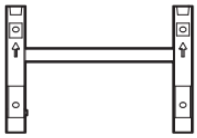
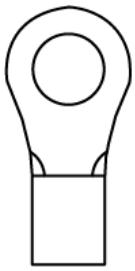
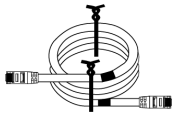
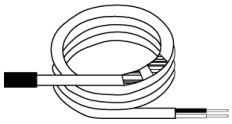
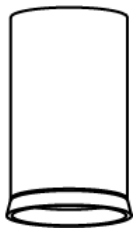
1. Check the outer packaging for damage, such as deformation, openings, cracks, or other signs that may cause damage to the equipment in the package. If there is damage, do not open the package and contact your dealer.
2. When removing the battery, ensure that the packaging carton is intact. If the packaging is accidentally damaged and you need to return or exchange the product due to quality issues, please contact GoodWe after-sales or your distributor to obtain a dedicated packaging box.
3. Check whether the equipment model is correct. If it does not match, do not open the packaging and contact your distributor or after-sales service center.
4. Check whether the types and quantities of delivered items are correct and whether the appearance is damaged. If there is any damage, please contact your distributor or after-sales service center.

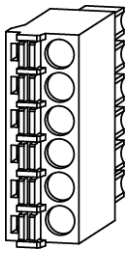
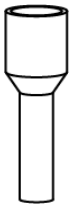
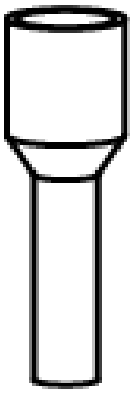
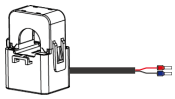
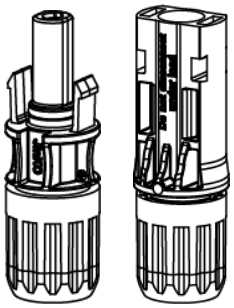
3.2 Delivered Items

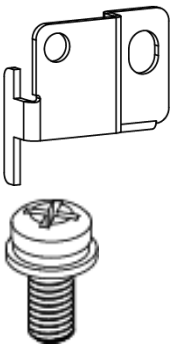
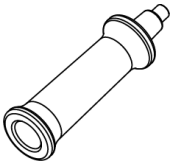
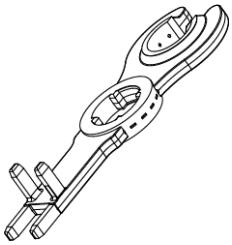
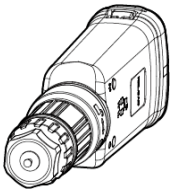
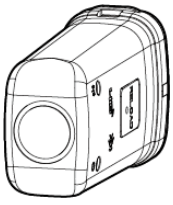
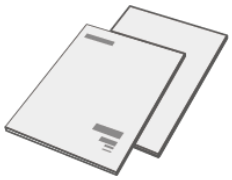
⚠WARNING

Check whether the types and quantities of delivered items are correct and whether there is any appearance damage. If damaged, contact your dealer.
After the delivered items are removed from the packaging, do not place them on rough, uneven, or sharp surfaces to avoid paint damage.

3.2.1 Inverter Delivered Items

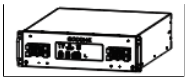
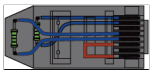
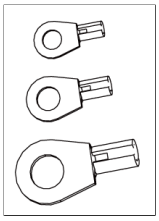
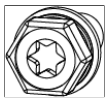
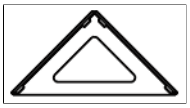
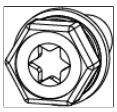
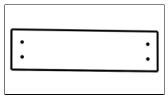
Component	Description	Component	Description
	Inverter x1		Back mounting plate x1
	Expansion screws x4		Grounding terminals x4
	BMS network cable • GW5K-ET-L-G10、GW6K-ET-L-G10、GW8K-ET-L-G10、GW10K-ET-L-G10、GW12K-ET-L-G10、GW12K-ET-LL-G10 x 1 • GW15K-ET-L-G10、GW20K-ET-L-G10 x 2		Lead-acid battery temperature sensor cable x N N: China region x 0; other regions x 1.
	Lead-acid battery temperature sensor cable fixing adhesive stickers x N N: 0 for China; 2 for other regions.		Battery power cable tubular terminal • GW5K-ET-L-G10、GW6K-ET-L-G10、GW8K-ET-L-G10、GW10K-ET-L-G10、GW12K-ET-L-G10 、GW12K-ET-LL-G10 x 2 • GW15K-ET-L-G10、GW20K-ET-L-G10 x 4

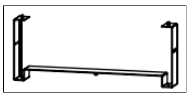
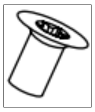
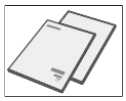
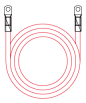
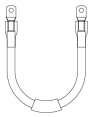
Component	Description	Component	Description
	6-pin communication terminal x 4		Signal cable tubular terminal x 28
	GEN tubular terminal x 4		BACK-UP and ON-GRID tubular terminals x 8
	CT x 3		PV DC terminal • GW5K-ET-L-G10、GW6K-ET-L-G10、GW8K-ET-L-G10 x 2 • GW10K-ET-L-G10、GW12K-ET-L-G10 、GW12K-ET-LL-G10 x 3 • GW15K-ET-L-G10、GW20K-ET-L-G10 x 4

Component	Description	Component	Description
	(Optional) • Anti-theft lock mounting bracket x 1 • M5 screw x 1 Note: If you need to install an anti-theft lock, please contact GoodWe to purchase the anti-theft lock mounting bracket.		M6 hex wrench x 1
	Lifting handle x 2		PV unlocking tool x N N: China region x 0; other regions x 1.
 or 	Communication module x 1		Product documentation x 1
	Communication ferrite ring ×N N: 0 or 1, subject to actual product		

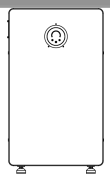
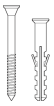
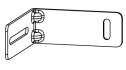
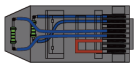
3.2.2 Battery Deliverables

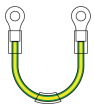
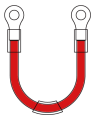
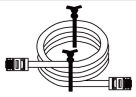
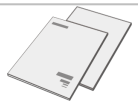
3.2.2.1 LX A5.0-30

Component	Description	Component	Description
	Battery module x 1		Termination resistor x 1 When connecting to a third-party busbar, this termination resistor must be installed on the battery
	• M5 OT terminal x 2: recommended for 10mm^{2}cable • M8 OT terminal x 4: recommended for 50mm^{2}cable • M10 OT terminal x 2: recommended for 70mm^{2}cable		M5*12 grounding screw x 2
	Mounting bracket x 2 Supplied when the wall-mounted Mounting Method is selected		M6*70 expansion bolt x 4 Supplied when the wall-mounted Mounting Method is selected
	M5*12 grounding screw x 2 Supplied when the wall-mounted Mounting Method is selected		Marking template x 1 Supplied when the wall-mounted Mounting Method is selected

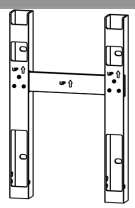
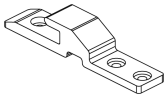
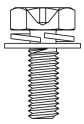
Component	Description	Component	Description
	Battery bracket x 2 (optional) Provided when the stacking Mounting Method is selected		M4*8 screws x 8 Provided when the stacking Mounting Method is selected
	Product documentation x 1		Negative power cable (optional) x 1
	Positive power cable (optional) x 1		Grounding cable (optional) x 1
	Communication cable (optional) x 1		Decorative cover (optional) x 1

3.2.2.2 Battery Delivery Items (GW14.3-BAT-LV-G10)

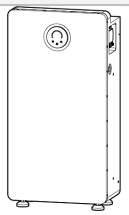
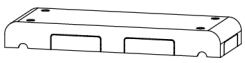
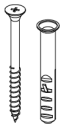
Component	Description	Component	Description
	Battery x 1		Cable cover x 1
	Lifting handle x 2 (Shipped with the unit after October 2025)		Expansion bolts x 2
	M5*16 cross-recessed hex head screw x 7		Wall-lock anti-tip bracket x 2
	Termination resistor x 1		Grounding OT terminal x 1 (Shipped with the unit before October 2025)

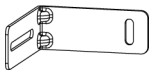
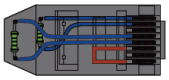
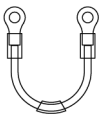
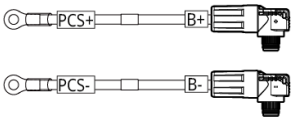
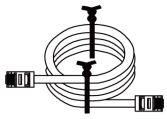
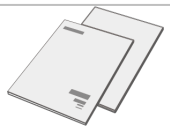
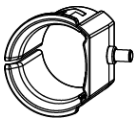
	DC OT terminal x 6 (Shipped with the unit before October 2025)		Grounding cable x 1 (Shipped with the unit after October 2025)
	Positive power cable x 1 (Shipped with the unit after October 2025)		Negative power cable x 1 (Shipped with the unit after October 2025)
	Communication cable x 1		Product documentation x 1

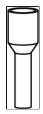
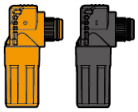
Optional accessories

Component	Description	Component	Description
	Wall-mount bracket x 1		Hooks x 4
	M5*16 cross-recessed hex head screw x 12		M10 expansion bolts x 4

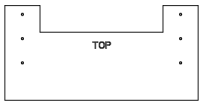
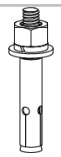
3.2.2.3 Battery Delivery Items (GW16.1-BAT-LV-G10)

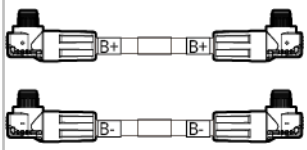
Component	Description	Component	Description
	Battery x 1		Decorative cover x 1
	Lifting handle x 2		Expansion bolts x 2

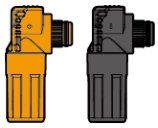
Component	Description	Component	Description
	M5*12 hex socket head screw x 7		Wall-lock anti-tip bracket x 2
	Termination resistor x 1		Grounding cable x 1
	Positive power cable x 1 Negative power cable x 1 • 1 m cable: standard for some configurations • 2 m cable: ◦ Overseas: standard for some configurations ◦ Domestic: none		Decorative cover rubber plug x 4
	Communication cable x 1		Product documentation x 1
	Quick-connect terminal unlocking tool x 1		(Optional) Dry contact connector x 1

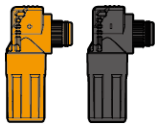
Component	Description	Component	Description
	(Optional) Tubular terminal x 4		SC50-8 OT terminal • Domestic: standard for some configurations x 2 • Overseas: x 0
	Battery positive quick plug Battery negative quick plug • Domestic: standard for some configurations x 2 • Overseas: x 0		

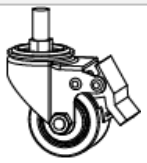
Optional accessories

Component	Description	Component	Description
	Wall-mount bracket x 2		Positioning template x 1
	M10 expansion bolt x 6		M10*60 bolt x 2

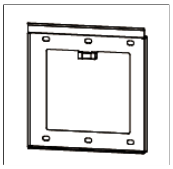
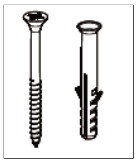
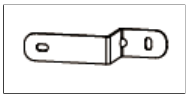
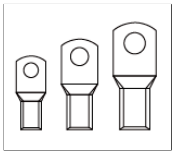
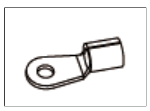
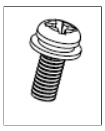
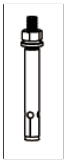
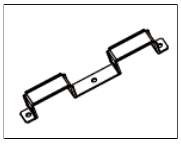
Component	Description	Component	Description
	Inter-battery parallel positive power cable x 1 Inter-battery parallel negative power cable x 1		

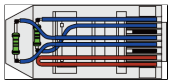
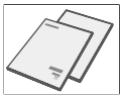
Component	Description	Component	Description
	Battery positive quick plug x 1 Battery negative quick plug x 1		SC50-8 OT terminal x 5
	Positive power cable x 1 Negative power cable x 1		

Component	Description	Component	Description
	Battery positive quick plug x 1 Battery negative quick plug x 1		SC50-8 OT terminal x 2

Component	Description	Component	Description
	Battery roller x 4		

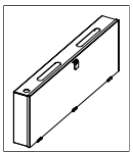
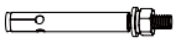
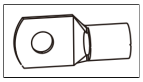
3.2.2.4 Battery Delivery Items (LX U5.0-30)

Component	Description	Component	Description
	Battery x 1		Plastic top cover x 1
	Wall-mount bracket x 1		Expansion screws x 2
	Anti-tip bracket x 2		• 35-8 OT terminal x 4: recommended for connecting 25 mm² or 35 mm² cables • 50-8 OT terminal x 4: recommended for connecting 50 mm² cable • 70-10 OT terminal x 2: recommended for connecting 70 mm² cable
	14-5 grounding terminal x 2		M5 combination bolts x 7
	M10 expansion bolts x 6		Wiring harness fixing plate x 1

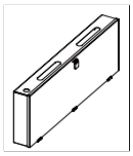
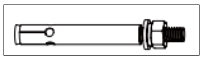
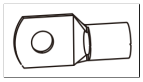
Component	Description	Component	Description
	Termination resistor x 1		Product documentation x 1

3.2.3 Combiner Box Deliverables

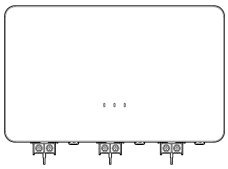
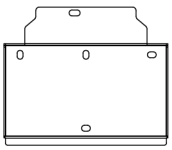
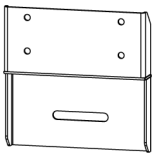
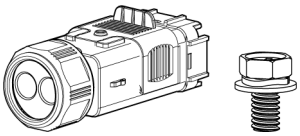
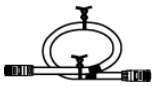
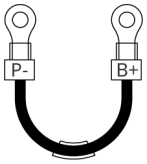
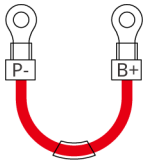
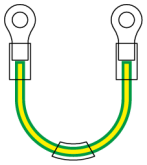
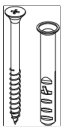
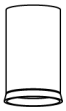
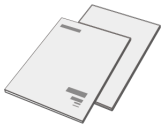
3.2.3.1 BCB-22-WW-0

Component	Description	Component	Description
	BCB-22-WW-0 combiner box x 1		M6 expansion bolts x 4
	(25-8) OT terminals x 36 (70-10) OT terminals x 6	-	-

3.2.3.2 BCB-32-WW-0, BCB-33-WW-0 (Optional)

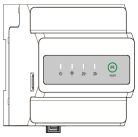
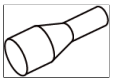
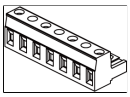
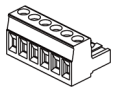
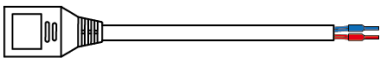
Component	Description	Component	Description
	BCB-32-WW-0, BCB-33-WW-0 combiner box x 1		M6 expansion bolts x 4
	(50-8) OT terminals x 30 (70-10) OT terminals x 6	-	-

3.2.4 Mix Parallel Unit Delivery Items

Component	Description	Component	Description
	Mix Parallel Unit x 1		Rear mounting plate x 1
	Mounting bracket x 1		Wall-mount bracket fixed end x 1
	Power terminal connectors x 3 M8 screws for power cables x 6		BMS communication cable x 1
	Negative power cable x 1		Positive power cable x 1
	Grounding cable x 1		Expansion screws x 5
	M5*12 hex socket head cap screws x 5		Tubular terminals for inverter battery port power cables x 2
	Product documentation x 1		M8 OT terminals: • SC25-8: 2 • SC35-8: 2 • SC50-8: 2 • SC70-8: 6

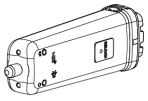
Component	Description	Component	Description
	Flat-head screwdriver x 1		

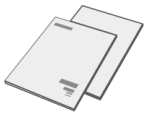
3.2.5 GM330

Component	Description	Component	Description
	Smart meter x 1		2PIN communication terminal x 1
	Tubular terminals x 6		7PIN communication terminal x 1
	6PIN communication terminal x 1		RS485 communication terminal x 1
	Screwdriver x 1		Product documentation x 1
	2PINterminal-to-RJ45terminal adapter cable x 1	-	-

3.2.6 Smart Communication Stick Deliverable

3.2.6.1 Accessory List

Component	Description	Component	Description
			

Component	Description	Component	Description
	4G Smart Communication Dongle x1		Wrench x1 Only applicable when no SIM card is configured. Only applicable to 4G Kit-G20.
	Product Documentation x1		Antenna x1 Only applicable to 4G Kit-G20.
	Waterproof Gasket x1 Only applicable to 4G Kit-G20.		Unlocking Tool x1 Only applicable when no SIM card is configured. Applicable to 4G Kit-G20 and 4G Kit-IN-G20.

3.3 Equipment Storage

NOTICE
[1] The storage period starts from the SN date on the battery's outer packaging. After exceeding the storage period, charge/discharge maintenance is required. (Battery maintenance date = SN date + charge/discharge maintenance cycle). For how to view the SN date, refer to:11.4.SN code meaning(Page 377)。 [2] After passing charge/discharge maintenance, if a Maintaining Label is affixed to the outer box, update the maintenance information on the Maintaining Label; if there is no Maintaining Label, record the maintenance time and battery SOC yourself and keep the data properly to facilitate maintenance record retention.

If the equipment is not put into use immediately, store it according to the following requirements. After long-term storage, the equipment can be used only after inspection and confirmation by professional personnel.

1. If the inverter has been stored for more than two years or has not been operating for more than 6 months after installation, inspection and testing by professional personnel before putting it into use is recommended.
2. To ensure good electrical performance of the inverter's internal electronic components, it is recommended to power it on once every 6 months during storage. If it has not been powered on for more than 6 months, inspection and testing by professional personnel before putting it into use is recommended.
3. To ensure battery performance and service life, avoid long-term idle storage. Long-term storage may cause deep discharge of the battery, resulting in irreversible chemical loss, capacity fading, or even complete failure; prompt use is recommended. If the battery needs long-term storage, perform maintenance as follows:

<table>
<tr><th>Battery model</th><th>Initial SOC range for battery storage</th><th>Recommended Storage Temperature</th><th>Charge/discharge maintenance cycle[1]</th><th>Battery maintenance method[2]</th></tr>
<tr><td>LX A5.0-30</td><td>30%~40%</td><td>0~35 ℃</td><td>-20~45°C, ≤6 months</td><td rowspan="4">For maintenance methods, please consult your dealer or after-sales service center.</td></tr>
<tr><td>GW14.3-BAT-LV-G10</td><td rowspan="2">30%~40%</td><td rowspan="2">0~35℃</td><td rowspan="2">-20~35°C, ≤12 months
35~45°C, ≤6 months</td></tr>
<tr><td>GW16.1-BAT-LV-G10</td></tr>
<tr><td>LX U5.0-30</td><td>30%~40%</td><td>0~35℃</td><td>-20~35°C, ≤12 months
35~45°C, ≤6 months</td></tr>
</table>

Packaging requirements:

Ensure that the outer packaging box has not been removed and the desiccant inside the box has not been lost.

Environmental requirements:

1. Ensure the equipment is stored in a cool place and avoid direct sunlight.
2. Ensure the storage environment is clean, with appropriate temperature and

humidity ranges and no condensation. If condensation is present at the equipment ports, do not install the equipment.
3. Ensure the equipment is stored away from flammable, explosive, and corrosive materials.

Stacking requirements:

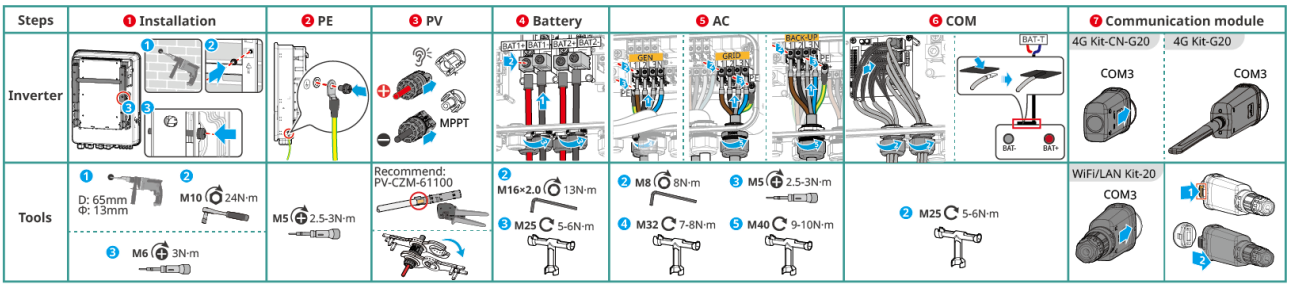
1. Ensure that the inverter is stacked at the height and in the orientation specified on the packaging box label.
2. Ensure that there is no risk of the inverter tipping over after stacking.

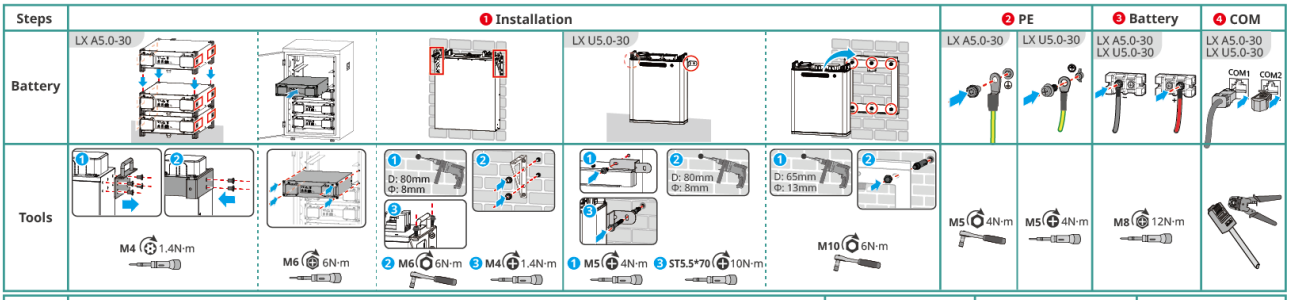
4 Installation

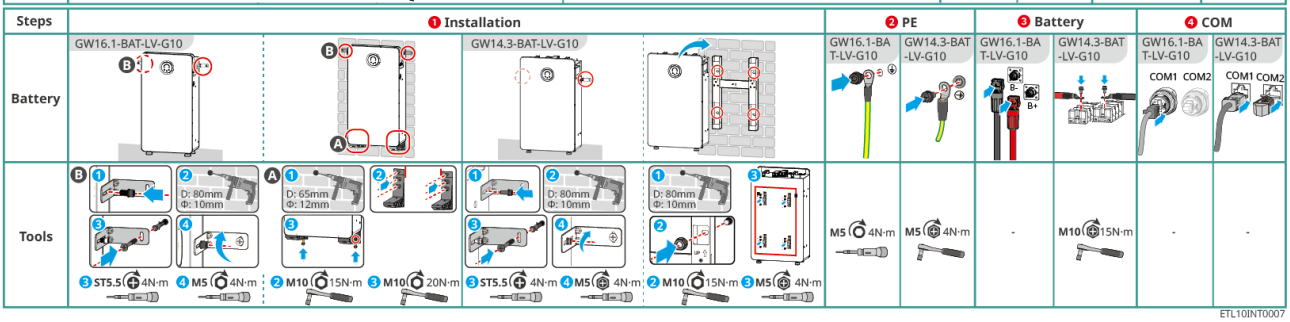
⚠DANGER

When installing the equipment and making electrical connections, use the delivered accessories shipped with the box; otherwise, equipment damage is not covered by the warranty.

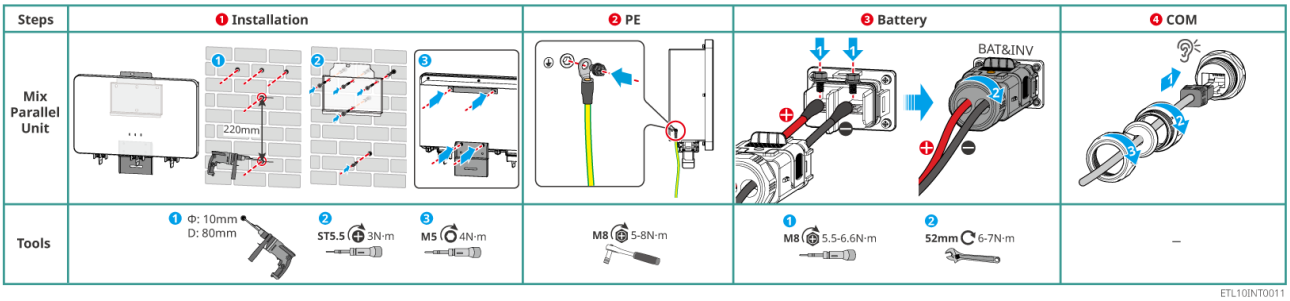
4.1 System Installation and Commissioning Process



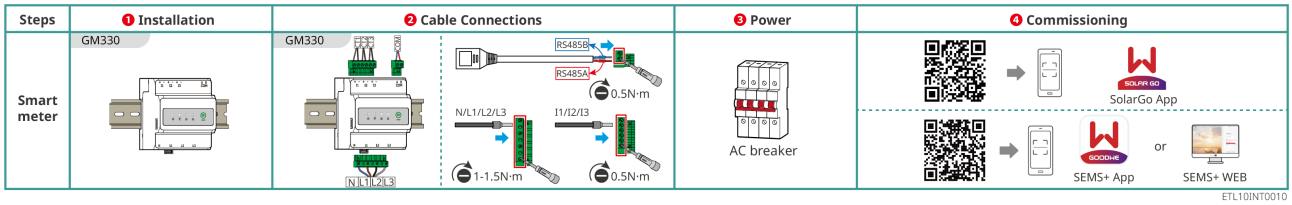




ETL10INT0007



ETL10INT0011



4.2 Installation Requirements

4.2.1 Installation Environment Requirements

1. The equipment must not be installed in flammable, explosive, corrosive, or similar environments.
2. The temperature and humidity of the equipment installation environment must be within the appropriate range.
3. The installation location must be out of reach of children and avoid positions that are easy to touch.
4. When the inverter is running, the enclosure temperature may exceed 60°C. Do not touch the enclosure before it has cooled to prevent burns.
5. The equipment must be installed away from direct sunlight, rain, snow accumulation, and other unfavorable conditions. It is recommended to install it in a sheltered location; if necessary, a sunshade can be erected.
6. Direct sunlight, high temperatures, and other adverse environmental conditions may cause derating of the inverter output power.
7. The installation space must meet the equipment's ventilation and heat dissipation requirements and operational space requirements.
8. The installation environment must meet the equipment's Ingress Protection Rating. The inverter, battery, and Smart Communication Stick are suitable for indoor and outdoor installation; the meter is suitable for indoor installation.
9. The equipment installation height must facilitate operation and maintenance, ensuring that the equipment indicators and all labels are easy to view and the wiring terminals are easy to operate.
10. The equipment installation altitude must be lower than the Max. Operating Altitude.
11. Before installing equipment outdoors in salt-damage areas, consult the equipment manufacturer. Salt-damage areas mainly refer to areas within 500 m of the coast. The affected area depends on sea breeze, precipitation, terrain, and other conditions.
12. The DC cable and communication cable between the battery and inverter must be less than 3 m in length. Ensure that the installation distance between the inverter

and battery meets the cable length requirements.

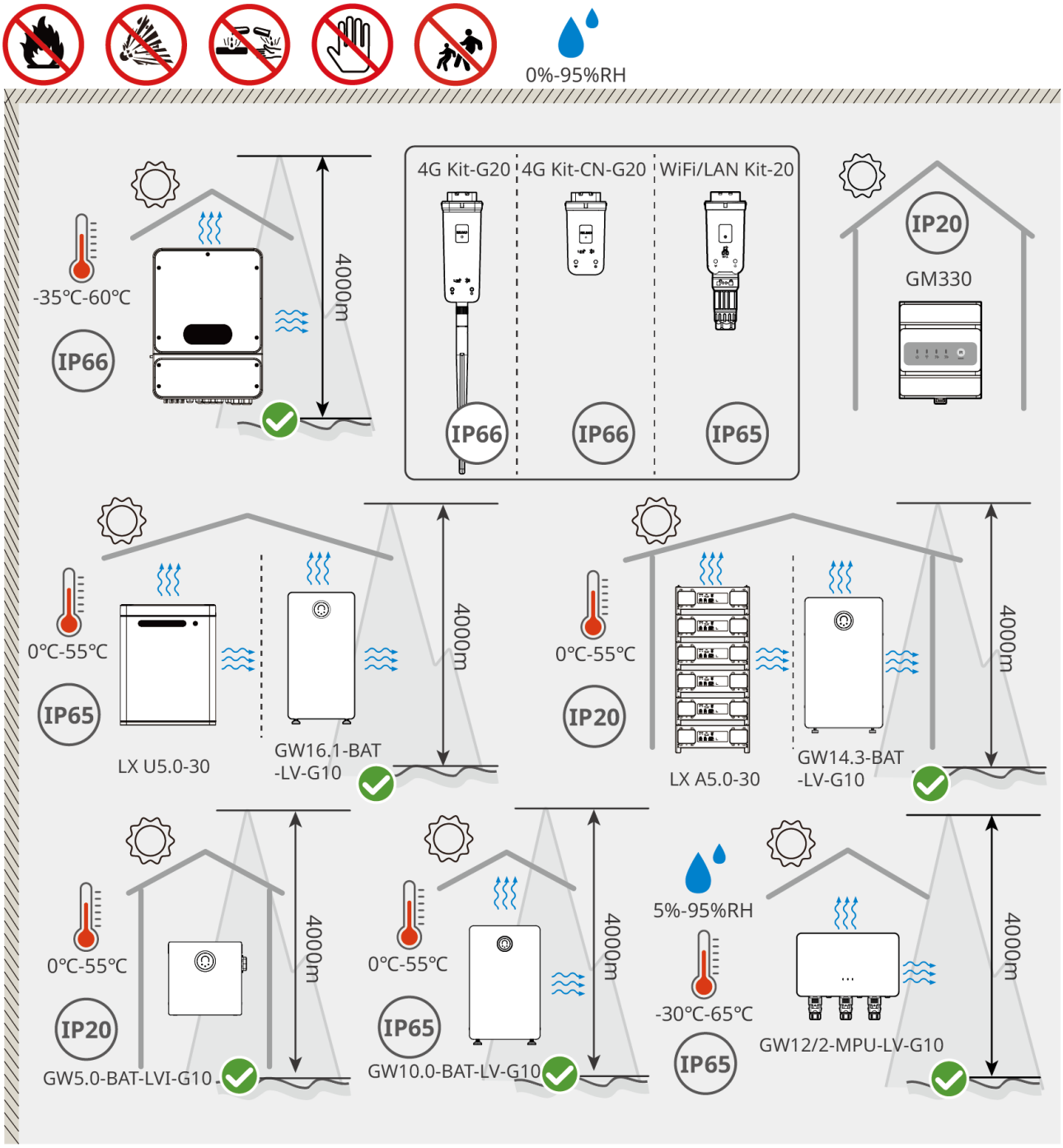
13. To ensure stable battery operating status, the installation or storage location should be away from direct cold airflow sources such as air conditioners, avoiding uneven local temperature fields that may cause excessive battery internal temperature differences, and prevent condensation from causing equipment abnormalities.
14. Keep away from strong magnetic field environments to avoid electromagnetic interference. If there is a radio station or wireless communication equipment operating below 30 MHz near the installation location, install the equipment according to the following requirements:

- Inverter: Add a ferrite core with multiple turns on the inverter DC input cable or AC output cable, or add a low-pass EMI filter; or ensure that the distance between the inverter and the wireless electromagnetic interference equipment exceeds 30 m
- Other equipment: The distance between the equipment and the wireless electromagnetic interference equipment must exceed 30 m.

NOTICE

If installed in an environment below 0°C, the battery cannot continue to charge and recover energy after being fully discharged, resulting in Battery Undervoltage protection.

- LX A5.0-30, LX U5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10: Charging temperature range: $0 < T \leq 55°C$; discharging temperature range: $-20 < T \leq 55°C$
- For batteries with optional heating film:
  - LX U5.0-30: Charging temperature range: $-20 < T \leq 55°C$; discharging temperature range: $-20 < T \leq 55°C$



ETL10INT0005

4.2.2 Installation Space Requirements

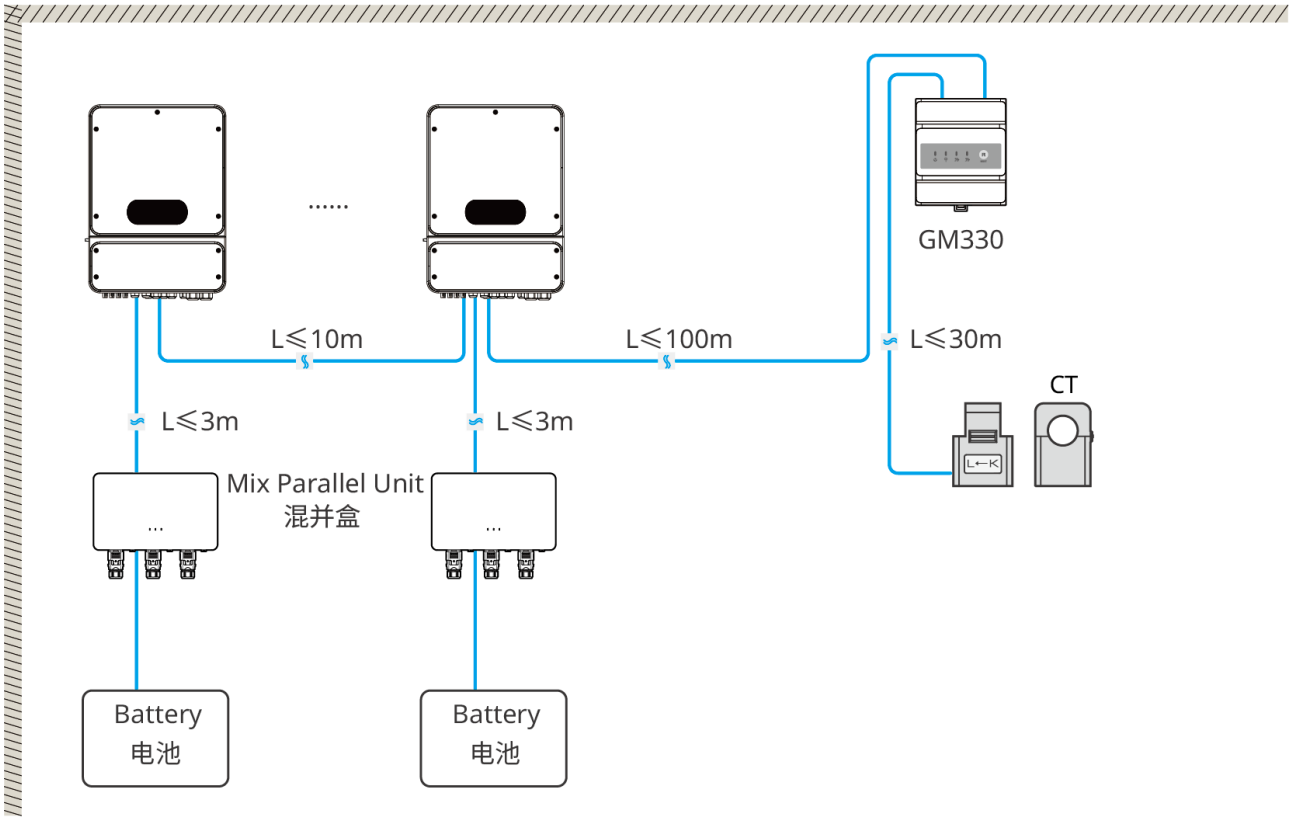
When installing equipment in the system, reserve a certain amount of space around the equipment to ensure sufficient installation and heat dissipation space.

- When using CAT 7E communication cables between inverters, the cable length

must not exceed 10 m; when using CAT 5E or CAT 6E communication cables, the cable length must not exceed 5 m. Do not exceed 10 m for communication cables; otherwise, communication abnormalities may occur.

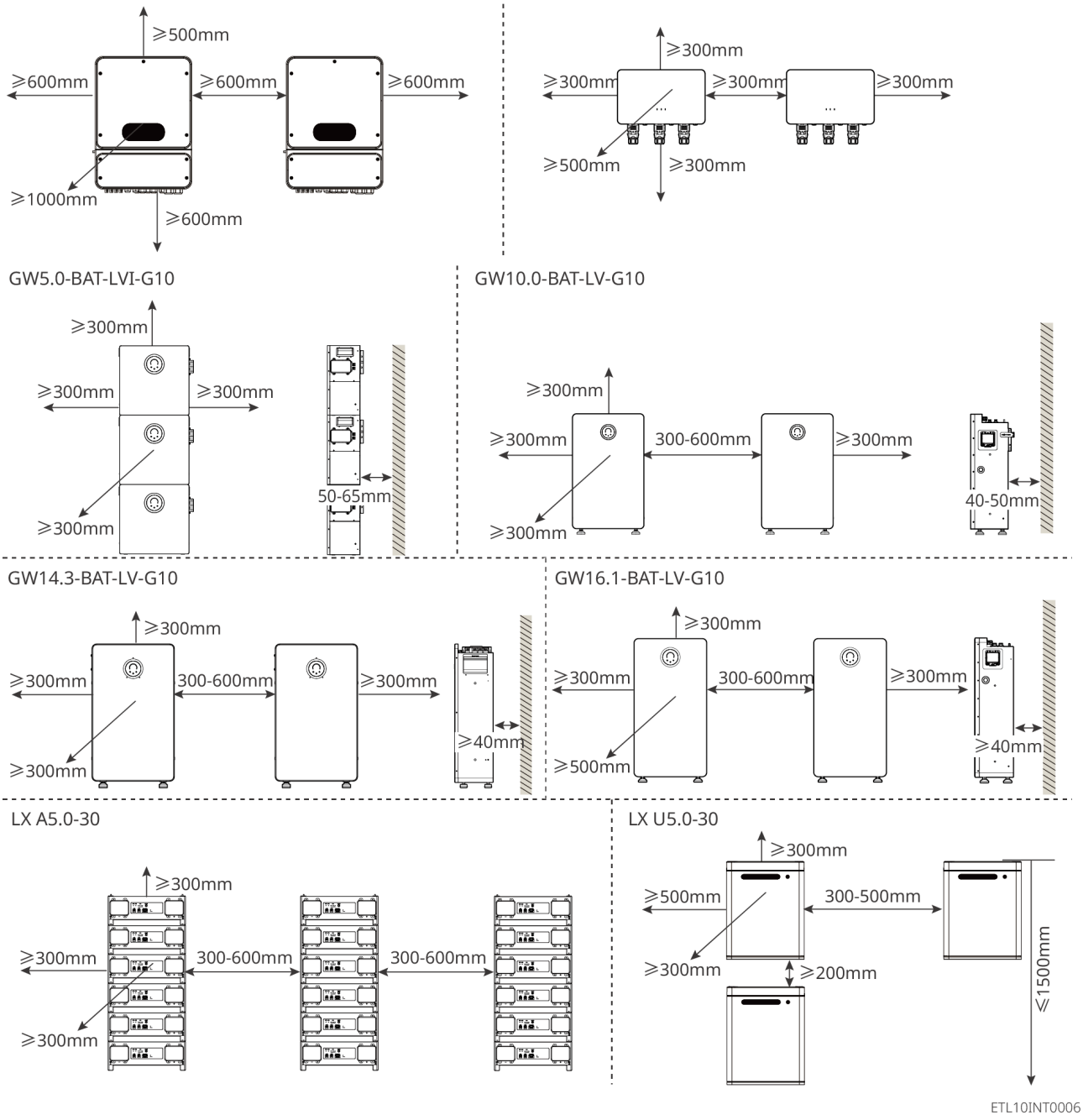
- When installing the CT, use shielded network cables of CAT 5E or higher, with a cable length not exceeding 30 m.
- The RS485 twisted-pair shielded cable for communication between the inverter and meter must not exceed 100 m.

Communication Cable Length



ETL10INT0009

Installation Space

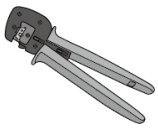
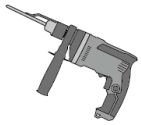
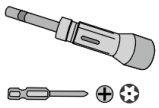
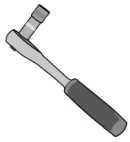
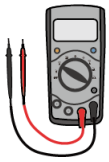
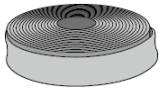


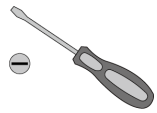
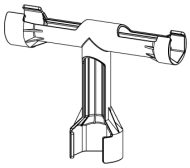
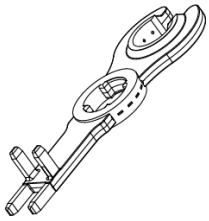
4.2.3 Tool Requirements

NOTICE

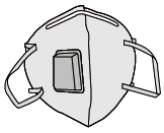
During installation, the following installation tools are recommended. If necessary, other auxiliary tools may be used on site.

Installation Tools

Tool Type	Description	Tool Type	Description
	Diagonal pliers		RJ45 modular plug crimping tool
	Wire stripper		Spirit level
	Open-end wrench		PV terminal crimping tool A-2546B
	Impact drill (Φ13 mm drill bit)		Torque wrench M4、M5、M6、M8
	Rubber mallet		Socket wrench set
	Marker pen		Multimeter Measuring range ≤1000 V
	Heat-shrink tubing		Heat gun
	Cable ties		Vacuum cleaner

Tool Type	Description	Tool Type	Description
	Flat-head screwdriver		Cable gland unlocking tool Note: If required, please contact your dealer or GoodWe to purchase.
	Inverter battery cable crimping tool HS-95WF		Hex key M16、M8
	(China only) PV unlocking tool	-	-

Personal protective equipment

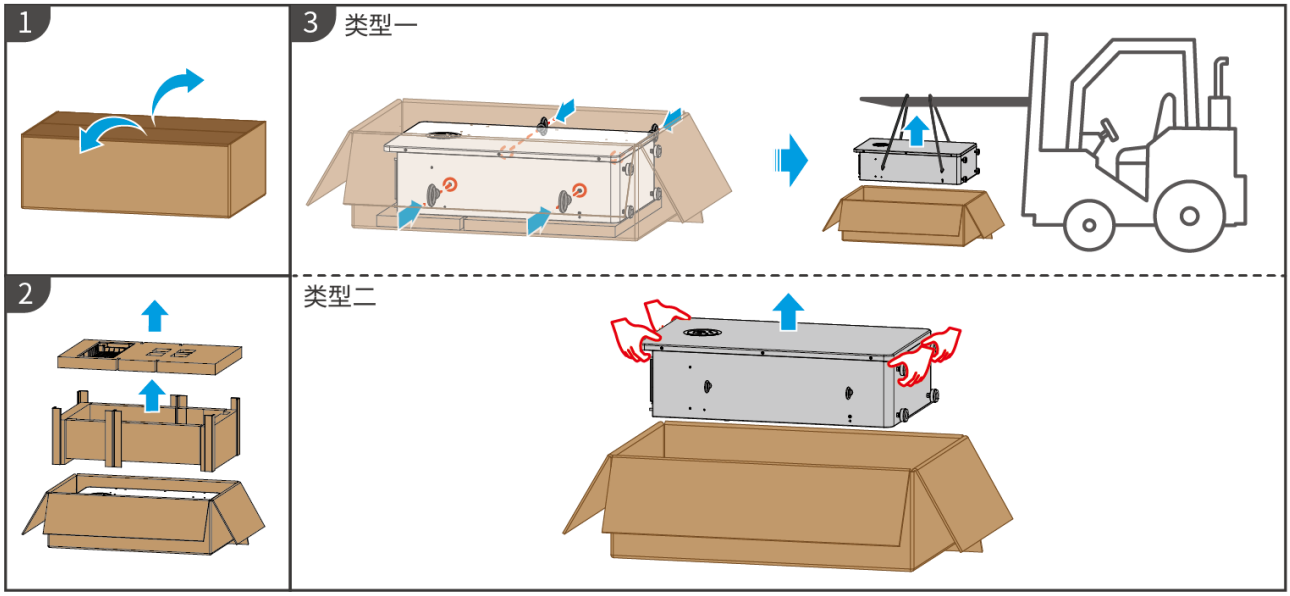
Tool Type	Description	Tool Type	Description
	Insulated gloves, protective gloves		Dust mask
	Safety goggles		Safety shoes

4.3 Equipment Transport

⚠CAUTION

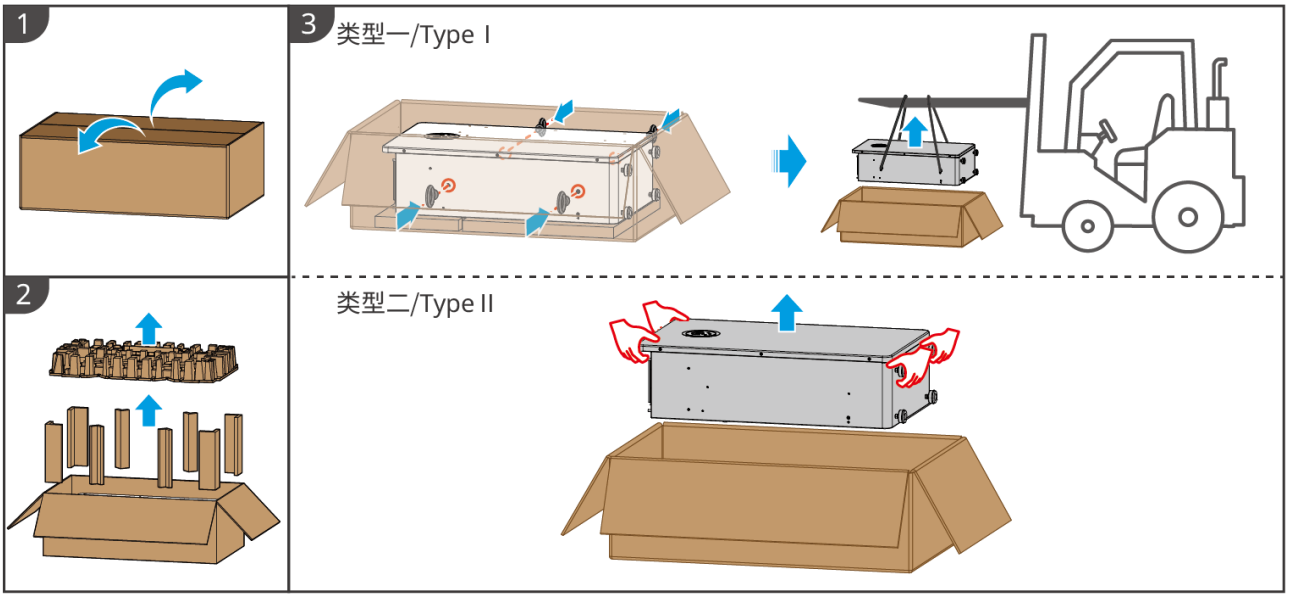
1. During transportation, transfer, installation, and other operations, the laws, regulations, and relevant standards of the country and region must be complied with.
2. Before installation, the equipment must be transported to the installation site. During transport, to prevent personal injury or equipment damage, observe the following precautions:
3. Please assign personnel according to the Weight of the equipment to prevent the equipment from exceeding the Weight range that personnel can carry, causing it to fall and injure personnel.
4. Wear safety gloves to prevent injury.
5. Ensure the equipment remains balanced during handling to avoid dropping.
6. The battery system can be removed from the packaging box by crane or hoisting and transported to the installation site.
   - Crane requirements (GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10, GW10.0-BAT-LV-G10): load capacity ≥180 kg
7. When handling equipment by hoisting, use flexible slings or straps. Requirements for the lifting rings and lifting ropes of GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10, and GW10.0-BAT-LV-G10:
   - Lifting rings: 4 x M10 lifting rings, lifting ring load capacity ≥260 kg
   - Lifting rope: 1 piece, rope length ≥2.5 m, lifting rope load capacity ≥600 kg

GW14.3-BAT-LV-G10:



LXA10INT0010

GW16.1-BAT-LV-G10、GW10.0-BAT-LV-G10:



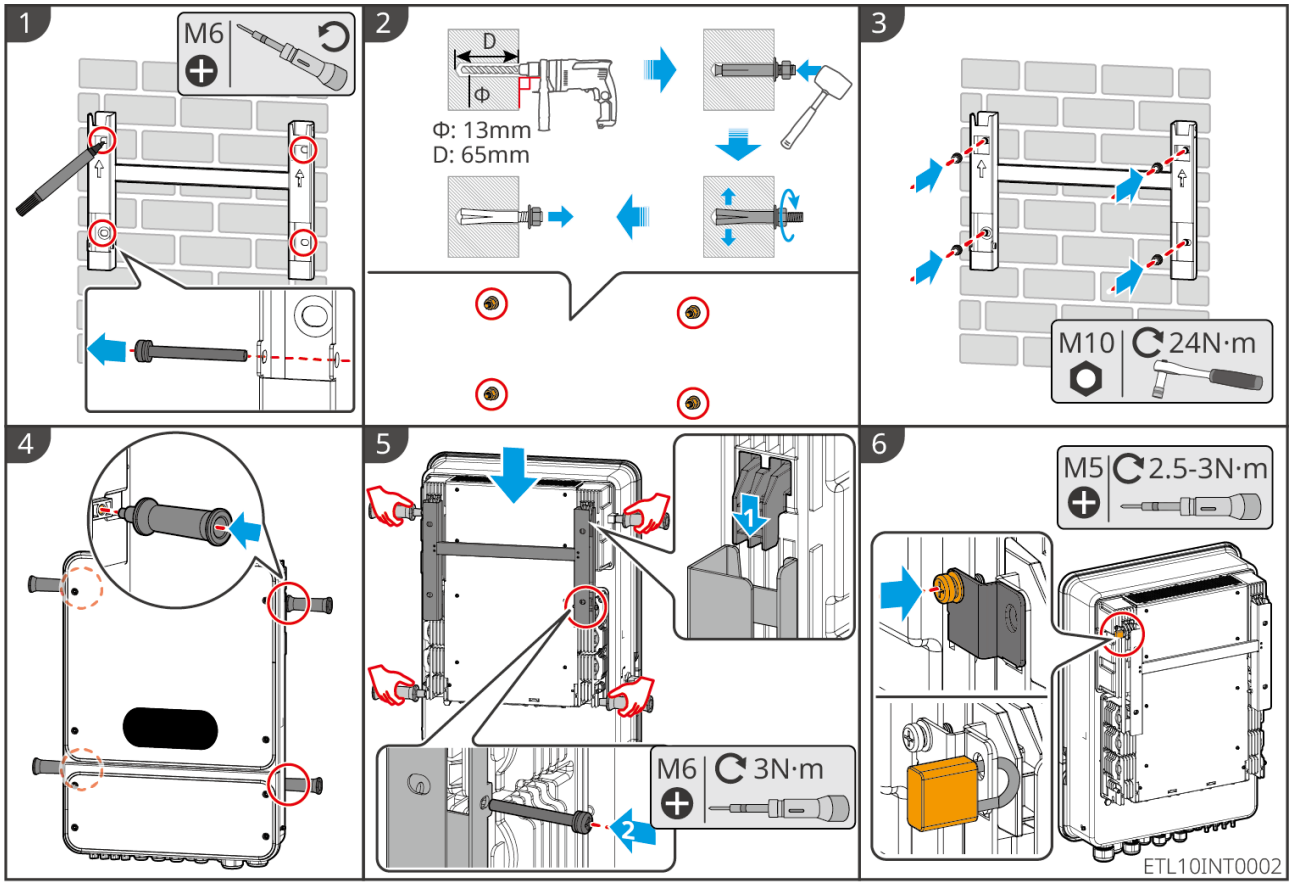
LXA40INT0005

4.4 Installing the Inverter

⚠CAUTION

- When drilling, ensure the drilling positions avoid water pipes, cables, etc. in the wall to prevent danger.
- When drilling, wear safety goggles and a dust mask to prevent dust from being inhaled into the respiratory tract or entering the eyes.
- Ensure the inverter is installed securely to prevent it from falling and injuring personnel.

1. Place the back mounting plate horizontally on the wall and use a marker pen to mark the drilling positions.
2. Use an impact drill to drill holes.
3. Use expansion screws to secure the inverter back mounting plate bracket to the wall.
4. (Optional) Install the lifting handles on the inverter.
5. Mount the inverter on the backplate. After mounting, secure the backplate and inverter with screws to ensure the inverter is installed securely.
6. (Optional) Install the anti-theft lock.



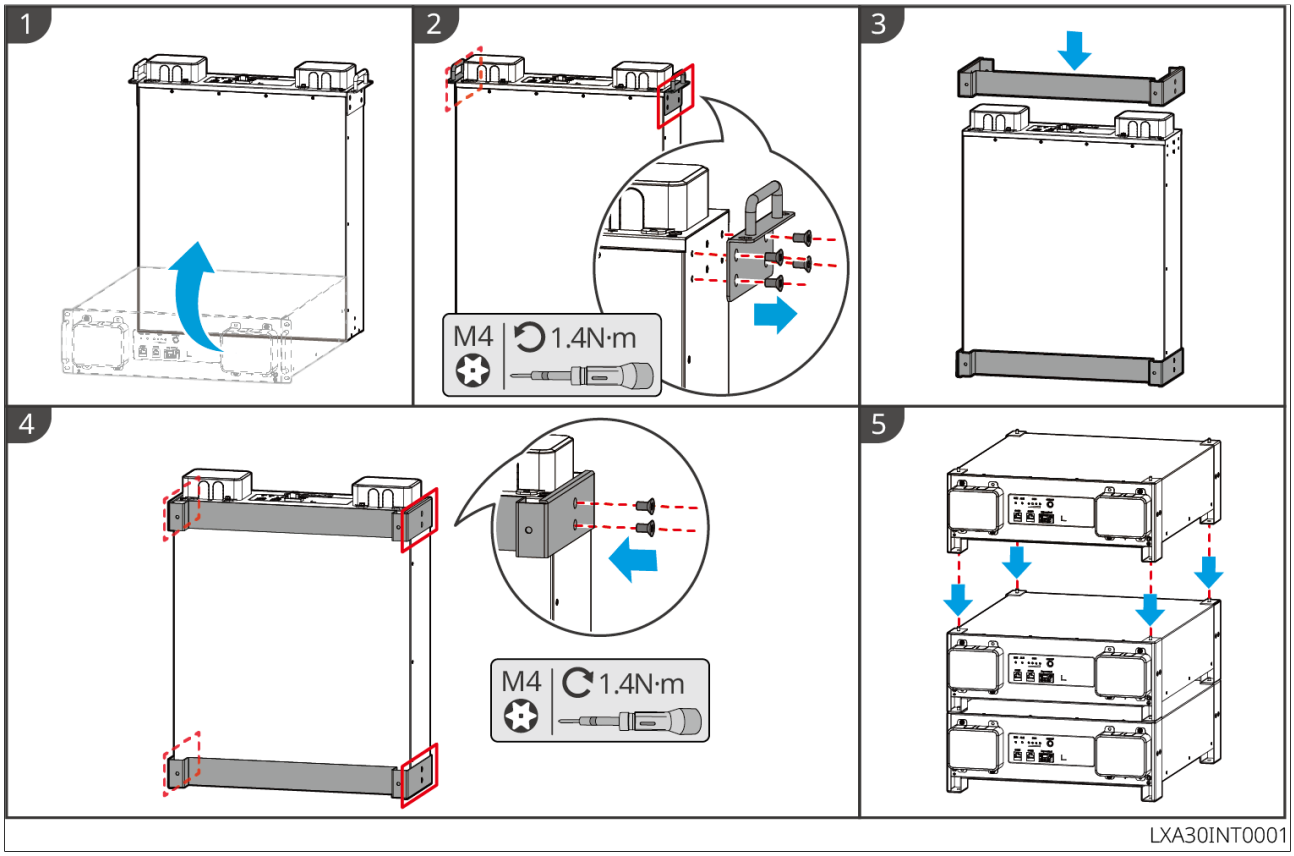
4.5 Install the Battery

4.5.1 LX A5.0-30

LX A5.0-30: Floor stacking

NOTICE
Floor stacking supports up to 6 batteries.

1. Place the battery vertically and remove the battery handles.
2. Install the bracket on the battery and secure it with screws.
3. Lay the battery flat and install multiple batteries in a stacked configuration. Ensure that the locating pins are inserted into the locating holes.

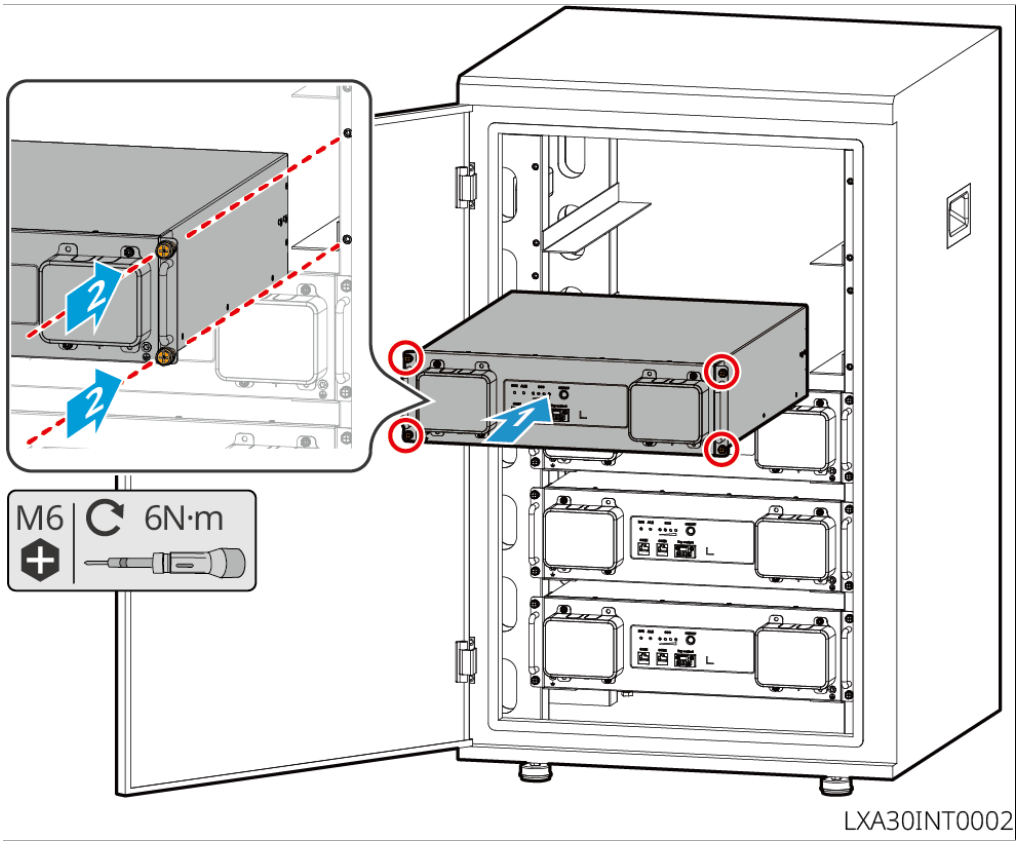


LX A5.0-30: Cabinet installation

NOTICE

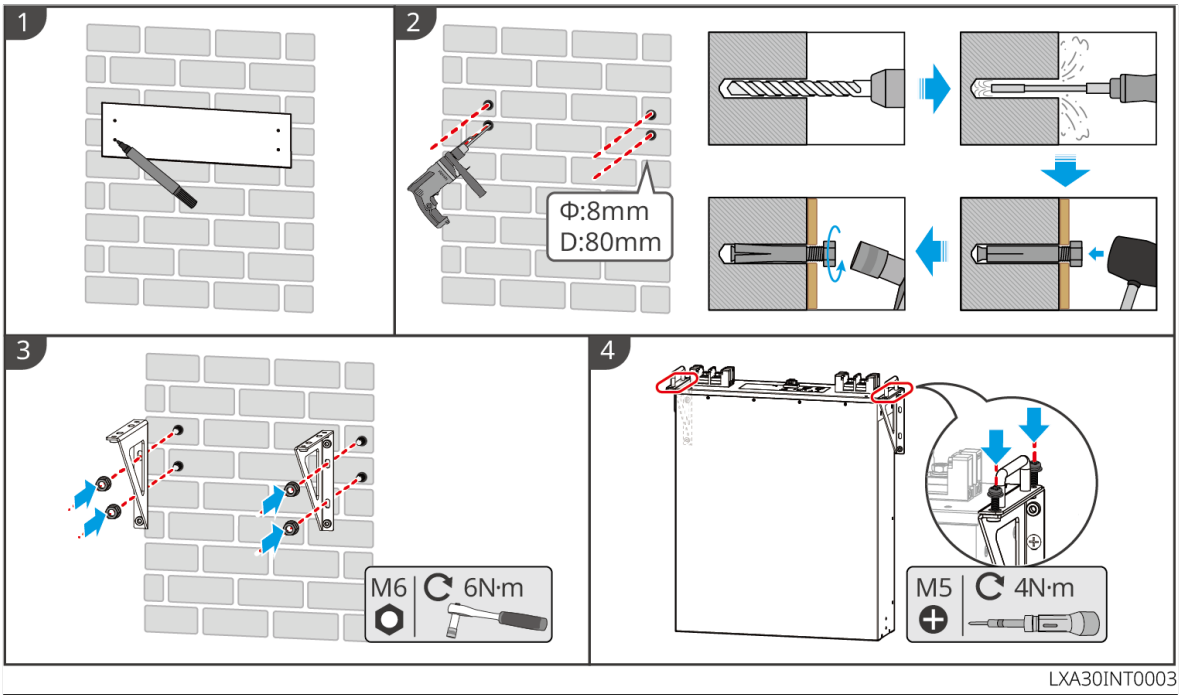
- Recommended for installation in a 19-inch standard cabinet. Length × width: 600 × 800 mm or above; height: select according to battery thickness (133 mm) or above.
- For cabinet installation, electrical labels and warning labels must be affixed to the front panel of any battery (these labels are shipped as additional accessories).

1. Place the battery onto the guide rails in the cabinet, and secure the battery to the cabinet with screws through the handles.



LX A5.0-30: Wall-mounted installation

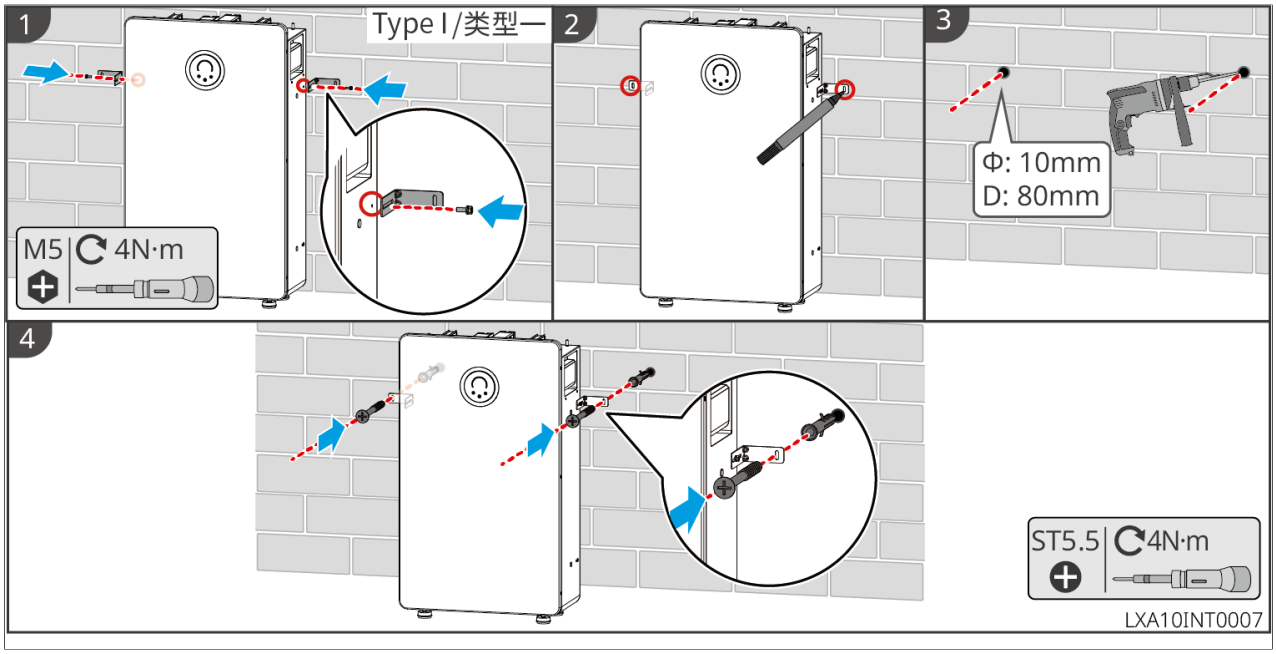
1. Determine the drilling positions according to the drilling template, and mark the drilling positions with a marker.
2. Drill holes with an impact drill.
3. Install the battery mounting bracket.
4. Install the battery on the mounting bracket, and securely connect the battery and bracket with screws.



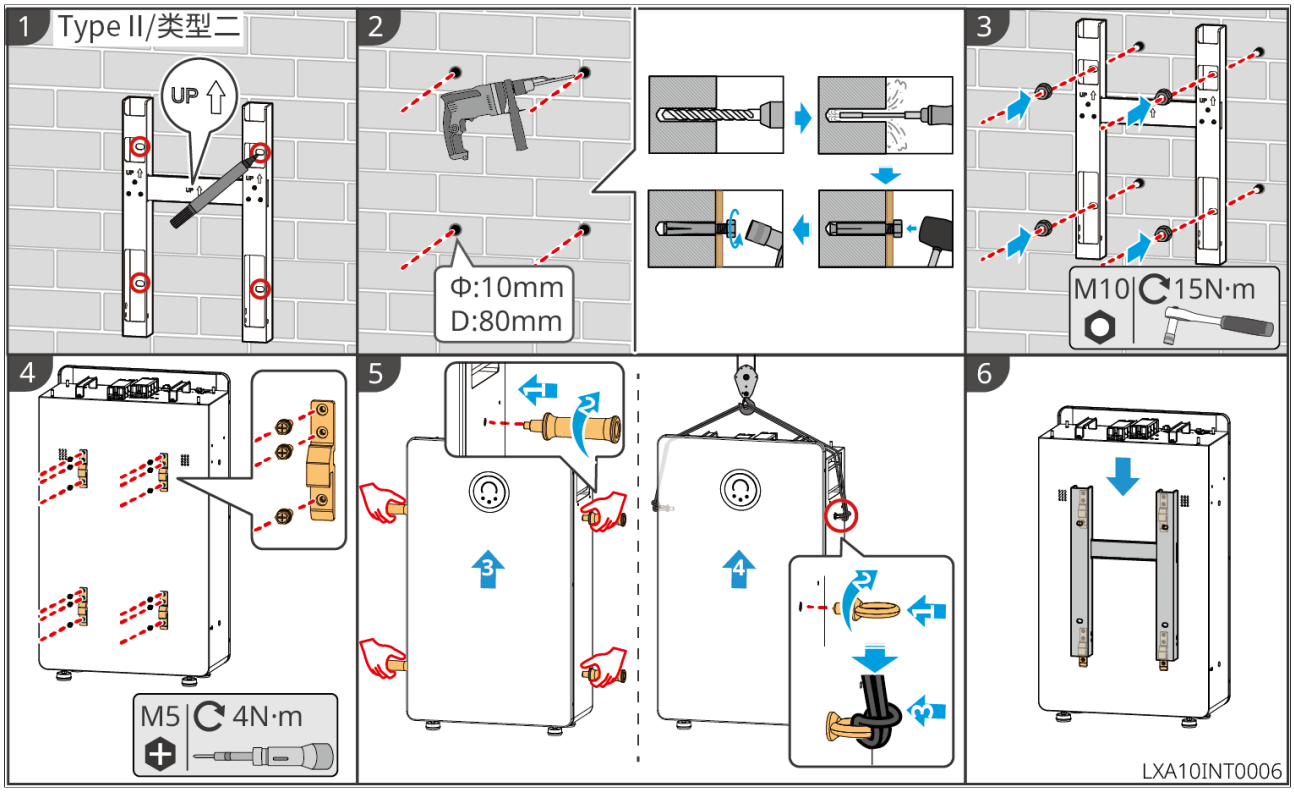
4.5.2 GW14.3-BAT-LV-G10

NOTICE
• Wall mounting requires two-person installation.

GW14.3-BAT-LV-G10: Floor-standing installation

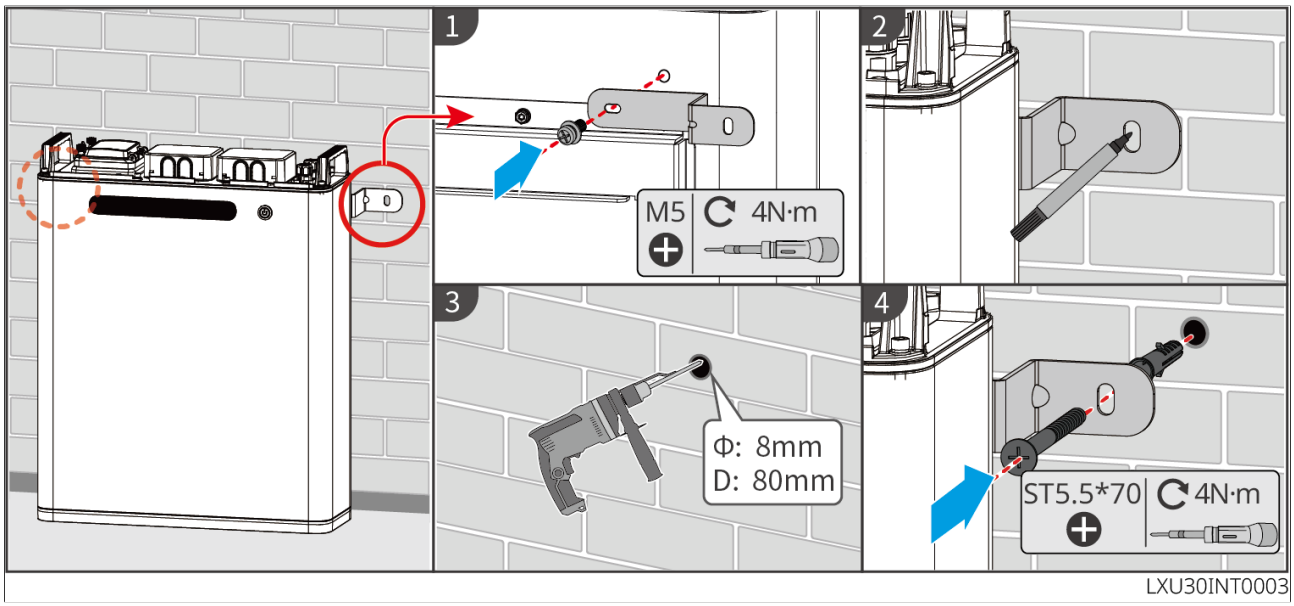


GW14.3-BAT-LV-G10: Wall-mounted installation

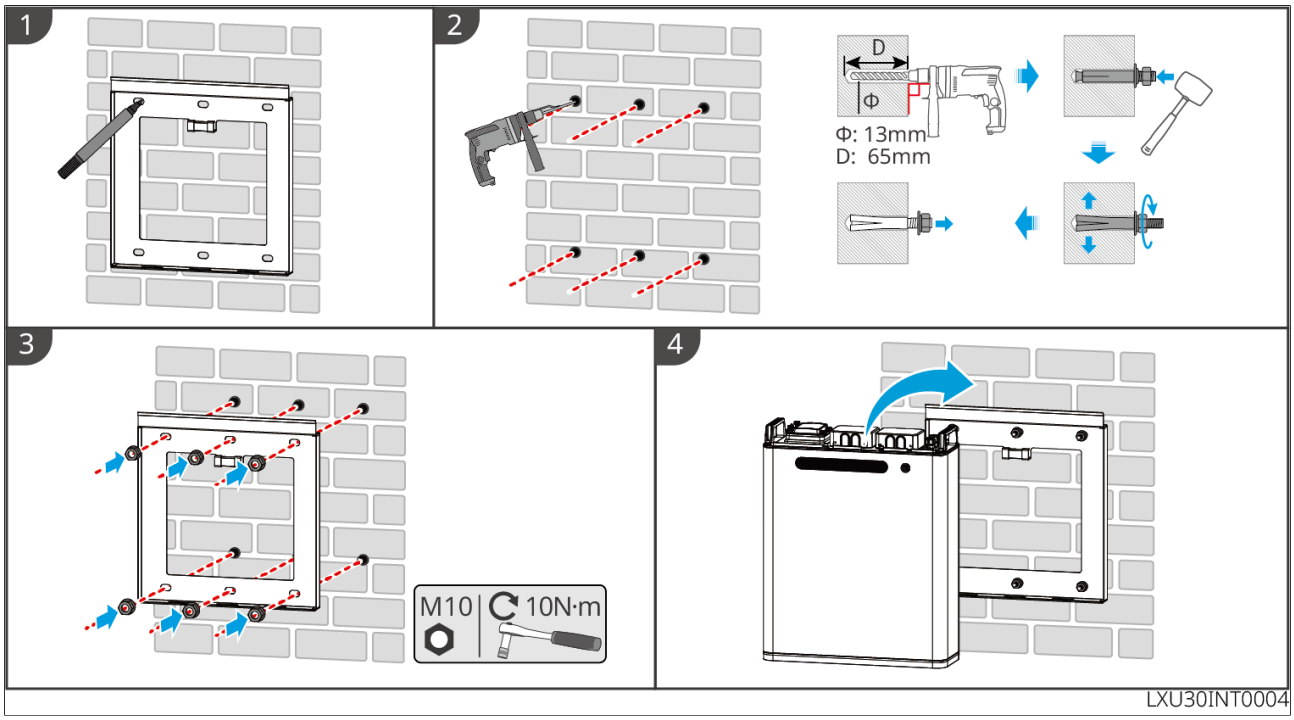


4.5.3 LX U5.0-30

LX U5.0-30: Floor-standing installation



LX U5.0-30: Wall-mounted installation

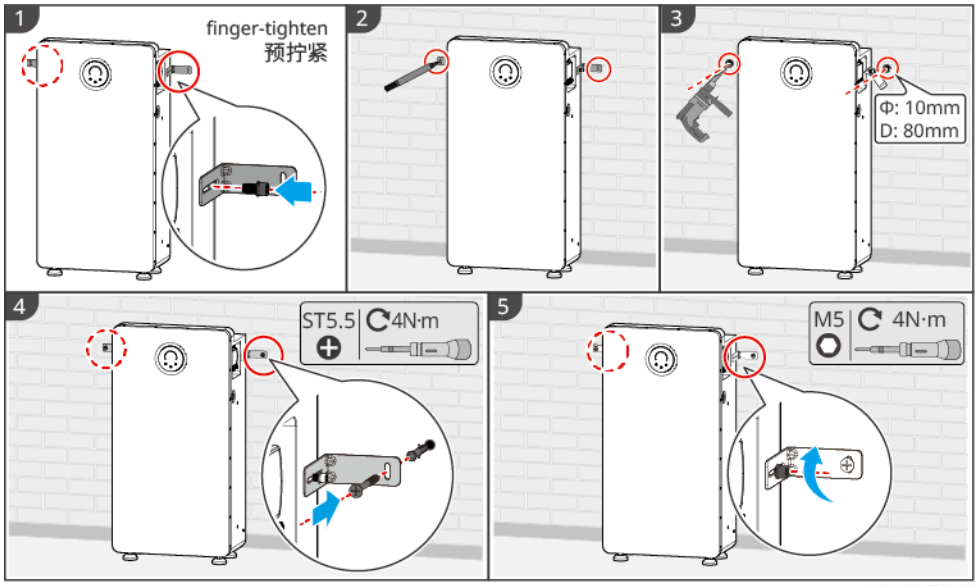


4.5.4 GW16.1-BAT-LV-G10

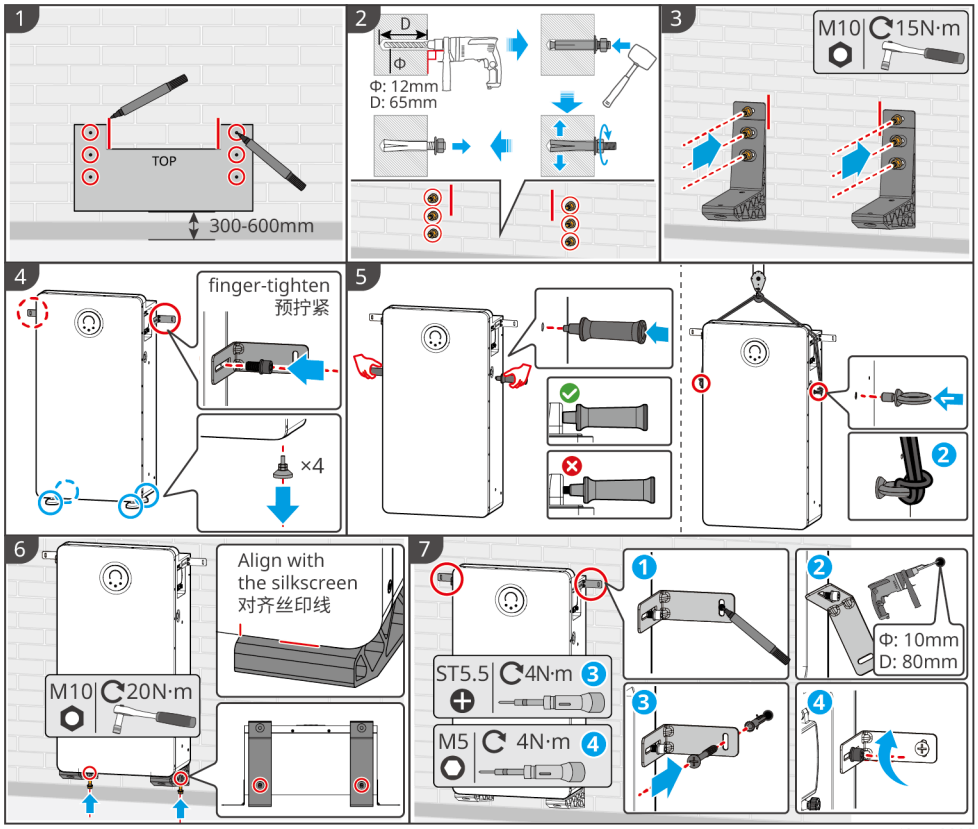
NOTICE

- Wall mounting requires two-person installation.

Floor-standing installation

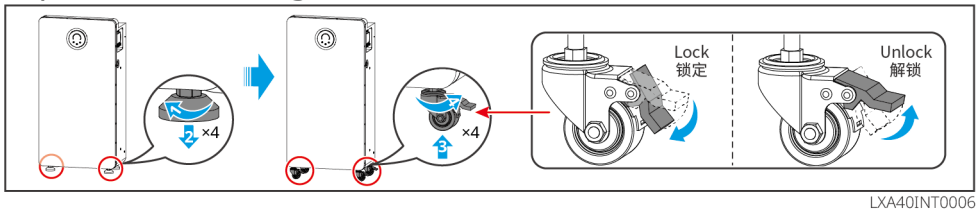


Wall-mounted installation



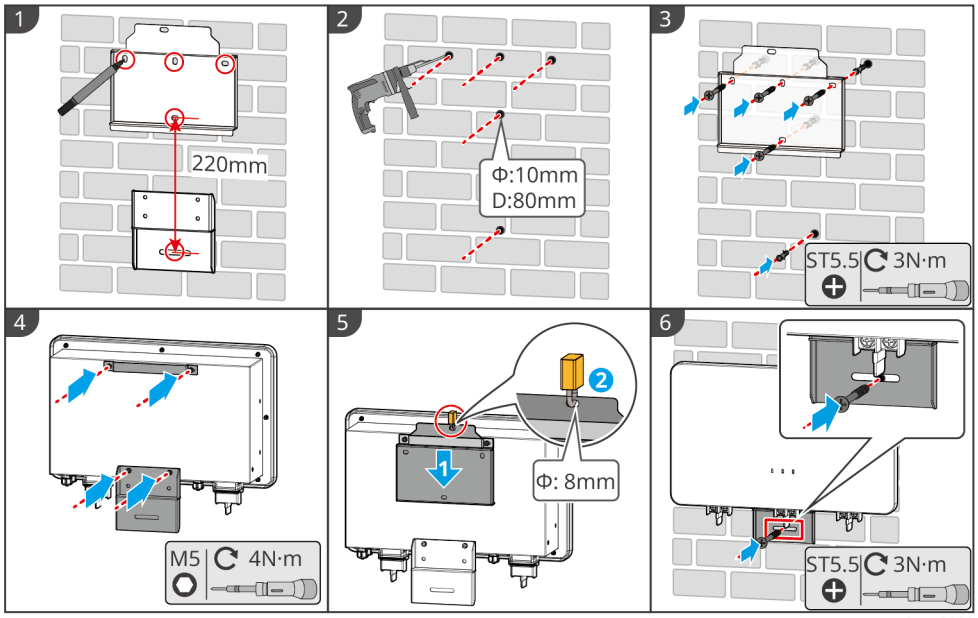
LXA40INT0003

(Optional) Mounting roller



LXA40INT0006

4.6 Install the Battery Mix Parallel Unit



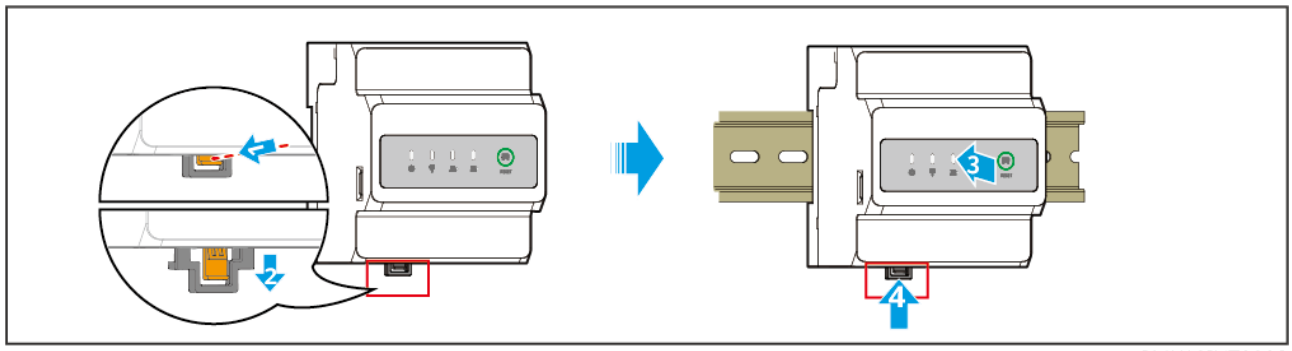
MPU10INT0002

4.7 Install the Electricity Meter

⚠WARNING

In areas with lightning hazards, if the meter cable length exceeds 10 m and the cable is not routed in grounded metal conduit, it is recommended to install external lightning protection devices.

GM330



GMK10INT0003

5 System Wiring

⚠DANGER

- The erection, routing, and connection of cables must comply with local laws, regulations, and standards.
- All operations during electrical connection and the specifications of the cables and components used must comply with local laws and regulations.
- Before making electrical connections, disconnect the equipment's DC Switch and AC output switch to ensure the equipment is powered off. Live operation is strictly prohibited; otherwise, hazards such as electric shock may occur.
- Cables of the same type should be bundled together and routed separately from cables of different types; mutual winding or crossing is prohibited.
- If the cables are subjected to excessive tensile force, poor connection may result. During wiring, reserve a certain length of cable before connecting it to the inverter wiring terminals.
- When crimping terminals, ensure that the conductor portion of the cable is in full contact with the terminal. Do not crimp the cable insulation together with the terminal; otherwise, the equipment may fail to operate, or after operation, heat generation due to unreliable connection may damage the inverter terminal block, etc.
- For unused cable entry holes and ports (including communication ports), use the dedicated terminals or plugs in the accessories supplied with the box to seal them reliably. Otherwise, the following risks may occur:
  - Electric shock hazard: Open electrical ports may allow personnel to directly contact live parts, causing electric shock accidents.
  - Protection failure: Open ports can allow dust, moisture, or foreign objects to enter, which may cause short circuits, fire, or equipment failure.

NOTICE

- When making electrical connections, wear personal protective equipment such as safety shoes, protective gloves, and insulating gloves as required.
- Only professionals are permitted to perform operations related to electrical connections.
- The cable colors in the figures in this document are for reference only. The specific cable specifications must comply with local regulatory requirements.
- For parallel systems, please observe the safety precautions in the user manuals corresponding to the relevant products in the system.

5.1 System Wiring Electrical Block Diagram

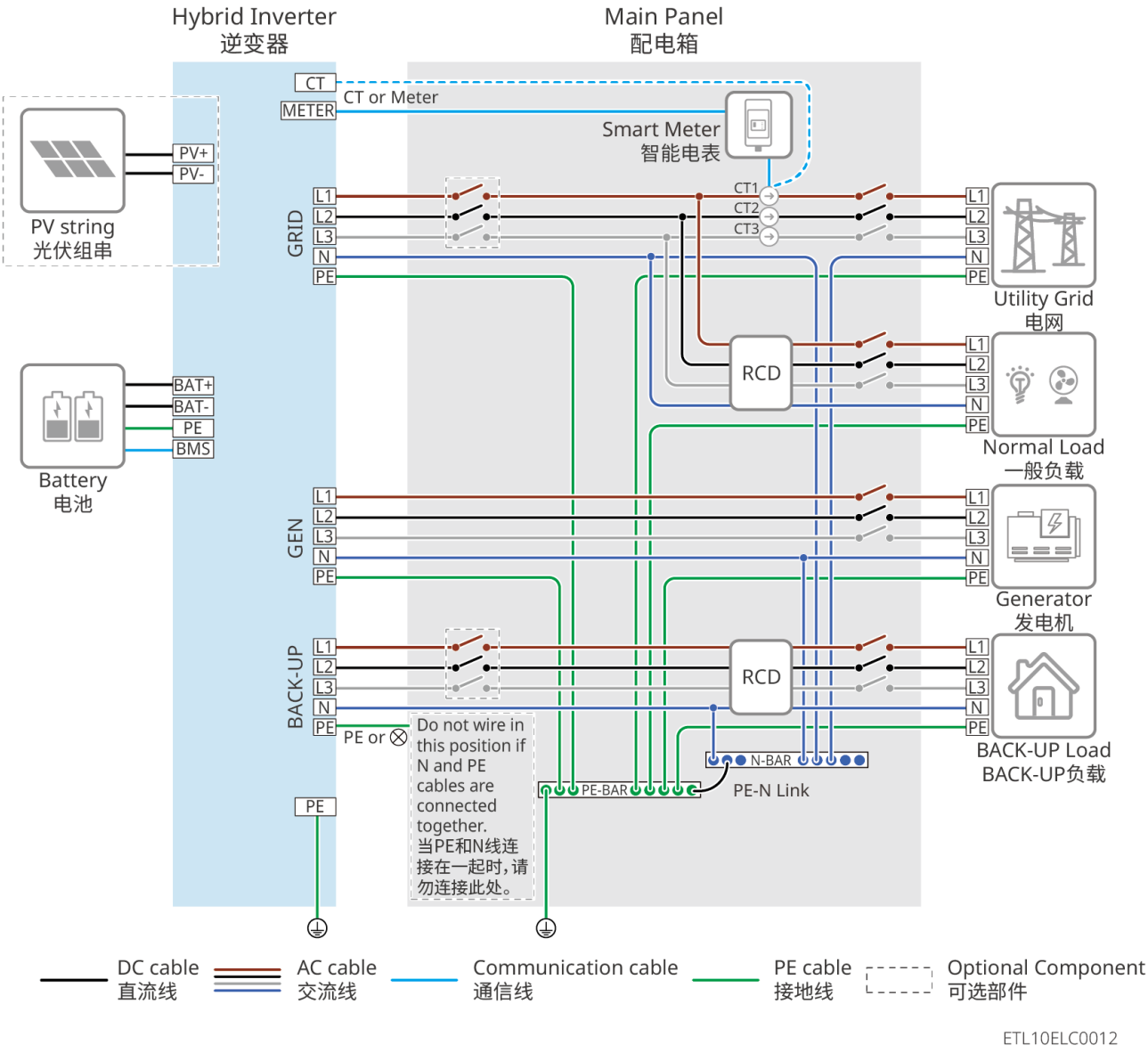
NOTICE

- According to regulatory requirements in different regions, the wiring methods for the N and PE conductors at the inverter's ON-GRID and BACK-UP ports differ. The local regulatory requirements shall prevail.
- The inverter has a built-in meter and can be used by connecting directly to a CT. The CT cable shipped with the unit is 10 m. If a longer distance is required, a shielded cable compliant with local regulations can be used to extend it to 30 m.
- CTIf the connection length to the inverter exceeds 30m, accuracy will decrease; if high accuracy is required, an external smart meter can be connected.
- The inverter's ON-GRID and GEN AC ports have built-in relays. When the inverter is in off-grid mode, the built-in ON-GRID relay is open; when the inverter is in grid-connected operation mode, the built-in ON-GRID relay is closed.
- After the inverter is powered on, the BACK-UP AC port is energized. If maintenance is required for BACK-UP loads, power off the inverter; otherwise, electric shock may result.

N and PE conductors are connected together in the distribution box.

NOTICE

- To maintain neutral integrity, the neutral conductors on the grid side and off-grid side must be connected together; otherwise, the off-grid function cannot be used normally.
- The following figure shows the grid system for Australia, New Zealand, and other regions:

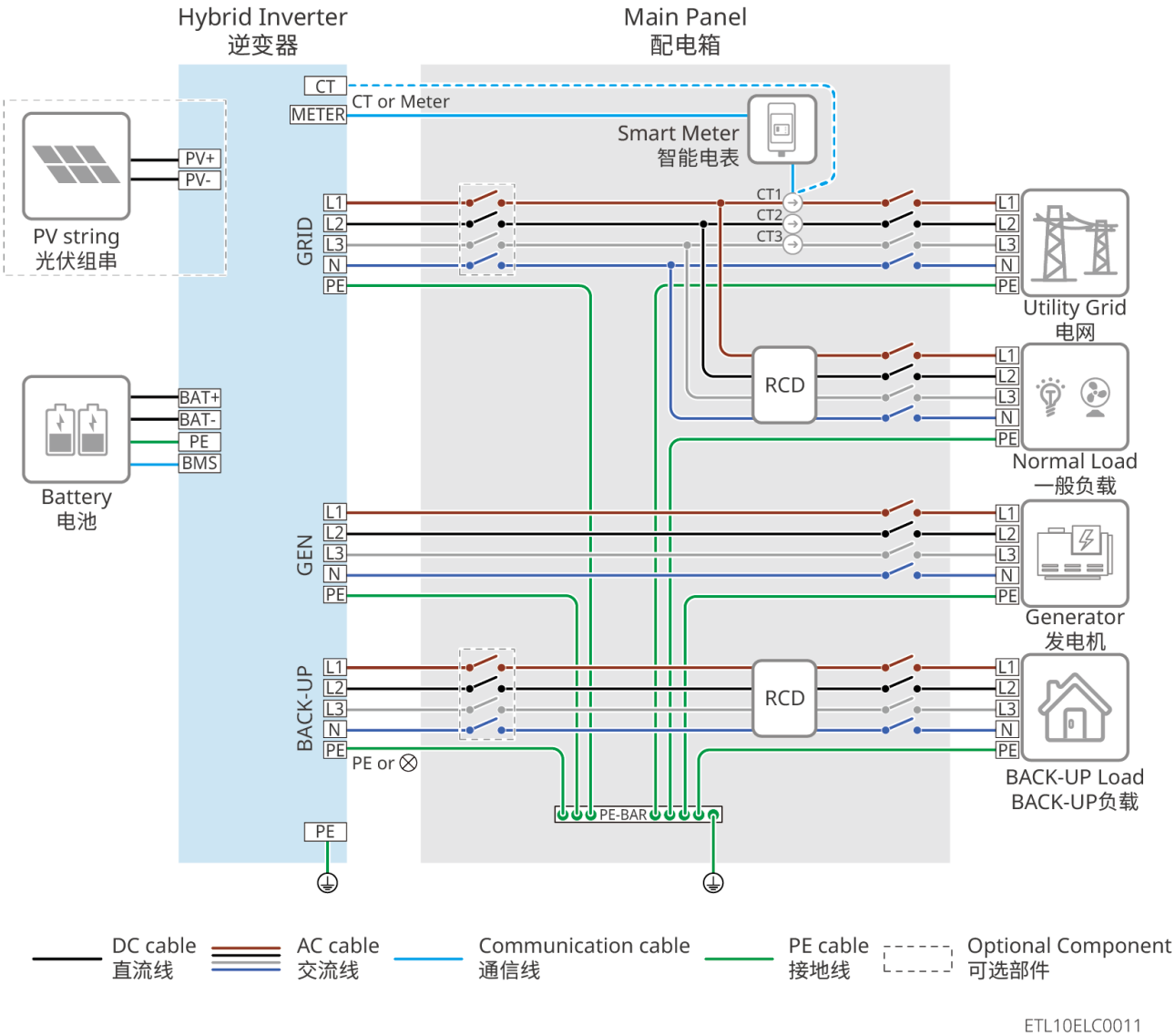


ETL10ELC0012

NandPEconductors are wired separately in the distribution box.

NOTICE

- Ensure that the BACK-UP Protection ground conductor is correctly and securely connected; otherwise, the BACK-UP function may be abnormal in the event of a grid fault.
- The following wiring method applies to regions other than Australia, New Zealand, and similar regions:

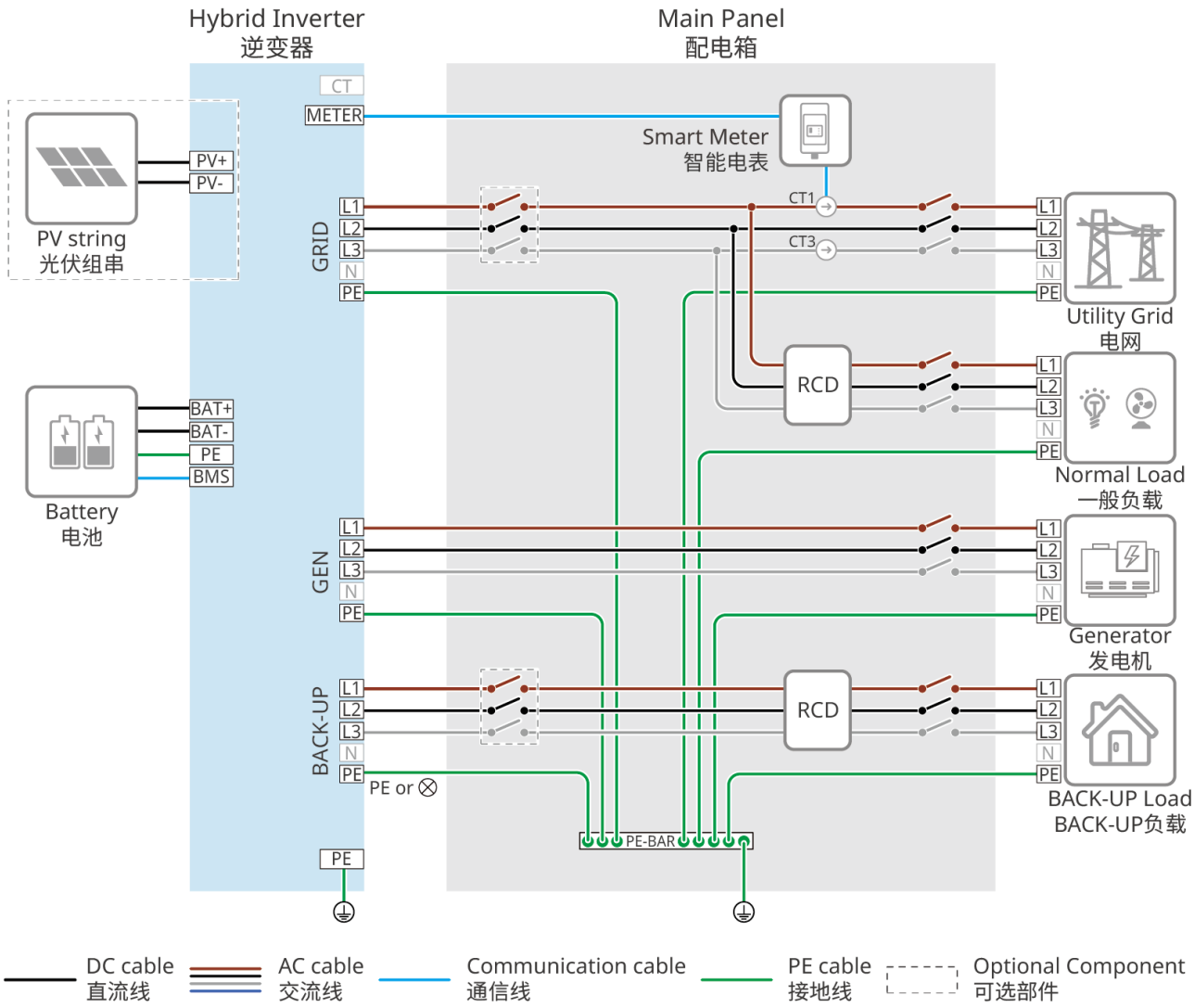


ETL10ELC0011

Electrical Wiring Block Diagram of a Three-Phase Three-Wire System

NOTICE

- Only GW12K-ET-LL-G10 supports connection to a three-phase three-wire grid. For other special grid connection methods, please contact after-sales service.



ETL10ELC0048

5.2 System Wiring Diagram

When all loads in the PV system cannot consume the Energy Generation produced by the system, the surplus energy will be fed into the grid. In this case, a smart meter or

CT can be used to monitor the system Energy Generation and control the Energy Generation fed into the grid.

- Connecting a smart meter enables output power limit and load monitoring functions.
- After connecting the smart meter, please enable the "Grid Power Limit" function through the App.

The detailed system wiring diagram only illustrates wiring for some equipment models. Please refer to the corresponding wiring guidance chapter for the equipment actually used when wiring.

NOTICE

- An optional GM330 meter is available; if you need to use it, please contact your dealer or GoodWe to purchase it.
- If output power limit is required for the grid-tied inverter, please connect a separate meter or CT device.
- When the inverter's built-in meter is not used, do not connect the inverter's CT port.

5.2.1 Detailed Wiring Diagram of Single-Inverter System

5.2.1.1 Single-Device Connection at GEN Port (Smart Load/Grid-Tied Inverter/Generator)

When a single device is connected to the GEN port (smart load/grid-tied inverter/generator), an external CT or GM330 is required.

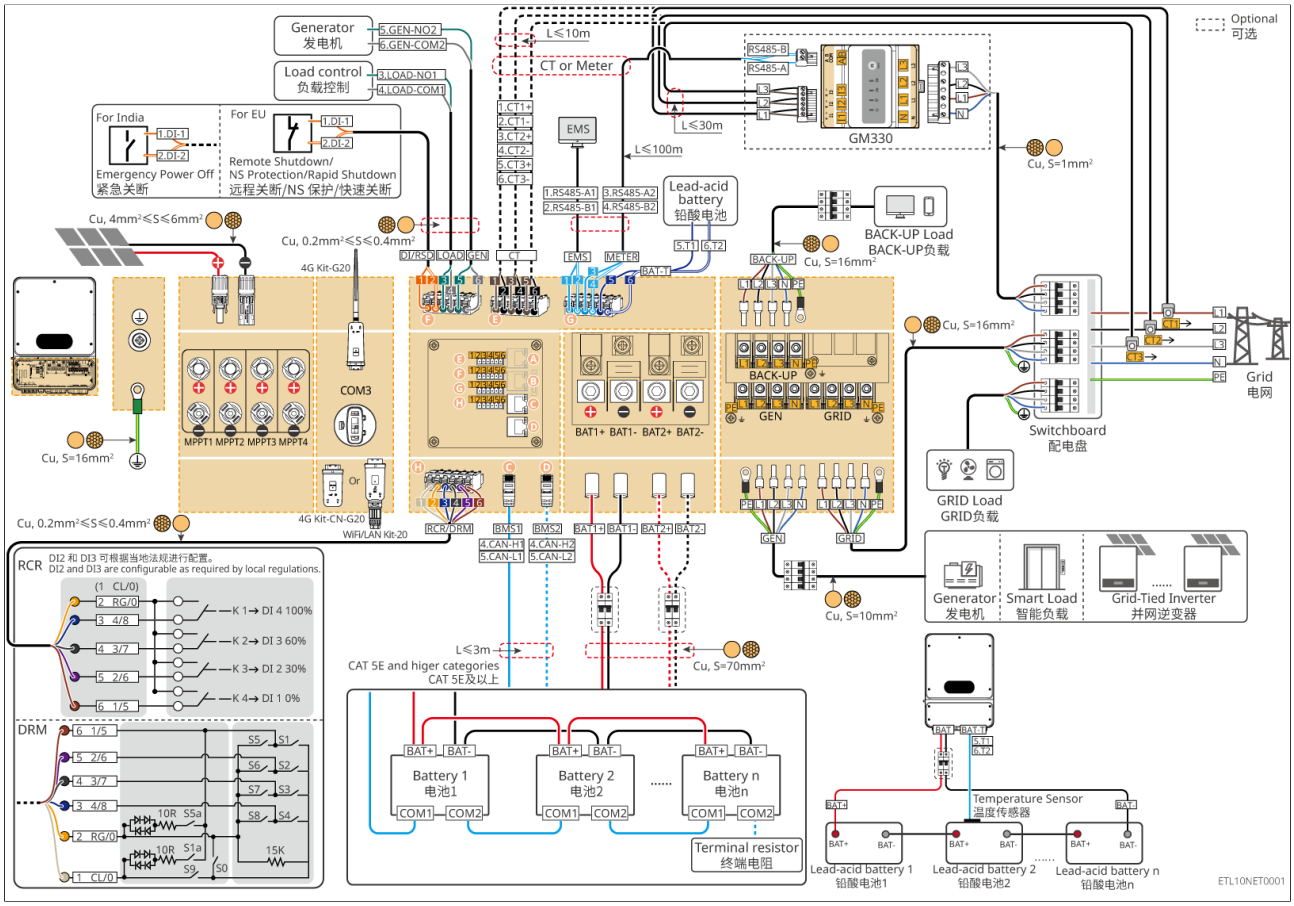


Figure1 Single-inverter scenario (built-in meter/GM330)

5.2.1.2 Smart Load/Generator at GEN Port + Grid-Tied Inverter Connected to GRID Port

GEN port smart load/generator + GRID port connected to grid-tied inverter; external CT or GM330 required

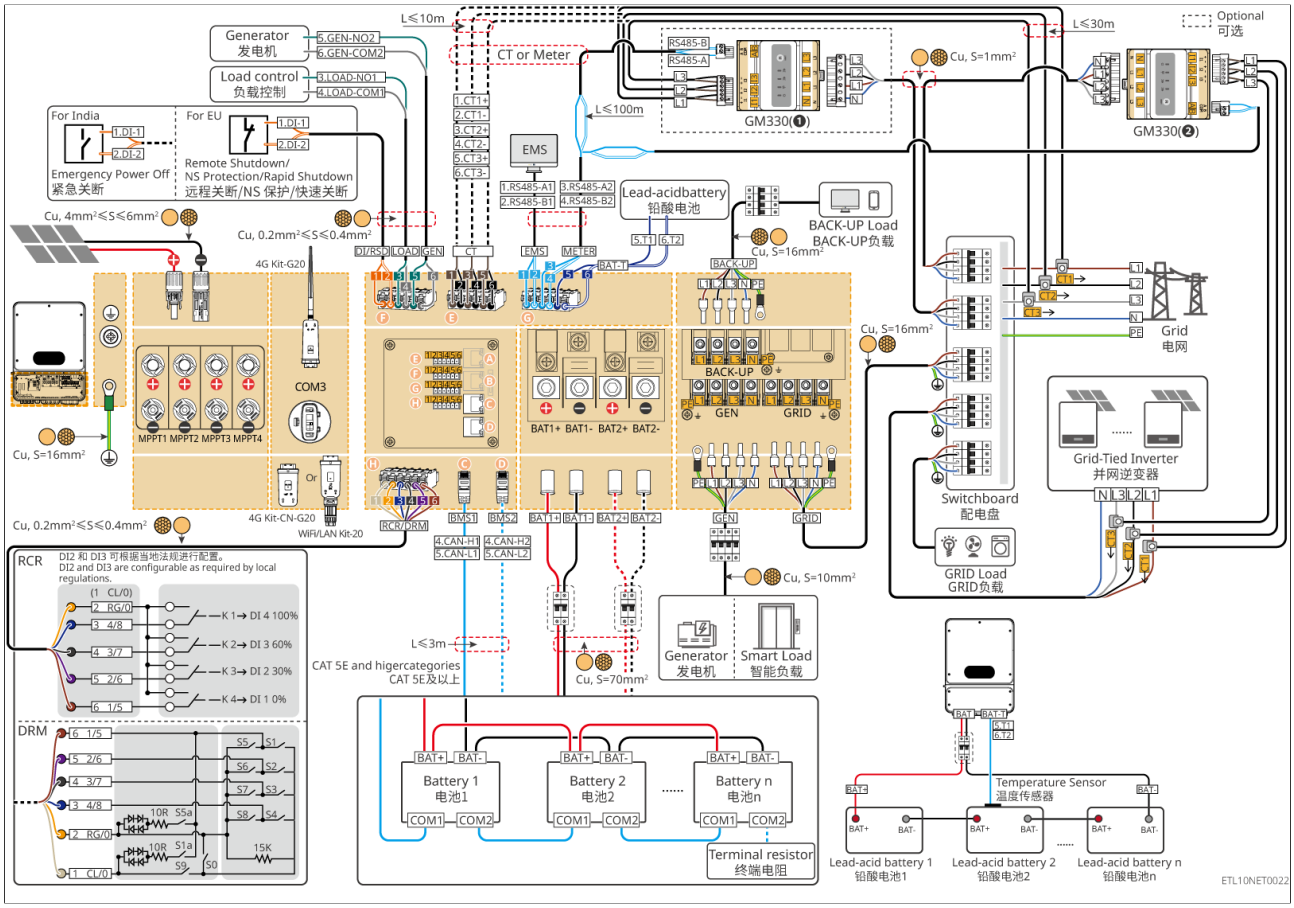


Figure2 Single-unit scenario (built-in meter/GM330❶ + GM330❷)

5.2.2 Single-Unit System Wiring Detail - Three-Phase Three-Wire

NOTICE

- Only GW12K-ET-LL-G10 supports connection to a three-phase three-wire grid.
- When connected to a three-phase three-wire grid, an external GM330 meter is required for output Power Control.

5.2.2.1 Single-Device Connection at GEN Port (Smart Load/Generator)

When a single device (smart load/generator) is connected to the GEN port, GM330 must be used

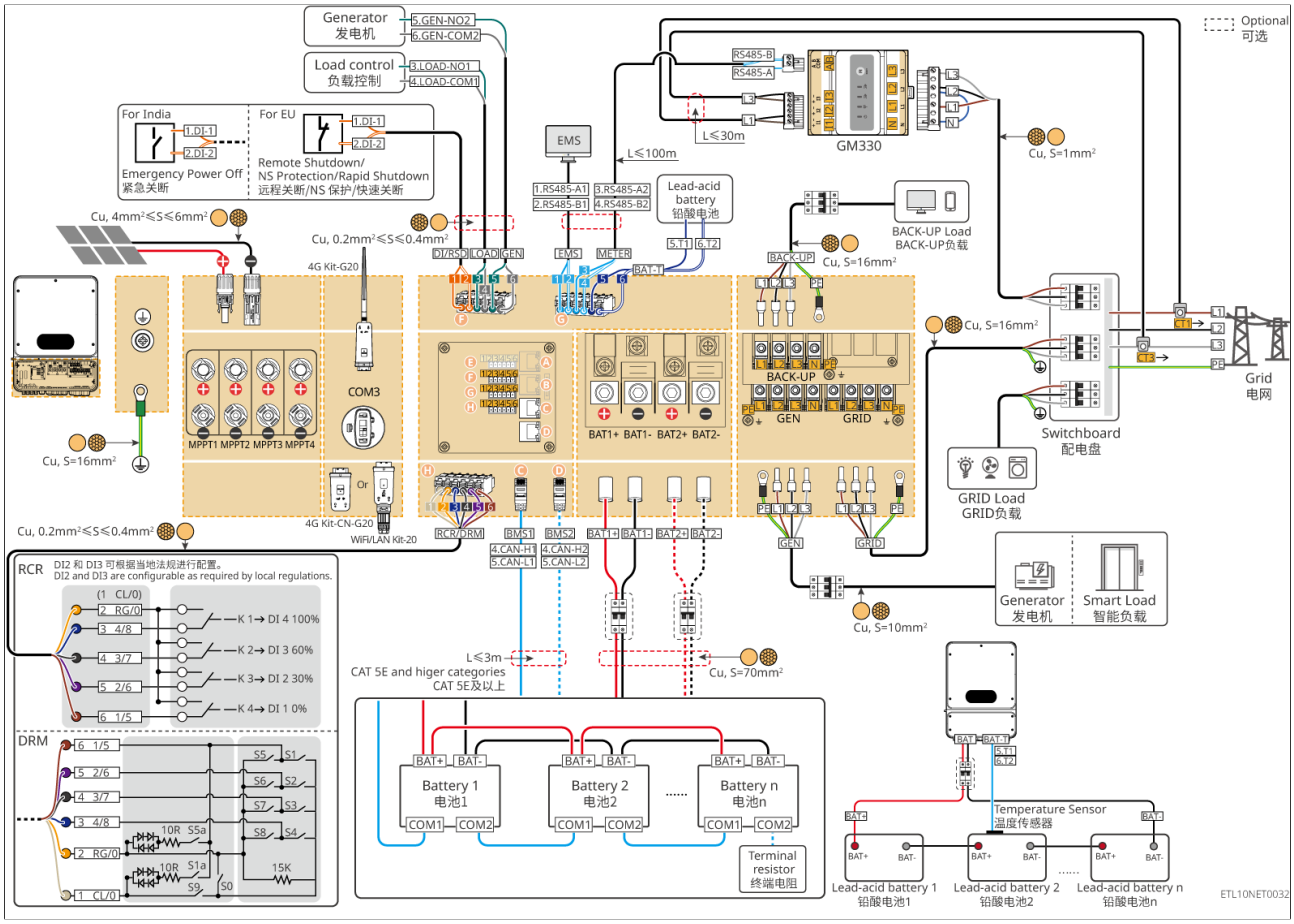


Figure3 Single-inverter scenario (GM330)

5.2.2.2 Smart Load/Generator at GEN Port + Grid-Tied Inverter Connected to GRID Port

When the GEN port is connected to a smart load/generator and the GRID port is connected to a grid-tied inverter, GM330 must be used

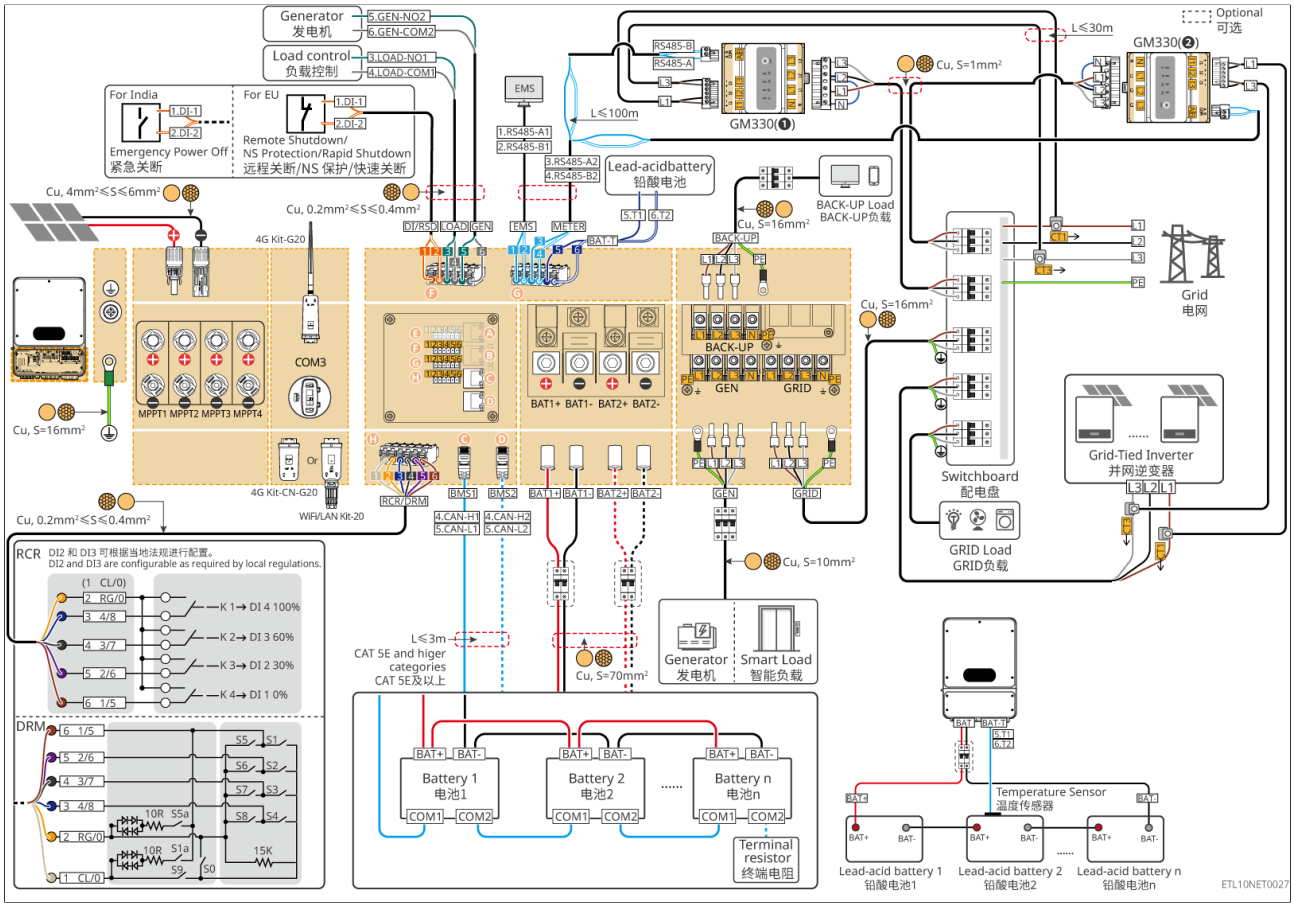


Figure4 Single-unit scenario (GM330❶ + GM330❷)

5.2.3 Detailed Wiring Diagram of Parallel System

NOTICE

- If DRED devices, RCR devices, Remote Shutdown devices, NS Protection, SG Ready heat pumps, generators, etc. need to be connected in the system, connect them to the master inverter.
- Remote Shutdown/NS Protection Function/Emergency Power Off: Connect the communication cable to the master inverter. Rapid Shutdown (RSD: Rapid Shutdown) function: Connect the communication cables to each inverter separately. If Rapid Shutdown and Remote Shutdown/NS Protection Function are required simultaneously, please contact the after-sales service center.
- In a parallel system, if any port circuit breaker of an inverter needs to be disconnected, disconnect the circuit breakers of the other ports of the same

NOTICE

inverter at the same time; otherwise, the system may operate abnormally.

- In a parallel system, each inverter needs to be equipped with a WiFi/LAN Kit-20, 4G Kit-CN-G20, or 4G Kit-G20.
- When using the battery non-busbar Access Mode in the parallel system:
  - The inverter's "BAT Access Mode" only supports "Independent Access".
  - Each battery interface of each inverter must be connected to a battery system.
  - GoodWe batteries of different models can be connected. For the relevant wiring method, refer to the "5.8.Connect the Battery Cables.(Page 139)" chapter.
- If GoodWe batteries of different models exist in a parallel system, the corresponding battery parameters must be configured separately for each inverter through the App. For detailed setting steps, refer to the "Setting Battery Function" chapter in the App manual.
- The GoodWe combiner box supports parallel connection of up to 6 inverters. If 10 inverters need to be connected in parallel, please prepare busbars yourself.
- When connecting a generator to the parallel system, the following requirements must be met:
  - The generator power must be greater than the total power of all loads connected to the BACKUP port.
  - The Nominal Voltage of the generator combiner box should be consistent with the Nominal Voltage of the inverter GEN port, and the insulation voltage of the busbar relative to the combiner box enclosure should be greater than DC2120V; the Rated Current should be greater than 1.2 times the sum of the Rated Currents of all GEN ports in the parallel system, i.e., (number of parallel units × Rated Current of a single unit's GEN port × 1.2).
- In parallel scenarios, the GEN port does not support parallel connection of smart loads or grid-tied inverters; otherwise, inverter damage may occur, and equipment failures caused thereby are not covered by the warranty.
- If more than two inverters are connected in parallel, use a GM330 meter.
- In a Parallel Microgrid Scenario, batteries only support busbar connection.
- During parallel connection, the two adjacent parallel cables in the middle share the same magnetic ring and are wound 5 turns; all other parallel cables must be individually wound 5 turns on a magnetic ring.
- The following figures focus on the wiring related to parallel connection. For wiring requirements of other ports, refer to the single-inverter system.

In a parallel scenario, the inverter connected to the meter is the master inverter, and the others are slave inverters.
The master inverter must be set as the master unit through the App "Parallel System Settings"。For specific settings, refer to the App manual.

5.2.3.1 Single-Device Connection to a Generator at GEN Port

When a single generator is connected to the GEN port, an external CT or GM330 is required

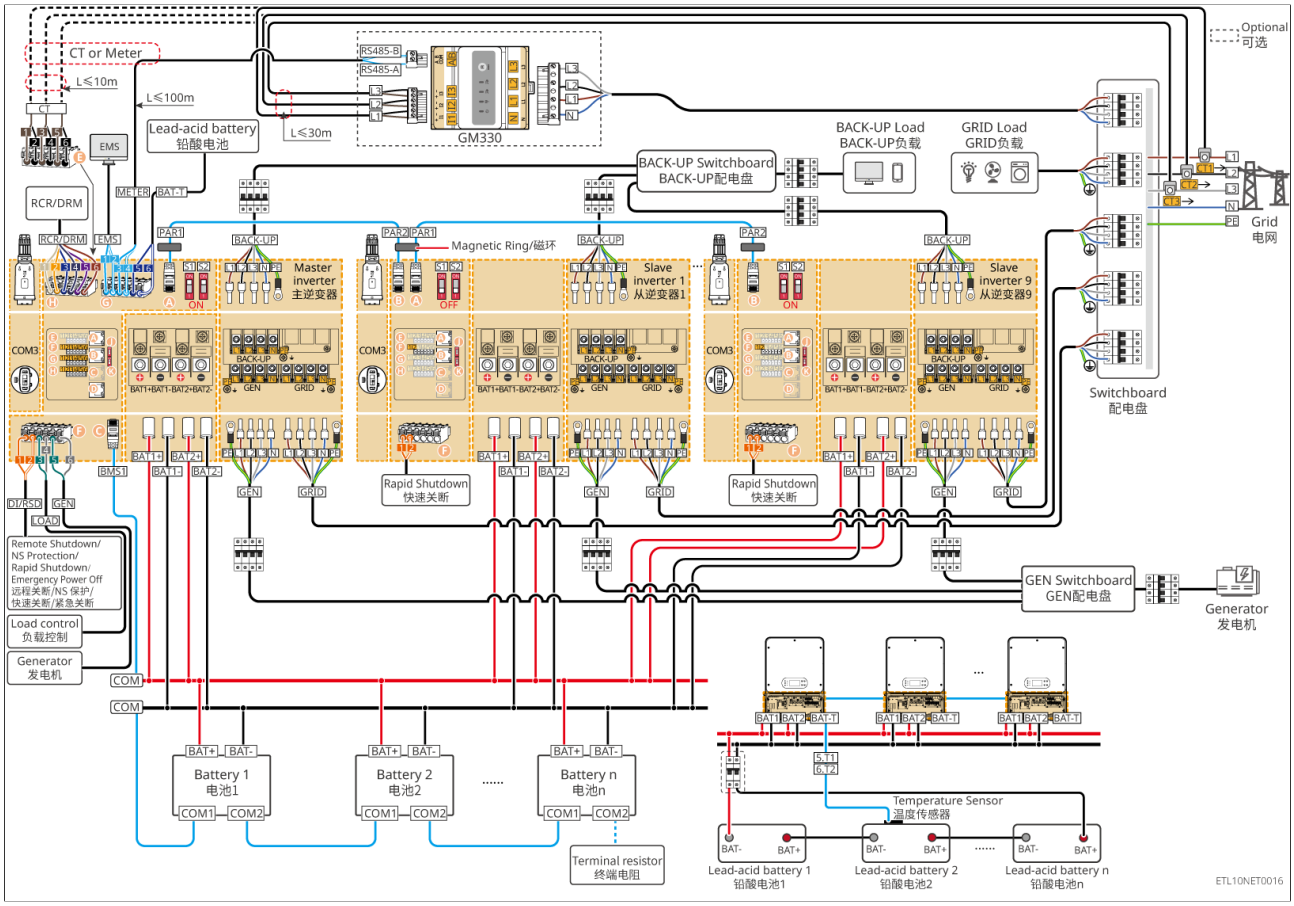


Figure5 Parallel operation scenario (built-in meter/GM330)

5.2.3.2 Smart Load/Grid-Tied Inverter Connected to GEN Port

When a smart load/grid-tied inverter is connected to the GEN port, an external CT or GM330 is required

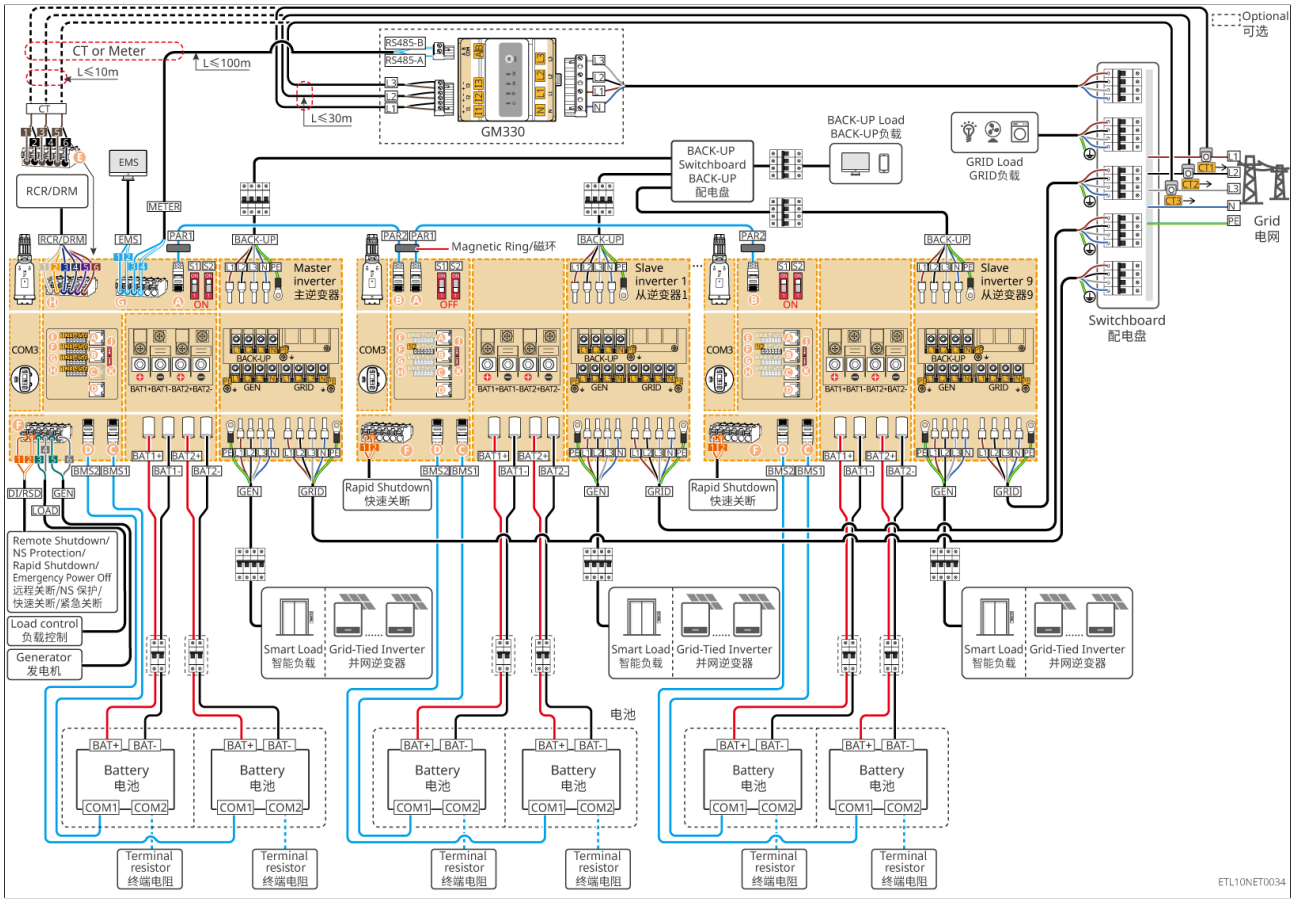


Figure6 Parallel operation scenario (built-in meter/GM330)

5.2.3.3 Smart Load Connected to GEN Port + Grid-Tied Inverter Connected to GRID Port

When the GEN port is connected to a smart load and the GRID port is connected to a grid-tied inverter, GM330 must be used

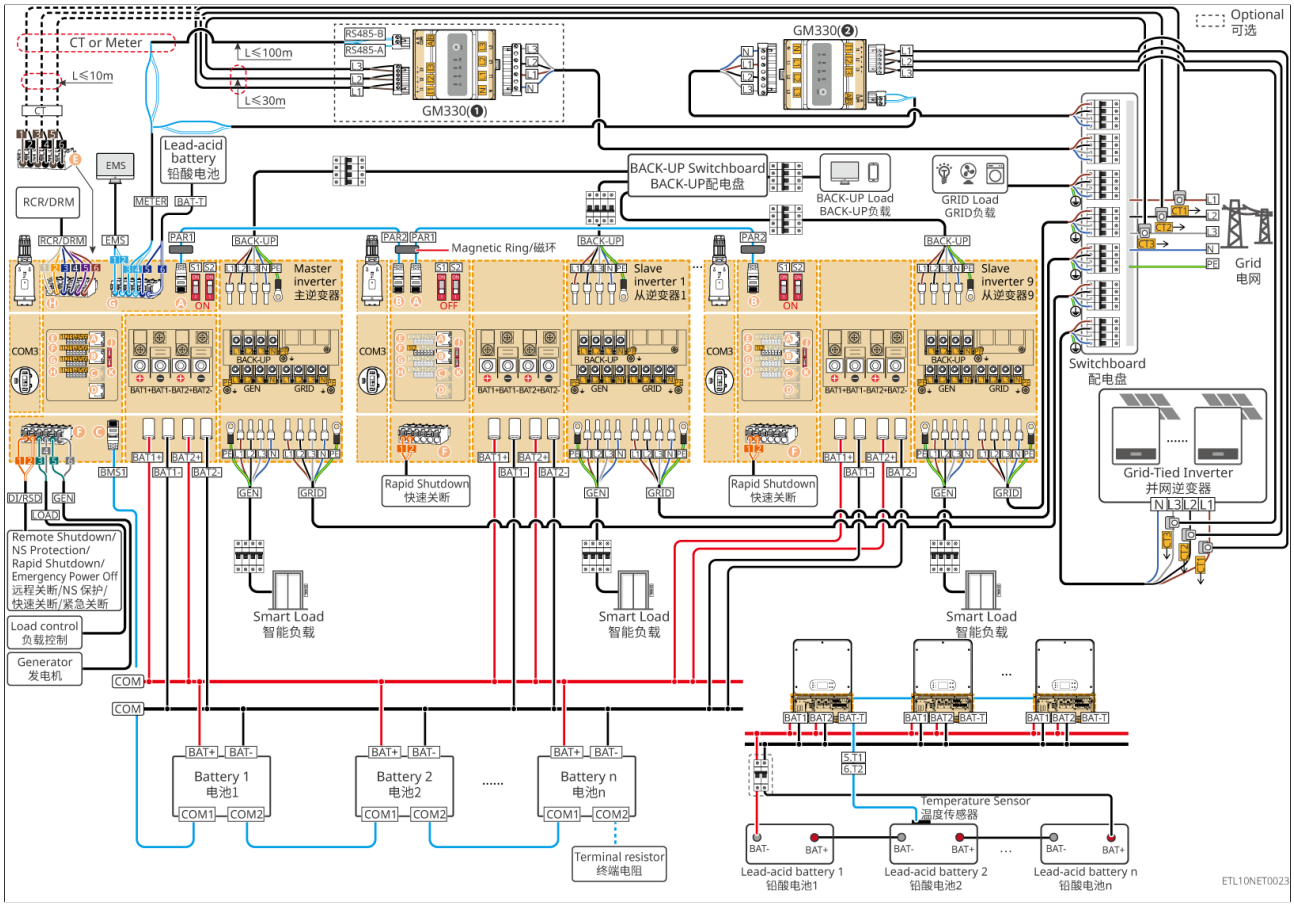


Figure7 Parallel operation scenario (built-in meter/GM330❶ + GM330❷)

5.3 Material Preparation

⚠WARNING

- Do not connect loads between the inverter and the AC Switch directly connected to the inverter.
- Each inverter must be equipped with an AC output circuit breaker. Multiple inverters must not be connected to the same AC circuit breaker at the same time.
- To ensure that the inverter can safely disconnect from the grid in the event of an abnormal condition, connect an AC circuit breaker on the inverter's AC side. Select an appropriate AC circuit breaker in accordance with local regulations.
- After the inverter is powered on, the BACK-UP AC port is energized. If maintenance is required for BACK-UP loads, power off the inverter; otherwise, electric shock may result.
- For cables used in the same system, it is recommended that the conductor material, cross-sectional area, length, etc. of the following cables be consistent.
  - BACK-UP AC cable for each inverter
  - ON-GRID AC cable for each inverter
  - Power cable between the inverter and the battery
  - Power cable between batteries
  - Power cable between the inverter and the busbar
  - Power cable between the battery and the busbar

5.3.1 Switch Preparation

No.	Circuit breaker	Recommended Specifications	Procurement method	Remarks
1	• ON-GRID circuit breaker • BACK-UP load circuit breaker	Recommendations for partial backup scenarios are as follows: • Nominal Voltage ≥230 Vac, Rated Current requirements are as follows: ◦ GW5K-ET-L-G10, GW6K-ET-L-G10: Rated Current ≥20A ◦ GW8K-ET-L-G10, GW10K-ET-L-G10: Rated Current ≥32A ◦ GW12K-ET-L-G10, GW15K-ET-L-G10, GW20K-ET-L-G10: Rated Current ≥63A • Nominal Voltage ≥127 Vac, Rated Current requirements are as follows: ◦ GW12K-ET-LL-G10: Rated Current ≥63A	Self-provided	During actual selection, you can also select, based on the actual operating current, a circuit breaker that fully complies with local installation regulations.
2	• ON-GRID circuit breaker • BACK-UP load circuit breaker	Recommendations for whole-home backup scenarios are as follows: • Nominal Voltage ≥230 Vac, Rated Current requirements are as follows: ◦ GW5K-ET-L-G10, GW6K-ET-L-G10, GW8K-ET-L-G10, GW10K-ET-L-G10, GW12K-ET-L-G10, GW15K-ET-L-G10, GW20K-ET-L-G10: Rated Current ≥100A • Nominal Voltage ≥127 Vac, Rated Current requirements are as follows: ◦ GW12K-ET-LL-G10: Rated Current ≥100A	Self-provided	

No.	Circuit breaker	Recommended Specifications	Procurement method	Remarks
3	GEN circuit breaker	Nominal Voltage ≥230Vac Rated Current requirements are as follows: 63A for all power ranges	Self-provided	
4	Battery switch	Optional according to local laws and regulations • Nominal Voltage ≥60Vdc, Rated Current requirements are as follows: ◦ GW5K-ET-L-G10: Rated Current ≥125A ◦ GW6K-ET-L-G10: Rated Current ≥160A ◦ GW8K-ET-L-G10: Rated Current ≥200A ◦ GW10K-ET-L-G10: Rated Current ≥250 A ◦ GW12K-ET-L-G10: Rated Current ≥250 A ◦ GW15K-ET-L-G10: Rated Current ≥200 A × 2 ◦ GW20K-ET-L-G10: Rated Current ≥250 A × 2 • Nominal Voltage ≥60Vdc, Rated Current requirements are as follows: ◦ GW12K-ET-LL-G10: Rated Current ≥250 A	Self-provided	
5	Leakage Current Protection Device	Optional according to local laws and regulations • Type A • ON-GRID side[*1]: 300mA • BACK-UP side: 30 mA	Self-provided	-

No.	Circuit breaker	Recommended Specifications	Procurement method	Remarks
*1: The inverter has a built-in general-purpose current-sensing residual current monitoring unit. Once a leakage current exceeding the limit is detected, the inverter will immediately disconnect from the utility grid. However, if regulations mandate the installation of an external Residual Current Protection Device (RCD), it is recommended that the RCD have a residual operating current of not less than 300 mA and be Type A (for Apparent Power less than 30 kVA, 300 mA is recommended; for greater than 30 kVA, select according to 10 mA/kVA). Alternatively, an RCD whose residual operating current meets the requirements may be selected in accordance with local regulations. For example, in Chile, local regulations require an RCD with a residual operating current not greater than 30 mA to be installed between the inverter and the grid for inverters of 5 kVA and below. Note that due to the PV panels, an RCD with a smaller residual operating current is more prone to nuisance tripping in harsh environments such as rainy weather.				

5.3.2 Cable Preparation

No.	cable	Recommended Specifications	Procurement method	Remarks
1	Inverter Protection Grounding Cable	• Single-core outdoor copper cable • Conductor cross-sectional area: S=16 mm^2 • Cable outer diameter: 7.5 mm–9.0 mm	Self-provided	-

No.	cable	Recommended Specifications	Procurement method	Remarks
2	Battery Protection Grounding Cable	• Single-core outdoor copper cable • Conductor cross-sectional area: ◦ LX A5.0-30：10mm² ◦ LX U5.0-30：10mm² ◦ GW14.3-BAT-LV-G10：10mm² ◦ GW16.1-BAT-LV-G10：10mm²	• Self-provided • LX A5.0-30: Accessory available (optional) • GW14.3-BAT-LV-G10: For some units, the grounding cable is shipped with the battery accessories • GW16.1-BAT-LV-G10: Standard configuration	-
3	PV DC cable	• Industry-standard outdoor PV cable • Conductor cross-sectional area: 4–6 mm² • Cable outer diameter: 5.9 mm–8.8 mm	Self-provided	-

No.	cable	Recommended Specifications	Procurement method	Remarks
4	Battery DC cable	• Single-core outdoor copper cable • Inverter Battery Port Wiring Requirements: ◦ Conductor cross-sectional area: 70 mm^2 ◦ Cable outer diameter: 15.7 mm–16.7 mm • Cable Requirements Between the Battery and Busbar: ◦ LX A5.0-30, conductor cross-sectional area: 50 mm^2 ◦ LX U5.0-30, conductor cross-sectional area: 50 mm^2 ◦ GW14.3-BAT-LV-G10, conductor cross-sectional area: 70 mm^2 ◦ GW16.1-BAT-LV-G10, conductor cross-sectional area: 50 mm^2 • Cable Requirements Between the Battery and Mix Parallel Unit: ◦ LX A5.0-30, conductor cross-sectional area: 35 mm^2 ◦ GW14.3-BAT-LV-G10, conductor cross-sectional area: 70 mm^2	• Self-provided • LX U5.0-30: can be purchased from GoodWe • GW14.3-BAT-LV-G10: for some models, the battery DC cable is shipped with the battery accessories • GW16.1-BAT-LV-G10： ◦ DC cable between inverter and battery: supplied as standard ◦ DC cable between batteries: can be purchased from GoodWe	-

No.	cable	Recommended Specifications	Procurement method	Remarks
		◦ GW16.1-BAT-LV-G10, conductor cross-sectional area: 50 mm^2 • Battery Cluster Parallel Connection Cable Requirements: ◦ LX A5.0-30, conductor cross-sectional area: 50 mm^2 ◦ LX U5.0-30, conductor cross-sectional area: 25 mm^2 ◦ GW14.3-BAT-LV-G10, conductor cross-sectional area: 70 mm^2 ◦ GW16.1-BAT-LV-G10, conductor cross-sectional area: 50 mm^2		

No.	cable	Recommended Specifications	Procurement method	Remarks
5	AC cable	• Inverter AC Input/Output Cables (BACK-UP/ON-GRID): ◦ Conductor cross-sectional area: 16 mm^2 ◦ Outer diameter of multi-core outdoor copper cable: 25–32 mm • Generator Power Cable (GEN): ◦ Conductor cross-sectional area: 10 mm^2 ◦ Outer diameter of multi-core outdoor copper cable: 18–22 mm	Self-provided	When selecting the cable size, you can also select a cable size that complies with local installation regulations based on the actual operating current.
6	Smart meter power cable	• Outdoor copper cable • Conductor cross-sectional area: 1 mm^2	Self-provided	-
7	BatteryBMScommunication cable	Custom communication cable, default length is3m	Shipped with the inverter	If you provide your own, recommended:CAT 5Eor higher standard Ethernet cable andRJ45connectors

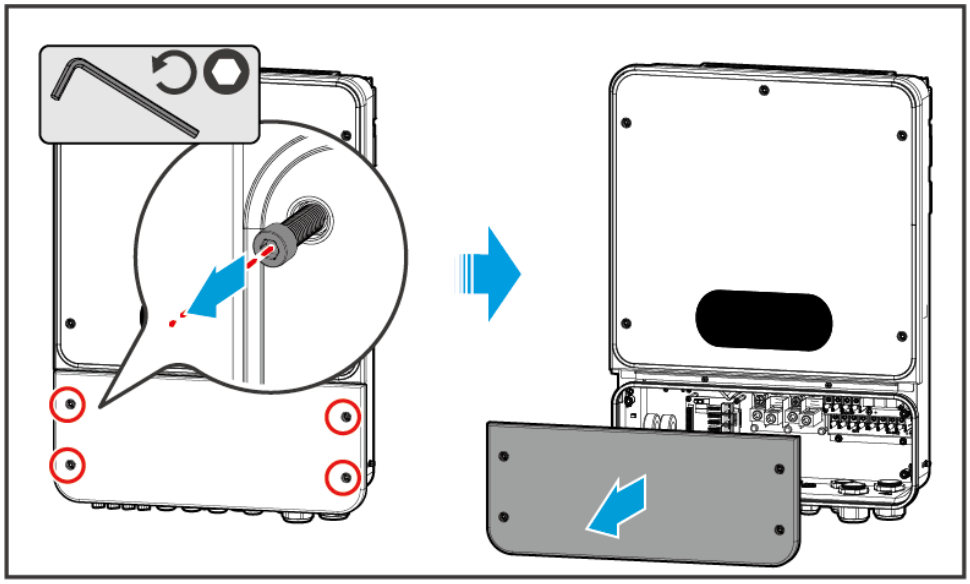
No.	cable	Recommended Specifications	Procurement method	Remarks
8	Battery communication cable	Communication between the combiner box and the battery, as well as between batteries, requires standard shielded Ethernet cable of CAT 5E or higher specification and shielded RJ45 connectors.	• Self-provided • LX A5.0-30: Accessory available (optional) • GW14.3-BAT-LV-G10: ◦ Communication cable between inverter and battery: supplied as standard on some models ◦ Communication cable between batteries: user-supplied, cable length ≤ 2 m • GW16.1-BAT-LV-G10: ◦ Communication cable between inverter and battery: supplied as standard ◦ Communication cable between batteries: user-supplied, cable length ≤ 1 m	-
9	WiFi/LAN Kit-20 communication cable	Standard shielded network cable of CAT 5E or higher specification and shielded RJ45 connectors	Self-provided	-

No.	cable	Recommended Specifications	Procurement method	Remarks
10	CT communication cable	• Shielded cable meeting local standards • Conductor cross-sectional area:0.2mm²-0.4mm² • Cable outer diameter:5mm-8mm	Self-provided	-
11	EMS RS485 communication cable	• Shielded twisted pair cable • Conductor cross-sectional area:0.2mm²-0.4mm²	Self-provided	-
12	Meter RS485 communication cable			
13	Load control and Diesel Generator Control communication cable	• Shielded cable meeting local standards • Conductor cross-sectional area:0.2mm²-0.4mm² • Cable outer diameter:5mm-8mm	Self-provided	-
14	Remote Shutdown communication cable Rapid Shutdown communication cable NS Protection communication cable			-

No.	cable	Recommended Specifications	Procurement method	Remarks
15	RCR/DREDs ignal cable			-
16	Lead-acid battery temperatur e sensor cable		Self-provided	China only
16	Inverter parallel communica tion cable	• RJ45 connector • CAT 5E or higher specification straight-through network cable ◦ CAT 5E or CAT 6E; recommended length not exceeding 5 m ◦ CAT 7E; recommended length not exceeding 10 m	Self-provided	-

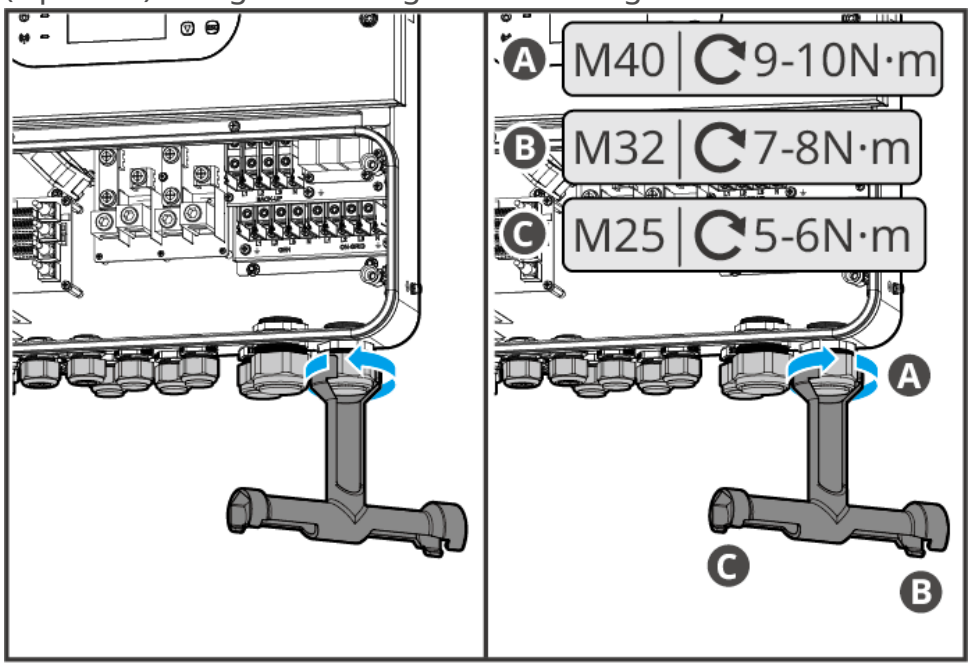
5.4 Remove the Inverter Enclosure Lower Cover

Remove the inverter enclosure lower cover:



ETL10INT0003

(Optional) Using the cable gland unlocking tool:



ETL10INT0008

5.5 Connect the Protection Ground Cable

⚠WARNING

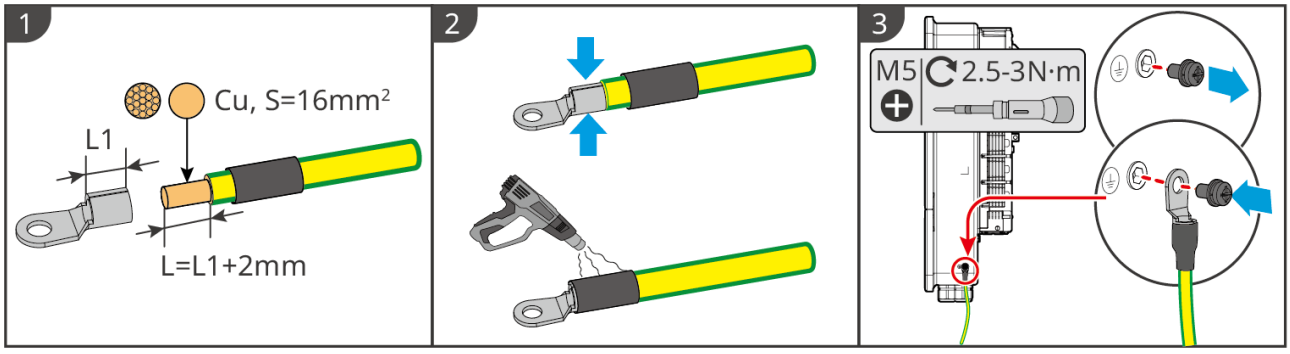
- The protective grounding (Protection) of the enclosure cannot replace the protective earth conductor (Protection) of the AC output; when wiring, ensure that the protective earth conductors (Protection) at both locations are reliably connected.
- To improve terminal corrosion resistance, after the Protection ground cable is connected and installed, it is recommended to apply silicone gel or paint to the exterior of the grounding terminal for protection.
- When installing the equipment, the protective earth conductor (Protection) must be installed first; when removing the equipment, the protective earth conductor (Protection) must be removed last.

NOTICE

GW14.3-BAT-LV-G10:

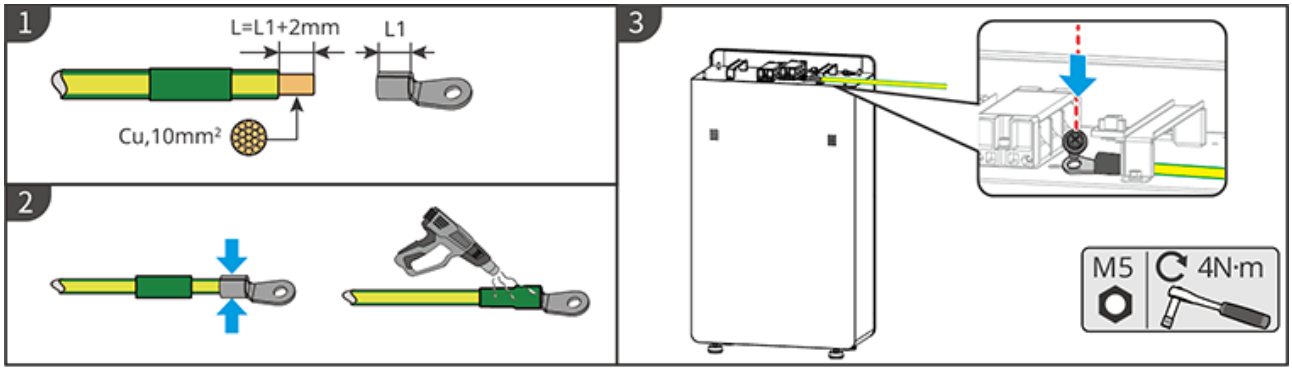
- If the battery grounding cable is provided in the packing box, use it directly; no crimping operation is required.
- If the battery grounding cable is not provided in the packing box, follow the steps below to make the cable.

Inverter



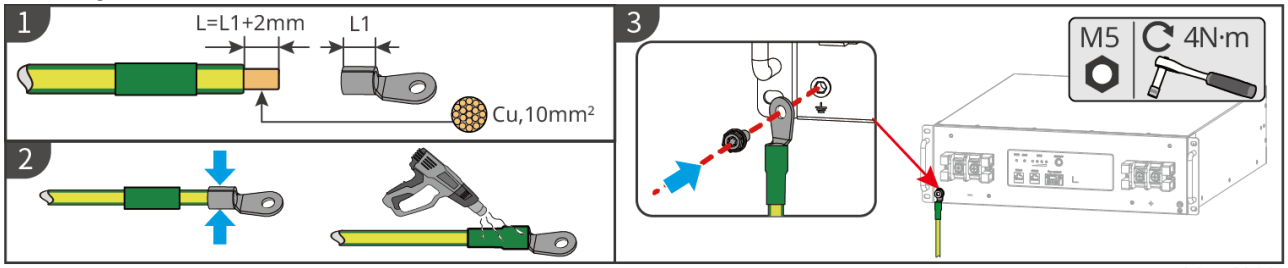
ETL10ELC0001

Battery (GW14.3-BAT-LV-G10)



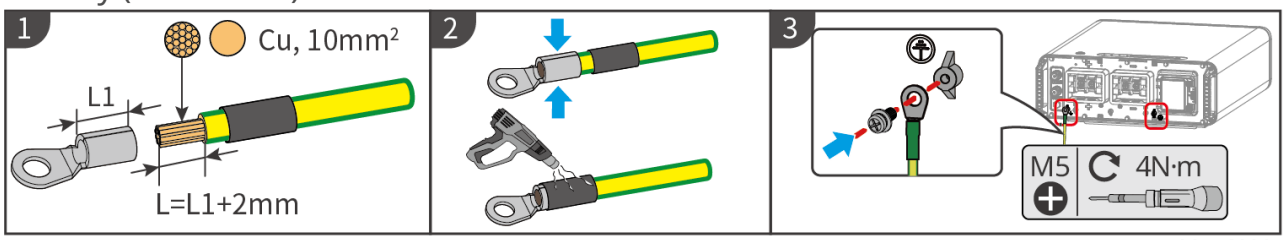
LXA10ELC0014

Battery (LX A5.0-30)



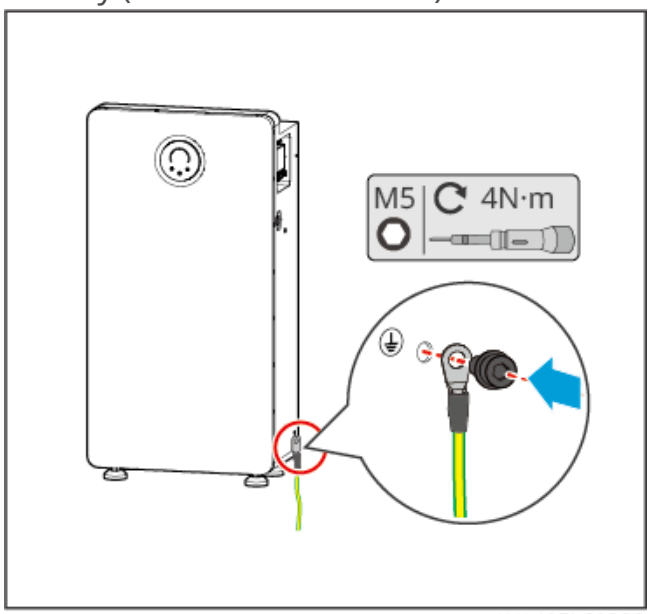
LXA30ELC0001

Battery (LX U5.0-30)



LXU30ELC0001

Battery (GW16.1-BAT-LV-G10)

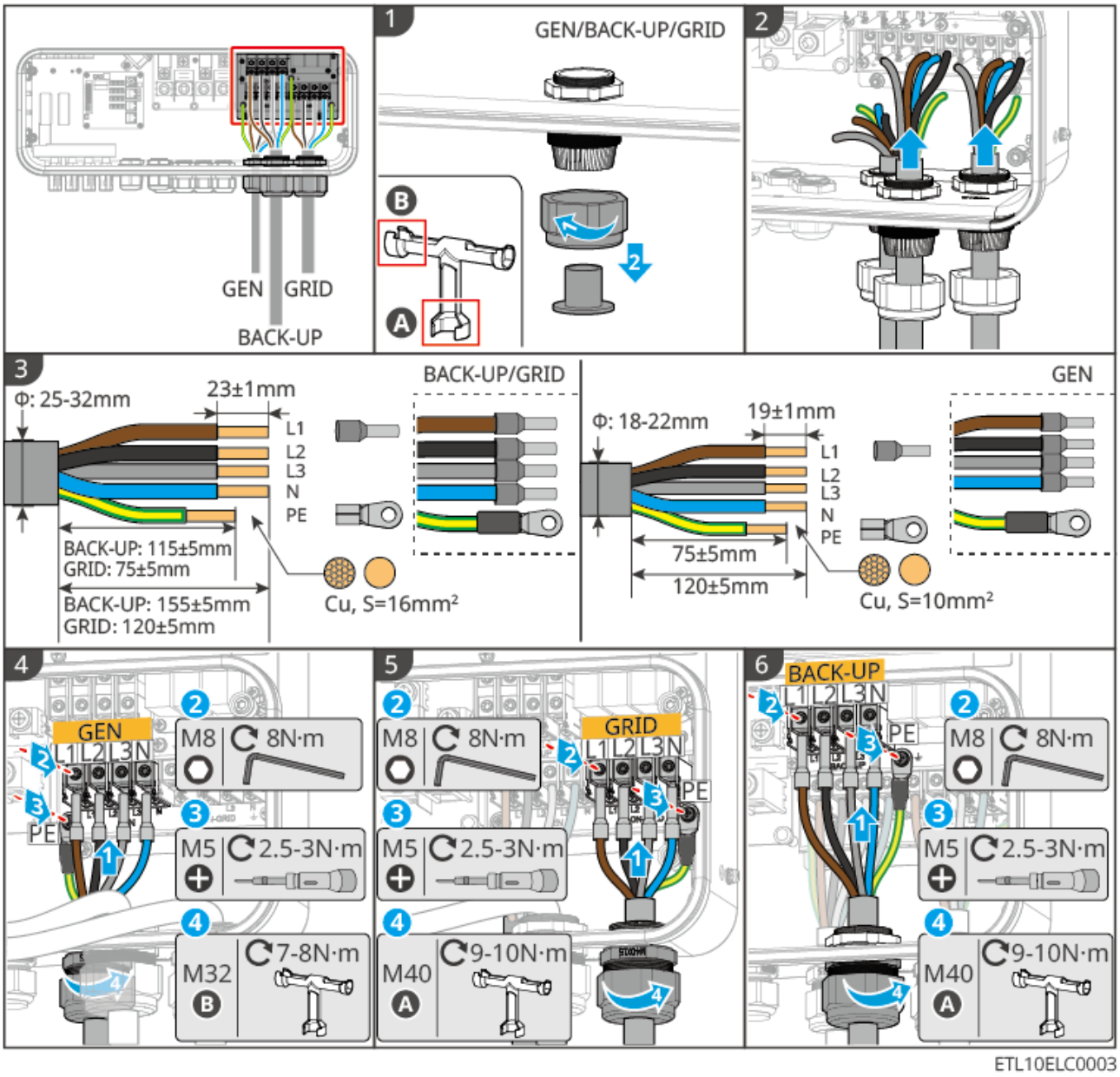


LXA40ELC0006

5.6 Connect AC Cables

⚠WARNING

- The inverter integrates a Residual Current Monitoring Unit (RCMU) to prevent residual current from exceeding the specified value. When the inverter detects a leakage current greater than the permitted value, it will quickly disconnect from the grid.
- During wiring, the AC cables must exactly match the "BACK-UP", "GRID", "GEN", and grounding ports of the AC terminals. Incorrect cable connection will cause equipment damage.
- Ensure the wire conductors are fully inserted into the terminal wiring holes and no conductor is exposed.
- Ensure the insulation plate at the AC terminal is securely clamped and not loose.
- Ensure the cables are securely connected; otherwise, during equipment operation, the wiring terminals may overheat and cause equipment damage.
- For a three-phase three-wire grid, no N wire connection is required.



5.7 Connect PV Cables

⚠DANGER

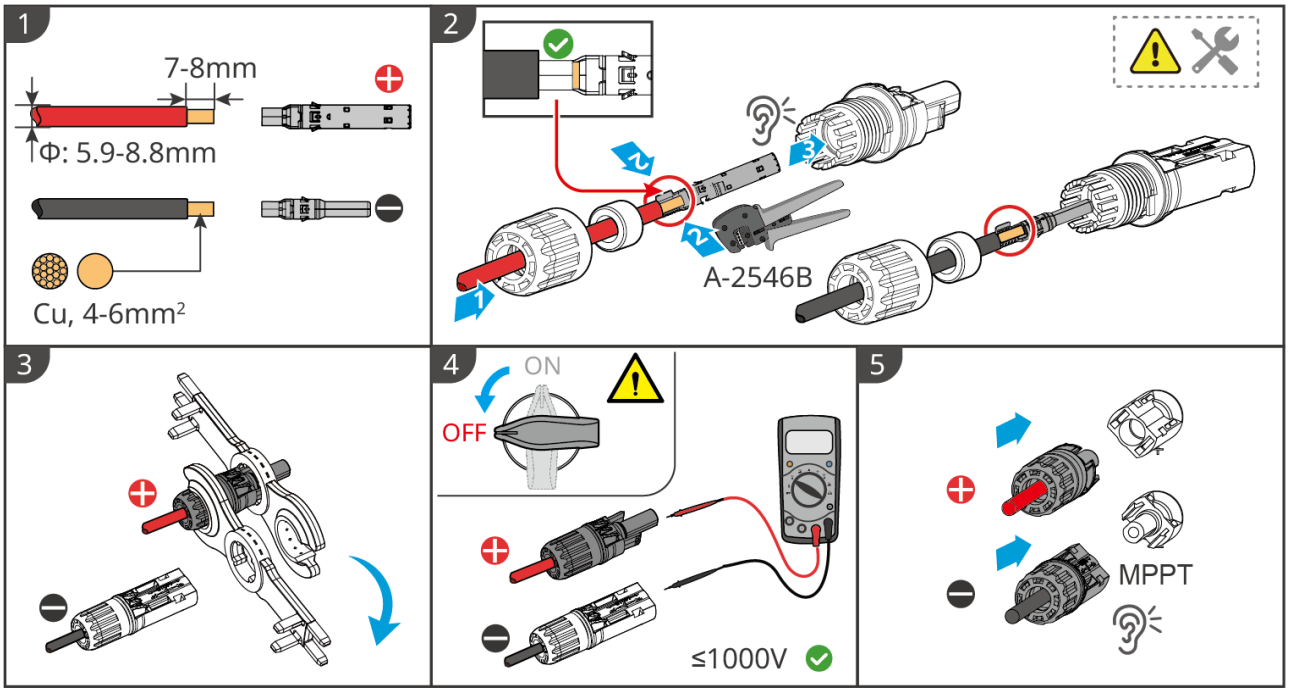
- Do not connect the same PV string to multiple inverters; otherwise, the inverters may be damaged.
- Before connecting PV strings to the inverter, verify the following information. Failure to do so may cause permanent damage to the inverter and, in severe cases, may result in fire, causing personal injury and property damage.
  1. Ensure that the Max. MPPT Short Circuit Current and Max. Input Voltage of each MPPT are within the inverter's permitted range.
  2. Ensure that the positive terminal of the PV string is connected to the inverter's PV+ and the negative terminal of the PV string is connected to the inverter's PV-.

⚠WARNING

- PV string output does not support grounding. Before connecting the PV strings to the inverter, ensure that the minimum insulation resistance of the PV strings to ground meets the minimum insulation impedance requirement (R = Max. Input Voltage/30mA).
- After completing the DC cable connection, ensure that the cables are securely connected and not loose.
- Use a multimeter to measure the positive and negative poles of the DC cable to ensure that the positive and negative poles are correct and not reversed, and that the voltage is within the permitted range.

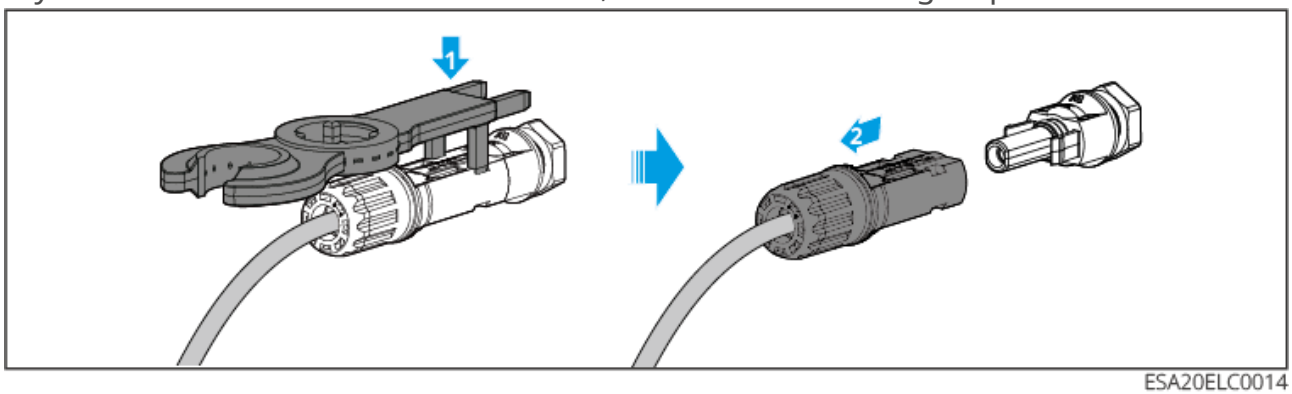
NOTICE

The two PV strings in each MPPT must use the same model, the same number of PV modules, and the same tilt angle and azimuth to ensure maximum Efficiency.



ETL10ELC0002

If you need to remove the PV connector, refer to the following steps for removal.



ESA20ELC0014

5.8 Connect the Battery Cables.

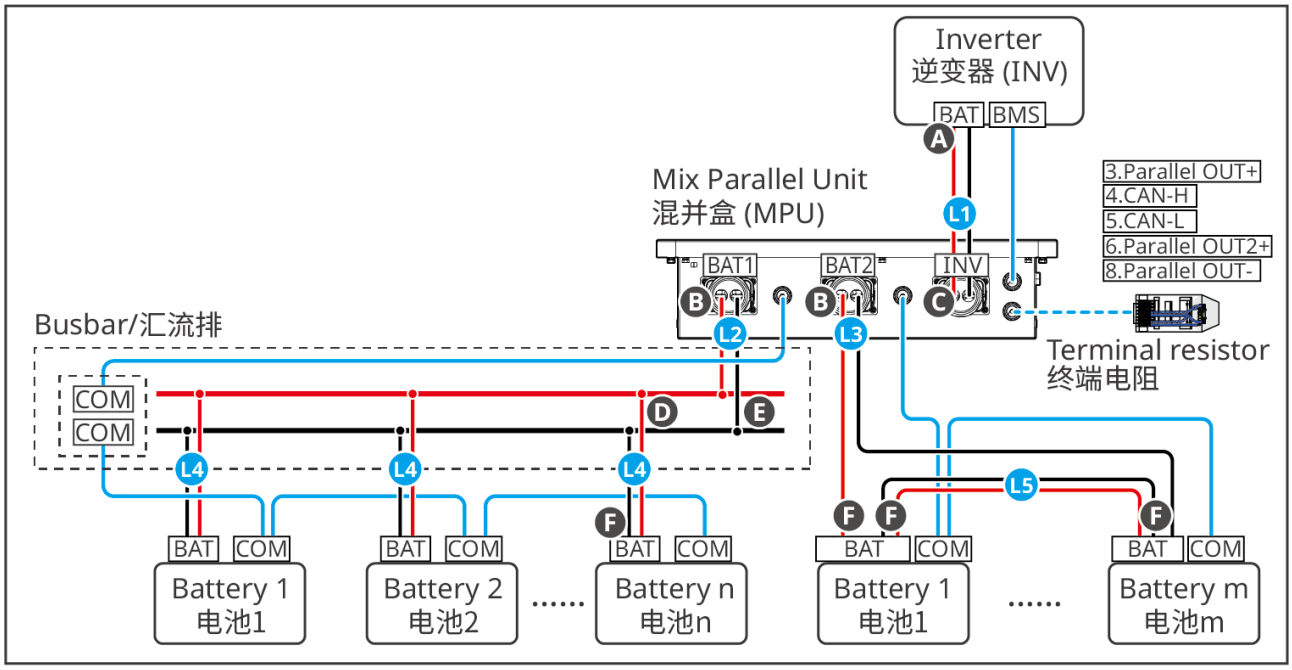
⚠DANGER

- In a single-inverter system, do not connect the same Battery BANK to multiple inverters; otherwise, the inverter may be damaged.
- Do not connect any load between the inverter and the battery.
- When connecting battery cables, use insulated tools to prevent accidental electric shock or causing Battery Short Circuit.
- Ensure that the battery open-circuit voltage is within the inverter's allowable range.
- Between the inverter and the battery, select whether to install a DC Switch in accordance with local laws and regulations.

NOTICE

- The GW15K-ET-L-G10 and GW20K-ET-L-G10 have two battery connection ports and support connecting lithium batteries of different models; they do not support separate connection of lithium batteries and lead-acid batteries. When batteries are connected in parallel to the inverter, connect the battery management system (BMS) communication cable to the BMS1 port of the inverter.
- When using the battery bus Access Mode in a parallel system, connect the battery management system (BMS) communication cable to the BMS1 port of the master inverter.
- When using the battery non-bus Access Mode in a parallel system, each inverter channel supports a maximum of 15 batteries in parallel cluster connection. If more battery parallel cluster connections are required, contact the GoodWe after-sales service center.
- Batteries can be connected to GoodWe combiner boxes and third-party busbars. For details on the use of terminal resistors for each battery and busbar, see the table below.
- For inverters with two battery output ports, the battery wiring supported by the BAT2 port is the same as that of BAT1.
- In scenarios where a battery Mix Parallel Unit is used, the BAT1 power port of the Mix Parallel Unit must be paired with the BAT1 communication port, and the BAT2 power port must be paired with the BAT2 communication port. The communication ports must not be cross-paired.
- The battery wiring supported by the BAT2 port of the Mix Parallel Unit is the same as that of BAT1.

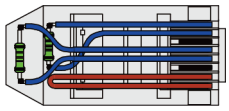
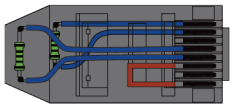
Refer to the table below for recommended cables between the inverter, battery, busbar, and Mix Parallel Unit:



MPU10ELC0004

L1: Power cable from inverter to Mix Parallel Unit	L2: Power cable from Mix Parallel Unit to busbar	L4: Power cable from busbar to battery	L5: Power cable between batteries	L3: Power cable from Mix Parallel Unit to battery	Power cable from inverter to busbar	Power cable for direct connection between inverter and battery *1
70mm²	70mm²	LX U5.0-30：25mm² LX A5.0-30：50mm² GW14.3-BAT-LV-G10：70mm² GW16.1-BAT-LV-G10：50mm²	LX A5.0-30、LX U5.0-30：50mm² GW14.3-BAT-LV-G10：70mm² GW16.1-BAT-LV-G10：50mm²	LX A5.0-30：35mm² GW14.3-BAT-LV-G10：70mm² GW16.1-BAT-LV-G10：50mm² LX U5.0-30: Not applicable	70mm²	70mm²
*1: When the inverter is directly connected to a battery, the power cables should be selected according to the recommended specifications. If the directly connected battery model is GW16.1-BAT-LV-G10, only 50mm² cables are supported; if the directly connected battery model is GW14.3-BAT-LV-G10, only 70mm² cables are supported. In addition, the maximum continuous charge/discharge current of the port is the maximum charge/discharge current of the battery.						

Terminal resistor usage description:

Terminal resistor appearance	Battery Type	Pin Description
	LX U5.0-30, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10 (GW Combiner Box)	Connect a 120 Ω resistor across PIN1/2 and PIN4/5 respectively; short the 7/8 harness
	LX U5.0-30, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10 (third-party busbar)	Connect a 120 Ω resistor across PIN1/2 and PIN4/5 respectively; short the 6/8 harness

BMS communication connection between the inverter and battery:

Inverter port	Connected to battery port	Port definition	Description
BMS1/BMS2	COM1	4: CAN_H 5: CAN_L	• CAN communication is used between the inverter and battery • Connect the inverter BMS port to the battery COM1 port

Mix Parallel Unit communication port definition

PIN	COM1	COM2	Description
1	RS485A	RS485A	
2	RS485B-	RS485B-	
3	Parallel OUT+	Parallel OUT+	Combiner box identification
4	CAN_H	CAN_H	
5	CAN_L	CAN_L	

PIN	COM1	COM2	Description
6	Parallel OUT2+	Parallel OUT2+	Busbar identification
7	-	-	
8	Parallel OUT-	Parallel OUT-	Identification signal ground

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 to the inverter communication port or battery cluster parallel communication port
5	CAN_1L	CAN_1L	
6	Parallel OUT2+	Parallel OUT2+	Parallel interlock communication port
7	-	-	Reserved
8	Parallel OUT-	Parallel OUT-	Parallel communication port

Communication port definition for LX U5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

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 to the inverter communication port or battery cluster parallel communication port
5	CAN_L	CAN_L	
6	Parallel OUT2+	Parallel OUT2+	Parallel communication port
7	-	-	Reserved
8	Parallel OUT-	Parallel OUT-	Parallel communication port

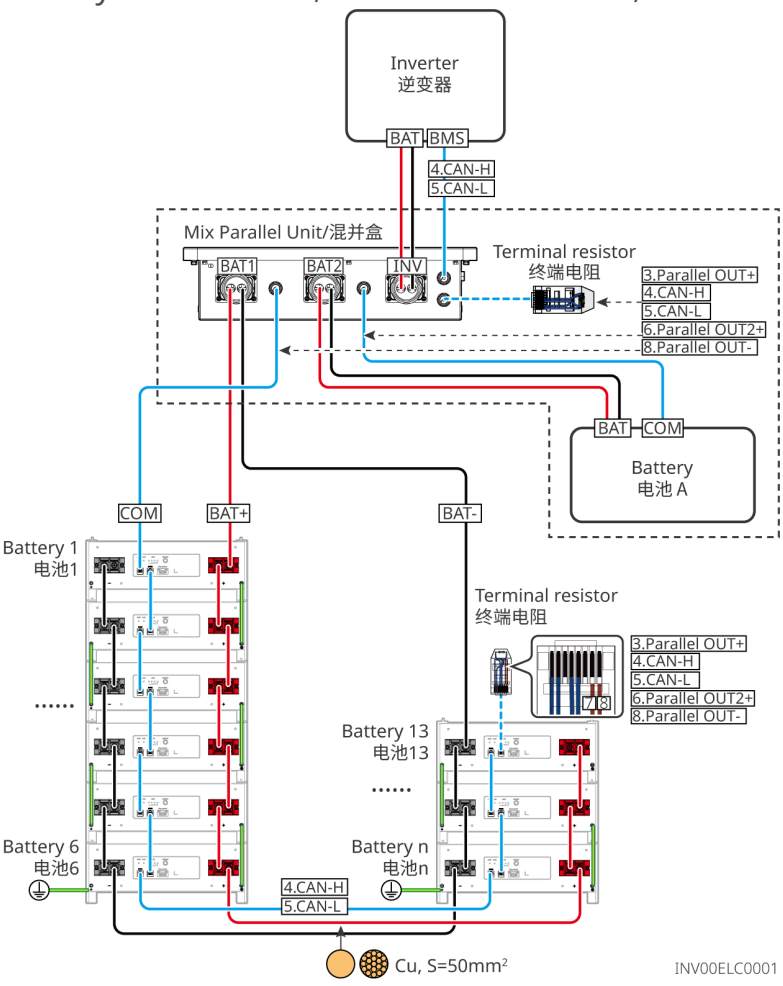
The Battery Qty that can be connected when a Mix Parallel Unit is used in the system varies depending on the busbar, battery, or inverter model.
The corresponding maximum number of batteries is shown in the following table:

Description of the number of battery clusters in parallel in the system					
Battery model	Inverter	ET LV			
		BAT1		BAT2	
	Mix Parallel Unit	BAT1(m)	BAT2(n)	BAT1(m)	BAT2(n)
LX A5.0-30	Daisy chain	m+n≤15		m+n≤15	
	BCB-22-WW-0	≤6	≤6	≤6	≤6
	BCB-32-WW-0	m+n≤15		m+n≤15	
	Third-party busbar	m+n≤15		m+n≤15	
GW14.3-BAT-LV-G10	Daisy chain	m+n≤15		m+n≤15	
	BCB-32-WW-0	m+n≤15		m+n≤15	
	Third-party busbar	m+n≤15		m+n≤15	
GW16.1-BAT-LV-G10	Daisy chain	m+n≤15		m+n≤15	
	BCB-32-WW-0	m+n≤15		m+n≤15	
	Third-party busbar	m+n≤15		m+n≤15	

Battery system wiring diagram

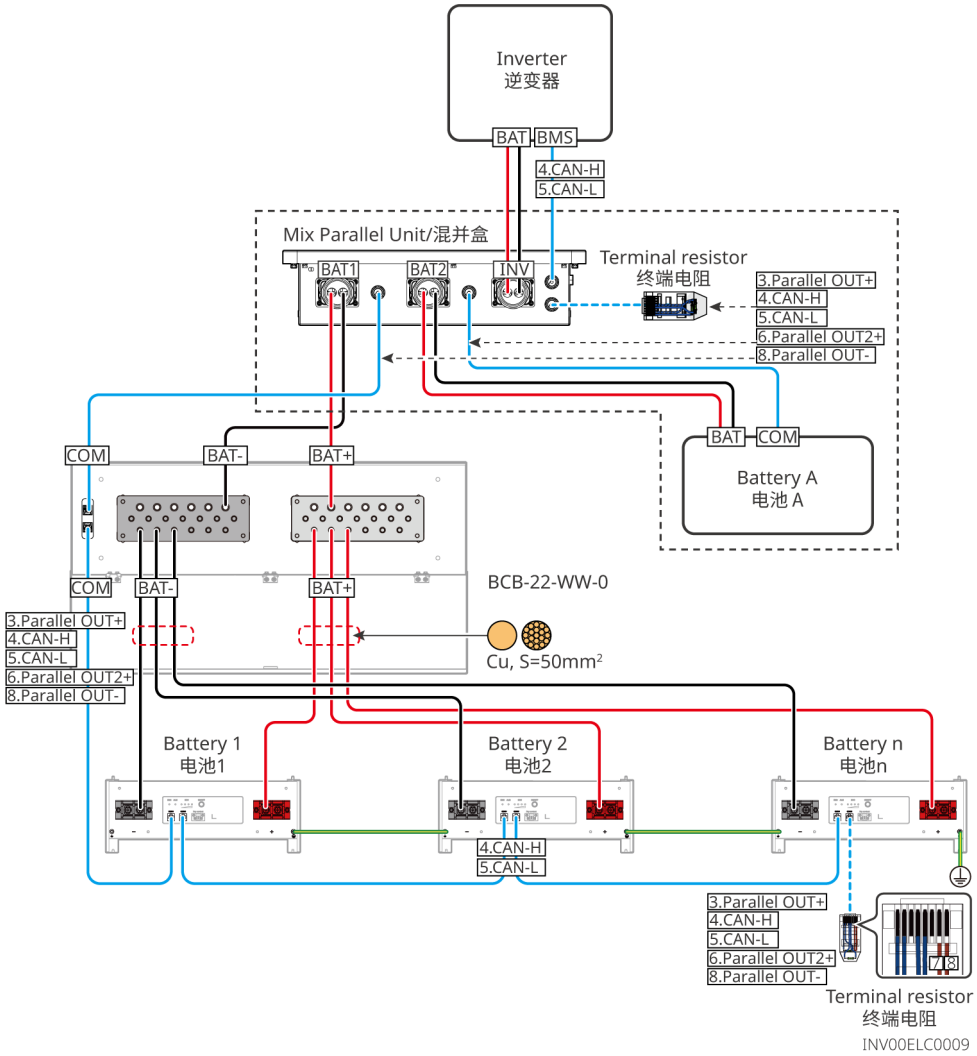
- LX A5.0-30: Daisy-chain connection method

Battery A: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10



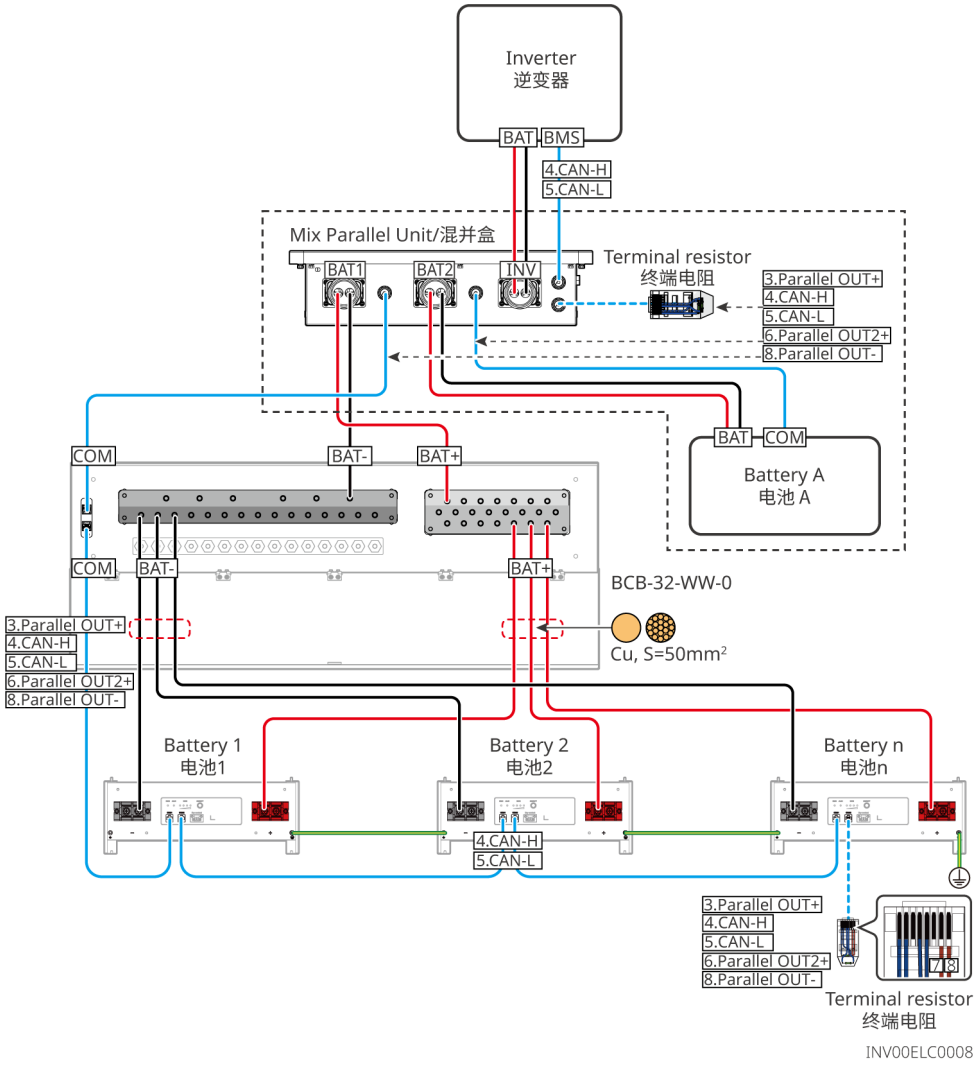
- LX A5.0-30: Connection method with Combiner Box BCB-22-WW-0

Battery A: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10



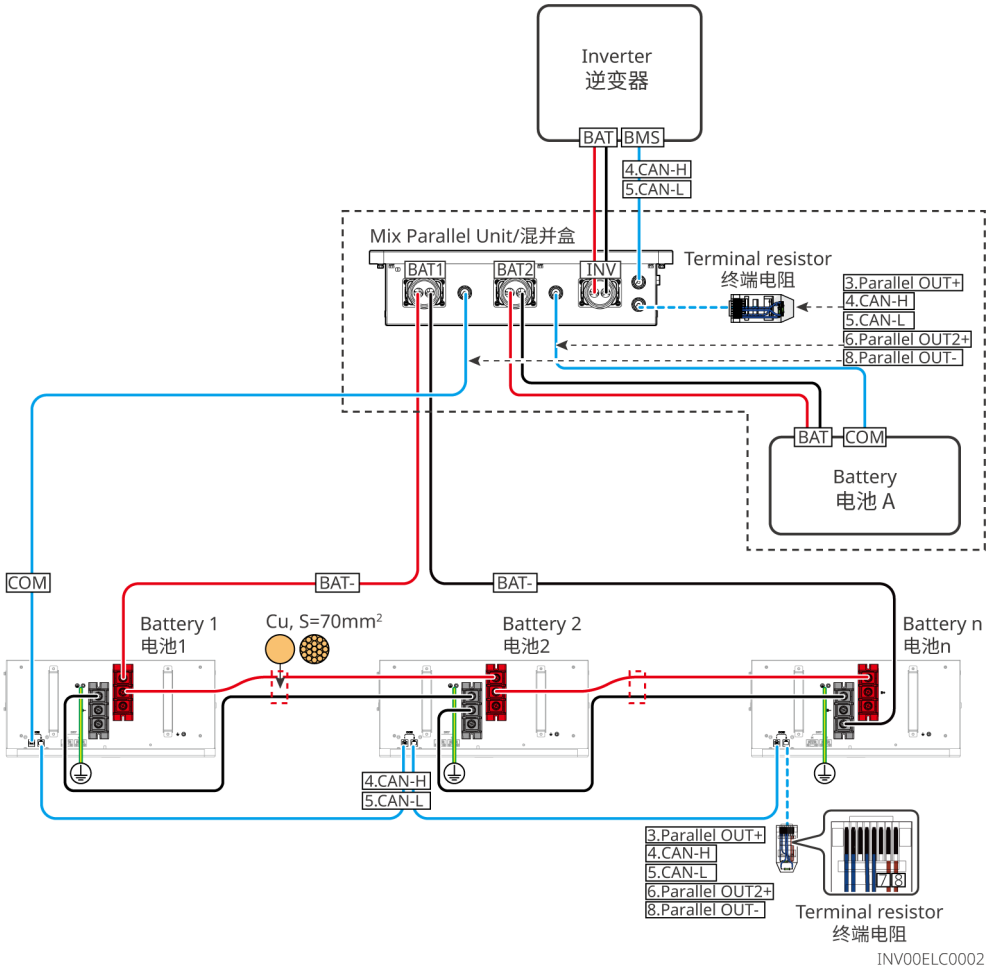
LX A5.0-30: Connection method with combiner box BCB-32-WW-0

- Battery A: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

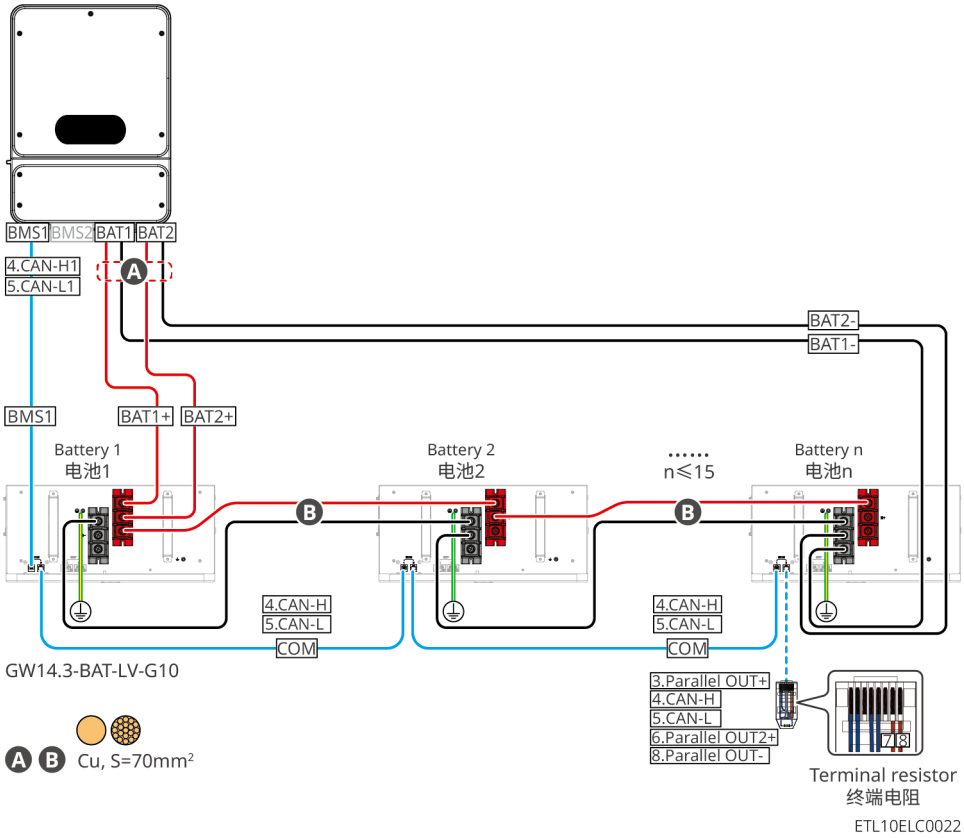


- GW14.3-BAT-LV-G10: Daisy-chain connection method

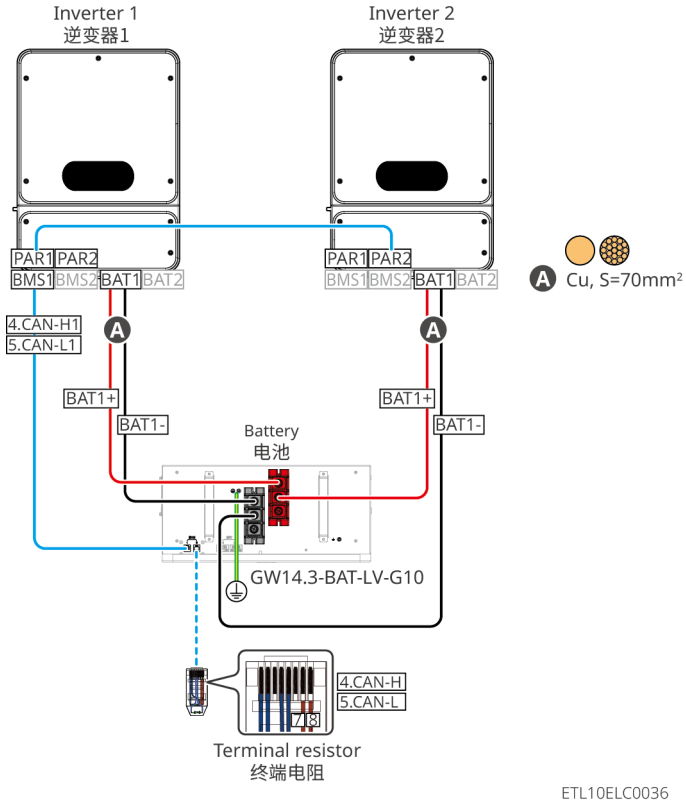
Battery A: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10



GW14.3-BAT-LV-G10: When dual-channel batteries are connected to a single 2-output inverter

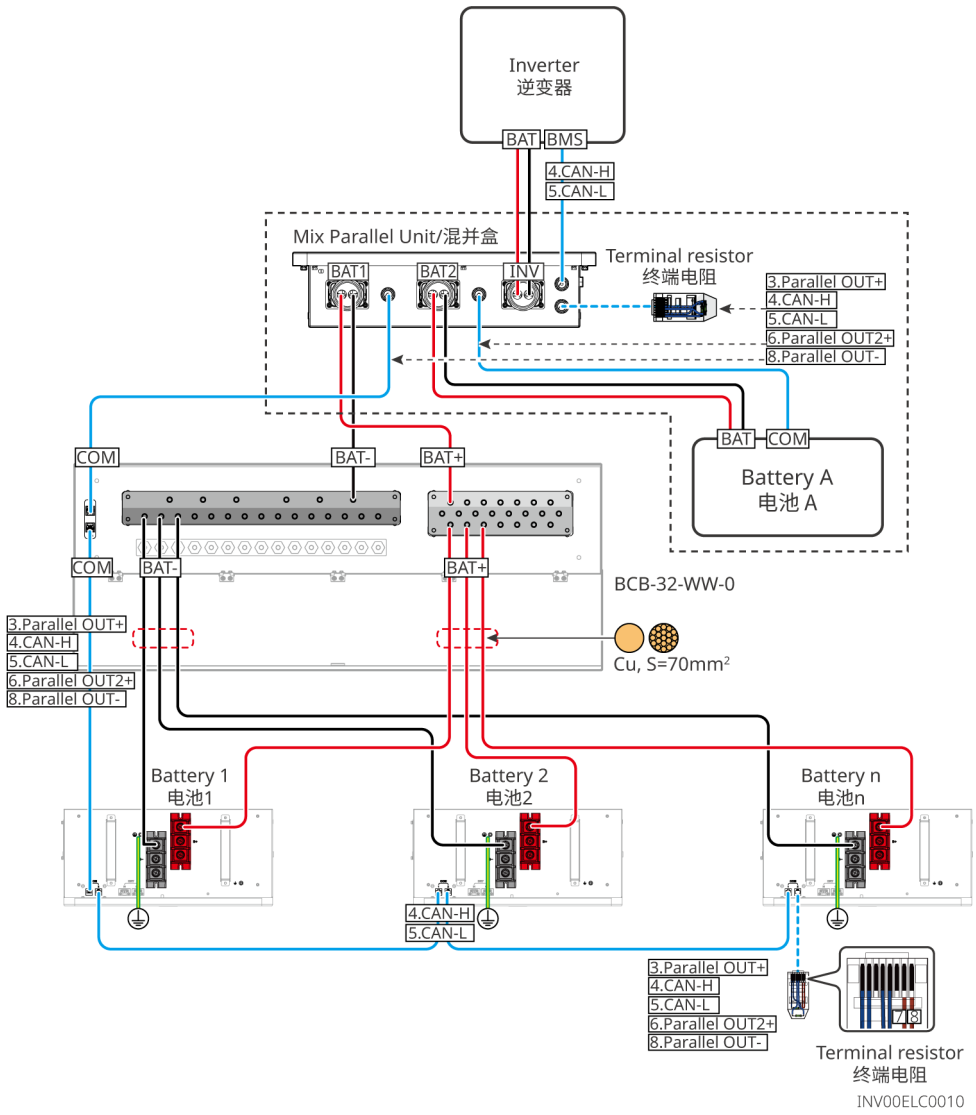


GW14.3-BAT-LV-G10: When batteries are directly connected to two 1-output inverters, use the App to set the battery Access Mode to "Combiner Connection".

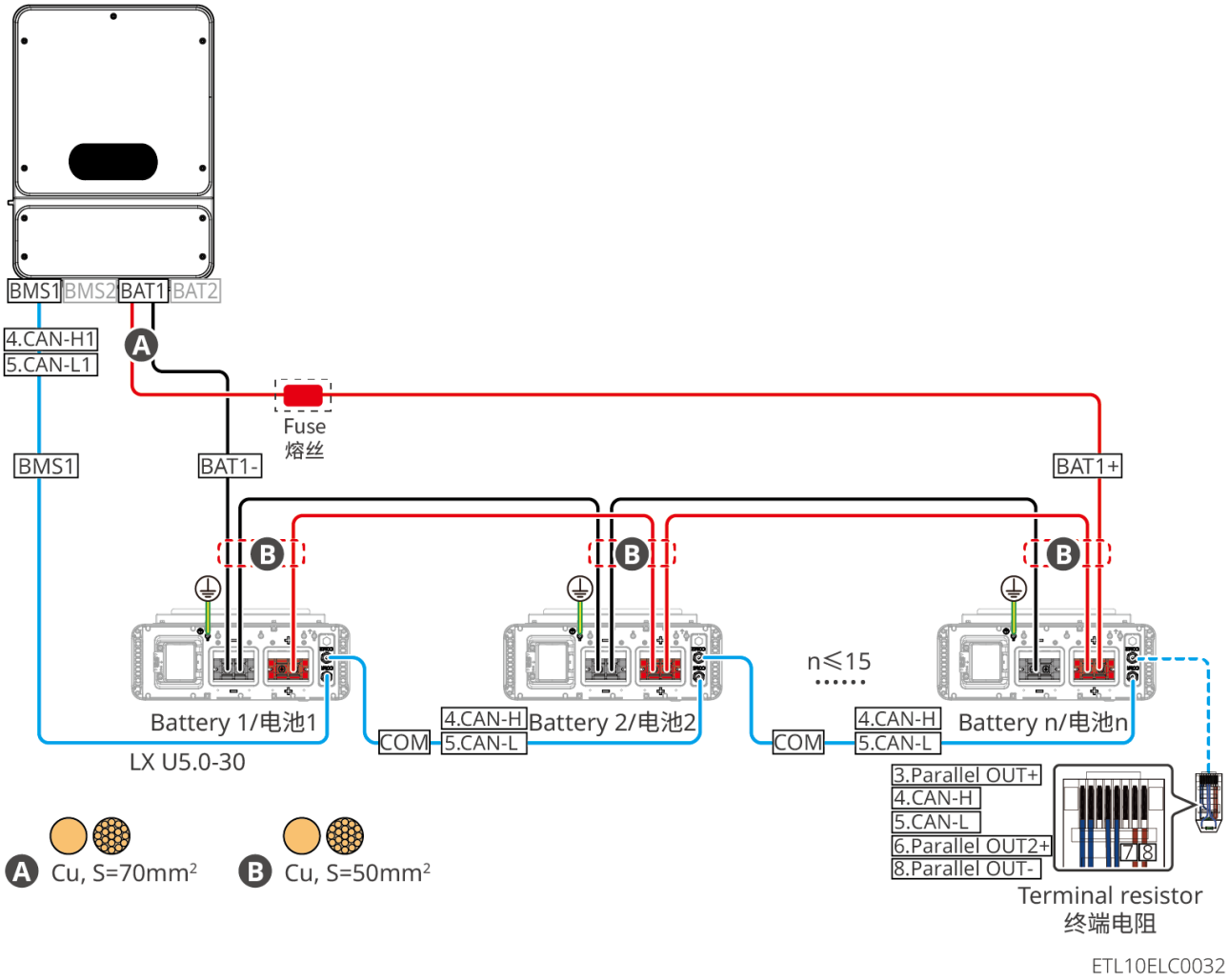


GW14.3-BAT-LV-G10: When Battery Qty is less than or equal to 15 and a combiner box (BCB-32-WW-0, current ≤720 A) is used to connect a 1-output inverter, the wiring diagram is as follows:

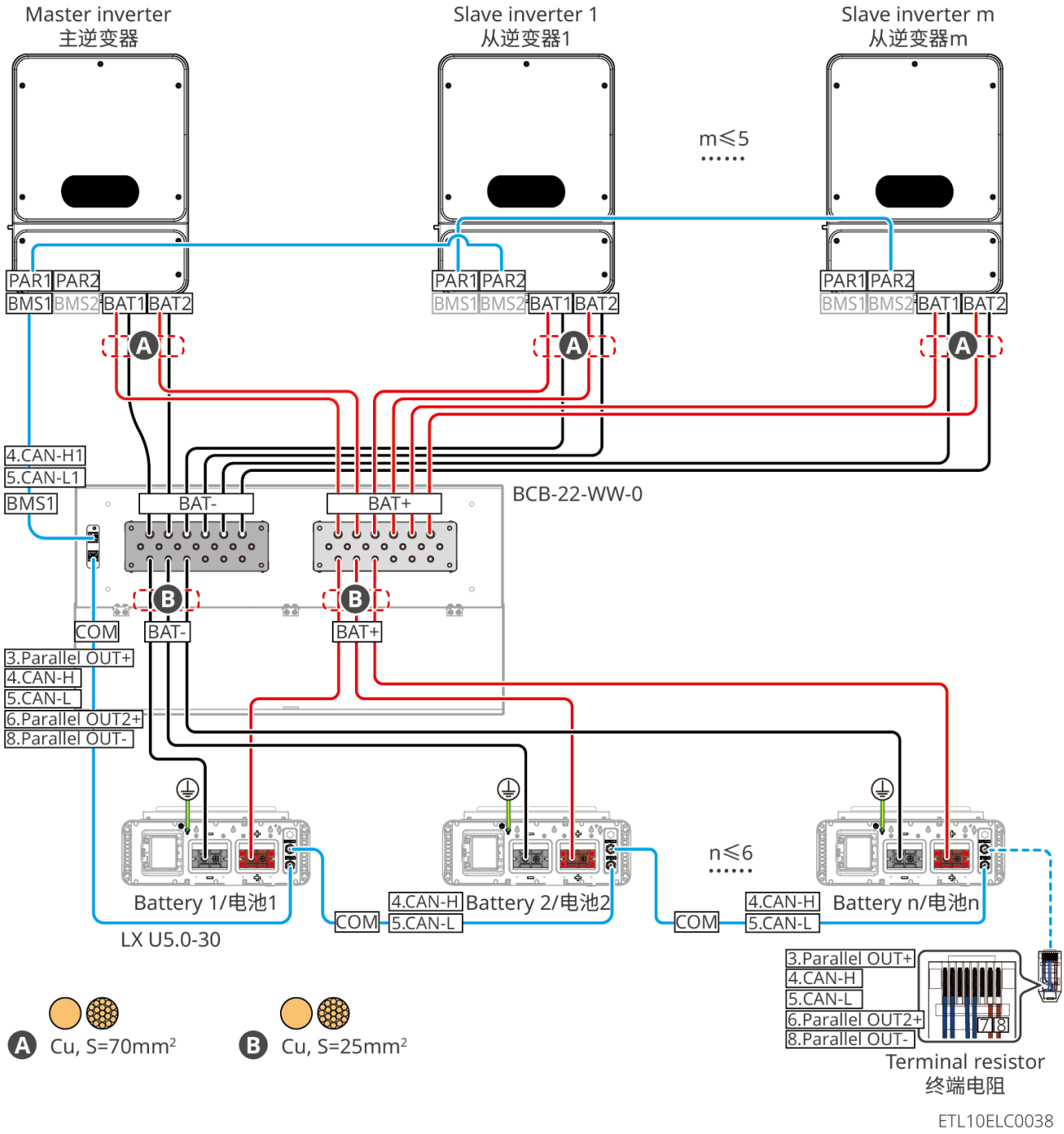
- Battery A: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10



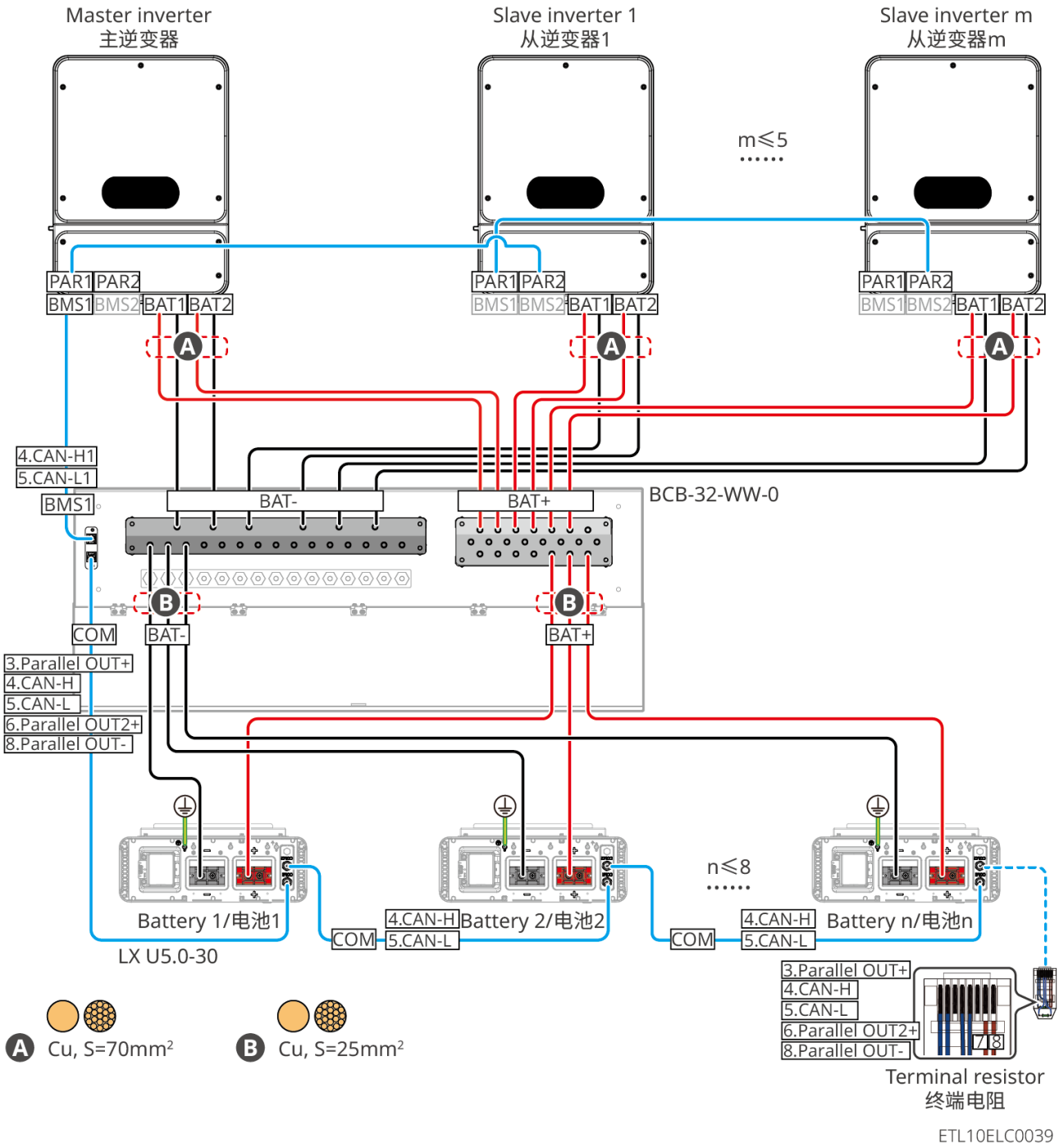
LX U5.0-30: Daisy-chain connection method, when batteries are connected to a single inverter with two outputs:
When Battery Qty n > 8, a fuse must be added. Recommended specifications: Nominal Voltage ≥60 V, Rated Current ≥300 A, ultimate/operating breaking capacity ≥50 kA.



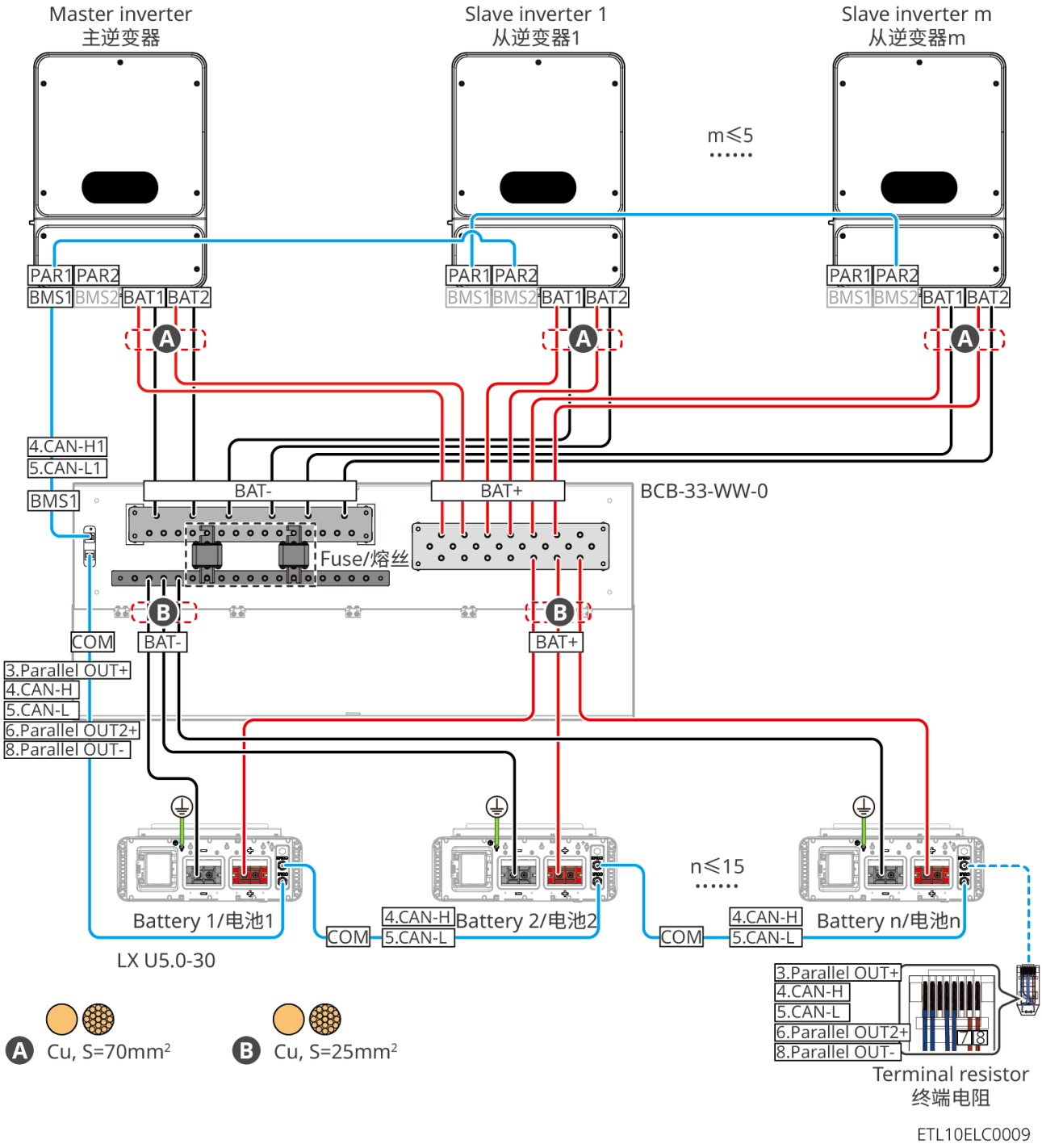
LX U5.0-30: When Battery Qty ≤6, battery connection method with BCB-22-WW-0



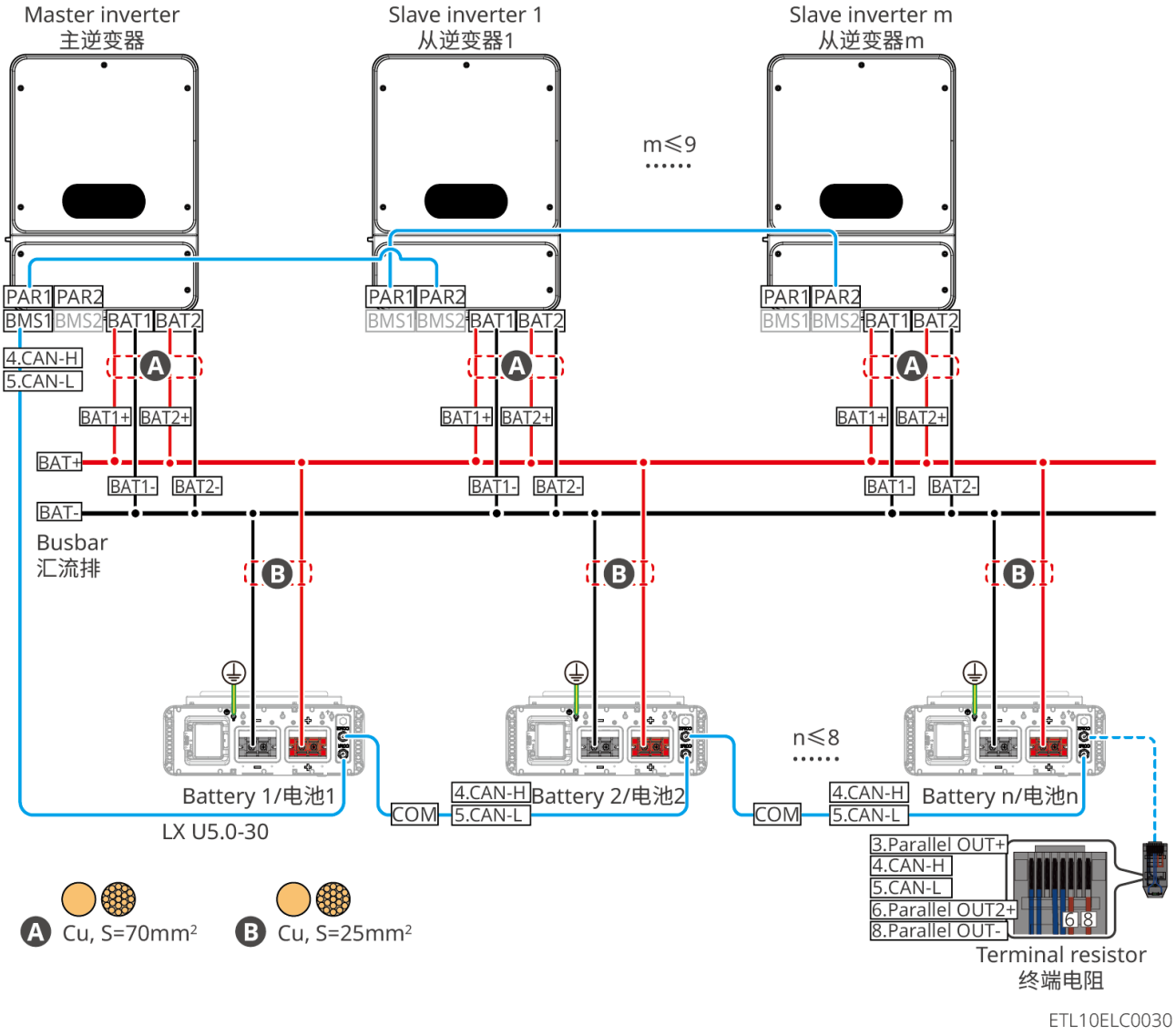
LX U5.0-30: When Battery Qty ≤8, battery connection method with BCB-32-WW-0



LX U5.0-30: When Battery Qty ≤15, battery connection method with combiner box BCB-33-WW-0

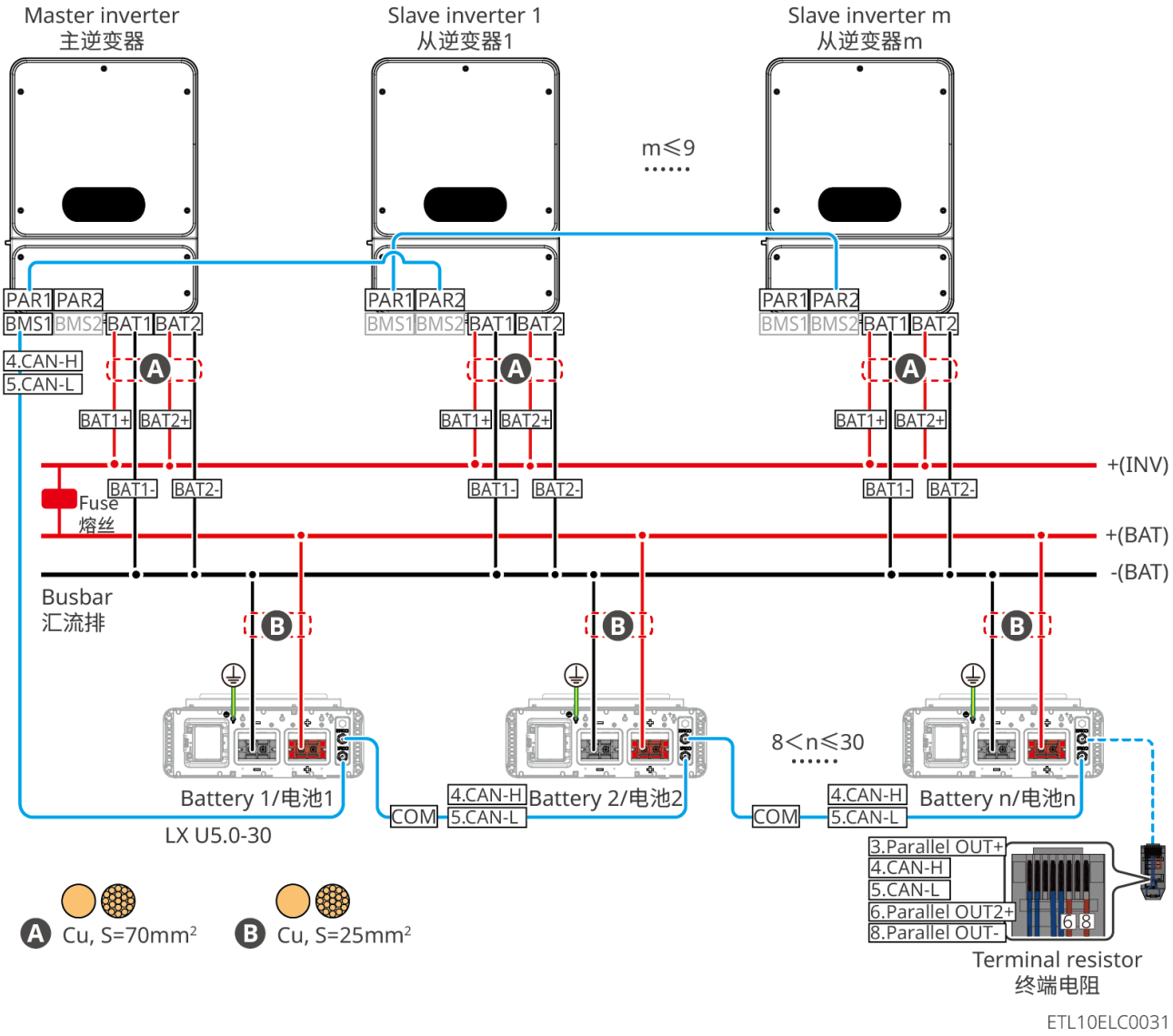


LX U5.0-30: When Battery Qty ≤8, battery connection method with third-party busbar



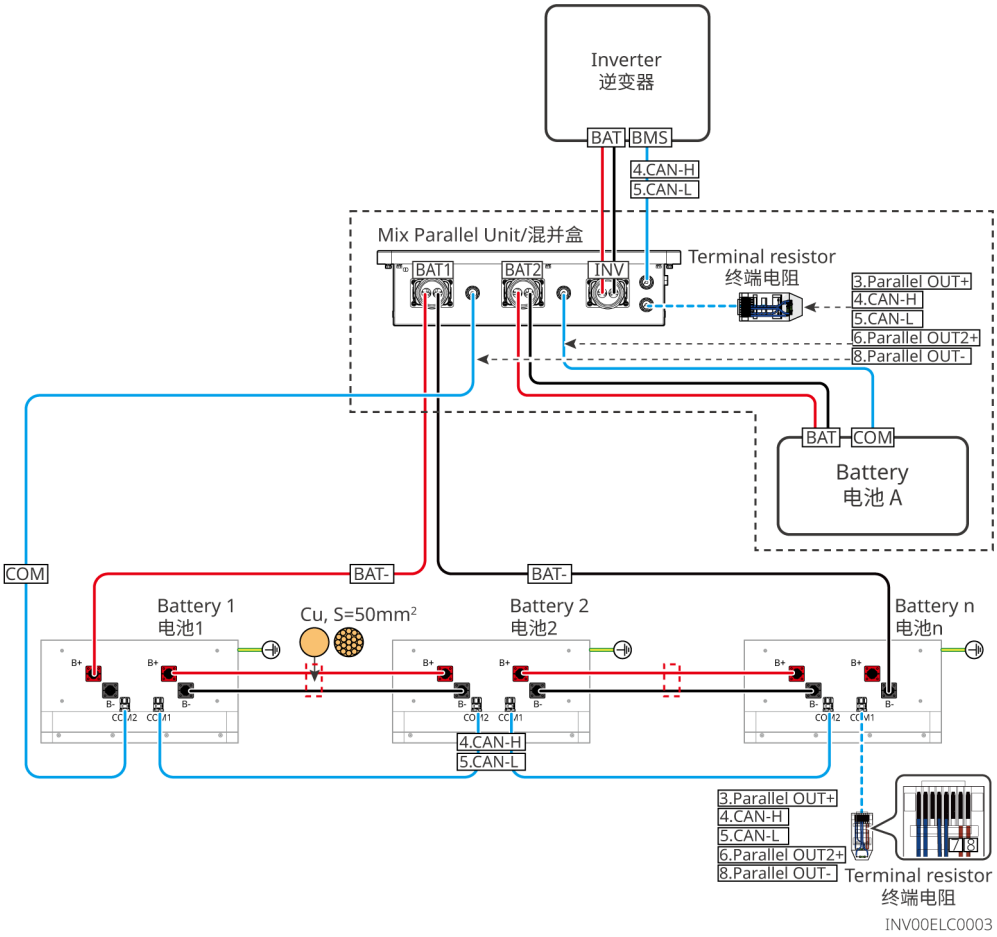
LX U5.0-30: When Battery Qty >8, battery connection method with third-party busbar

When Battery Qty n > 8, fuses must be used. Recommended specifications: Nominal Voltage ≥80 V, Rated Current ≥1.6 times the system rated current, ultimate/operating breaking capacity ≥50 kA.



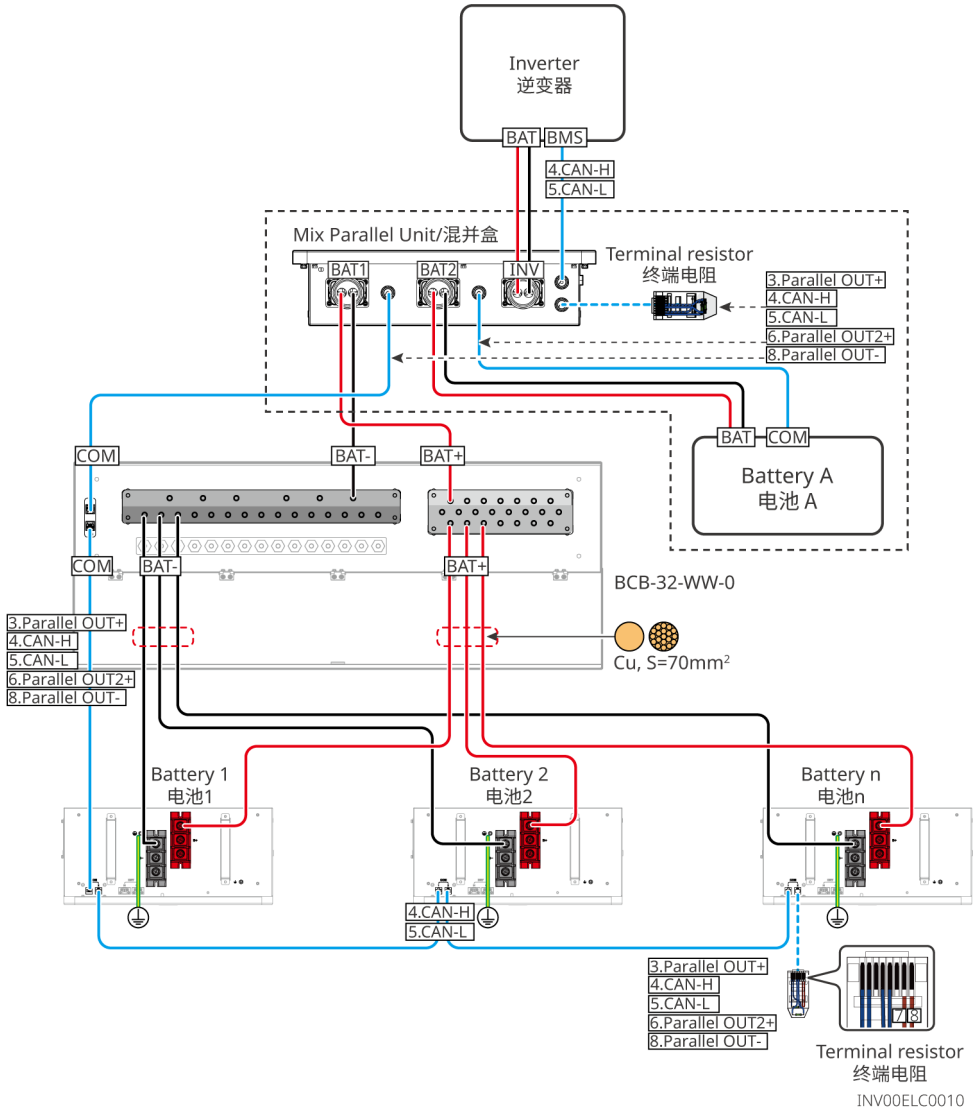
GW16.1-BAT-LV-G10: Daisy-chain battery connection to inverter:

- Battery A: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

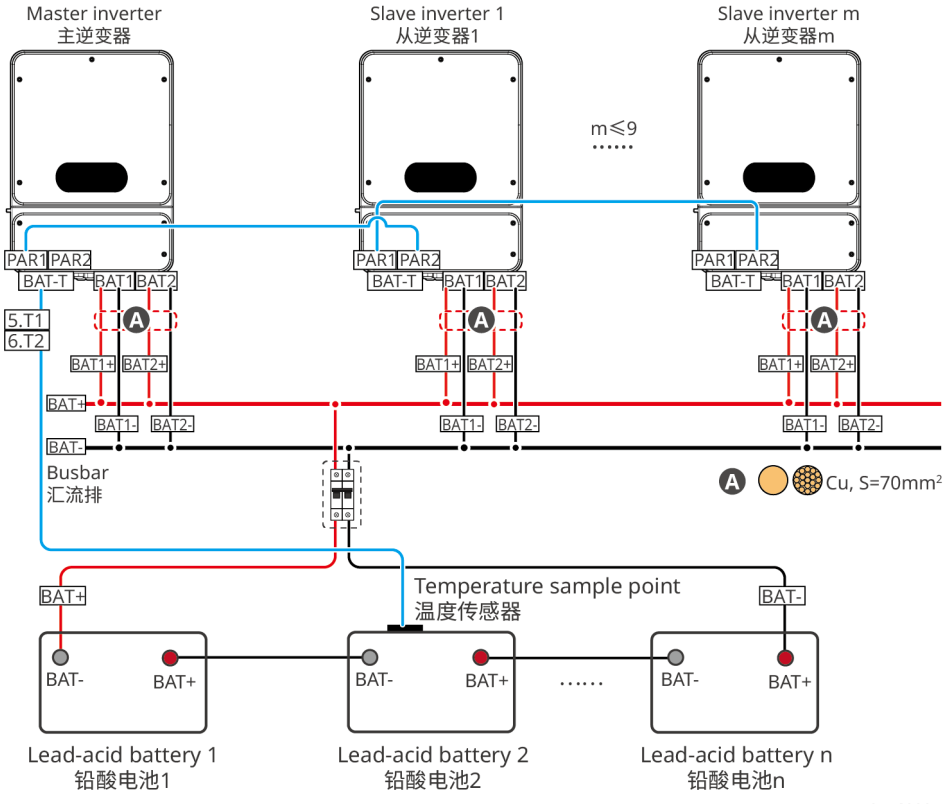


GW16.1-BAT-LV-G10: When Battery Qty is less than or equal to 15, use a combiner box (BCB-32-WW-0, current ≤720 A) to connect the inverter:

- Battery A: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

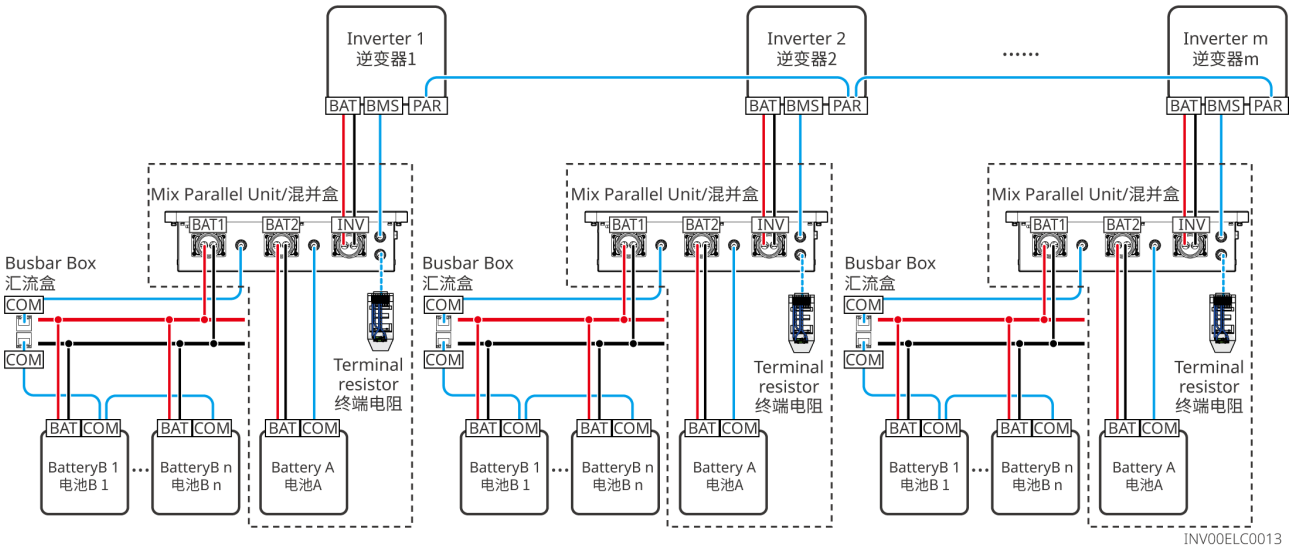


Lead-acid battery connection method with busbar:



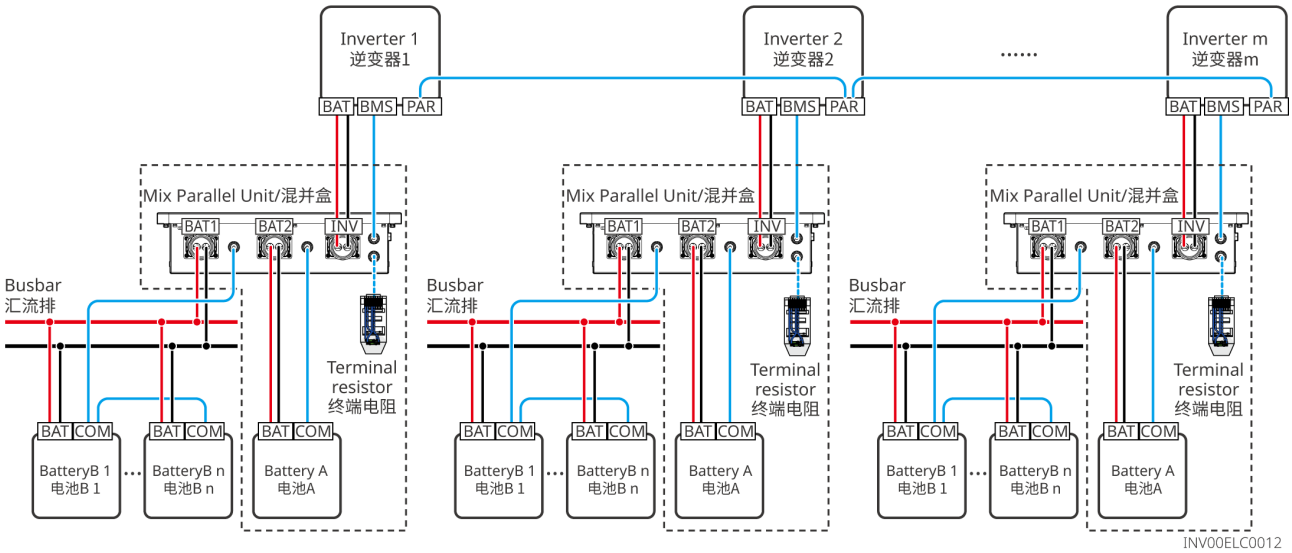
When inverters are paralleled, with GW combiner box, battery connection method:

- Battery A: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10
- Battery B: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10



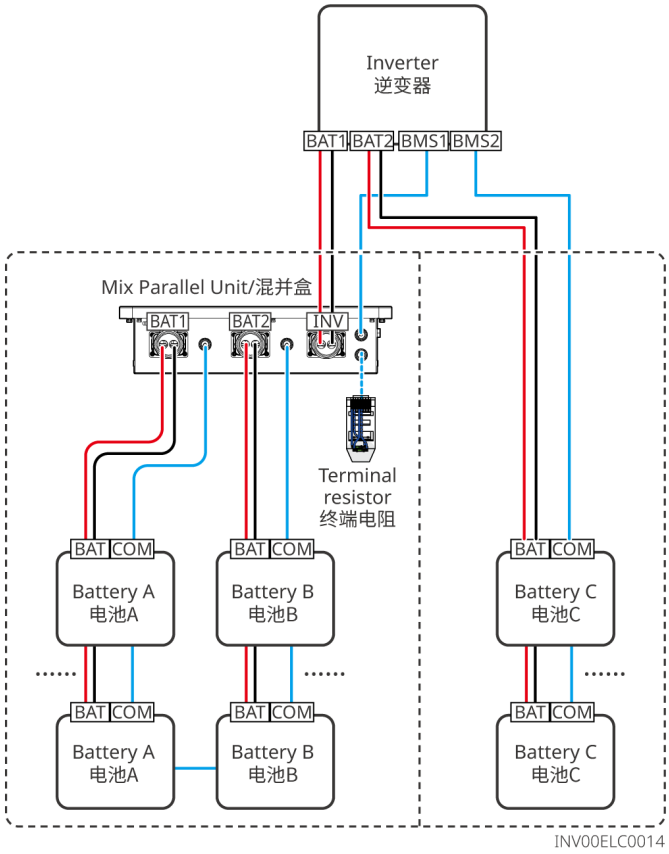
When inverters are paralleled, batteries with third-party busbar, wiring diagram as follows:

- Battery A: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10
- Battery B: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10



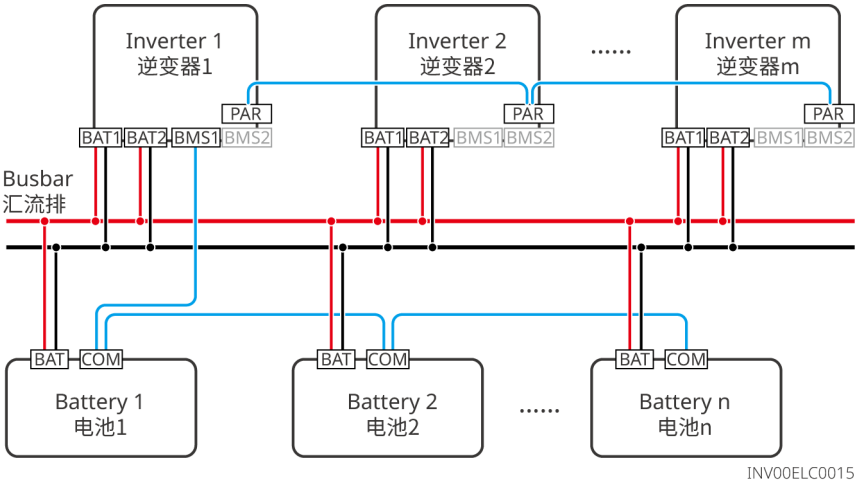
When batteries are separately connected to 2-output inverters, the wiring diagram is as follows:

- Battery A: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10
- Battery B: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10
- Battery C: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10, LX U5.0-30



When inverters with two battery ports are connected in combiner mode, use the App to set the battery Access Mode to "Combiner Connection"

Battery: LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10, LX U5.0-30



5.8.1 Connect Inverter and Battery Power Cables

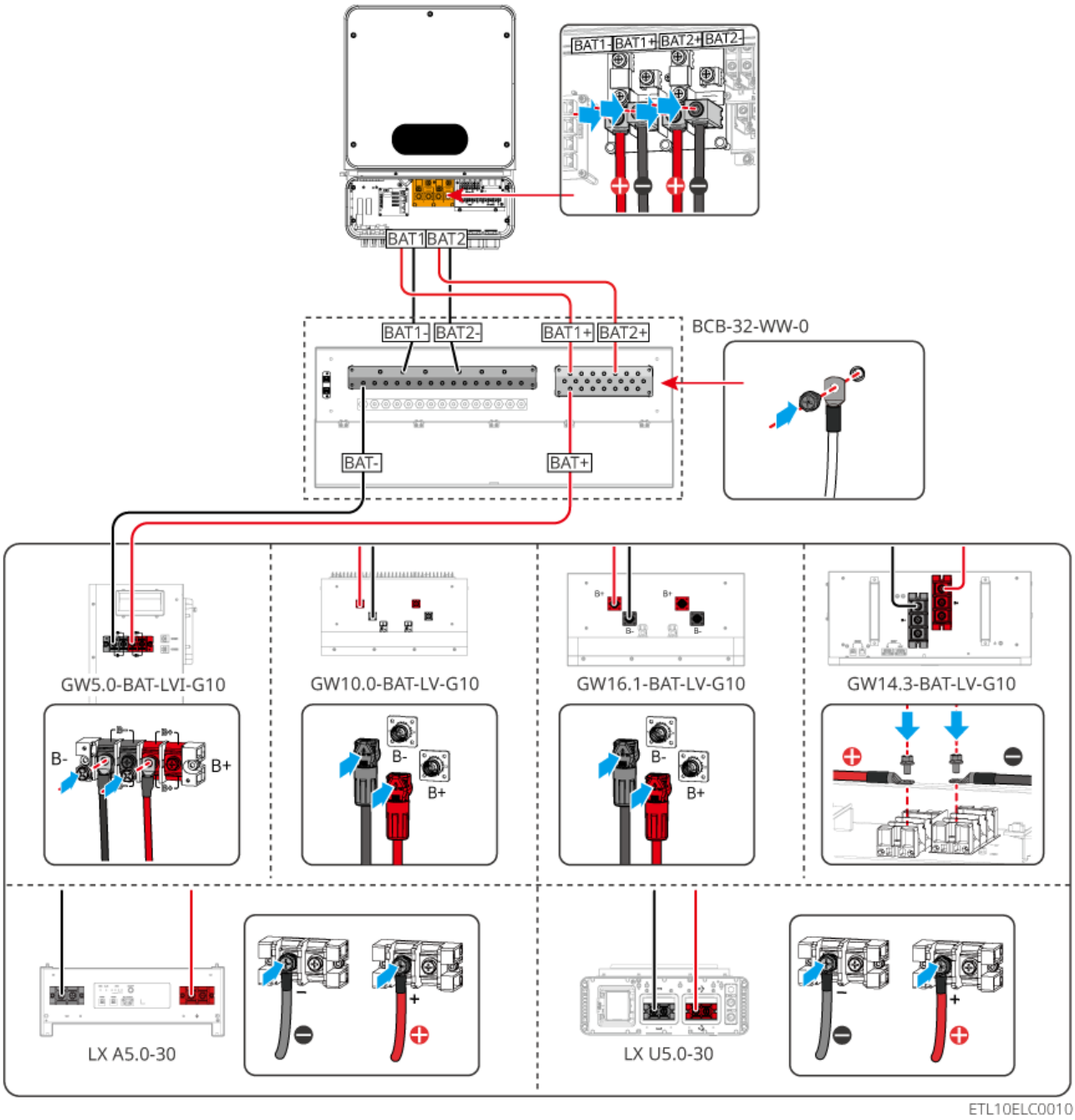
⚠WARNING

- Use a multimeter to measure the positive and negative poles of the DC cable to ensure that the positive and negative poles are correct and not reversed, and that the voltage is within the permitted range.
- During wiring, the battery cables must completely match the "BAT+", "BAT-", and grounding ports of the battery terminals. Incorrect cable connection will cause equipment damage.
- Ensure that the wire core is fully inserted into the terminal wiring hole with no exposed part.
- Ensure that cables are securely connected; otherwise, during equipment operation, the terminal block may overheat and cause equipment damage.
- Do not connect the same Battery BANK to multiple inverters; otherwise, the inverter may be damaged.

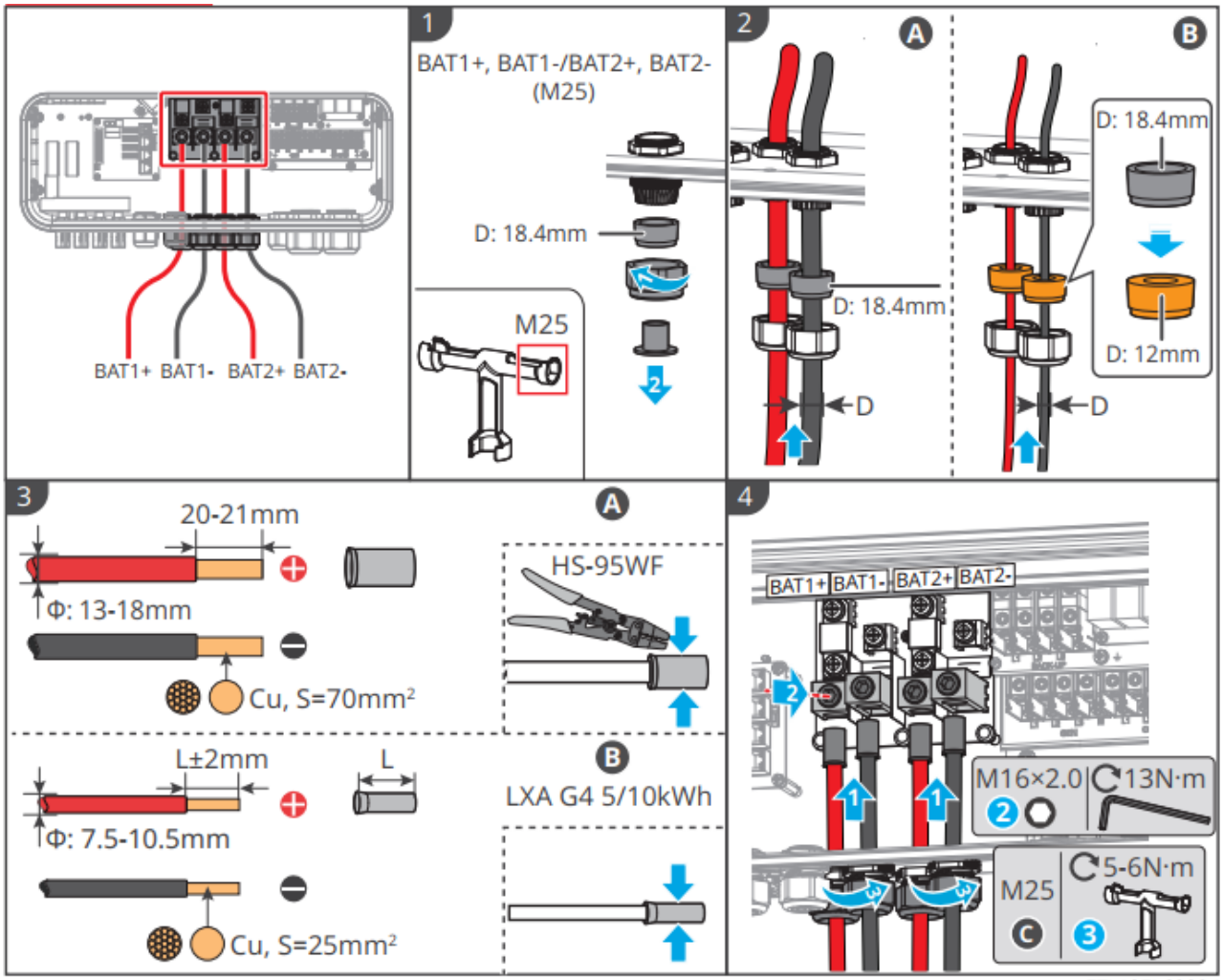
NOTICE

- When the inverter is directly connected to GW5.0-BAT-LVI-G10, please contact the dealer to purchase crimp terminals and sealing rings.
- When the inverter is directly connected to GW10.0-BAT-LV-G10, please use the crimp terminals and sealing rings in the battery accessories.

Inverter-to-Battery Power Cable Overview

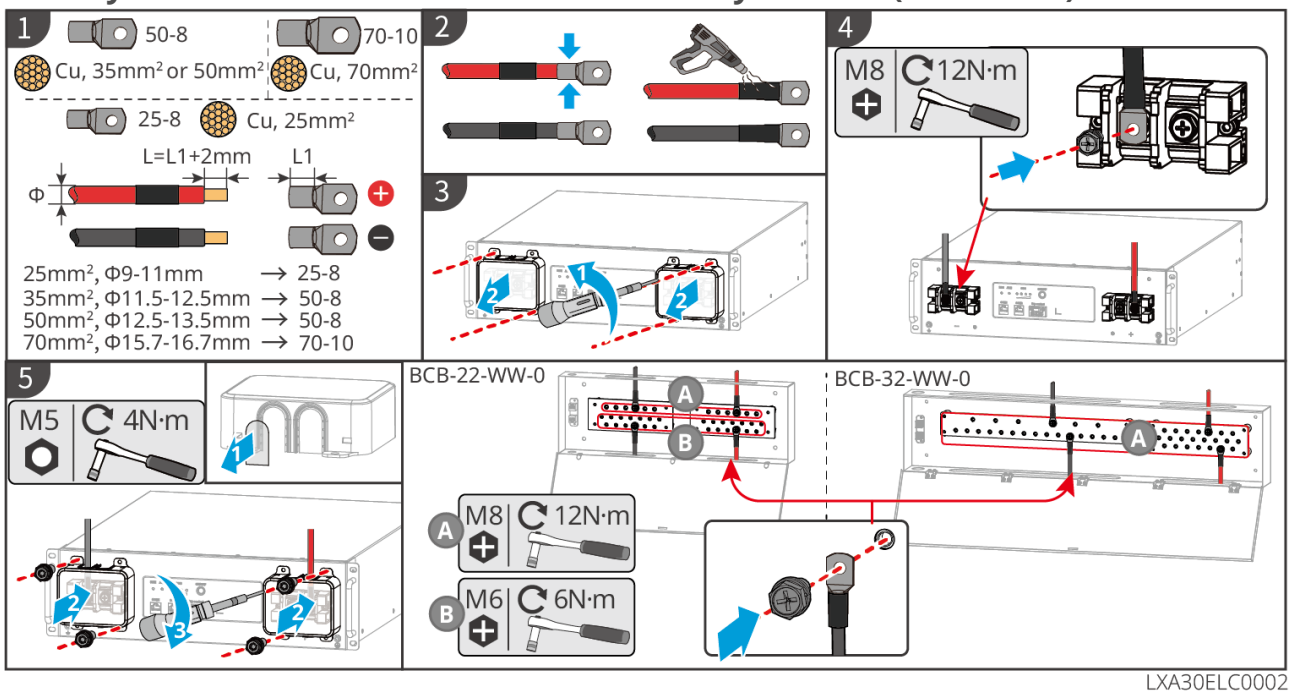


Inverter-Side Cable Assembly



ETL10ELC0004

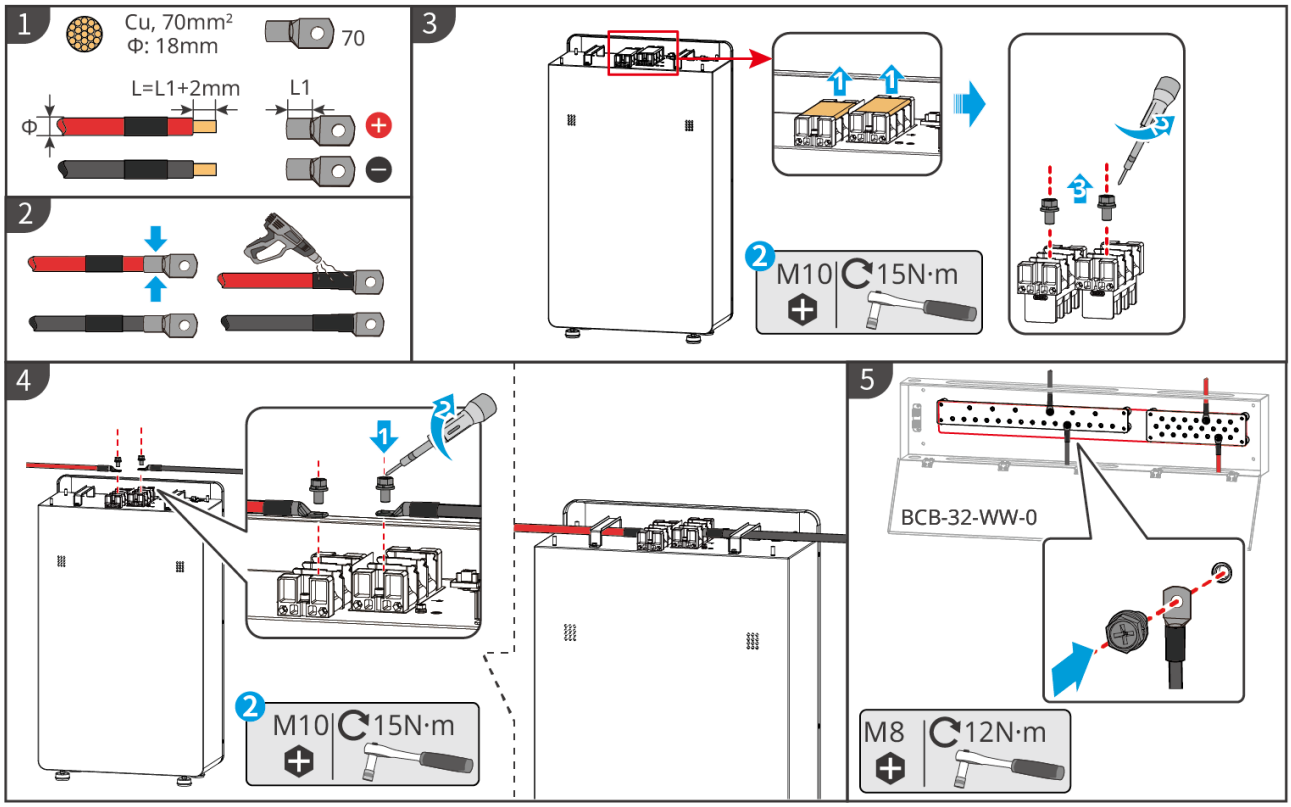
Battery and Combiner Box End Cable Assembly Method (LX A5.0-30)



LXA30ELC0002

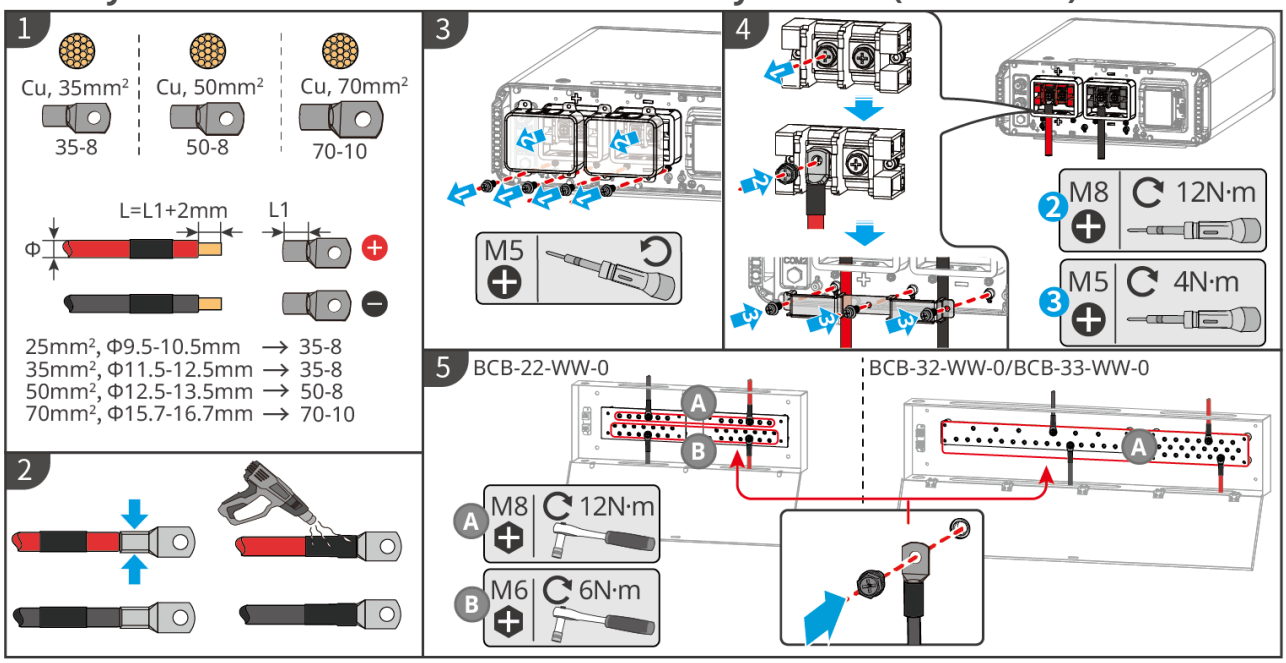
Battery and Combiner Box End Cable Assembly Method (GW14.3-BAT-LV-G10)

- GW14.3-BAT-LV-G10: If the power cables are shipped with the battery accessories, use the shipped cables; no crimping is required.



LXA10ELC0015

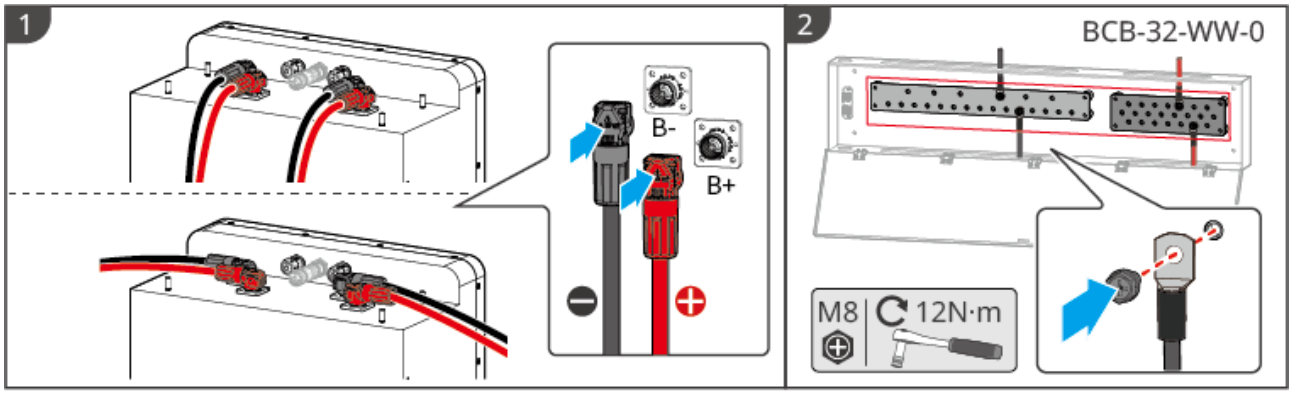
Battery and Combiner Box End Cable Assembly Method (LX U5.0-30)



LXU30ELC0004

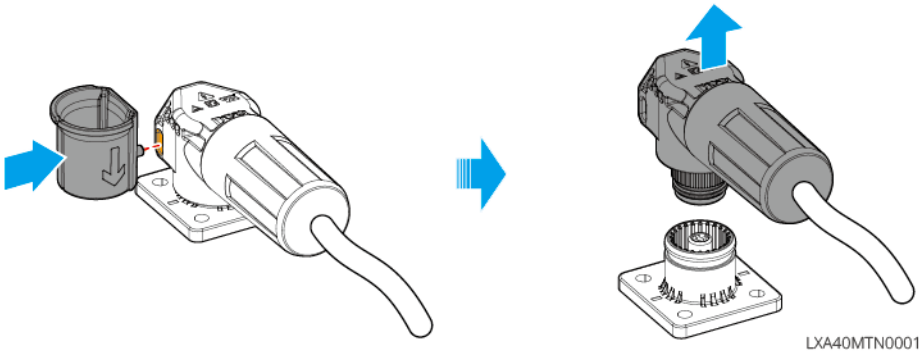
Battery-End Cable Assembly Method (GW16.1-BAT-LV-G10)

- A 1 m positive and negative power cable between the inverter and battery is shipped with the battery. If the cable length is insufficient during actual wiring, prepare your own cables and crimp them according to the following steps. After cable assembly is complete, mate the battery quick-connect terminal plug with the battery port.



LXA40ELC0007

Unlocking Method for Battery DC Quick-Connect Terminal (Optional)

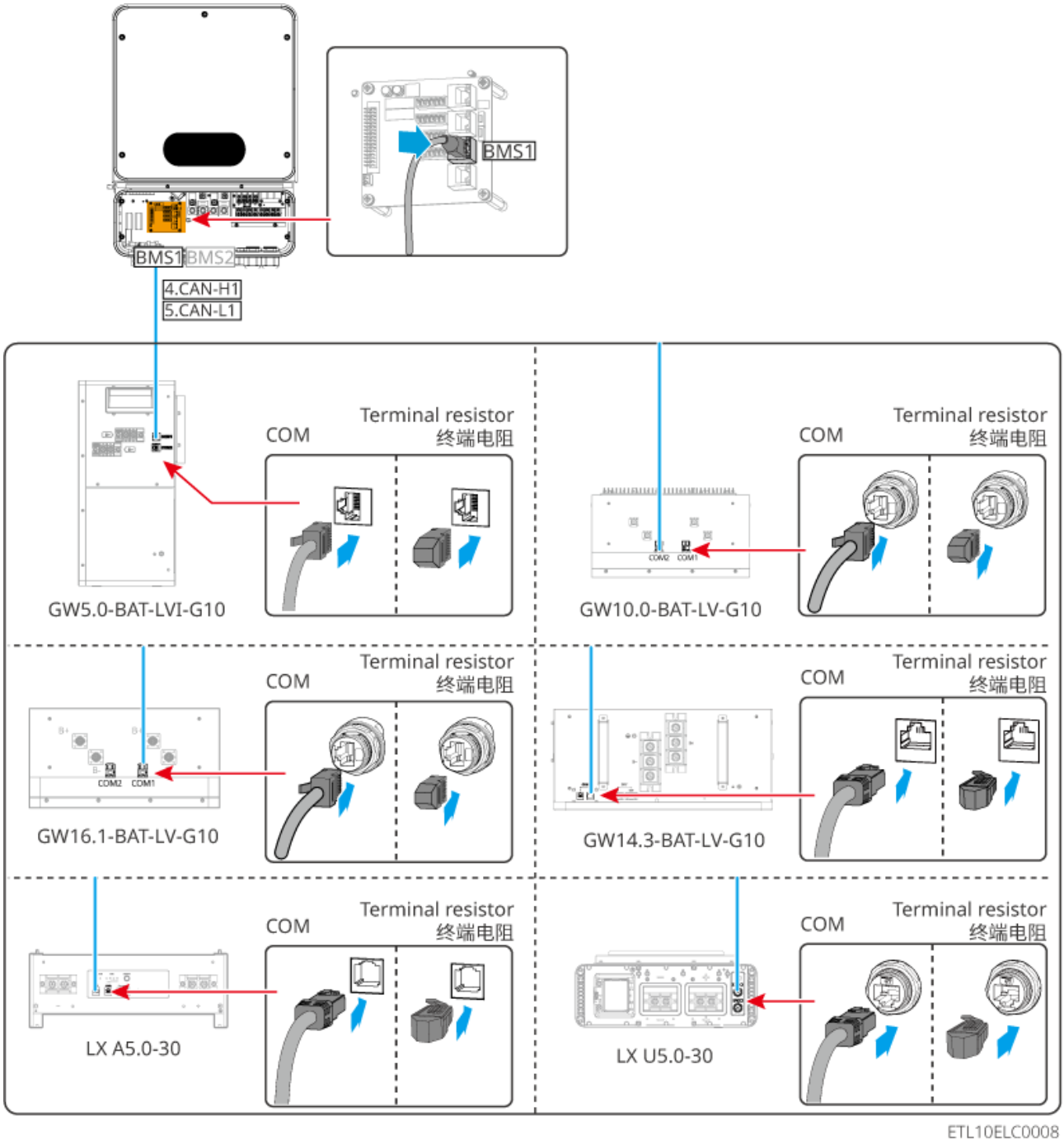

LXA40MTN0001

5.8.2 Connect the Inverter-to-Battery Communication Cable

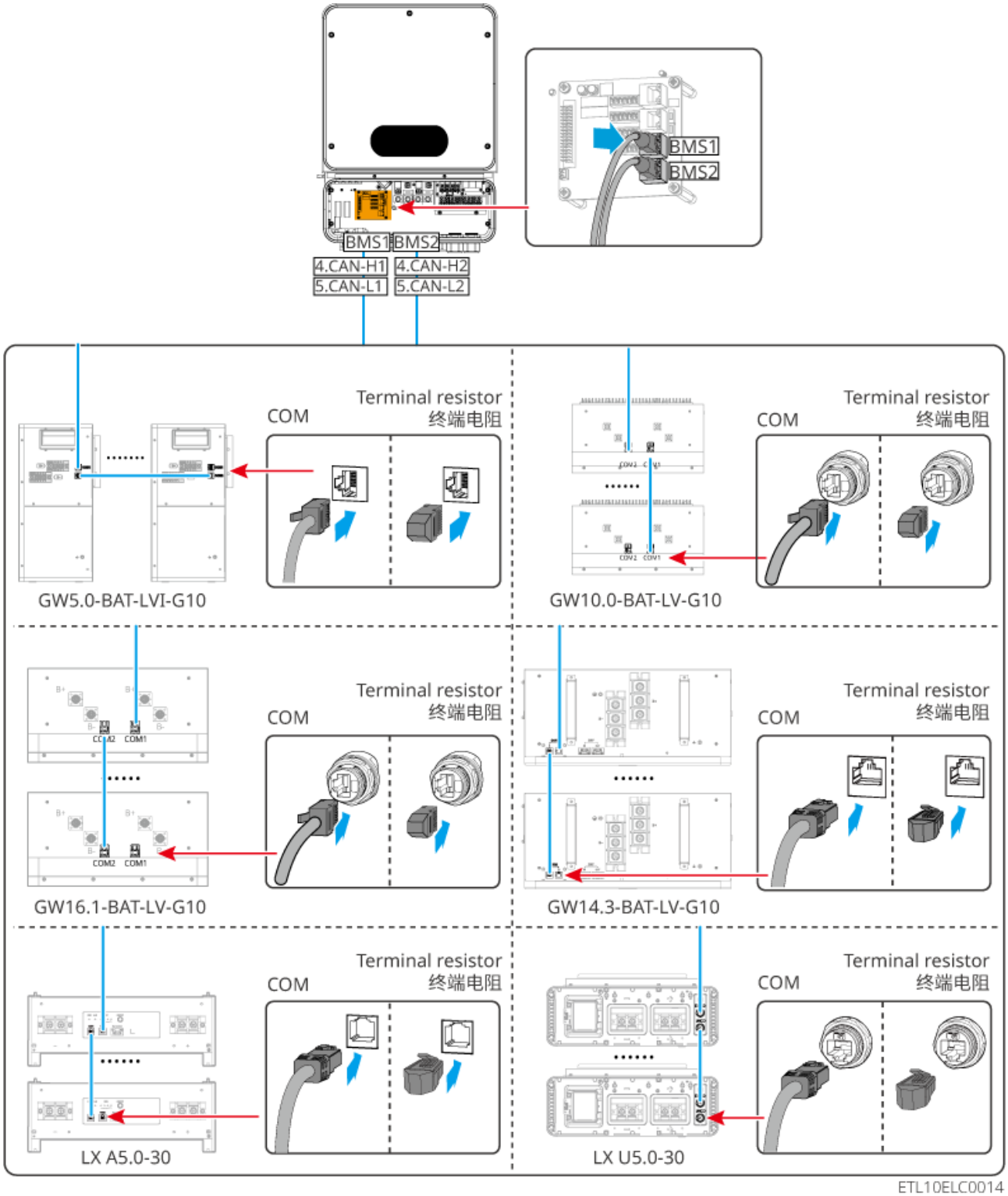
NOTICE

- A BMS battery communication cable is supplied with the inverter. It is recommended to use the supplied BMS battery communication cable. If the supplied communication cable cannot meet the requirements, prepare a shielded network cable and shielded RJ45 plug. When crimping, crimp only PIN4 and PIN5 of the RJ45 plug; otherwise, communication failure may occur.
- The GW16.1-BAT-LV-G10 model has a built-in termination resistor. If a third-party busbar is selected, remove the termination resistor on the device and use the termination resistor supplied with the accessory kit instead.

Schematic for Connecting Inverter BMS1 Communication:



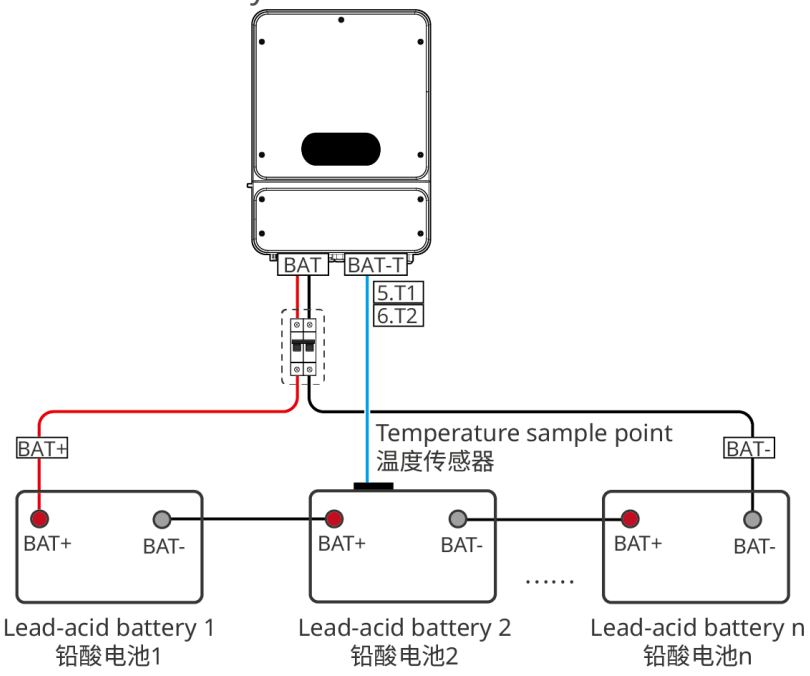
Schematic for Connecting Both Inverter BMS1 and BMS2 Communications:


BMS1
BMS2
BMS1
BMS2
4.CAN-H1
5.CAN-L1
4.CAN-H2
5.CAN-L2
COM
Terminal resistor
终端电阻
GW5.0-BAT-LVI-G10
COM
Terminal resistor
终端电阻
GW10.0-BAT-LV-G10
COM
Terminal resistor
终端电阻
GW16.1-BAT-LV-G10
COM
Terminal resistor
终端电阻
GW14.3-BAT-LV-G10
COM
Terminal resistor
终端电阻
LX A5.0-30
COM
Terminal resistor
终端电阻
LX U5.0-30
ETL10ELC0014

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, secure the sensor to the middle lead-acid battery.
- To better provide Protection for the battery cells, the temperature sampling cable must be installed, and it is recommended to place the battery in an environment with good heat dissipation.

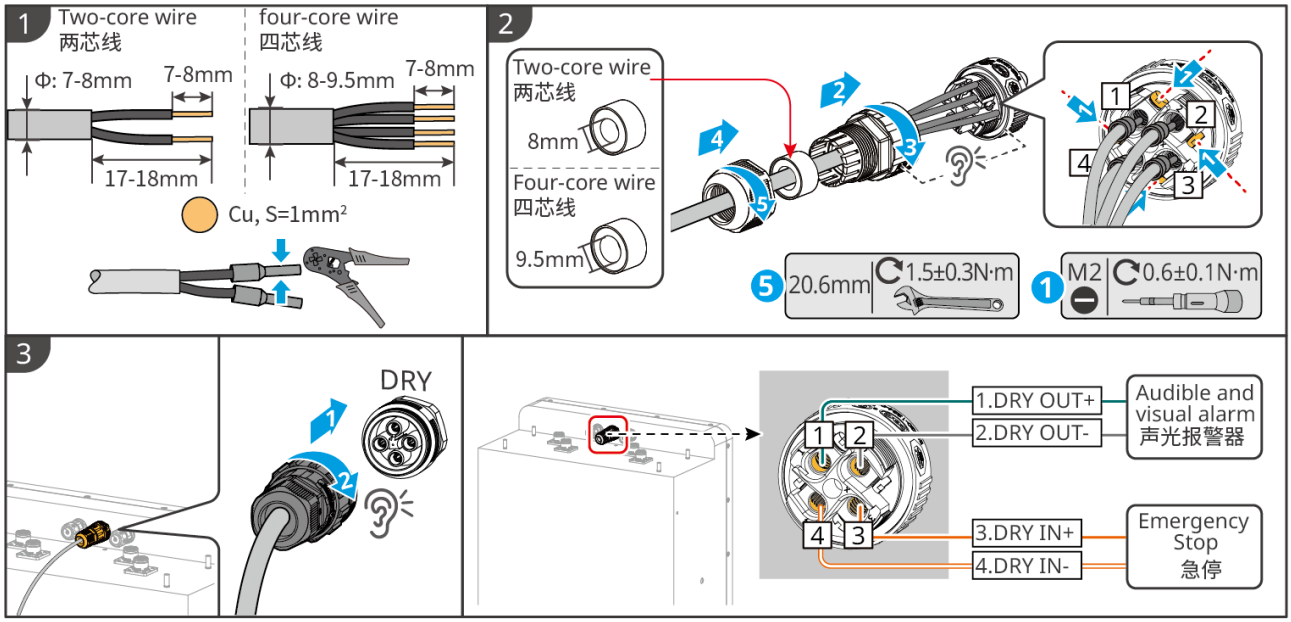
Lead-Acid Battery Communication Schematic:



ETL10ELC0013

5.8.3 Connect Battery Communication Cable

GW16.1-BAT-LV-G10:



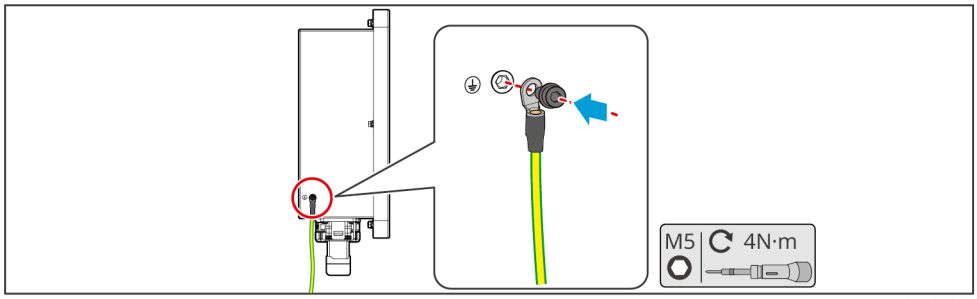
LXA40ELC0010

Communication Function Description

Port	Function	Description
1-2	Fire protection action signal communication port	Dry contact output signal port, normally NO (normally open state) The DO contact rating is 5 V @ 10 mA. Connect the audible and visual alarm cable to trigger the external audible and visual alarm device.
3-4	EPO signal communication port	Dry contact input signal port, normally NO (normally open state) The DI contact rating is 5 V @ 10 mA. Connect an external EPO switch to shut down the battery system in the event of a fire.

5.9 Connect the Mix Parallel Unit Cables

5.9.1 Connect the Mix Parallel Unit Grounding Cable

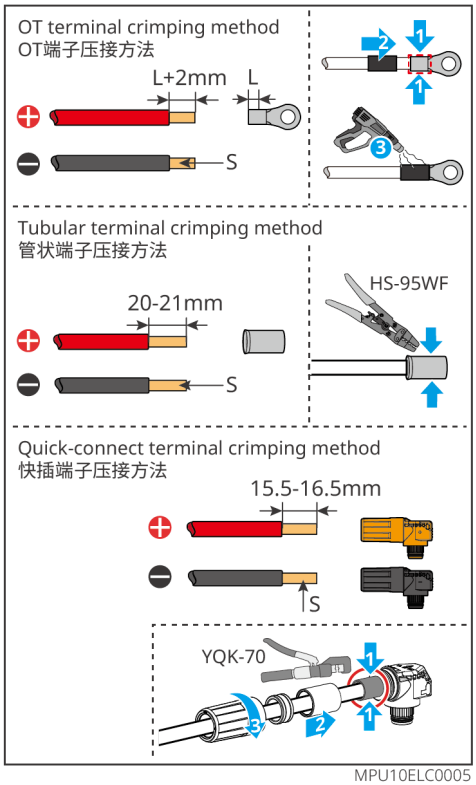


MPU10ELC0001

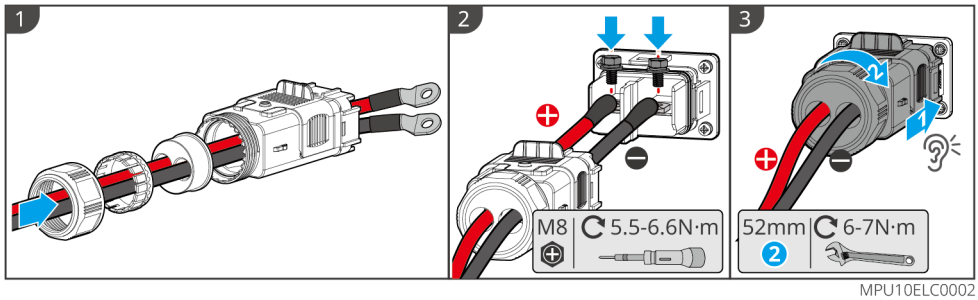
5.9.2 Connect the Mix Parallel Unit Power Cable

Cable-to-Terminal Matching Table/线缆与端子匹配关系	
Cable cross-sectional area (S) 线缆横截面积（S）	Terminal type 端子型号
25mm²	OT: SC25-8
35mm²	OT: SC35-8
50mm²	OT: SC50-8 Quick-connect termina 快插端子
70mm²	OT: SC70-8/SC70-10 Tubular terminal 管状端子

Port Name/端口名称	Terminal Type 端子类型
A: Inverter BAT Terminal A：逆变器BAT接线端子	OT/Tubular terminal 管状端子
B: Mix Parallel Unit BAT Terminal B：混并盒BAT接线端子	OT
C: Mix Parallel Unit INV Terminal C：混并盒INV接线端子	OT
D: Busbar/Busbar Junction Box Battery Terminal D：汇流排/汇流盒电池接线端子	OT
E: Busbar/Busbar Junction Box Inverter Terminal E：汇流排/汇流盒逆变器接线端子	OT
F: Battery Terminal F：电池接线端子	OT/Quick-connect terminal快插端子

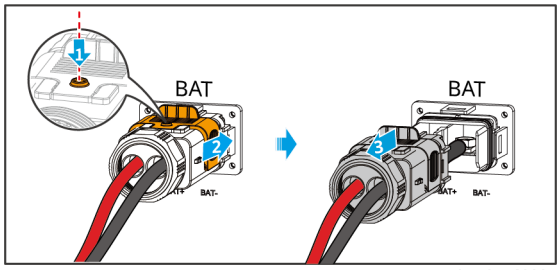


MPU10ELC0005



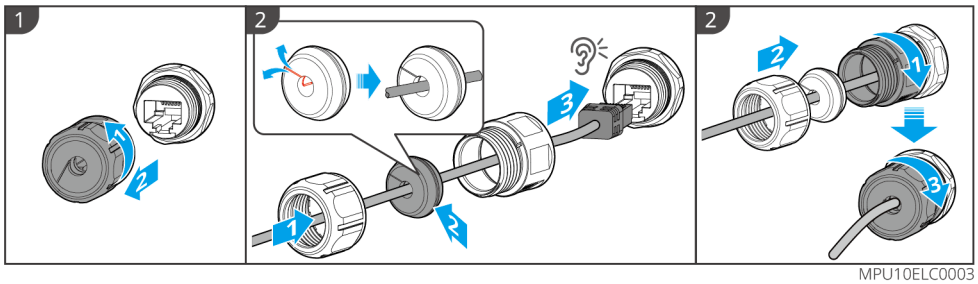
MPU10ELC0002

Removal method for the Mix Parallel Unit power terminal cover (optional)



ESU10ELC0095

5.9.3 Connect the Mix Parallel Unit Communication Cable



MPU10ELC0003

5.10 Connect the Meter Cables

NOTICE

- Ensure the CT connection direction and phase sequence are correct; otherwise, the monitoring data may be incorrect.
- Ensure all cables are correctly and securely connected without looseness. Improper wiring may cause poor contact or damage to the meter.
- In areas with lightning hazards, if the meter cable length exceeds 10 m and the cable is not routed in grounded metal conduit, it is recommended to install external lightning protection devices.
- The outer diameter of the AC power cable must be smaller than the CT aperture to ensure the AC power cable can pass through the CT.
- To ensure the CT current detection accuracy, the CT cable length is recommended not to exceed 30 m.
- Do not use a network cable as the CT cable; otherwise, excessive current may damage the meter.
- The CTs provided by the equipment manufacturer vary slightly in size and appearance depending on the model, but the installation and wiring methods are identical.

GM330 meter wiring

- Three-phase four-wire

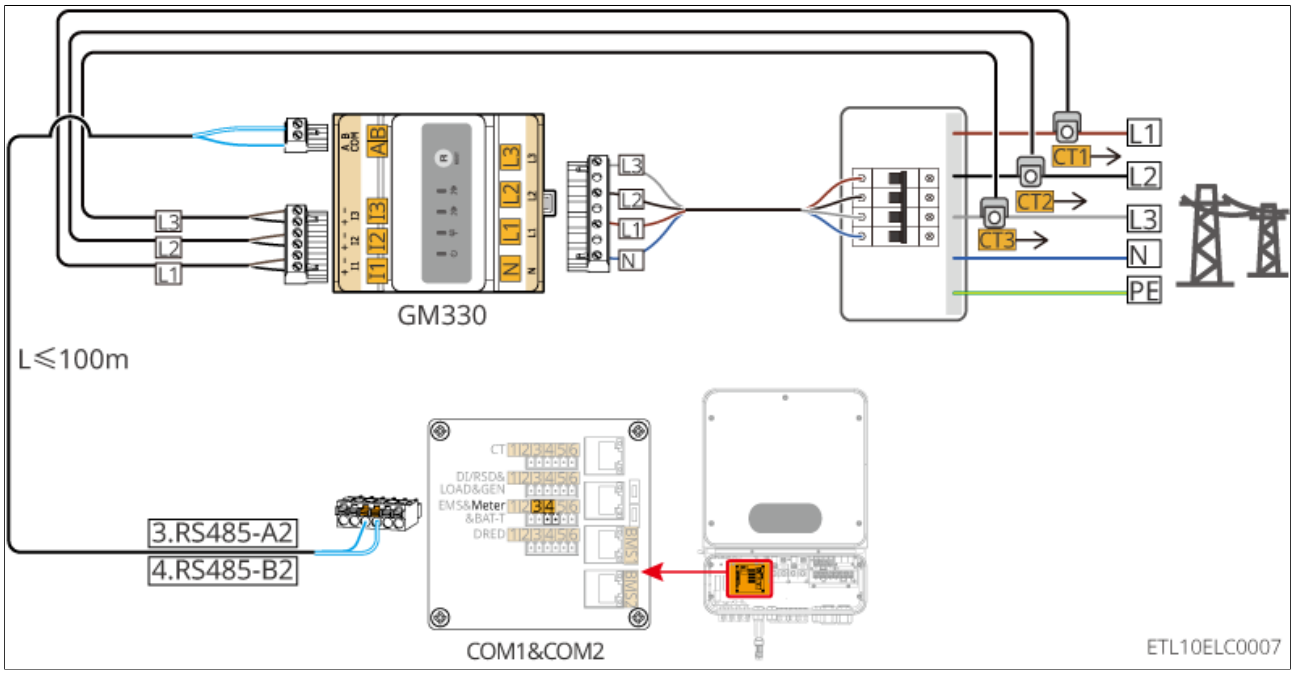


Figure8 Three-phase four-wire meter wiring method

- Three-phase three-wire

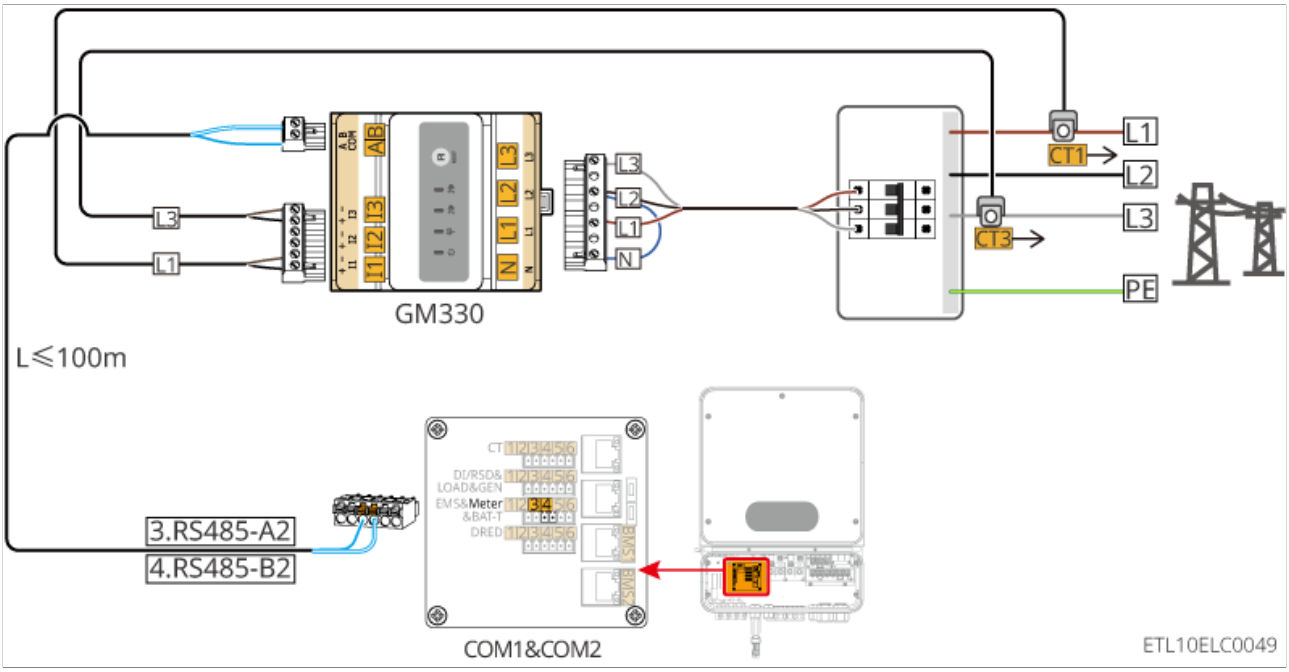
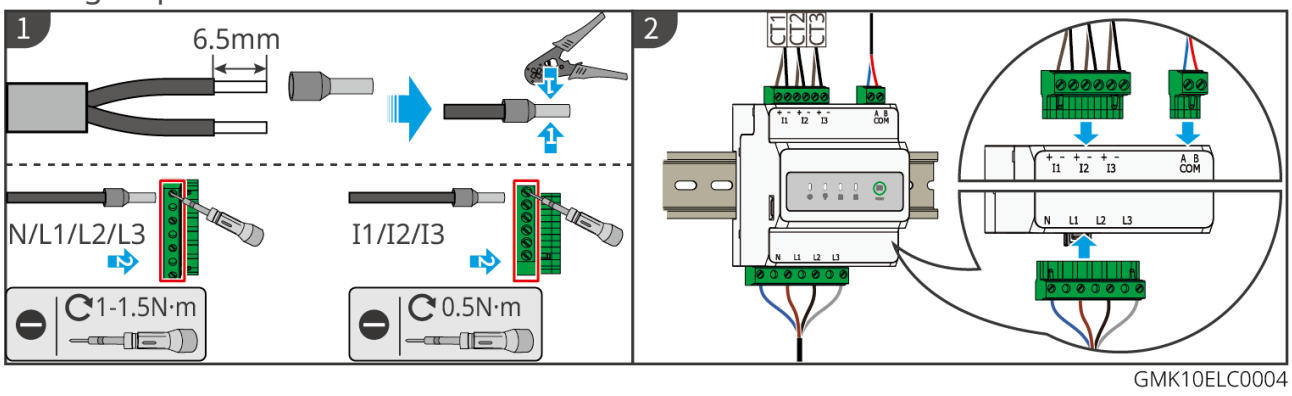
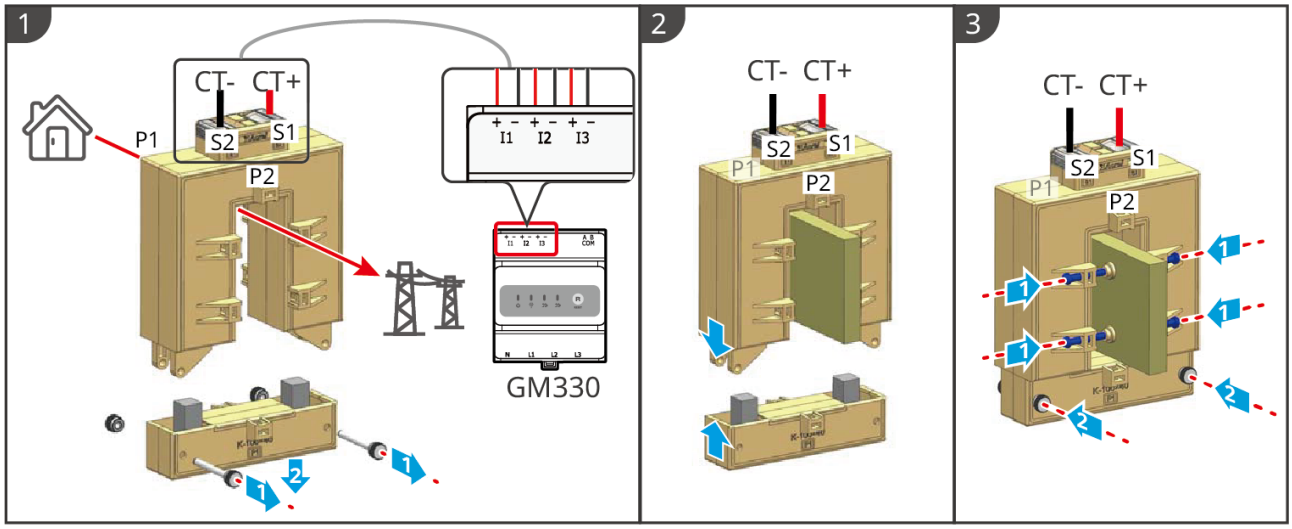


Figure9 Three-phase three-wire meter wiring method

Wiring steps

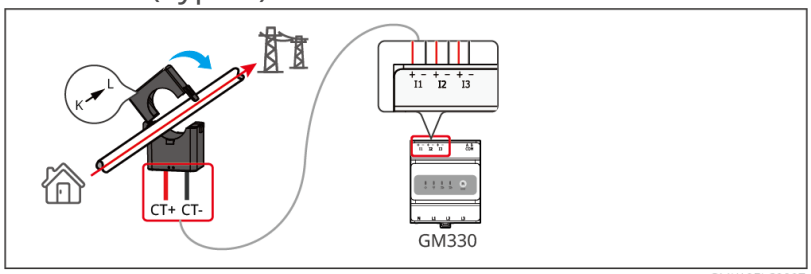


Install CT (Type 1)



GMK10ELC0006

Install CT (Type 2)

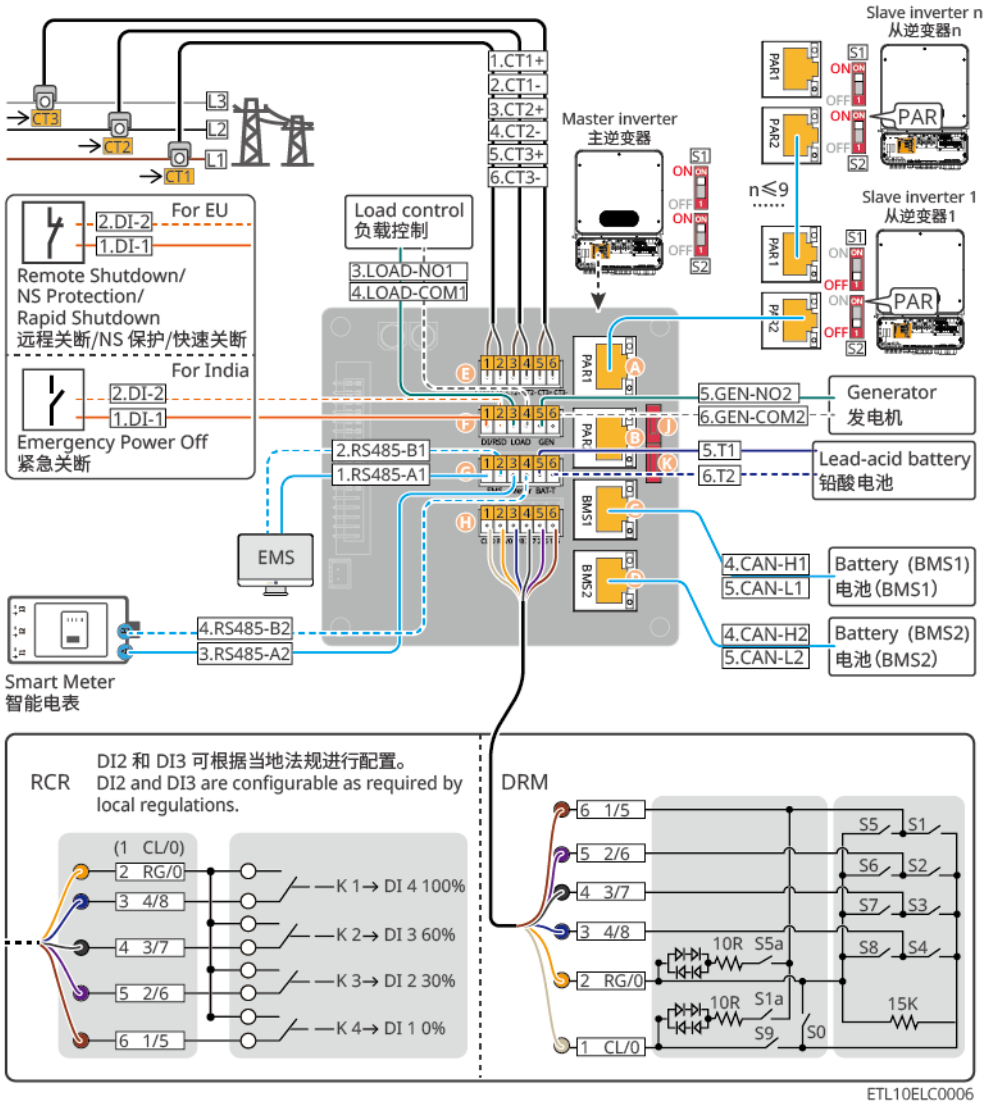


GMK10ELC0007

5.11 Connect Inverter Communication Cable

NOTICE

- To ensure normal operation of the meter and CT, ensure the following:
  - Please ensure the CTs are connected matching the phase conductors: CT1 to L1, CT2 to L2, and CT3 to L3.
  - Please connect the CTs according to the direction indicated on the meter; reverse connection may trigger a CT reverse fault.
  - When replacing or maintaining CTs later, use the "Meter/CT-Assisted Detection" function in the App so that the inverter can re-adapt to the CT sampling current direction.
- When using the built-in meter, use the CTs shipped with the unit.
- If the inverter is Not ConnectedDREDequipment or Remote Shutdown equipment, do not enable this function in App; otherwise, the inverter cannot operate in grid-tied mode.
- In a parallel system, to implement DRED and RCR functions, only connect the DRED and RCR communication cables to the master inverter.
- To ensure the inverter's waterproof rating, do not remove the waterproof plugs from unused communication ports on the inverter.
- InverterDOsignal communication port, capable of connecting to dry contact signals with the following specifications:Max≤24Vdc，1A。
- The inverter's communication function is optional; select according to the actual application scenario.
- The inverter supports connection to a mobile phone or WEB interface via 4G, Bluetooth, WiFi, or LAN communication to set device-related parameters and view device operating information and error information, enabling timely awareness of system status.
- In a single-unit system, WiFi/LAN Kit-20, 4G Kit-CN-G20, or 4G Kit-G20 smart communication sticks can be installed.
- In a parallel system, both master and slave inverters need to be equipped with WiFi/LAN Kit-20 or 4G Kit-CN-G20.
- When using 4G Kit-G20:
  - If Parallel Networking is required, please contact GoodWe to purchase WiFi/LAN Kit-20.
  - Connection to third-party monitoring platforms is not supported.
- The 4G Kit-CN-G20 and 4G Kit-G20 are LTE single-antenna devices, suitable for application scenarios with lower data transmission rate requirements.



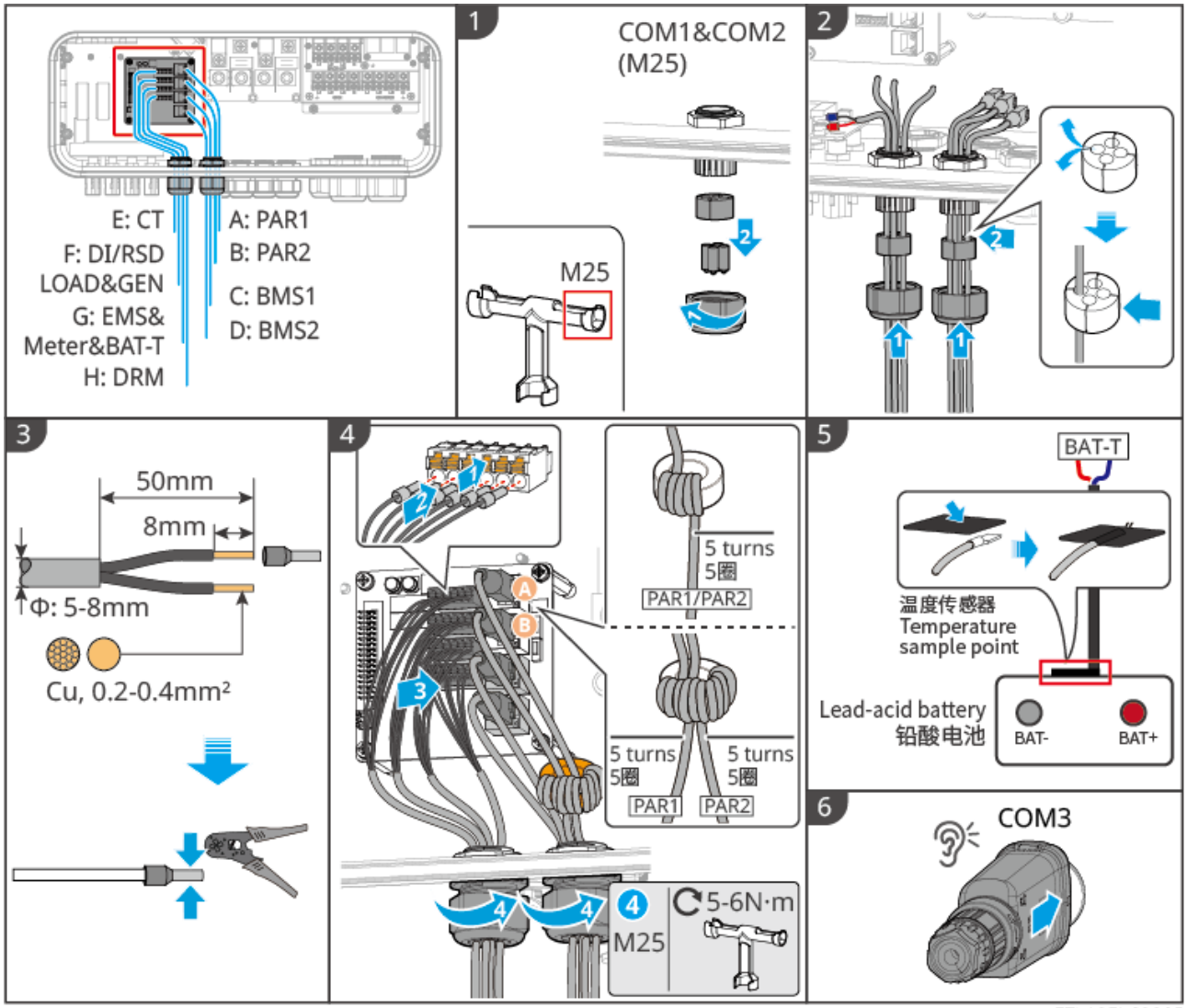
Communication Function Description

Port (silkscreen)		Function	Description
A	PAR1	Parallel communication port 1	Parallel Communication Port Use CAT 5E or higher standard network cables and RJ45 connectors.
B	PAR2	Parallel Communication Port 2	
C	BMS 1		

Port (silkscreen)		Function	Description
D	BMS 2	Battery BMS Communication	When connecting lithium-ion batteries, this port is used to connect the battery system BMS communication cable and supports CAN signal communication.
E	CT	CT Connection Port	The CT communication cable needs to be connected only when the inverter's built-in meter is used.
F	DI	Remote Shutdown/NS Protection/Rapid Shutdown	• Connects to an external Remote Shutdown or local NS Protection device; disabled by default. • In a Rapid Shutdown system, the Rapid Shutdown transmitter and receiver work together to achieve rapid system shutdown. The receiver maintains PV module output by receiving signals from the transmitter. The transmitter can be external or built into the inverter. In an emergency, the transmitter can be stopped by enabling the external trigger device, thereby shutting down the PV modules.
	LOAD	Load control	• Supports dry contact signal connection to implement load control and other functions. The DO contact rating is 24 V DC @ 1 A, with NO/COM normally open contacts. • Supports SG Ready heat pump integration and controls the heat pump via dry contact signals.
	GEN	Diesel Generator Control Port	Supports Diesel Generator Control signal input to control generator start/stop. Connecting a generator is not supported in a Microgrid Scenario.
G	EMS	EMS	Connects to third-party EMS devices for energy control.

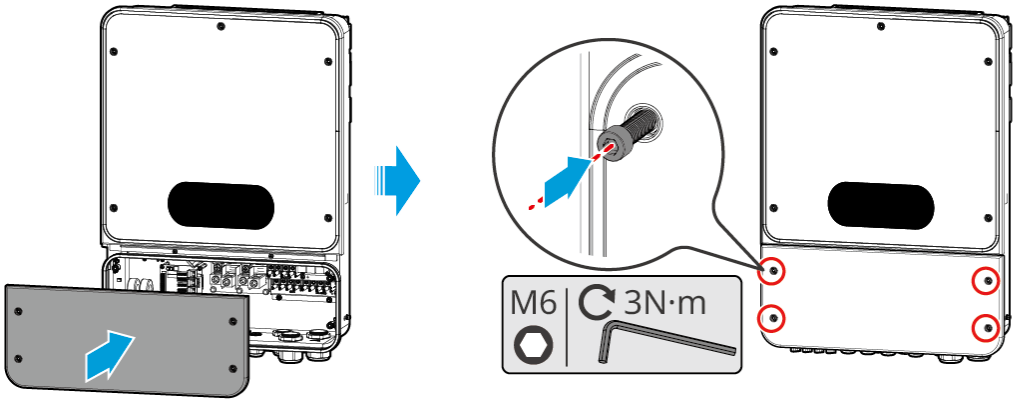
Port (silkscreen)		Function	Description
	METER	Meter Connection Port	Uses RS485 communication to connect an external smart meter.
	BAT-T	Lead-Acid Temperature Sampling Port	Used to connect the temperature sensor cable for lead-acid battery temperature measurement.
H	DRED	RCR or DRED Function Connection Port	• RCR (Ripple Control Receiver): Provides an RCR signal control port to meet grid dispatch requirements in Europe. • DRED (Demand Response Enabling Device): Provides a DRED signal control port to meet DRED Certification requirements in Australia and other regions.
J	SW1	Parallel DIP Switch	In multi-unit parallel scenarios, set the parallel DIP switches of the first and last inverters to ON, and those of the other inverters to OFF.
K	SW2		

Communication Cable Connection Method



ETL10ELC0005

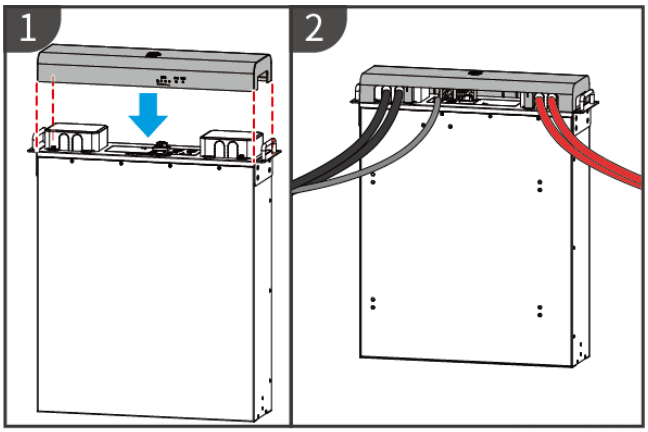
5.12 Install the Inverter Enclosure Lower Cover



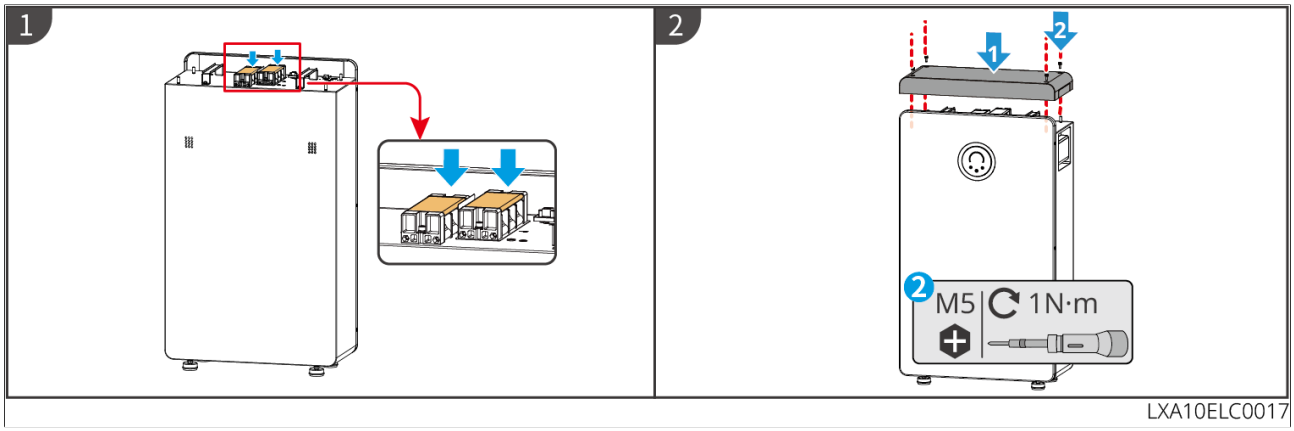
ETL10INT0004

5.13 Install the Battery Protection Cover

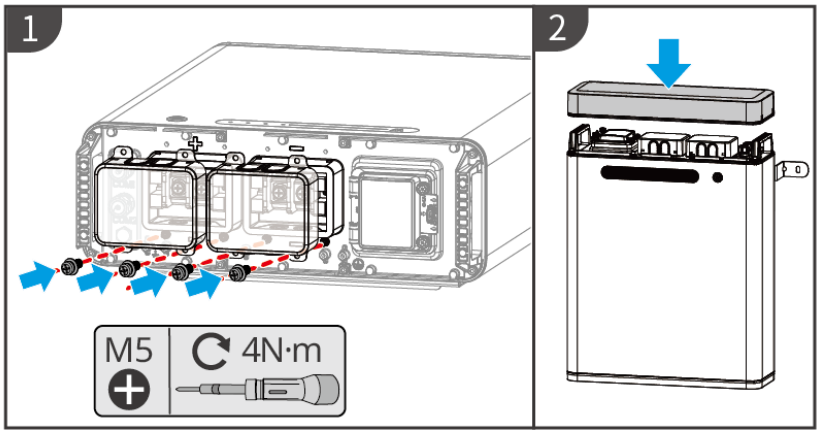
5.13.1 LX A5.0-30



5.13.2 GW14.3-BAT-LV-G10

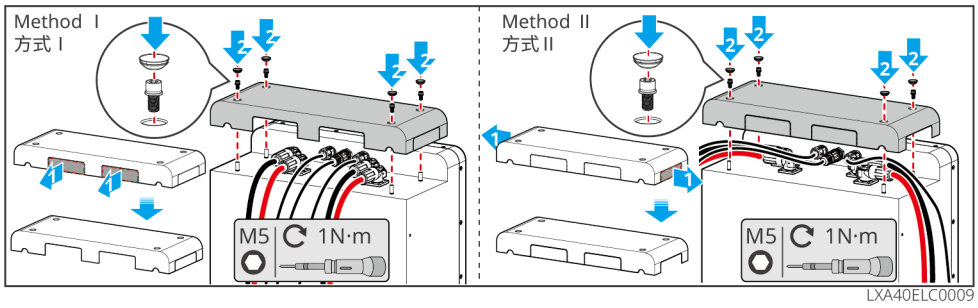


5.13.3 LX U5.0-30



LXU30INT0006

5.13.4 GW16.1-BAT-LV-G10



LXA40ELC0009

6 System Trial Operation

6.1 Pre-Power-on Checks for the System

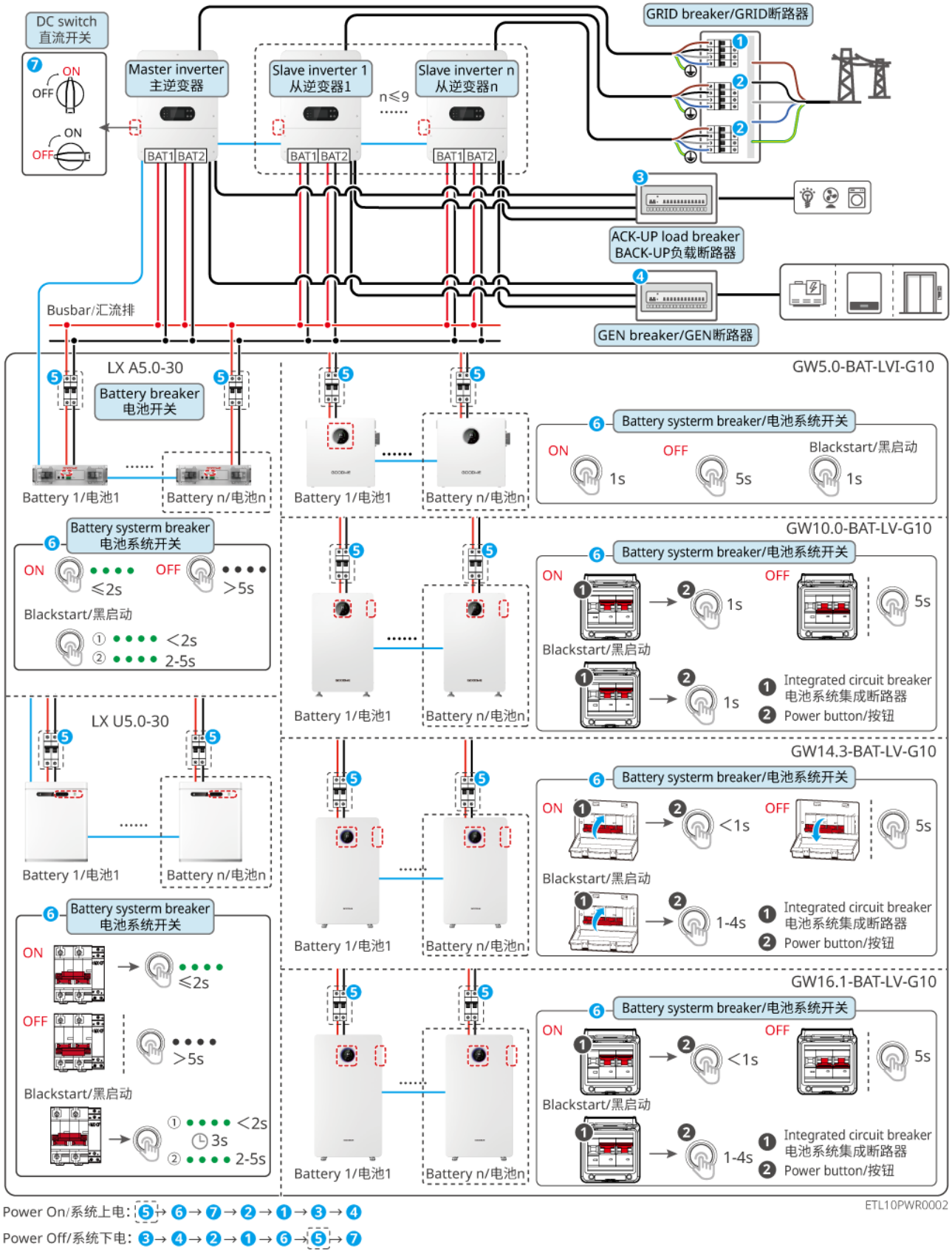
No.	Inspection Items
1	The equipment is installed securely; the installation location is convenient for operation and maintenance; the installation space allows for ventilation and heat dissipation; and the installation environment is clean and tidy.
2	The Protection ground wire, DC cables, AC cables, communication cables, and terminal resistors are correctly and securely connected.
3	Cables are tied in compliance with routing requirements, distributed reasonably, and free from damage.
4	Unused cable entry holes and ports must be reliably connected using the matching terminals provided in the accessories and must be sealed.
5	Ensure that used cable entry holes are sealed.
6	The voltage and frequency at the inverter's grid connection point meet grid connection requirements.

6.2 Power on the System

⚠WARNING

- Battery black-start function: When no PV power is generated in the PV system and the grid is abnormal, if the inverter cannot operate normally, the battery black-start function can be used to force the battery to discharge and start the inverter. The inverter can then enter off-grid mode, with the battery supplying power to loads.
- After the battery system starts, ensure that communication between the inverter and battery system is normal within 15 minutes. If the inverter and battery system cannot communicate normally, the battery system switch will automatically open and power off the battery system.
- When multiple batteries in the system are connected in parallel clusters, starting any one battery will start all batteries.
  - GW14.3-BAT-LV-G10: After the battery is powered off and then powered on again, restart each battery one by one, or wait 15 minutes and then start any one battery to start all batteries.

Power on



Power On/系统上电：5→6→7→2→1→3→4

Power Off/系统下电：3→4→2→1→6→5→7

1. (Select according to local regulations) Close the switch between the inverter and the battery.
2. Start the battery system.
   - Normal Battery Startup
     - GW14.3-BAT-LV-G10, LX U5.0-30, GW16.1-BAT-LV-G10: Close the battery system integrated circuit breaker and short press the multifunction button for less than 1 s.
     - LX A5.0-30: Press the battery system switch for ≤2 s.
   - Battery Black Start
     - LX A5.0-30, LX U5.0-30: Short press the battery multifunction button for <2 s, then long press for 2–5 s to start the battery system; the battery will forcibly discharge to activate the inverter.
     - GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10: Long press the battery multifunction button for 1–4 s to start the battery system; the battery will forcibly discharge to activate the inverter.
3. Close the inverter's DC Switch.
4. (Optional) Close the inverter ON-GRID circuit breaker.
5. Close the ON-GRID circuit breaker of the main inverter.
6. Close the BACK-UP circuit breaker.
7. (Optional) Close the GEN circuit breaker.

6.3 Indicator Light Introduction

6.3.1 Inverter Indicator Lights

Type 1:

Indicator	Status	Description
		The inverter is starting and in self-test mode.
		The inverter is operating normally in grid-connected power generation or off-grid mode.
		BACK-UP output Overload
		System Fault

Indicator	Status	Description
		LCD ON: The inverter is powered on and in standby mode. LCD OFF: The inverter is powered off.
		Grid abnormal; inverter BACK-UP port is supplying power normally.
		Grid normal; inverter BACK-UP port is supplying power normally.
		No power supply to BACK-UP port
		Inverter monitoring module is resetting
		No connection established between inverter and communication terminal
		Communication failure between communication terminal and cloud server
		Inverter monitoring is normal
		Inverter monitoring module is not started

Type 2:

Indicator	Status	Description
		Inverter is powered on and in standby mode
		The inverter is starting and in self-test mode.
		The inverter is operating normally in grid-connected power generation or off-grid mode.
		BACK-UP output Overload
		System Fault
		Inverter is powered off
		Grid abnormal; inverter BACK-UP port is supplying power normally.
		Grid normal; inverter BACK-UP port is supplying power normally.

Indicator	Status	Description
		No power supply to BACK-UP port
		Inverter monitoring module is resetting
		No connection established between inverter and communication terminal
		Communication failure between communication terminal and cloud server
		Inverter monitoring is normal
		Inverter monitoring module is not started

6.3.2 Battery LED Indicator

6.3.2.1 LX A5.0-30

Indicator		System status
○○○○	No green indication on the SOC indicator	SOC=0%
●○○○	The first SOC indicator is green	0% < SOC≤25%
●●○○	The second SOC indicator is green	25% < SOC≤50%
●●●○	The third SOC indicator is green	50% < SOC≤75%
●●●●	The fourth SOC indicator is green	75% < SOC≤100%
RUN indicator	Steady green	Battery system operating normally
	Green flashing 1 time/s	Battery system in standby state
	Green flashing 3 times/s	PCS Comm Loss
	Slow flashing	After an alarm occurs in the battery system, a self-check will be performed. Wait for the self-check to complete, then the system will switch to normal operation or fault state.

Indicator		System status
ALM indicator	Steady red	Determine the fault type based on the SOC indicator display pattern, and handle it according to the methods recommended in the troubleshooting chapter.

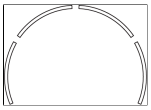
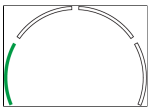
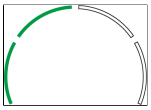
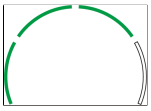
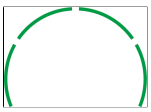
6.3.2.2 LX A5.0-30、LX U5.0-30

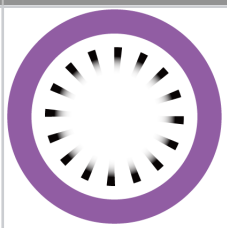
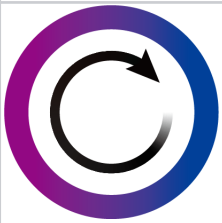
Indicator		System status
○○○○	No green indication on the SOC indicator	SOC=0%
●○○○	The first SOC indicator is green	0% < SOC≤25%
●●○○	The second SOC indicator is green	25% < SOC≤50%
●●●○	The third SOC indicator is green	50% < SOC≤75%
●●●●	The fourth SOC indicator is green	75% < SOC≤100%
RUN indicator	Steady green	Battery system operating normally
	Green flashing 1 time/s	Battery system in standby state
	Green flashing 3 times/s	PCS Comm Loss
	Slow flashing	After an alarm occurs in the battery system, a self-check will be performed. Wait for the self-check to complete, then the system will switch to normal operation or fault state.
ALM indicator	Steady red	Determine the fault type based on the SOC indicator display pattern, and handle it according to the methods recommended in the troubleshooting chapter.

6.3.2.3 GW14.3-BAT-LV-G10

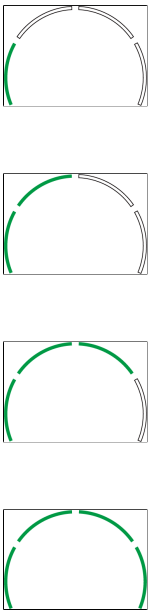
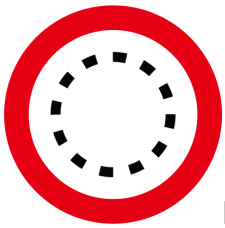


Normal Status

Indicator Name	Indicator status		Corresponding Status of Other Indicators	System status
SOC indicator	    	SOC Indicator Steady Green	/	SOC=0% 0% < SOC≤25% 25% < SOC≤50% 50% < SOC≤75% 75% < SOC≤100%
		SOC Indicator Flashing Green		Battery System in Discharging State

Indicator Name	Indicator status		Corresponding Status of Other Indicators	System status
Running Indicator + Touch Button		Steady White	 Blue-Purple Breathing Light	System Operating Normally
		Flashing White	 Blue-Purple Marquee Light	System Preparing
Communication indicator		Steady White	/	PCS communication normal

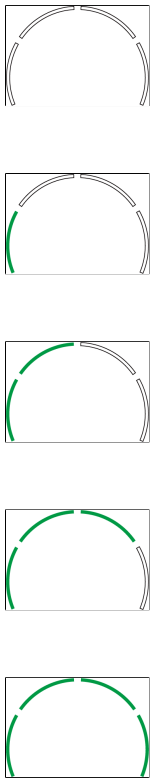
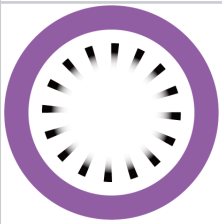
Abnormal status

Indicator Name	Indicator status		Corresponding Status of Other Indicators	System status
SOC indicator		SOC Indicator Steady Green	 Flashing red  Off  Steady red	Determine the fault type based on the SOC indicator display pattern, and handle it according to the methods recommended in the troubleshooting chapter.
Communication indicator		Off	/	PCS Comm Loss
System alarm indicator		Steady White	/	System alarm and Level 2, 3, and 4 undervoltage faults

6.3.2.4 GW16.1-BAT-LV-G10

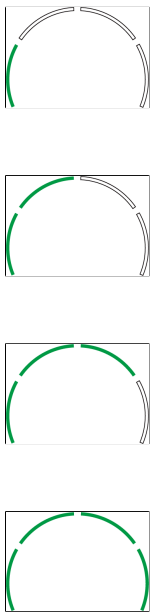
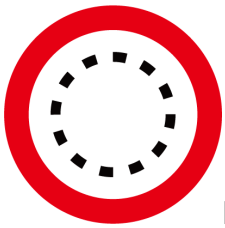


Normal Status

Indicator Name	Indicator status		Corresponding Status of Other Indicators	System status
SOC indicator		SOC Indicator Steady Green	/	SOC=0% 0% < SOC≤25% 25% < SOC≤50% 50% < SOC≤75% 75% < SOC≤100%
		SOC Indicator Flashing Green		Battery System in Discharging State
Running Indicator + Touch Button		Steady White	 Blue-Purple Breathing Light	System Operating Normally
		Flashing White	 Blue-Purple Marquee Light	System Preparing

Indicator Name	Indicator status		Corresponding Status of Other Indicators	System status
Communication indicator		Steady White	/	PCS communication normal

Abnormal status

Indicator Name	Indicator status		Corresponding Status of Other Indicators	System status
SOC indicator		SOC Indicator Steady Green	 Flashing red  Off  Steady red	Determine the fault type based on the SOC indicator display pattern, and handle it according to the methods recommended in the troubleshooting chapter.
Communication indicator		Off	/	PCS Comm Loss
System alarm indicator		Steady White	/	System Alarm and Undervoltage Fault Levels 2, 3, and 4

6.3.3 Mix Parallel Unit Indicator Light

Indicator	Status	Description
	Steady green	System Operating Normally
	Green flashing	System Preparing
	Green off	System Fault
	Steady green	Communication normal
	Green off	Communication lost
	Steady red	System Fault
	Red off	System normal

6.3.4 Smart Meter LED Indicator

GM330

Type	Status	Description
Power LED 	Steady on	Meter is powered on, no RS485 communication
	Flashing	Meter is powered on, RS485 communication is normal
	Off	Meter is powered off
Communication LED 	Off	Reserved
	Flashing	Press and hold the Reset button for ≥5s; the Power LED and Buy/Export Energy LED flash: meter reset
Buy/Export Energy LED 	Steady on	Purchase energy from the grid
	Flashing	Export Energy to the grid
	Off	No energy purchase and no Export Energy
	Reserved	

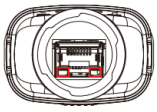
6.3.5 Smart Communication Dongle LED Indicator

- **WiFi/LAN Kit-20**

NOTICE

- After double-clicking the Reload button to enable Bluetooth, the communication LED changes to a single-blink state. Please connect to the App within 5 minutes; otherwise, Bluetooth will automatically turn off.
- The single-blink state of the communication LED appears only after double-clicking the Reload button to enable Bluetooth.

Indicator	Status	Description
Power LED		Steady on: The smart communication dongle is powered on.
		Off: The smart communication dongle is not powered on
Communication LED		Steady on: Wi-Fi mode or LAN mode communication is normal.
		Flashes once: The Bluetooth signal of the smart communication stick is enabled, waiting for App connection.
		Flashes twice: The smart communication stick is Not Connected to the router.
		Flashes four times: The smart communication stick is communicating normally with the router, but is Not Connected to the server.
		Flashes six times: The smart communication stick is identifying connected devices.
		Off: The smart communication stick is undergoing a software reset or is not powered.

Indicator	Color	Status	Description
LAN port communication LED 	Green	Steady on	100 Mbps wired network connection is normal.
		Off	• Ethernet cable is Not Connected. • 100 Mbps wired network connection is abnormal. • 10 Mbps wired network connection is normal.

Indicator	Color	Status	Description
	Yellow	Steady on	10/100 Mbps wired network connection is normal; no communication data is being sent or received.
		Flashing	Communication data is being sent and received.
		Off	Ethernet cable is Not Connected.

Button	Description
Reload	Press and hold for 0.5–3 seconds to reset the smart communication stick.
	Press and hold for 6–20 seconds to restore the smart communication stick to factory settings.
	Quick double-click to enable the Bluetooth signal (active for only 5 minutes).

- **4G Kit-CN-G20 & 4G Kit-G20**

Indicator	Status	Description
		Steady on: The smart communication dongle is powered on.
		Off: The smart communication stick is not powered.
		Steady on: The smart communication stick is connected to the server and communication is normal.
		Double flash: The smart communication stick is Not Connected to the communication base station.
		Four flashes: The smart communication stick is connected to the communication base station but Not Connected to the server.
		Six flashes: Communication between the smart communication stick and the inverter is disconnected.

Indicator	Status	Description
	———	Off: The smart communication stick is undergoing a software reset or is not powered.

Button	Description
RELOAD	Double-click to enable Bluetooth broadcasting on the smart communication stick. 【1】
	Press and hold for 0.5–3 seconds to restart the smart communication stick.
	Press and hold for 6–20 seconds to restore the smart communication stick to factory settings.

[1] Only applicable to 4G Kit-G20.

7 System Commissioning

7.1 Configure via LCD (Type 1)

7.1.1 LCD Introduction

Through the LCD screen, users can:

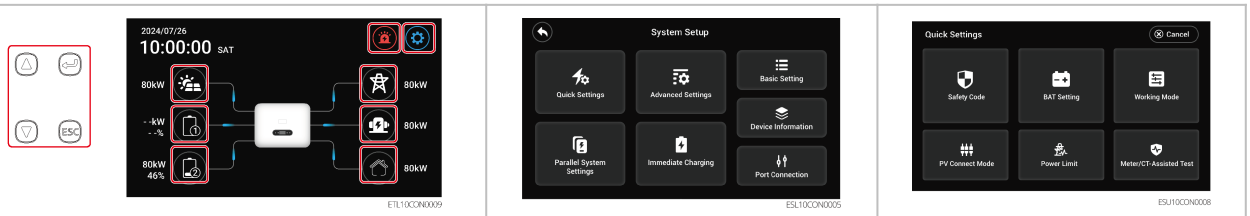
1. View the device's operating data, software version, alarm information, etc.
2. Set parameters, safety region, Power Limit, etc.

NOTICE
The LCD display interface varies depending on the device model and the safety country set. Please refer to the actual interface displayed.

LCD Interface Introduction

The LCD supports both touch and button operations.

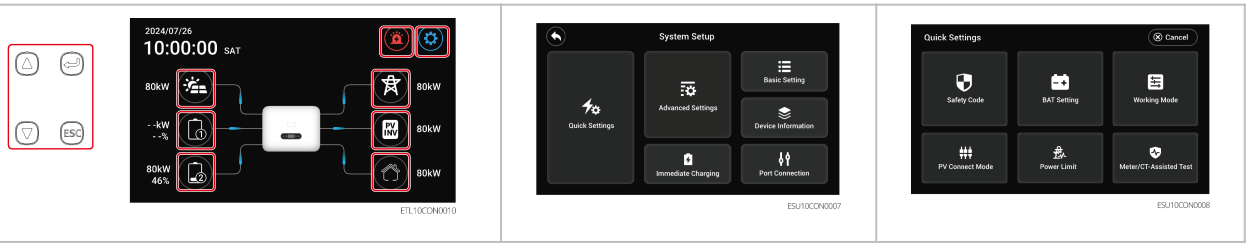
General Status



Name/Icon	Description
	Up
	Down
	Confirm

Name/Icon	Description
ESC	• Short press: exit the page • ESC and △ press and hold simultaneously for 5 s: restart the device
	Used to view PV current, voltage, Energy Generation, and other information
	Used to view battery model, status, and other information • GW5K-ET-L-G10, GW6K-ET-L-G10, GW8K-ET-L-G10, GW10K-ET-L-G10, GW12K-ET-L-G10, GW12K-ET-LL-G10 display one battery channel • GW15K-ET-L-G10, GW20K-ET-L-G10 display two battery channels
	Used to view the inverter fault codes
	Used to enter the inverter settings interface
	Used to view grid status information
	Used to view generator status
	Used to view inverter load information
	Return to the main interface
Cancel	Return to the previous menu
Next	Go to the next settings page
Back	Return to the previous settings page

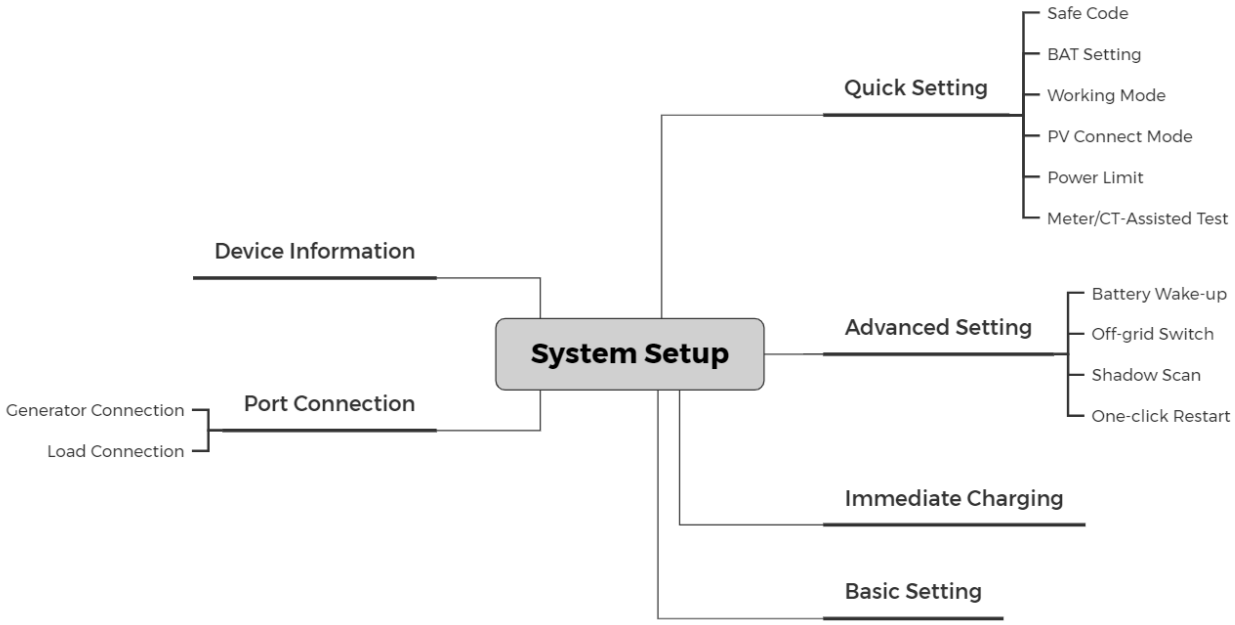
Microgrid Status



Name/Icon	Description
	Up
	Down
	Confirm
	• Short press: exit the page •  and  press and hold simultaneously for 5 s: restart the device
	Used to view PV current, voltage, Energy Generation, and other information
	Used to view battery model, status, and other information • GW5K-ET-L-G10, GW6K-ET-L-G10, GW8K-ET-L-G10, GW10K-ET-L-G10, GW12K-ET-L-G10, GW12K-ET-LL-G10 display one battery channel • GW15K-ET-L-G10, GW20K-ET-L-G10 display two battery channels
	Used to view the inverter fault codes
	Used to enter the inverter settings interface
	Used to view grid status information
	Used to display the status of the grid-tied inverter
	Used to view inverter load information
	Return to the main interface
Cancel	Return to the previous menu
Next	Go to the next settings page

Name/Icon	Description
Back	Return to the previous settings page

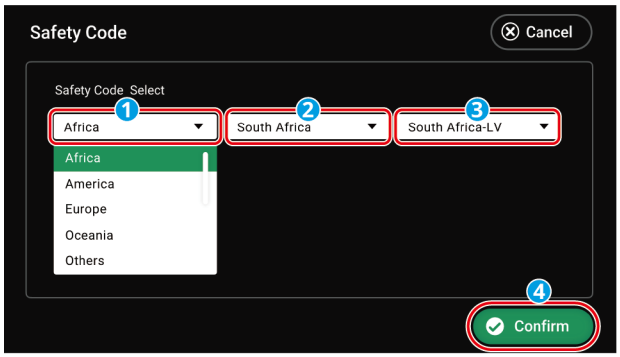
LCD Settings Interface Structure



7.1.2 Quick Settings

Safety Regulation Settings

1. On the main screen, tap > Quick Settings > Safe Code to enter the parameter settings screen.
2. Select the corresponding safety code according to the country or region where the device is located.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.



ETL10CON0002

Battery Parameter Settings

1. On the main screen, tap > Quick Settings > BAT Setting to enter the parameter settings screen.
2. Set the parameters according to the actual conditions.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.

NOTICE

Make sure to tap Confirm on each page to ensure that the parameters take effect; otherwise, the system will run with default parameters.



ETL10CON0003

General Data Settings

BAT Connection Mode	Type	Description
Battery	GOODWE	If a GoodWe brand lithium battery is connected to the system, select GOODWE and select the correct model. If the actual GOODWE battery model is not in the options, use the App to set it.
	Default	If the third-party lithium battery model connected to the system is not in this list, select according to the actual conditions: • Lithium 50Ah • Lithium 100Ah
	Others	If the third-party lithium battery model connected to the system is in this list, select the correct model according to the actual conditions.
	Lead acid	If a lead-acid battery is connected to the system, select Lead acid and select the correct lead-acid type. Currently, GEL, AGM, and Flooded are supported.
NO Battery	No battery is connected to the system	
BAT Setting	Set according to the battery actually connected to the system.	

Lithium Battery Parameter Settings

Parameter Name	Description
SOC Protection	Enable or disable the SOC Protection Function.
Depth Of Discharge (On-Grid)	The maximum depth of discharge Protection point of the battery when the inverter is operating in grid-connected mode.
Depth Of Discharge (Off-Grid)	The maximum depth of discharge Protection point of the battery when the inverter operates off-grid.
Backup SOC Holding	To ensure that the battery SOC is sufficient to maintain normal system operation when off-grid, when the system operates grid-connected, the battery is charged via the grid or PV to the configured SOC Protection value.

Lead-acid battery parameter settings

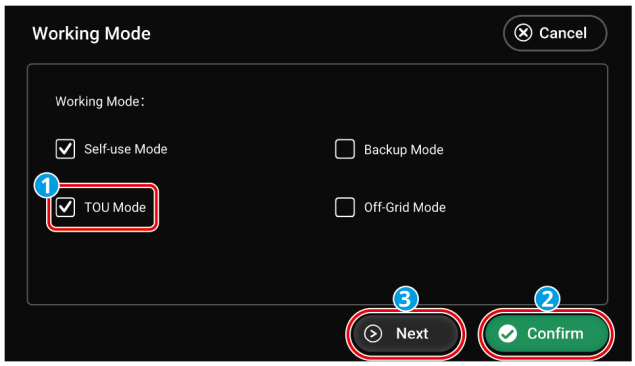
Parameter Name	Description
Maximum Charging Current	Battery charging defaults to constant charging mode; The maximum charging voltage and maximum Charging Current in this mode need to be set; set them according to the battery technical parameters.
Constant Charging Voltage	
Float Voltage	When the battery Charging Current is less than Maximum Current For Switch To Float Charge and the Duration reaches The Time Float Charging, the battery charging state switches from constant charging mode to float charging mode. Float Voltage is the maximum battery charging voltage in float charging mode; set it according to the battery technical parameters.
The Time Float Charging	
Maximum Current For Switch To Float Charge	
Battery Capacity	Set the battery capacity according to the parameters of the actually connected battery.
Internal Resistance	The internal resistance of the battery; set it according to the battery technical parameters.
Temperature Compensation	By default, after the temperature exceeds 25°C, for every 1°C increase, the upper limit of the charging voltage decreases by 3 mV. In practice, set it according to the battery technical parameters.
Lower Limit Of Discharge Voltage	Set it according to the battery technical parameters.
Maximum Discharging Current	Set it according to the battery technical parameters. The higher the discharge current, the shorter the battery operating time.

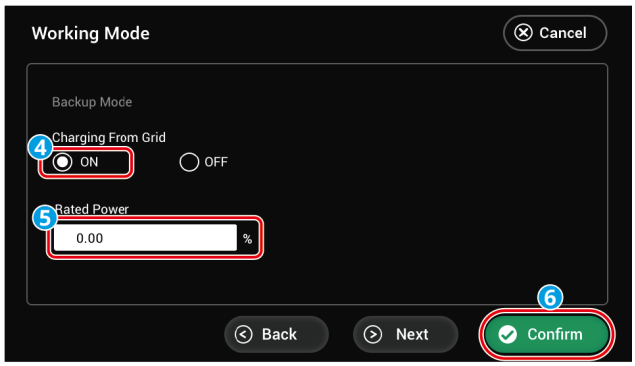
Set working mode

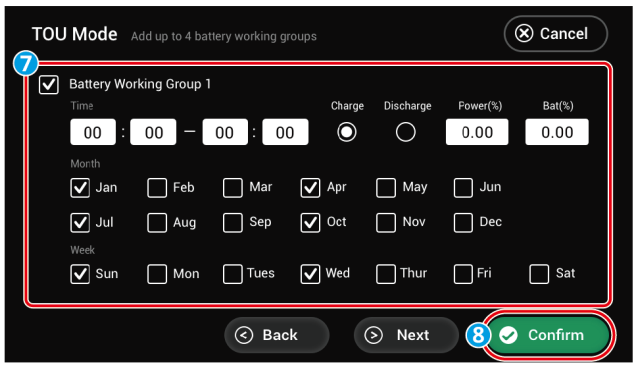
1. On the main screen, tap > Quick Settings > Working Mode to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.

NOTICE

Make sure to tap Confirm on each page to ensure that the parameters take effect; otherwise, the system will run with default parameters.







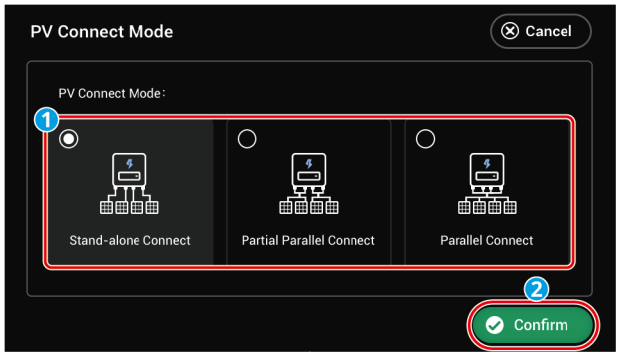
ETL10CON0008

Parameter Name		Description
Self-use Mode		When Working Mode Settings is set to Self-use Mode, Back-up Mode, TOU Mode, and Off-Grid Mode can be enabled simultaneously; select according to actual conditions. Working mode operation priority: Off-Grid Mode > Back-up Mode > TOU Mode > Self-use Mode.
Back-up Mode	Charging From Grid	Enable this function to allow the system to purchase electricity from the grid.
	Rated Power	The percentage of the power when purchasing electricity relative to the inverter Rated Power.
TOU Mode	Time	Within the start time and End Time, the battery charges or discharges according to the configured charge/discharge mode and Rated Power.

	Charge/Discharge	Set to charging or discharging according to actual requirements.
	Power (%)	The percentage of the charging or discharging power relative to the inverter Rated Power.
	Bat (%)	After the battery SOC reaches the set SOC, stop charging. To set the stop SOC for battery discharge, refer to9.2.2.2 Setting Battery Parameterssection, and set Depth of Discharge (On-Grid) and Depth of Discharge (Off-Grid) via the LCD screen.
Off-Grid Mode		In off-grid mode, the inverter disconnects from the grid, and the output supplies power only to the BACK-UP load, with surplus energy charging the battery.

Set PV Access Mode

1. On the main screen, tap > Quick Settings > PV Connect Mode to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.



ESU10CON0015

Parameter Name	Description
Stand-alone Connect	The PV strings are connected to the inverter-side MPPT ports in a one-to-one correspondence.

Partial Parallel Connect	When a single PV string is connected to multiple MPPT ports on the inverter side, other PV modules are simultaneously connected to other MPPT ports on the inverter side.
Parallel Connect	When an external PV string is connected to the inverter-side PV input ports, one PV string is connected to multiple PV input ports.

Set grid-connected power limit

1. On the main screen, tap > Quick Settings > Power Limit to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.



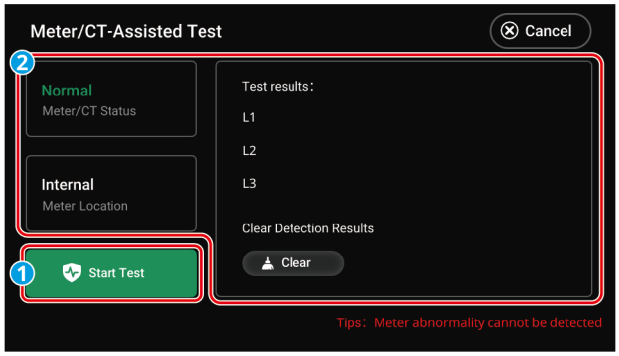
ESU10CON0016

Parameter Name	Description
Power Limit	Enable this function when Output Power Limit is required according to the grid standards of certain countries or regions.
Export Power	Set according to the actual Maximum Power that can be fed into the grid.

External CT Ratio	Set to the ratio of the primary-side current to the secondary-side current of the external CT. • Built-in meter: No need to set the CT ratio. The default CT ratio is 120A/40mA. • GM330: CTs can be sourced from GoodWe or purchased independently; CT ratio requirement: nA/5A ◦ nA: CT primary-side input current; the range of n is 200–5000. ◦ 5A: CT secondary-side output current.

Meter/CT Auxiliary Detection

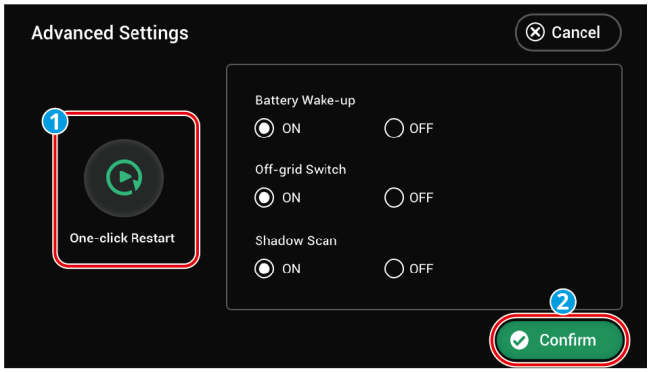
1. On the main screen, tap > Quick Settings > Meter/CT Assisted Test to enter the parameter settings screen.
2. Tap Start Test to start the detection. After detection is complete, determine the test result according to the on-screen prompt.



ESU10CON0026

7.1.3 Set Advanced Parameters

1. On the main screen, tap > Advanced Settings to enter the parameter settings screen. Enter the initial password: 1111.
2. Set the parameters according to the actual conditions.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.

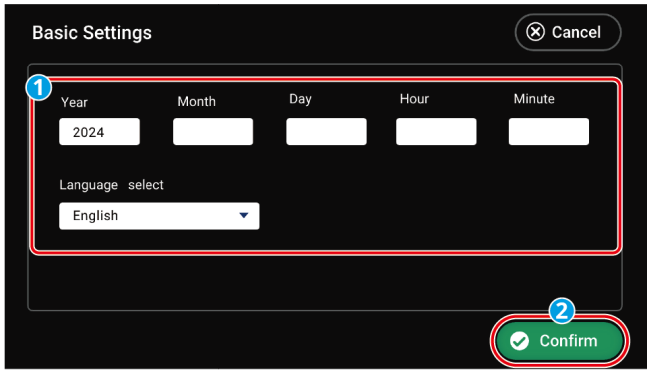


ESU10CON0020

Parameter Name	Description
One-click restart	Use this function to quickly restart the inverter.
Battery Wake-up	After enabling, the battery can be woken up when it shuts down due to undervoltage Protection. If there is a circuit breaker between the lithium battery and the inverter, ensure that the circuit breaker is closed. After enabling, the output voltage at the battery port is approximately 60 V.
Off-grid Switch	In off-grid mode, the off-grid control switch controls enabling and disabling of the inverter's off-grid function. In grid-tied mode, this function is not active. The switch is initially in the ON state, and the off-grid function is available. After the inverter is powered on, the inverter enables the off-grid output function. In off-grid state, by turning the off-grid switch off and then on again, the off-grid Overload time can be cleared and off-grid output can restart.
Shadow Scan	When PV modules are severely shaded, enabling the shadow scan function can optimize the inverter's power generation Efficiency.

7.1.4 Set General Data

1. On the main screen, tap > Basic Settings to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.



ESU10CON0027

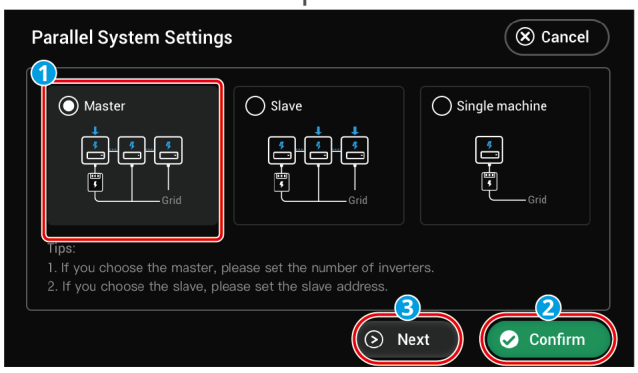
7.1.5 Parallel System Settings

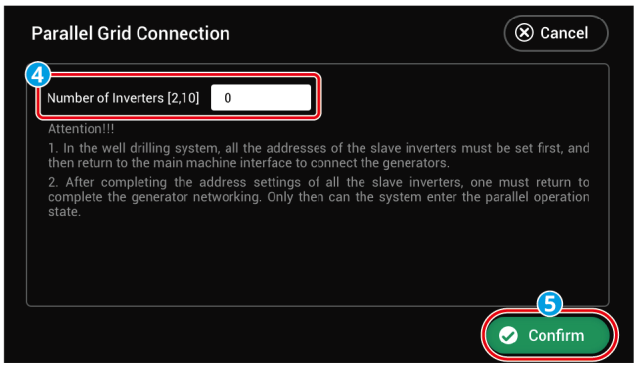
1. On the main screen, tap >Parallel System Settings to enter the parameter settings interface.
2. According to the actual wiring of the inverters, set them as master, slave, or single unit.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.

NOTICE

Make sure to tap Confirm on each page to ensure that the parameters take effect; otherwise, the system will run with default parameters.

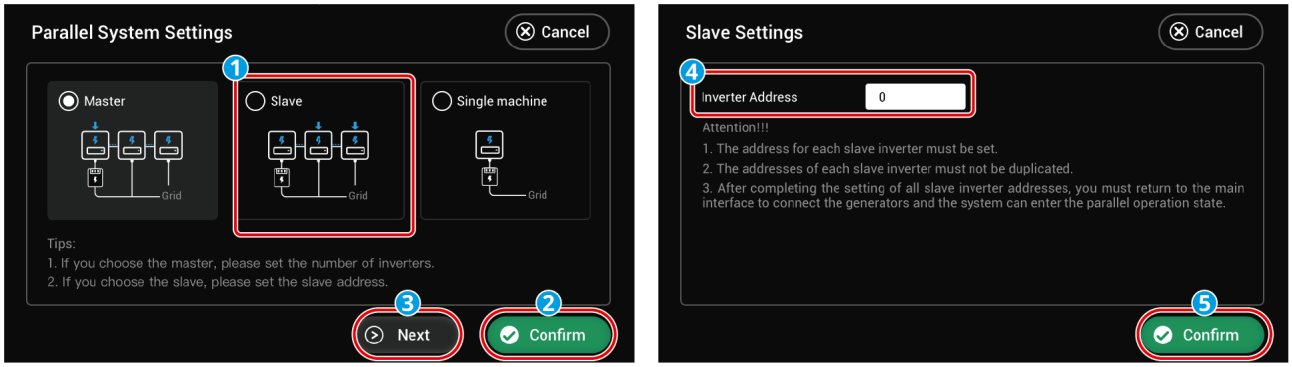
Set master inverter parameters





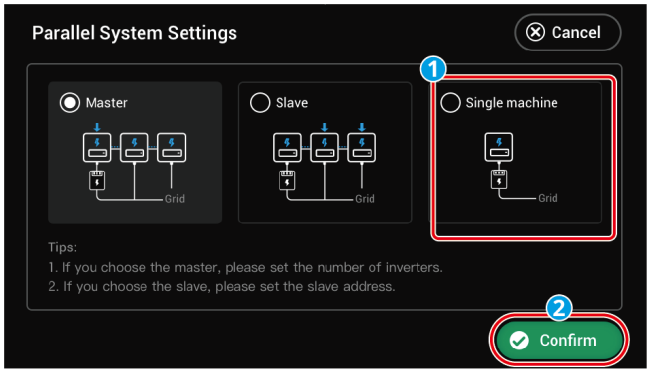
ESL10CON0006

Set slave inverter parameters



ESL10CON0007

Set standalone mode



ESL10CON0008

7.1.6 Set Port Connection

NOTICE

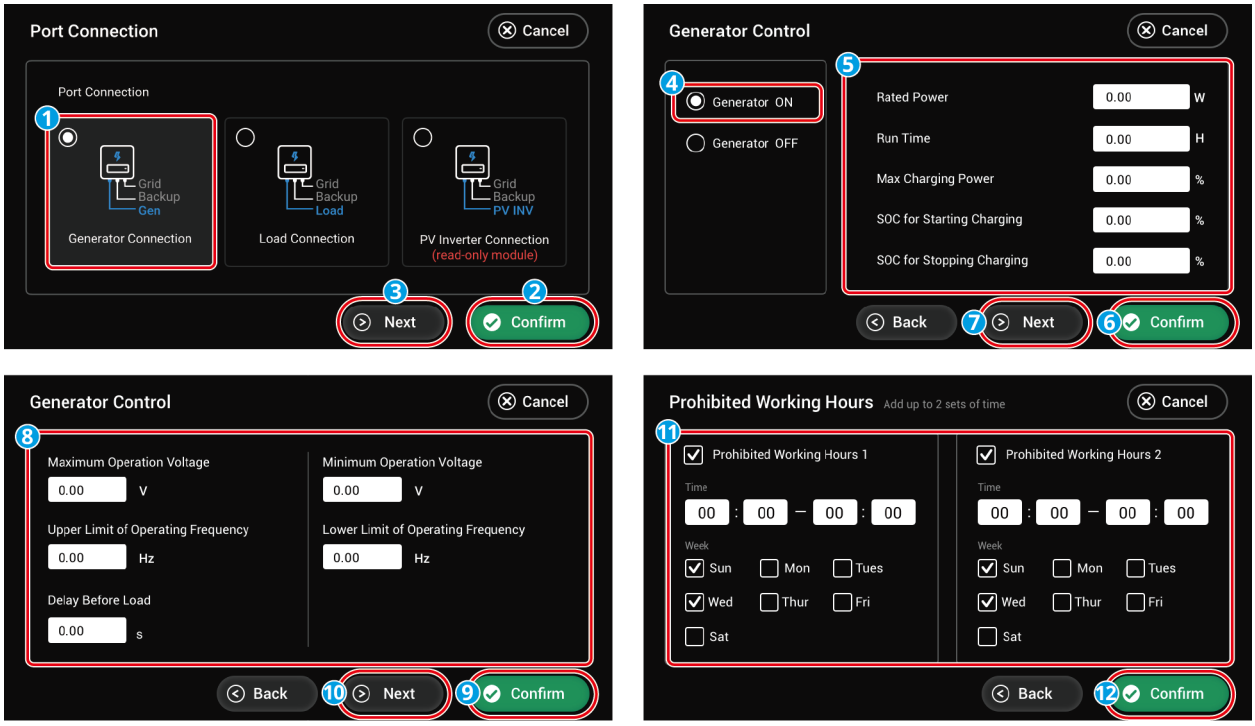
In microgrid mode, if you need to set relevant parameters of the grid-tied inverter, connect to the App to configure them.

Set Generator Port Connection

1. On the main screen, tap > Port Connection to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.

NOTICE

Make sure to tap Confirm on each page to ensure that the parameters take effect; otherwise, the system will run with default parameters.



ETL10CON0004

No.	Parameter Name	Description
1	Generator ON/OFF	Control the start and stop of the generator. Only applicable to generators that support dry contacts.
2	Rated Power	The Rated Power of the generator.
3	Run Time	The continuous running time of the generator. After exceeding the set running time, the generator will automatically shut down. This function is only effective for generators that support dry contact connections.
4	Max Charging Power	Set the Max. Charging Power for the generator to charge the battery.
5	SOC for Starting Charging	Set the start SOC for the generator to charge the battery. When the battery SOC is lower than the set value, the generator will charge the battery.
6	SOC for Stopping Charging	Set the SOC at which the generator stops charging the battery. When the battery SOC reaches the set value, the generator will stop charging the battery.
7	Maximum Operation Voltage	Set the upper limit of the generator operating voltage.

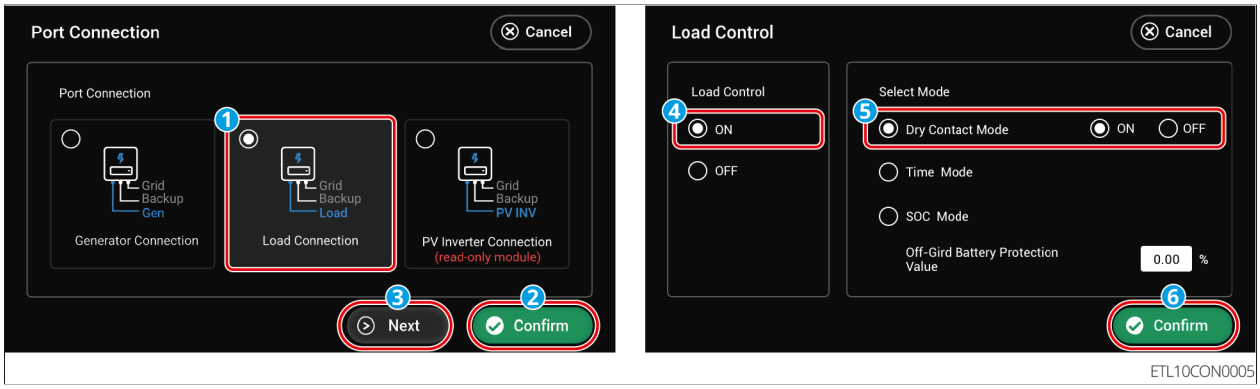
8	Minimum Operation Voltage	Set the lower limit of the generator operating voltage.
9	Upper Limit Of Operating Frequency	Set the upper operating frequency limit of the generator.
10	Lower Limit Of Operating Frequency	Set the lower operating frequency limit of the generator.
11	Delay Before Load	No-load warm-up time before the generator is loaded.
12	Prohibited Working Hours	Set the generator prohibited operation time according to actual conditions.

Set port-connected load control

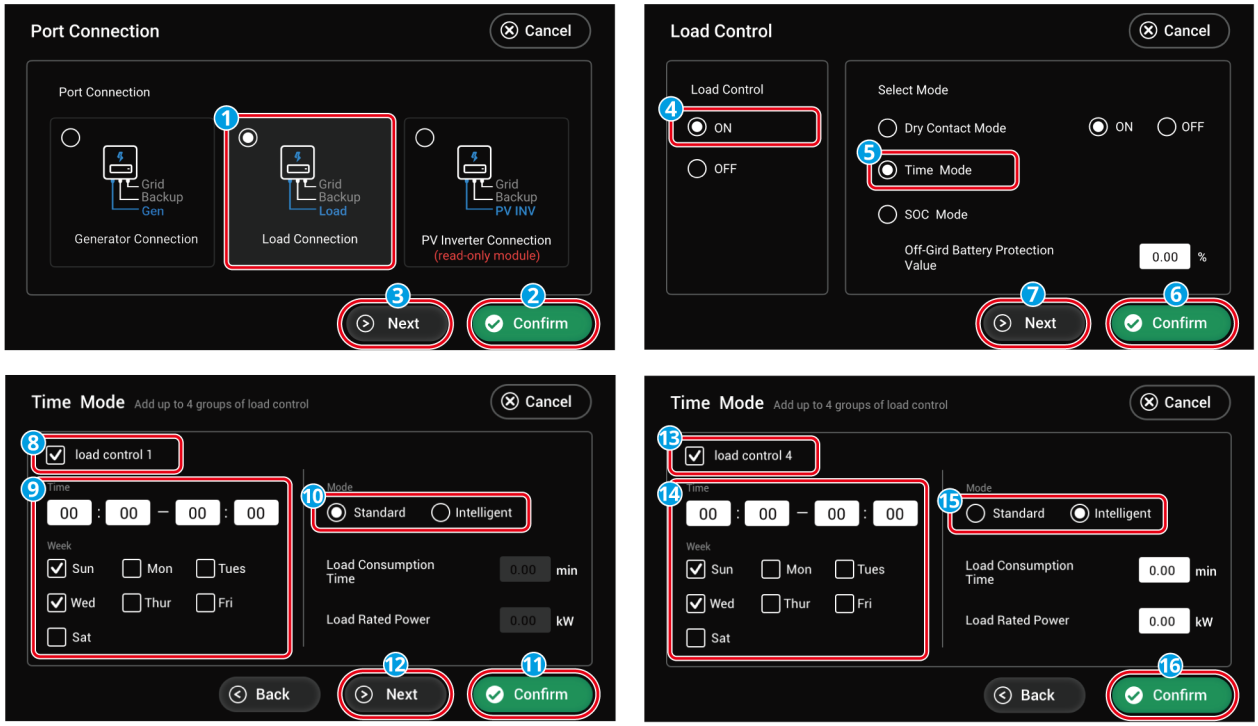
1. On the main screen, tap > Port Connection to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.

NOTICE
Make sure to tap Confirm on each page to ensure that the parameters take effect; otherwise, the system will run with default parameters.

Dry Contact Mode

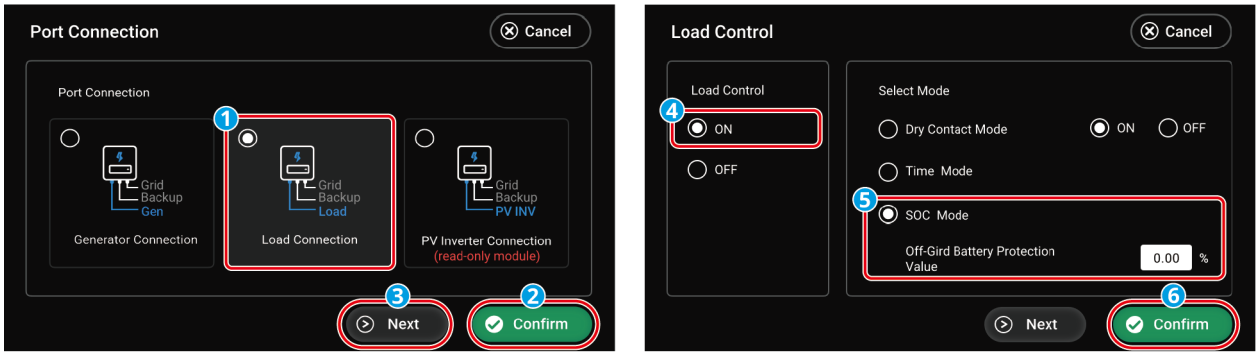


Time Mode



ETL10CON0007

SOC Mode



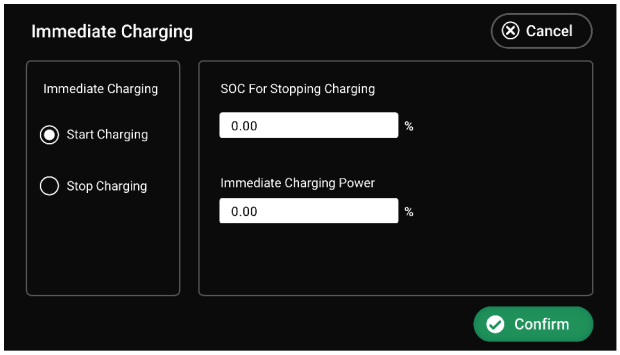
ETL10CON0006

No.	Parameter Name	Description
1	Load Control ON/OFF	Set the load control function to on/off
2	Dry Contact Mode	ON: When the switch status is set to ON, start supplying power to the load OFF: When the switch status is set to OFF, stop supplying power to the load
3	Time Mode	Within the set time period, the load will automatically be powered on or off. Standard Mode or Smart Mode can be selected.
4	Load Control 1	Set the load control time for Group 1; up to 4 groups can be set.

5	Mode: Standard/Intelligent	Standard Mode: Power will be supplied to the load within the set time period. Smart Mode: Within the set time period, when the surplus energy generated by PV exceeds the preset Rated Power of the load, start supplying power to the load.
6	Load Consumption Time	Minimum operating time after the load is turned on to prevent frequent switching due to energy fluctuations. Only applicable to Smart Mode.
7	Load Rated Power	When the surplus energy generated by PV exceeds this load's Rated Power, start supplying power to the load. Only applicable to Smart Mode.
8	SOC Mode	The inverter has a built-in relay dry contact control port, through which whether to supply power to the load can be controlled.
9	Off-Grid Battery Protection Value	In off-grid mode, if an Overload at the BACK-UP terminal is detected or the battery SOC is lower than the off-grid battery Protection setting, power supply to loads connected to the relay port can be stopped. Set the off-grid battery Protection value according to actual needs.

7.1.7 Set Immediate Charging

1. On the main screen, tap > Immediate Charging to enter the parameter settings screen.
2. Set the parameters according to the actual conditions.
3. After setting is complete, tap Confirm. When the screen displays Confirm OK, the parameters are set successfully.



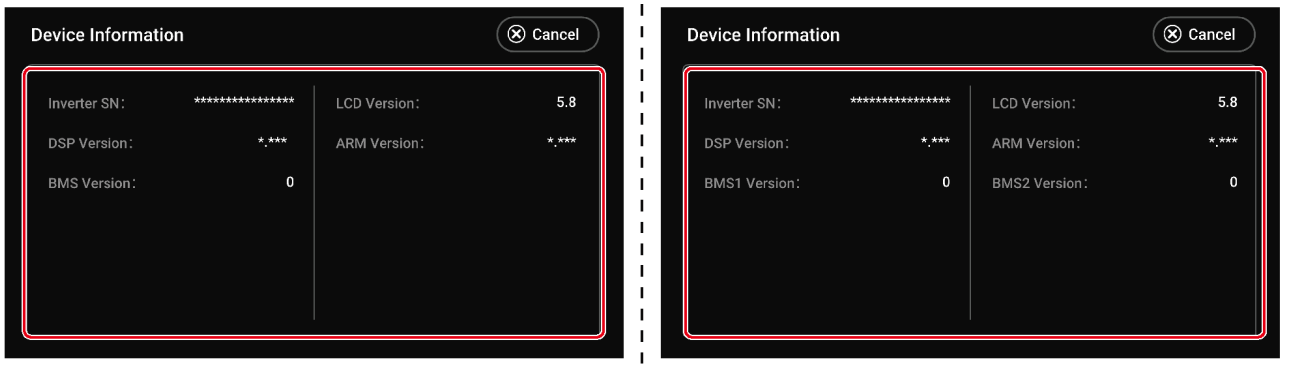
ETL10CON0012

Parameter Name	Description
Immediate Charging	After enabling, the utility grid immediately charges the battery. This takes effect only once. Select Enable or Stop as required.
SOC For Stopping Charging	When Immediate Charging is enabled, battery charging will stop when the battery SOC reaches the charge cutoff SOC.
Immediate Charging Power	When Immediate Charging is enabled, the charging power as a percentage of the inverter's Rated Power. For example, for an inverter with a Rated Power of 10 kW, when it is set to 60, the charging power is 6 kW.

7.1.8 View Device Information

1. On the main screen, tap > Device Information to enter the parameter query screen.

NOTICE
You can query the inverter serial number, DSP version, BMS version, LCD version, and ARM version.



ETL10CON0011

7.2 Configure via LCD (Type 2)

7.2.1 LCD Introduction

NOTICE

- The interface shown in this manual may be updated from time to time. Please refer to the actual interface.
- The displayed parameters and functions may vary depending on the device model, device type, and the Safety Regulation standards of the country.
- The functions and parameters that can be set on the screen are limited. For more settings, please use the SEMS+ App.

Through the LCD screen, users can:

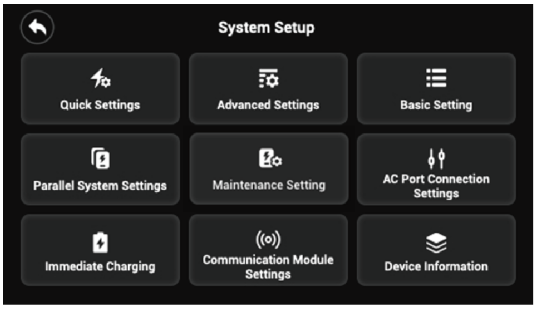
1. View the device's operating data, software version, alarm information, etc.
2. Set parameters, safety region, Power Limit, etc.

LCD Interface Introduction

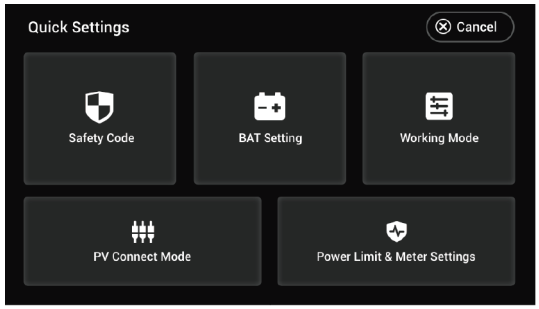
The LCD supports both touch and button operations.



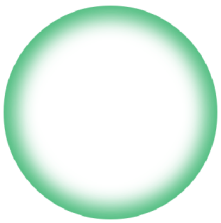
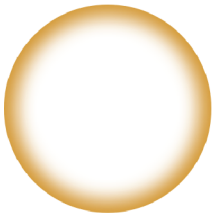
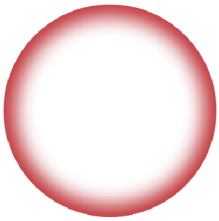
SYSCON0002



SYSCON0032



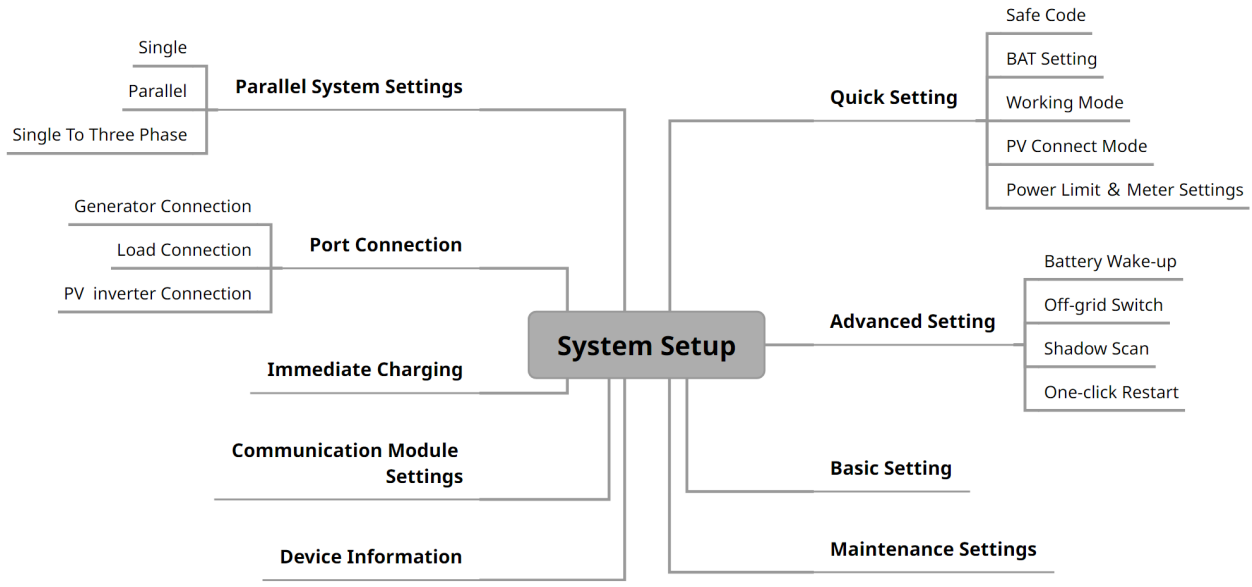
SYSCON0026

Inverter Operating Status Description		
		
The inverter is operating normally	The inverter is in standby	Fault alarm

Name/Icon	Description
	Up
	Down
	Confirm
	• Short press: exit the page •  and  press and hold simultaneously for 5 s: restart the device
	Used to view PV current, voltage, Energy Generation, and other information
	Used to view battery model, status, and other information
 	Used to view inverter alarm and fault information
	Press and hold for 3s to enter the inverter settings screen
	Used to view grid-side parameter information
	
	

Name/Icon	Description
	
	
	Return to the main interface
Cancel	Return to the previous menu
Next	Go to the next settings page
Back	Return to the previous settings page

LCD Settings Interface Structure

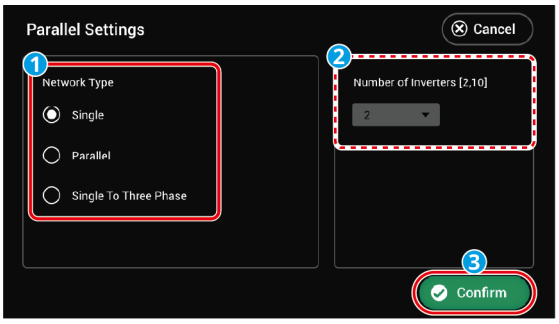


7.2.2 Parallel System Settings

NOTICE

- Make sure to click Confirm on each page. When the interface prompts Are you sure to confirm?, select YES to ensure the parameters take effect. Otherwise, the system will run with the default parameters.
- The parallel and single-phase-to-three-phase settings must be configured before other parameter settings; otherwise, the system cannot operate normally.

1. On the main interface, press and hold for 3 s >Parallel Settings to enter the parameter settings screen.
2. Configure according to the actual wiring of the inverter.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.



SYSCON0016

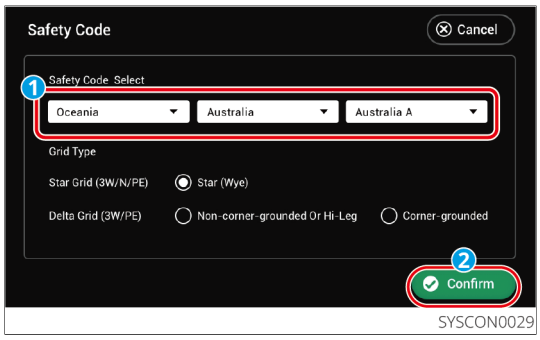
Parameter Name	Description
Single	Standalone scenario
Parallel	Parallel scenario • Set the parallel mode and number of parallel units via the master inverter LCD screen. Related parameters set through the master inverter will be automatically synchronized and delivered to the slave inverters. • When batteries are connected to the inverters in non-busbar mode, if the battery models connected to each inverter are different, the battery model can be set separately via the App.
Single To Three Phase	Single-phase-to-three-phase scenario (supported only by some single-phase models) • When single-phase inverters form a three-phase system, configure via the LCD screen of any inverter. The inverter configured for single-phase-to-three-phase is the master inverter.

7.2.3 Quick Settings

NOTICE
Make sure to click Confirm on each page. When the interface prompts Are you sure to confirm?, select YES to ensure the parameters take effect. Otherwise, the system will run with the default parameters.

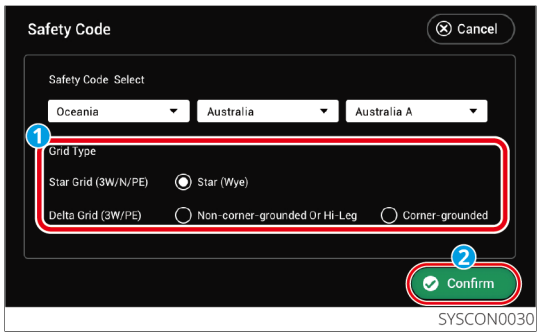
Safety Regulation Settings

1. On the main screen, tap ⚙ > Quick Settings > Safe Code to enter the parameter settings screen.
2. Select the corresponding safety code according to the country or region where the device is located.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.



Select Type of Electrical Supply System

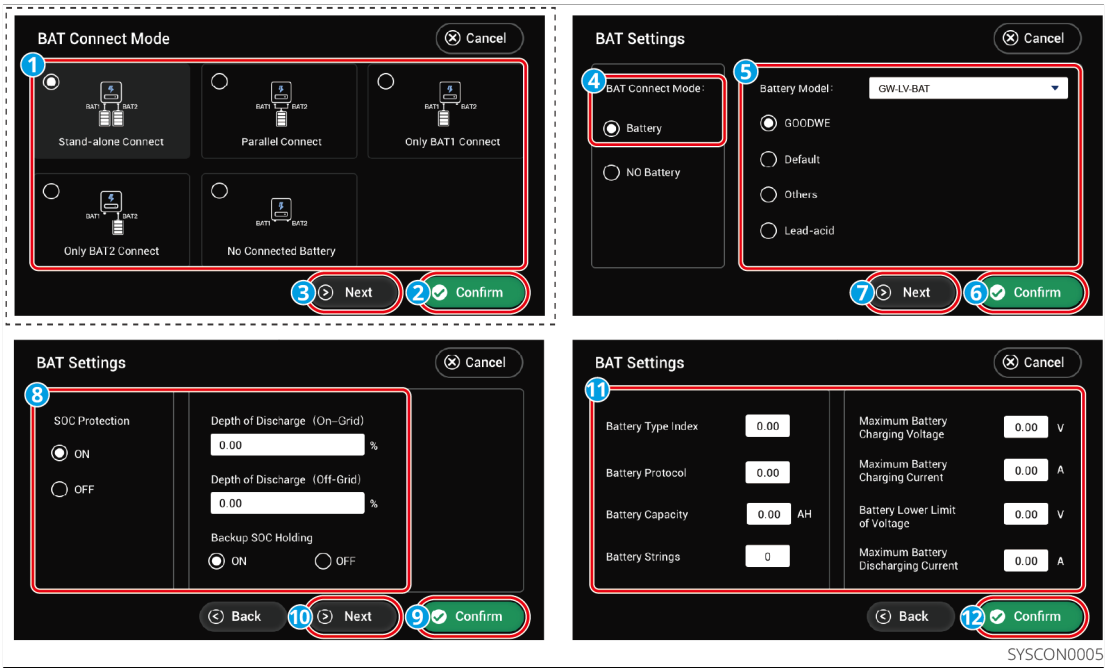
1. On the main screen, tap ⚙ > Quick Settings > Safe Code to enter the parameter settings screen.
2. Select the corresponding Type of Electrical Supply System according to your country or region.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.



Type of Electrical Supply System	Specific Category	Description
Star Grid (3W/N/PE)	Star (Wye)	Star grid (three-phase five-wire system)
Delta Grid (3W/PE)	Non-corner-grounded Or Hi-Leg	Delta grid (three-phase three-wire + PE) • Non-corner-grounded grid or high-leg delta grid • Corner-grounded delta grid
	Corner-grounded	

Battery Parameter Settings

1. On the main screen, tap > Quick Settings > BAT Settings to enter the parameter settings screen.
2. Set the parameters according to the actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.



Battery Connection Mode Parameter Settings

Battery Connection Mode	Description
Stand-alone Connect	For an inverter with dual battery ports, each battery port is connected to a different battery. In this mode, parameters must be set separately for the battery connected to each port.
Parallel Connect	For an inverter with dual battery ports, both battery ports of the inverter are connected to the same battery bank.
Only BAT1 Connect	For an inverter with dual battery ports, only the BAT1 port is connected.
Only BAT2 Connect	For an inverter with dual battery ports, only the BAT2 port is connected.
No Connected Battery	No battery is connected in the system.

BAT Connection Mode	Battery Type	Description
BAT Model	GOODWE	If a GoodWe brand lithium battery is connected in the system, select GOODWE and choose according to the actual situation: • GW-LV-BAT: Low-voltage lithium battery • GW-HV-BAT: High-voltage lithium battery
	Default	If the third-party lithium battery model connected to the system is not in this list, select according to the actual conditions: • Default (Lithium 50Ah) • Default (Lithium 100Ah)
	Others	If the third-party lithium battery model connected to the system is included in this list, select the correct model according to the actual configuration.
	Lead acid	If a lead-acid battery is connected to the system, select Lead acid and select the correct lead-acid type. Currently, GEL, AGM, and Flooded are supported.

Battery Parameter Settings

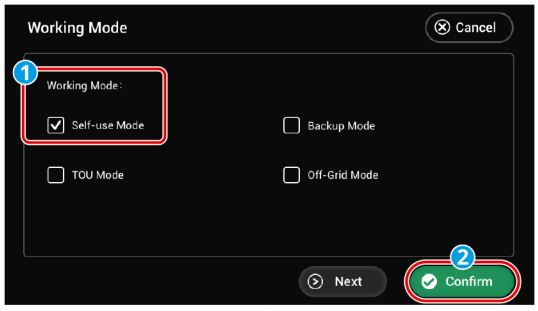
Parameter Name	Description
SOC Protection	After enabling, when the battery capacity is lower than the set depth of discharge, the battery Protection function can be activated.
On-Grid SOC Lower Limit	Maximum allowable battery discharge value when the inverter is operating grid-tied.
Off-Grid SOC Lower Limit	Maximum allowable battery discharge value when the inverter is operating off-grid.
Backup Capacity Retention	To ensure that the battery SOC is sufficient to maintain normal system operation when off-grid, when the system operates grid-connected, the battery is charged via the grid or PV to the configured SOC Protection value.

Parameter Name	Description
Battery Type Index	Set it according to the battery technical parameters.
Battery Protocol	Set it according to the battery technical parameters.
Maximum Battery Charging Voltage	Battery charging defaults to constant charging mode; The maximum charging voltage and maximum Charging Current in this mode need to be set; set them according to the battery technical parameters.
Maximum Battery Charging Current	
Battery Capacity	Set the battery capacity according to the parameters of the actually connected battery.
Battery Lower Limit Of Voltage	Set it according to the battery technical parameters.
Battery Strings	Set according to the actual number of battery strings.
Maximum Battery Discharging Current	Set it according to the battery technical parameters. The higher the discharge current, the shorter the battery operating time.

Set working mode

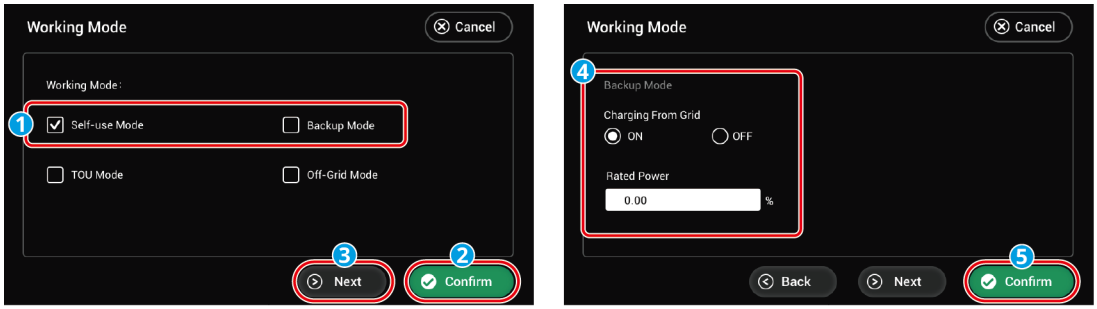
1. On the main screen, tap > Quick Settings > Working Mode to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.

Self-consumption



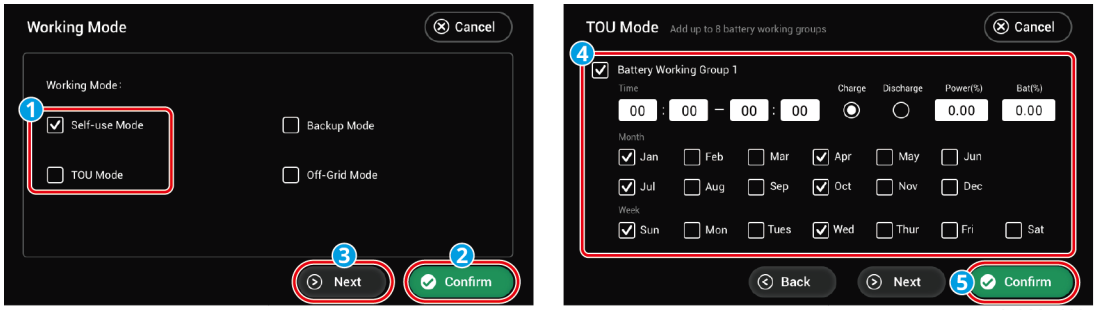
SYSCON0006

Backup Mode



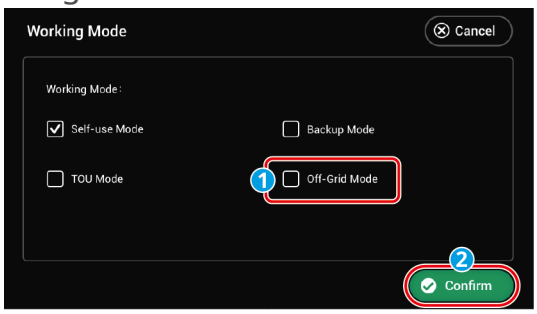
SYSCON0008

TOU Mode



SYSCON0007

Off-grid Mode



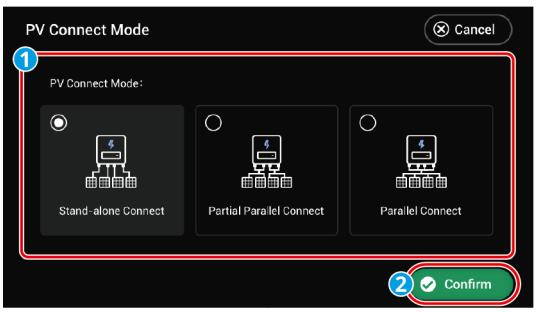
SYSCON0009

Parameter Name		Description
Self-use Mode		When Working Mode Settings is set to Self-use Mode, Back-up Mode, TOU Mode, and Off-Grid Mode can be enabled simultaneously; select according to actual conditions. Working mode operation priority: Off-Grid Mode > Back-up Mode > TOU Mode > Self-use Mode.
Back-up Mode	Charging From Grid	Enable this function to allow the system to purchase electricity from the grid.
	Rated Power	The percentage of the power when purchasing electricity relative to the inverter Rated Power.

Parameter Name		Description
TOU Mode	Time	Within the start time and End Time, the battery charges or discharges according to the configured charge/discharge mode and Rated Power.
	Charge/Discharge	Set to charging or discharging according to actual requirements.
	Power (%)	The percentage of the charging or discharging power relative to the inverter Rated Power.
	Bat (%)	After the battery SOC reaches the set SOC, stop charging. To set the stop SOC for battery discharge, refer to**Battery Parameter Settings**chapter, and set On-Grid SOC Lower Limit and Off-Grid SOC Lower Limit via the LCD screen.
Off-Grid Mode		In off-grid mode, the inverter disconnects from the grid, and the output supplies power only to the BACK-UP load, with surplus energy charging the battery.

Set PV Access Mode

1. On the main screen, tap > Quick Settings > PV Connect Mode to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.

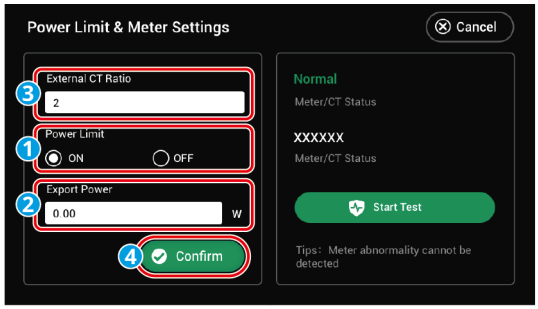


SYSCON0010

Parameter Name	Description
Stand-alone Connect	The PV strings are connected to the inverter-side MPPT ports in a one-to-one correspondence.
Partial Parallel Connect	When a single PV string is connected to multiple MPPT ports on the inverter side, other PV modules are simultaneously connected to other MPPT ports on the inverter side.
Parallel Connect	When an external PV string is connected to the inverter-side PV input ports, one PV string is connected to multiple PV input ports.

Set grid-connected power limit

1. On the main screen, tap ⚙ > Quick Settings > Power Limit & Meter Settings to enter the parameter settings screen.
2. Set the parameters according to the actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.



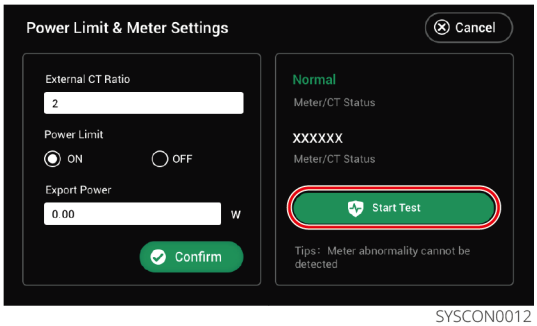
SYSCON0011

Parameter Name	Description
Power Limit	Enable this function when Output Power Limit is required according to the grid standards of certain countries or regions.
Export Power	Set according to the actual Maximum Power that can be fed into the grid.

Parameter Name	Description
External CT Ratio	Set to the ratio of the primary-side current to the secondary-side current of the external CT. • Built-in meter: CT ratio setting is not required. The default CT ratio is 120 A: 40 mA. • GM330: CTs can be sourced from GoodWe or purchased independently; CT ratio requirement: nA/5A ◦ nA: CT primary-side input current; the range of n is 200–5000. ◦ 5A: CT secondary-side output current.

Meter Settings

1. On the main screen, tap > Quick Settings > Power Limit & Meter Settings to enter the parameter settings screen.
2. Tap Start Test to start the detection. After detection is complete, determine the test result according to the on-screen prompt.



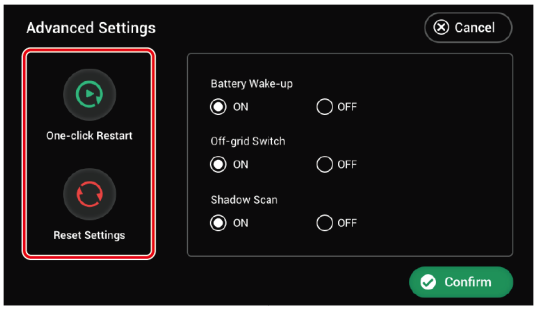
SYSCON0012

7.2.4 Set Advanced Parameters

NOTICE
Make sure to click Confirm on each page. When the interface prompts Are you sure to confirm?, select YES to ensure the parameters take effect. Otherwise, the system will run with the default parameters.

One-click restartand**Parameter Reset**

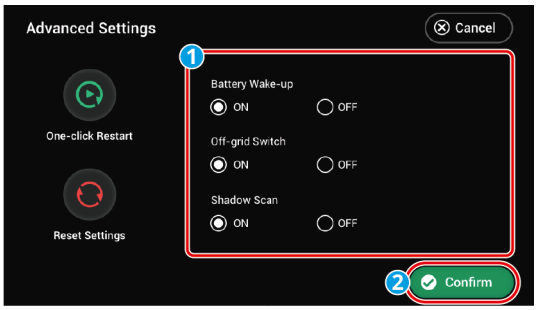
1. On the main interface, press and hold for 3 s > Advanced Settings to enter the parameter settings screen. Enter the initial password: 1111.
2. Set the parameters according to the actual conditions.
3. After the settings are complete, wait a moment as prompted on the page until the settings are successfully applied.



SYSCON0013

Battery Wake-up、Off-grid Switch、Shadow Scan

1. On the main interface, press and hold for 3 s > Advanced Settings to enter the parameter settings screen. Enter the initial password: 1111.
2. Set the parameters according to the actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.



SYSCON0014

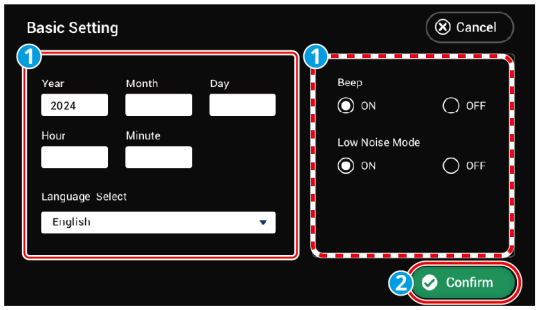
Parameter Name	Description
One-click restart	Use this function to quickly restart the inverter.
Reset Settings	Use this function to restore the inverter to factory settings.

Parameter Name	Description
Battery Wake-up	After enabling, the battery can be woken up when it shuts down due to undervoltage Protection. Some models do not support configuring the battery wake-up function; refer to the actual model. If there is a circuit breaker between the lithium battery and the inverter, ensure that the circuit breaker is closed. After enabling, the output voltage at the battery port is approximately 60 V.
Off-grid Switch	In off-grid mode, the off-grid control switch controls enabling and disabling of the inverter's off-grid function. In grid-tied mode, this function is not active. The switch is initially in the ON state, and the off-grid function is available. After the inverter is powered on, the inverter enables the off-grid output function. In off-grid state, by turning the off-grid switch off and then on again, the off-grid Overload time can be cleared and off-grid output can restart.
Shadow Scan	When PV modules are severely shaded, enabling the shadow scan function can optimize the inverter's power generation Efficiency.

7.2.5 Set General Data

NOTICE
Make sure to click Confirm on each page. When the interface prompts Are you sure to confirm?, select YES to ensure the parameters take effect. Otherwise, the system will run with the default parameters.

1. On the main interface, press and hold for 3 s > Basic Settings to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.



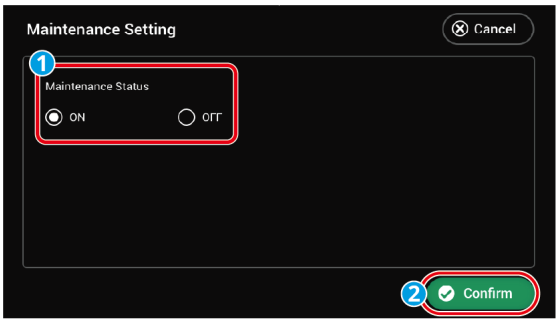
SYSCON0015

Parameter Name	Description
Year/Month/Day/Hour /Minute	Set the system time.
Language Select	Set the screen language.
Beep	(Australia only) Select whether to enable the buzzer alarm function according to actual conditions. • ON: When enabled, if a serious fault occurs in the inverter, the buzzer will sound and the screen will display a red fault indicator. • OFF: When disabled, if a serious fault occurs in the inverter, the buzzer will not sound and the screen will not indicate a fault.

Parameter Name	Description
Low Noise Mode	• Enabling silent mode can reduce device noise. Select whether to enable Low Noise Emission mode according to actual conditions. Some device screens do not support setting Low Noise Emission mode; please enable it through the App. • Before enabling silent mode, confirm that the device has been connected to a stable and reliable power grid; otherwise, it will not take effect. • After enabling silent mode, if the load power consumption in the system is too high and the Energy Generation cannot meet the demand, the system may automatically purchase electricity from the power grid to ensure load operation. • During silent mode operation, some PV Energy Generation may be lost.

7.2.6 Maintenance Status Settings

1. On the main interface, press and hold for 3 s > Maintenance Settings to enter the parameter settings interface.
2. Please set according to actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.



SYSCON0017

Parameter Name		Description
Maintenance Setting	Maintenance Status	Maintenance Status Settings: when performing maintenance operations on the device, the AC output of the device can be disconnected to place the device in standby mode
	ON	Inverter powered off; disconnect the inverter's AC output and prohibit PV from charging the battery
	OFF	Inverter started and system running; the inverter is allowed to perform AC port output, PV input, and battery input/output

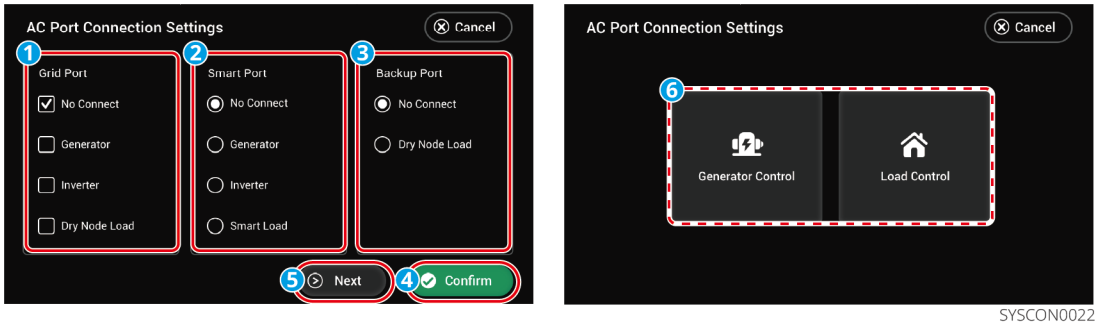
7.2.7 Set Port Connection

NOTICE

- Make sure to click Confirm on each page. When the interface prompts Are you sure to confirm?, select YES to ensure the parameters take effect. Otherwise, the system will run with the default parameters.
- In microgrid mode, if relevant parameters of the grid-tied inverter need to be set, connect to the APP for configuration.

AC Port Settings main page

1. On the main interface, press and hold for 3 s > AC Port Connection Settings to enter the parameter setting screen.
2. Check the devices connected to the port according to actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.

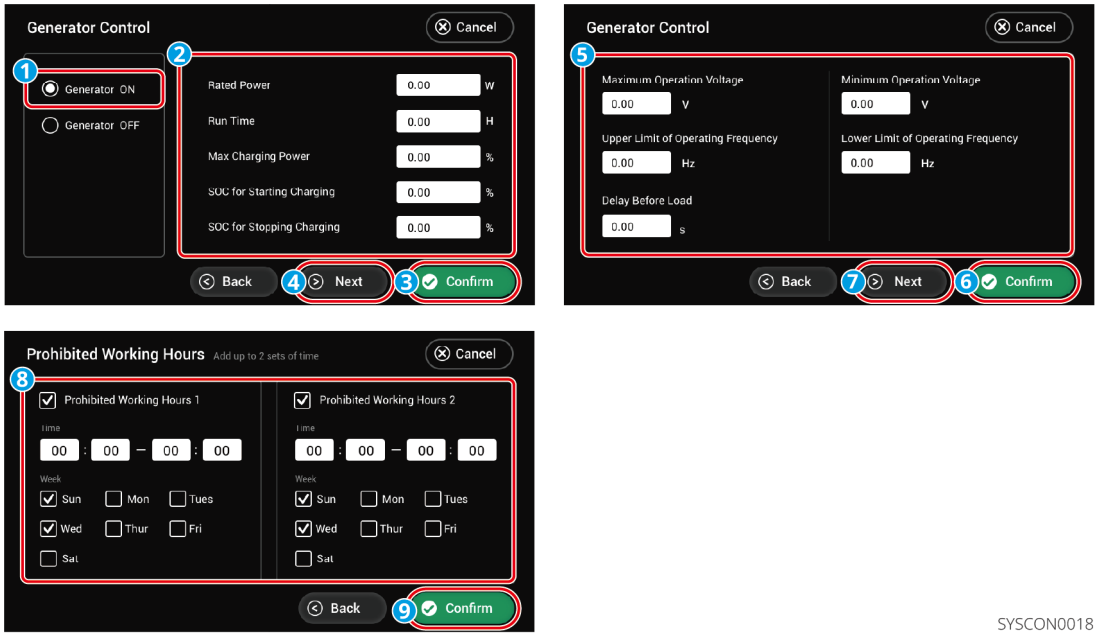


SYSCON0022

Parameter Name		Description
Grid Port	No Connect	No connection on the grid side. Only single selection is supported.
	Generator	Generator connected on the grid side. Only single selection is supported.
	Inverter	Grid-tied inverter connected on the grid side. The grid-side grid-tied inverter and dry contact load can be selected simultaneously.
	Dry Node Load	Dry contact load connected on the grid side. The grid-side grid-tied inverter and dry contact load can be selected simultaneously.
Smart Port	No Connect	No connection on the Smart Port. Only single selection is supported.
	Generator	Generator connected to the Smart Port. Only single selection is supported.
	Inverter	Grid-tied inverter connected to the Smart Port. Only single selection is supported.
	Smart Load	The smart port connects to a smart load. Single selection only.
Backup Port	No Connect	No connection on the Backup port. Single selection only.
	Dry Node Load	The Backup port connects to a dry contact load. Single selection only.

Set Generator Port Connection

1. On the main interface, press and hold for 3 s > AC Port Connection Settings to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.



SYSCON0018

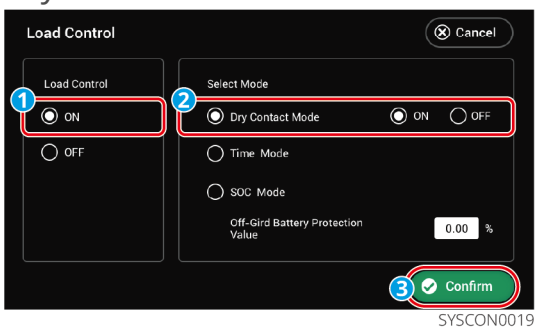
Parameter Name	Description
Generator ON/OFF	Control the start and stop of the generator. Only applicable to generators that support dry contacts.
Rated Power	The Rated Power of the generator.
Run Time	The continuous running time of the generator. After exceeding the set running time, the generator will automatically shut down. This function is only effective for generators that support dry contact connections.
Max Charging Power	Set the Max. Charging Power for the generator to charge the battery.
SOC for Starting Charging	Set the start SOC for the generator to charge the battery. When the battery SOC is lower than the set value, the generator will charge the battery.
SOC for Stopping Charging	Set the SOC at which the generator stops charging the battery. When the battery SOC reaches the set value, the generator will stop charging the battery.
Maximum Operation Voltage	Set the upper limit of the generator operating voltage.
Minimum Operation Voltage	Set the lower limit of the generator operating voltage.

Parameter Name	Description
Upper Limit Of Operating Frequency	Set the upper operating frequency limit of the generator.
Lower Limit Of Operating Frequency	Set the lower operating frequency limit of the generator.
Delay Before Load	No-load warm-up time before the generator is loaded.
Prohibited Working Hours	Set the generator prohibited operation time according to actual conditions.

Set port-connected load control

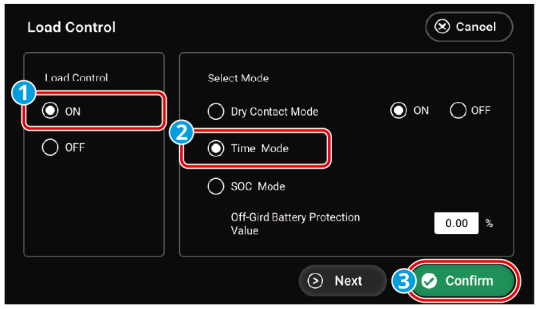
1. On the main interface, press and hold for 3 s > AC Port Connection Settings to enter the parameter setting screen.
2. Set the parameters according to the actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.

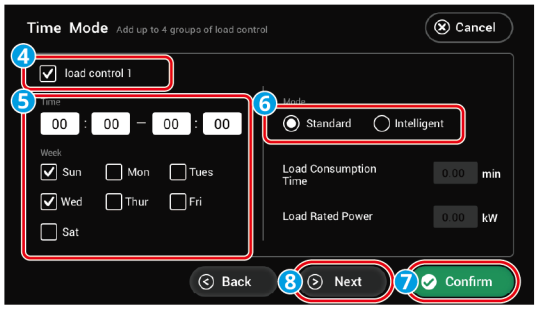
Dry Contact Mode

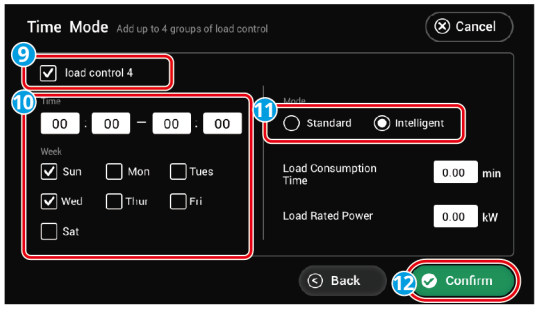


SYSCON0019

Time Mode

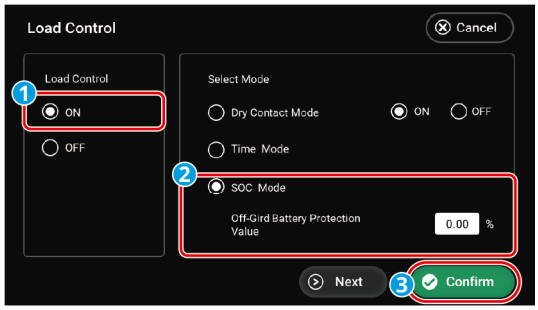






SYSCON0021

SOC Mode



SYSCON0020

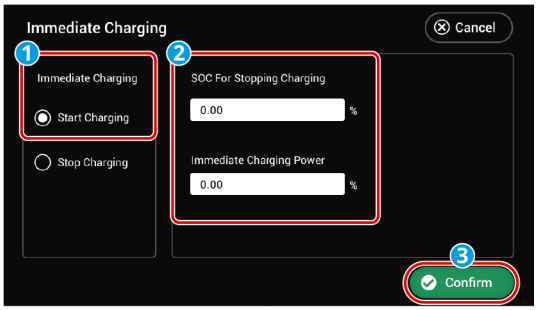
Parameter Name	Description
Load Control ON/OFF	Set the load control function to on/off
Dry Contact Mode	ON: When the switch status is set to ON, start supplying power to the load OFF: When the switch status is set to OFF, stop supplying power to the load
Time Mode	Within the set time period, the load will automatically be powered on or off. Standard Mode or Smart Mode can be selected.
Load Control	Set the load control time. Up to 4 groups can be configured.

Parameter Name	Description
Mode: Standard/Intelligent	Standard Mode: Power will be supplied to the load within the set time period. Smart Mode: Within the set time period, when the surplus energy generated by PV exceeds the preset Rated Power of the load, start supplying power to the load.
Load Consumption Time	Minimum operating time after the load is turned on to prevent frequent switching due to energy fluctuations. Only applicable to Smart Mode.
Load Rated Power	When the surplus energy generated by PV exceeds this load's Rated Power, start supplying power to the load. Only applicable to Smart Mode.
SOC Mode	The inverter has a built-in relay dry contact control port, through which whether to supply power to the load can be controlled.
Off-Grid Battery Protection Value	In off-grid mode, if an Overload at the BACK-UP terminal is detected or the battery SOC is lower than the off-grid battery Protection setting, power supply to loads connected to the relay port can be stopped. Set the off-grid battery Protection value according to actual needs.

7.2.8 Set Immediate Charging

NOTICE
Make sure to click Confirm on each page. When the interface prompts Are you sure to confirm?, select YES to ensure the parameters take effect. Otherwise, the system will run with the default parameters.

1. On the main interface, press and hold for 3 s > Immediate Charging to enter the parameter settings screen.
2. Set the parameters according to the actual conditions.
3. After completing the settings, click Confirm > YES. The parameter settings are then successful.



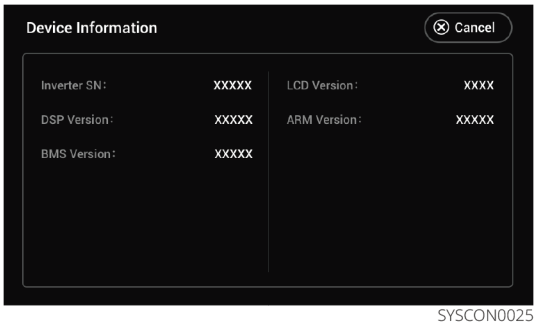
SYSCON0023

Parameter Name	Description
Immediate Charging	After enabling, the utility grid immediately charges the battery. This takes effect only once. Select Enable or Stop as required.
SOC For Stopping Charging	When Immediate Charging is enabled, battery charging will stop when the battery SOC reaches the charge cutoff SOC.
Immediate Charging Power	When Immediate Charging is enabled, the charging power as a percentage of the inverter's Rated Power. For example, for an inverter with a Rated Power of 10 kW, when it is set to 60, the charging power is 6 kW.

7.2.9 View Device Information

NOTICE
You can query the inverter serial number, DSP version, BMS version, LCD version, and ARM version.

1. On the main interface, press and hold for 3 s > Device Information to enter the parameter query screen.

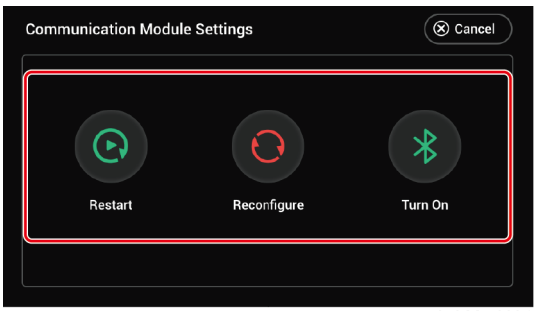


SYSCON0025

7.2.10 Set Communication Module

NOTICE

- Make sure to click Confirm on each page. When the interface prompts Are you sure to confirm?, select YES to ensure the parameters take effect. Otherwise, the system will run with the default parameters.
- The communication module parameter setting page is only for inverters with a built-in wireless module. For external modules, perform the relevant settings through the module.



SYSCON0024

Parameter Name	Description
Restart	Restart the wireless signal.
Reconfigure	Restore communication factory settings. To continue using the device, reconfigure the WiFi connection information.
Turn On	Enable the Bluetooth signal. The Bluetooth signal is enabled by default at the factory. After connecting to the APP, follow the prompts to choose whether to keep it on. If you select No, you will need to enable the Bluetooth signal again the next time you connect.

8 System Commissioning and Plant Monitoring

8.1 Set Inverter Parameters via the App

SEMS+ App is software for remote PV plant monitoring or local device commissioning and testing. It supports installers or owners in:

- Remotely monitoring PV plant operation status and setting operating parameters for the plant and devices.
- Connecting to devices locally, viewing device operating status, and setting device parameters.

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

SEMS+ App User Manual

8.1.1 Download and Install SEMS+ App

Phone requirements

- Phone operating system requirements: Android 7.0 and above, iOS 15.1 and above.
- Phone supports a web browser and can connect to the Internet.
- Phone supports WLAN/Bluetooth functions.

Download Method
Method 1:
Search for SEMS+ in Google Play, App Store, Huawei, HONOR, Xiaomi, OPPO, and vivo

app stores to download and install it.



SEMS0163

Method 2:

Scan the following QR code to download and install.



SEMS0164

Add home screen widget

- When the App version is V2.5.2 or later, the SEMS+ App can be added to the home screen of your phone.
- The steps for adding a home screen widget differ by operating system. Please follow the actual steps.
- After the home screen widget is added, you can quickly view the PV plant operating status without opening the App.

8.2 Perform Plant Monitoring via SEMS+ WEB

SEMS+ WEB is a monitoring platform that can communicate via Wi-Fi or LAN. The following are common functions of SEMS+ WEB:

1. Manage organization or user information, etc.
2. Add and monitor plant information, etc.
3. Maintain devices.

For detailed functions, please refer toSEMS+ WEB User Manual。



SEMS+ WEB User Manual

9 System Maintenance

9.1 System Power-Off

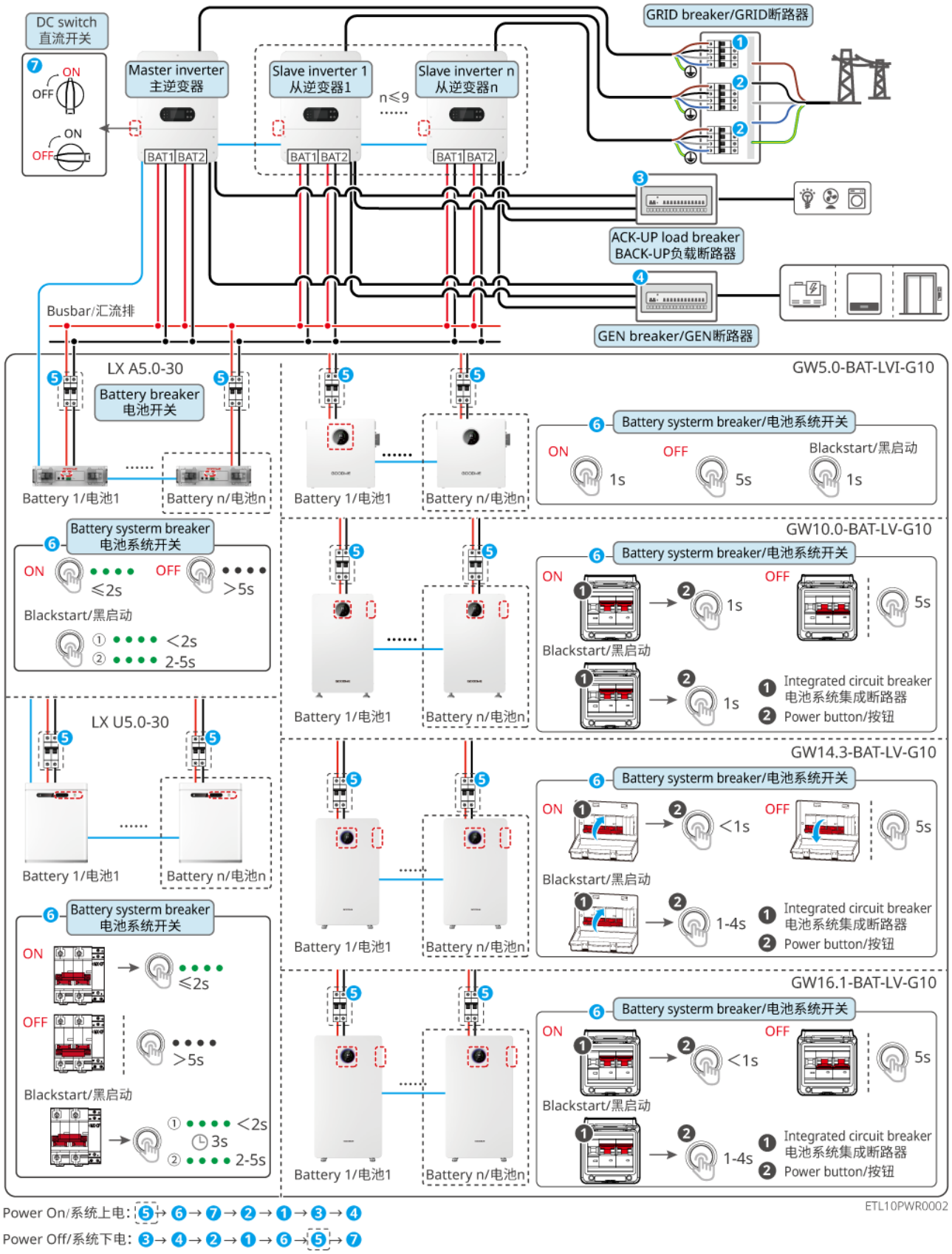
⚠DANGER

- When operating and maintaining devices in the system, power off the system first. Operating energized devices may cause equipment damage or electric shock hazards.
- After the equipment is powered off, internal components take time to discharge. Wait until the equipment is fully discharged according to the time requirement on the label.
- To restart the battery, use the air switch to power it on for restart.
- When shutting down the battery system, strictly follow the battery system power-off requirements to prevent damage to the battery system.
- When there are multiple batteries in the system, powering off any one battery can power off all batteries.

NOTICE

- The circuit breakers between the inverter and the battery, as well as between battery systems, must be installed in accordance with local laws and regulations.
- To ensure effective protection of the battery system, keep the cover of the battery system switch closed. The protective cover can close automatically after being opened. If the battery system switch is not used for a long time, secure it with screws.

Power-Off Procedure



Power On/系统上电：5→6→7→2→1→3→4

Power Off/系统下电：3→4→2→1→6→5→7

1. Disconnect the BACK-UP circuit breaker.
2. (Optional) Disconnect the GEN circuit breaker.
3. Disconnect the main inverter ON-GRID circuit breaker.
4. (Optional) Disconnect the slave inverter ON-GRID circuit breaker.
5. Power down the battery system:
   a. LX A5.0-30: Press and hold the multi-function button on any battery for more than 5 seconds to power off all batteries.
   b. LX U5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10: Close the battery system integrated circuit breaker or press and hold the battery system button for 5 seconds or more, and the battery system integrated circuit breaker will automatically open.
6. (Select according to local regulations) Disconnect the switch between the inverter and the battery.
7. Disconnect the inverter's DC Switch.

9.2 Equipment Removal

⚠DANGER

- Ensure that the equipment is de-energized.
- Wear personal protective equipment when operating the equipment.
- Use proper removal tools when removing wiring terminals to avoid damaging terminals or equipment.
- Unless otherwise specified, the equipment removal method is the reverse of the installation method, which will not be repeated in this document.

1. Power off the system.
2. Label the cables connected in the system to identify cable types.
3. Disconnect the connecting cables of the inverter, battery, and smart meter in the system, such as DC cables, AC cables, communication cables, and Protection ground cables.
4. Remove devices such as the smart communication stick, inverter, battery, and smart meter.
5. Store the equipment properly. If it will be put into use later, ensure that the storage conditions meet the requirements.

9.3 Equipment Scrapping

When the equipment can no longer be used and needs to be scrapped, dispose of it in accordance with the electrical waste disposal requirements of the laws and regulations of the country/region where the equipment is located. Do not dispose of the equipment as domestic waste.

9.4 Regular Maintenance

⚠WARNING

- If any problem that may affect the battery or energy storage inverter system is found, please contact after-sales personnel. Unauthorized disassembly is prohibited.
- If exposed copper wires are found inside a conductive cable, do not touch them. High voltage hazard. Contact after-sales personnel. Do not disassemble the equipment without authorization.
- If other emergencies occur, contact after-sales personnel immediately, operate under their guidance, or wait for after-sales personnel to operate on site.

Maintenance content	Maintenance method	Maintenance interval	Maintenance purpose
System cleaning	Check the heatsink, fan, and air inlet/outlet for foreign objects and dust. Check whether the installation space meets the requirements and whether there is debris accumulated around the equipment.	Once every six months	Prevent heat dissipation faults.

Maintenance content	Maintenance method	Maintenance interval	Maintenance purpose
System Installation	Check whether the equipment is installed securely and whether the fastening screws are loose. Check the equipment appearance for damage and deformation.	Once every 6 months to once a year	Verify that the equipment is installed securely.
Electrical Connection	Check electrical connections for looseness and cable appearance for damage or exposed copper.	Once every 6 months to once a year	Confirm electrical connection reliability.
Sealing	Check whether the sealing of the equipment cable entry holes meets the requirements. If the gap is too large or the holes are not sealed, reseal them.	Once a year	Confirm that the machine is properly sealed and the waterproof performance is intact.
Battery maintenance	If the battery has not been used for an extended period or is not fully charged, periodic charging of the battery is recommended.	Once every 15 days	Protection of the battery service life.

9.5 Fault

NOTICE
The fault information in this manual is updated periodically. Faults may vary slightly among different models. Please refer to the real-time display on the device for details.

9.5.1 View Fault/Alarm Details

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

center.

- SEMS+ App

1. Open the SEMS App and log in with any account.
2. Through [Plant] > [Alarm], you can view fault information for all plants.
3. Click a specific fault name to view the time when the fault occurred, possible causes, and solutions.

- SEMS+ WEB

1. Open SEMS+ WEB and log in with any account.
2. On the plant details page, click [Alarm] to view all alarm information for the current plant.

9.5.2 Fault Information and Handling Methods

Please troubleshoot according to the following methods. If the troubleshooting methods do not resolve the issue, contact the after-sales service center.
When contacting the after-sales service center, please collect the following information to facilitate rapid problem resolution.

1. Product information, such as serial number, software version, equipment installation date, fault occurrence time, fault occurrence frequency, etc.
2. Equipment installation environment, such as weather conditions and whether modules are obstructed or shaded; it is recommended to provide photos, videos, and other files to assist in problem analysis.
3. Grid conditions.

9.5.2.1 System Fault

If the system experiences a problem not listed, or if following the instructions still fails to eliminate the problem or abnormality, stop system operation immediately and contact your dealer immediately.

No.	Fault	Corrective Measures
1	Cannot find the wireless signal of the smart communication stick	1. Ensure that no other device is connected to the wireless signal of the smart communication stick. 2. Ensure that the App has been upgraded to the latest version. 3. Ensure the Smart Communication Dongle is powered normally, and the blue signal indicator is flashing or steady on. 4. Ensure the smart device is within the communication range of the Smart Communication Dongle. 5. Refresh the device list in the App again. 6. Restart the inverter.
2	Unable to connect to the wireless signal of the Smart Communication Dongle	1. Ensure that no other device is connected to the wireless signal of the smart communication stick. 2. Restart the inverter or the communication dongle, and try to connect to the wireless signal of the Smart Communication Dongle again. 3. Ensure encrypted Bluetooth pairing is successful.
3	Unable to find the router SSID	1. Place the router closer to the Smart Communication Dongle, or add a WiFi repeater to enhance the WiFi signal. 2. Reduce the number of devices connected to the router.
4	After all configurations are complete, the Smart Communication Dongle fails to connect to the router.	1. Restart the inverter. 2. Check whether the network name, encryption method, and password in the WiFi configuration are the same as those of the router. 3. Restart the router. 4. Place the router closer to the Smart Communication Dongle, or add a WiFi repeater to enhance the WiFi signal.

No.	Fault	Corrective Measures
5	After all configurations are complete, the Smart Communication Dongle fails to connect to the server.	Restart the router and inverter.

9.5.2.2 Inverter Faults

9.5.2.2.1 Troubleshooting (Fault Codes F01-F40)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F01	Grid Power Outage	1. Grid power outage. 2. The AC line or AC Switch is disconnected.	1. The alarm disappears automatically after grid power supply is restored. 2. Check whether the AC line or AC Switch is disconnected.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F02	Grid Overvoltage Protection	The grid voltage is above the permissible range, or the high-voltage Duration exceeds the high voltage ride-through setting value.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, check whether the grid voltage is within the allowable range. If not, contact the local power operator. If it is, the Grid Overvoltage Protection threshold also needs to be modified after obtaining the consent of the local power operator. 3. If it cannot be recovered for a long time, check whether the AC-side circuit breaker and output cables are connected properly.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F03	Grid Undervoltage Protection	The grid voltage is below the permissible range, or the Low Voltage Duration exceeds the Low Voltage ride-through setting value.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, check whether the grid voltage is within the allowable range. If not, contact the local power operator. If it is, the Grid Undervoltage Protection threshold also needs to be modified after obtaining the consent of the local power operator. 3. If it cannot be recovered for a long time, check whether the AC-side circuit breaker and output cables are connected properly.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F04	Grid Rapid Overvoltage Protection	An abnormality occurs in grid voltage detection, or an ultra-high voltage triggers the fault.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, check whether the grid voltage is within the allowable range. If not, contact the local power operator. If it is, the Grid Undervoltage Protection threshold also needs to be modified after obtaining the consent of the local power operator. 3. If it cannot be recovered for a long time, check whether the AC-side circuit breaker and output cables are connected properly.
F05	10minOvervoltage	The10minsliding average value of the grid voltage exceeds the range specified by safety regulations.	Check whether the grid voltage has been operating at a high voltage for a long time. If it occurs frequently, check whether the grid frequency is within the allowed range. If not, contact your local power operator. If yes, after obtaining approval from the local power operator, it is also necessary to modify the10minOvervoltage protection point.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F06	Grid Overfrequency	Grid abnormality: The actual grid frequency is higher than the local grid standard requirement.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, contact the local power operator. If it is, the Grid Overfrequency protection threshold also needs to be modified after obtaining the consent of the local power operator.
F07	Grid Underfrequency	Grid abnormality: The actual grid frequency is lower than the local grid standard requirement.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, contact the local power operator. If it is, the Grid Underfrequency protection threshold also needs to be modified after obtaining the consent of the local power operator.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F08	Grid Frequency Instability	Grid abnormality: The actual grid frequency rate of change does not comply with the local grid standard.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, contact the local power operator.
F09	Anti-islanding Protection	The grid has been disconnected; grid voltage is maintained due to the presence of loads. According to the safety regulation requirements for Protection, grid connection is stopped.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, contact the local power operator.
F10	Voltage Ride-Through Undervoltage Fault	Grid abnormality: The duration of Grid Voltage Abnormal exceeds the time specified for high and low voltage ride-through.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, please check whether the grid voltage and frequency are within the allowable range and stable. If not, contact the local power operator.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F11	HVRT Overvoltage	Grid abnormality: The duration of Grid Voltage Abnormal exceeds the time specified for high and low voltage ride-through.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, please check whether the grid voltage and frequency are within the allowable range and stable. If not, contact the local power operator.
F12	30mAGfciProtection	During inverter operation, the input-to-ground insulation resistance becomes low.	1. If it occurs occasionally, it may be caused by an occasional abnormality in the external circuit. After the fault is cleared, normal operation will be restored, and manual intervention is not required. 2. If it occurs frequently or cannot be recovered for a long time, check whether the PV string-to-ground impedance is too low.
F13	60mAGfciProtection	During inverter operation, the input-to-ground insulation resistance becomes low.	1. If it occurs occasionally, it may be caused by an occasional abnormality in the external circuit. After the fault is cleared, normal operation will be restored, and manual intervention is not required. 2. If it occurs frequently or cannot be recovered for a long time, check whether the PV string-to-ground impedance is too low.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F14	150mAGfciProtection	During inverter operation, the input-to-ground insulation resistance becomes low.	1. If it occurs occasionally, it may be caused by an occasional abnormality in the external circuit. After the fault is cleared, normal operation will be restored, and manual intervention is not required. 2. If it occurs frequently or cannot be recovered for a long time, check whether the PV string-to-ground impedance is too low.
F15	GfciGradual Change Protection	During inverter operation, the input-to-ground insulation resistance becomes low.	1. If it occurs occasionally, it may be caused by an occasional abnormality in the external circuit. After the fault is cleared, normal operation will be restored, and manual intervention is not required. 2. If it occurs frequently or cannot be recovered for a long time, check whether the PV string-to-ground impedance is too low.
F16	DCIProtection Level1	The High DC Component of the inverter output current exceeds the allowable range specified by safety regulations or the machine default.	1. If the abnormality is introduced by an external fault, the inverter will automatically resume normal operation after the fault disappears, and manual intervention is not required. 2. If this alarm occurs frequently and affects the normal power generation of the plant, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F17	DCIProtection Level2	The High DC Component of the inverter output current exceeds the allowable range specified by safety regulations or the machine default.	1. If the abnormality is introduced by an external fault, the inverter will automatically resume normal operation after the fault disappears, and manual intervention is not required. 2. If this alarm occurs frequently and affects the normal power generation of the plant, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F18	Low Insulation Resistance	1. PV string short-circuited to Protection ground. 2. The environment where the PV strings are installed has been humid for a long time, and the line-to-ground insulation is poor. 3. Low Insulation Resistance of the battery port line to ground.	1. Check the impedance of the PV string/battery port to Protection ground. If a short circuit occurs, locate the short-circuit point and rectify it. 2. Check whether the inverter's Protection ground wire is correctly connected. 3. If it is confirmed that this impedance is indeed lower than the default value in rainy weather, please use the Appto reconfigure the inverter“Insulation Resistance Protection Point”。 For inverters in the Australian and New Zealand markets，when an insulation resistance fault occurs, alarms can also be provided in the following ways: 1. The inverter is equipped with a buzzer. When a fault occurs, the buzzer sounds continuously for1minute; if the fault is not resolved, the buzzer sounds again every30minutes. 2. If the inverter is added to the monitoring platform, after setting the alarm notification method, alarm information can be sent to the customer by email.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F19	Grounding Abnormal	1. The Protection ground wire of the inverter is Not Connected. 2. When the PV string output is grounded, the inverter output side is not connected to an isolation transformer.	1. Please confirm whether the inverter's Protection ground wire is Not Connected properly. 2. If the PV string output is grounded, please confirm whether the inverter output side is connected to an isolation transformer.
F20	Hardware Power Limit Protection	Abnormal load fluctuation	1. If the abnormality is introduced by an external fault, the inverter will automatically resume normal operation after the fault disappears, and manual intervention is not required. 2. If this alarm occurs frequently and affects the normal power generation of the plant, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F21	Internal Comm Loss	SlaveDSP1communication timeout-MasterDSP, slaveDSP2communication timeout-MasterDSP, slaveDSP2communication timeout-SlaveDSP1, masterDSPcommunication timeout-SlaveDSP1, masterDSPcommunication timeout-SlaveDSP2or slaveDSP1communication timeout-SlaveDSP2: 1. Chip not powered on 2. Chip program version error	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
		MasterDSPcanmodule error, slaveDSP1canmodule error or slaveDSP2canmodule error: 1. Frame format error 2. Parity error 3. can busoffline 4. HardwareCRCcheck error 5. Control bit is receive (transmit) when transmitting (receiving) 6. Transmission to an unauthorized unit	
F22	Generator waveform detection fault	1. When the generator is Not Connected, this fault will always be displayed; 2. When the generator is operating, failure to meet the generator safety regulations will trigger this fault.	
F23	Generator abnormal connection		
F24	Generator voltage low		
F25	Generator voltage high		
F26	Generator frequency low		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F27	Generator frequency high		1. When the generator is not connected, ignore this fault; 2. It is normal for this fault to appear when the generator is faulty. After the generator recovers, wait for a period of time and the fault will clear automatically; 3. This fault will not affect normal operation in off-grid mode 4. If both the generator and the utility grid are connected and meet the safety regulation requirements, the utility grid is prioritized for grid connection, and the system will operate in grid-connected mode.
F28	ParallelI/Oself-check abnormal	Parallel communication cable is not securely connected or the parallelIOchip is damaged	Check whether the parallel communication cable is securely connected, then check whether theIOchip is damaged; if so, replace theIOchip.
F29	Paralell Grid Line Reversed	The grid lines of some machines are connected in reverse to those of others	Reconnect the grid lines.
F30	AC HCT check Abnormal	The AC sensor has a sampling abnormality	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F31	GFCI HCT Check Abnormal	The leakage current sensor has a sampling abnormality	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F32	Inverter Internal Failure	The inverter has a fault	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F33	FlashR/W Abnormal	Possible cause: flashcontent has changed;flashservice life is exhausted;	1. Upgrade to the latest firmware; 2. Contact your dealer or after-sales service center.
F34	AFCI Check Failure	During the Arc Failure self-test, the Arc Failure module failed to detect an Arc Failure.	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F35	Cabinet Overtemperature	Cabinet Overtemperature, possible cause: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permitted ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature occurs, please improve the ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F36	Bus Overvoltage	BUSovervoltage, possible cause: 1. PVvoltage is too high; 2. InverterBUSvoltage sampling is abnormal; 3. The isolation effect of the dual-split transformer downstream of the inverter is poor, causing mutual interference when two inverters are connected to the grid; one inverter reports DC overvoltage during grid connection;	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F37	PVInput Overvoltage	PVinput voltage is too high. Possible causes: The PV array configuration is incorrect. Too many PV modules are connected in series in the string, causing the string open-circuit voltage to be higher than the inverter maximum operating voltage.	Check the series configuration of the corresponding PV array string to ensure that the string open-circuit voltage does not exceed the inverter maximum operating voltage. After the PV array is correctly configured, the inverter alarm will automatically clear.
F38	PVContinuous Hardware Overcurrent	1. Improper module configuration 2. Hardware damage	Disconnect the AC output side switch and the DC input side switch,5minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F39	PVContinuous Software Overcurrent	1. Improper module configuration 2. Hardware damage	Disconnect the AC output side switch and the DC input side switch,5minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F40, F98	String reverse connection(String1-n) n: Determine based on the inverter's actual Number of Strings	PVString reverse connection	Check whether the strings are connected in reverse.

9.5.2.2.2 Fault Handling (Fault Codes F41-F80)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F41	Generator Port Overload	1. The off-grid side output exceeds the requirements specified in the datasheet 2. Short circuit on the off-grid side 3. Off-grid terminal voltage is too low 4. When used as a heavy-load port, the heavy load exceeds the requirements specified in the datasheet	Verify the off-grid side output voltage, current, power, and other data to determine the cause of the problem.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F42, F164,F165	DC Arcing Failure(String1-n) n: Determine based on the inverter's actual Number of Strings	1. DC-side connection terminal is loose; 2. Poor contact of the DC-side connection terminal; 3. DC cable core is damaged with poor contact	1. After the unit is reconnected to the grid, check whether the voltage and current of each channel abnormally drop to zero; 2. Check whether the DC-side terminals are securely connected.
F43	Grid Waveform Abnormal	Grid abnormality: abnormal grid voltage detection triggers the fault.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, please check whether the grid voltage and frequency are within the allowable range and stable. If not, contact the local power operator.
F44	Grid Phase Loss	Grid anomaly: single-phase grid voltage dip.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, please check whether the grid voltage and frequency are within the allowable range and stable. If not, contact the local power operator.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F45	Grid Voltage Imbalance	Excessive difference in grid phase voltages.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, please check whether the grid voltage and frequency are within the allowable range and stable. If not, contact the local power operator.
F46	Grid Phase Sequence Failure	Abnormal wiring between the inverter and the grid: wiring is not in positive phase sequence.	1. Check whether the wiring between the inverter and the grid is in positive phase sequence. After the wiring is correct (e.g., swap any two live wires), the fault will clear automatically. 2. If the wiring is correct and the fault persists, contact your dealer or after-sales service center.
F47	Grid Rapid Shutdown Protection	Rapidly shut down the output after detecting a Grid Power Outage condition.	The fault will clear automatically after grid power supply is restored.
F48	Grid Neutral Wire Loss (Splitgrid)	Split-phase Grid Neutral Wire Loss	1. The alarm disappears automatically after grid power supply is restored. 2. Check whether the AC line or AC Switch is disconnected.
F49	L-PE Short Circuit	Output phase line toPEimpedance is low or short-circuited.	Measure the impedance from the output phase line toPEand identify the location with low impedance and repair it.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F50	DCVProtection Level1	Abnormal load fluctuation	1. If the abnormality is introduced by an external fault, the inverter will automatically resume normal operation after the fault disappears, and manual intervention is not required. 2. If this alarm occurs frequently and affects the normal power generation of the plant, contact the distributor or after-sales service center.
F51	DCVProtection Level2	Abnormal load fluctuation	
F52	Leakage current (GFCI) multiple fault shutdowns	North American safety regulations require that automatic recovery is not allowed after multiple faults; recovery requires manual action or waiting24hbefore recovery	Please check whether the PV string-to-ground impedance is too low.
F53	DC Arc Failure (AFCI) multiple fault shutdowns	North American safety regulations require that automatic recovery is not allowed after multiple faults; recovery requires manual action or waiting24hbefore recovery	1. After the unit is reconnected to the grid, check whether the voltage and current of each channel abnormally drop to zero; 2. Check whether the DC-side terminals are securely connected.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F54	External communication link disconnection	Communication with the inverter's external devices is lost; possible causes include external device power supply issues, Communication Protocols mismatch, or the corresponding external devices not being configured.	Determine based on the actual model and detection enable bit; peripherals not supported by some models will not be detected.
F55	Back-upOutput Overload	Prevent continuous Overload output from the inverter.	Turn off some off-grid loads to reduce the inverter's off-grid output power.
F56	Back-upOutput Overvoltage	Prevent inverter output overvoltage from damaging loads.	1. If it occurs occasionally, it may be caused by load switching and does not require manual intervention. 2. If it occurs frequently, please contact your dealer or after-sales service center.
F57	ExternalBox Fault	During Switch On-Grid to Off-Grid, waiting forBoxrelay switching takes too long.	1. Check whether theBoxis working properly; 2. Check whether theBoxcommunication wiring is correct;
F58	CTLoss	CTconnection cable disconnected (Japanese safety regulation requirement)	Check whether theCTwiring is correct;

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F59	ParallelCAN Comm Abnormal	Parallel communication cable is not securely connected, or some units are not online.	Check whether all units are powered on and whether the parallel communication cable is securely connected.
F60	ParallelBack-upLine Reversed	For some units, thebackupline is reversed relative to the others.	Reconnect thebackupline.
F61	Inverter Soft Start Failure	Inverter Soft Start Failure during off-grid cold start.	Check whether the inverter module of the unit is damaged.
F62	AC HCT Failure	HCTsensor is abnormal	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F63	GFCI HCT Failure	Leakage current sensor abnormality.	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F64	Inverter Internal Failure	The inverter has a fault	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F65	AC Terminal Overtemperature	AC Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permitted ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature occurs, please improve the ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact your dealer or after-sales service center.
F66	INVModule Overtemperature	Inverter module overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permitted ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature occurs, please improve the ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F67	BoostModule Overtemperature	BoostModule Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permitted ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature occurs, please improve the ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact your dealer or after-sales service center.
F68	AC Capacitor Overtemperature	Output filter capacitor overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permitted ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature occurs, please improve the ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact your dealer or after-sales service center.
F69	PV IGBT short-circuit fault	Possible cause: 1. IGBTShort Circuit 2. Inverter Sampling Circuit Abnormal	

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F70	PV IGBTOpen Circuit	1. No PWM output due to software issue: 2. Drive circuit abnormal: 3. IGBTOpen Circuit	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F71	NTCAbnormal	NTCTemperature sensor abnormal	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F72	PWM Abnormal	PWMAbnormal waveform detected	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F73	CPUInterrupt Abnormal	CPUInterrupt abnormal	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F74	Microelectronic Fault	Function Safety abnormality detected	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F75	PV HCTFault	boostCurrent sensor abnormal	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F76	1.5VRef Abnormal	Reference circuit fault	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F77	0.3VRef Abnormal	Reference circuit fault	
F78	CPLDVersion Error	CPLDVersion Error	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F79	CPLDComm Failure	CPLDandDSPcommunication data error or timeout	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F80	Model identification fault	Fault related to Model Recognition Error	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

9.5.2.2.3 Fault Handling (Fault Codes F81-F121)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F81	P-Bus Overvoltage	BUSovervoltage, possible cause: 1. PVvoltage is too high; 2. InverterBUSvoltage sampling is abnormal; 3. The isolation effect of the dual-split transformer downstream of the inverter is poor, causing mutual interference when two inverters are connected to the grid; one inverter reports DC overvoltage during grid connection;	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F82	N-Bus Overvoltage		
F83	Bus Overvoltage (AuxiliaryCPU1)		Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F84	P-Bus Overvoltage (AuxiliaryCPU1)		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F85	N-Bus Overvoltage (AuxiliaryCPU1)	BUSovervoltage, possible cause: 1. PVvoltage is too high; 2. InverterBUSvoltage sampling is abnormal; 3. The isolation effect of the dual-split transformer downstream of the inverter is poor, causing mutual interference when two inverters are connected to the grid; one inverter reports DC overvoltage during grid connection;	
F86	Bus Overvoltage (AuxiliaryCPU2)		Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F87	P-Bus Overvoltage (AuxiliaryCPU2)		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F88	N-Bus Overvoltage (AuxiliaryCPU2)	BUSovervoltage, possible cause: 1. PVvoltage is too high; 2. InverterBUSvoltage sampling is abnormal; 3. The isolation effect of the dual-split transformer downstream of the inverter is poor, causing mutual interference when two inverters are connected to the grid; one inverter reports DC overvoltage during grid connection;	
F89	P-Bus Overvoltage(CPLD)		Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F90	N-Bus Overvoltage(CPLD)	BUSovervoltage, possible cause: 1. PVvoltage is too high; 2. InverterBUSvoltage sampling is abnormal; 3. The isolation effect of the dual-split transformer downstream of the inverter is poor, causing mutual interference when two inverters are connected to the grid; one inverter reports DC overvoltage during grid connection;	
F91	FlyCap Software Overvoltage	FlyCap Overvoltage, possible causes: 1. PVvoltage is too high; 2. Inverter flying capacitor voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch,5minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F92	FlyCap Hardware Overvoltage		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F93	FlyCap Undervoltage	FlyCap Undervoltage, possible causes: 1. PVinsufficient energy; 2. Inverter flying capacitor voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch,5minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F94	FlyCap Precharge Failure	FlyCap Precharge Failure, possible causes: 1. PVinsufficient energy; 2. Inverter flying capacitor voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch,5minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F95	FlyCap Precharge Abnormal	1. Improper control loop parameters 2. Hardware damage	Disconnect the AC output side switch and the DC input side switch,5minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F96, F97	String overcurrent(String1-n) n: Determine based on the inverter's actual Number of Strings	Possible cause: 1. String overcurrent; 2. String current sensor abnormal	Disconnect the AC output side switch and the DC input side switch,5minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F99, F100	String missing(String1-n) n: Determine based on the inverter's actual Number of Strings	String fuse open (if present)	Check whether the fuse is open.
F101	Battery1Precharge Failure	Battery1precharge circuit failure (precharge resistor burned out, etc.)	Check whether the precharge circuit is in good condition. After only the battery is powered on, check whether the Battery Voltage and bus voltage are consistent. If not, please contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F102	Battery1Relay Failure	Battery1relay fails to operate normally	After the battery is powered on, check whether the battery relay operates and whether a closing sound is heard. If it does not operate, please contact your dealer or after-sales service center.
F103	Battery1Overvoltage	Battery1input voltage exceeds the equipment rated range	Check whether the Battery Voltage is within the rated range of the machine.
F104	Battery2Precharge Failure	Battery2precharge circuit failure (precharge resistor burned out, etc.)	Check whether the precharge circuit is in good condition. After only the battery is powered on, check whether the Battery Voltage and bus voltage are consistent. If not, please contact your dealer or after-sales service center.
F105	Battery2Relay Failure	Battery2relay fails to operate normally	After the battery is powered on, check whether the battery relay operates and whether a closing sound is heard. If it does not operate, please contact your dealer or after-sales service center.
F106	Battery2Overvoltage	Battery2input voltage exceeds the equipment rated range	Check whether the Battery Voltage is within the rated range of the machine.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F107	On-grid PWM Sync Failure	Carrier synchronization abnormality occurs during grid connection	1. Check whether the synchronization cable is connected properly. 2. Check whether the master-slave settings are correct; 3. Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists,, please contact your dealer or after-sales service center.
F108	DSPCommunication Failure	-	-
F109	ExternalSTSFault	Inverter andSTSconnecting cable abnormality	Check whether the wiring harness connection sequence between the inverter andSTScorresponds one-to-one in order.
F110	Export Limit Protection	1. Inverter reports an error and disconnects from the grid. 2. metercommunication is unstable 3. A reverse power flow condition occurs.	1. Check whether the inverter has other error messages. If yes, take targeted measures; 2. Check whether themeterconnection reliability; 3. If this alarm occurs frequently and affects the normal power generation of the plant, contact the distributor or after-sales service center.
F111	BypassOverload	-	-
F112	Black Start Failure	-	-

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F113	Offgrid AC Ins Volt High	-	-
F114	Relay Failure2	Relay abnormality, cause: 1. Relay abnormality (relay short circuit) 2. Relay sampling circuit abnormality. 3. AC-side wiring abnormality (possible loose connection or short circuit)	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F115	SVGPrecharge Disabled	SVGPrecharge Hardware Failure	Contact your dealer or after-sales service center.
F116	SVG ModeSVG PIDPrevention Failure	PIDPID Hardware Abnormality	
F117	DSPVersion Error	DSPSoftware Version Identification Error	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F118	MOSContinuous Overvoltage	1. Software issue causes the inverter drive to be shut down earlier than the flyback drive: 2. Inverter drive circuit abnormality prevents turn-on: 3. PVvoltage is too high; 4. Mosvoltage sampling is abnormal;	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F119	Bus short-circuit fault	Hardware damage	If aBUSshort-circuit fault occurs and the inverter remains disconnected from the grid, contact your dealer or after-sales service center.
F120	Bus sampling abnormality	1. BUSvoltage sampling hardware failure	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F121	DCSample Abnormal	1. BUSvoltage sampling hardware failure 2. Battery Voltage sampling hardware failure 3. DcrlyRelay Failure	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

9.5.2.2.4 Fault Handling (Fault Codes F122-F171)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F122	PVInput Mode Error	PVAccess Mode has three modes; taking four-channelMPPTas an example: 1. Parallel mode: i.e.,AAAAmode(same-source mode），PV1-PV4are same-source,4-channelPVconnected to the same PV module 2. Partial parallel mode: i.e.,AACCmode,PV1andPV2are connected to the same source,PV3andPV4are connected to the same source 3. Independent mode: i.e.,ABCDmode(non-same-source），PV1、PV2、PV3、PV4are independently connected,4-channelPVeach connected to one PV module	Check whether thePVAccess Mode is correctly set (ABCD、AACC、AAAA); then set thePVAccess Mode 1. Confirm whether each channel of actually connectedPVis correctly connected; 2. IfPVis correctly connected, useAPPor the screen to check whether the currently set "PVAccess Mode" corresponds to the actual Access Mode; 3. If the currently set "PVAccess Mode" does not match the actual Access Mode, useAPPor the screen to set the "PVAccess Mode" to a mode consistent with the actual situation; after completing the setting, disconnectPVandACpower supply and restart; 4. After completing the setting, if the current "PVAccess Mode" is consistent with the actual Access Mode but this fault is still reported, please contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
		If the actualPVAccess Mode does not match thePVAccess Mode set on the device, this fault will be reported	
F123	Multi-channelPVphase error	PVinput mode setting error	Check whether thePVAccess Mode is correctly set (ABCD、AACC、AAAA); then set thePVAccess Mode 1. Confirm whether each channel of actually connectedPVis correctly connected; 2. IfPVis correctly connected, useAPPor the screen to check whether the currently set "PVAccess Mode" corresponds to the actual Access Mode; 3. If the currently set "PVAccess Mode" does not match the actual Access Mode, useAPPor the screen to set the "PVAccess Mode" to a mode consistent with the actual situation; after completing the setting, disconnectPVandACpower supply and restart; 4. After completing the setting, if the current "PVAccess Mode" is consistent with the actual Access Mode but this fault is still reported, please contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F124	Battery1Reversed	Battery1reverse polarity connection	Check whether the positive and negative poles of the battery and the machine wiring terminals are consistent.
F125	Battery2Reversed	Battery2reverse polarity connection	Check whether the positive and negative poles of the battery and the machine wiring terminals are consistent.
F126	Abnormal battery connection	Abnormal battery connection	Check whether the battery is operating normally.
F127	BAT Overtemperature	Battery overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F128	Ref Voltage Abnormal	Reference circuit fault	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F129	Cabinet Under Temperature	Cabinet Under Temperature, possible cause: ambient temperature too low.	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F130	ACSideSPDFault	ACside surge protection device failed	Replace theACside surge protection device.
F131	DCSideSPDFault	DCside surge protection device failed	Replace theDCside surge protection device.
F132	Internal Fan Abnormal	Internal Fan Abnormal, possible causes: 1. Abnormal fan power supply; 2. Mechanical fault(locked rotor）; 3. Fan aging and damage.	Disconnect the AC output side switch and the DC input side switch,5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F133	External Fan Abnormal	External Fan Abnormal, possible causes: 1. Abnormal fan power supply; 2. Mechanical fault(locked rotor）; 3. Fan aging and damage.	

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F134	PIDAbnormal	PIDhardware fault orPVovervoltagePID paused	PVovervoltage-inducedPIDpause warning requires no action;PIDhardware fault can be cleared by turning off thePIDswitch and then turning it on again to clearPIDfault; replacePIDdevice.
F135	Trip-Switch Trip Warning	Possible cause: Overcurrent orPVreverse connection caused the trip switch to trip;	Contact your dealer or after-sales service center; the cause of tripping isPVshort circuit or reverse connection; check whether there is a historicalPVshort-circuit warning or historicalPVreverse-connection warning. If present, maintenance personnel must check the correspondingPVcondition. After checking and finding no fault, the trip switch can be manually closed, and via theAPPinterface, use the clear historical fault operation to clear this warning.
F136	HistoricalPV IGBT Short-Circuit Warning	Possible cause: Overcurrent occurred, causing the trip switch to trip;	Contact your dealer or after-sales service center; maintenance personnel must, according to the historicalPVshort-circuit warning subcode, check whether theBoosthardware where the short circuit occurred and the external string have faults; after checking and finding no fault, you can use theAPPinterface, use the clear historical fault operation to clear this warning.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F137, F138	HistoricalPVreverse-connection warning(String1-n) (n: determined according to the actual Number of Strings of the inverter)	Possible cause: APVreverse connection caused the trip switch to trip;	Contact your dealer or after-sales service center; maintenance personnel must, according to the historicalPVreverse-connection warning subcode, check whether the corresponding string is reverse-connected, and check whether thePVpanel configuration has a voltage difference; after checking and finding no fault, you can use theAPPinterface, use the clear historical fault operation to clear this warning.
F139	FlashR/W Error	Possible cause: 1. Flashcontent has changed; 2. Flashservice life is exhausted;	1. Upgrade to the latest firmware; 2. Contact your dealer or after-sales service center.
F140	Meter Comm Loss	This warning may occur only after the Power Limit function is enabled. Possible causes: 1. Meter not connected; 2. The communication cable between the meter and inverter is incorrectly connected.	Check the meter wiring and connect the meter correctly. If the fault persists after checking, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F141	PVType Identification Failure	PVpanel identification hardware abnormal	Contact your dealer or after-sales service center.
F142	PV String Mismatch	PVString Mismatch, under the sameMPPTthe two strings have different open-circuit voltage configurations	Check the open-circuit voltages of the two strings and configure strings with the same open-circuit voltage under the sameMPPT. Long-term PV String Mismatch poses a safety hazard.
F143	CTnot connected	CTnot connected	Check whether theCTwiring.
F144	CTReversed	CTReversed	Check whether theCTwiring.
F145	PE Loss	PE Not Connected	Check the PE cable.
F146	PV String Terminal Overtemperature(String 1~8)	37176register:PVterminal temperature alarm subcode1is set	-
F147	PV String Terminal Overtemperature(String 9~16)	37177register:PVterminal temperature alarm subcode2is set	-
F148	PV String Terminal Overtemperature(String 17~20)	37178register:PVterminal temperature alarm subcode3is set	-

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F149	HistoricalPVreverse-connection warning(String33~48)	Possible cause: APVreverse connection caused the trip switch to trip;	Contact your dealer or after-sales service center; maintenance personnel must, according to the historicalPVreverse-connection warning subcode, check whether the corresponding string is reverse-connected, and check whether thePVpanel configuration has a voltage difference; after checking and finding no fault, you can use theAPPinterface, use the clear historical fault operation to clear this warning.
F150	Battery1Voltage Low	Battery Voltage Below Setpoint	-
F151	Battery2Voltage Low	Battery Voltage Below Setpoint	-
F152	Low Voltage of Battery Power	Battery not in charging mode; voltage below shutdown voltage.	-
F153	Battery1Voltage High	-	-
F154	Battery2Voltage High	-	-

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F155	Online Low Insulation Resistance	1. PV string short-circuited to Protection ground. 2. The environment where the PV strings are installed has been humid for a long time, and the line-to-ground insulation is poor.	1. Check the impedance of the PV string to Protection earth (PE); if a short circuit occurs, rectify the short-circuit point. 2. Check whether the inverter's Protection ground wire is correctly connected. 3. If it is confirmed that this impedance is indeed lower than the default value in rainy weather, reset the Insulation Resistance Protection Point.
F156	Micro-grid Overload Warning	backupterminal input current is too high	If it occurs occasionally, no action is required; if the alarm occurs frequently, contact your dealer or after-sales service center.
F157	Manual Reset	-	-
F158	Generator Phase Sequence Abnormal	-	-
F159	Multiplexed Port Configuration Abnormal	The multiplexed(Generator）port is configured as a micro-grid or large load, but a generator is actually connected.	Before using aAPPto change the multiplexed(Generator）port configuration.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F160	EMSForced Off-grid	EMSissued a forced off-grid command, but the off-grid function is not enabled.	Enable off-grid function.
F161	Passive Anti-islanding Protection	-	-
F162	Grid Type Fault	Actual Type of Electrical Supply System(two-phase or split-phase）does not match the configured safety standard.	According to the actual Type of Electrical Supply System, switch to the corresponding safety standard.
F163	Grid Phase Instability	Grid abnormality: The rate of change of the grid voltage phase does not comply with the local grid standard.	1. If it occurs occasionally, it may be caused by a short-term grid abnormality. The inverter will resume normal operation after detecting that the grid is normal, and no manual intervention is required. 2. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, contact the local power operator.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F166	PV Terminal Overtemperature	PV Terminal Overtemperature. Possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permitted ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature occurs, please improve the ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact your dealer or after-sales service center.
F167	AC Terminal Overtemperature Warning	AC Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	
F168	BAT Terminal Overtemperature	BAT Terminal Overtemperature. Possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature.	

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F169	BAT Terminal Overtemperature Warning	BAT Terminal Overtemperature. Possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature.	
F170	STS Overtemperature	STS Overtemperature. Possible causes: 1. Insufficient ventilation at the STS installation location. 2. Ambient Overtemperature.	
F171	Inverter-to-battery wiring fault	Power cable connection fault between the battery and inverter	Check whether the power cable connection between the battery and inverter is correct.

9.5.2.2.5 Fault Symptom Handling

Fault Name	Fault Cause	Troubleshooting Recommendations
Generator Failure	1. This fault will be continuously displayed when the generator is Not Connected. 2. When the generator is running, failure to meet the generator safety standard will trigger this fault.	1. If the generator is not connected, ignore this fault; 2. It is normal for this fault to appear when the generator is faulty. After the generator recovers, wait for a period of time, and the fault will be automatically cleared; 3. This fault will not affect the normal operation of off-grid mode. 4. When the generator and grid are connected simultaneously and meet the safety standard requirements, the grid will be prioritized for grid connection, and the system will operate in grid-connected state.
BMS Status Bit Error	BMS Module Fault	Disconnect the AC output-side switch and DC input-side switch. After 5 minutes, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
Ambient Overtemperature	1. Poor ventilation of the equipment 2. Hot airflow recirculates to the ambient temperature sampling point	Disconnect the AC output-side switch and DC input-side switch. After 5 minutes, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
PV Terminal Overtemperature	PV Terminal Overtemperature. Possible causes: 1. The inverter installation location is not well ventilated. 2. Ambient Overtemperature. 3. Internal fan operating abnormally.	1. Check whether the inverter installation location is well ventilated and whether the ambient temperature exceeds the maximum permissible ambient temperature range. 2. If ventilation is inadequate or Ambient Overtemperature occurs, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or after-sales service center.
BAT Terminal Overtemperature	BAT Terminal Overtemperature. Possible causes: 1. The inverter installation location is not well ventilated. 2. Ambient Overtemperature.	1. Check whether the inverter installation location is well ventilated and whether the ambient temperature exceeds the maximum permissible ambient temperature range. 2. If ventilation is inadequate or Ambient Overtemperature occurs, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or after-sales service center.
AC Terminal Overtemperature Warning	AC Terminal Overtemperature, possible causes: 1. The inverter installation location is not well ventilated. 2. Ambient Overtemperature. 3. Internal fan operating abnormally.	

Fault Name	Fault Cause	Troubleshooting Recommendations
BAT Terminal Overtemperature Warning	BAT Terminal Overtemperature. Possible causes: 1. The inverter installation location is not well ventilated. 2. Ambient Overtemperature.	1. Check whether the inverter installation location is well ventilated and whether the ambient temperature exceeds the maximum permissible ambient temperature range. 2. If ventilation is inadequate or Ambient Overtemperature occurs, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or after-sales service center.
Three-phase on-grid fault	Three-phase external wiring error	Rewire.
External STS Failure	Abnormal connection cable between the inverter and STS	Check whether the wiring harness connection sequence between the inverter and STS corresponds one-to-one in order.

Fault Name	Fault Cause	Troubleshooting Recommendations
Parallel Comm Timeout Shutdown	In parallel operation, if the slave has not communicated with the master for more than400seconds	Check whether the parallel communication harness is reliably connected and whether slave addresses are duplicated.
Three-phase off-grid phase loss fault	Three-phase system phase loss	1. Check whether all inverters are powered on; 2. Check whether each phase of the three-phase group is connected to an inverter;

Fault Name	Fault Cause	Troubleshooting Recommendations
EPO	External triggering of the hardware EPO button or remote triggering of the EPO command	1. If Remote Shutdown is actively triggered, it can be ignored; 2. If there is no active triggering,please contact your dealer or after-sales service center.
High combustible gas concentration	The combustible gas device automatically triggers when it detects a concentration of 20% LEL or above	1. After the fault occurs, the machine automatically opens the air valve to exhaust gas and reduce the concentration. When the concentration drops below 5% LEL and remains so for 15 minutes, the fault is automatically cleared. 2. After the fault occurs, if a cluster-level Fire Fighting Failure is triggered, the air valve will be automatically closed, and the air valve status will be confirmed within 30 s to ensure that cluster-level fire fighting executes Protection in a closed space. 3. Please contact your dealer or after-sales service center.
The air valve opening signal and feedback signal of the combustible gas device are inconsistent	The control signal for opening the air valve is inconsistent with the feedback signal	1. Check that the wiring harness signal connection is correct. 2. Please contact your dealer or after-sales service center.
One-click Shutdown Stop	Check via the App whether the one-click shutdown function is enabled.	Disable the one-click shutdown.

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

Fault Name	Fault Cause	Troubleshooting Recommendations
Combustible Gas Detection Device Communication Failure	1. The combustible gas device was not properly configured with RS-485 address 2 at the factory. 2. Abnormal communication link between the combustible gas device and the LC control box.	1. Check the communication harness of the link and observe whether the fault is cleared; 2. Try restarting the machine and observe whether the fault is cleared; 3. Use the method provided by the combustible gas manufacturer to check whether the address of the combustible gas device is 2; if not, modify it. 4. If the fault persists after restarting, please contact your dealer or after-sales service center.
DG Communication Failure	Abnormal communication link between the control board and the DG.	1. Check the communication harness of the link and observe whether the fault is cleared; 2. Try restarting the machine and observe whether the fault is cleared; 3. If the fault persists after restarting, please contact your dealer or after-sales service center.
Battery Over Voltage	1. Individual cell overvoltage 2. Abnormal voltage sampling line	Record the fault symptom, restart the battery, wait a few minutes, and confirm whether the fault disappears. If the problem still exists after restarting, please contact the after-sales service center.
	1. Battery total overvoltage 2. Abnormal voltage sampling line	
Battery Undervoltage	1. Individual cell undervoltage 2. Abnormal voltage sampling line	

Fault Name	Fault Cause	Troubleshooting Recommendations
	1. Battery total undervoltage 2. Abnormal voltage sampling line	
Battery Overcurrent	1. Excessive Charging Current, abnormal battery current limiting: sudden changes in temperature and voltage values 2. Abnormal inverter response	
	Excessive battery discharge current	
Battery Overtemperature	1. Ambient Overtemperature 2. Temperature sensor abnormality	
Battery Undertemperature	1. Ambient Undertemperature 2. Temperature sensor abnormality	
Battery Terminal Overtemperature	Terminal post overtemperature	

Fault Name	Fault Cause	Troubleshooting Recommendations
Battery Imbalance	1. Excessive temperature difference. At different stages, the battery limits its power, i.e., limits the charge/discharge current. Therefore, this problem is generally unlikely to occur. 2. Cell capacity degradation leads to excessive internal resistance; under Overcurrent, the temperature rise is large, resulting in a large temperature difference. 3. Poor welding of cell tabs causes the cell temperature to rise too quickly under Overcurrent. 4. Temperature sampling issue; 5. Loose power cable connection	

Fault Name	Fault Cause	Troubleshooting Recommendations
	1. Inconsistent degree of cell aging 2. Chip issues on the slave board can also cause excessive cell voltage differential; 3. Balancing issues on the slave board can also cause excessive cell voltage differential 4. Caused by wiring harness issues	
Insulation Resistance	Insulation resistance damage	Check whether the ground wire is properly connected, and restart the battery. If the problem persists after restart, please contact the after-sales service center.
Pre-charging Failure	Pre-charging Failure	Indicates that during pre-charging, the voltage across the pre-charge MOS consistently exceeds the specified threshold. After shutdown and restart, observe whether the fault persists, and check whether the wiring is correct and whether the pre-charge MOS is damaged.
Sampling Wire Fault	Poor contact or disconnection of the battery sampling wire	Check the wiring and restart the battery. If the problem persists after restart, please contact the after-sales service center.
	Poor contact or disconnection of the cell voltage sampling wire	Check the wiring and restart the battery. If the problem persists after restart, please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
	Poor contact or disconnection of the cell temperature sampling wire	
	Excessive error in dual-channel current comparison, or abnormal current sampling circuit	
	Excessive error in dual-channel voltage comparison or excessive voltage comparison error between MCU and AFE, or abnormal voltage sampling circuit	
	Abnormal temperature sampling circuit, or poor contact or disconnection	
	Level 5 overvoltage or Level 5 overtemperature; three-terminal fuse blown	The three-terminal fuse is blown; please contact the after-sales service center to replace the main control board.
Relay or MOS Overtemperature	Relay or MOS Overtemperature	This fault indicates that the MOS temperature exceeds the specified threshold. Shut down and let it stand for 2 h until the temperature recovers.

Fault Name	Fault Cause	Troubleshooting Recommendations
Shunt Overtemperature	Shunt Overtemperature	This fault indicates that the shunt temperature exceeds the specified threshold. Shut down and let it stand for 2 h until the temperature recovers.
BMS1 Other Fault 1 (Residential ESS)	Relay or MOS open circuit	1. Upgrade the software, shut down and let it stand for 5 minutes, then restart and check whether the fault persists; 2. If it persists, replace the battery pack
	Relay or MOS short circuit	1. Upgrade the software, shut down and let it stand for 5 minutes, then restart and check whether the fault persists; 2. If it persists, replace the battery pack
	Abnormal communication between the master cluster and slave clusters, or cell inconsistency between clusters	1. Check the battery information and software version of the slave unit, and whether the communication cable connection to the master unit is normal 2. Upgrade the software
	Battery system circuit harness abnormality, causing the interlock signal not to form a closed loop	Check whether the termination resistor is installed correctly

Fault Name	Fault Cause	Troubleshooting Recommendations
	BMS-PCS communication abnormal	1. Confirm whether the communication cable connector pinout between the battery and the inverter is correct; 2. Please contact the after-sales service center to check the backend data and observe whether the inverter and battery software match correctly.
	BMS master control and slave control communication harness abnormal	1. Check the wiring and restart the battery; 2. Upgrade the battery. If the problem persists after restart, please contact the after-sales service center.
	Communication between main negative chips lost	
	Air circuit breaker and shunt trip abnormal	1. Leave it powered off for 5 minutes, then restart and check whether the fault persists; 2. Check whether the bottom blind-mate communication pins between the PACK and PCU are loose or bent;
	MCU self-test failed	Upgrade the software and restart the battery. If the problem persists after restart, please contact the after-sales service center.
	1. The software version is too low or the BMS board is damaged 2. The number of parallel inverters is large, and the impact on the battery during pre-charging is too high	1. Upgrade the software and observe whether the fault persists 2. In the case of parallel operation, black-start the battery first, then start the inverter

Fault Name	Fault Cause	Troubleshooting Recommendations
	MCU internal fault	Upgrade the software and restart the battery. This is generally caused by damage to the MCU or external components. If the problem persists after restart, please contact the after-sales service center.
	Total control current exceeds the specified threshold	1. Leave it powered off for 5 minutes, then restart and check whether the fault persists; 2. Check whether the inverter power is set too high, causing the bus load to be exceeded;
	Parallel cluster battery cells are inconsistent	Confirm whether the cells of the parallel cluster batteries are consistent
	Parallel cluster battery positive and negative poles are reversely connected	Check whether the positive and negative poles of the parallel cluster batteries are reversely connected
	Severe over-temperature, over-voltage, etc. triggering the fire protection system	Contact the after-sales service center.
Air Conditioner Failure	Air conditioner abnormal failure	Try restarting the system. If the fault is not cleared, please contact the after-sales service center.
	Cabinet door is not closed	Check whether the cabinet door is properly closed
	Supply voltage is too high	

Fault Name	Fault Cause	Troubleshooting Recommendations
	Insufficient supply voltage	Verify that the supply voltage meets the air conditioner input voltage requirements, and power on again after confirmation.
	No voltage input	
	Unstable supply voltage	
	Unstable compressor voltage	Try restarting the system. If the fault is not cleared, please contact the after-sales service center.
	Sensor poor contact or damage	
	Air conditioner fan abnormality	
BMS1 Other Fault 2 (residential energy storage type)	Abnormal voltage or current inside DCDC	Refer to the specific DC Failure details.
	DCDC Overload or excessive heatsink temperature, etc.	
	Abnormal cell data acquisition or inconsistent aging levels	Please contact the after-sales service center.
	Fan operation not executed normally	Please contact the after-sales service center.
	Output port screws loose or poor contact	1. Shut down the battery and check the wiring and output port screws. 2. After confirmation, restart the battery and observe whether the fault persists. If it persists, contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
	Battery has been in use too long or battery cells are severely damaged	Please contact the after-sales service center to replace the pack.
	1. The software version is too low or the BMS board is damaged 2. The number of parallel inverters is large, and the impact on the battery during pre-charging is too high	1. Upgrade the software and observe whether the fault persists. 2. In parallel operation, black-start the battery first, then start the inverter.
	Heating film damaged	Please contact the after-sales service center.
	The three-terminal fuse of the heating film is open, and the heating function is unavailable	Please contact the after-sales service center.
	Software model, cell type, and hardware model do not match	Check whether the software model, SN number, cell type, and hardware model are consistent. If not, contact the after-sales service center.
	Thermal management board communication disconnected	1. Leave it powered off for 5 minutes, then restart and check whether the fault persists; 2. If the fault does not clear, contact after-sales to replace the pack.
	Pack fan fault signal triggered	

Fault Name	Fault Cause	Troubleshooting Recommendations
DCDC Failure	Output port voltage too high	Check the output port voltage. If the output port voltage is normal and the fault cannot be cleared automatically after restarting the battery, please contact the after-sales service center.
	The DCDC module detects that the Battery Voltage exceeds the maximum charging voltage	Stop charging, discharge to below 90% SOC, or leave it standing for 2 h. If ineffective and the fault still exists after restart, please contact the after-sales service center.
	Heat sink temperature too high	Leave the battery standing for 1 h until the heat sink temperature drops. If ineffective and the fault still exists after restart, please contact the after-sales service center.
	Excessive battery discharge current	Check whether the load exceeds the battery's discharge capability. Turn off the load or stop the PCS for 60 s. If ineffective and the fault still exists after restart, please contact the after-sales service center.
	The positive and negative poles of the power harness at the output port are reversely connected to the parallel battery clusters or PCS	Turn off the battery manual switch, check whether the output port wiring is correct, and restart the battery.
	The output power relay cannot close	Check whether the output port wiring is correct and whether there is a short circuit. If ineffective and the fault still exists after restart, please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
	Power device temperature too high	Leave the battery standing for 1 h until the temperature of the power devices inside the battery drops. If ineffective and the fault still exists after restart, please contact the after-sales service center.
	Relay sticking	If the fault still exists after restart, please contact the after-sales service center.
Battery Rack Circulating Current Failure	1. Cell imbalance 2. No full-charge calibration at first power-on	Record the fault symptom, restart the battery, wait a few minutes, and confirm whether the fault disappears. If the problem still exists after restarting, please contact the after-sales service center.
BMS1 Other Fault 3 (Large-scale Energy Storage Type)	Abnormal communication with the Linux module	1. Check whether the communication cable connection is normal 2. Upgrade the software, restart the battery, and observe whether the fault persists. If it persists, please contact the after-sales service center.
	Cell temperature rises too fast	Cell abnormality. Contact after-sales to replace the pack.
	SOC below 10%	Charge the battery.
	SN writing does not comply with the rules	Check whether the SN length is correct. If abnormal, please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
	1. Abnormal daisy-chain communication within the battery cluster 2. Inconsistent cell aging levels between battery clusters	1. Check the contact condition of the pack in a single battery cluster 2. Confirm the usage of each battery cluster, such as cumulative charge/discharge capacity and cycle count 3. Please contact the after-sales service center.
	High humidity inside the pack	-
	Fuse open	Contact after-sales service to replace the pack.
	Low battery level	Charge the battery.
BMS1 Other Fault 4 (Utility-Scale Storage)	Circuit breaker abnormality	Contact after-sales service to replace the pack.
	External device fault	Contact after-sales service to replace the pack.
Contactor Failure 1	-	-
Contactor Failure 2	-	-
Overload Protection (Ksic)	Continuous overload (over 690 kVA) for 10 s	Please contact the after-sales service center.
Overload Protection (Smart Port	Continuous overload (over 690 kVA) for 10 s	Please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
Overcurrent Protection (Ksic)	-	-
Overcurrent Protection (Smart Port)	-	-
Master AC On Meter Comm Error	1. The meter may not be connected to the master 2. The meter communication cable may be loose	1. Check whether the meter is connected to the master 2. Check whether the meter communication cable is loose
Parallel Slave Meter Error	Meter connected to slave	The device connected to the meter is set as the master
Slave AC On Timeout with Master	1. Slave address is set incorrectly 2. Slave communication cable is loose	1. Check whether slave addresses are duplicated 2. Check whether the parallel communication cable is loose

9.5.2.3 Battery Fault (LX a5.0-30, LX U5.0-30)

Alarm status

● When the battery ALM indicator is red, use the SOC indicator status to locate and troubleshoot the fault.

No.	SOC indicator	Fault Name	Corrective Measures
1	○○○●	Battery Over Voltage Battery Undervoltage	1. Check via the App whether the inverter Charging Current limit is 0. If it is 0, confirm whether the communication cable between the battery and the inverter is reliably connected and communication is normal. 2. Shut down and let it stand for 5 minutes. After restarting, confirm whether the fault persists. 3. If the fault is not cleared, please contact the after-sales service center.
2	○○●●	Battery Overcurrent	1. Check via the App whether the battery model is correct, and confirm whether the real-time battery current is greater than the Charging Current limit or the Discharge Current Limit value; please contact the after-sales service center. 2. If it is less than the limit, shut down the battery or upgrade the firmware, then restart and confirm whether the fault persists. 3. If the fault is not cleared, please contact after-sales.
3	○○●○	Battery Overtemperature Battery Undertemperature Battery Terminal Overtemperature	Power off and leave the system idle for 60 minutes to allow the temperature to recover. If the issue persists after restart, contact the after-sales service center.

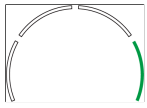
No.	SOC indicator	Fault Name	Corrective Measures
4	○●○○	Battery Imbalance	Power off and leave the system idle for 30 minutes. If the issue persists after restart, contact the after-sales service center.
		Low SOH Fault	
5	●○●●	Pre-charging Failure	1. Check whether the battery output and inverter connections are reversed. 2. Power off and leave the system idle for 5 minutes. If the issue persists after restart, contact the after-sales service center.
6	○●○●	Sampling Wire Fault	Confirm whether the battery switch is closed. If the battery switch is closed and the issue persists, contact the after-sales service center.
7	●●○○	Relay or MOS Overtemperature Shunt Overtemperature	Power off and leave the system idle for 30 minutes. If the issue persists after restart, contact the after-sales service center.
		Other BMS Fault: Output Port Overtemperature Fault	1. Check whether the battery power cables are securely locked. Power off and leave the system idle for 5 minutes. If the issue persists after restart, contact the after-sales service center.
8	○●●○	Other Protection: MOS Cannot Close	Power off and leave the system idle for 5 minutes. If the issue persists after restart, contact the after-sales service center.
9	○●●●	Other Protection: MOS Stuck	

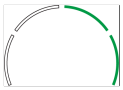
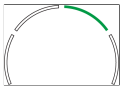
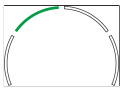
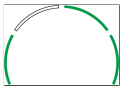
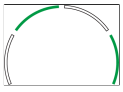
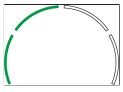
No.	SOC indicator	Fault Name	Corrective Measures
10	●○○○	Other Protection: Parallel Cluster Fault	1. Confirm whether the terminal resistor type and installation position are correct. 2. Check whether the communication cable connections between batteries and between the battery and the inverter are reliable and communication is normal. 3. If the fault is not cleared, please contact the after-sales service center.
11	○○○○	Other Protection: Loss of Communication with Inverter	1. Check whether the communication cable connections between batteries and between the battery and the inverter are reliable and communication is normal. 2. If the fault is not cleared, please contact the after-sales service center.
12	●○○●	Other Protection: BMU Communication Fault	1. Confirm whether the terminal resistor type and installation position are correct. 2. Check whether the communication cable connections between batteries and between the battery and the inverter are reliable and communication is normal. 3. Power off and leave the system idle for 5 minutes. If the issue persists after restart, contact the after-sales service center.
13	●○●○	Other Protection: Circuit Breaker Stuck Fault	Power off and leave the system idle for 5 minutes. If the issue persists after restart, contact the after-sales service center.
14	●●○●	Other Protection: Software Failure	Restart the battery. If the issue persists after restart, contact the after-sales service center.

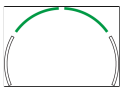
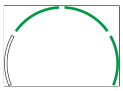
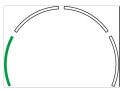
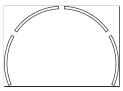
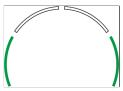
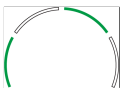
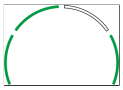
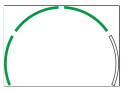
No.	SOC indicator	Fault Name	Corrective Measures
15	●●●○	Other Protection: Hardware Overcurrent Fault	
16	●●●●	Other Protection: Microelectronics Fault	
		Heating Film Three-Terminal Abnormality	1. Upgrade software 2. Power off and leave the system idle for 5 minutes. If the issue persists after restart, contact the after-sales service center.

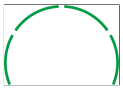
9.5.2.4 Battery Fault (GW14.3-BAT-LV-G10)

When the battery alarm indicator is red , the outer-ring running light flashes red , and when the running light is off, locate and troubleshoot the fault based on the SOC indicator status.

No.	SOC indicator	Fault Name	Corrective Measures
1		Battery Over Voltage	1. Check via the App whether the inverter's Charging Current limit is 0. If it is 0, confirm whether the communication cable between the battery and the inverter is reliably connected and communication is normal 2. Shut down and leave idle for 5 minutes. After restarting, confirm whether the fault persists 3. If the fault does not clear, contact the after-sales service center
		Battery Undervoltage	

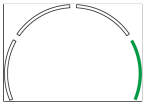
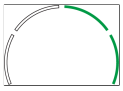
2		Battery Overcurrent	1. Check via the App whether the battery model is correct, and confirm whether the battery's real-time current is greater than the Charging Current limit or Discharge Current Limit value. If so, contact the after-sales service center 2. If it is less than the limit, shut down the battery or upgrade the firmware, then restart and confirm whether the fault persists 3. If the fault does not clear, contact after-sales
3		Battery Overtemperature	Power off and leave the system idle for 60 minutes to allow the temperature to recover. If the issue persists after restart, contact the after-sales service center.
		Battery Undertemperature	
		Battery Terminal Overtemperature	
4		Battery Imbalance	Power off and leave the system idle for 30 minutes. If the issue persists after restart, contact the after-sales service center.
		Low SOH Fault	
5		Pre-charging Failure	1. Confirm whether the battery output terminal and the inverter are reversely connected 2. Shut down and leave idle for 5 minutes. If the problem persists after restarting, contact the after-sales service center
6		Sampling Wire Fault	Confirm whether the battery circuit breaker is closed. If the battery circuit breaker is already closed and the problem persists, contact the after-sales service center
7		Relay or MOS Overtemperature	Power off and leave the system idle for 30 minutes. If the issue persists after restart, contact the after-sales service center.

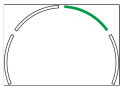
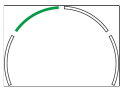
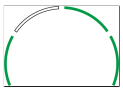
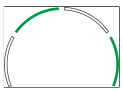
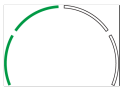
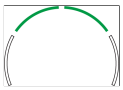
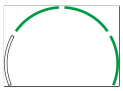
		Output port overtemperature	1. Check whether the battery power cable is securely tightened 2. Shut down and leave idle for 5 minutes. If the problem persists after restarting, contact the after-sales service center
8		MOS cannot close	Power off and leave the system idle for 5 minutes. If the issue persists after restart, contact the after-sales service center.
9		MOS stuck closed	
10		Parallel cluster fault	1. Confirm whether the type and installation position of the terminating resistor are correct 2. Confirm whether the communication cable between batteries and the communication cable between the battery and the inverter are reliably connected and communication is normal 3. If the fault does not clear, contact the after-sales service center
11		Software and hardware version mismatch	Restart the battery. If the issue persists after restart, contact the after-sales service center.
12		BMU communication fault	
13		Circuit breaker stuck-closed fault	Power off and leave the system idle for 5 minutes. If the issue persists after restart, contact the after-sales service center.
14		Software Failure	Restart the battery. If the issue persists after restart, contact the after-sales service center.
15		Hardware Overcurrent Fault	

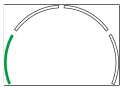
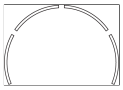
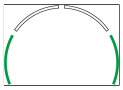
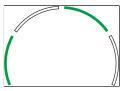
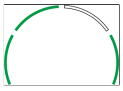
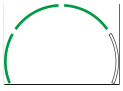
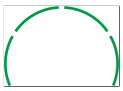
16		Microelectronic Fault	
		Heating Film Three-Terminal Abnormality	1. Upgrade the software 2. Shut down and leave idle for 5 minutes. If the problem persists after restarting, contact the after-sales service center

9.5.2.5 Battery Fault (GW16.1-BAT-LV-G10)

When the battery alarm indicator is red , the outer-ring running light flashes red , and when the running light is off, locate and troubleshoot the fault based on the SOC indicator status.

No.	SOC indicator	Fault Name	Corrective Measures
1		Battery Over Voltage	1. Check via the App whether the inverter's Charging Current limit is 0. If it is 0, confirm whether the communication cable between the battery and the inverter is reliably connected and communication is normal 2. Shut down and leave idle for 5 minutes. After restarting, confirm whether the fault persists 3. If the fault does not clear, contact the after-sales service center
		Battery Undervoltage	
2		Battery Overcurrent	1. Check via the App whether the battery model is correct, and confirm whether the battery's real-time current is greater than the Charging Current limit or Discharge Current Limit value. If so, contact the after-sales service center 2. If it is less than the limit, shut down the battery or upgrade the firmware, then restart and confirm whether the fault persists 3. If the fault does not clear, contact after-sales

3		Battery Overtemperature	Power off and leave the system idle for 60 minutes to allow the temperature to recover. If the issue persists after restart, contact the after-sales service center.
		Battery Undertemperature	
		Battery Terminal Overtemperature	
4		Battery Imbalance	Power off and leave the system idle for 30 minutes. If the issue persists after restart, contact the after-sales service center.
		Low SOH Fault	
5		Pre-charging Failure	1. Confirm whether the battery output terminal and the inverter are reversely connected 2. Shut down and leave idle for 5 minutes. If the problem persists after restarting, contact the after-sales service center
6		Sampling Wire Fault	Confirm whether the battery circuit breaker is closed. If the battery circuit breaker is already closed and the problem persists, contact the after-sales service center
7		Relay or MOS Overtemperature	Power off and leave the system idle for 30 minutes. If the issue persists after restart, contact the after-sales service center.
		Output port overtemperature	1. Check whether the battery power cable is securely tightened 2. Shut down and leave idle for 5 minutes. If the problem persists after restarting, contact the after-sales service center
8		MOS cannot close	Power off and leave the system idle for 5 minutes. If the issue persists after restart, contact the after-sales service center.
9		MOS stuck closed	

10		Parallel cluster fault	1. Confirm whether the type and installation position of the terminating resistor are correct 2. Confirm whether the communication cable between batteries and the communication cable between the battery and the inverter are reliably connected and communication is normal 3. Confirm via the battery SN code whether the battery cells in the parallel clusters are consistent 4. If the fault is not resolved, please contact the after-sales service center
11		Software and hardware version mismatch	Restart the battery. If the issue persists after restart, contact the after-sales service center.
12		BMU communication fault	
13		Circuit breaker stuck-closed fault	Power off and leave the system idle for 5 minutes. If the issue persists after restart, contact the after-sales service center.
14		Software Failure	Restart the battery. If the issue persists after restart, contact the after-sales service center.
15		Hardware Overcurrent Fault	
16		Microelectronic Fault	
		Heating Film Three-Terminal Abnormality	1. Upgrade the software 2. Shut down and leave idle for 5 minutes. If the problem persists after restarting, contact the after-sales service center

9.5.2.6 Mix Parallel Unit Fault

No.	Fault Name	Corrective Measures
1	Parallel cluster fault	Confirm the actual number of battery clusters in parallel. If >30, remove the excess batteries; if the actual number is ≤30, shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
2	Shunt temperature too high	Power off and let stand for 2 h, shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
3	Software Failure	Shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
4	Master control Overload fault	Shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
5	Parallel unit Hardware Overcurrent fault	Shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
6	Control box communication alarm	Check whether the communication cable between the battery and the parallel unit is loose or has poor contact. Shut down the parallel system and restart the parallel unit. If the fault persists, contact the after-sales service center.
7	Control box communication fault	Check whether the communication cable between the battery and the parallel unit is loose or has poor contact. Shut down the parallel system and restart the parallel unit. If the fault persists, contact the after-sales service center.

No.	Fault Name	Corrective Measures
8	PCS Comm Loss	Check whether the communication cable between the inverter and the parallel unit is loose or has poor contact. Shut down the parallel system and restart the parallel unit. If the fault persists, contact the after-sales service center.
9	Parallel unit MOS open-circuit fault	Shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
10	Parallel unit MOS stuck-on fault	Shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
11	Parallel unit MOS over-temperature fault	Power off and let stand for 2 h, shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
12	Parallel unit wiring abnormality	Check whether the wire sequence of the communication cable and power cable of the battery connected to the parallel unit matches. Shut down the parallel system and restart the parallel unit. If the fault persists, contact the after-sales service center.

10 Technical Specifications

10.1 Inverter Parameters

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Battery Side*1				
Battery Type	Li-Ion/Lead-acid	Li-Ion/Lead-acid	Li-Ion/Lead-acid	Li-Ion/Lead-acid
Nominal Battery Voltage (V)	48	48	48	48
Battery voltage range (V)	40~60	40~60	40~60	40~60
Start-up Voltage(V)	30	30	30	30
Number of Battery Input	1	1	1	1
Max. Continuous Charging Current (A)	125	135	175	220
Max. Continuous Discharging Current (A)	125	135	175	220
Max Charging Power (kW)	5	6	8	10

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Max Discharging Power (kW)	5.5	6.6	8.8	11
PV Side				
Max. Input Power (kW)	10	12	16	20
Max. Input Voltage (V) *2	1000	1000	1000	1000
MPPT Operating Voltage Range (V) *4	150-850	150-850	150-850	150-850
MPPT Operating Voltage Range at Nominal Power (V)	300~850	300~850	300~850	300~850
Start-up Voltage (V)	180	180	180	180
Nominal Input Voltage (V)	620	620	620	620
Max. MPPT Current (A)	20/20	20/20	20/20	20/20/20
Max. MPPT Short Circuit Current(A)	26/26	26/26	26/26	26/26/26
Max. Backfeed Current to the Array (A)	0	0	0	0

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Number of MPPTs	2	2	2	3
Number of Strings per MPPT	1/1	1/1	1/1	1/1/1
AC Side (On-grid)				
Nominal Power (kW)	5	6	8	10
Max. Power (kW)	5.5*5	6.6*5	8.8*5	11.0*5
Nominal Power at 40 ℃ (kW)	5	6	8	10
Max. Power at 40 ℃ (kW)	5.5*5	6.6*5	8.8*5	11.0*5
Nominal Apparent Power Output to Grid (kVA)	5	6	8	10
Max. Apparent Power to Utility Grid (kVA)*6	5.5*5	6.6*5	8.8*5	11.0*5
Nominal Apparent Power from Grid(kVA)	5	6	8	10
Max. Apparent Power from Grid (kVA)	48.3	48.3	48.3	48.3

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Nominal Voltage (V)	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE
Voltage Range (V)	295~502	295~502	295~502	295~502
Nominal Frequency (Hz)	50/60	50/60	50/60	50/60
Frequency Range (Hz)	45~65	45~65	45~65	45~65
Max. Current to Grid (A)	7.9@230V 8.3@220V	9.6@230V 10@220V	12.8@230V 13.4@220V	15.9@230V 16.7@220V
Max. Current From Grid (A)	70	70	70	70
Nominal Current From Grid (A)	7.5@220V 7.2@230V	9.1@220V 8.7@230V	12.1@220V 11.6@230V	15.2@220V 14.5@230V
Max. Output Fault Current (Peak and Duration) (A)	99	99	99	99
Inrush Current (Peak and Duration) (A)	300A/2ms	300A/2ms	300A/2ms	300A/2ms
Nominal Current to Grid (A)	7.5@220V 7.2@230V	9.1@220V 8.7@230V	12.1@220V 11.6@230V	15.2@220V 14.5@230V

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Power Factor	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)
THDI	<3%	<3%	<3%	<3%
Maximum Output Overcurrent Protection (A)	70	70	70	70
Type of voltage	a.c.	a.c.	a.c.	a.c.
Back-up Side				
Nominal Output Apparent Power (kVA)	5	6	8	10
Max. Output Apparent Power(kVA)	5.5 (10.0, 10s)	6.6 (12.0, 10s)	8.8 (16.0, 10s)	11.0 (20.0, 10s)
Max. Output Apparent Power with Grid (kVA)	48.3	48.3	48.3	48.3
Nominal Output Current (A)	7.5@220V 7.2@230V	9.1@220V 8.7@230V	12.1@220V 11.6@230V	15.2@220V 14.5@230V
Max Output Current(Bypass)	70	70	70	70

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Max. Fault Current (Peak and Duration) (A)	99 @100ms	99 @100ms	99 @100ms	99 @100ms
Inrush Current (Peak and Duration) (A)	300 @2ms	300 @2ms	300 @2ms	300 @2ms
Maximum Overcurrent Protection (A)	70	70	70	70
Nominal Output Voltage (V)	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE
Nominal Output Frequency (Hz)	50/60	50/60	50/60	50/60
Generator Side				
Nominal Apparent Power (kVA)	20	20	20	20
Max. Apparent Power (kVA)	20	20	20	20
Nominal Voltage (V)	400/380	400/380	400/380	400/380
Input Voltage Range (V)	295~502	295~502	295~502	295~502
Nominal Frequency (Hz)	50/60	50/60	50/60	50/60

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Frequency Range (Hz)	45~55/55~65	45~55/55~65	45~55/55~65	45~55/55~65
Max. Current (A)	30.3	30.3	30.3	30.3
Efficiency				
Max. Efficiency	0.978	0.978	0.978	0.978
European Efficiency	0.97	0.97	0.971	0.973
Max. Battery to AC Efficiency	0.955	0.955	0.955	0.955
MPPT Efficiency	0.999	0.999	0.999	0.999
Protection				
PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Battery Reverse Polarity Protection	Optional	Optional	Optional	Optional
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated	Integrated
DC Surge Protection	Type II	Type II	Type II	Type II
AC Surge Protection	Type II	Type II	Type II	Type II
AFCI *9	Optional	Optional	Optional	Optional
Rapid Shutdown	Optional	Optional	Optional	Optional
Remote Shutdown	Integrated	Integrated	Integrated	Integrated
General Data				
Operating Temperature Range (℃)	-35~+60	-35~+60	-35~+60	-35~+60
Operating Environment	Outdoor	Outdoor	Outdoor	Outdoor

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Relative Humidity	0 ~ 95%	0 ~ 95%	0 ~ 95%	0 ~ 95%
Max. Operating Altitude (m)	4000	4000	4000	4000
Cooling Method	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling
User Interface	LCD	LCD	LCD	LCD
Communication with BMS	CAN	CAN	CAN	CAN
Communication	WIFI+LAN+Bluetooth, 4G, RS485, CAN	WIFI+LAN+Bluetooth, 4G, RS485, CAN	WIFI+LAN+Bluetooth, 4G, RS485, CAN	WIFI+LAN+Bluetooth, 4G, RS485, CAN
Communication Ptotocols	Modbus RTU(RS485), Modbus TCP/IP(Ethernet), Sunspec Modbus RTU	Modbus RTU(RS485), Modbus TCP/IP(Ethernet), Sunspec Modbus RTU	Modbus RTU(RS485), Modbus TCP/IP(Ethernet), Sunspec Modbus RTU	Modbus RTU(RS485), Modbus TCP/IP(Ethernet), Sunspec Modbus RTU
Weight (kg)	42.2	42.2	42.2	45.3
Dimension（W×H×D mm）	551*756*258	551*756*258	551*756*258	551*756*258
Noise Emission (dB)	<45	<45	<45	<45
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Power Self-consumption at Night (W)	<15	<15	<15	<15

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Ingress Protection Rating	IP66	IP66	IP66	IP66
Anti-corrosion Class	C4	C4	C4	C4
DC Connector	MC4	MC4	MC4	MC4
AC Connector	Tube Terminal	Tube Terminal	Tube Terminal	Tube Terminal
Environmental Category	4K4H	4K4H	4K4H	4K4H
Pollution Degree	III	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I	I
Storage Temperature (℃)	-40~70	-40~70	-40~70	-40~70
Decisive Voltage Classification (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	Battery：A PV：C AC：C Com：A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	AFDPF + AQDPF *10	AFDPF + AQDPF *10	AFDPF + AQDPF *10	AFDPF + AQDPF *10

Technical Data	GW5K-ET-L-G10	GW6K-ET-L-G10	GW8K-ET-L-G10	GW10K-ET-L-G10
Type of Electrical Supply System	Three phase Grid	Three phase Grid	Three phase Grid	Three phase Grid
Country of Manufacture	China	China	China	China
Certification				
Grid Standards	NRS 097-2-1, IEC 62116, IEC 61727, IEC 61683, IEC 62891, IEC 60068, EN50530			
Safety Regulation	IEC 62109-1, IEC 62109-2			
EMC	IEC 62920, IEC 61000, EN300328, EN 301489, EN IEC 62311, EN 62479			

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Battery Side*1				
Battery Type	Li-Ion/Lead-acid	Li-Ion/Lead-acid	Li-Ion/Lead-acid	Li-Ion/Lead-acid
Nominal Battery Voltage (V)	48	48	48	48
Battery voltage range (V)	40~60	40~60	40~60	40~60
Start-up Voltage(V)	30	30	30	30
Number of Battery Input	1	2	2	1

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Max. Continuous Charging Current (A)	250	165/165	208/208	250
Max. Continuous Discharging Current (A)	250	165/165	208/208	250
Max Charging Power (kW)	12	15	20	12
Max Discharging Power (kW)	13.2	16.5	22	13.2
PV Side				
Max. Input Power (kW)	24	30	40	24
Max. Input Voltage (V) *2	1000	1000	1000	1000*3
MPPT Operating Voltage Range (V) *4	150-850	150-850	150-850	150-850
MPPT Operating Voltage Range at Nominal Power (V)	300~850	350~850	350~850	300~760

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Start-up Voltage (V)	180	180	180	180
Nominal Input Voltage (V)	620	620	620	620
Max. MPPT Current (A)	20/20/20	20/20/20/20	20/20/20/20	20/20/20
Max. MPPT Short Circuit Current(A)	26/26/26	26/26/26/26	26/26/26/26	26/26/26
Max. Backfeed Current to the Array (A)	0	0	0	0
Number of MPPTs	3	4	4	3
Number of Strings per MPPT	1/1/1	1/1/1/1	1/1/1/1	1/1/1
AC Side (On-grid)				
Nominal Power (kW)	12	15	20	12
Max. Power (kW)	13.2*5	16.5*5	22.0*5	12.0*5
Nominal Power at 40 ℃ (kW)	12	15	20	12
Max. Power at 40 ℃ (kW)	13.2*5	16.5*5	22.0*5	12.0*5

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Nominal Apparent Power Output to Grid (kVA)	12	15	20	12
Max. Apparent Power to Utility Grid (kVA)*6	13.2*5	16.5*5	22.0*5	12.0*5
Nominal Apparent Power from Grid(kVA)	12	15	20	12
Max. Apparent Power from Grid (kVA)	48.3	48.3	48.3	26.7
Nominal Voltage (V)	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE	220, 3L/N/PE, 3L/PE*7
Voltage Range (V)	295~502	295~502	295~502	170~290
Nominal Frequency (Hz)	50/60	50/60	50/60	60
Frequency Range (Hz)	45~65	45~65	45~65	55~65
Max. Current to Grid (A)	19.1@230V 20@220V	23.9@230V 25@220V	31.9@230V 33.3@220V	31.5@127V

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Max. Current From Grid (A)	70	70	70	70
Nominal Current From Grid (A)	18.2@220V	22.7@220V	30.3@220V	31.5@127V
	17.4@230V	21.7@230V	29@230V	
Max. Output Fault Current (Peak and Duration) (A)	99	99	99	99
Inrush Current (Peak and Duration) (A)	300A/2ms	300A/2ms	300A/2ms	300A/2ms
Nominal Current to Grid (A)	18.2@220V	22.7@220V	30.3@220V	31.5@127V
	17.4@230V	21.7@230V	29.0@230V	
Power Factor	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)
THDI	<3%	<3%	<3%	<3%
Maximum Output Overcurrent Protection (A)	70	70	70	70

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Type of voltage	a.c.	a.c.	a.c.	a.c.
Back-up Side				
Nominal Output Apparent Power (kVA)	12	15	20	12
Max. Output Apparent Power(kVA)	13.2 (24.0, 10s)	16.5 (30.0, 10s)	22.0 (40.0, 10s)	13.2 (24.0, 10s)
Max. Output Apparent Power with Grid (kVA)	48.3	48.3	48.3	26.7
Nominal Output Current (A)	18.2@220V	22.7@220V	30.3@220V	31.5@127V
	17.4@230V	21.7@230V	29@230V	
Max Output Current(Bypass)	70	70	70	70
Max. Fault Current (Peak and Duration) (A)	99 @100ms	99 @100ms	99 @100ms	99 @100ms
Inrush Current (Peak and Duration) (A)	300 @2ms	300 @2ms	300 @2ms	300 @2ms

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Maximum Overcurrent Protection (A)	70	70	70	70
Nominal Output Voltage (V)	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE	220, 3L/N/PE, 3L/PE*7
Nominal Output Frequency (Hz)	50/60	50/60	50/60	60
Generator Side				
Nominal Apparent Power (kVA)	20	20	20	12
Max. Apparent Power (kVA)	20	20	20	12
Nominal Voltage (V)	400/380	400/380	400/380	220
Input Voltage Range (V)	295~502	295~502	295~502	170~290
Nominal Frequency (Hz)	50/60	50/60	50/60	60
Frequency Range (Hz)	45~55/55~65	45~55/55~65	45~55/55~65	55~65
Max. Current (A)	30.3	30.3	30.3	31.5

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Efficiency				
Max. Efficiency	0.978	0.979	0.978	0.978
European Efficiency	0.973	0.973	0.974	0.973
Max. Battery to AC Efficiency	0.955	0.955	0.955	0.955
MPPT Efficiency	0.999	0.999	0.999	0.999
Protection				
PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection	Optional *8	Optional *8	Optional *8	Integrated

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated	Integrated
DC Surge Protection	Type II	Type II	Type II	Type II
AC Surge Protection	Type II	Type II	Type II	Type II
AFCI *9	Optional	Optional	Optional	Integrated
Rapid Shutdown	Optional	Optional	Optional	Optional
Remote Shutdown	Integrated	Integrated	Integrated	Integrated
General Data				
Operating Temperature Range (℃)	-35~+60	-35~+60	-35~+60	-35~+60

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Operating Environment	Outdoor	Outdoor	Outdoor	Outdoor
Relative Humidity	0 ~ 95%	0 ~ 95%	0 ~ 95%	0 ~ 95%
Max. Operating Altitude (m)	4000	4000	4000	4000
Cooling Method	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling
User Interface	LCD	LCD	LCD	LCD
Communication with BMS	CAN	CAN	CAN	CAN
Communication	WIFI+LAN+Bluetooth, 4G, RS485, CAN	WIFI+LAN+Bluetooth, 4G, RS485, CAN	WIFI+LAN+Bluetooth, 4G, RS485, CAN	WIFI+LAN+Bluetooth, 4G, RS485, CAN
Communication Ptotocols	Modbus RTU(RS485), Modbus TCP/IP(Ethernet), Sunspec Modbus RTU	Modbus RTU(RS485), Modbus TCP/IP(Ethernet), Sunspec Modbus RTU	Modbus RTU(RS485), Modbus TCP/IP(Ethernet), Sunspec Modbus RTU	Modbus RTU(RS485), Modbus TCP/IP(Ethernet), Sunspec Modbus RTU
Weight (kg)	45.3	49.7	51.2	45.1
Dimension（W×H×D mm）	551*756*258	551*756*258	551*756*258	551*756*258
Noise Emission (dB)	<45	<45	<45	<45

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Power Self-consumption at Night (W)	<15	<15	<15	<15
Ingress Protection Rating	IP66	IP66	IP66	IP66
Anti-corrosion Class	C4	C4	C4	C4
DC Connector	MC4	MC4	MC4	MC4
AC Connector	Tube Terminal	Tube Terminal	Tube Terminal	Tube Terminal
Environmental Category	4K4H	4K4H	4K4H	4K4H
Pollution Degree	III	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I	I
Storage Temperature (℃)	-40~70	-40~70	-40~70	-40~70
Decisive Voltage Classification (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	Battery：A PV：C AC：C Com：A

Technical Data	GW12K-ET-L-G10	GW15K-ET-L-G10	GW20K-ET-L-G10	GW12K-ET-LL-G10
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	AFDPF + AQDPF *10	AFDPF + AQDPF *10	AFDPF + AQDPF *10	AFDPF + AQDPF *10
Type of Electrical Supply System	Three phase Grid	Three phase Grid	Three phase Grid	Three phase Grid
Country of Manufacture	China	China	China	China
Certification				
Grid Standards	NRS 097-2-1, IEC 62116, IEC 61727, IEC 61683, IEC 62891, IEC 60068, EN50530			
Safety Regulation	IEC 62109-1, IEC 62109-2			
EMC	IEC 62920, IEC 61000, EN300328, EN 301489, EN IEC 62311, EN 62479			

*1: Different models of batteries cannot be mixed in parallel on same battery input

*2: When the input voltage is greater than 980V, the inverter will enter standby mode, and when the voltage returns to below 950V the inverter will return to normal operation.

*3: The Max. PV voltage should be kept below 800V; otherwise, it will affect the load-carrying capacity.

*4: Please refer to the user manual for the MPPT Voltage Range at Nominal Power.

*5: For Brazil and Chile and Sri Lanka, the Max. power is the same as the Nominal Power.

*6: For Chile, Max. Apparent Power to Utility Grid is same as Nominal Apparent Power Output to Grid.

*7: GW12K-ET-LL-G10 supports delta grids in some regions.

*8: For Brazil, for GW12K-ET-L-G10, GW15K-ET-L-G10 and GW20K-ET-L-G10, the Battery Reverse Polarity Protection is integrated.

*9: AFCI is integrated in Brazil.

*10: AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback.

10.2 Battery Technical Specifications

10.2.1 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
Rated Capacity (Ah)	100
Nominal Charge Current (A) *2	60
Max. Continuous Charge Current (A) *2*3	90
Nominal Discharge Current (A) *2	100
Max. Continuous Discharge Current (A) *2*3	150
Max. Pulse Discharge Current (A)*2*3	<200A（30s）
Max. Continuous Discharge Power (W)	7200
Communication	CAN
Operating Temperature Range (℃)	Charge: 0＜T≤55 Discharge: -20＜T≤55
Maximum Operating Altitude (m)	4000

Technical Parameters	LX A5.0-30
Weight (Kg)	44
Dimensions (W x H x D mm)	442*133*520 (Excluding hanger) 483*133*559 (Including hanger)
Ingress Protection Rating	IP20
Application Method	On-grid/On-grid + Backup/ off Grid
Scalability	Max. 30 in Parallel (150kWh) (Hand to hand /Combiner box /Busbar)
Mounting Method	19-inch standard rack, Floor-mounted, Wall-Mounted
Round-trip Efficiency*1	≥96%
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

*1 Test conditions: 100% DOD, 0.2C charge & discharge at 25°C± 2°C, 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 and power values maybe variant with different inverter models.

10.2.2 LX U5.0-30

Technical Parameters	LX U5.0-30
Nominal Battery Energy (kWh)	5.12
Usable Energy (kWh)*1	5

Technical Parameters	LX U5.0-30
Cell Type	LiFePO4
Nominal Voltage (V)	51.2
Operating Voltage Range (V)	43.2~58.24
Rated Capacity (Ah)	100
Nominal Charge Current (A)	60
Max Charge Current (A)*2*3	90
Nominal Discharge Current (A)*4	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
TChg (Charging Temperature Range) (℃) TDsch (Discharging Temperature Range) (℃)	0<T≤55
	-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%

Technical Parameters	LX U5.0-30
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.	

10.2.3 GW14.3-BAT-LV-G10

Technical Data	GW14.3-BAT-LV-G10
Rated Energy (kWh)	14.3
Usable Energy (kWh)*1	≥13.8
Battery Type	LFP ($LiFePO_4$)
Nominal Voltage (V)	51.2
Max. Continuous Charging Current (A)	224
Max. Continuous Discharging Current (A)	260
Max. Input Power (System) (kW)*2	12
Max. Output Power (System) (kW)*2	12 (13.2 @10min)

Technical Data	GW14.3-BAT-LV-G10
Peak Output Power (System) (kW)*2	20 @15s
Charging Temperature Range (°C)	0~55
Discharging Temperature Range (°C)	-20~55
Relative Humidity	5~85%
Max. Operating Altitude (m)	4000
Noise Emission (dB)	≤35
Communication	CAN, RS485
Weight (kg)	125
Dimensions (W×H×D mm)	530*885*246 (Without the base) 530*918.6*246 (With base included)
Optional Function Configuration	Aerosol
Ingress Protection	IP20
Storage Temperature (℃)	-20~45
Ambient Temperature (℃)	0~45 (Standard configuration) 10~35 (Recommend) -20~45 (Optional)
Max. Storage time	12 months (-20℃~35℃) 6 months (35℃~45℃)
Scalability	30 pcs
Mounting Method	Floor-Mounted, Wall-Mounted
Cycle Life	≥6500 (25±2℃, 0.5C, 90%DOD, 70%EOL)

Technical Data		GW14.3-BAT-LV-G10
Country of Manufacture		China
Standard and Certification	Safety	IEC 62619, IEC 63056, IEC 60730-1
	EMC	EN IEC61000-6-1, EN IEC61000-6-2, EN IEC61000-6-3, EN IEC61000-6-4
	Transportation	UN38.3, ADR, MSDS

*1: Test conditions, 100% DOD (cell 2.85~3.6V voltage range), 0.2P charge & discharge at 25±2 °C for battery system at the beginning of life. Usable energy is defined by its initial design value. Actual available energy may vary depending on charge/discharge rate, environmental conditions (e.g. temperature), transport and storage factors.
*2: Max. Input Power /Max. Output Power/Peak.Output Power derating will occur related to Temperature and SOC.

10.2.4 GW16.1-BAT-LV-G10

Technical Data	GW16.1-BAT-LV-G10
Battery Type	LFP (LiFePO4)
Rated Capacity (Ah)	314
Rated Energy (kWh)	16.1
Usable Energy (kWh)*1	≥14.9
Nominal Voltage(V)	51.2
Voltage Range(V)	45.92~57.76
Max. Continuous Charging Current (System) (A)	157
Max. Continuous Discharging Current (System) (A)	200
Max. Input.Power (kW)*2	8

Technical Data	GW16.1-BAT-LV-G10
Max. Output.Power (kW)*2	10
Peak Output Power (System)(kW)*2	16 (15s)
Charging Temperature Range(℃)	0~55
Discharging Temperature Range (℃)	-20~55
Relative Humidity	5-95%
Max. Operating Altitude (m)	4000
Communication	CAN
Weight (kg)	≤122
Useable Extinguishing Agent	CO2, H2O
Crucial Material	$LiFePO_4$, C, Cu, $LiPF_6$, Al, $(C_3H_6)n$
Ingress Protection	IP65
Anti-corrosion Class	C5-M
Protective Class	Ⅰ
Dimensions (W×H×D mm)	≤470*895*245 (No base)
Optional Function Configuration	Regulating wheel (Optional); Aerosol fire extinguishing (Optional)
Storage Temperature (℃)	-20 ~45
Max. Storage time	-20-35℃≤12months
	35-45℃≤ 6 months
Scalability	30P
Mounting Method	Wall-Mounted、Floor-Mounted
Cycle Life	≥10000 （25±2℃ 0.5C 90%DOD 70% SOH ）

Technical Data		GW16.1-BAT-LV-G10
Country of Manufacture		China
Standard and Certification	Safety	IEC62619, IEC60730，IEC63056，CE
	EMC	CE
	Transportation	UN38.3, MSDS

*1: For South America, different models of batteries cannot be mixed in parallel directly, if you need to mix and connect different models, please contact GoodWe.
*2: Test conditions, 100% DOD (cell 2.87~3.61V voltage range), 0.5C charge & discharge at 25±2℃ for battery system at the beginning of life. Usable energy is defined by its initial design value. Actual available energy may vary depending on charge/discharge rate, environmental conditions (e.g. temperature), transport and storage factors.
*3: Max.Input Power/Max.Output Power/Peak Output Power derating will occur related to Temperature and SOC.
*4: Based on test data under specific laboratory conditions.

10.3 Mix Parallel Unit Technical Data

Technical Data	GW12/2-MPU-LVO-G10
Battery Voltage Range (V)	40~60
Max.Single-port Input Current（A）	200
Max. Output Current（A）	240
Max.Single-port Input Power (kW)*1	10

Technical Data	GW12/2-MPU-LVO-G10
Max. Output Power (kW)*1	12
Peak Output Power (kW)	18（10S）
Number of input power ports	2
Number of output power ports	1
Operation Temperature Range （℃）	-30~65
Relative Humidity	5%~95%
Max. Operating Altitude (m)	4000
Communication	CAN
Number of input Communication ports	2
Number of output Communication ports	1
Weight (kg)	≤10kg
Dimensions (H×W×D mm)	332*537*132

Technical Data	GW12/2-MPU-LVO-G10
Maximum number of batteries supported in parallel*2	30P
Ingress Protection	IP65
Storage Temperature (℃)	-40~85
Mounting Method	Wall-Mounted
Country of Manufacture	China

*1: Max.Single-port Input Power/Max. Output Power derating will occur related to Temperature and State of Charge (SOC) of battery products.
*2 The maximum number of batteries that can be connected in parallel is determined by the total capacity supported across all input ports. Additionally, the maximum parallel capacity per individual port is constrained by the specified maximum parallel capacity of the battery model.

10.4 Smart Meter Technical Specifications

10.4.1 GM330

Technical Specifications		GM330
Measurement Range	Supported Type of Electrical Supply System	Three-phase, split-phase, single-phase
	Voltage Range L-L (Vac)	172~817
	Voltage Range L-N (Vac)	100~472
	Nominal Frequency (Hz)	50/60
	CT Ratio	nA:5A

Technical Specifications		GM330
Communication Parameters	Communication Method	RS485
	Communication Distance (m/ft)	1000/3280
Accuracy Parameters	Voltage/Current	Class 0.5
	Active Energy	Class 0.5
	Reactive Energy	Class 1
General Parameters	Dimensions (WxHxD mm/in)	72x85x72/2.83x3.35×2.83
	Housing	4 modules
	Weight (g/Ib)	240/0.53
	Mounting Method	DIN rail
	User Interface	4 LEDs, reset button
	Power Consumption (W)	≤5
Environmental Parameters	IP Rating	IP20
	Operating Temperature Range (℃/°F)	-30~+70/-22~+158
	Storage Temperature Range (℃/°F)	-30~70/-22~+158
	Relative Humidity (non-condensing)	0~95%
	Max. Operating Altitude (m/ft)	3000/9842
Certification Parameters	Certificate	UL1741/ANSI

10.5 Smart Communication Stick Technical Specifications

10.5.1 WiFi/LAN Kit-20

Technical Specifications	WiFi/LAN Kit-20
Output Voltage (V)	5

Technical Specifications		WiFi/LAN Kit-20
Power Consumption (W)		≤2
Communication Interface		USB
Communication Parameters	Ethernet	10M/100Mbps Auto-negotiation
	Wireless	IEEE 802.11 b/g/n @2.4 GHz
	Bluetooth	Bluetooth V4.2 BR/EDR and Bluetooth LE standards
Mechanical Parameters	Dimensions (W×H×D mm)	48.3*159.5*32.1
	Weight (g)	82
	Ingress Protection Rating	IP65
	Mounting Method	USB Port Plug/Unplug
Operating Temperature Range (℃)		-30~+60
Storage Temperature Range (℃)		-40~+70
Relative Humidity		0-95%
Max. Operating Altitude (m)		4000

10.5.2 4G Kit-CN-G20

Product Model	4G Kit-CN-G20
Device management	
Maximum number of supported inverters	1
Power parameters	
Input voltage (V)	5
Power Consumption (W)	≤4
Interface Type	USB
Communication Parameters	
4G/3G/2G	LTE-FDD：B1/B3/B5/B8 LTE-TDD：B34/B39/B40/B41
GNSS Positioning	/
Bluetooth	Bluetooth V5.0
Mechanical Parameters	
Dimensions (W×H×D mm)	48.3*95.5*32.1
Weight (g)	87
Indicator	LED* 2

Product Model	4G Kit-CN-G20
Mounting Method	Plug and Play
SIM Card Size	Micro sim,15mm*12mm
Environmental Parameters	
Operating Temperature Range (℃)	-30~+65
Storage Temperature Range (℃)	-40~+70
Relative Humidity	0-100%
IP Rating	IP66
Max. Operating Altitude (m)	4000
Safe Service Life (years)	5

10.5.3 4G Kit-G20

Product Model	4G Kit-G20
Device management	
Maximum number of supported inverters	1
Power parameters	
Input voltage (V)	5
Power Consumption (W)	≤5
Interface Type	USB
Communication Parameters	
4G/3G/2G	LTE-FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28/66 LTE-TDD: B34/38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM/EDGE: B2/3/5/8
GNSS Positioning	/
Bluetooth	Bluetooth V5.0
Mechanical Parameters	
Dimensions (W×H×D mm)	48.3*328*32.3 (including external antenna)
Weight (g)	100 (including external antenna)
Indicator	LED* 2
Mounting Method	Plug and Play
SIM Card Size	Micro sim, 15mm*12mm

Product Model	4G Kit-G20
Environmental Parameters	
Operating Temperature Range (℃)	-30~+65
Storage Temperature Range (℃)	-40~+70
Relative Humidity	0-100%
IP Rating	IP66
Max. Operating Altitude (m)	4000
Standards Met	
Certification	CE-RED（EN18031）、RCM

11 Appendix

11.1 FAQ

11.1.1 How to Perform Meter/CT Auxiliary Detection?

The Meter Connect Check function can check whether the meter CT is connected correctly and the current operating status of the meter and CT.

- Method 1:

1. Go to**[Home]** > **[Settings]** > **[Meter/CT Auxiliary Detection]**to enter the detection page.
2. Click Start Detection. After the detection is complete, view the detection results.

- Method 2:

1. Tap > **[System Setup]** > **[Quick Setting]** > **[Meter/CT Assisted Test]**to enter the detection page.
2. Click Start Detection. After the detection is complete, view the detection results.

- Method 3:

1. Press and hold for 3s > **[System Setup]** > **[Quick Settings]** > **[Power Limit & Meter Settings]**to enter the detection page.
2. Click Start Detection. After the detection is complete, view the detection results.

11.1.2 How to Upgrade the Device Version

You can view or upgrade the following via Firmware Information:
Inverter DSP version, ARM version, communication module software version, battery BMS version, DCDC version, etc.

- **Prompted Upgrade:**

When the user opens the App, an upgrade prompt is displayed on the home page, and the user can choose whether to upgrade. If the user chooses to upgrade, follow the on-screen instructions to complete the upgrade.

- **Regular Upgrade:**

Go to**[Home]** > **[Settings]** > **[Firmware Information]**to enter the firmware information viewing screen.
Tap Check for Updates. If a new version is available, follow the on-screen instructions to complete the upgrade.

- **Forced Upgrade:**

The App pushes upgrade information. Users must upgrade as prompted; otherwise, they cannot use the App. Follow the on-screen instructions to complete the upgrade.

Inverter Software Version Upgrade

- The inverter supports software upgrade via aUSB flash drive.
- Before using aUSB flash drive to upgrade the device, contact the after-sales service center to obtain the software upgrade package and upgrade method.

11.2 Abbreviations

Abbreviation	English Description	Chinese Description
Ubatt	Battery Voltage Range	Battery Voltage Range
Ubatt,r	Nominal Battery Voltage	Rated Battery Voltage
Ibatt,max (C/D)	Max. Charging Current Max. Discharging Current	Max. Charge/Discharge Current
EC,R	Rated Energy	Rated Energy
UDCmax	Max.Input Voltage	Max. Input Voltage
UMPP	MPPT Operating Voltage Range	MPPT Voltage Range
IDC,max	Max. Input Current per MPPT	Max. Current from Grid per MPPT
ISC PV	Max. Short Circuit Current per MPPT	Max. Short-circuit Current per MPPT
PAC,r	Nominal Output Power	Rated Output Power
Sr (to grid)	Nominal Apparent Power Output to Utility Grid	Rated Grid-connected Output Apparent Power
Smax (to grid)	Max. Apparent Power Output to Utility Grid	Max. Grid-connected Output Apparent Power

Abbreviation	English Description	Chinese Description
Sr (from grid)	Nominal Apparent Power from Utility Grid	Rated Apparent Power to Grid for Grid Purchase
Smax (from grid)	Max. Apparent Power from Utility Grid	Max. Apparent Power to Grid for Grid Purchase
UAC,r	Nominal Output Voltage	Rated Output Voltage
fAC,r	Nominal AC Grid Frequency	Output Voltage Frequency
IAC,max(to grid)	Max. AC Current Output to Utility Grid	Max. Grid-connected Output Current
IAC,max(from grid)	Max. AC Current From Utility Grid	Max. Current from Grid
P.F.	Power Factor	Power Factor
Sr	Back-up Nominal apparent power	Off-grid Rated Apparent Power
Smax	Max. Output Apparent Power (VA) Max. Output Apparent Power without Grid	Max. Apparent Power to Grid
IAC,max	Max. Output Current	Max. Current to Grid
UAC,r	Nominal Output Voltage	Max. Output Voltage
fAC,r	Nominal Output Freqency	Rated Output Voltage Frequency
Toperating	Operating Temperature Range	Operating Temperature Range
IDC,max	Max. Input Current	Max. Current from Grid
UDC	Input Voltage	Input Voltage
UDC,r	DC Power Supply	DC Input
UAC	Power Supply/AC Power Supply	Input Voltage Range / AC Input
UAC,r	Power Supply/Input Voltage Range	Input Voltage Range / AC Input
Toperating	Operating Temperature Range	Operating Temperature Range
Pmax	Max Output Power	Maximum Power
PRF	TX Power	Transmit Power
PD	Power Consumption	Power Consumption
PAC,r	Power Consumption	Power Consumption
F (Hz)	Frequency	Frequency

Abbreviation	English Description	Chinese Description
ISC PV	Max. Input Short Circuit Current	Max. Input Short-circuit Current
Udcmin-Udcmax	Range of input Operating Voltage	Operating Voltage Range
UAC,rang(L-N)	Power Supply Input Voltage	Adapter Input Voltage Range
Usys,max	Max System Voltage	Max. System Voltage
Haltitude,max	Max. Operating Altitude	Max. Operating Altitude
PF	Power Factor	Power Factor
THDi	Total Harmonic Distortion of Current	Current Harmonics
THDv	Total Harmonic Distortion of Voltage	Voltage Harmonics
C&I	Commercial & Industrial	Commercial & Industrial
SEMS	Smart Energy Management System	Smart Energy Management System
MPPT	Maximum Power Point Tracking	Maximum Power Point Tracking
PID	Potential-Induced Degradation	Potential Induced Degradation
Voc	Open-Circuit Voltage	Open Circuit Voltage
Anti PID	Anti-PID	Anti-PID
PID Recovery	PID Recovery	PID Recovery
PLC	Power-line Commucation	Power Line Carrier Communication
Modbus TCP/IP	Modbus Transmission Control / Internet Protocol	Modbus over TCP/IP
Modbus RTU	Modbus Remote Terminal Unit	Modbus over Serial Line
SCR	Short-Circuit Ratio	Short Circuit Ratio
UPS	Uninterruptable Power Supply	Uninterruptible Power Supply
ECO mode	Economical Mode	ECO Mode
TOU	Time of Use	Usage Time
ESS	Energy Stroage System	Energy Storage System
PCS	Power Conversion System	Power Conversion System
RSD	Rapid shutdown	Rapid Shutdown
EPO	Emergency Power Off	Emergency Power Off
SPD	Surge Protection Device	Lightning Protection

Abbreviation	English Description	Chinese Description
ARC	zero injection/zero export Power Limit / Export Power Limit	Power Limit
DRED	Demand Response Enabling Device	Command Response Device
RCR	Ripple Control Receiver	-
AFCI	AFCI	AFCI
GFCI	Ground Fault Circuit Interrupter	Grounding Failure Circuit Breaker
RCMU	Residual Current Monitioring Unit	Residual Current Monitoring Device
FRT	Fault Ride Through	Fault Ride-Through
HVRT	High Voltage Ride Through	High Voltage Ride-Through
LVRT	Low Voltage Ride Through	Low Voltage Ride-Through
EMS	Energy Management System	Energy Management System
BMS	Battery Management System	Battery Management System
BMU	Battery Measure Unit	Battery Data Acquisition Unit
BCU	Battery Control Unit	Battery Control Unit
SOC	State of Charge	Battery State of Charge (SOC)
SOH	State of Health	Battery State of Health (SOH)
SOE	State Of Energy	Battery Remaining Energy
SOP	State Of Power	Battery Charge/Discharge Capability
SOF	State Of Function	Battery Functional Status
SOS	State Of Safety	Safety Status
DOD	Depth of discharge	Depth of Discharge (DOD)

11.3 Terminology

- **Overvoltage Category Description**
  - **Overvoltage Category I**: Equipment connected to circuits in which measures are taken to limit transient overvoltages to a suitably low level.
  - **Overvoltage Category II**: Energy-consuming equipment supplied from a fixed electrical installation. Such equipment includes appliances, portable tools, and other household and similar loads. If special requirements are imposed on the reliability and suitability of such equipment, Overvoltage Category III shall be used.

- **Overvoltage Category III**: Equipment in fixed electrical installations where the reliability and suitability of the equipment must meet special requirements. This includes switchgear and controlgear in fixed electrical installations and industrial equipment permanently connected to fixed electrical installations.
- **Overvoltage Category IV**: Equipment used upstream in the power supply of a distribution installation, including measuring instruments and upstream overcurrent Protection devices, etc.

- **Wet Location Category Definitions**

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

- **Environmental Category Description:**
  - **Outdoor inverter**: ambient air temperature range is -25 to +60°C, suitable for environments with Pollution Degree 3;
  - **Indoor Type II inverter**: ambient air temperature range is -25 to +40°C, suitable for environments with Pollution Degree 3;
  - **Indoor Type I inverter**: ambient air temperature range is 0 to +40°C, suitable for environments with Pollution Degree 2;
- **Pollution Degree Category Description**
  - **Pollution Degree 1**: no pollution or only dry, non-conductive pollution;
  - **Pollution Degree 2**: normally only non-conductive pollution occurs, but temporary conductive pollution caused by occasional condensation must be considered;
  - **Pollution Degree 3**: conductive pollution occurs, or non-conductive pollution becomes conductive due to condensation;
  - **Pollution Degree 4**: persistent conductive pollution, for example, pollution caused by conductive dust or rain and snow.

11.4 Meaning of Battery SN Code



LXD10DSC0002

The 11th to 14th characters of the product SN code are the production time code. The production date in the above figure is 2023-08-08

- The 11th and 12th characters represent the last two digits of the production year; for example, 2023 is represented as 23;
- The 13th character represents the production month; for example, August is represented as 8;
  as follows:

Month	Months 1–9	October	November	December
Month code	1~9	A	B	C

- The 14th character represents the production day; for example, the 8th day is represented as 8;
  Numbers are used preferentially; for example, 1–9 represent days 1–9, A represents the 10th day, and so on. The letters I and O are not used to avoid confusion. Details are as follows:

Production day	1	2	3	4	5	6	7	8	9
Code	1	2	3	4	5	6	7	8	9

Production day	10	11	12	13	14	15	16	17	18
Code	A	B	C	D	E	F	G	H	J

Production day	21	22	23	24	25	26	27	28	29
Code	M	N	P	Q	R	S	T	U	V

11.5 Safety Country

No.	Safety Regulation Name	No.	Safety Regulation Name
Europe			
1	IT-CEI 0-21	56	IE-LV-72A
2	IT-CEI 0-16	57	IE-ESB-C&D(< 110kV)
3	DE LV with PV	58	IE-EirGrid-110kV
4	DE LV without PV	59	PT-D
5	DE-MV	60	EE
6	ES-A	61	NO
7	ES-B	62	FI-A
8	ES-C	63	FI-B
9	ES-D	64	FI-C
10	ES-island	65	FI-D
11	BE	66	UA-A1
12	FR-LV	67	UA-A2
13	FR-island-50Hz	68	EN 50549-1
14	FR-island-60Hz	69	EN 50549-2
15	type A-PL_V.1.1	70	DK-West-B-MVHV
16	type B-LV-PL_V.1.1	71	DK-East-B-MVHV
17	type C-PL_V.1.1	72	DK-West-C-MVHV
18	type D-PL_V.1.1	73	DK-East-C-MVHV
19	NL-16/20A	74	DK-West-D-MVHV
20	NL-A	75	DK-East-D-MVHV
21	NL-B	76	FR-Reunion

No.	Safety Regulation Name	No.	Safety Regulation Name
22	NL-C	77	BE-LV（>30kVA）
23	NL-D	78	BE-HV
24	SE-A	79	CH-B
25	SE MV	80	NI-G99-A
26	SK-A	81	NI-G99-B
27	SK-B	82	NI-G99-C
28	SK-C	83	NI-G99-D
29	HU	84	IE-LV-170kVA
30	CH-A	85	IE-MV&HV-200kVA
31	CY	86	DE-HV
32	GR	87	FR-MV
33	DK-West-A	88	CZ-A1/A2-09
34	DK-East-A	89	DE-EHV
35	DK-West-B	90	IE-EirGrid-400KV
36	DK-East-B	91	IE-EirGrid-220KV
37	AT < 1kV	92	IE-EirGrid-66KV
38	AT > 1kV	93	IE-ESB-B
39	BG	94	IE-ESB-D(≥110kV)
40	Czech	95	type B-MV-PL_V.1.1
41	CZ-A1-09	96	GB-G99-A HV
42	CZ-A2-09	97	GB-G99-B LV
43	CZ-B1/B2-09	98	GB-G99-C LV
44	CZ-C	99	UA-B

No.	Safety Regulation Name	No.	Safety Regulation Name
45	CZ-D	100	UA-C
46	RO-A	101	UA-D
47	RO-B	102	UK-G98
48	RO-D	103	UK-G99-A LV
49	GB-G98	104	UK-G99-B LV
50	GB-G99-A LV	105	UK-G99-C LV
51	GB-G99-B HV	106	CZ-A1
52	GB-G99-C HV	107	UK-A-MV
53	GB-G99-D	108	UK-B-MV
54	NI-G98	109	UK-C-MV
55	IE-LV-16/25A	-	-
Global			
1	60Hz-Default	6	IEC 61727-60Hz
2	50Hz-Default	7	Warehouse
3	127Vac-60Hz-Default	8	IEC61727-480Vac-60Hz
4	127Vac-50Hz-Default	9	IEC61727-480Vac-50Hz
5	IEC 61727-50Hz		
Americas			
1	Argentina-220V-LV	38	LUMAPR-2024-220Vac-3P
2	US-208Vac	39	LUMAPR-2024-240Vac-3P
3	US-240Vac	40	Cayman
4	Mexico-220Vac	41	Brazil-220Vac
5	Mexico-440Vac	42	Brazil-208Vac
6	US-480Vac	43	Brazil-230Vac

No.	Safety Regulation Name	No.	Safety Regulation Name
7	US-208Vac-3P	44	Brazil-240Vac
8	US-220Vac-3P	45	Brazil-254Vac
9	US-240Vac-3P	46	Brazil-127Vac
10	US-CA-208Vac	47	Brazil-ONS
11	US-CA-240Vac	48	Barbados
12	US-CA-480Vac	49	Chile-BT
13	US-CA-208Vac-3P	50	Chile-MT-A
14	US-CA-220Vac-3P	51	Chile MT-B
15	US-CA-240Vac-3P	52	Colombia
16	US-HI-208Vac	53	Colombia<0.25MW-208Vac-1P
17	US-HI-240Vac	54	Colombia<0.25MW-120Vac-3P
18	US-HI-480Vac	55	IEEE 1547-208Vac
19	US-HI-208Vac-3P	56	IEEE 1547-220Vac
20	US-HI-220Vac-3P	57	IEEE 1547-240Vac
21	US-HI-240Vac-3P	58	IEEE 1547-230Vac
22	US-Kauai-208Vac	59	Colombia<0.25MW-127Vac-3P
23	US-Kauai-240Vac	60	Colombia>5MW
24	US-Kauai-480Vac	61	Mexico-127V
25	US-Kauai-208Vac-3P	62	Mexico-240V
26	US-Kauai-220Vac-3P	63	US-O&R-208Vac
27	US-Kauai-240Vac-3P	64	US-O&R-240Vac
28	US-ISO-NE-208Vac	65	US-O&R-480Vac
29	US-ISO-NE-240Vac	66	US-O&R-208Vac-3P

No.	Safety Regulation Name	No.	Safety Regulation Name
30	US-ISO-NE-480Vac	67	US-O&R-220Vac-3P
31	US-ISO-NE-208Vac-3P	68	US-O&R-240Vac-3P
32	US-ISO-NE-220Vac-3P	69	Brazil-277Vac
33	US-ISO-NE-240Vac-3P	70	Chile-BT ≤9MW
34	LUMAPR-2024-208Vac	71	Chile-MT ≤9MW
35	LUMAPR-2024-240Vac	72	Chile > 9MW
36	LUMAPR-2024-480Vac	73	Mexico-277Vac
37	LUMAPR-2024-208Vac-3P		
Oceania			
1	Australia-A	4	Newzealand
2	Australia-B	5	Newzealand:2015
3	Australia-C	6	NZ-GreenGrid
Asia			
1	China A	33	Israel-MV
2	China B	34	Israel-HV
3	China Higher Voltage	35	Vietnam
4	China Highest Voltage	36	Malaysia-LV
5	China Power Station	37	Malaysia-MV
6	China Shandong	38	DEWA-LV
7	China Hebei	39	DEWA-MV
8	China PCS	40	Saudi Arabia-220V-LV
9	Taiwan	41	JP-690Vac-50Hz
10	Hong Kong	42	JP-690Vac-60Hz
11	China Northeast	43	Srilanka-MV/HV

No.	Safety Regulation Name	No.	Safety Regulation Name
12	Thailand-MEA	44	IEC 61727-127Vac-50Hz
13	Thailand-PEA	45	IEC 61727-127Vac-60Hz
14	Mauritius	46	JP-550Vac-50Hz
15	Korea	47	JP-550Vac-60Hz
16	India	48	India-Higher
17	India-CEA	49	JP-220Vac-50Hz
18	Pakistan	50	JP-220Vac-60Hz
19	Philippines	51	Saudi Arabia-127V-LV
20	Philippines-127Vac	52	Srilanka-LV >1MW
21	JP-200Vac-50Hz	53	China-YN
22	JP-200Vac-60Hz	54	GB/T 29319-LV
23	JP-440Vac-50Hz	55	GB/T 29319-MV
24	JP-440Vac-60Hz	56	Philippines-277Vac
25	JP-420Vac-50Hz	57	JP-360Vac-50Hz
26	JP-420Vac-60Hz	58	JP-360Vac-60Hz
27	JP-480Vac-50Hz	59	JP-320Vac-50Hz
28	JP-480Vac-60Hz	60	JP-320Vac-60Hz
29	Srilanka-LV<1MW	61	JP-340Vac-50Hz
30	Singapore	62	JP-340Vac-60Hz
31	Israel-OG	63	JP-380Vac-50Hz
32	Israel-LV	64	JP-380Vac-60Hz
Africa			
1	Mauritius	5	Ghana-LV

No.	Safety Regulation Name	No.	Safety Regulation Name
2	South Africa-LV	6	Ghana-HV
3	South Africa-B-MV	7	South Africa-A3-LV
4	South Africa-C-MV	8	Nigeria

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