V2.9 2026-10-10

Residential Smart Inverter

ES Uniq 8.0-12kW

- LX A5.0-10
- LX A5.0-30
- LX U5.4-L
- LX U5.4-20
- LX U5.0-30
- GW14.3-BAT-LV-G10
- GW16.1-BAT-LV-G10
- GW5.0-BAT-LVI-G10
- GW10.0-BAT-LV-G10

Solutions Manual

GOODWE

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NOTE

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

Preface

Overview

This document mainly describes the product information, installation and wiring, configuration and commissioning, troubleshooting, and maintenance of an energy storage system composed of inverters, battery systems, and smart meters. Before installing and using the product, please read this manual carefully to understand product safety information and familiarize yourself with the product functions and features. The document may be updated from time to time; 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	ES Uniq Series	Rated output power: 8 kW–12 kW
Battery System	LX A5.0-10	Rated capacity: 5.0 kWh; supports up to 15 parallel clusters
	LX A5.0-30	Rated capacity: 5.12 kWh; supports up to 30 parallel clusters
	LX U5.4-L	Rated capacity: 5.4 kWh; supports up to 6 parallel clusters
	LX U5.4-20	Rated capacity: 5.12 kWh; supports up to 30 parallel clusters
	LX U5.0-30	
	GW14.3-BAT-LV-G10	Rated capacity: 14.3 kWh; supports up to 30 parallel clusters
	GW16.1-BAT-LV-G10	Rated capacity: 16.1 kWh; supports up to 30 parallel clusters
	GW5.0-BAT-LVI-G10	Rated capacity: 5 kWh; supports up to 12 parallel clusters

Product Type	Product Information	Description
	GW10.0-BAT-LV-G10	Rated capacity: 10 kWh; supports up to 12 parallel clusters
Battery Mix Parallel Unit	GW12/2-MPU-LVO-G10	Supports parallel cluster expansion between different battery models, with a maximum of 30 batteries in parallel clusters
Meter	GMK110	Monitoring module in the energy storage system, capable of detecting operating voltage, current, and other information in the system
	GM330	
Communication Module	WiFi/LAN Kit-20	In standalone scenarios, system operating information can be uploaded to the monitoring platform via WiFi or LAN signals
	4G Kit-CN-G20、4G Kit-CN-G21	System operating information can be uploaded to the monitoring platform via 4G signals.
	Ezlink3000	In parallel operation scenarios, it is connected to the master inverter and uploads system operating information to the monitoring platform via WiFi or LAN signals

Symbol Definitions

⚠DANGER
Indicates a highly potential hazard that, if not avoided, could result in death or serious injury.
⚠WARNING
Indicates a moderately hazardous situation which, if not avoided, could result in death or serious injury to personnel.
⚠CAUTION

Indicates a low-level potential hazard which, if not avoided, could result in moderate or minor injury to personnel.
NOTE
Emphasis and supplement to the content; may also provide tips or tricks for optimized use of the product, helping you solve a problem or save time.

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1 Safety Precautions

Always comply with 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 result in serious injury or property damage.

1.1 General Safety

NOTE

- Due to product version upgrades or other reasons, the document content may be updated periodically. Unless otherwise agreed, the document content does not replace the safety precautions on the product labels. All descriptions in the document are for use guidance only.
- Before installing the equipment, read this document carefully to understand the product and precautions.
- All operations on the equipment must be performed by professional, qualified electrical technicians who are 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., for Protection of the equipment from electrostatic damage.
- Unauthorized disassembly or modification may cause equipment damage, which is not covered by the warranty.
- Equipment damage or personal injury caused by failure to install, use, or configure the equipment in accordance with this document or the corresponding user manual is not within the responsibility of the equipment manufacturer.
- For more product warranty information, please obtain it from the official website:https://www.goodwe.com/warrantyrelated.html。

1.2 Personnel Requirements

NOTE

To ensure safety, compliance, and efficiency throughout 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's working principles, system structure, and knowledge of risks and hazards, and who 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 the dangers that specific work may pose to themselves, and can take protective measures to minimize risks to themselves and others.
   - Qualified electrical technicians who comply with the regulatory requirements of the country/region where they are located.
   - Hold a degree in electrical engineering / an advanced diploma or equivalent qualification in an electrical discipline / a professional qualification in the electrical field, and have at least 2/3/4 years of experience in testing and supervisory 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. Operations on medium-voltage equipment must be performed by certified high-voltage electricians.
4. Equipment and component replacement may only be performed by authorized personnel.

1.3 System Safety

⚠DANGER

- Before making electrical connections, disconnect all upstream switches of the equipment and ensure that the equipment is de-energized. Live-line operation is strictly prohibited; otherwise, hazards such as electric shock may occur.
- For devices that support 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 ports. If energizing from the PV ports is required, follow the steps below. If equipment damage is caused by violation of these instructions, it is human-induced damage and is not covered by product warranty.
  1. First, limit the output current of the DC voltage source to within the Max. Current from Grid allowed by the PV port.
  2. Then close the inverter's DC Switch.
  3. Finally, slowly increase the DC source output voltage from zero to the target value at a rate of ≤50 V/s.
- To prevent personal danger or equipment damage caused by live-line operation, a circuit breaker must be added on the voltage input side of the equipment.
- During all operations such as transportation, storage, installation, operation, use, and maintenance, applicable laws, regulations, standards, and specifications shall be complied with.
- The specifications of cables and components used for electrical connections shall comply with local laws, regulations, standards, and specifications.
- Use the cable connectors shipped with the package to connect the equipment cables. If connectors of other models are used, any resulting equipment damage is not within 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 the equipment.
- The equipment's Protection ground cable must be securely connected.
- To provide Protection for the equipment and its components from damage during transportation, ensure that transportation personnel are professionally trained. Record the operating steps during transportation, keep the equipment balanced, and prevent it from falling.
- The equipment is heavy. Please allocate personnel according to the equipment Weight to avoid the equipment exceeding the Weight range that a person can carry and causing personal injury.
- Ensure that the equipment is placed stably and not tilted; tipping 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 tensile force on cables; otherwise, poor connections may occur. During wiring, reserve an appropriate cable length to avoid cables being in a taut state.
- Correctly secure and support cables to prevent cable self-weight, tensile force, bending force, torsional force, or other external mechanical stress from acting on terminals or connectors for extended periods.
- Ensure the Protection ground cable is reliably connected and reserve an appropriate margin. Under external mechanical stress such as accidental tensile force, ensure that the Protection ground cable does not break before other conductors.
- Cables of the same type shall be bundled together; cables of different types shall be routed at least 30 mm apart. Do not intertwine or cross-route them.
- Using cables in high-temperature environments may cause insulation aging or damage. The distance between cables and heat-generating components or the outer area of heat sources shall be at least 30 mm.

1.3.1 PV String Safety

⚠WARNING

- Ensure that the module frames and mounting bracket system are well 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 cables to ensure that the polarity is correct and no reverse connection occurs; and that the voltage is within the allowed range.
- Use a multimeter to measure the DC cables to ensure that the positive and negative poles are correct and no reverse connection occurs; the voltage should be lower than the maximum DC input voltage. Damage caused by reverse connection and Overvoltage is not within 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 inverter may be damaged.
- PV modules used with the inverter must comply with IEC 61730 Class A standards.
- When the PV string input voltage or input current is relatively 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.
- On the AC side of the inverter, it is recommended to add Protection devices such as circuit breakers or fuses. The specifications of the Protection devices must be greater than 1.25 times the inverter's AC output Max. Current.
- If the inverter triggers the Arc Failure alarm fewer than 5 times within 24 hours, the alarm can be automatically cleared. After the 5th Arc Failure alarm, the inverter shuts down for Protection. The inverter can only operate normally after the fault is cleared.
- In a PV system, if no battery is configured, the BACK-UP function is not recommended; otherwise, it may cause a risk of system power outage.
- When the grid voltage and frequency vary, the inverter output power may be derated.

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 operation of the equipment, strictly observe 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. Losses caused thereby are not within the responsibility of the equipment manufacturer.
- Do not hit, pull, drag, squeeze, or step on the equipment, and do not place the battery in fire; otherwise, the battery may explode.
- Do not place the battery in a high-temperature environment. Ensure that there is no heat source near the battery and that it is not exposed to direct sunlight. A fire may occur if the ambient temperature exceeds 60°C.
- Do not use the battery or control box if there are obvious defects, cracks, damage, or other conditions. 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, 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.

⚠WARNING

- Battery Current may be affected by factors such as temperature, humidity, and weather conditions, which may cause battery current limiting and affect the load-carrying capability.
- If the battery cannot start, contact the after-sales service center as soon as possible. Otherwise, the battery may be permanently damaged.
- Periodically inspect and maintain the battery 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 attention immediately.
  - Eye contact: Flush with clean water for at least 15 minutes and seek medical attention immediately.
  - Skin contact: Wash the contacted area thoroughly with soap and clean water, and seek medical attention immediately.
  - Ingestion: Induce vomiting and seek medical assistance immediately.
- Fire
  - When the battery temperature exceeds 150°C, the battery has a fire risk, and if the battery catches fire, it may release toxic and harmful gases.
  - To avoid fire, ensure that carbon dioxide, Novec1230, 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 Triggers Fire Protection Function
  For batteries with the optional fire protection function, after the fire protection function is triggered, perform the following operations:
  - Immediately turn off the main power switch to ensure that no current flows through the battery system.
  - Perform a preliminary inspection of the battery appearance for damage, deformation, leakage, or odor, and inspect the battery enclosure, connectors, and cables.
  - Use a temperature sensor to detect the temperature of the battery and its environment to ensure that there is no overheating risk.
  - Isolate and mark damaged batteries, and handle them properly in accordance with local regulations.

1.3.4 Meter Safety

⚠WARNING

If the grid voltage fluctuation exceeds 265 V, long-term overvoltage operation may cause damage to 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.

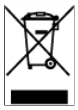
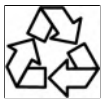
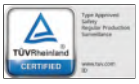
1.4 Description of Safety Symbols and Certification Marks

⚠DANGER

- After the equipment is installed, the labels and warning signs on the enclosure must be clearly visible. They must not be obstructed, altered, or damaged.
- The following enclosure warning label descriptions are for reference only. Please refer to the actual labels used on the equipment.

No.	Symbol	Meaning
1		Potential hazards exist when the equipment is running. Take proper protective measures when operating the equipment.
2		High voltage hazard. High voltage is present when the equipment is running. Before operating the equipment, ensure that the equipment is powered off.
3		The inverter surface is hot. Do not touch it while the equipment is running; otherwise, burns may occur.
4		Use the equipment properly. Using it under extreme conditions may pose an explosion risk.
5		The battery contains flammable materials. Beware of fire.

No.	Symbol	Meaning
6		The equipment contains corrosive electrolyte. Avoid contact with leaking electrolyte or volatile gases.
7		Delayed discharge. After the equipment is powered off, wait 5 minutes until the equipment is fully discharged.
8		Keep the equipment away from open flames or ignition sources.
9		Keep the equipment out of reach of 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 in operation.
12		Do not disassemble
13		Before operating the equipment, 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.

No.	Symbol	Meaning
16	 	The equipment must not be disposed of as household waste. Dispose of it in accordance with local laws and regulations, or return it to the equipment manufacturer.
17		Protection earthing conductor connection point.
18		Recycling mark.
19		CE Certification Mark.
20		TUV Mark.
21		RCM Mark.

1.5 EU Declaration of Conformity

1.5.1 Devices with Wireless Communication Function

Devices with wireless communication function that can be sold on the European market meet 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 Devices Without Wireless Communication Function (Excluding Batteries)

Devices without wireless communication function 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)
- 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 specified in this regulation.

More EU Declarations of Conformity can be obtained fromthe official website.

2 System Introduction

2.1 System Overview

The residential smart inverter solution integrates devices such as inverters, batteries, smart meters, and smart communication sticks. In the PV system, it converts solar energy into electrical energy to meet household electricity demand. The energy IoT devices in the system manage power-consuming devices by identifying the overall power status in the system, thereby intelligently managing power for load consumption, battery storage, or grid output.

⚠WARNING

- Battery models are selected according to the inverter and battery compatibility list. For battery requirements in the same system, such as whether models can be mixed and matched and whether capacities are consistent, refer to the user manual for the corresponding battery 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 from time to time. 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
- For detailed networking and wiring schemes for each scenario, please refer to:5.2.Detailed System Wiring Diagram(Page 130)
- The energy storage system is not suitable for connecting to equipment that requires a stable power supply, such as life-sustaining medical equipment. Ensure that when the system is powered off, it does not cause personal injury.
- In a system where the inverter operates fully off-grid, if the battery is exposed to prolonged low-light or rainy weather and cannot be recharged in time, it may be over-discharged, resulting in battery performance degradation or damage. To ensure long-term stable operation of the system, the battery should be prevented from being completely discharged. 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%.
  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, the battery should be recharged 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.

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

Off-grid Load Capacity Description		
Inverter Model	GW8000-ES-C10	GW10K-ES-C10 GW12K-ES-C10
Rated Power of a single inductive load (kVA)	2.2	2.2
Total Rated Power of multiple inductive loads (kVA)	5.9	8.1
Capacitive Load (kVA)	0.33Pn	0.33Pn
Note: • Pn: Rated output power of the inverter. • For two or more units in parallel, the allowable total motor load Rated Power = total Rated Power of a single inductive load * number of parallel units * 80%.		

General Scenario

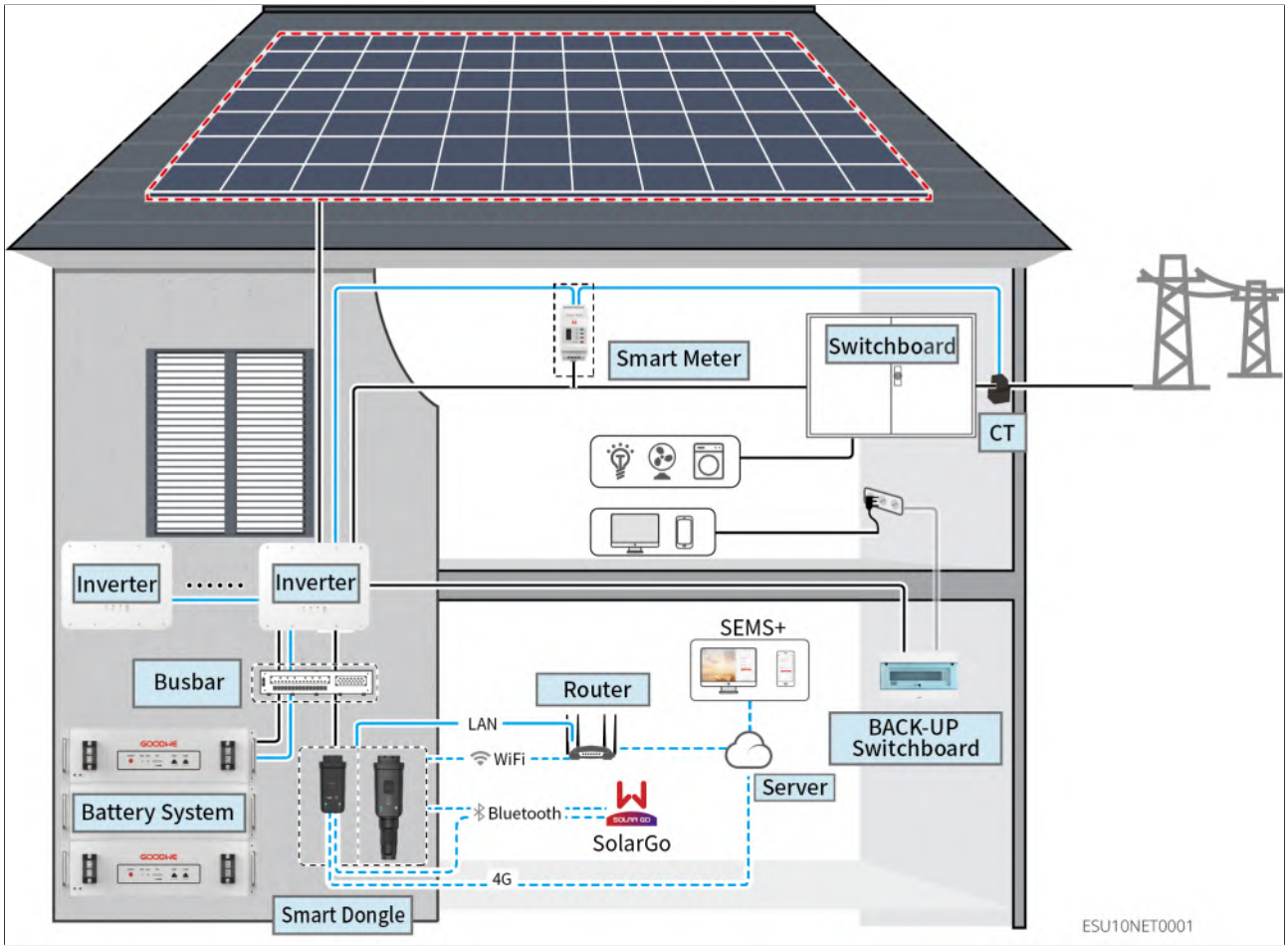


Figure1 General Scenario

Device Type	Model	Description
Inverter	GW8000-ES-C10 GW10K-ES-C10 GW12K-ES-C10	• When only one inverter is used in the system, connection to a generator or large load is supported • When multiple inverters are used in the system, connection to a generator or large load is not supported; up to 6 inverters are supported to form a parallel system, and parallel operation requires Ezlink3000 • When the units are connected in parallel and networked, the following version requirements must be met: ◦ All inverters in the parallel system must have the same software version ◦ Inverter ARM software version is 15.494 or later ◦ Inverter DSP software version is 07.65 or later ◦ All inverters in the parallel system must be of the same model and have identical appearance and ports. • Version requirements for supporting the Mix Parallel Unit: ◦ Inverter ARM software version is 18.522 or later ◦ Inverter DSP software version is 07.65 or later
Battery System	LX A5.0-10	The same system supports a maximum of 15 parallel clusters
	LX A5.0-30	The same system supports a maximum of 30 parallel clusters
	LX U5.4-L	

Device Type	Model	Description
	LX U5.4-20	• The same system supports a maximum of 6 parallel clusters • The battery system does not support capacity expansion
	LX U5.0-30	• The same system supports a maximum of 30 parallel clusters • 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
	GW14.3-BAT-LV-G10	The same system supports a maximum of 30 parallel clusters: • Products with SN code 25C and later support 30 parallel clusters by default • For products before 25C, if 30 parallel clusters are required, please contact GoodWe After-Sales Service Center to Upgrade Firmware version • To view the product SN code, refer to11.4.SN Code Meaning(Page 394)。
	GW16.1-BAT-LV-G10	The same system supports a maximum of 30 parallel clusters
	GW5.0-BAT-LVI-G10	The same system supports a maximum of 8 parallel clusters
	GW10.0-BAT-LV-G10	

Device Type	Model	Description
	Lead-Acid Battery	• Supports connection to AGM, GEL, and Flooded lead-acid batteries • Calculate the Battery Qty that can be connected in series according to the lead-acid Battery Voltage; the total voltage of the series-connected batteries must not exceed 60V.
Combiner Box	BCB-11-WW-0 BCB-22-WW-0 BCB-32-WW-0 BCB-33-WW-0 (Purchased from GoodWe) Third-party Busbar	Select the combiner box according to the charging/discharging capability of the inverter in the system, the load size, and the battery charging/discharging capability • BCB-11-WW-0: ◦ When used with LX A5.0-10, the battery system supports a maximum operating current of 360 A, operating power of 18 kW, connection of up to 3 inverters, and 6 batteries • BCB-22-WW-0: ◦ When used with LX A5.0-10, the battery system supports a maximum operating current of 720 A, operating power of 36 kW, connection of up to 6 inverters, and 12 batteries. ◦ When paired with LX A5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 6 batteries ◦ When paired with LX U5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 6 batteries • BCB-32-WW-0: ◦ When paired with LX A5.0-10, the battery system supports a maximum operating

Device Type	Model	Description
		current of 720 A, an operating power of 36 kW, up to 6 inverters, and 15 batteries. ◦ When paired with LX A5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 15 batteries. ◦ When paired with LX U5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 8 batteries ◦ When paired with GW14.3-BAT-LV-G10, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 15 batteries ◦ When paired with GW16.1-BAT-LV-G10, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 15 batteries • BCB-33-WW-0: ◦ When paired with LX U5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 15 batteries. When Battery Qty exceeds 8, two 600 A fuses must be connected in parallel. • Third-party busbar: Please configure it yourself according to the system power and current.

Device Type	Model	Description
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 it has been more than one year since the customer purchased the battery and capacity expansion is required, be sure to use the second channel of the Mix Parallel Unit to expand capacity with the same battery model. ◦ Mix Parallel: The two battery ports of the Mix Parallel Unit can connect batteries of different GW models. • Equipped with two independent battery connection ports, 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; a single branch may only use batteries of the same model. • The total number of batteries connected to the two ports shall not exceed 30 (i.e., number of 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 INV port of the Mix Parallel Unit is limited by the battery with the smaller Max. Current from Grid among the two battery branches. • After the system is connected to the Mix Parallel Unit, the Max. Current from Grid of a single-port battery is limited by the Max. Current from Grid of the Mix Parallel Unit's BAT port.

Device Type	Model	Description
Smart Meter	• Built-in Meter (Standard) • GMK110 (purchased from GoodWe) • GM330 (purchased from GoodWe)	• Built-in Meter: When the number of inverters in parallel is ≤ 2 and the CT cable length is ≤ 10 m, the built-in meter can be used. The built-in meter uses a 10 m CT cable. The default CT ratio is 120 A/40 mA • GMK110: When the length of the inverter's built-in CT cable is insufficient to reach the distribution panel, it can be extended via an external GMK110 meter. CT replacement is not supported. CT ratio: 120 A/40 mA • GM330: The CT can be purchased from GoodWe or by yourself. CT ratio requirement: nA/5A • nA: CT primary-side input current; n ranges from 200 to 5000 • 5A: CT secondary-side output current
Communication Module	• WiFi/LAN Kit-20 (Standard) • 4G Kit-CN-G20 (China only) • 4G Kit-CN-G21 (China only) • Ezlink3000 (purchased from GoodWe)	• For single-unit operation, please use WiFi/LAN Kit-20, 4G Kit-CN-G20, 4G Kit-CN-G21 modules • In parallel operation, only the master inverter needs to connect to Ezlink3000; slave inverters do not need to connect a communication module. Ezlink3000 firmware version must be 05 or above
Large load	-	Supports SG Ready. Large load specifications require: 1. Total large load power < GEN port maximum output power 2. Large load power + BACK-UP power < AC Max. Input Power (grid)
Generator	-	Generator Nominal Voltage meets the inverter GEN port Nominal Voltage

Microgrid Scenario

⚠WARNING

- In a Microgrid Scenario, the PV open-circuit voltage of the PV-storage hybrid inverter is not recommended to be ≥500V, to avoid system overvoltage triggering overvoltage Protection under harsh conditions.
- In a microgrid system, the inverter does not support parallel operation; only one inverter can be used in the system.
- If the system is in a high-temperature or BMS current-limiting condition, the battery charging power may be limited, causing system overvoltage and triggering overvoltage Protection.

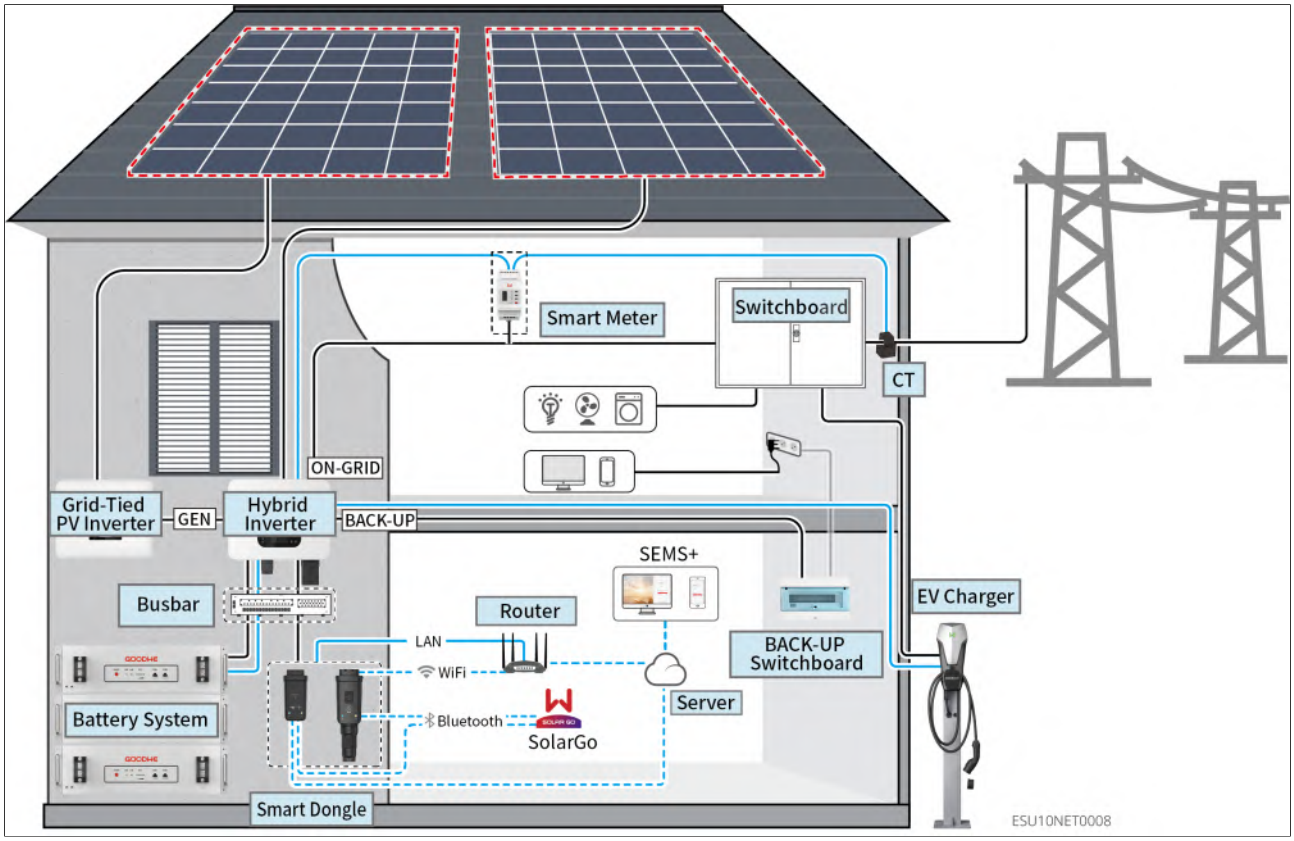


Figure2 Microgrid Scenario

<table>
<tr><th>Device Type</th><th>Model</th><th>Description</th></tr>
<tr><td>PV-storage hybrid inverter</td><td>GW8000-ES-C10
GW10K-ES-C10
GW12K-ES-C10</td><td>• In a microgrid system, the inverter does not support parallel operation; only one inverter can be used in the system
• Inverter Version Requirements:
◦ Inverter ARM software version is 15.494 or later
◦ Inverter DSP software version is 07.65 or later
◦ Some models do not support the microgrid function
• Version requirements for supporting the Mix Parallel Unit:
◦ Inverter ARM software version is 18.522 or later
◦ Inverter DSP software version is 07.65 or later</td></tr>
<tr><td rowspan="4">Battery System</td><td>LX A5.0-10</td><td>The same system supports a maximum of 15 parallel clusters</td></tr>
<tr><td>LX A5.0-30</td><td>The same system supports a maximum of 30 parallel clusters</td></tr>
<tr><td>LX U5.4-L</td><td rowspan="2">• The same system supports a maximum of 6 parallel clusters
• The battery system does not support capacity expansion</td></tr>
<tr><td>LX U5.4-20</td></tr>
<tr><td>LX U5.0-30</td><td>• The same system supports a maximum of 30 parallel clusters
• 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</td></tr>
</table>

Device Type	Model	Description
	GW14.3-BAT-LV-G10	The same system supports a maximum of 30 parallel clusters: • Products with SN code 25C and later support 30 parallel clusters by default • For products before 25C, if 30 parallel clusters are required, please contact GoodWe After-Sales Service Center to Upgrade Firmware version • To view the product SN code, refer to11.4.SN Code Meaning(Page 394)。
	GW16.1-BAT-LV-G10	The same system supports a maximum of 30 parallel clusters
	GW5.0-BAT-LVI-G10	The same system supports a maximum of 8 parallel clusters
	GW5.0-BAT-LVI-G10	
	Lead-Acid Battery	• Supports connection to AGM, GEL, and Flooded lead-acid batteries • Calculate the Battery Qty that can be connected in series according to the lead-acid Battery Voltage; the total voltage of the series-connected batteries must not exceed 60V.
Combiner Box	BCB-11-WW-0 BCB-22-WW-0 BCB-32-WW-0 BCB-33-WW-0 (Purchased from GoodWe) Third-party Busbar	Select the combiner box according to the charging/discharging capability of the inverter in the system, the load size, and the battery charging/discharging capability • BCB-11-WW-0： ◦ When used with LX A5.0-10, the battery system supports a maximum operating current of 360 A, operating power of 18 kW, connection of up to 3 inverters, and 6

Device Type	Model	Description
		batteries • BCB-22-WW-0: ◦ When used with LX A5.0-10, the battery system supports a maximum operating current of 720 A, operating power of 36 kW, connection of up to 6 inverters, and 12 batteries. ◦ When paired with LX A5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 6 batteries ◦ When paired with LX U5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 6 batteries • BCB-32-WW-0: ◦ When paired with LX A5.0-10, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 15 batteries. ◦ When paired with LX A5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 15 batteries. ◦ When paired with LX U5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 8 batteries ◦ When paired with GW14.3-BAT-LV-G10, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 15 batteries ◦ When paired with GW16.1-BAT-LV-G10, the battery system supports a maximum operating current of 720 A, an operating

Device Type	Model	Description
		power of 36 kW, up to 6 inverters, and 15 batteries • BCB-33-WW-0： ◦ When paired with LX U5.0-30, the battery system supports a maximum operating current of 720 A, an operating power of 36 kW, up to 6 inverters, and 15 batteries. When Battery Qty exceeds 8, two 600 A fuses 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 it has been more than one year since the customer purchased the battery and capacity expansion is required, be sure to use the second channel of the Mix Parallel Unit to expand capacity with the same battery model. ◦ Mix Parallel: The two battery ports of the Mix Parallel Unit can connect batteries of different GW models. • Equipped with two independent battery connection ports, 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; a single branch may only use batteries of the same model.

Device Type	Model	Description
		• The total number of batteries connected to the two ports shall not exceed 30 (i.e., number of 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 INV port of the Mix Parallel Unit is limited by the battery with the smaller Max. Current from Grid among the two battery branches. • After the system is connected to the Mix Parallel Unit, the Max. Current from Grid of a single-port battery is limited by the Max. Current from Grid of the Mix Parallel Unit's BAT port.
Smart Meter	• Built-in Meter (Standard) • GMK110 (purchased from GoodWe) • GM330 (purchased from GoodWe)	• Built-in Meter: When the number of inverters in parallel is ≤ 2 and the CT cable length is ≤ 10 m, the built-in meter can be used. The built-in meter uses a 10 m CT cable. The default CT ratio is 120 A/40 mA • GMK110: When the length of the inverter's built-in CT cable is insufficient to reach the distribution panel, it can be extended via an external GMK110 meter. CT replacement is not supported. CT ratio: 120 A/40 mA • GM330: The CT can be purchased from GoodWe or by yourself. CT ratio requirement: nA/5A • nA: CT primary-side input current; n ranges from 200 to 5000 • 5A: CT secondary-side output current

Device Type	Model	Description
Communication Module	• WiFi/LAN Kit-20 (Standard) • 4G Kit-CN-G20 (China only) • 4G Kit-CN-G21 (China only)	For single-unit operation, please use WiFi/LAN Kit-20, 4G Kit-CN-G20, 4G Kit-CN-G21 modules
Grid-tied inverter	-	• It is recommended to use GoodWe brand grid-tied inverters; third-party grid-tied inverters are supported. • In a microgrid system, please ensure that the rated output power of the grid-tied inverter is ≤ the rated output power of the hybrid inverter. • When the microgrid system is in grid-connected state, if power limitation is required, ensure that: ◦ The PV-storage hybrid inverter needs to be set via SEMS+ APP**Set Power Limit Parameters**interface; for the grid-tied inverter, please set according to the actual tool used. ◦ To ensure that the grid-tied inverter can continuously generate power, it is necessary to use SEMS+ APP**Microgrid Control Parameters**interface to adjust the output power of the hybrid inverter. • Note: The output Power Control accuracy of different grid-tied inverters varies. Please set the grid-tied power limit parameter value according to actual conditions.

2.2 Product Introduction

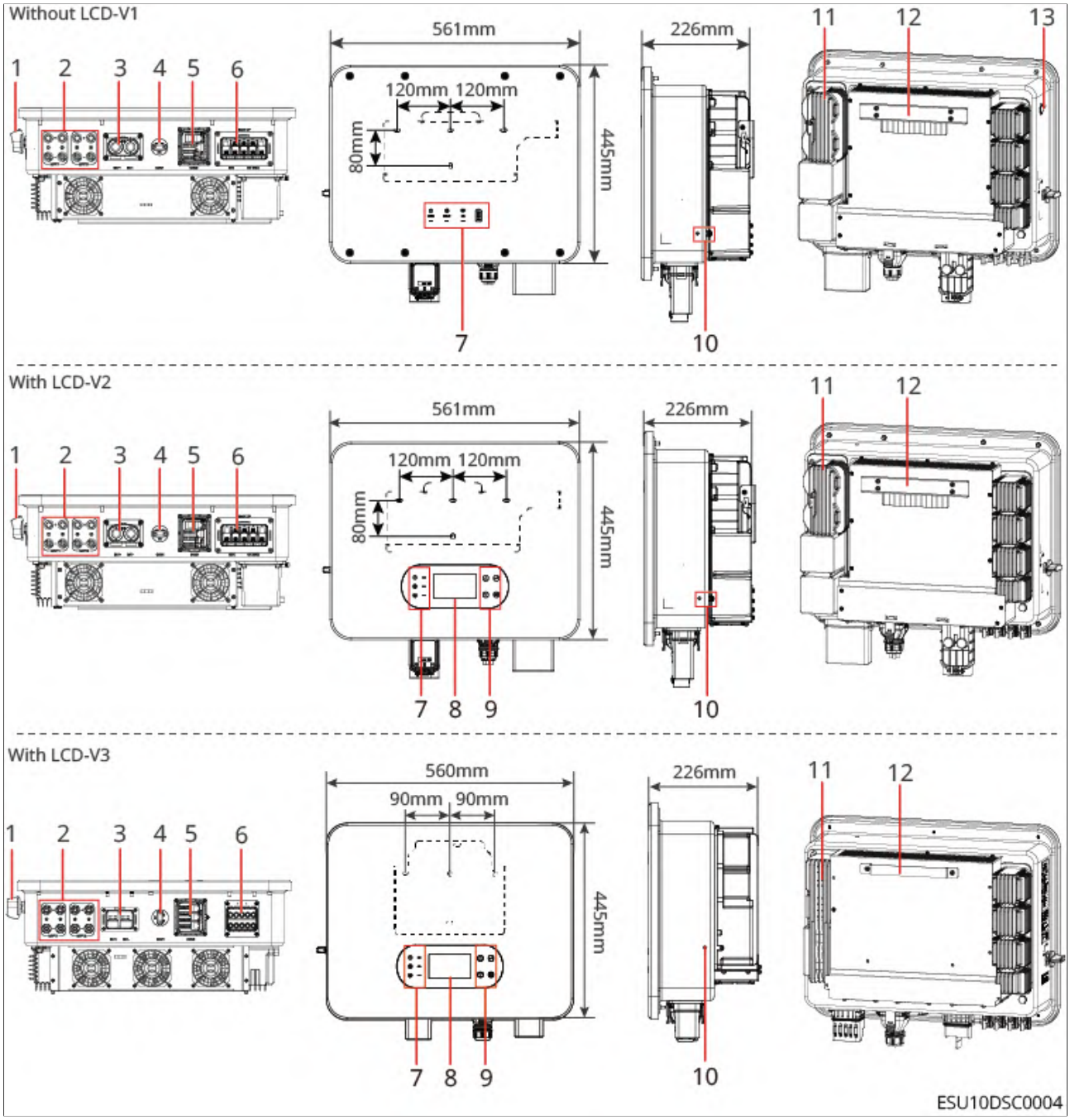
2.2.1 Inverter

In a PV system, the inverter controls and optimizes energy flow through an integrated energy management system. It can use the electricity generated in the PV system to supply loads, store it in batteries, output it to the grid, etc.

No.	Model	Rated Output Power	Rated Output Voltage
1	GW8000-ES-C10	8kW	220/230/240
2	GW10K-ES-C10	10kW	220/230/240
3	GW12K-ES-C10	12kW	220/230/240

NOTE

- The ES UNIQ 8-12kW series inverters have different appearance types. The product appearance and component differences are as follows.



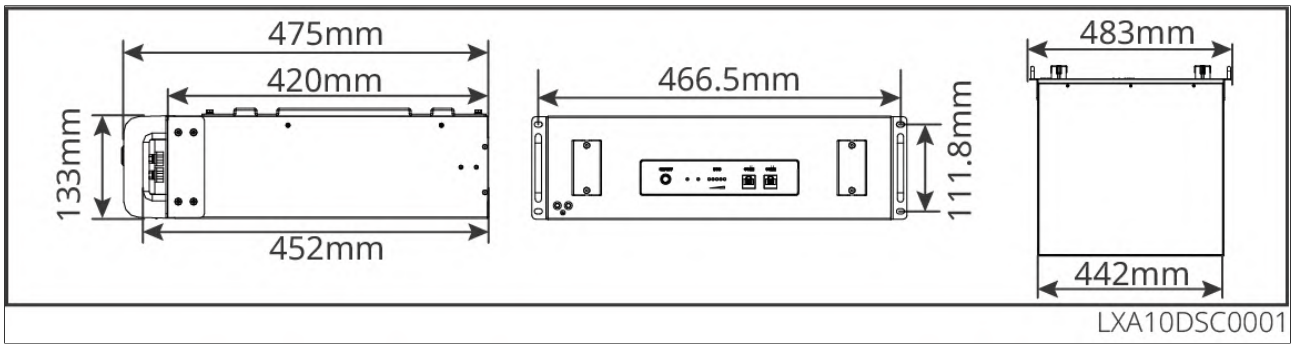
No.	Component/Silkscreen	Description
1	DC Switch	Controls the connection or disconnection of DC input.
2	PV input terminals	Can be connected to PV module DC input cables.

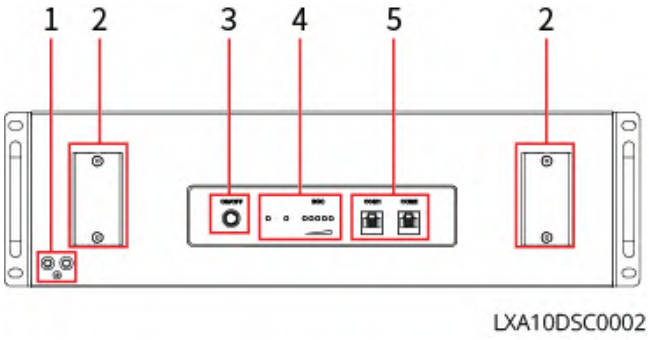
3	Battery input terminals	Can be connected to battery DC input cables.
4	Communication module port	Can be connected to a communication module; select the module type according to actual requirements.
5	Communication port	Can be connected to load control,CT、RS485, Remote Shutdown/Rapid Shutdown,DRED(Australia)/RCR(Europe), and other communication cables.
6	AC output port	Can be connected to AC output cables to connect the inverter to the grid.
7	Indicator lights	Indicates the operating status of the inverter.
8	Display (optional)	View inverter-related data.
9	Buttons (optional)	Used with the display to operate the inverter.
10	Grounding terminal	Connect the Protection ground wire.
11	Heat sink	Used for heat dissipation of the inverter.
12	Mounting bracket	Used to mount the inverter.
13	Off-grid control switch (screenless model only)	Controls whether the inverter supports off-grid operating mode. • Switch pressed: The inverter supports off-grid operating mode. • Switch not pressed: The inverter does not support off-grid operating mode.

2.2.2 Battery

The battery system can store and release power according to the requirements of the PV energy storage system. The input and output ports of the energy storage system are low-voltage DC. The inverter supports use with lead-acid batteries. For lead-acid battery-related product information, please obtain it from the lead-acid battery manufacturer.

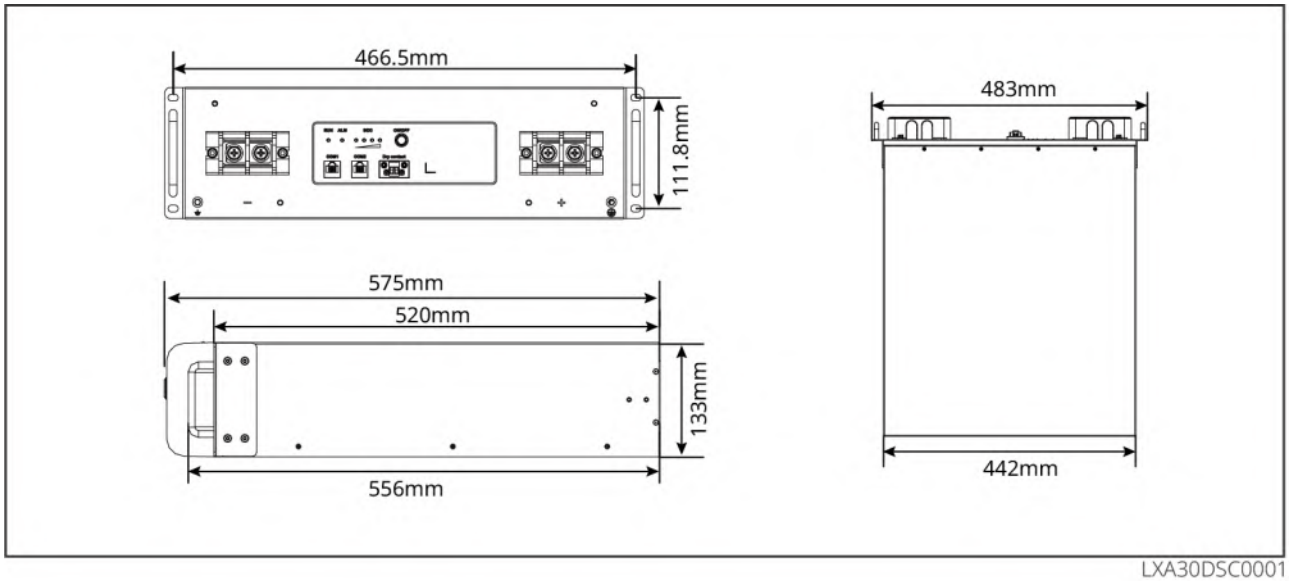
2.2.2.1 LX A5.0-10



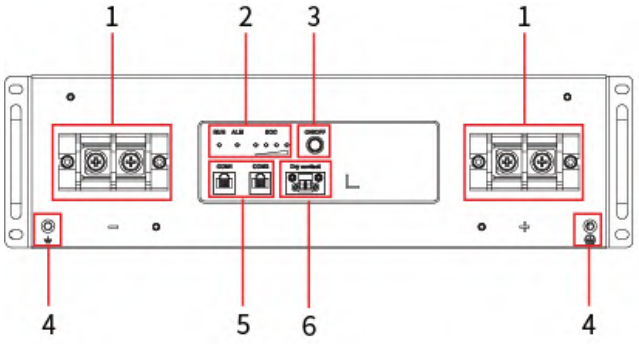


No.	Component/Silk screen	Description
1	Protection Grounding Terminal	Connect the enclosure Protection ground wire.
2	Battery DC port	Connect the battery DC input cable.
3	Battery system button	Used for battery power-on/off and black start.
4	Indicator lights	Indicates the battery operating status.
5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

2.2.2.2 LX A5.0-30



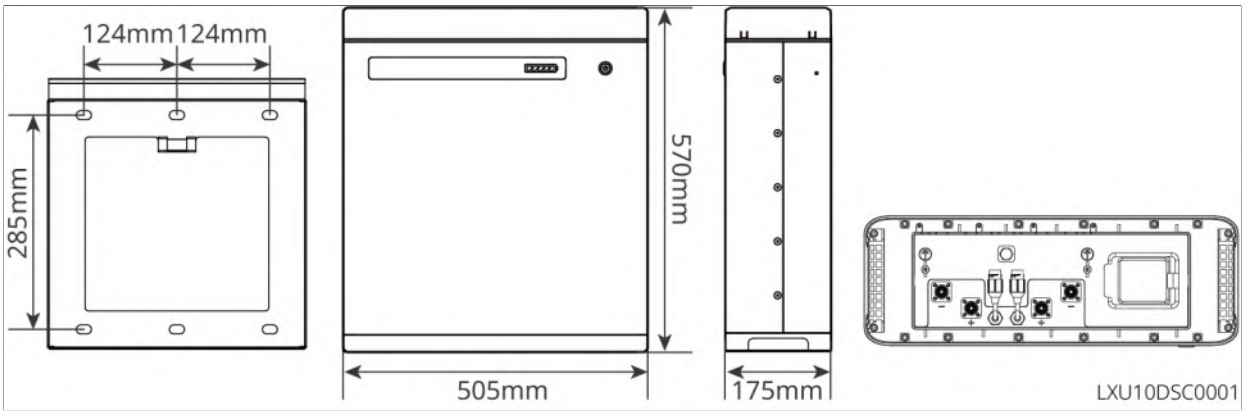
LXA30DSC0001

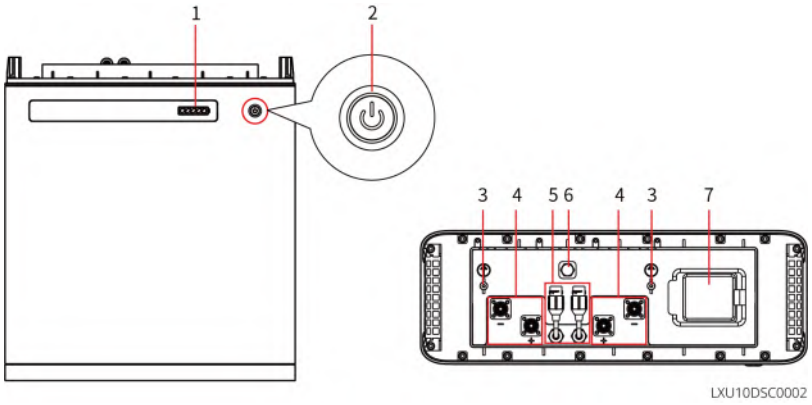


LXA30DSC0002

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

2.2.2.3 LX U5.4-L、LX U5.4-20

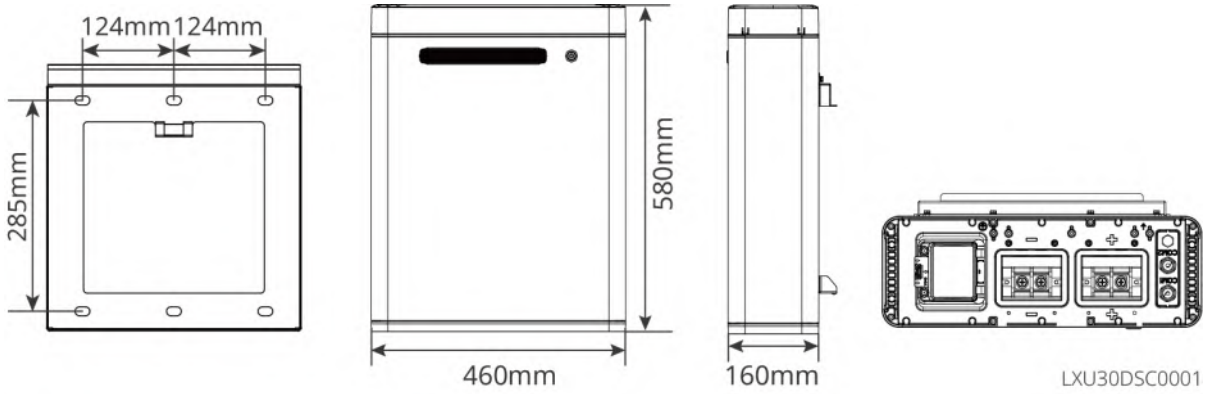


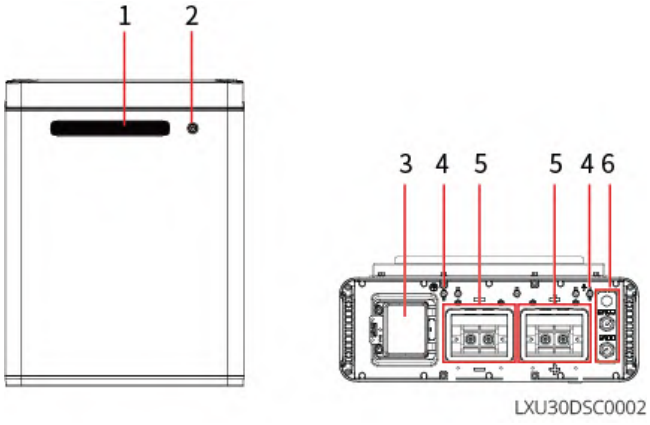


No.	Component/Silk screen	Description
1	Indicator lights	Indicates the battery operating status.
2	Battery system button	Used for battery power-on/off and black start.
3	Protection Grounding Terminal	Connect the enclosure Protection ground wire.
4	Battery DC port	Connect the battery DC input cable.
5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

No.	Component/Silk screen	Description
6	Explosion-proof vent valve	The explosion-proof vent valve balances the internal and external pressure of the battery and provides explosion protection.
7	Battery circuit breaker	Used for battery power-on/off.

2.2.2.4 LX U5.0-30

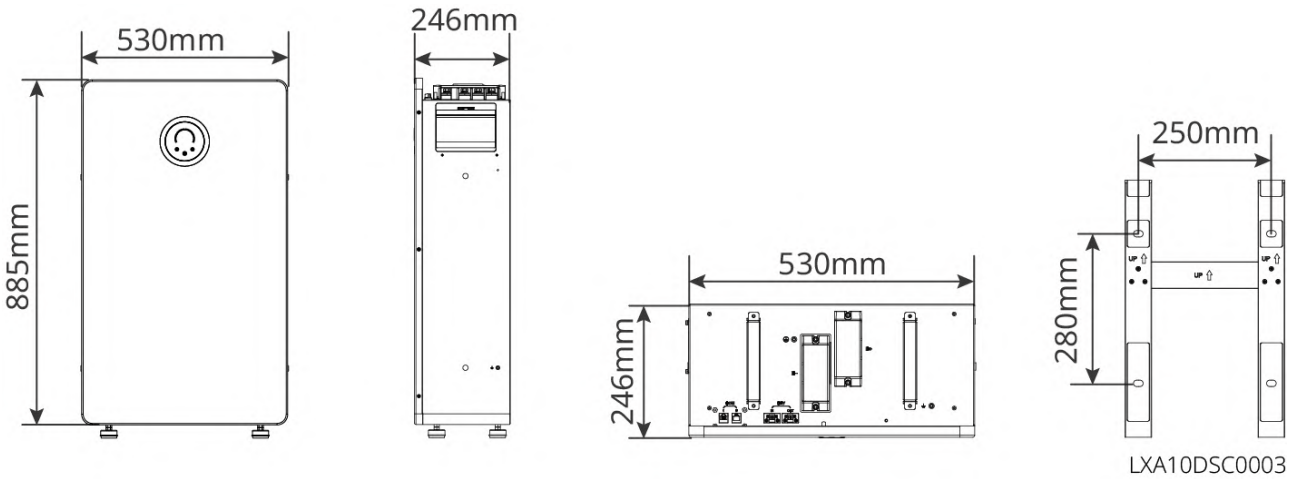


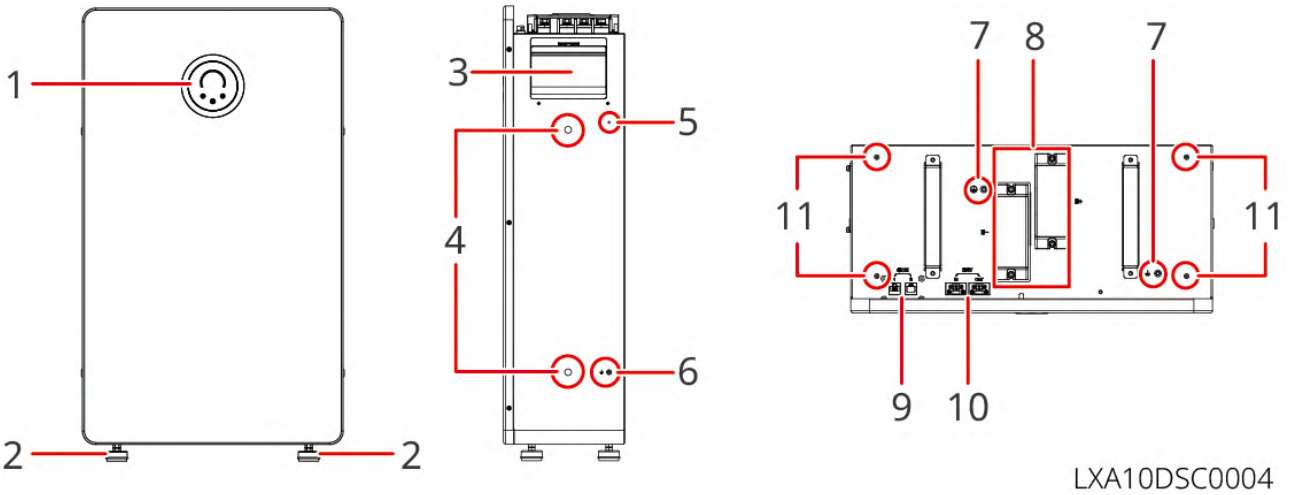


No.	Component/Silk screen	Description
1	Indicator lights	Indicates the battery operating status.
2	Battery system button	Used for battery power-on/off and black start.
3	Battery circuit breaker	Used for battery power-on/off.

No.	Component/Silk screen	Description
4	Protection Grounding Terminal	Connect the enclosure Protection ground wire.
5	Battery DC port	Connect the battery DC input cable.
6	Communication port	Connect the battery communication cable.

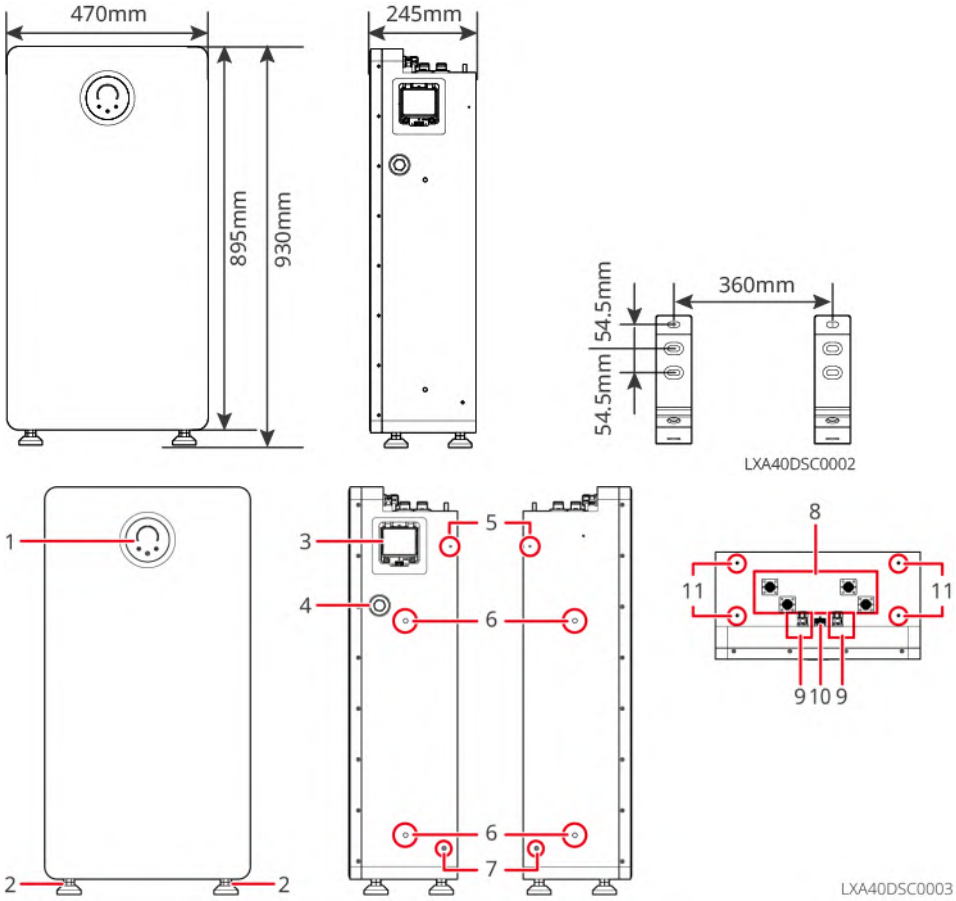
2.2.2.5 GW14.3-BAT-LV-G10





No.	Component/Silk screen	Description
1	Indicator lights	Indicates the battery operating status.
2	Feet	Supports the battery.
3	Battery circuit breaker	Used for battery power-on/off.
4	Lifting bar mounting holes	Used for installing the lifting bar. Used when manually carrying the battery.
5	L-shaped bracket mounting holes	Used to secure the battery to the wall.
6	Protection Grounding Terminal	Connect the enclosure Protection ground cable; reserved.
7	Protection Grounding 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 holes	Used to secure the battery decorative cover.

2.2.2.6 GW16.1-BAT-LV-G10



No.	Component/Silk screen	Description
1	Indicator lights	Indicates the battery operating status.
2	Feet	Supports the battery.
3	Battery circuit breaker	Used for battery power-on/off.
4	Explosion-proof vent valve	Equalize the internal and external air pressure of the battery to prevent explosion.
5	Anti-tip bracket mounting holes	Used to secure the battery to the wall.
6	Lifting bar mounting holes	Used for installing the lifting bar. Used when manually carrying the battery.
7	Protection Grounding Terminal	Connect the enclosure Protection ground wire.

No.	Component/Silk screen	Description
8	Battery DC port	Connect the battery DC input cable.
9	Communication port	Connect the BMS communication cable between the inverter and the battery
10	DRY port	Connect the battery dry contact signal cable. It can be connected to external fire protection equipment, etc.
11	Decorative cover mounting holes	Used to secure the battery decorative cover.

2.2.2.7 GW5.0-BAT-LVI-G10

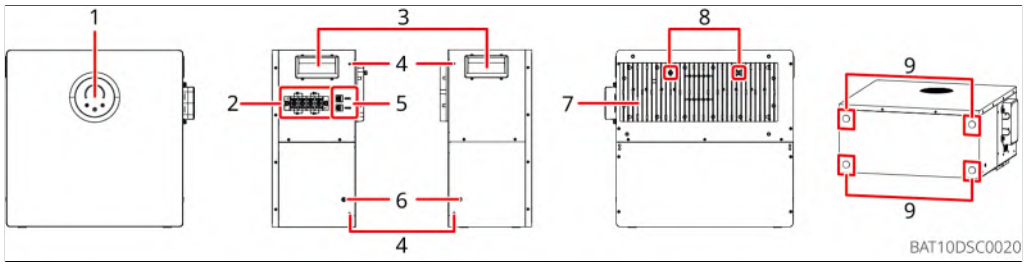


Figure3 Component Introduction

No.	Component/Silkscreen	Description
1	Indicator Lights and Buttons	• Indicator lights indicate the battery's operating status. • The button controls battery on/off.
2	Battery DC port	Connect battery power cables.
3	Handle slot	Carry the battery
4	Mounting holes	Secure batteries to each other when stacked or secure the anti-tip bracket
5	Communication port	Connect communication cable or terminating resistor

No.	Component/Silkscreen	Description
6	Protection Grounding Terminal	Connect the enclosure Protection ground wire.
7	Heat sink	Battery heat dissipation
8	Mounting holes for back mounting plate	Install the battery back mounting plate
9	Anti-slip sticker application position	For floor installation, anti-slip stickers need to be attached to the bottommost battery.

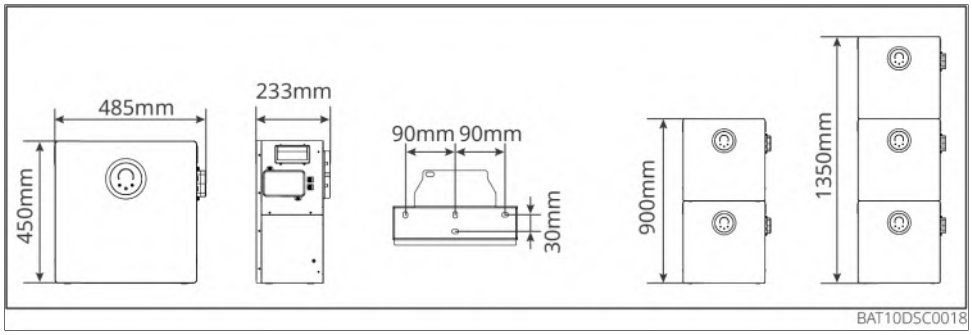


Figure4 Battery dimensions

2.2.2.8 GW10.0-BAT-LV-G10

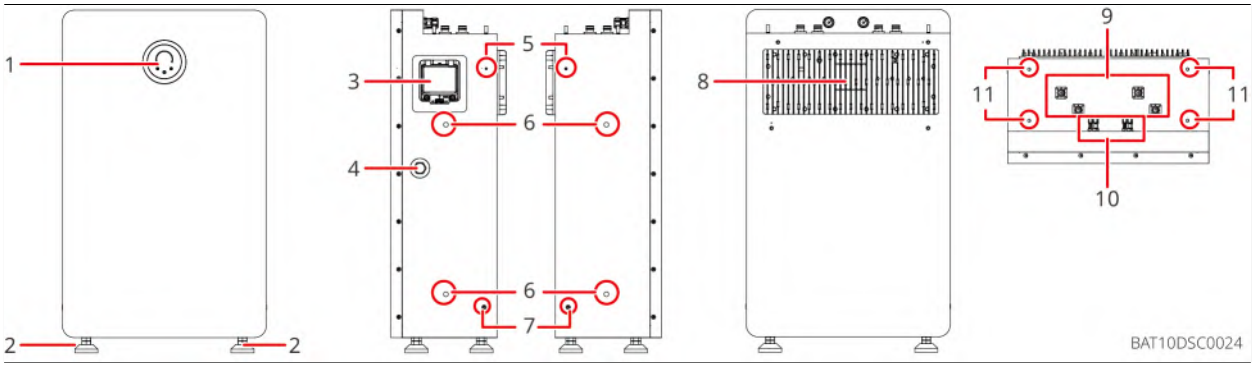


Figure5 Component Introduction

No.	Component/Silkscreen	Description
1	Indicator Lights and Buttons	• Indicator lights indicate the battery's operating status. • The button controls battery on/off.
2	Adjustable feet	Used when the battery is floor-mounted
3	Battery circuit breaker	Opens and closes the internal battery circuit
4	Explosion-proof vent valve	Balances internal and external air pressure of the battery, explosion-proof
5	Anti-tip bracket mounting holes	Used to secure the battery to the wall
6	Lifting bar mounting holes	Used to install the lifting bar and for manual battery handling
7	Protection Grounding Terminal	Connect the enclosure Protection ground wire.
8	Heat sink	Battery heat dissipation
9	Battery DC port	Connect battery power cables.
10	Communication port	Connect communication cable or terminating resistor
11	Decorative cover mounting holes	Used to secure the battery decorative cover

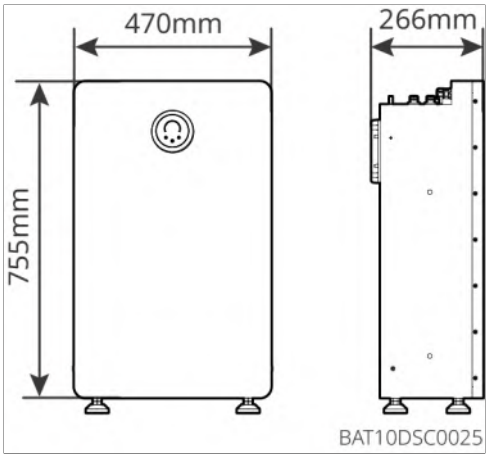
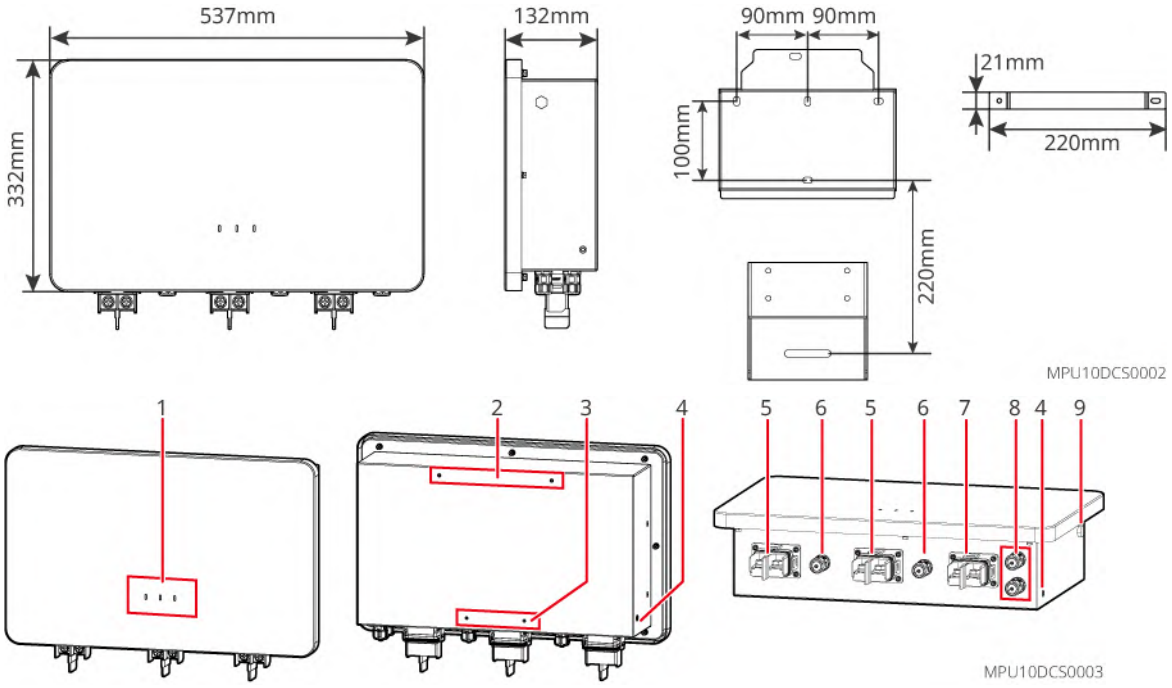


Figure6 Battery dimensions

2.2.3 Mix Parallel Unit

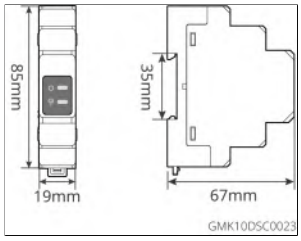
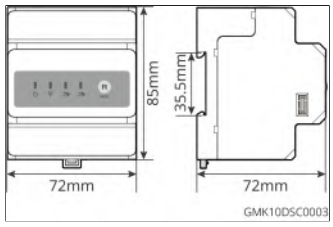
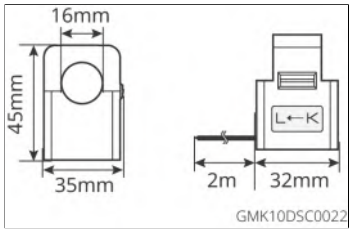


No.	Component/Silkscreen	Description
1	Indicator lights	Indicates the operating status of the Mix Parallel Unit.
2	Mounting Hole Positions for Hanging Bracket	Mounting bracket that can secure the Mix Parallel Unit.

No.	Component/Silkscreen	Description
3	Mounting Hole Positions for Enclosure Fixing Plate	Fixed-end mounting plate of the wall-mounting bracket that can secure the Mix Parallel Unit.
4	Protection Grounding Terminal	Connect the enclosure Protection ground wire.
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	Connect the communication cable from the inverter to the Mix Parallel Unit.
9	Vent 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.

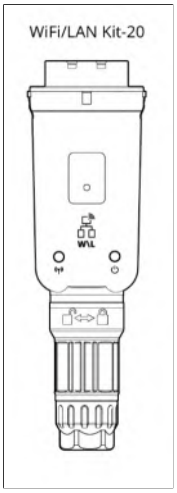
GMK110	GM330	CT
		

No.	Model	Applicable scenarios
1	GMK110	CT replacement is not supported; CT ratio: 120 A: 40 mA

No.	Model	Applicable scenarios
2	GM330	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

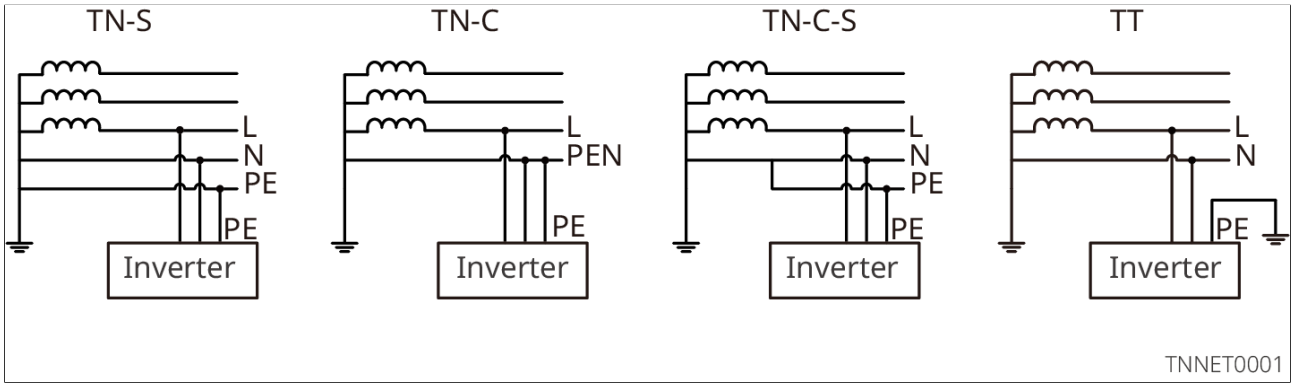
2.2.5 Smart Communication Stick

The Smart Communication Stick is mainly used for real-time transmission of various inverter power generation data to the SEMS+ remote monitoring platform, and for connecting to the Smart Communication Stick through the SEMS+ App to perform local device commissioning.

No.	Model	Signal Type	Applicable scenarios
1	WiFi/LAN Kit-20	Bluetooth, WiFi, LAN	For use in single-inverter scenarios
2	4G Kit-CN-G20	Bluetooth, 4G	
3	4G Kit-CN-G21	4G, Bluetooth, GNSS	
4	Ezlink3000	Bluetooth, WiFi, LAN	Master unit in multi-inverter scenarios

2.3 Supported Grid Types



2.4 System Mode

NOTE
After First-time Installation of the GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10, GW5.0-BAT-LVI-G10, and GW10.0-BAT-LV-G10 battery systems, a one-time full battery charge is automatically performed. After completion, the system switches to the configured operating mode.

Self-use Mode

- The basic mode for system operation.
- PV power generation preferentially supplies the load; excess energy charges the battery, and any remaining energy is sold to the grid. When PV generation 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.

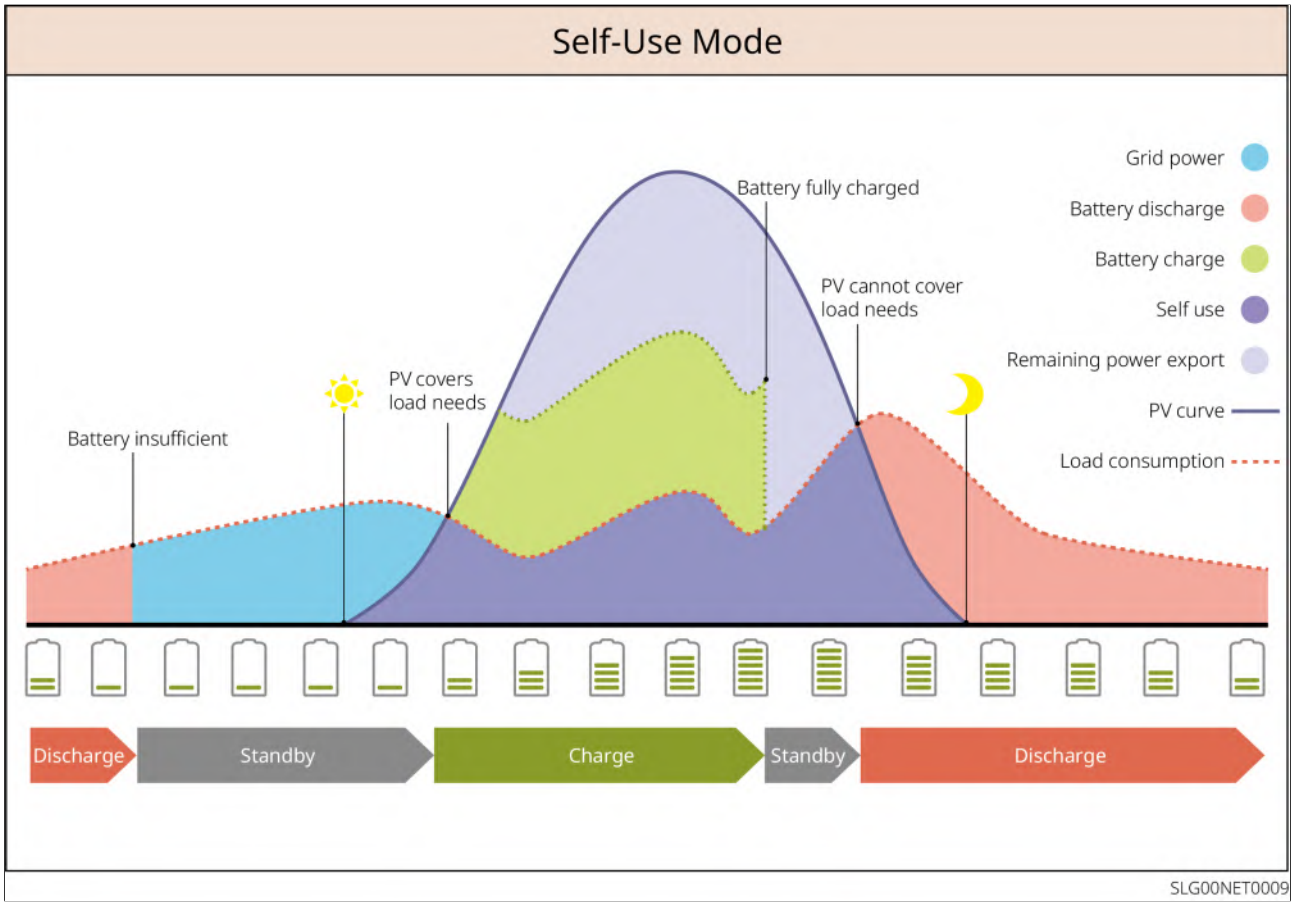


Figure7 **Self-use Mode**

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 the BACK-UP load remains powered. When the grid recovers, the inverter switches its operating mode to grid-connected operation.
- To ensure the battery SOC is sufficient to maintain normal system operation when off-grid, when the system is grid-connected, the battery will use PV or grid-purchased electricity to charge to the backup power SOC. If you need to charge the battery by purchasing electricity from the grid, please confirm that local grid laws and regulations are met.

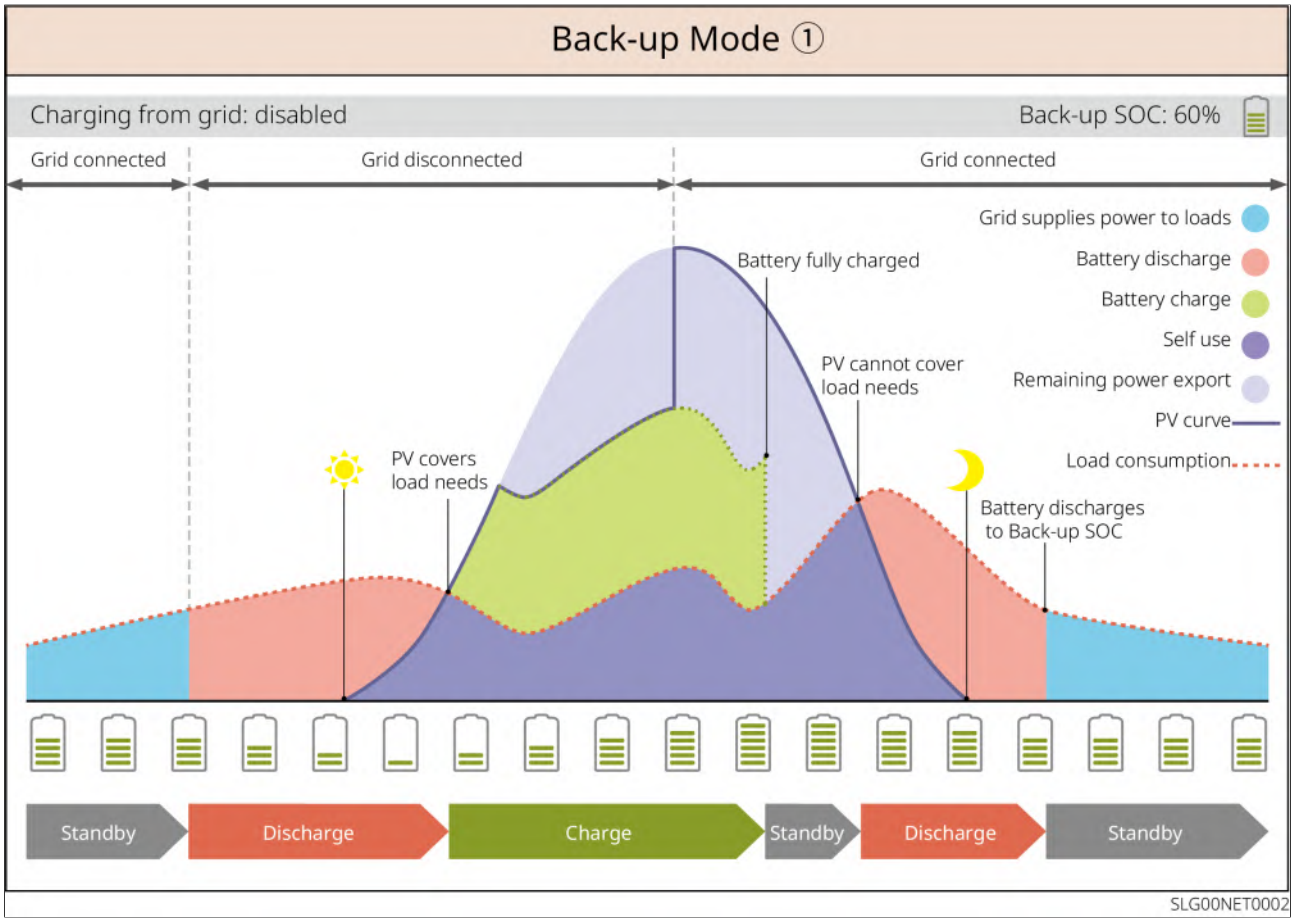


Figure8 **Backup Mode 1**

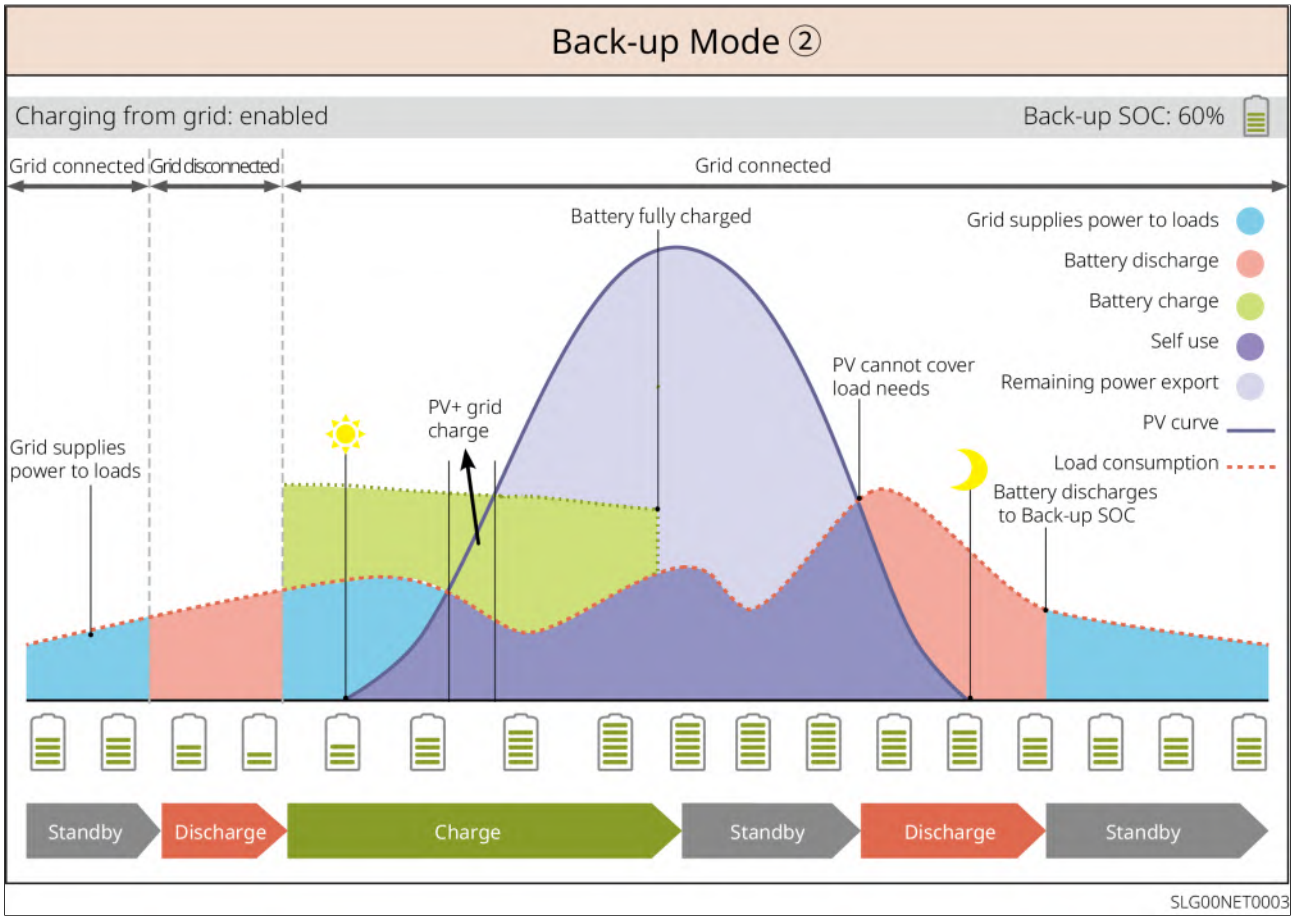


Figure9 **Backup Mode 2**

TOU Mode

In compliance with local laws and regulations, set different time periods for purchasing electricity and Export Energy according to grid peak-valley Tariff differences.

For example: during the valley Tariff period, set the battery to charging mode and charge it by purchasing electricity from the grid; during the peak Tariff period, set the battery to discharging mode and supply the load through the battery.

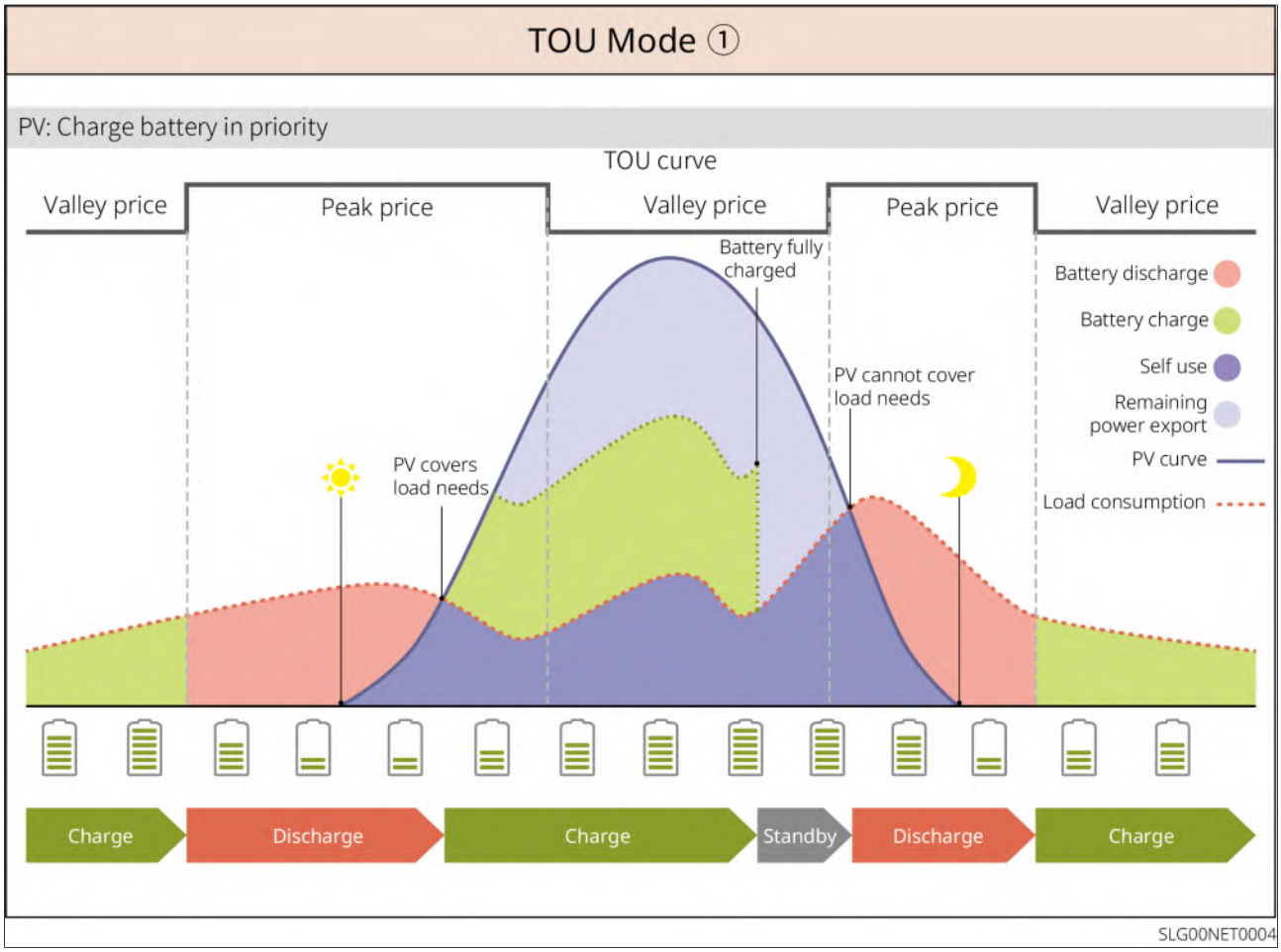


Figure10 **TOU Mode 1**

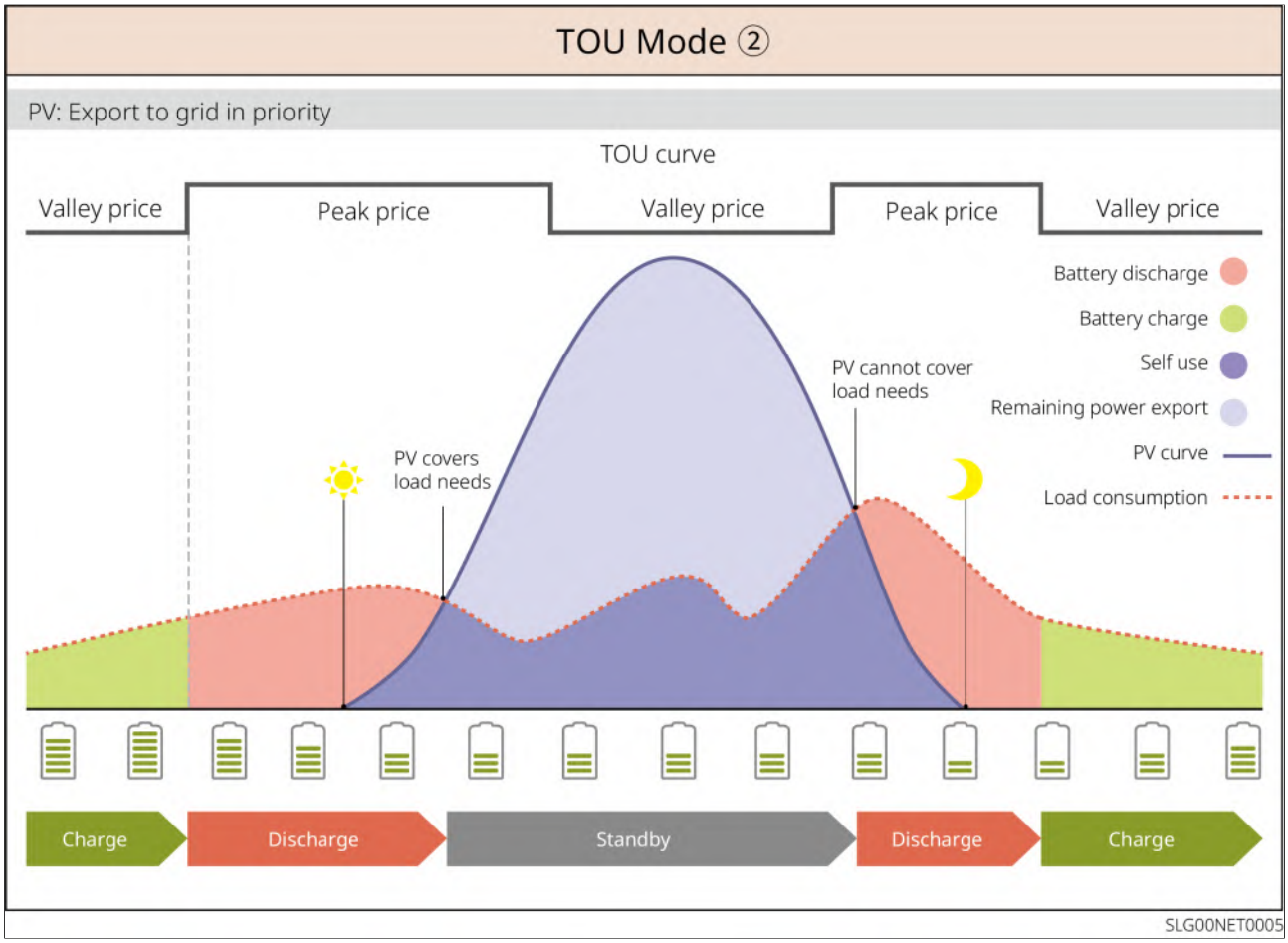


Figure11 **TOU Mode 2**

Off-grid Mode

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

- During the day, PV power generation preferentially supplies power to the load, and excess power charges the battery.
- At night, the battery discharges to supply power to the load, ensuring the BACK-UP load remains powered.
- Off-grid SOC recovery: After the system operates off-grid, the battery gradually recovers to the minimum SOC through PV power generation or other power generation methods.

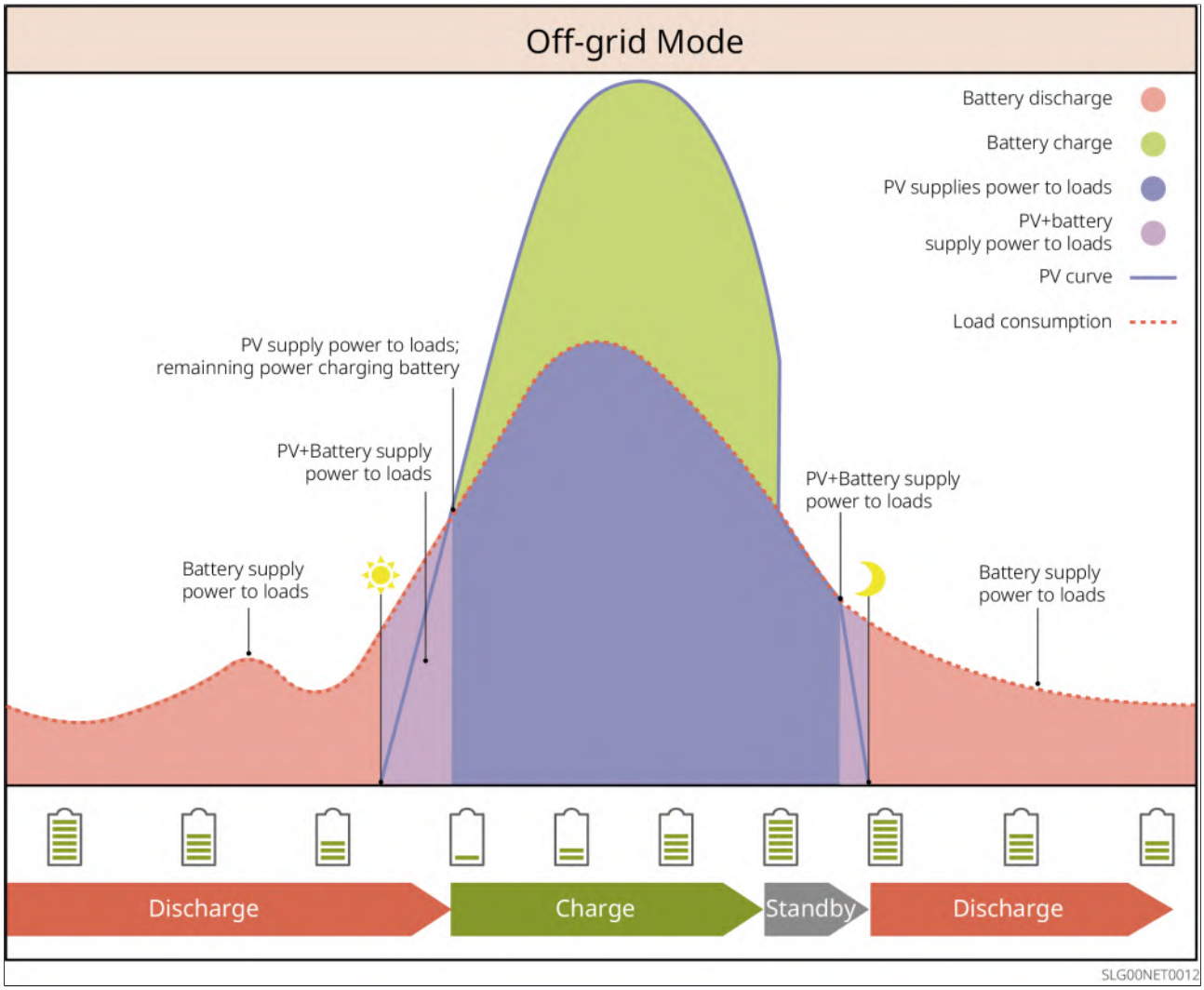


Figure12 **Off-grid Mode**

2.5 Features

AFCI

The inverter integrates an AFCI circuit Protection device to detect Arc Fault and quickly cut off the circuit upon detection, thereby preventing electrical fires.

Causes of arc generation:

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

Fault handling methods:

1. When the inverter detects an arc fault, the fault type can be viewed on the inverter display or App.
2. If the inverter triggers a fault less than 5 times within 24 hours, after waiting for 5 minutes, the machine will automatically restore grid connection and Protection. After the 5th Arc Fault, the inverter can only operate normally after the fault is cleared.

Load Control

The inverter's dry contact control port supports connecting additional contactors to control the turning on or off of loads. It supports household loads, heat pumps, etc. Load control methods are as follows:

- Time control: Set the time to control 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 set to OFF, the load will turn off.
- BACK-UP load control: The inverter has a built-in relay dry contact control port, which can control whether the load is turned off via the relay. In off-grid mode, if an Overload at the BACK-UP terminal is detected or the battery SOC falls below the battery off-grid Protection setting, the load connected to the relay port can be turned off.

Rapid Shutdown (RSD)

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

- External Transmitter
  - Transmitter 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

- Built-in Transmitter

- External trigger device: AC-side circuit breaker
- Receiver models: GR-B1F-20, GR-B2F-20
- When the inverter cannot connect to an external synchronization signal and there is a need to parallel multiple inverters, ensure that the PV cable routing of different inverters uses independent cable trays, and the cable trays maintain a spacing of at least 20 cm between them.
- When the inverter can connect to an external synchronization signal, ensure that a maximum of 5 transmitters are connected in the same synchronization group.

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 the product, please carefully check the following:

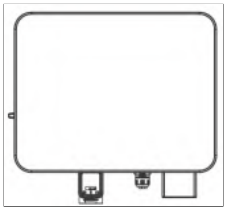
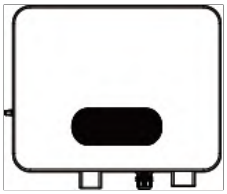
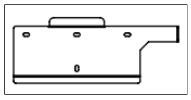
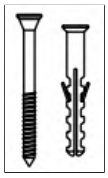
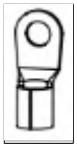
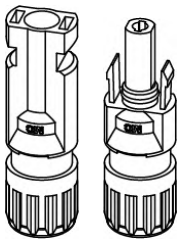
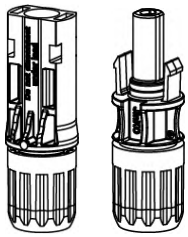
1. Check whether the outer packaging is damaged, such as deformation, holes, cracks, or other signs that may cause damage to the equipment inside the packaging box. If there is any damage, do not open the packaging and contact your dealer.
2. When removing the battery, ensure that the packaging carton is intact. If the packaging is accidentally damaged and a return or replacement is required due to product quality issues, please contact GoodWe after-sales service 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 package and contact your distributor or after-sales service center.
4. Check whether the type and quantity of delivered items are correct and whether the appearance is damaged. If there is any damage, contact your distributor or after-sales service center.

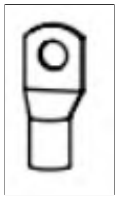
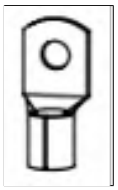
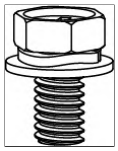
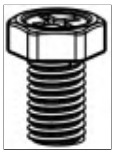
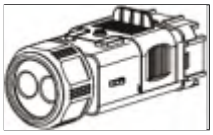
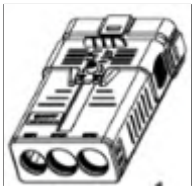
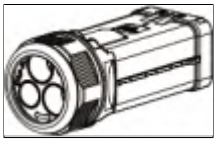
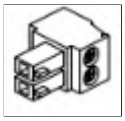
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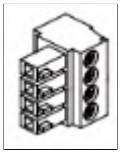
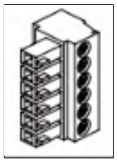
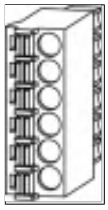
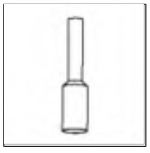
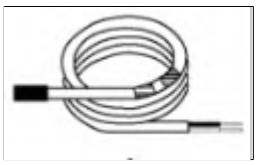
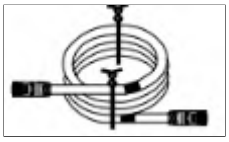
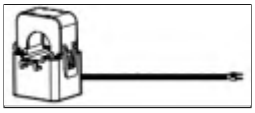
⚠WARNING

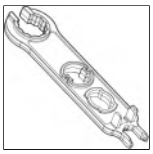
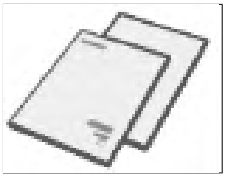
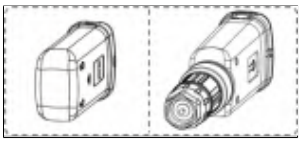
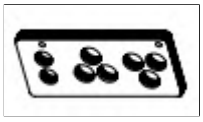
Check whether the type and quantity of delivered items are correct and whether the appearance is damaged. If there is any damage, contact your distributor. After the delivered items are removed from the packaging, do not place them on rough, uneven, or sharp surfaces to avoid paint peeling.

3.2.1 Inverter Delivered Items

Component	Description	Component	Description
 	Inverter x1 Provided according to actual conditions		Back mounting plate x1 Provided according to actual conditions
	Expansion bolts x4		Protection grounding terminal: 1 or 3 Provided according to actual conditions
 or 	PV DC terminal • GW8000-ES-C10 x 3 • GW10K-ES-C10、GW12K-ES-C10 x 4		MC4 PV terminal anti-tamper cover (Europe only) x 1

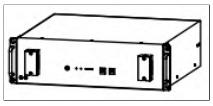
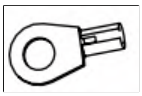
Component	Description	Component	Description
	Battery power connection terminal x 2 Used for some models		AC terminal: 2 or 6 Provided according to actual conditions
 	Battery screw x 2 Provided according to actual conditions		Grounding screw x1 Used for some models
	Nut x8 Used for some models		Battery connector x1 Used for some models
 	AC Protection Cover x1 Provided according to actual conditions		2-pin communication terminal x 2 Used for some models according to the communication port on the hardware board

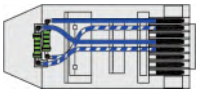
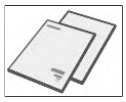
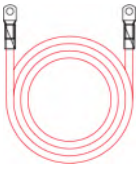
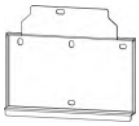
Component	Description	Component	Description
	4-pin communication terminal x 1 Used for some models according to the communication port on the hardware board	 	6-pin communication terminal: 2 or 3 or 4 Provided according to the actual condition of the communication ports on the hardware board
	AC pinhole terminal x10 Used for some models		Communication tubular terminal: 14 or 18 or 24 Provided according to actual conditions
	AC Protection cover unlocking tool x1 Used for some models		Lead-acid battery temperature sensor cable x 1
	BMS communication cable x 1		Lead-acid battery temperature sensor cable fixing adhesive sticker x 2
	CT connection cable x 1		PV terminal unlocking tool • China x 0 • Europe x 0 • Other regions x 1

Component	Description	Component	Description
	PV terminal unlocking tool (Europe only) x 1		Product documentation x 1
	Communication module x1 Provided according to actual conditions		Magnetic ring fixing cable tie x 2 Supplied for models with magnetic ring
	Magnetic ring x 1 Used for some models		Waterproof gasket x 1 Used for some models
	Magnet x 1 Used for some models		

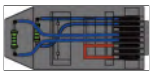
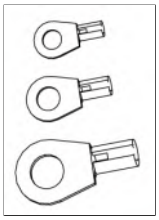
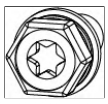
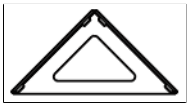
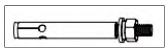
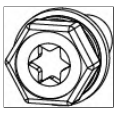
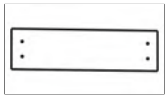
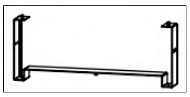
3.2.2 Battery Delivery Items

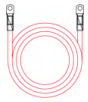
3.2.2.1 LX A5.0-10

Component	Description	Component	Description
	Battery module x 1		(25-8) Power cable OT terminal x 4 (5.5-5) Grounding OT terminal x 2
	M5 grounding screw x 2		Warning label x 1

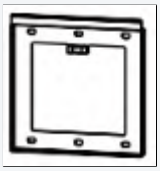
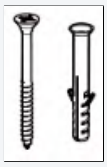
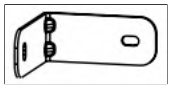
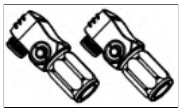
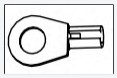
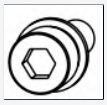
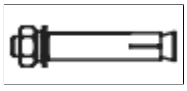
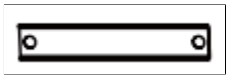
Component	Description	Component	Description
	Terminating resistor x 1		Electrical label x 1
	M4*8 screw x 8 (optional) Supplied when the bracket Mounting Method is selected		Battery bracket x 2 (optional) Supplied when the bracket Mounting Method is selected
	Product documentation x 1		Negative power 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
	Back mounting bracket expansion screws (optional) x 4		Back mounting bracket (optional) x 1
	Mounting bracket (optional) x 1		Mounting bracket screws (optional) x 4

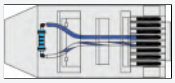
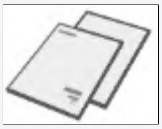
3.2.2.2 LX A5.0-30

Component	Description	Component	Description
	Battery module x 1		Terminating resistor x 1 When connecting to a third-party busbar, this terminating resistor must be installed on the battery
	• M5 OT terminal x 2: Recommended for connecting 10 mm^2cable • M8 OT terminal x 4: Recommended for connecting 50 mm^2cable • M10 OT terminal x 2: Recommended for connecting 70 mm^2cable		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
	Battery bracket x 2 (optional) Supplied when the stacking Mounting Method is selected		M4*8 screw x 8 Supplied when the stacking Mounting Method is selected

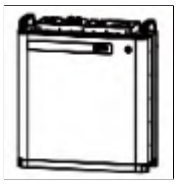
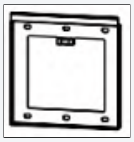
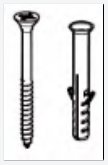
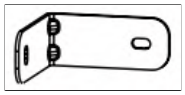
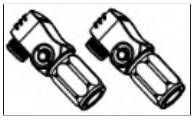
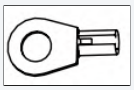
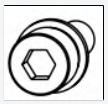
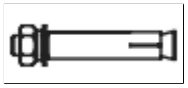
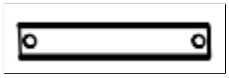
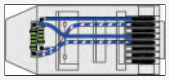
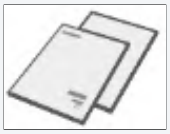
Component	Description	Component	Description
	Product documentation x 1		Negative power cable (optional) x 1
	Positive power cable (optional) x 1		Grounding cable (optional) x 1
	Communication cable (optional) x 1		Decorative cover (optional) x 1

3.2.2.3 Battery Delivery Items (LX U5.4-L)

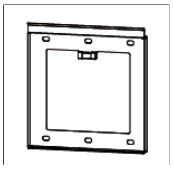
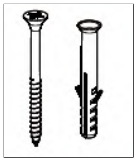
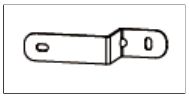
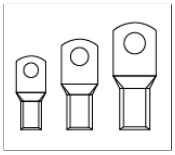
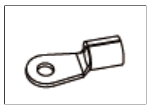
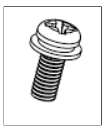
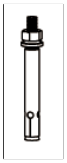
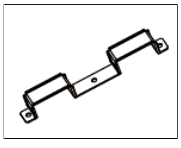
Component	Description	Component	Description
	Battery x 1		Plastic top cover x 1
	Wall Mounting Plate x 1		Expansion screw x 2
	Anti-tip bracket x 2		Power Connector x 2
	Grounding Terminal x 4		M5 Combination Bolt x 8
	M10 expansion bolts x 6		Wire Harness Fixing Plate x 2

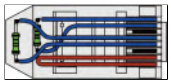
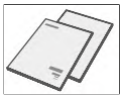
	Terminating resistor x 1		Product documentation x 1

3.2.2.4 Battery Delivery Items (LX U5.4-20)

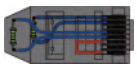
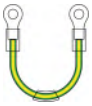
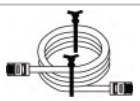
Component	Description	Component	Description
	Battery x 1		Plastic top cover x 1
	Wall Mounting Plate x 1		Expansion screw x 2
	Anti-tip bracket x 2		Power Connector x 2
	Grounding Terminal x 4		M5 Combination Bolt x 8
	M10 expansion bolts x 6		Wire Harness Fixing Plate x 2
	Terminating resistor x 1		Product documentation x 1

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

Component	Description	Component	Description
	Battery x 1		Plastic top cover x 1
	Wall bracket x 1		Expansion screw x 2
	Anti-tip bracket x 2		• 35-8 OT terminal x 4: Recommended for connecting 25 mm² or 35 mm² cable • 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 bolt x 7
	M10 expansion bolts x 6		Wiring harness fixing plate x 1

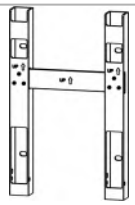
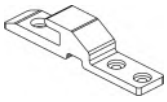
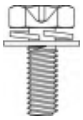
Component	Description	Component	Description
	Terminating resistor x 1		Product documentation x 1

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

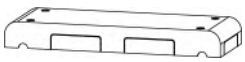
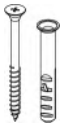
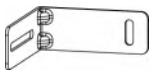
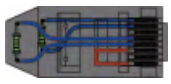
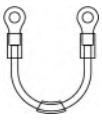
Component	Description	Component	Description
	Battery x 1		Cable cover x 1
	Lifting handle x 2 (Shipped with the box after October 2025)		Expansion screws x 2
	M5*16 cross recessed hex head screw x 7		Wall-locking anti-tip bracket x 2
	Terminating resistor x 1		Grounding ring terminal x 1 (Shipped with the box before October 2025)
	DC ring terminal x 6 (Shipped with the box before October 2025)		Grounding cable x 1 (Shipped with the box after October 2025)
	Positive power cable x 1 (Shipped with the box after October 2025)		Negative power cable x 1 (Shipped with the box after October 2025)
	Communication cable x 1		Product documentation x 1

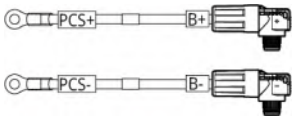
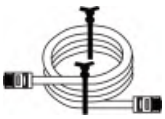
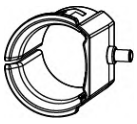
Optional accessories

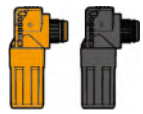
Component	Description	Component	Description

	Wall-mount bracket x 1		Hook x 4
	M5*16 cross recessed hex head x 12		M10 expansion screws x 4

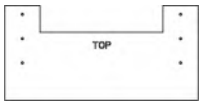
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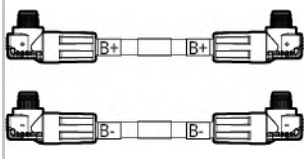
Component	Description	Component	Description
	Battery x 1		Decorative cover x 1
	Lifting handle x 2		Expansion screws x 2
	M5*12 hex socket head screw x 7		Wall-locking anti-tip bracket x 2
	Terminating resistor x 1		Grounding cable x 1

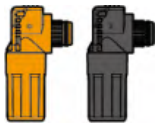
Component	Description	Component	Description
	Positive power cable x 1 Negative power cable x 1 • 1 m cable: partially standard • 2m cable: ◦ Overseas: partially standard ◦ Domestic: none		Decorative cover rubber plug x 4
	Communication cable x 1		Product documentation x 1
	Quick-connect terminal unlocking tool x 1		(Optional) Dry contact connector x 1
	(Optional) Tubular terminal x 4		SC50-8 OT terminal • Domestic: partially standard x 2 • Overseas: x 0

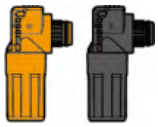
Component	Description	Component	Description
	Battery positive quick plug Battery negative quick plug • Domestic: partially standard x 2 • Overseas: x 0		

Optional accessories

Component	Description	Component	Description
	Wall-mounting bracket x 2		Positioning cardboard x 1
	M10 expansion bolt x 6		M10*60 bolt x 2

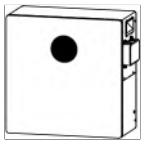
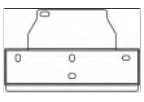
Component	Description	Component	Description
	Positive power cable for parallel connection between battery clusters x 1 Negative power cable for parallel connection between battery clusters x 1		

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

Component	Description	Component	Description
	Battery rollers x 4		

3.2.2.8 Battery Delivered Items (GW5.0-BAT-LVI-G10)

Component	Description	Component	Description
	Battery x 1		Back mounting plate x 1

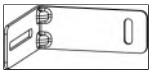
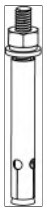
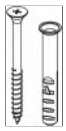
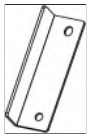
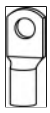
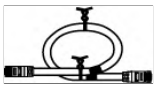
Component	Description	Component	Description
	Hanging bracket x 1		Anti-tip bracket x 2
	Expansion bolts x 4		Expansion screw x 2
	Stacking fixing bracket x 2		Fastening screws x 7
	Rubber washers x 5		Grounding cable x 1
	Positive and negative power cable 1 m x 1 Optional shipment		OT terminals x 4
	Communication cable 0.9m x 1		Battery busbar connection terminating resistor x 1
	Document x 1	-	-

Table51 Type I

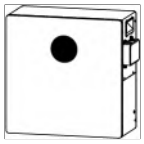
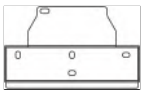
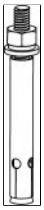
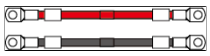
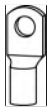
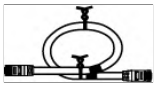
Component	Description	Component	Description
	Battery x 1		Back mounting plate x 1
	Hanging bracket x 1		Expansion bolts x 4
	Fixing screws x 3		Grounding cable x 1
	Positive and negative power cable 1 m x 1 Optional shipment		OT terminals x 4
	Communication cable 0.9m x 1		Battery busbar connection terminating resistor x 1
	Document x 1	-	-

Table52 Type II

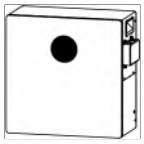
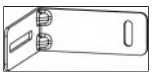
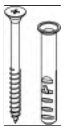
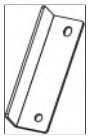
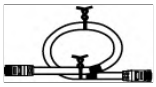
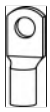
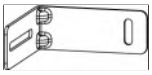
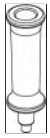
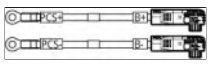
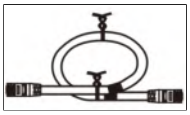
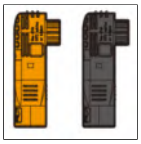
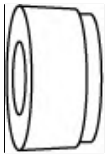
Component	Description	Component	Description
	Battery x 1		Anti-tip bracket x 2
	Expansion screws x 2		Stacking fixing bracket x 2
	Rubber washers x 5		Fixing screws x 5
	Positive and negative power cable 1 m x 1 Optional shipment		Grounding cable x 1
	Communication cable 0.9m x 1		OT terminals x 4
	Battery busbar connection terminating resistor x 1		Document x 1

Table53 Type III

3.2.2.9 Battery Delivery Items (GW10.0-BAT-LV-G10)

Component	Description	Component	Description
	Battery x 1		Anti-tip bracket x 2
	Decorative cover x 1		Lifting handle x 2
	Expansion screw x 2		Fastening screws x 7
	Rubber plug x 4		Grounding cable x 1
	Positive and negative power cable 1 m x 1 • China: Standard for some models • Other regions: Standard		Communication cable 0.9m x 1

Component	Description	Component	Description
 	Battery positive and negative connection terminal x 1 25-8 OT terminal x 2 • China: Standard for some models • Other regions: None		Battery busbar connection terminating resistor x 1
	Tubular terminal x 2 When the battery is directly connected to an ET LV series inverter, the battery cable on the inverter side must use this tubular terminal.		Sealing ring x 2 When the battery is directly connected to an ET LV series inverter, the sealing ring inside the cable gland on the inverter side must be replaced with a dedicated sealing ring.

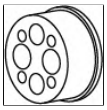
Component	Description	Component	Description
	Sealing ring x 1 When the battery is directly connected to an ES UNIQ 8-12kW series inverter, the sealing ring inside the cable gland on the inverter side must be replaced with a dedicated sealing ring.		Document x 1

Table54 Battery Accessories List

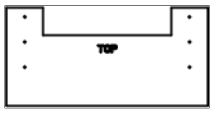
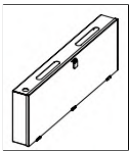
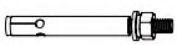
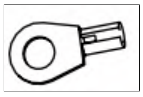
Component	Description	Component	Description
	Mounting bracket x 2		Mounting bracket marking paper x 1
	M10 expansion bolt x 6		M10 fastening screw x 2

Table55 Wall-mounting accessory kit (sold separately)

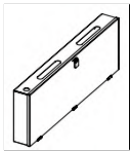
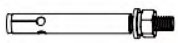
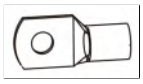
3.2.3 Combiner Box Delivered Items

3.2.3.1 BCB-11-WW-0 (Optional)

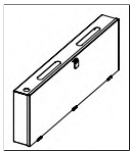
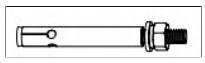
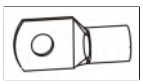
Component	Description	Component	Description
	BCB-11-WW-0 Combiner Box x 1		M6 Expansion Bolt x 4

Component	Description	Component	Description
	(25-8) OT Terminal x 18 (70-10) OT Terminal x 2	-	-

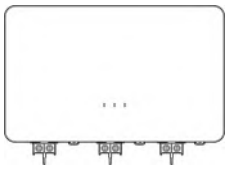
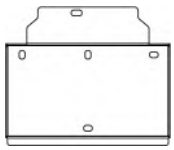
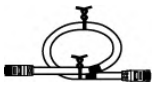
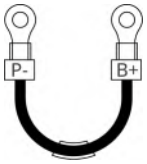
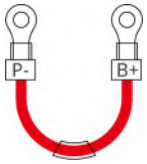
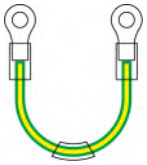
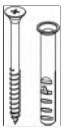
3.2.3.2 BCB-22-WW-0

Component	Description	Component	Description
	BCB-22-WW-0 Combiner Box x 1		M6 Expansion Bolt x 4
	(25-8) OT Terminal x 36 (70-10) OT Terminal x 6	-	-

3.2.3.3 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 Bolt x 4
	(50-8) OT Terminal x 30 (70-10) OT Terminal x 6	-	-

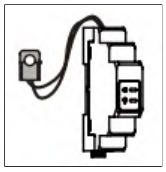
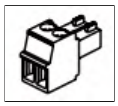
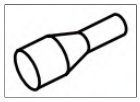
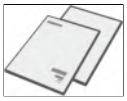
3.2.4 Mix Parallel Unit Delivered Items

Component	Description	Component	Description
	Mix Parallel Unit x 1		Back mounting plate x 1
	Mounting parts x1		Wall-mount bracket fixed end x 1
	Power terminal connector x 3 Power cable M8 screws x 6		BMS communication cable x 1
	Negative power cable x 1		Positive power cable x 1
	Grounding cable x 1		Expansion bolts x 5
	M5*12 hex socket cap screws x 5		Inverter battery port power cable tubular terminals x 2
	Product documentation x 1		M8 OT terminal: • SC25-8: 2 • SC35-8: 2 • SC50-8: 2 • SC70-8: 6

Component	Description	Component	Description
	Flathead screwdriver x 1		

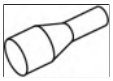
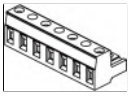
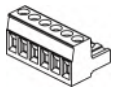
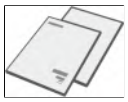
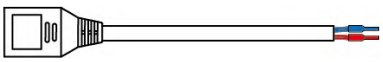
3.2.5 Smart Meter Delivery Items

3.2.5.1 GMK110

Component	Description	Component	Description
	Smart meter and CT x 1		RS485 communication terminal x 1
	Voltage input side terminal block x 1		Tubular terminal x 4
	Screwdriver x1		Product documentation x 1

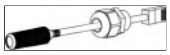
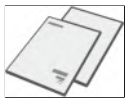
3.2.5.2 GM330

Component	Description	Component	Description
	Smart meter x1		2PIN communication terminal x1

Component	Description	Component	Description
	Tubular terminal x 6		7PIN communication terminal x1
	6PIN communication terminal x1		RS485 communication terminal x 1
	Screwdriver x1		Product documentation x 1
	2PINterminal andRJ45terminal adapter cable x 1	-	-

3.2.6 Smart Communication Stick

3.2.6.1 Ezlink3000

Component	Description	Component	Description
	Communication module x1		LAN cable connection port x1
	Product documentation x1		Unlocking tool x1 Some modules require a tool for removal. If the tool is not supplied, they can be unlocked via the button on the module body.

3.3 Equipment Storage

If the equipment is not put into use immediately, store it according to the following requirements. After long-term storage, the equipment must be inspected and

confirmed by qualified personnel before it can be used again.

1. If the inverter has been stored for more than two years or has not been in operation for more than 6 months after installation, it is recommended that it be inspected and tested by qualified personnel before being put into use.
2. To ensure good electrical performance of the internal electronic components of the inverter, 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, it is recommended that it be inspected and tested by qualified personnel before being put into use.
3. To ensure battery performance and service life, avoid long-term idle storage. Prolonged storage may cause deep discharge of the battery, resulting in irreversible chemical loss, capacity degradation, or even complete failure. Prompt use is recommended. If the battery needs to be stored for a long time, maintain it according to the following requirements:

Battery Model	Battery Storage Initial SOC Range	Recommended Storage Temperature	Charge/Discharge Maintenance Cycle[1]	Battery Maintenance Method[2]
LX A5.0-10	30%~40%	0~35℃	-20~0°C, ≤1 month 0~35°C, ≤6 months	For maintenance methods, please consult your dealer or after-sales service center.
n*LX A5.0-10				
LX A5.0-30	30%~40%	0~35℃	-20~35°C (<12 months) 35~+45°C(<6 months)	
LX U5.4-L	30%~40%	0~35℃	-20~0°C, ≤1 month 0~35°C, ≤6 months 35~40°C, ≤1 month	
LX U5.4-20				
n*LX U5.4-20				
LX U5.0-30	30%~40% 30%~40%	0~35℃ 0~35℃	-20~35°C, ≤12 months 35~45°C, ≤6 months	
GW14.3-BAT-LV-G10				
GW16.1-BAT-LV-G10				

GW5.0-BAT-LVI-G10				
GW10.0-BAT-LV-G10				

NOTE

[1] The storage time is calculated starting from the SN date on the battery outer packaging. After the storage period is exceeded, charge/discharge maintenance is required. (Battery maintenance time = SN date + charge/discharge maintenance period). For how to view the SN date, refer to:11.4.SN Code Meaning(Page 394)。

[2] After the charge/discharge maintenance passes, if a Maintaining Label is attached 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 retention of maintenance records.

Packaging requirements:

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

Environmental requirements:

1. Ensure the device 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 device ports, do not install the device.
3. Ensure the device is kept away from flammable, explosive, and corrosive items during storage.

Stacking requirements:

1. Ensure the inverter stacking height and orientation are arranged according to the label instructions on the packaging box.
2. Ensure there is no risk of tipping after the inverter is stacked.

4 Installation

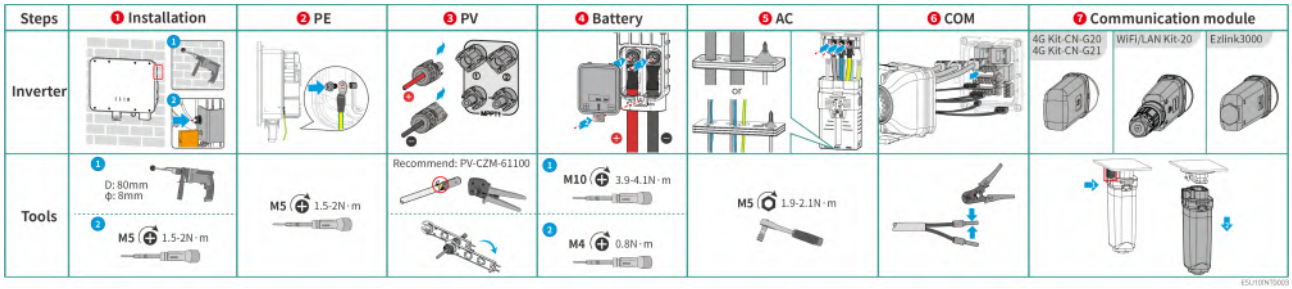
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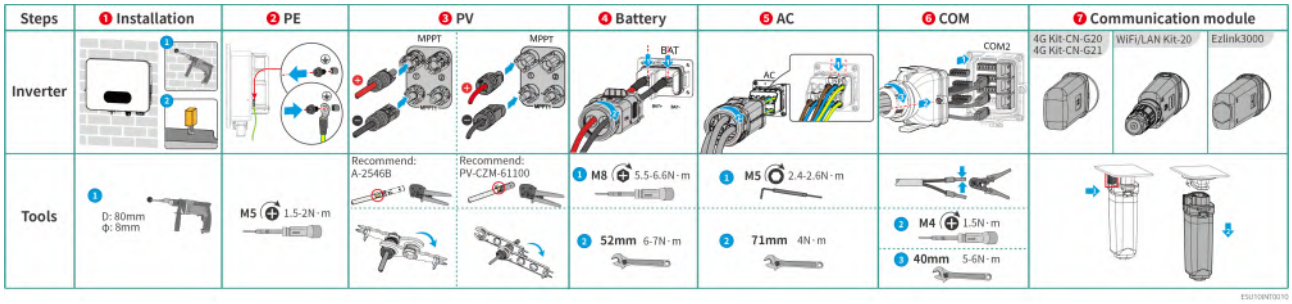
When performing device installation and electrical connections, use the delivered components shipped with the box; otherwise, device damage caused will not be covered by the warranty.

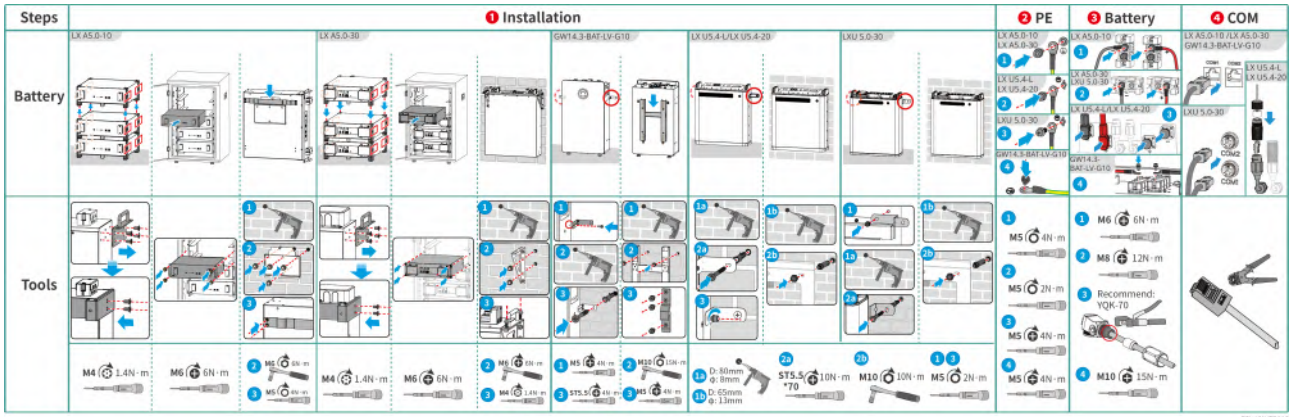
4.1 System Installation and Commissioning Process

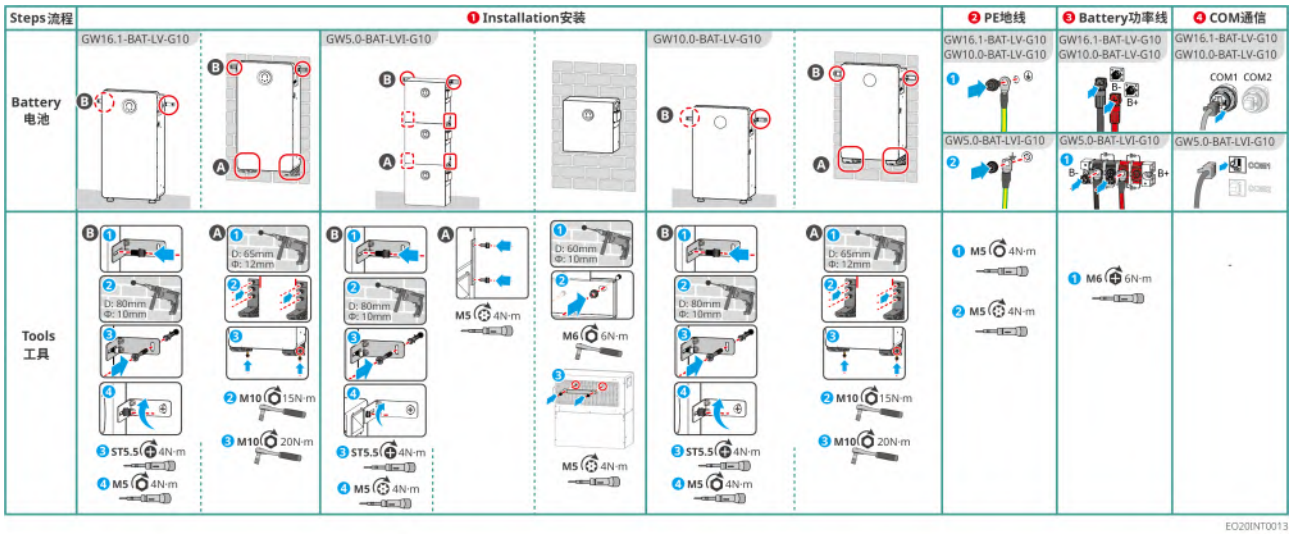
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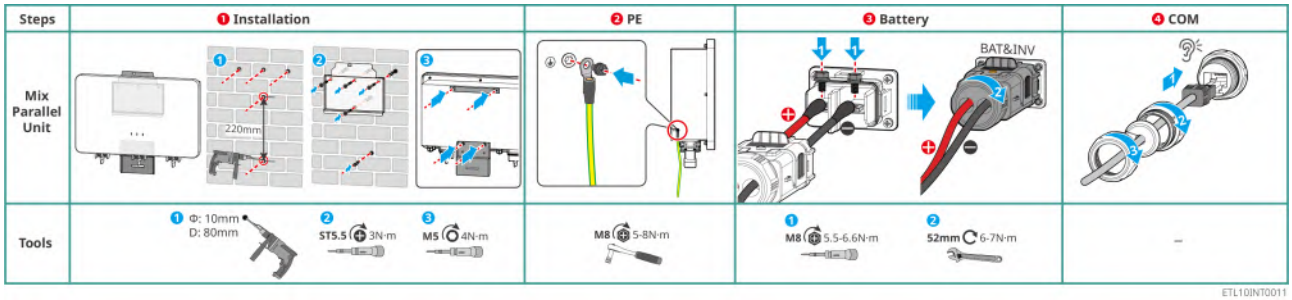
When performing device installation and electrical connections, use the delivered components shipped with the box; otherwise, device damage caused will not be covered by the warranty.

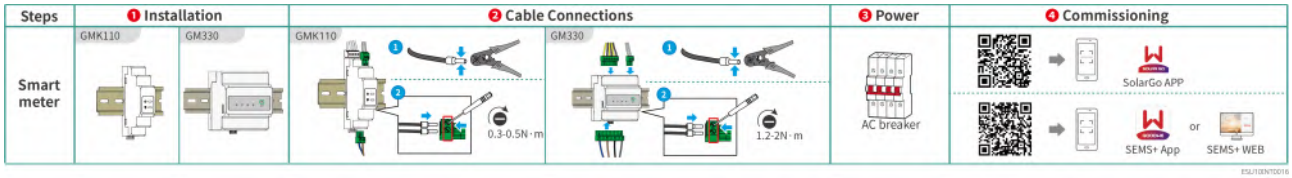












4.2 Installation Requirements

4.2.1 Installation Environment Requirements

1. The device must not be installed in flammable, explosive, corrosive, or similar

environments.

2. The temperature and humidity of the device installation environment must be within the appropriate range.
3. The installation location must avoid areas accessible to children and avoid locations that are easily touched.
4. When the inverter is running, the enclosure temperature may exceed 60°C. Do not touch the enclosure before it cools down to prevent burns.
5. It is recommended to install the device in a sheltered location, away from direct sunlight, rain, snow accumulation, etc. If on-site conditions prevent complete sheltering, ensure that environmental conditions such as temperature and humidity always remain within the allowable range specified in the device specifications, and take necessary protective measures.
6. Adverse environmental conditions such as direct sunlight and high temperatures may cause inverter output power derating. When selecting an installation site, fully consider heat dissipation conditions and avoid direct sunlight on the device itself.
7. The installation space must meet the device's ventilation and heat dissipation requirements as well as the operation space requirements.
8. The installation environment must meet the device's Ingress Protection Rating. The inverter, battery, and Smart Dongle 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 equipment indicators and all labels are easy to view and 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 is related to sea breeze, precipitation, topography, and other conditions.
12. Keep away from strong magnetic field environments to avoid electromagnetic interference. If there is a radio station or wireless communication equipment below 30 MHz near the installation location, install the equipment according to the following requirements:
    - Inverter: Add a multi-turn ferrite core at the inverter's DC input line or AC output line, or add a low-pass EMI filter; or ensure the distance between the inverter and wireless electromagnetic interference equipment exceeds 30 m
    - Other equipment: Ensure the distance between the equipment and wireless electromagnetic interference equipment exceeds 30 m.
13. 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.

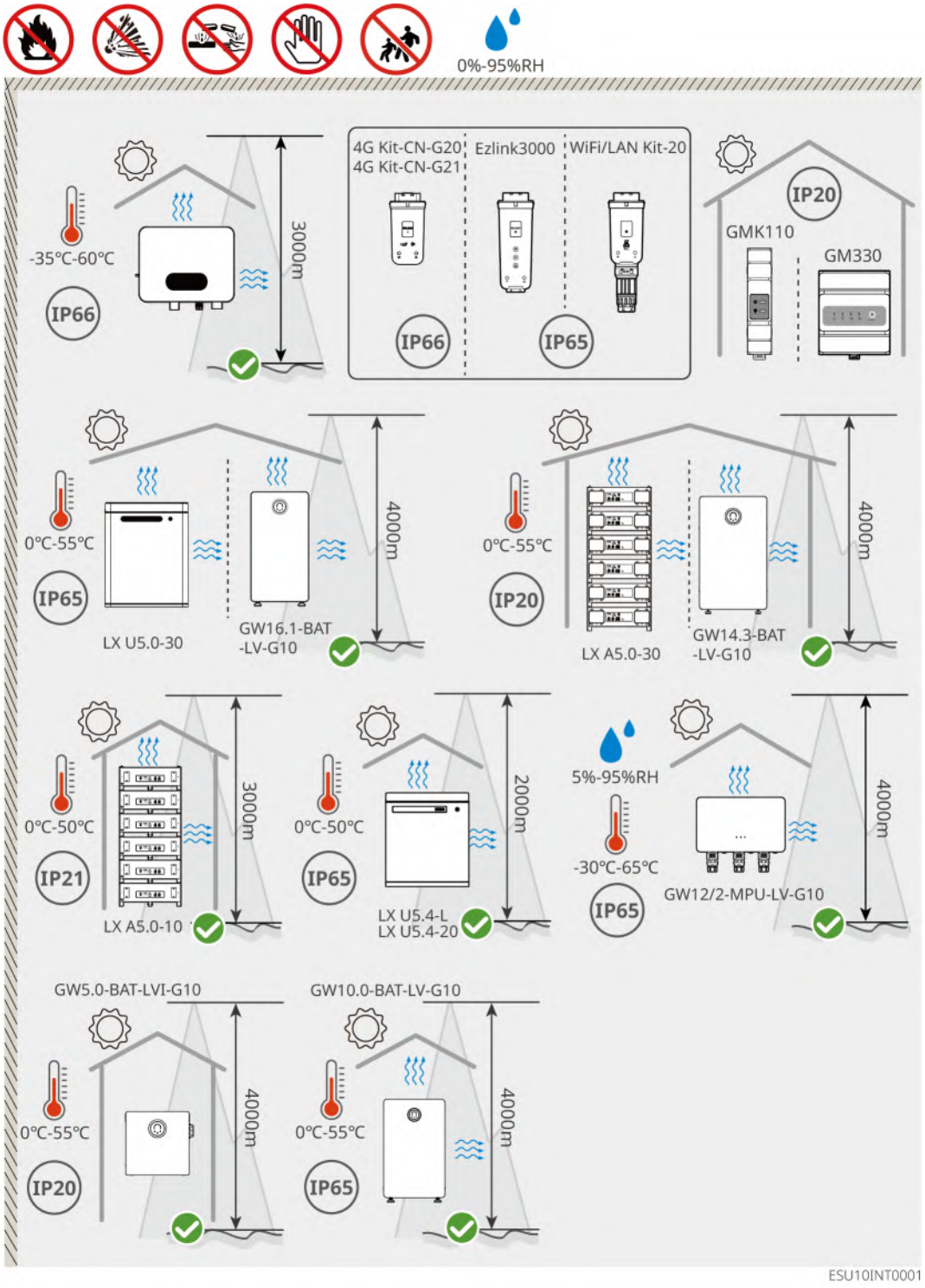
14. The installation and storage location of the equipment should avoid areas directly exposed to cold air such as air conditioner outlets. Excessive local temperature differences may cause condensation in the equipment, leading to the following risks:
    a. Electrical insulation performance degrades, posing a risk of electric leakage or short circuit;
    b. Metal connectors and terminals corrode, resulting in increased contact resistance;
    c. Electronic components are damaged by moisture;
    d. Long-term condensation may accelerate equipment aging and shorten service life;

    Installation recommendation: Select a well-ventilated location with uniform temperature and humidity distribution for equipment installation, ensuring that the surrounding environment of the equipment meets the Operating Environment requirements specified by the manufacturer.

NOTE

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

- LX A5.0-30, LX U5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10, GW5.0-BAT-LVI-G10, GW10.0-BAT-LV-G10: Charging temperature range: 0 < T ≤ 55°C; Discharging temperature range: -20 < T ≤ 55°C
- LX A5.0-10, LX U5.4-L, LX U5.4-20: Charging temperature range: 0 < T ≤ 50°C; Discharging temperature range: -10 < T ≤ 50°C
- For batteries with optional heating film:
  - LX U5.0-30, GW10.0-BAT-LV-G10: Charging temperature range: -20 < T ≤ 55°C; Discharging temperature range: -20 < T ≤ 55°C

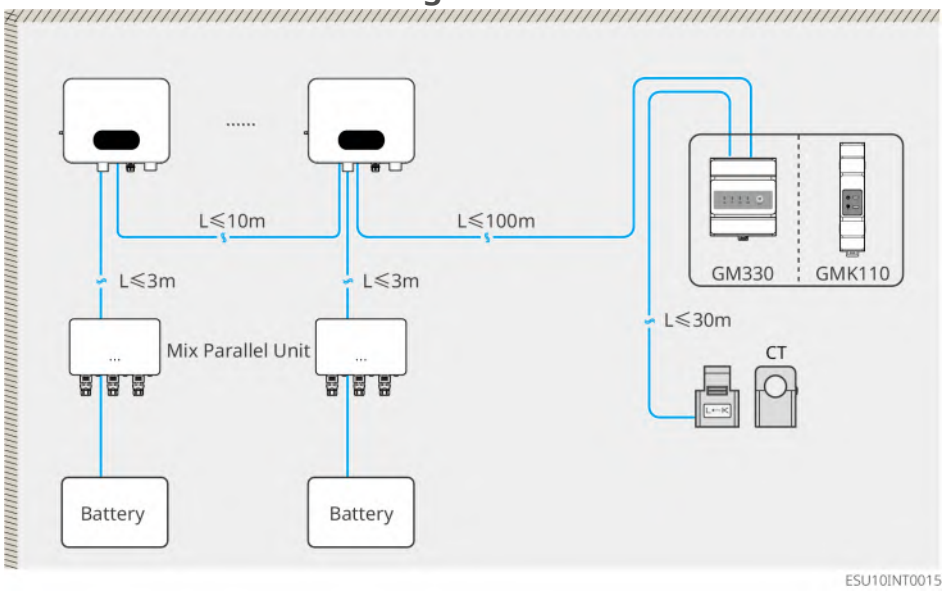


4.2.2 Installation Space Requirements

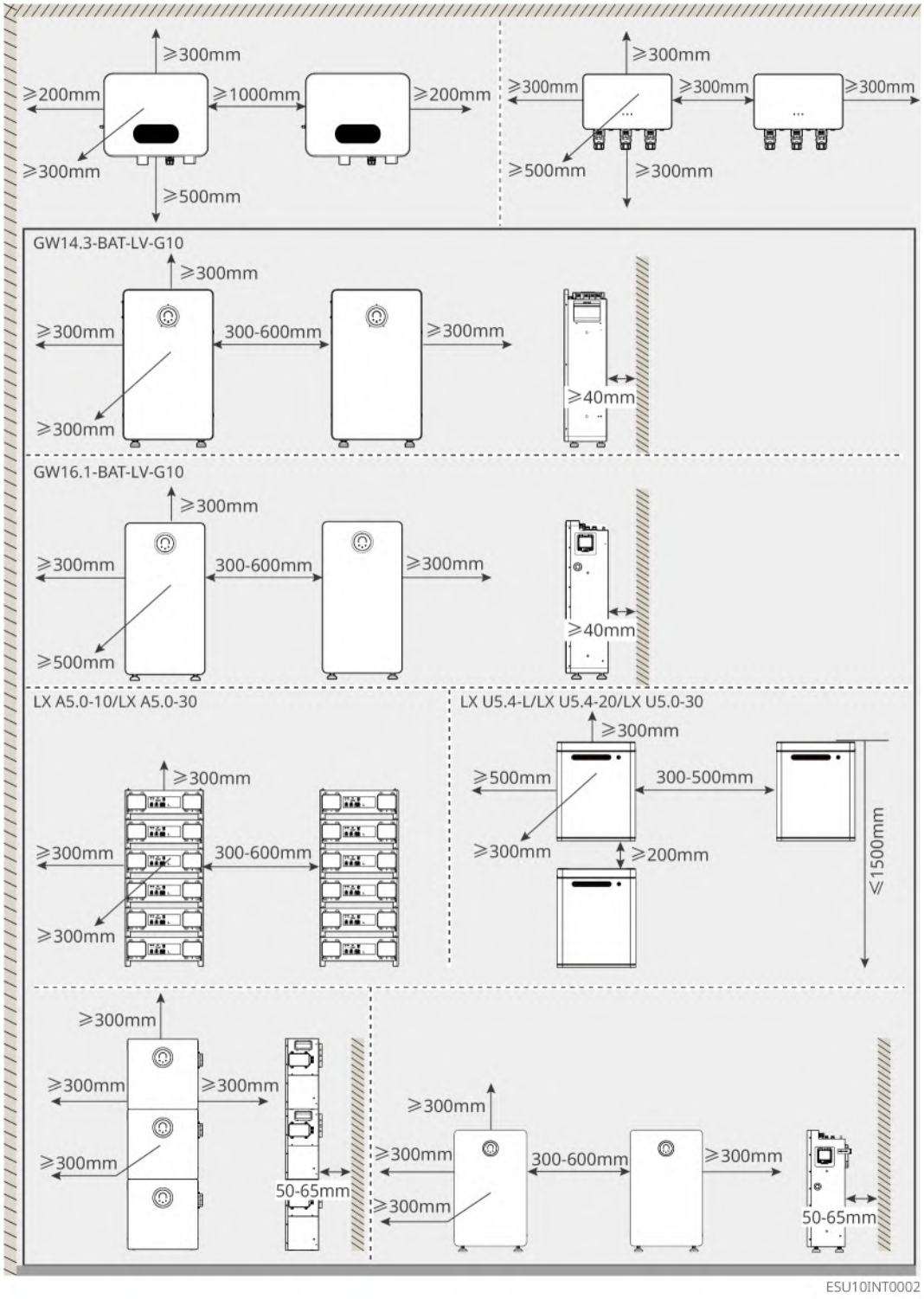
When installing equipment in the system, leave a certain amount of space around the equipment to ensure sufficient space for installation and heat dissipation.

- When using CAT7E communication cables between inverters, the cable distance must not exceed 10 m; when using CAT5E or CAT6E communication cables, the cable distance must not exceed 5 m. Do not exceed 10 m for communication cables; otherwise, communication abnormalities may occur.
- For CT installation, use shielded network cables of CAT5E or above, and the cable distance must not exceed 30 m.
- For RS485 twisted-pair shielded cables used for communication between the inverter and the meter, the cable distance must not exceed 100 m.

Communication Cable Length



Installation Space

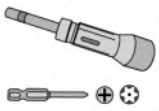


4.2.3 Tool Requirements

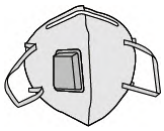
NOTE

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

Installation Tools

Tool Type	Description	Tool Type	Description
	Diagonal Cutting Pliers		RJ45 Crimping Tool
	Wire Stripper		Spirit level
	Open-end wrench		PV terminal crimping tool PV-CZM-61100、A-2546B
	Impact drill (drill bit Φ8 mm)		Torque wrench M4、M5、M6、M8
	Rubber mallet		Complete socket wrench set
	Marker		Multimeter Measuring range ≤600 V
	Heat-shrink tubing		Heat gun
	Cable ties		Vacuum cleaner

Personal protective equipment

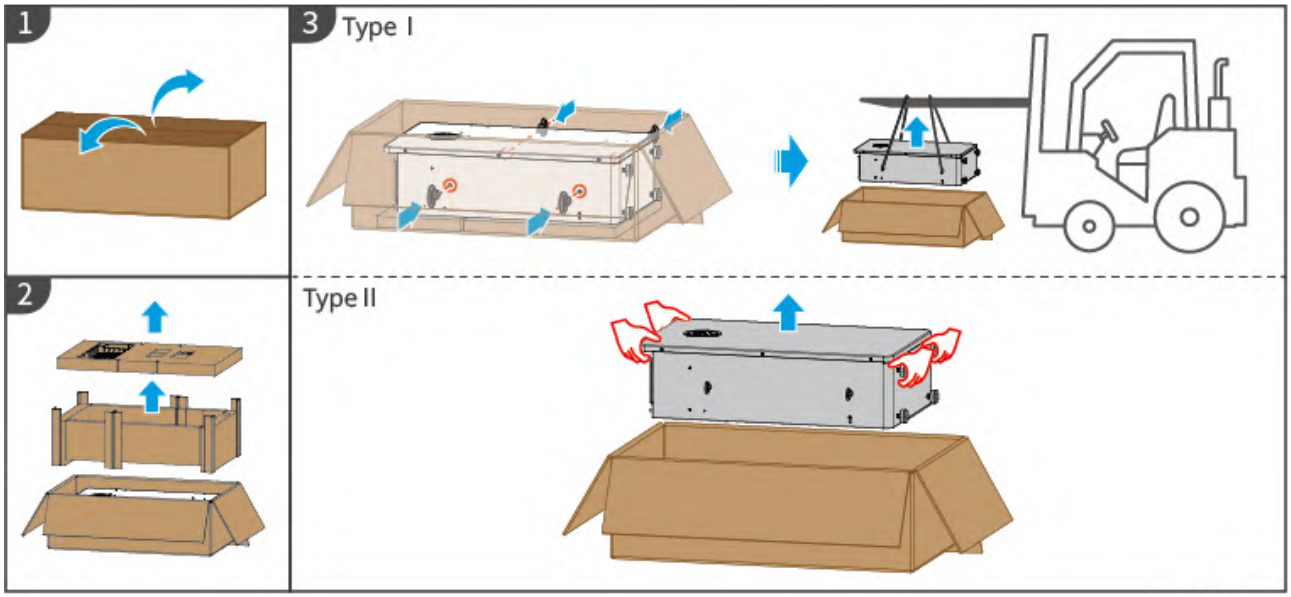
Tool Type	Description	Tool Type	Description
	Insulating gloves, protective gloves		Dust mask
	Safety goggles		Safety shoes

4.3 Equipment Handling

⚠CAUTION

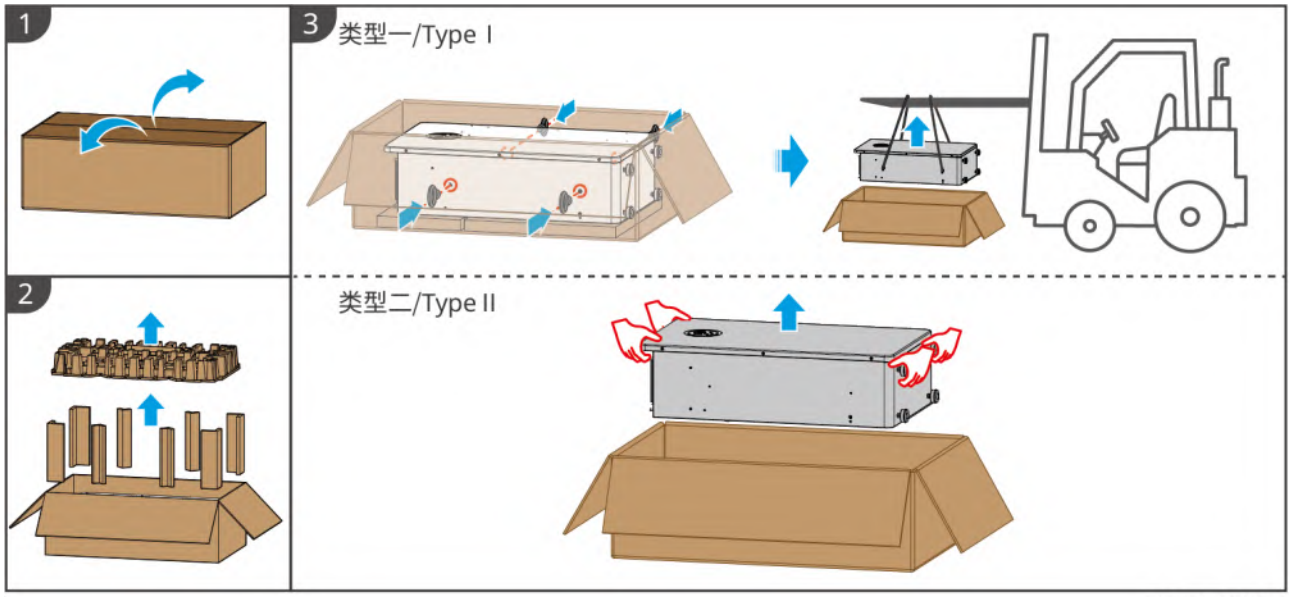
1. During transportation, transfer, installation, and other operations, the laws, regulations, and relevant standards of the country and region must be met.
2. Before installation, the equipment must be moved to the installation site. During handling, to avoid personal injury or equipment damage, please note the following:
3. Please assign the corresponding number of personnel according to the equipment Weight, to prevent the equipment from exceeding the Weight range that personnel can carry and causing crushing injuries.
4. Please wear safety gloves to avoid injury.
5. Please ensure that the equipment remains balanced during handling to avoid falling.
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 the 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 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:



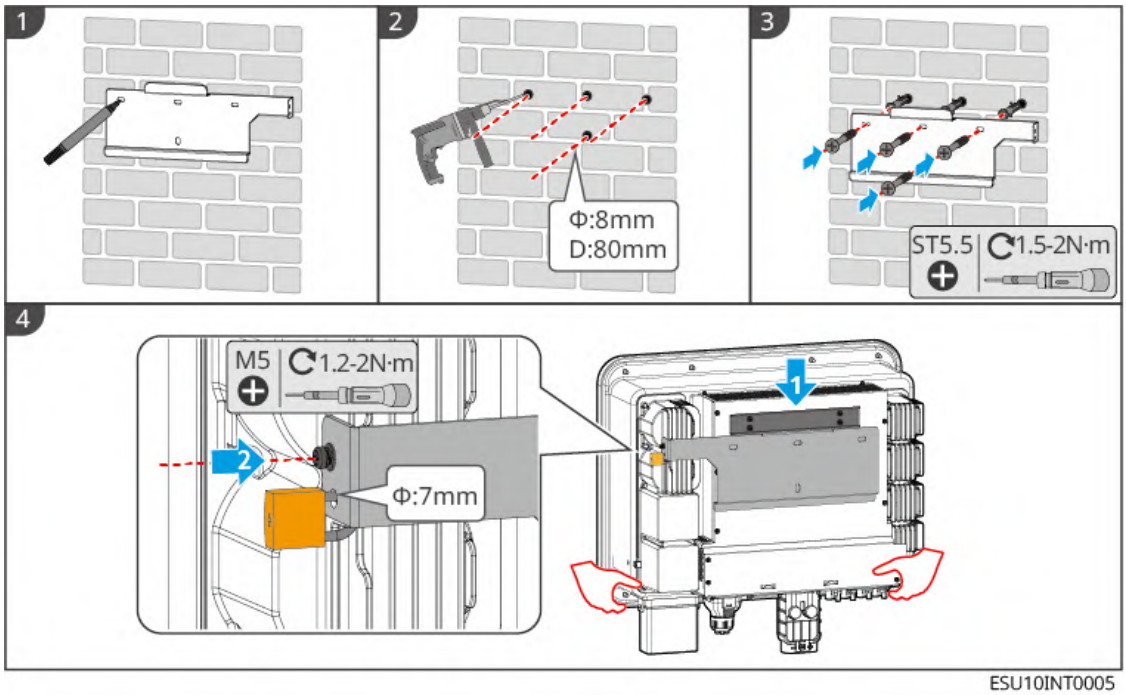
LXA40INT0005

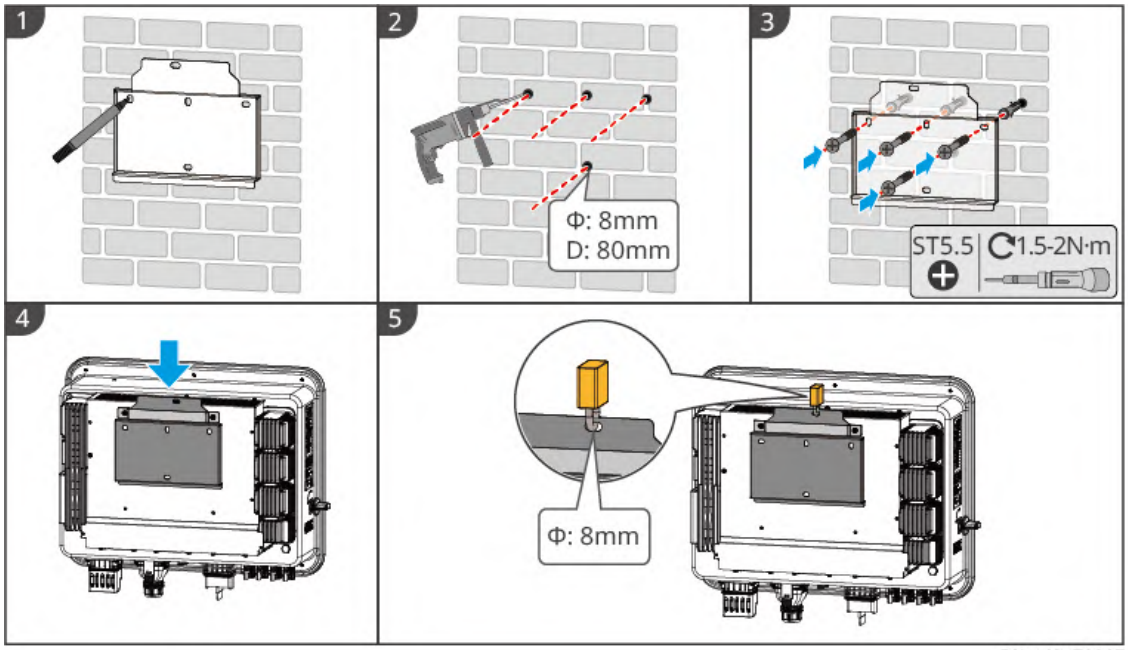
4.4 Installing the Inverter

⚠CAUTION

- When drilling, ensure that the drilling position avoids water pipes, cables, etc. inside the wall to prevent danger.
- When drilling, wear goggles and a dust mask to prevent dust from being inhaled into the respiratory tract or entering the eyes.
- Ensure the inverter is securely installed to prevent it from falling and causing personal injury.

1. Place the back mounting plate horizontally on the wall, and use a marker to mark the drilling positions.
2. Use an impact drill to drill the holes.
3. Use expansion screws to secure the inverter back mounting plate bracket to the wall.
4. Mount the inverter onto the backplate. After mounting, secure the backplate and the inverter with screws to ensure the inverter is installed securely.





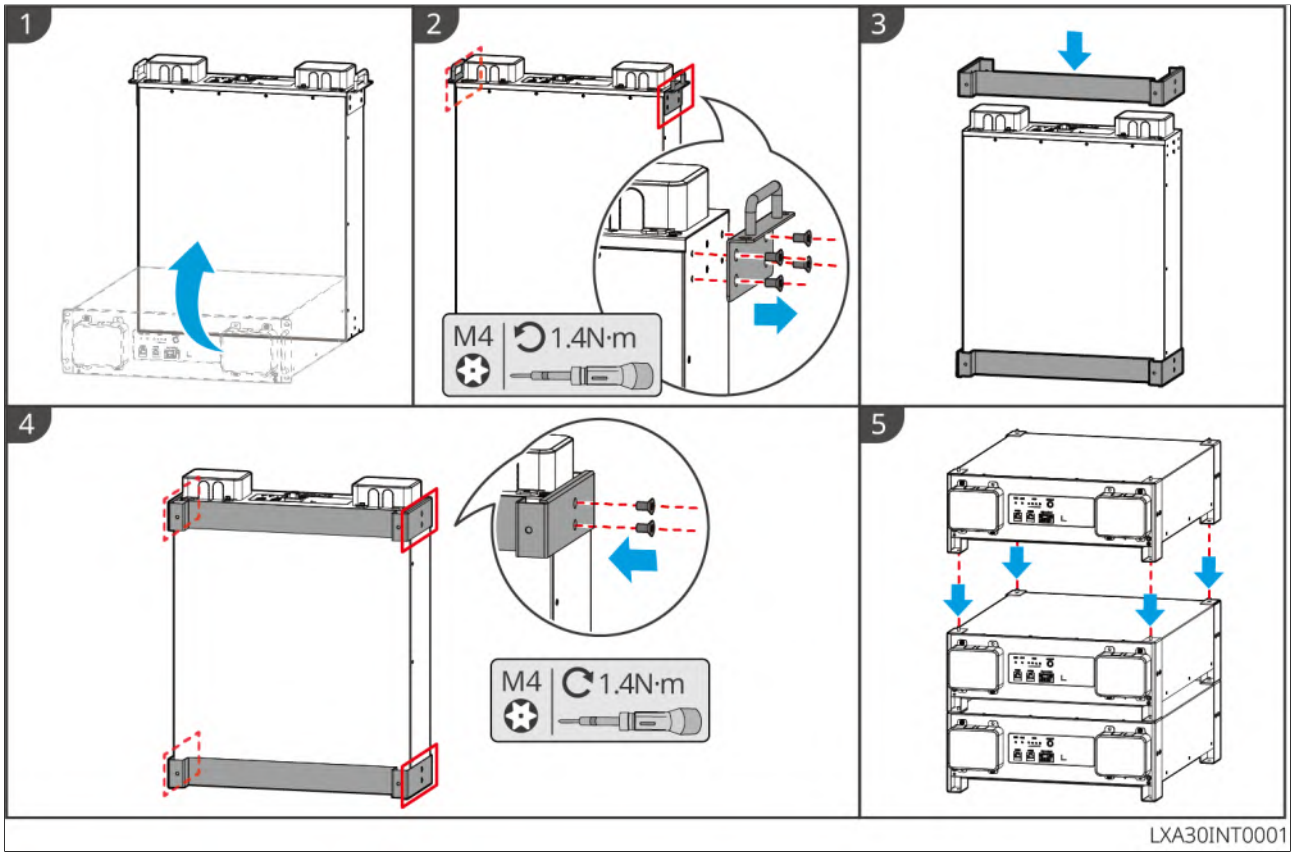
4.5 Install the Battery

4.5.1 LX A5.0-30

LX A5.0-30: Floor stacking

NOTE
For floor stacking, up to 6 batteries can be stacked.

1. Place the battery vertically and remove the battery handle.
2. Install the bracket on the battery and secure it with screws.
3. Place the battery flat and stack multiple batteries for installation. Ensure that the positioning pins are inserted into the positioning holes.

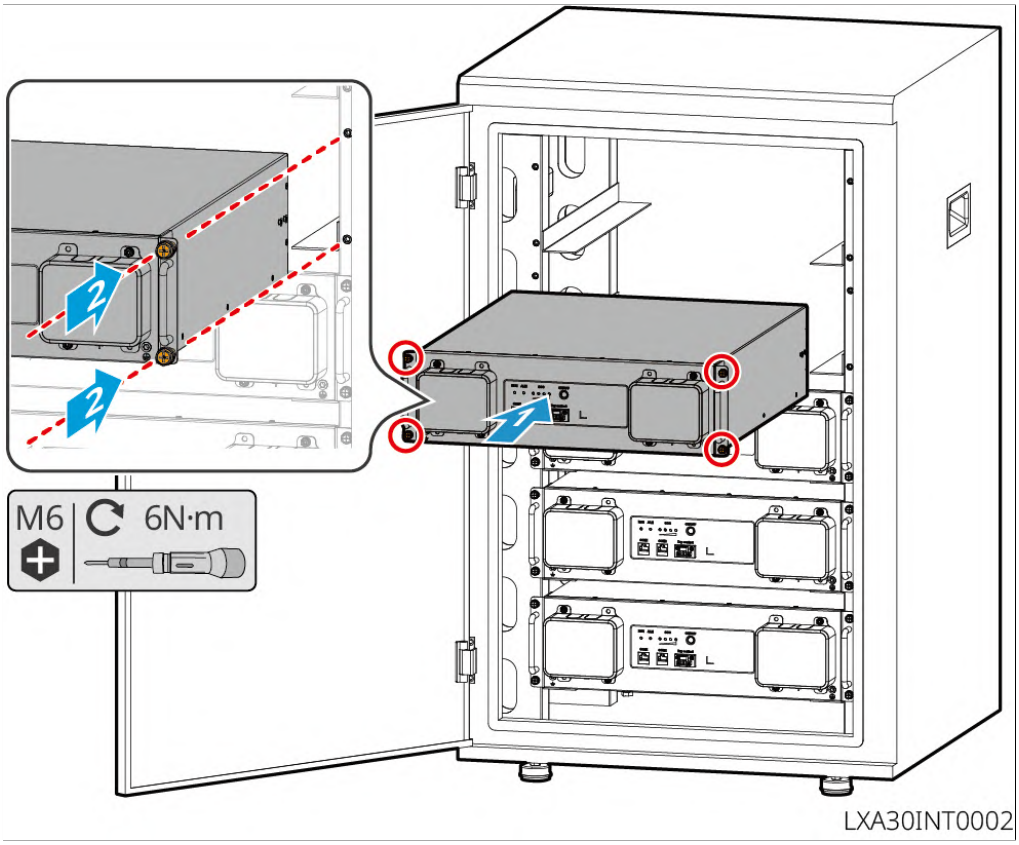


LX A5.0-30: Cabinet installation

NOTE

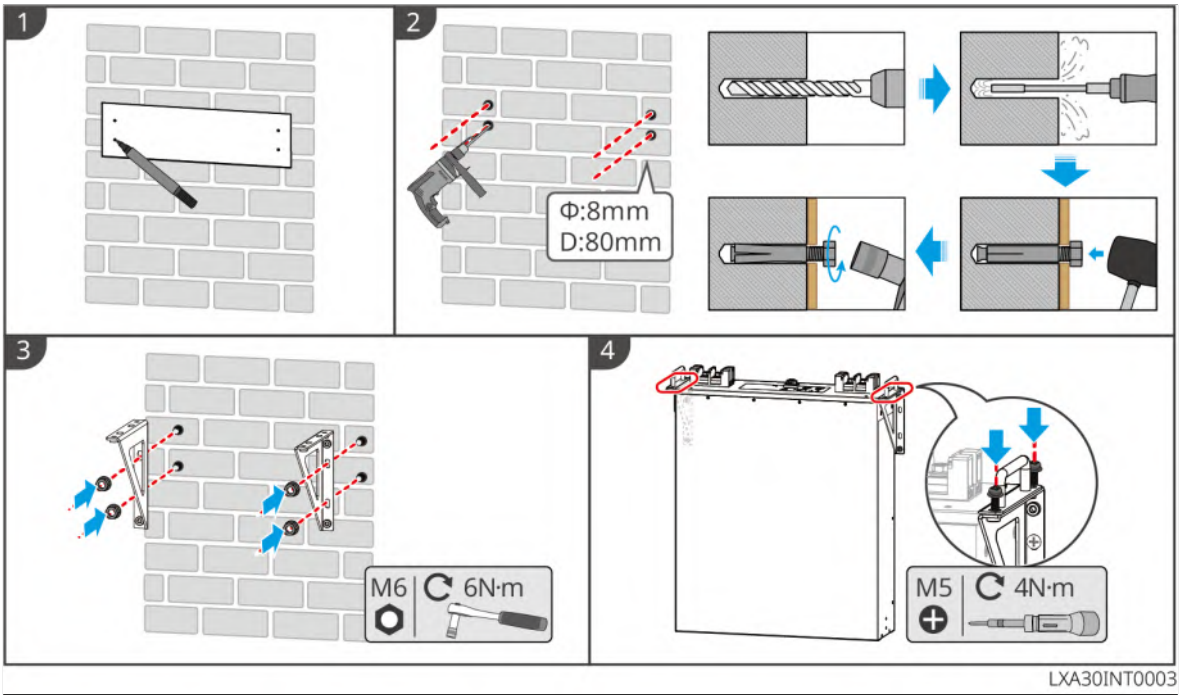
- Recommended for installation in a 19-inch standard cabinet. Length*Width: 600*800 mm or above; Height: select according to the battery thickness (133 mm) or above.
- For cabinet installation, electrical labels and warning labels must be affixed to the front panel of any battery (these labels are shipped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

1. Place the battery onto the guide rail in the cabinet, and secure the battery to the cabinet with screws from the handle positions.



LX A5.0-30: Wall mounting

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

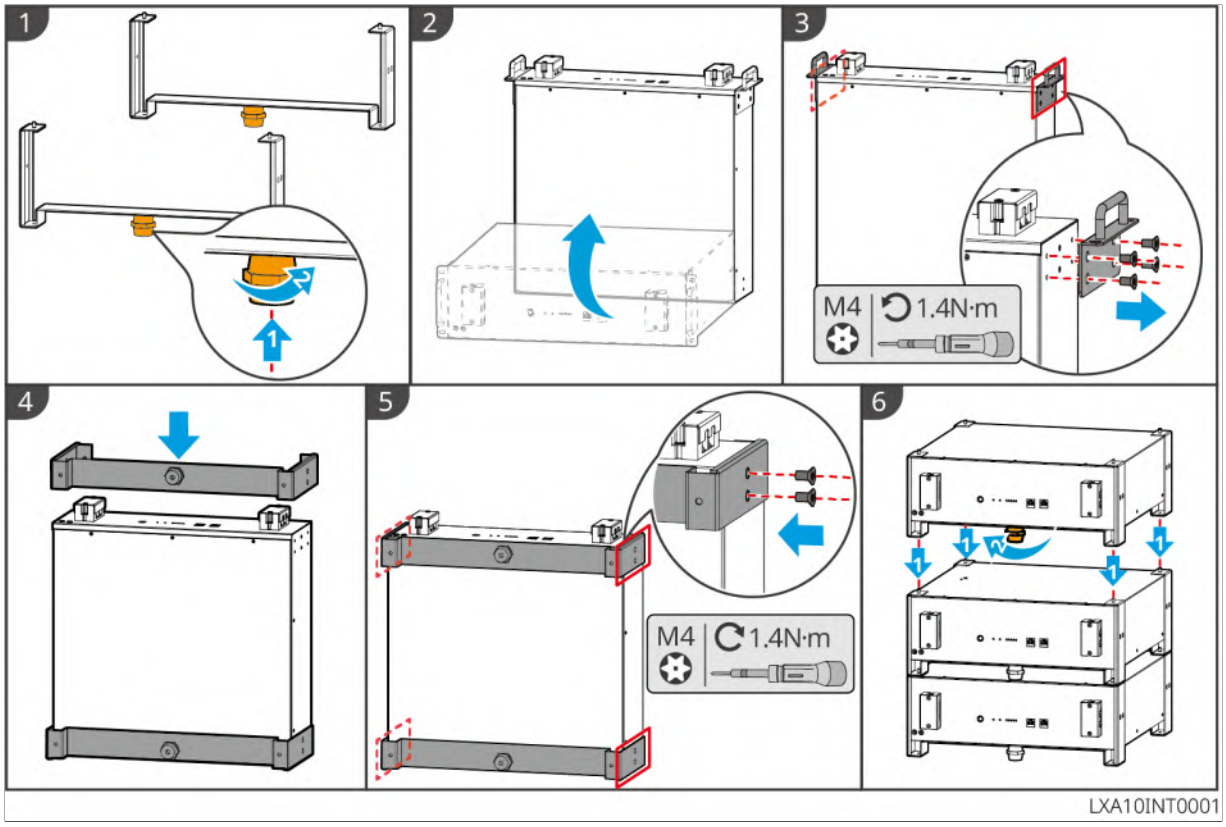


4.5.2 LX A5.0-10

LX A5.0-10: Floor stacking

NOTE
For floor stacking, up to 6 batteries can be stacked.

1. Place the battery vertically.
2. Place the bracket onto the battery and remove the handles from the battery.
3. Place another bracket onto the battery.
4. Secure the bracket to the battery with screws, and lay the battery flat.
5. Install multiple batteries in a stack.
   - Align the positioning pins on the lower battery bracket with the positioning holes on the upper battery bracket, and insert the positioning pins into the positioning holes.

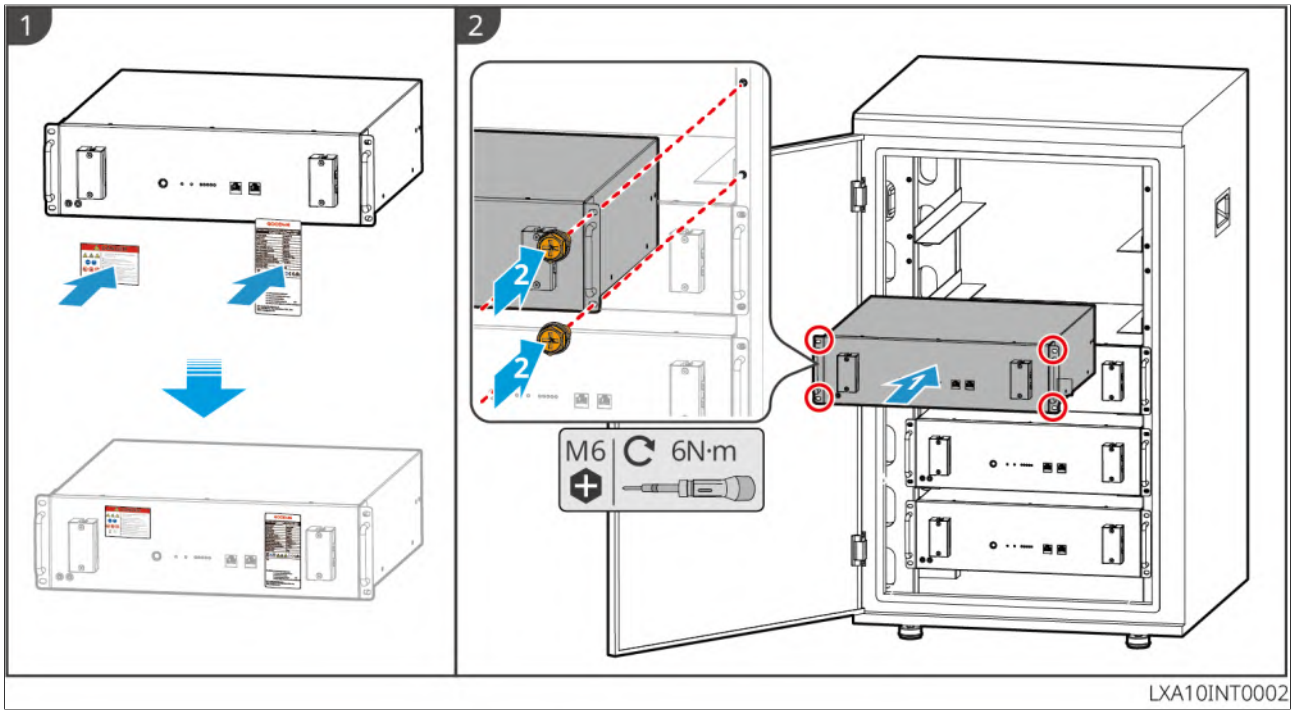


LX A5.0-10: Cabinet installation

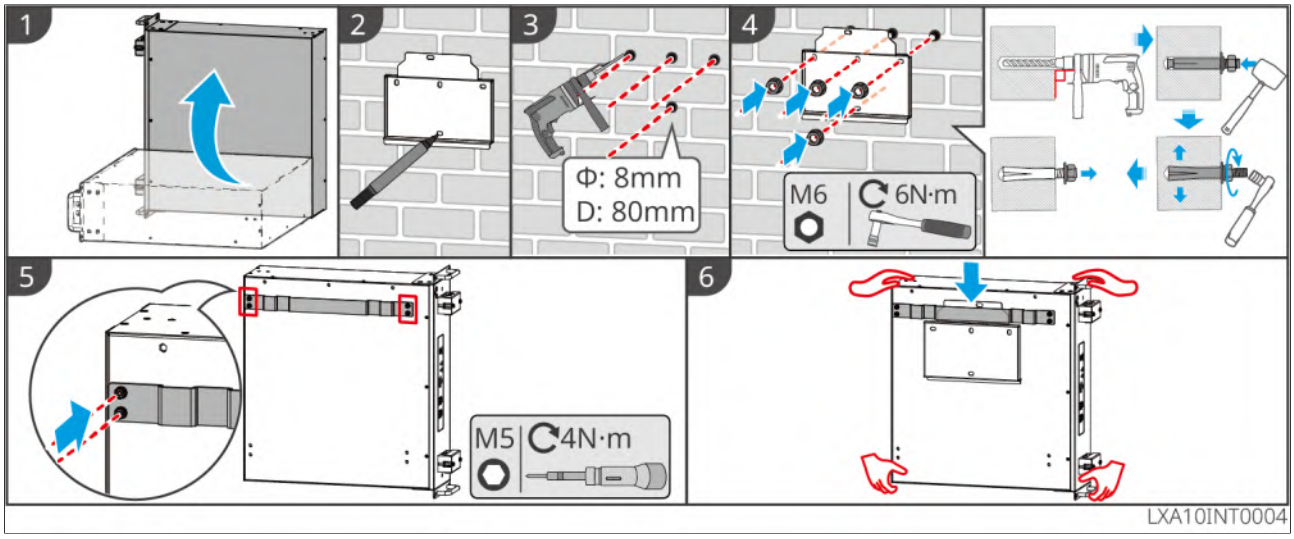
NOTE

- A 19-inch standard cabinet is recommended. The physical length and width can be selected as 600*800 mm or above, and the height can be selected according to the number of batteries connected in parallel.
- For cabinet installation, electrical labels and warning labels must be affixed to the front panel of any battery (these labels are shipped separately as accessories).

1. Affix the electrical labels and warning labels to the front panel of any battery.
2. Place the battery onto the guide rail in the cabinet, and secure the battery to the cabinet with screws from the handle positions.



LX A5.0-10: Wall mounting



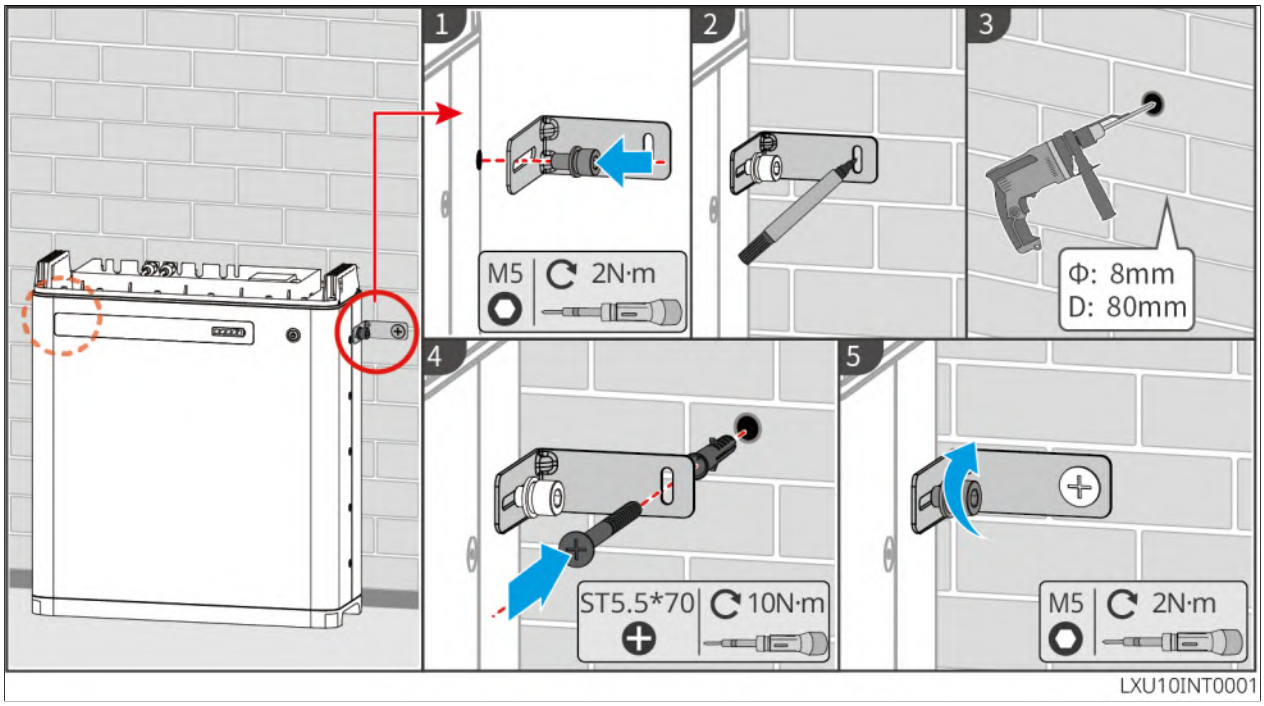
4.5.3 LX U5.4-L

LX U5.4-L: Floor-standing installation

NOTE

If parallel operation is required, check and select batteries with similar production dates and the same gear number to use together.

Step 1: Fasten the anti-tip bracket to the battery.
Step 2: Keep the battery parallel to the wall so that the anti-tip bracket is flush against the wall. Ensure it is placed securely, use a marker to mark the drilling positions, and remove the battery.
Step 3: Use an impact drill to drill holes in the wall (hole diameter: 10 mm, depth: 80 mm).
Step 4: Tighten the expansion screws. Torque requirement: 10 N·m.

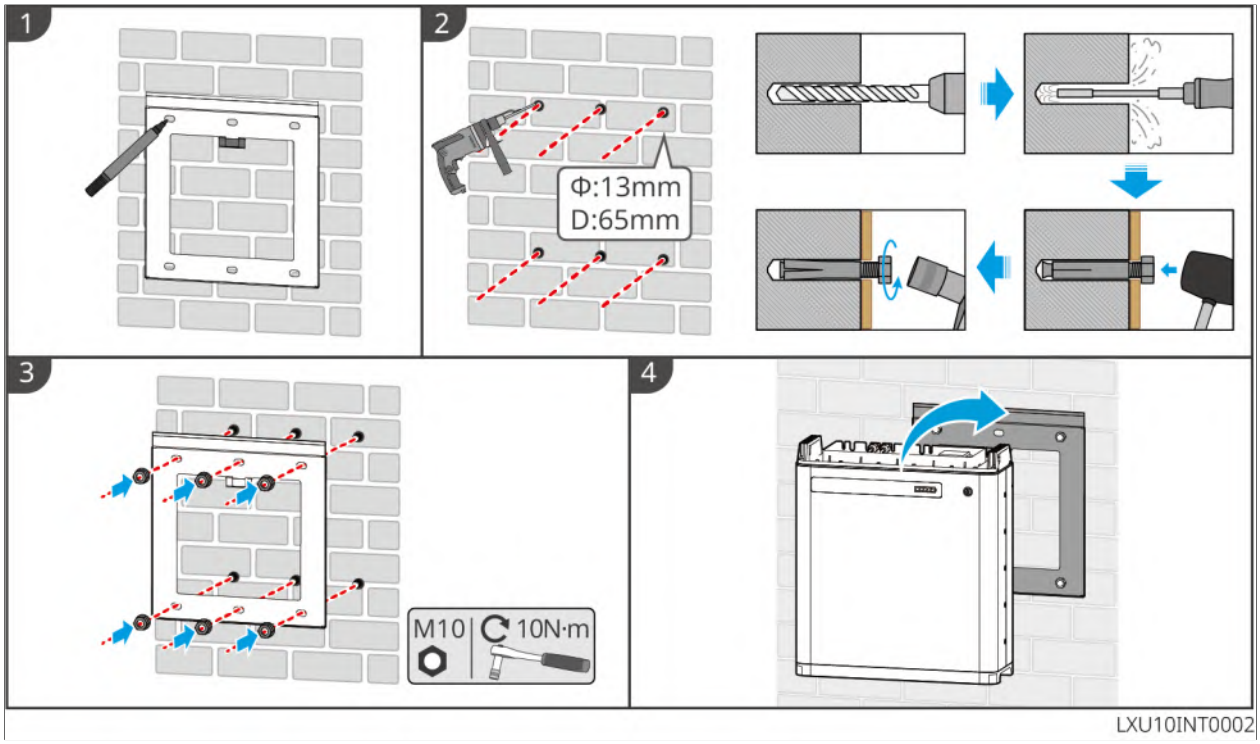


LX U5.4-L: Wall-mounted installation

NOTE

Wall-mounted installation requires two people.

Step 1: Keep the wall bracket flush against the wall. Ensure it is placed securely, use a marker to mark the drilling positions, and remove the wall bracket.
Step 2: Use an impact drill to drill holes in the wall (hole diameter: 13 mm, depth: 65 mm).
Step 3: Tighten the M10 expansion bolts. Torque requirement: 10 N·m.
Step 4: Install the battery onto the back bracket.

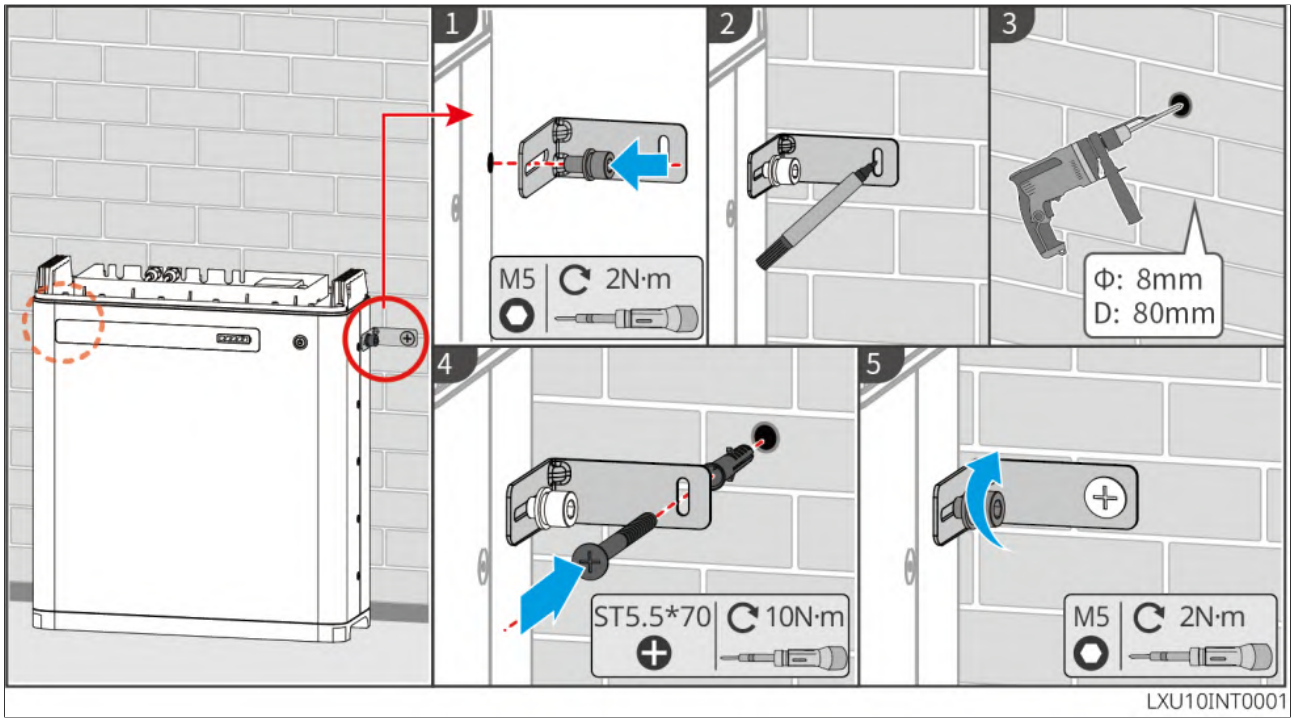


4.5.4 LX U5.4-20

LX U5.4-20: Floor-standing installation

NOTE
If parallel operation is required, check and select batteries with similar production dates and the same gear number to use together.

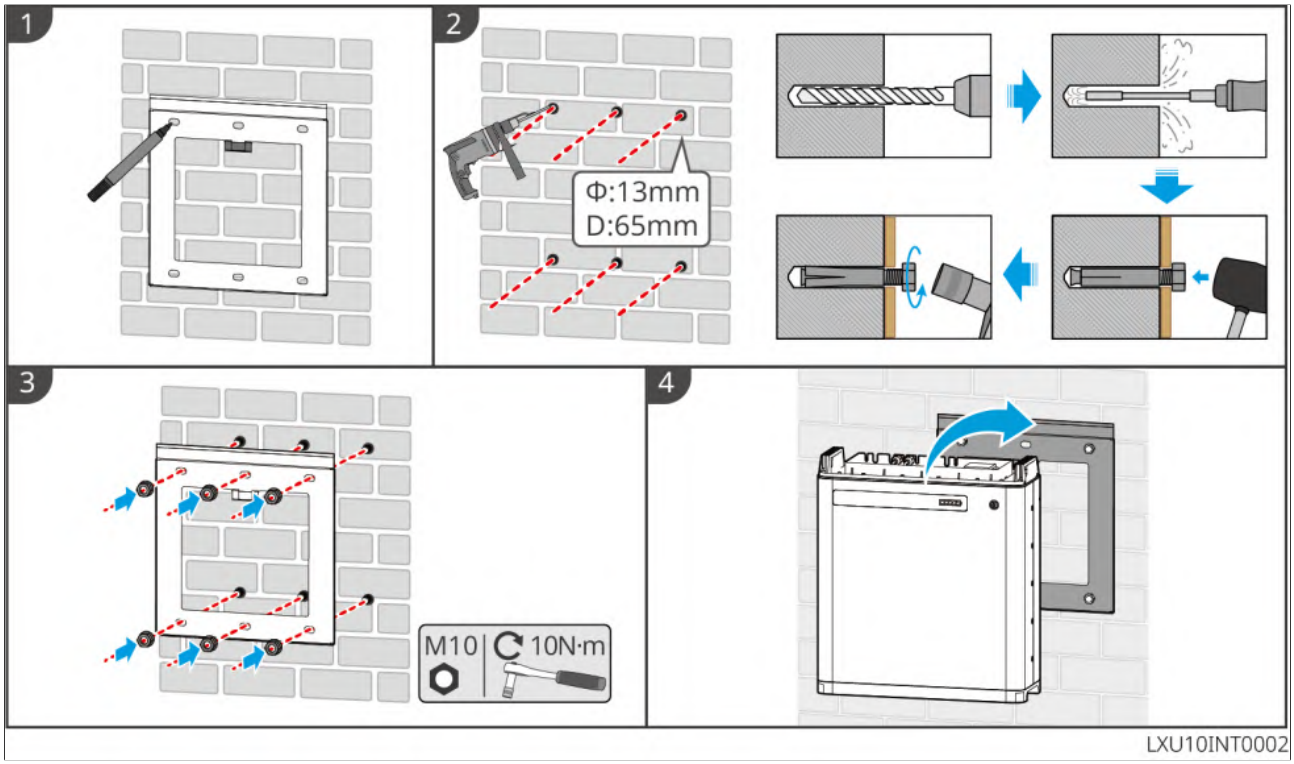
Step 1: Fasten the anti-tip bracket to the battery.
Step 2: Keep the battery parallel to the wall so that the anti-tip bracket is flush against the wall. Ensure it is placed securely, use a marker to mark the drilling positions, and remove the battery.
Step 3: Use an impact drill to drill holes in the wall.
Step 4: Tighten the expansion screws.



LX U5.4-20: Wall-mounted installation

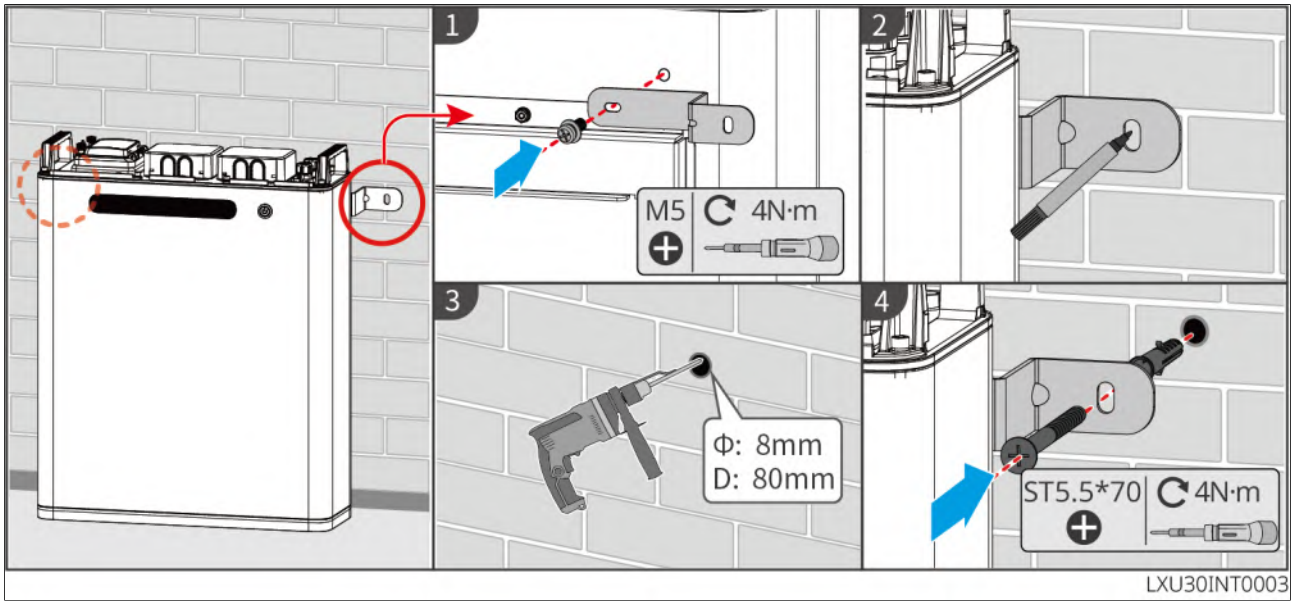
NOTE
Wall-mounted installation requires two people.

Step 1: Keep the wall bracket flush against the wall, and use a marker to mark the drilling positions.
Step 2: Use an impact drill to drill holes in the wall.
Step 3: Tighten the back bracket.
Step 4: Install the battery onto the back bracket.

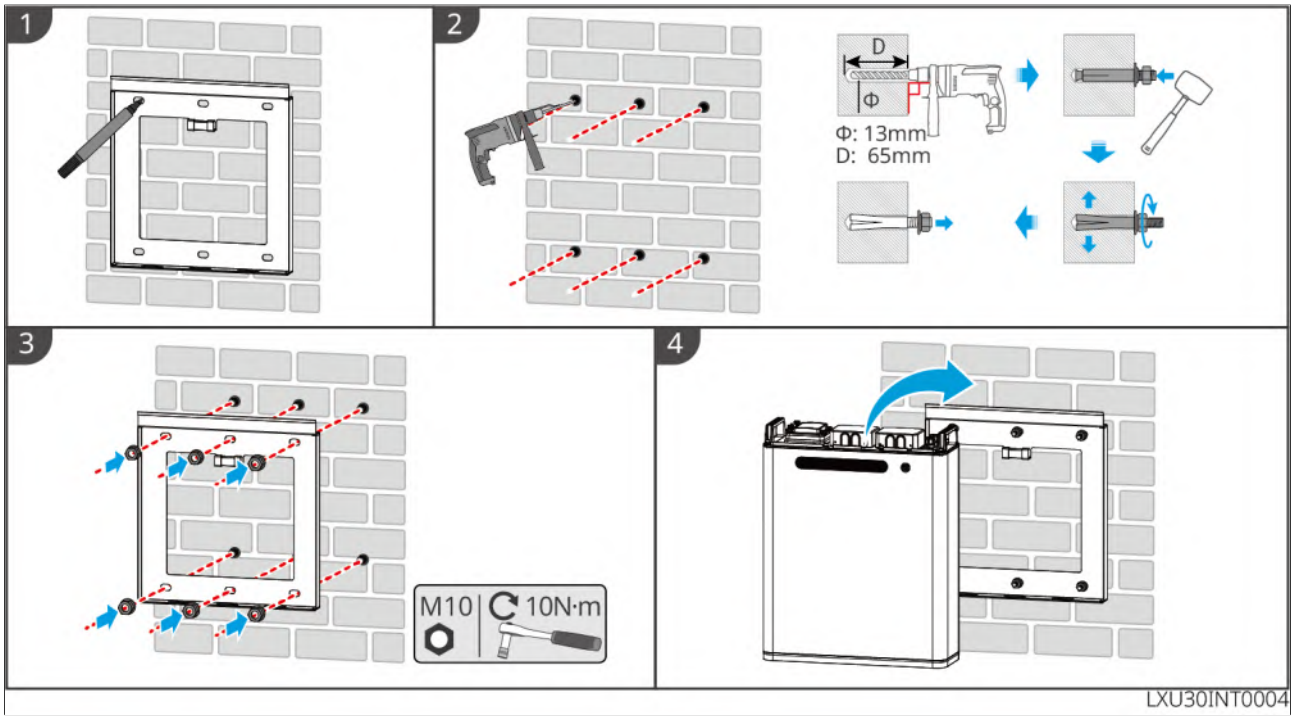


4.5.5 LX U5.0-30

LX U5.0-30: Floor-mounted installation



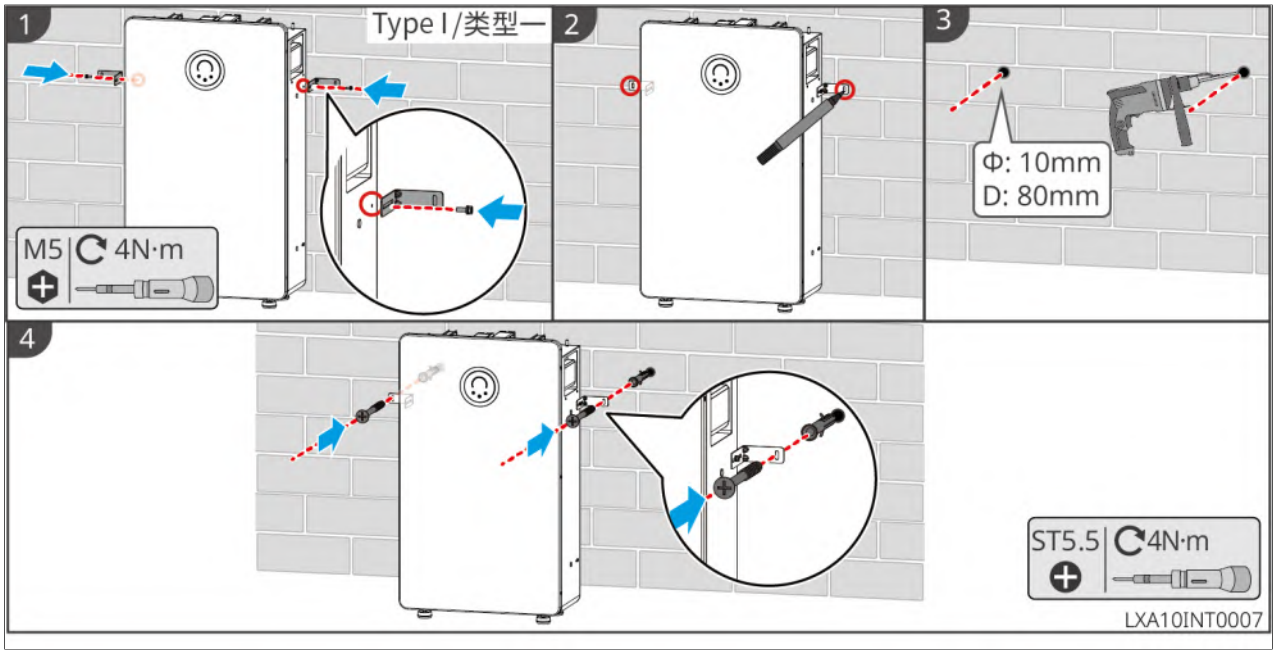
LX U5.0-30: Wall-mounted installation



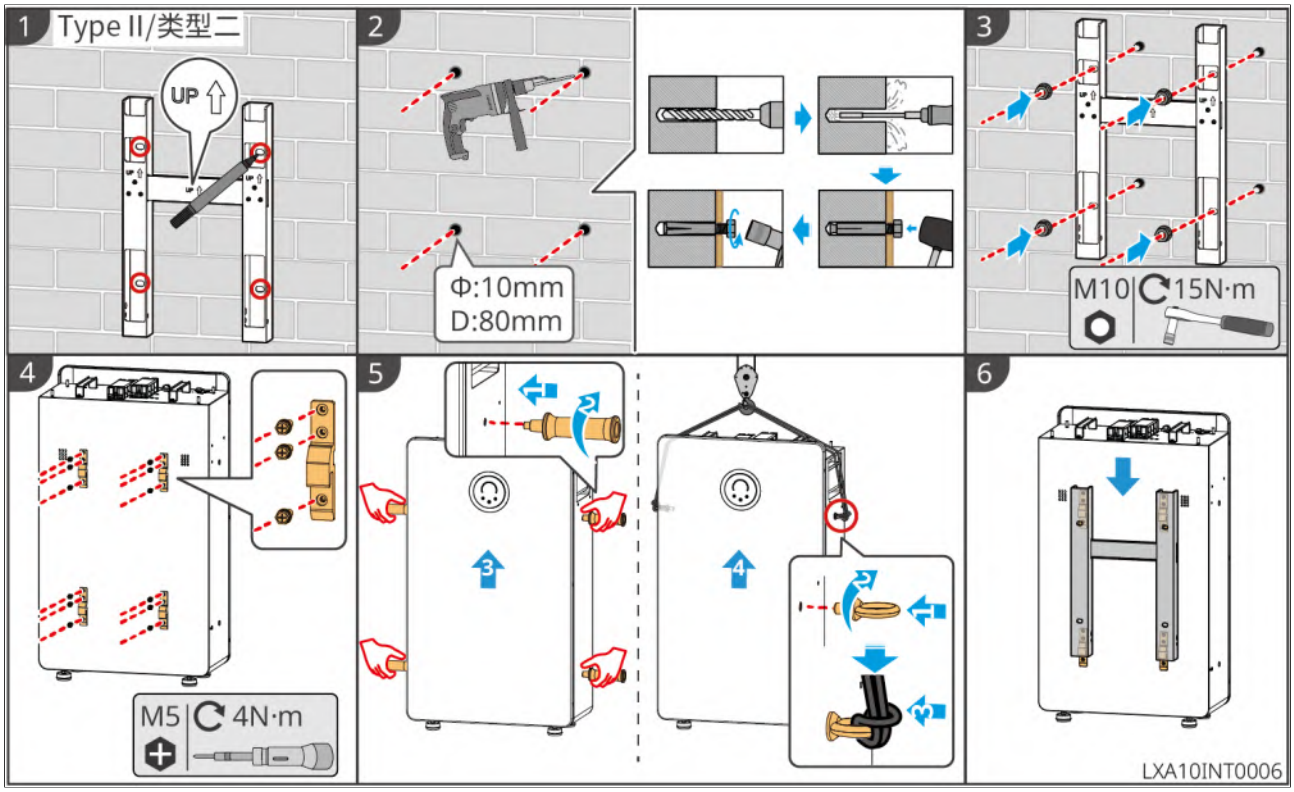
4.5.6 GW14.3-BAT-LV-G10

NOTE
• Wall-mounted installation requires two people.

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



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

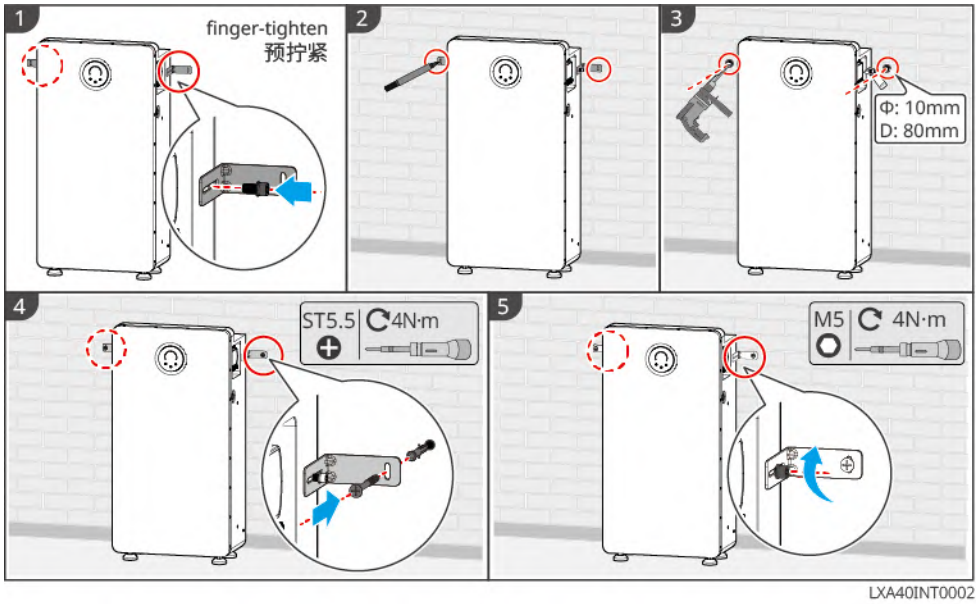


4.5.7 GW16.1-BAT-LV-G10

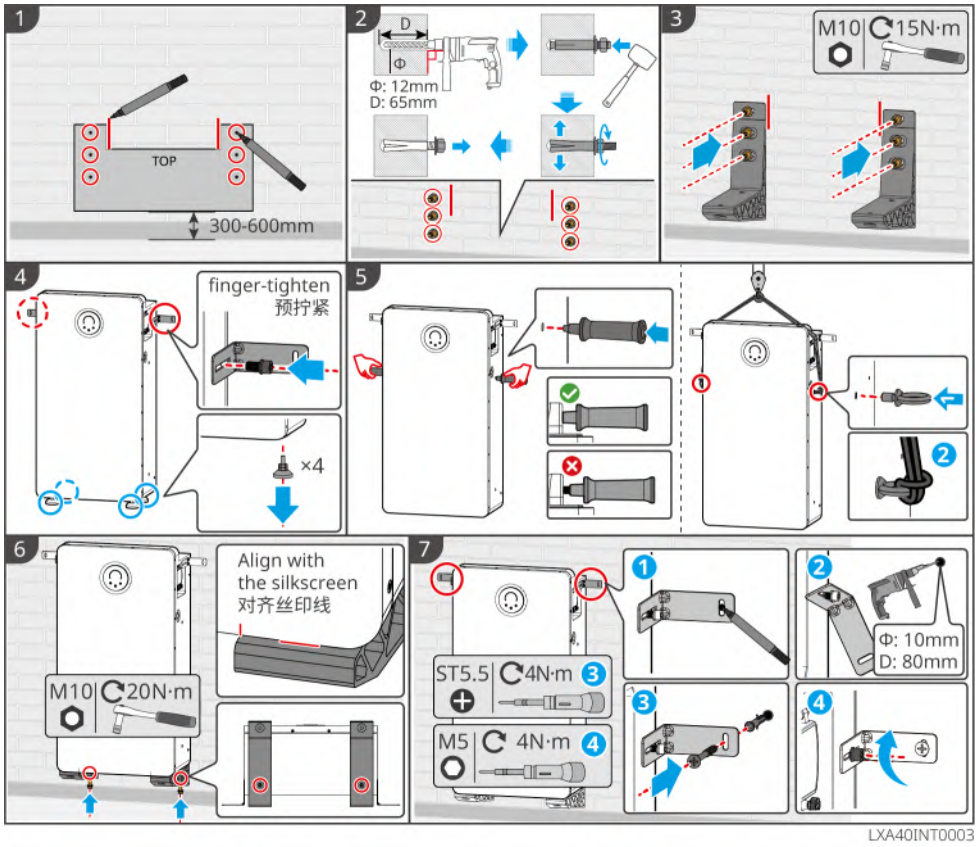
NOTE

- Wall-mounted installation requires two people.

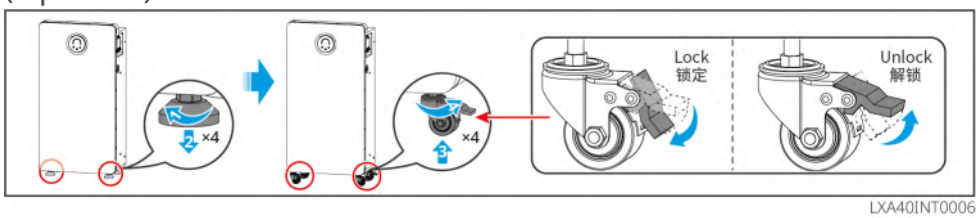
Floor-standing installation



Wall-mounted installation



(Optional) Install rollers



4.5.8 GW5.0-BAT-LVI-G10

NOTE

- The battery supports floor-standing and wall-mounted installation. Select the appropriate option based on the actual application scenario.
- Floor-standing installation supports stacking of up to 3 batteries.
- For stacked installation, attach the anti-slip pad only to the bottom battery. Do not attach it to the remaining batteries to avoid affecting the fixation between batteries.

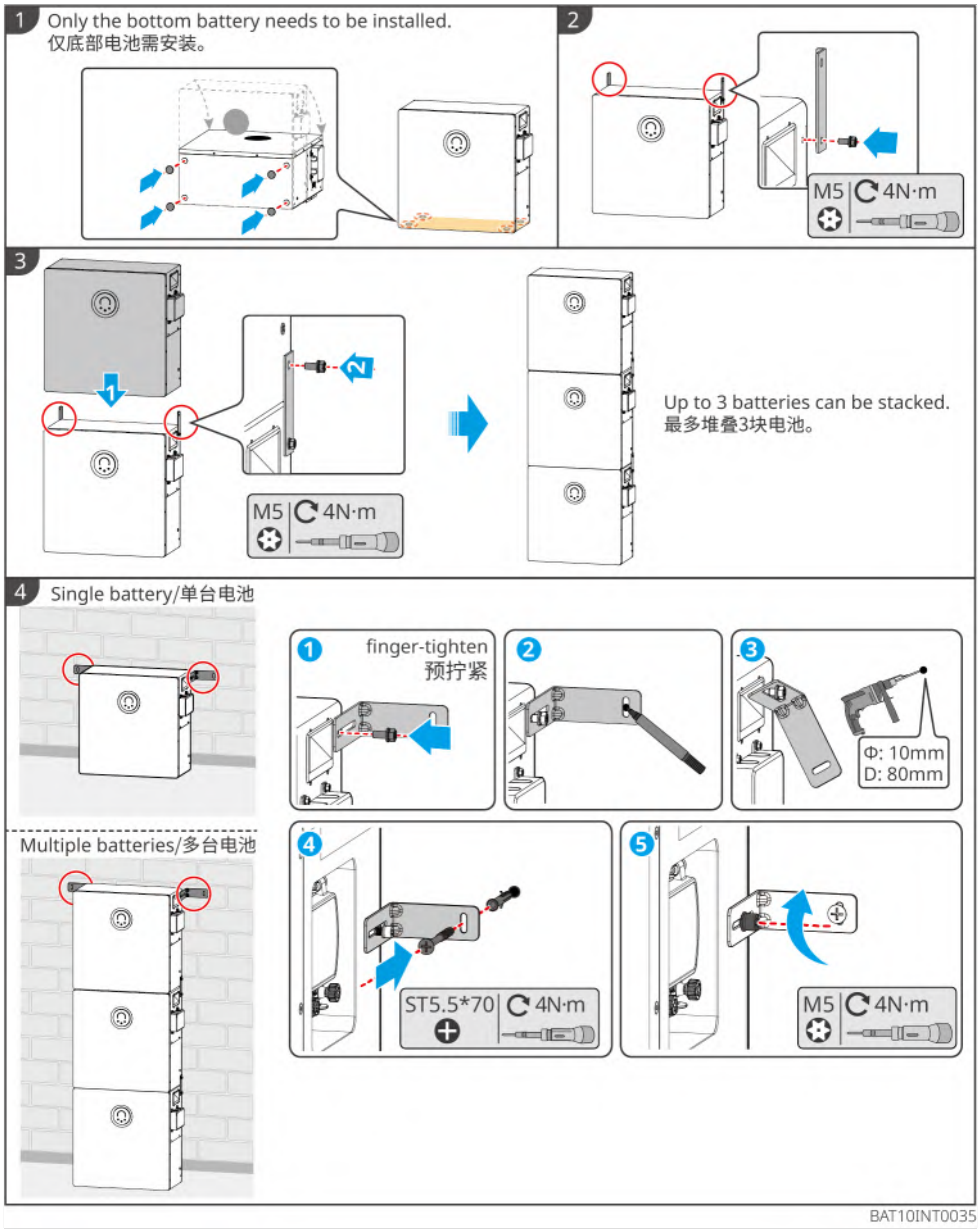


Figure13 Floor-standing installation

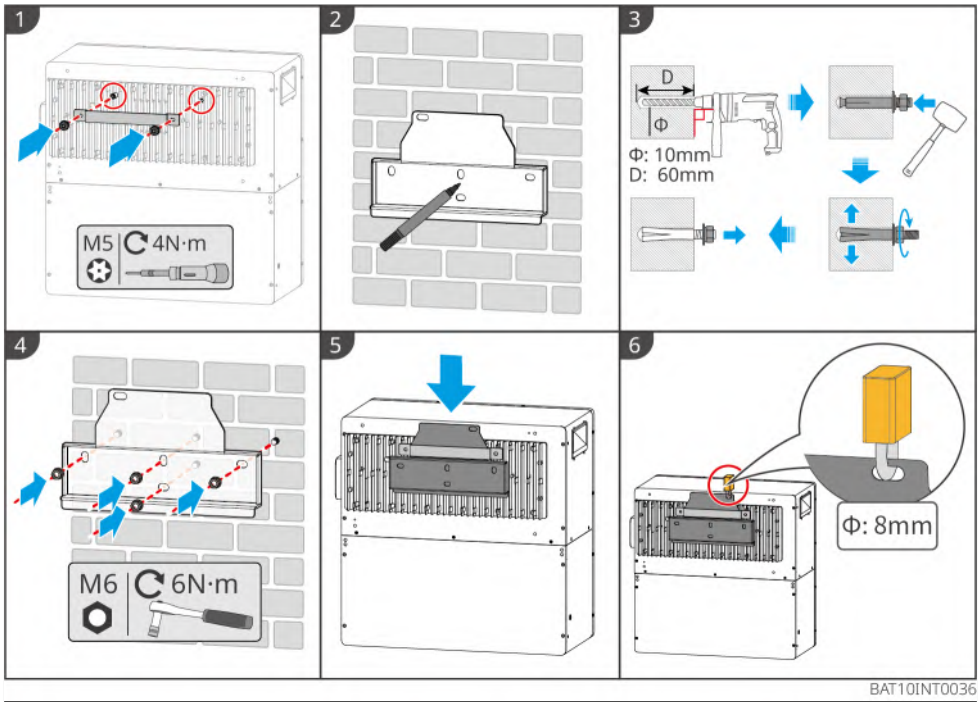


Figure14 Wall-mounted installation

4.5.9 GW10.0-BAT-LV-G10

NOTE

- The battery supports two Mounting Method types: floor-standing and wall-mounted. Stacked installation is not allowed. Please select according to the actual usage scenario.
- If wall-mounted installation is required, please contact your dealer to purchase the wall bracket installation kit.

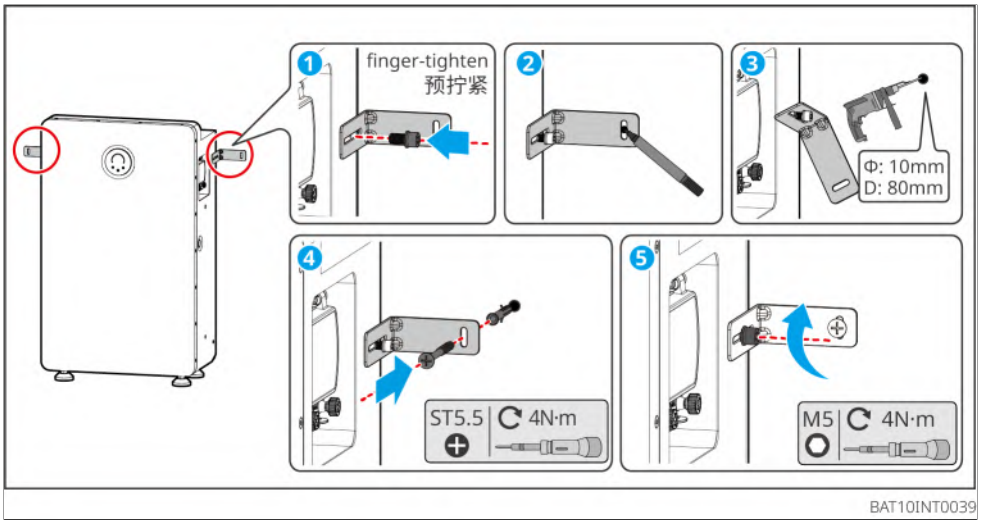


Figure15 Floor-standing installation

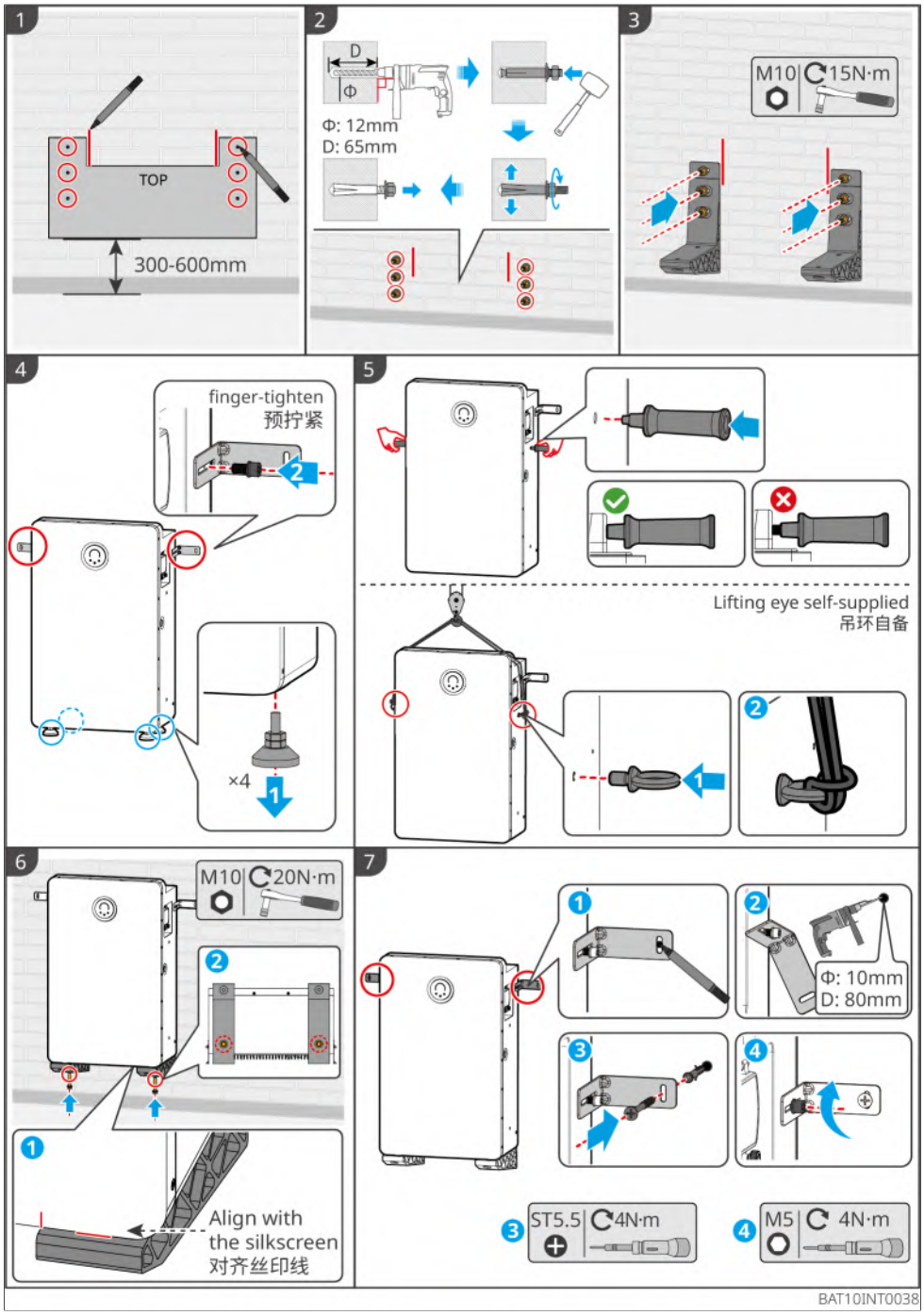
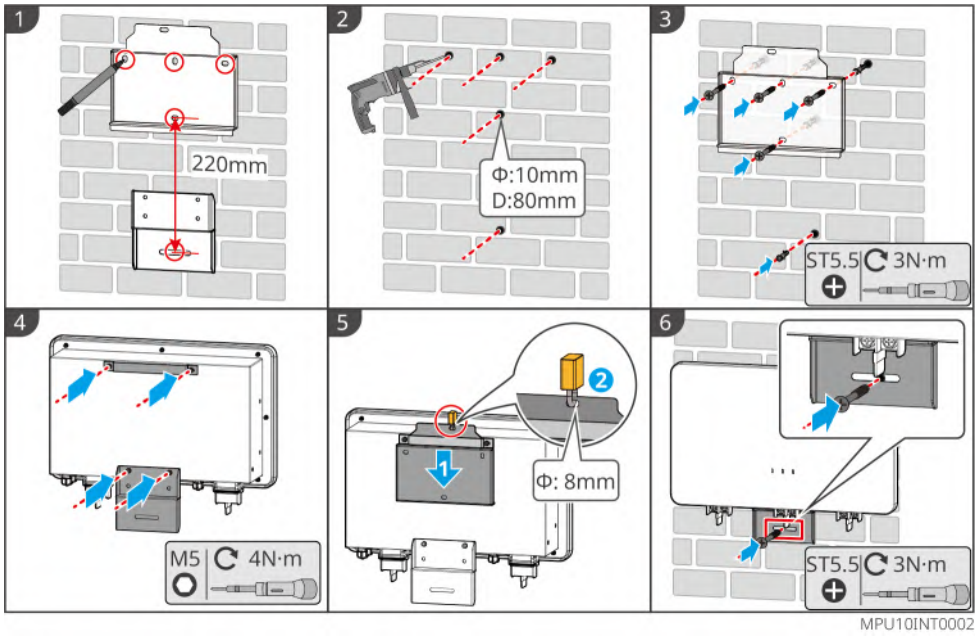


Figure16 Wall-mounted installation

4.6 Install Battery Mix Parallel Unit

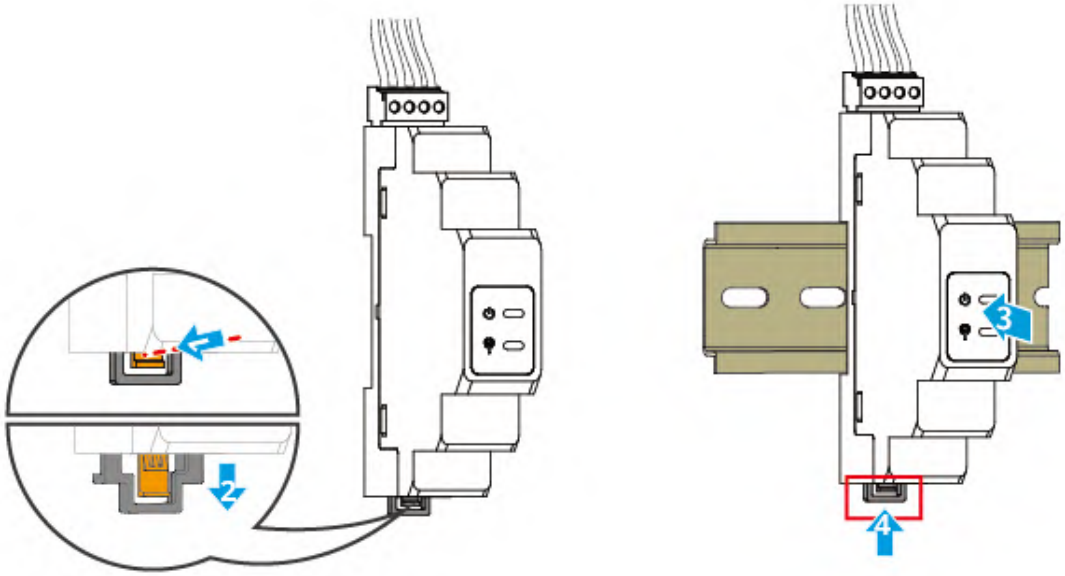


4.7 Install the Meter

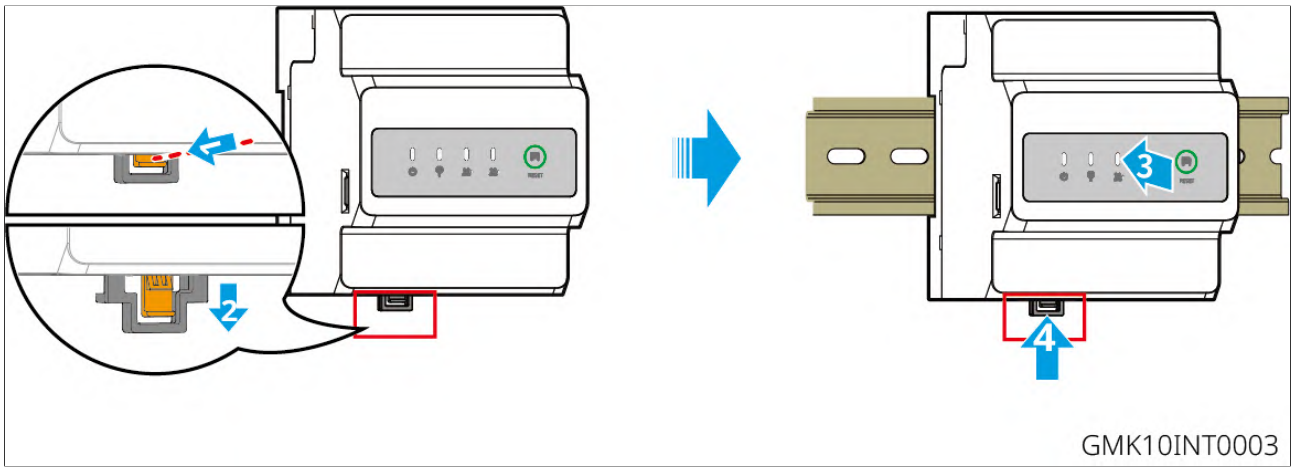
⚠WARNING

In areas at risk of lightning, 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.

GMK110



GM330



5 System Wiring

⚠DANGER

- The installation, routing, and connection of cables must comply with local laws, regulations, and code requirements.
- All operations during electrical connection and the specifications of the cables and components used must comply with local laws and regulations.
- Before performing electrical connections, disconnect the device's DC Switch and AC output switch, and ensure that the device is powered off. Live-line 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. They must not be twisted together or crossed.
- If a cable is subjected to excessive tensile force, it may cause a poor connection. When wiring, reserve a certain length of cable before connecting it to the inverter connection port.
- When crimping the terminal, 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 device may fail to operate, or after operation, unreliable connection may cause heating and other conditions that damage the inverter terminal block.
- For unused cable glands and ports (including communication ports), use the dedicated terminals or plugs in the accessories supplied with the box to reliably seal them. If not,
  the following risks may occur:
  - Electric shock hazard: Exposed electrical ports may allow personnel to directly contact live parts, resulting in electric shock accidents.
  - Protection failure: Open ports may allow dust, moisture, or foreign objects to enter, which may then cause short circuits, fire, or equipment failure.

NOTE

- When performing 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. Specific cable specifications must comply with local regulatory requirements.
- For parallel systems, please observe the safety precautions in the corresponding user manuals of relevant products in the system.

5.1 System Wiring Electrical Block Diagram

NOTE

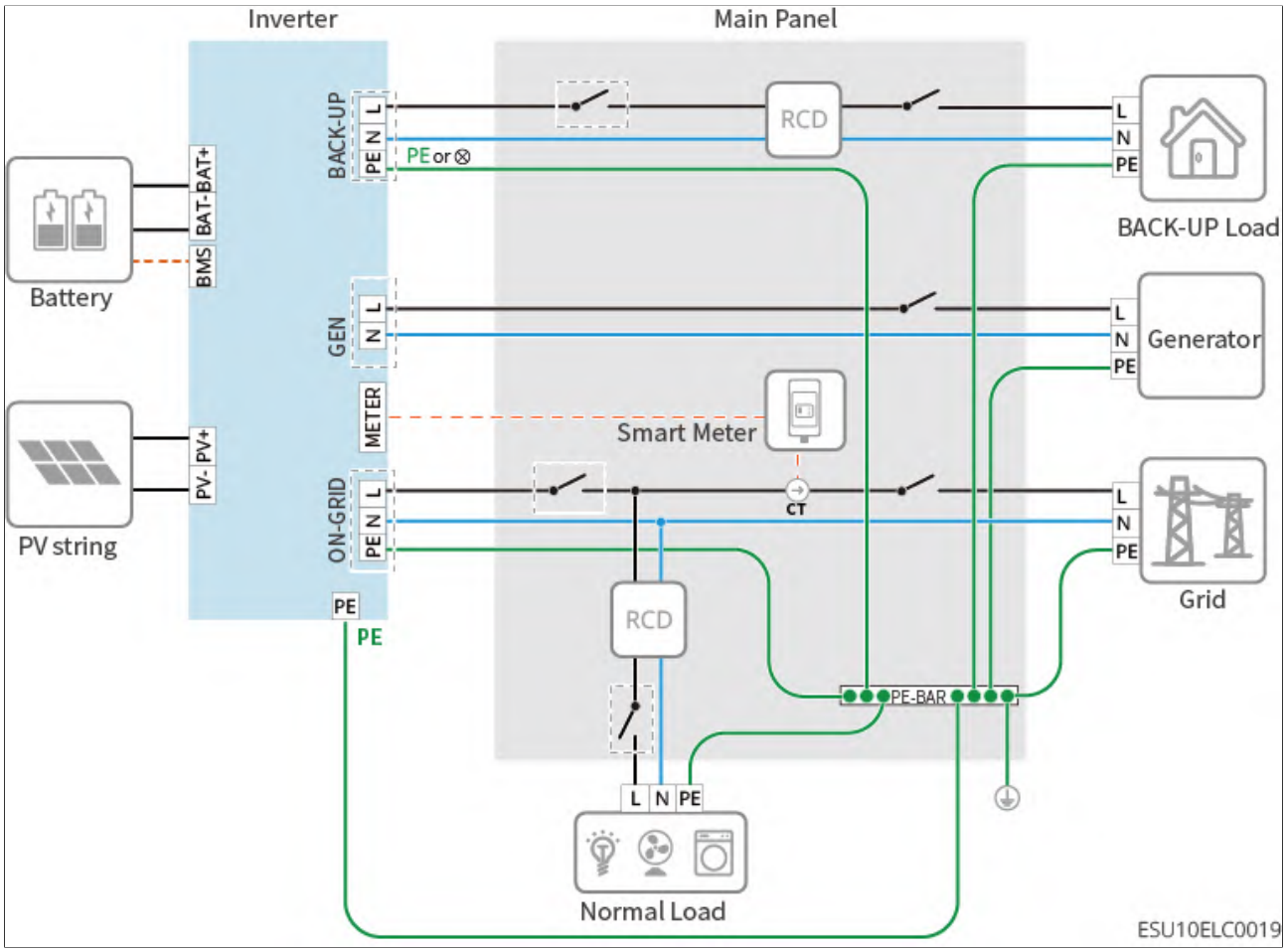
- Depending on the regulatory requirements of different regions, the wiring methods for the N and PE lines of the inverter's ON-GRID and BACK-UP ports are different. The local regulatory requirements shall prevail.
- The inverter's ON-GRID AC port has a built-in relay. When the inverter is in off-grid 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 live. If maintenance is required for the BACK-UP load, power off the inverter; otherwise, electric shock may occur.

The N and PE lines are wired separately in the distribution box.

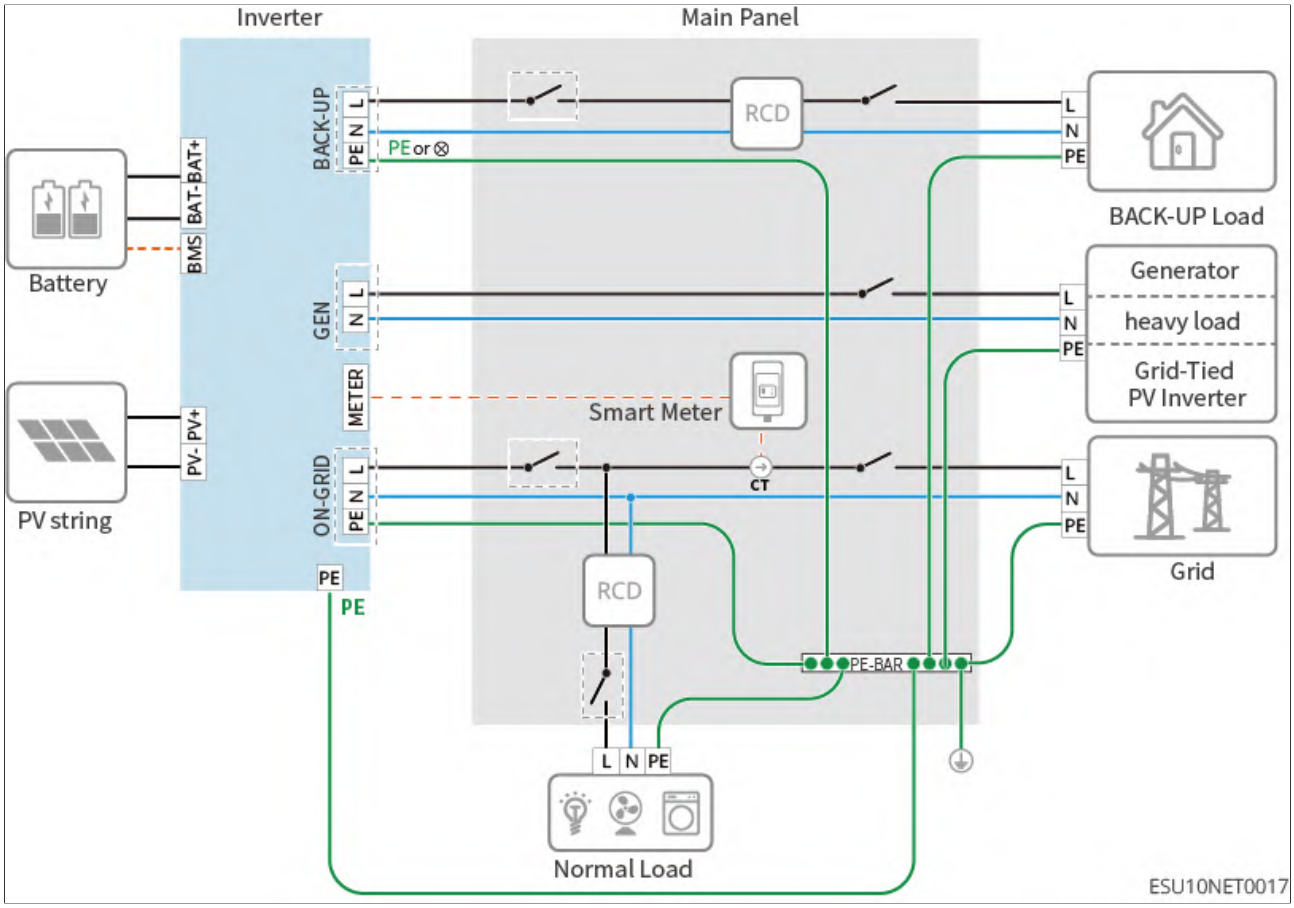
NOTE

- Ensure that the BACK-UP Protection earth wire is correctly connected and tightened; otherwise, when a grid fault occurs, the BACK-UP function may become abnormal.
- For regions other than Australia, New Zealand, etc., the following wiring method applies:

General Scenario



Microgrid Scenario



5.2 Detailed System Wiring Diagram

5.2.1 Single-Unit System Wiring Detail Diagram

In single-unit scenarios, meters of other specifications such as GM330 that meet the requirements can also be used; only the recommended types are shown here.

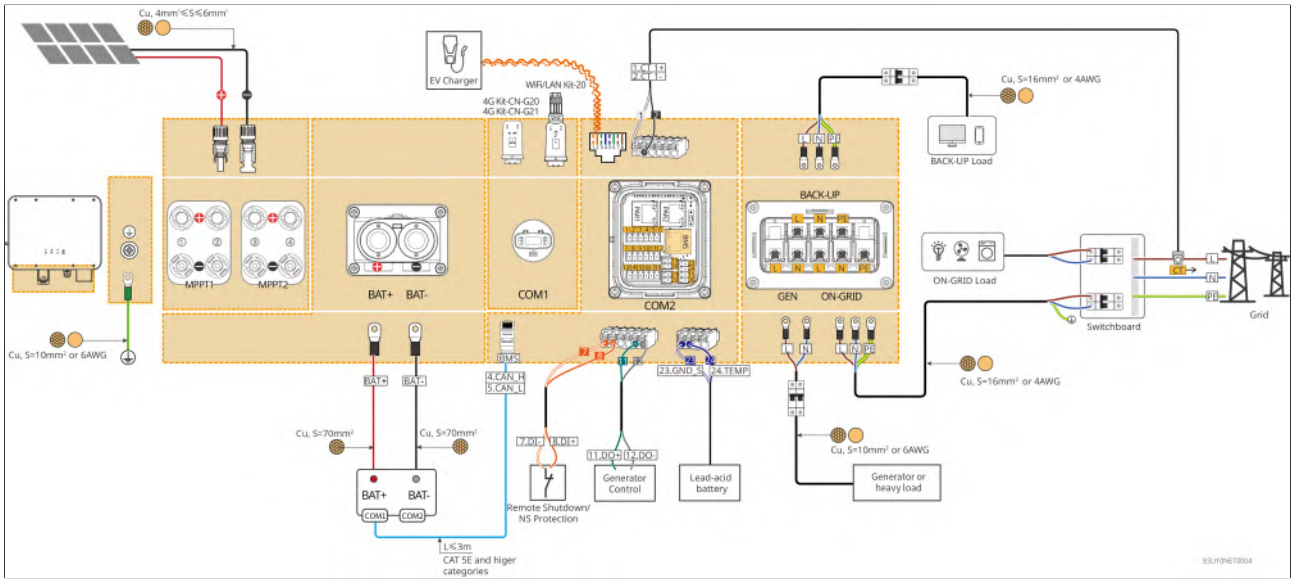


Figure17 Scenario 1 with Built-in Meter

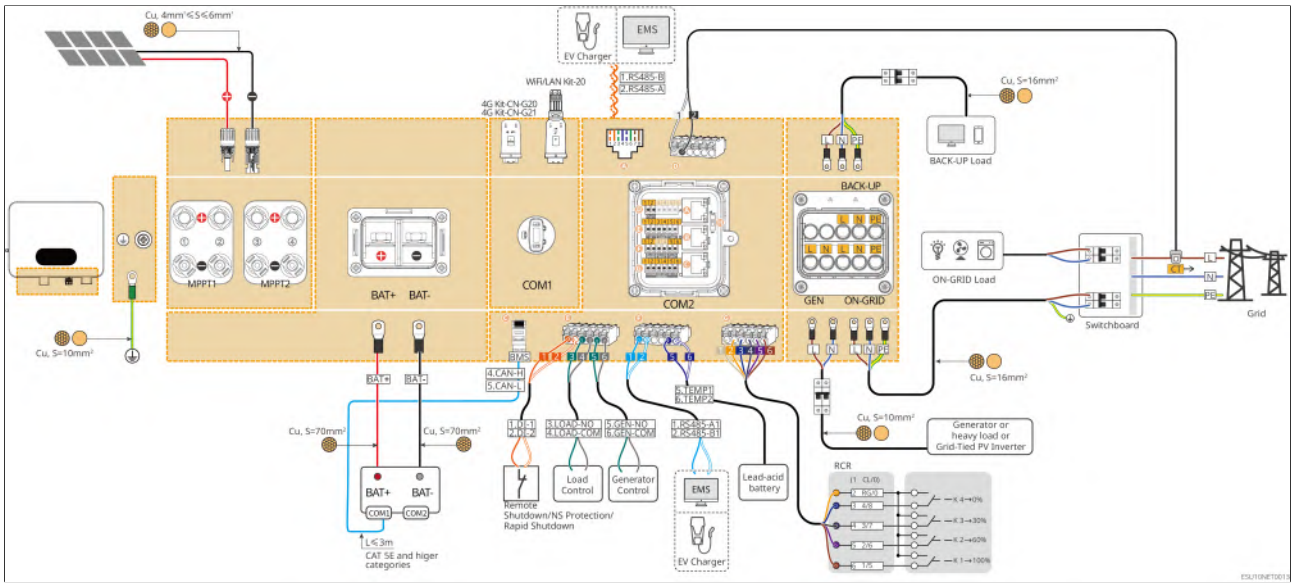


Figure18 Scenario 2 with Built-in Meter

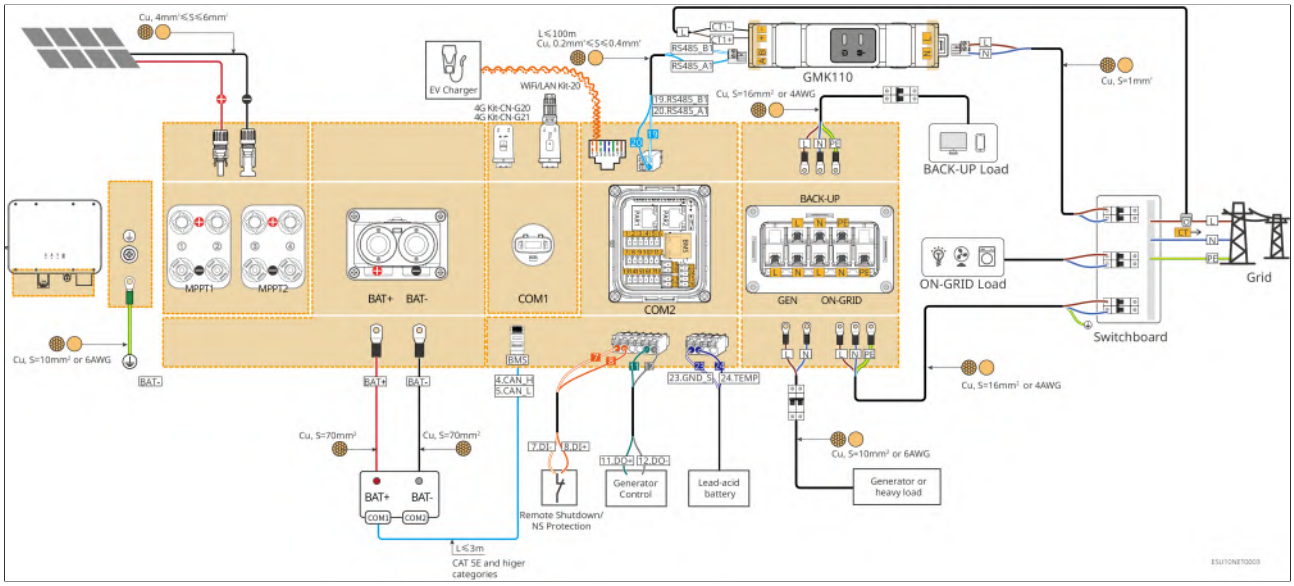


Figure19 Scenario 1 with GMK110

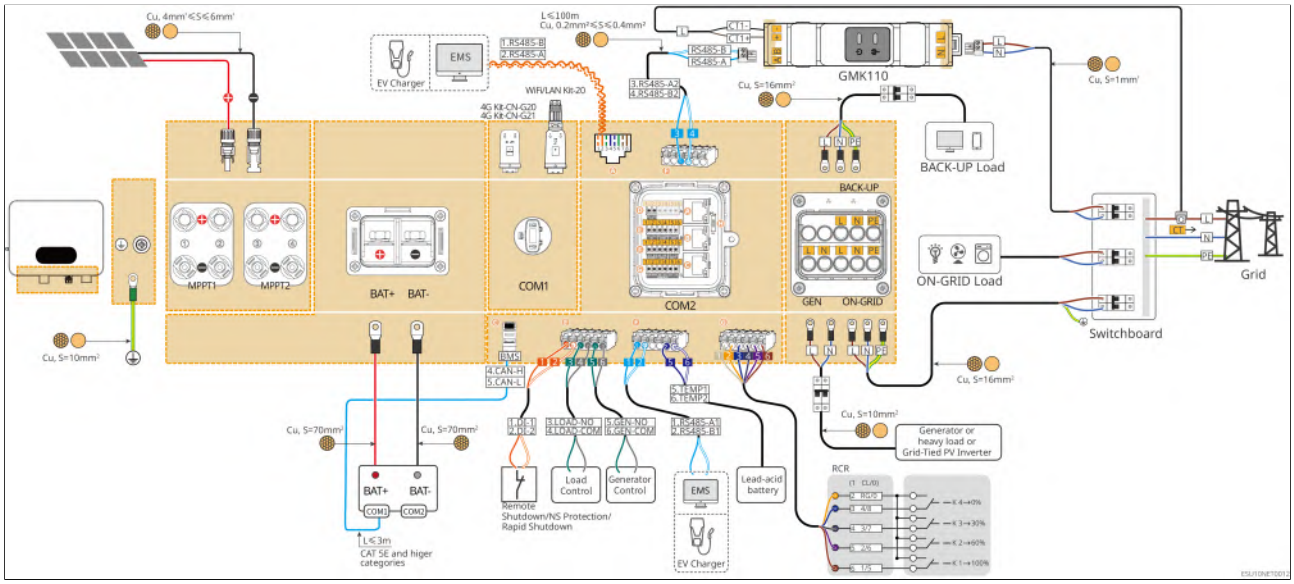


Figure20 Scenario 2 with GMK110

5.2.2 Parallel System Wiring Detail Diagram

NOTE

- In a parallel scenario, the inverter connected to the Ezlink3000 smart communication stick and the meter is the master inverter; the others are slave inverters. Do not connect a smart communication stick to slave inverters in the system.
- The parallel system does not support connection to generators, large loads, or grid-tied inverters.
- The following figures focus on the wiring related to parallel operation. For wiring requirements of other ports, refer to the single-unit system.
- In a parallel scenario, in non-busbar mode, each inverter can be connected to batteries of different models. For specific wiring methods, refer to5.6.Connecting Battery Cables(Page 157)。

Battery Busbar Access Mode when inverters are in parallel

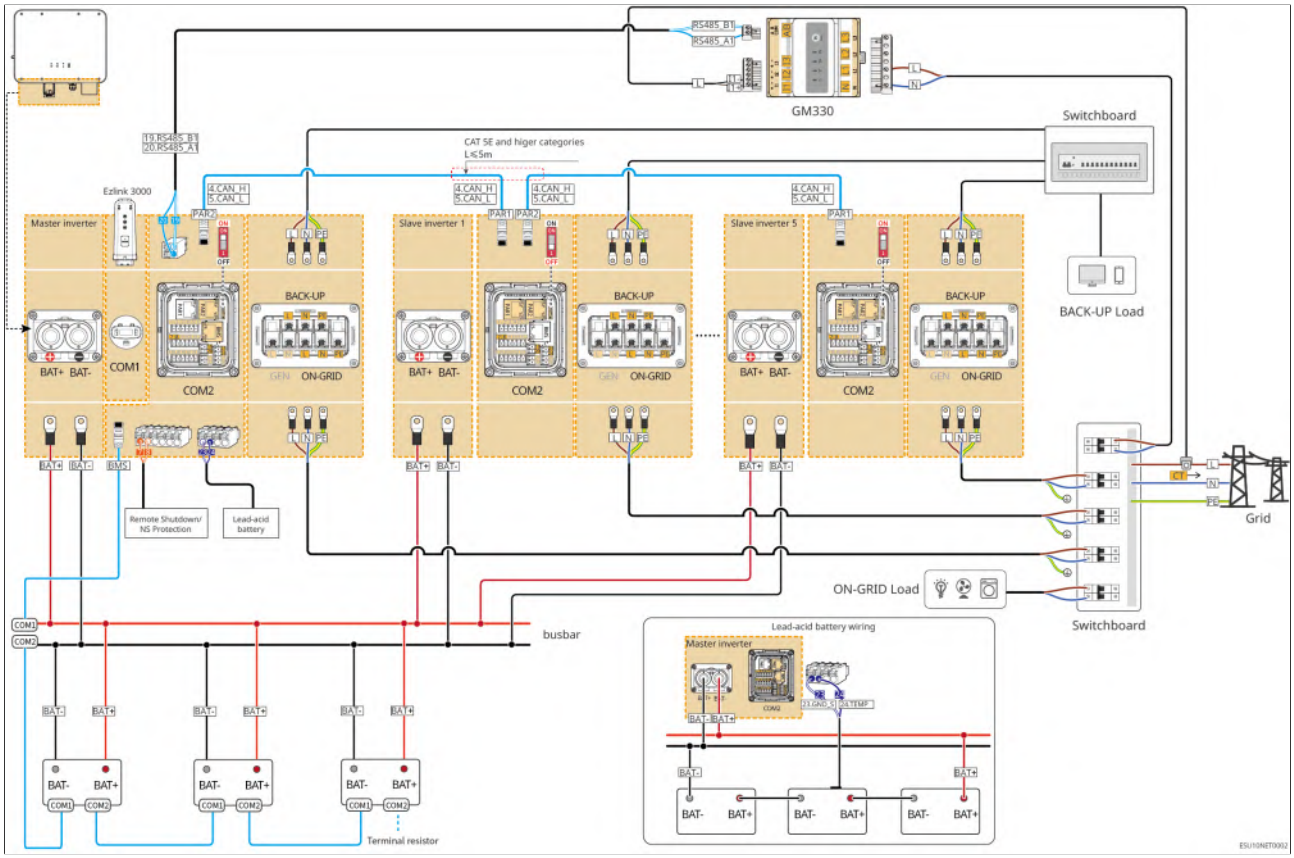


Figure21 Scenario 1 with GM330

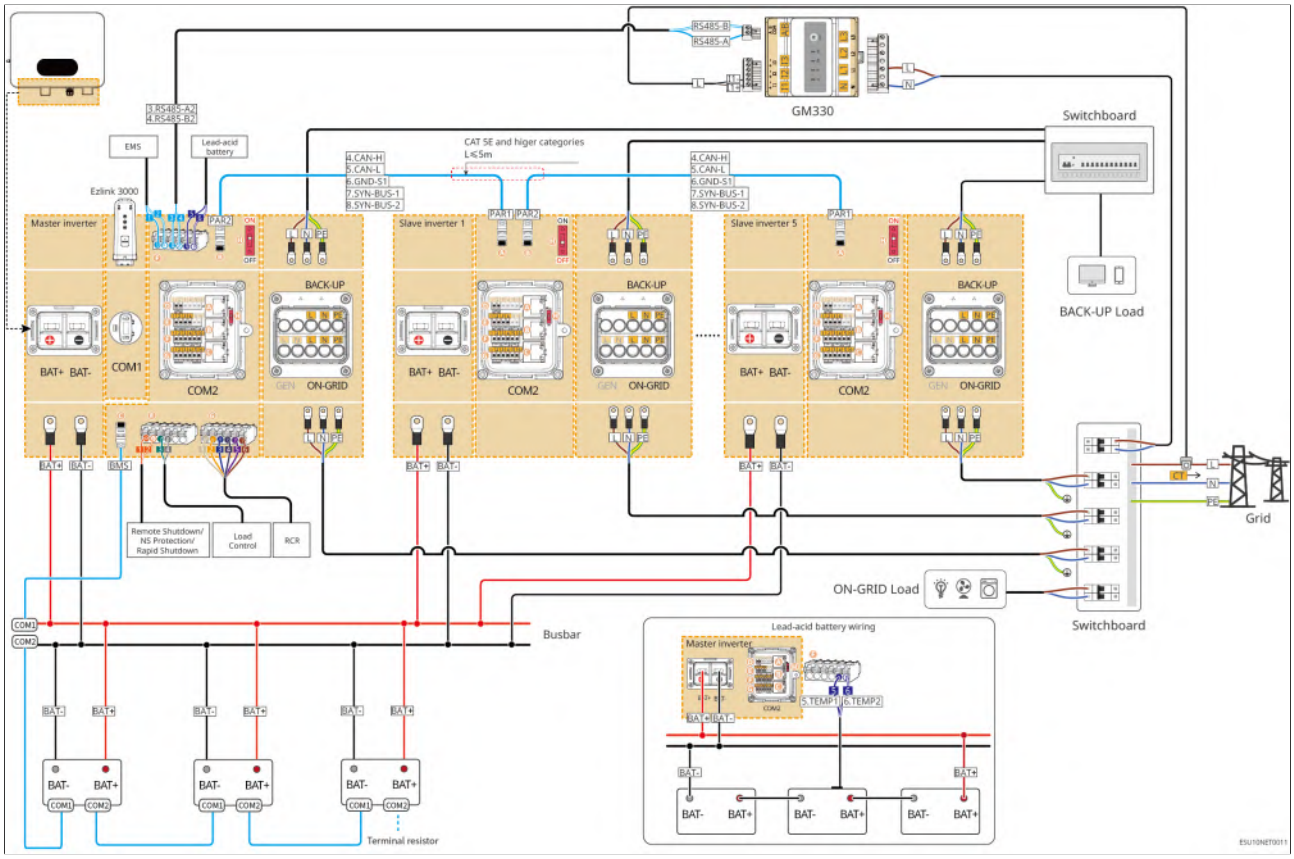


Figure22 Scenario 2 with GM330

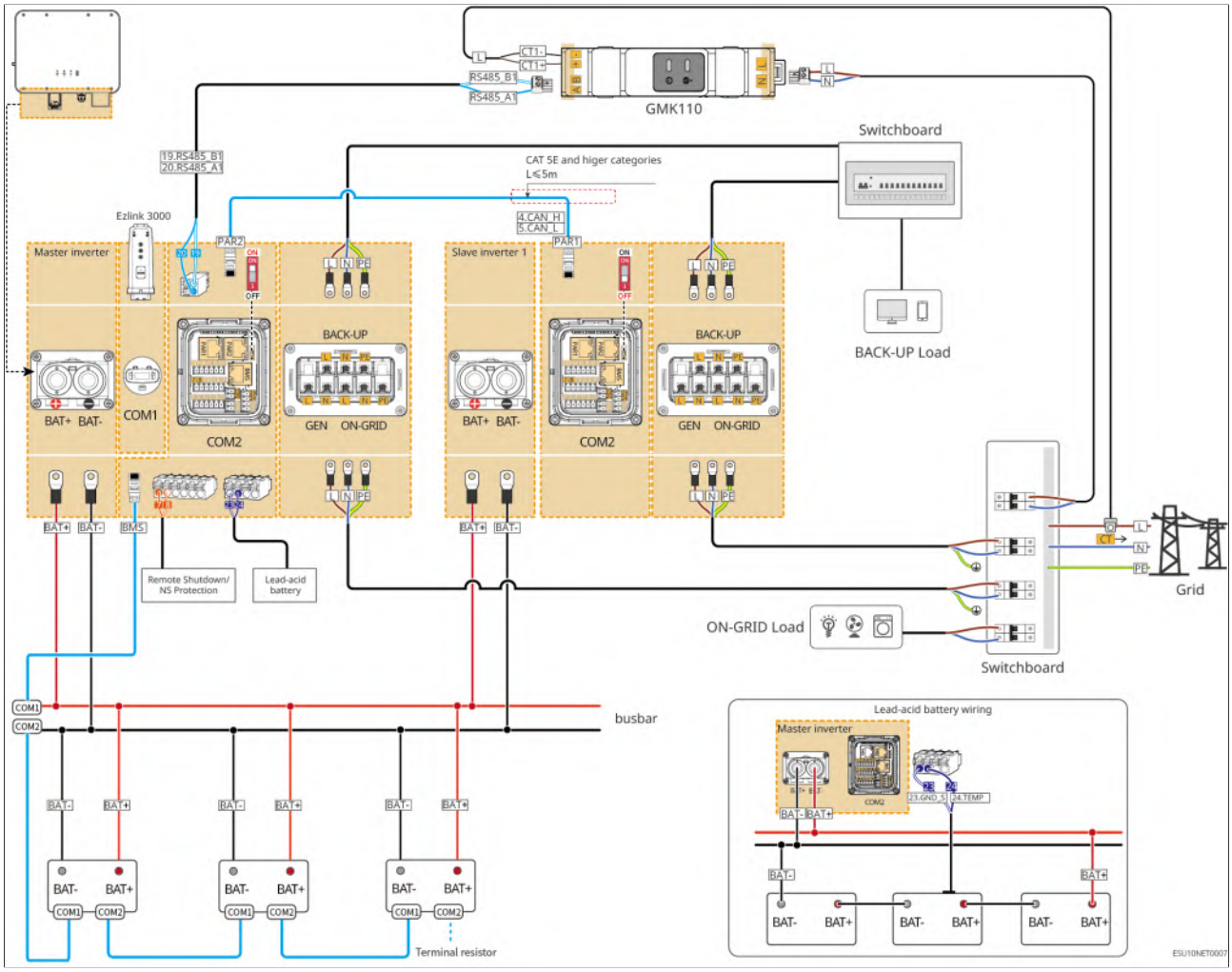


Figure23 Scenario 1 with GMK110

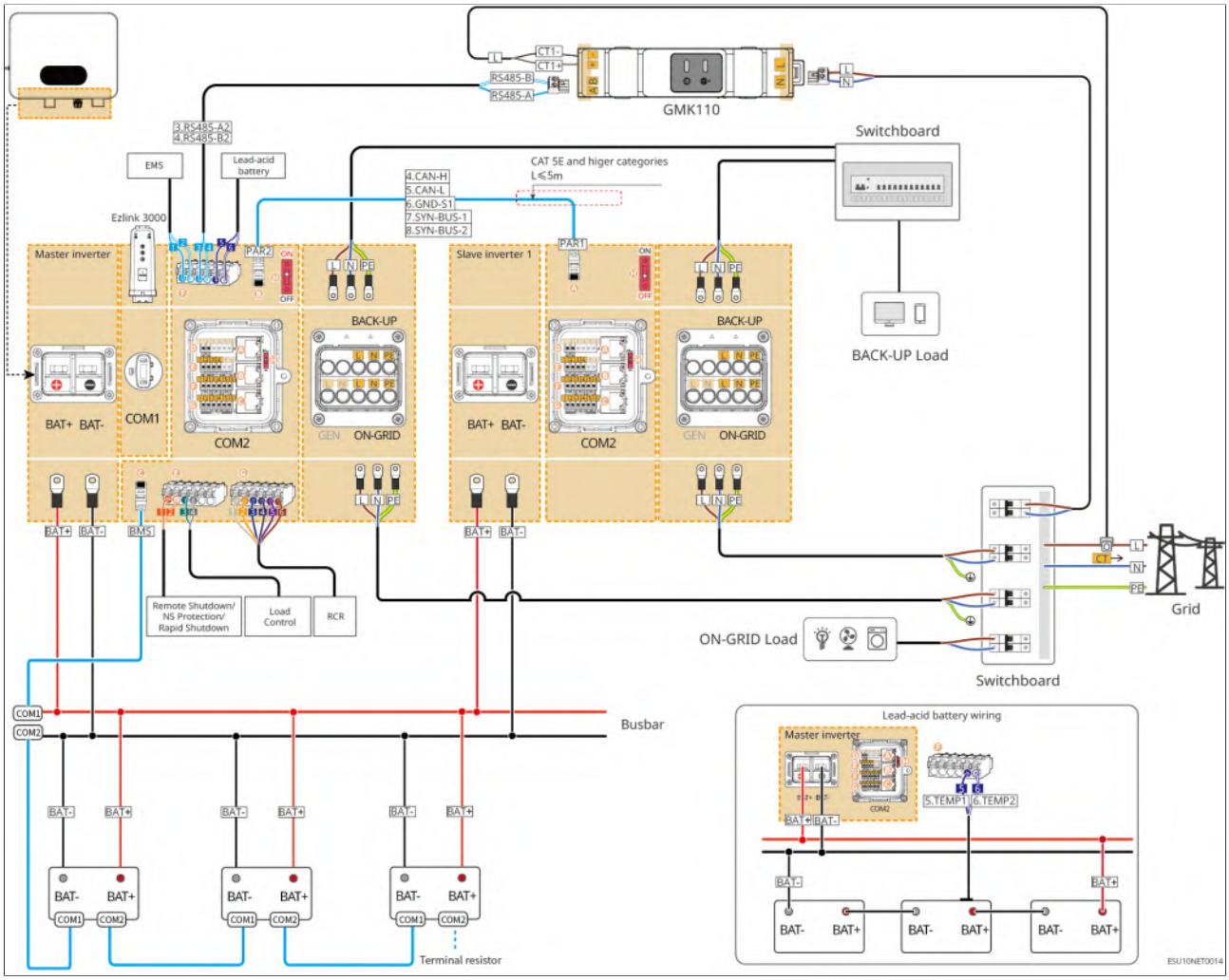


Figure24 Scenario 2 with GMK110

Battery Non-Busbar Access Mode when inverters are in parallel

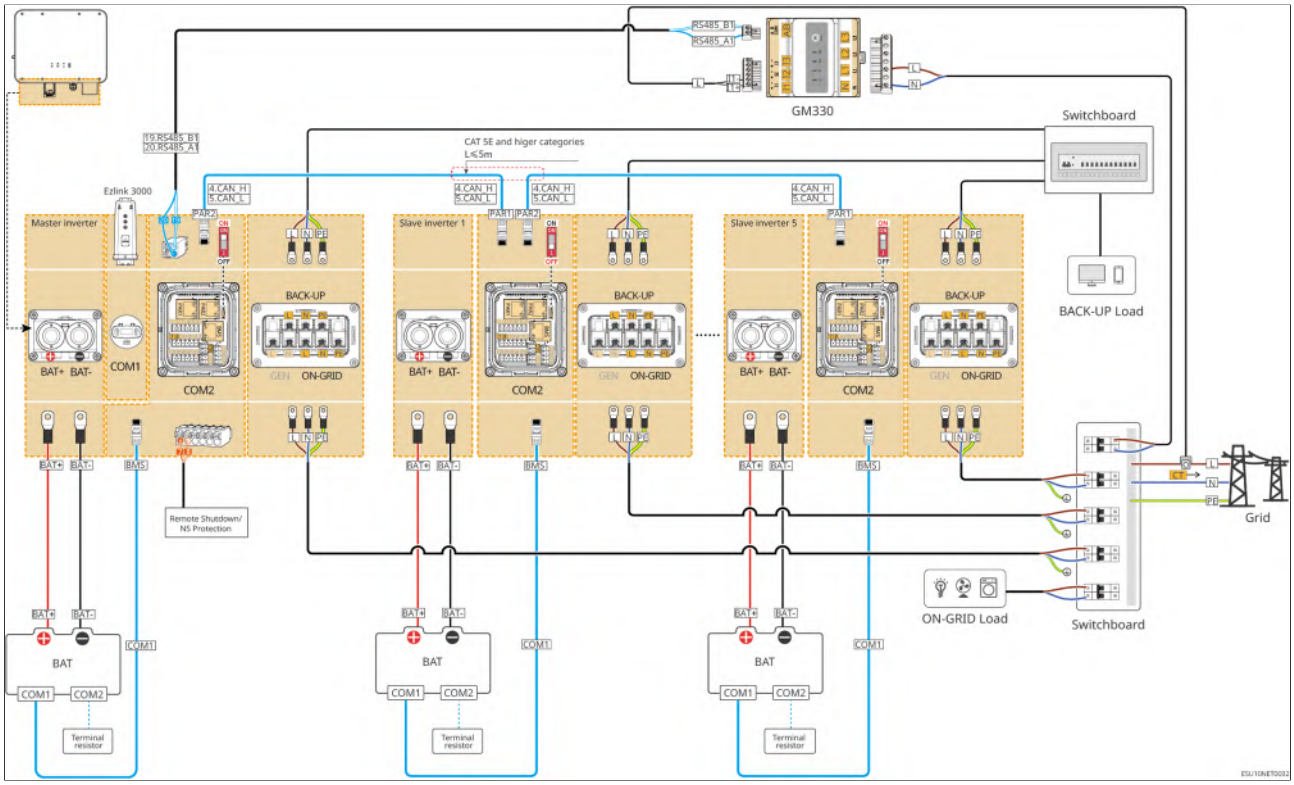


Figure25 Scenario 1 with GM330

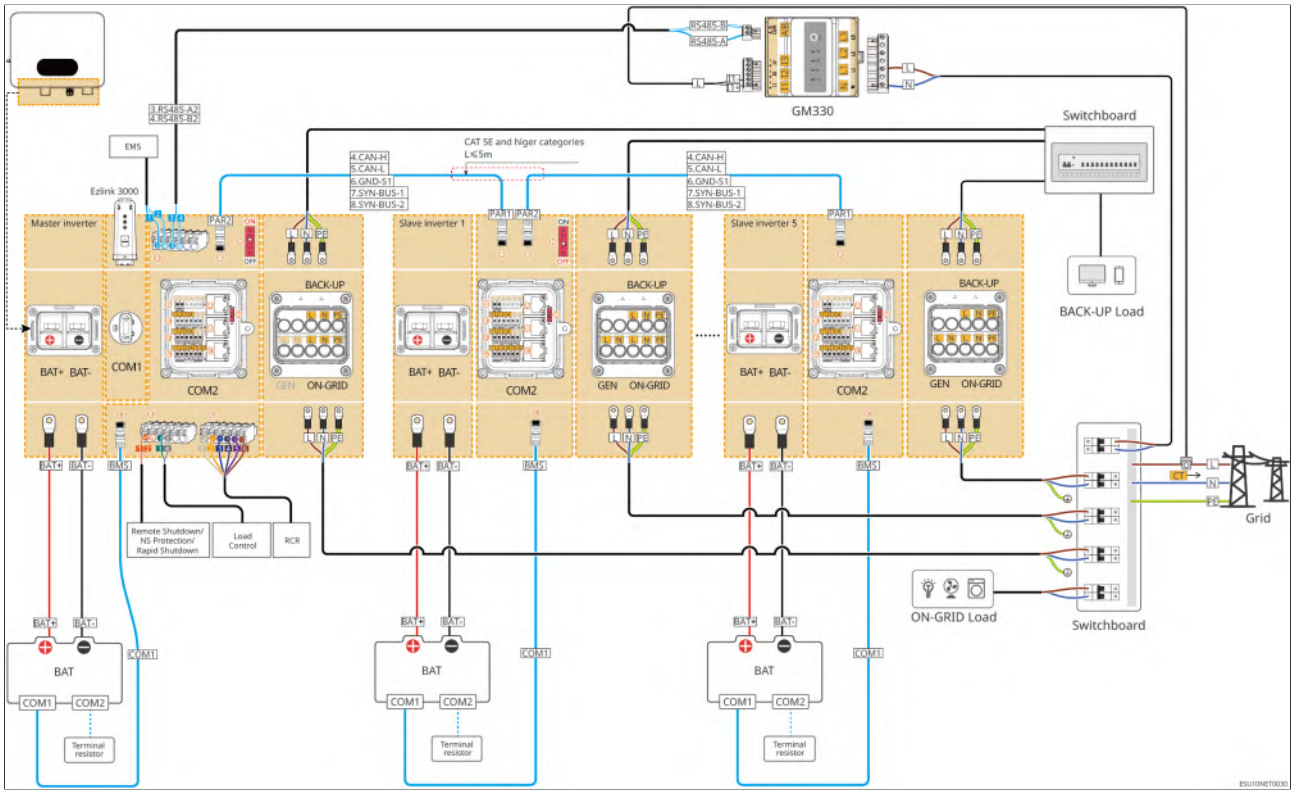


Figure26 Scenario 2 with GM330

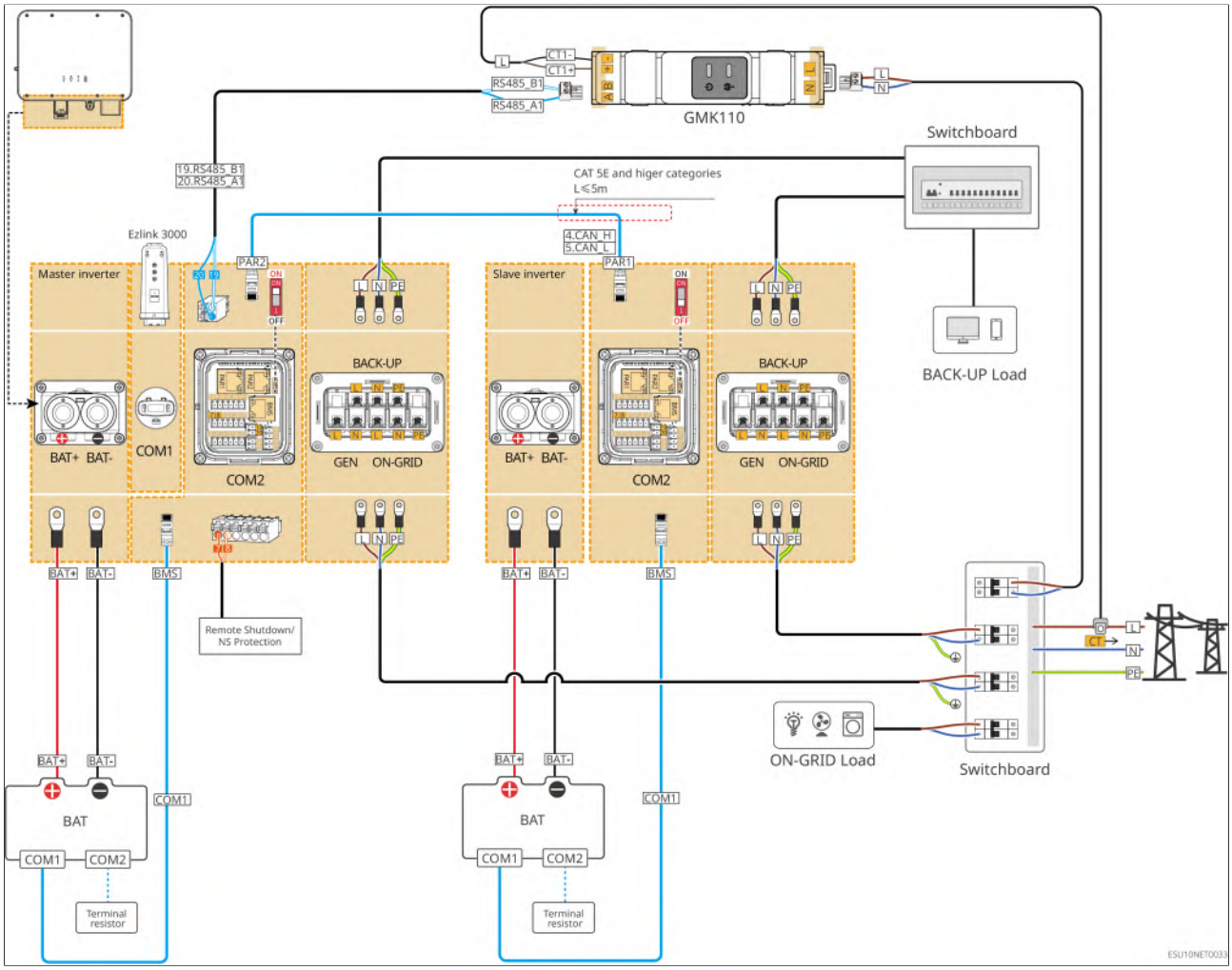


Figure27 Scenario 1 with GMK110

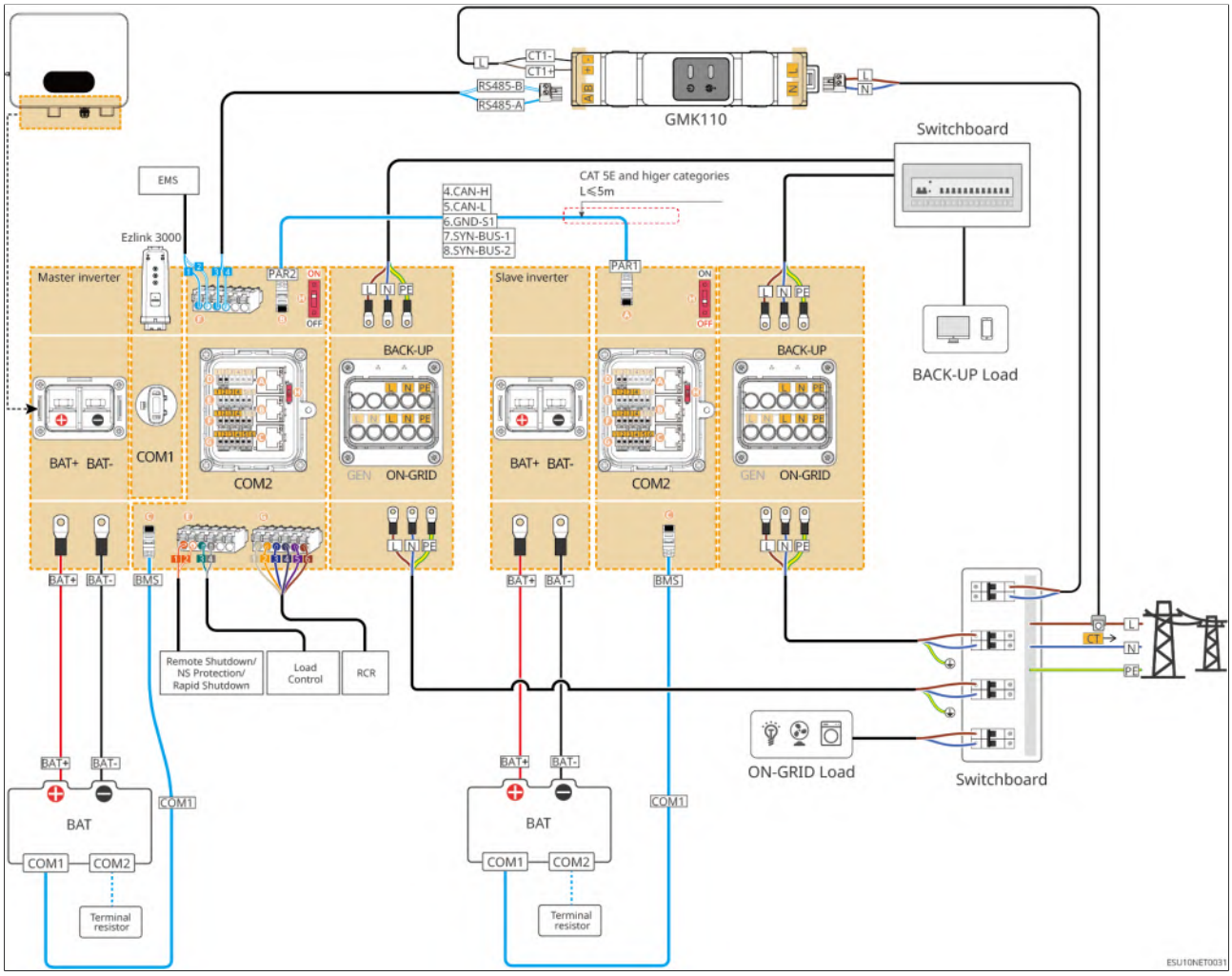


Figure28 Scenario 2 with GMK110

5.2.3 Detailed Wiring Diagram for Single-Phase and Three-Phase Systems

NOTE

- ES UNIQ 8-12kW series inverters have different appearance types. They all support single-phase and three-phase networking with the built-in meter and GMK110 meter, and all support scenarios where each phase is individually connected to a single-phase load or only three-phase loads are connected.
- The following scenario of connecting single-phase loads with the built-in meter is illustrated using only one machine type as an example. If the GMK110 is to be used or three-phase loads are to be connected, please refer to other wiring and networking diagrams.

Scenario with Built-in Meter

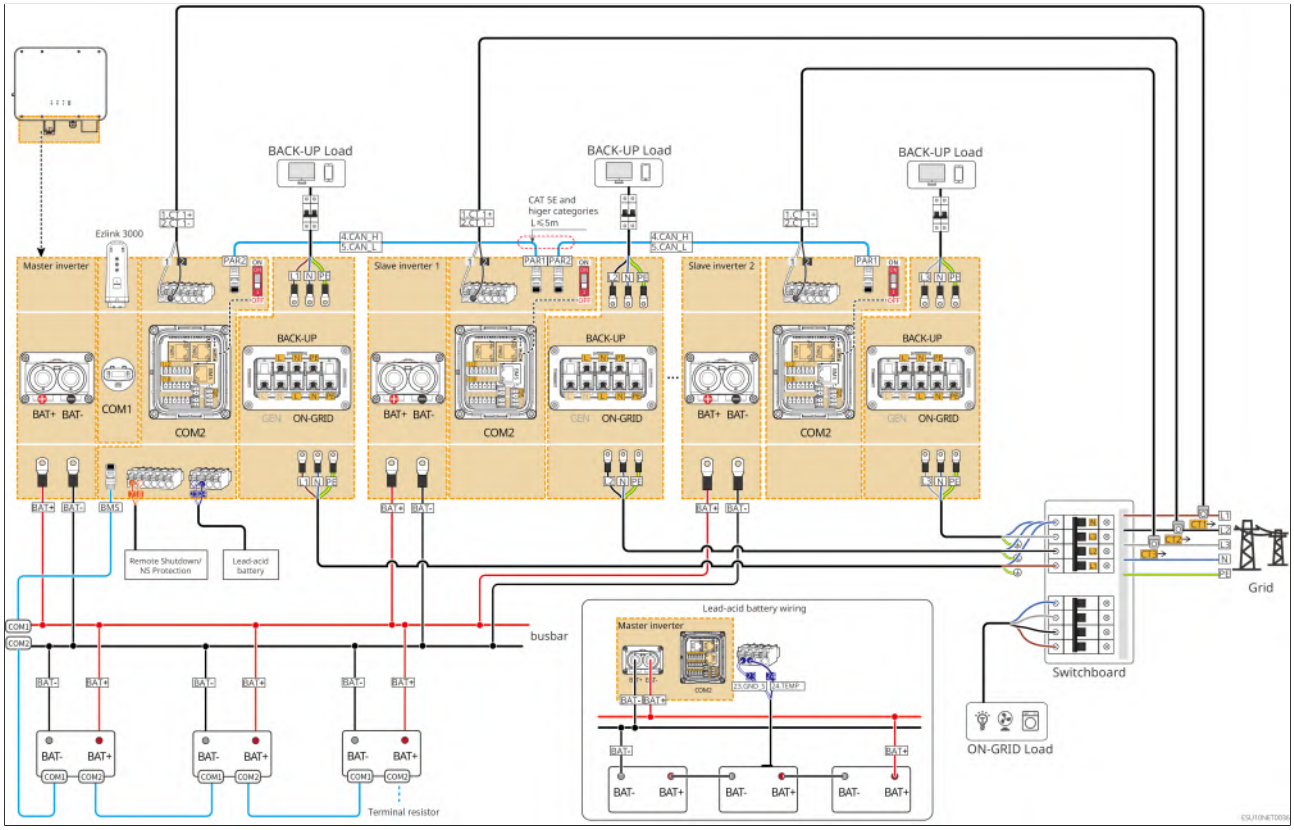


Figure29 Scenario of Each Phase Connected to a Single-phase Load Individually

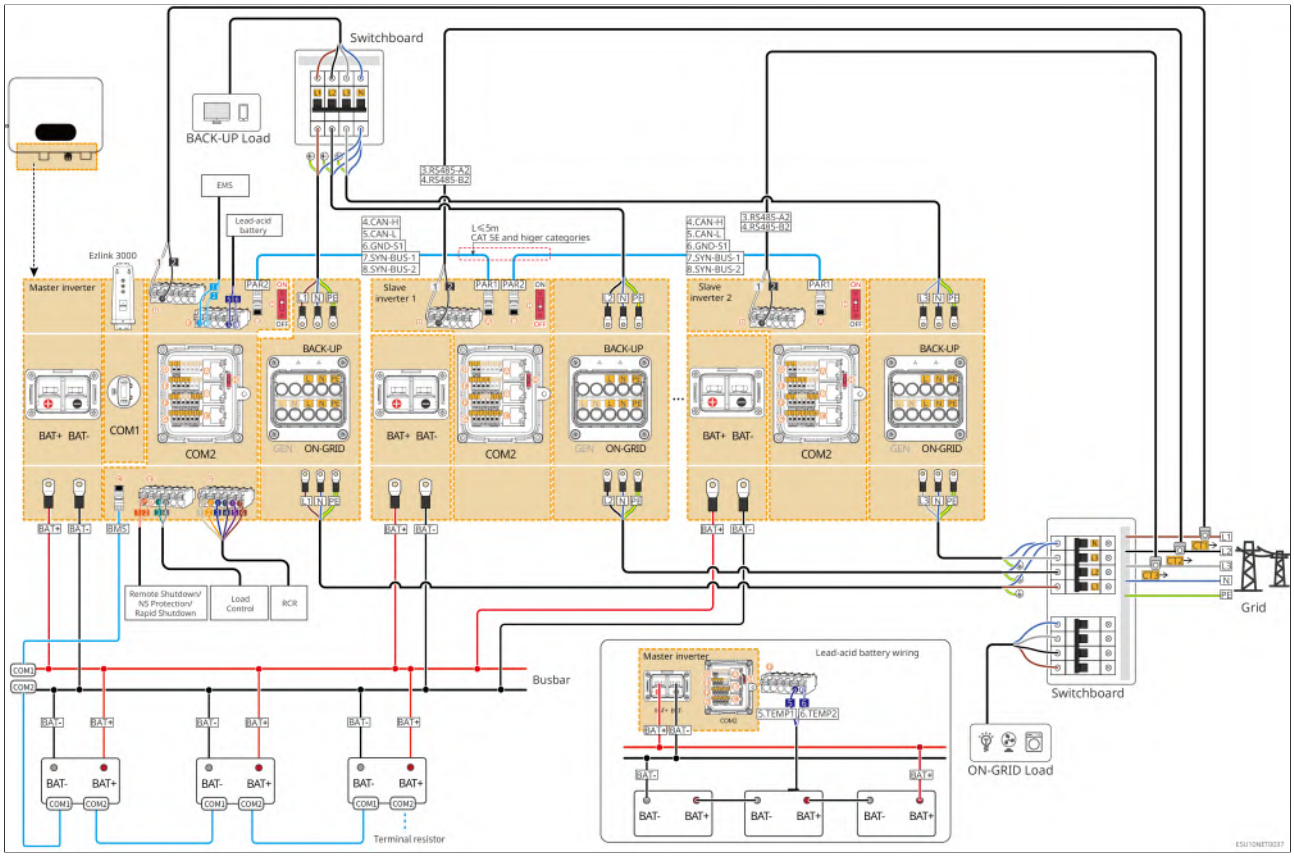


Figure30 Scenario of Three-phase Load Connection

Scenario with GMK110

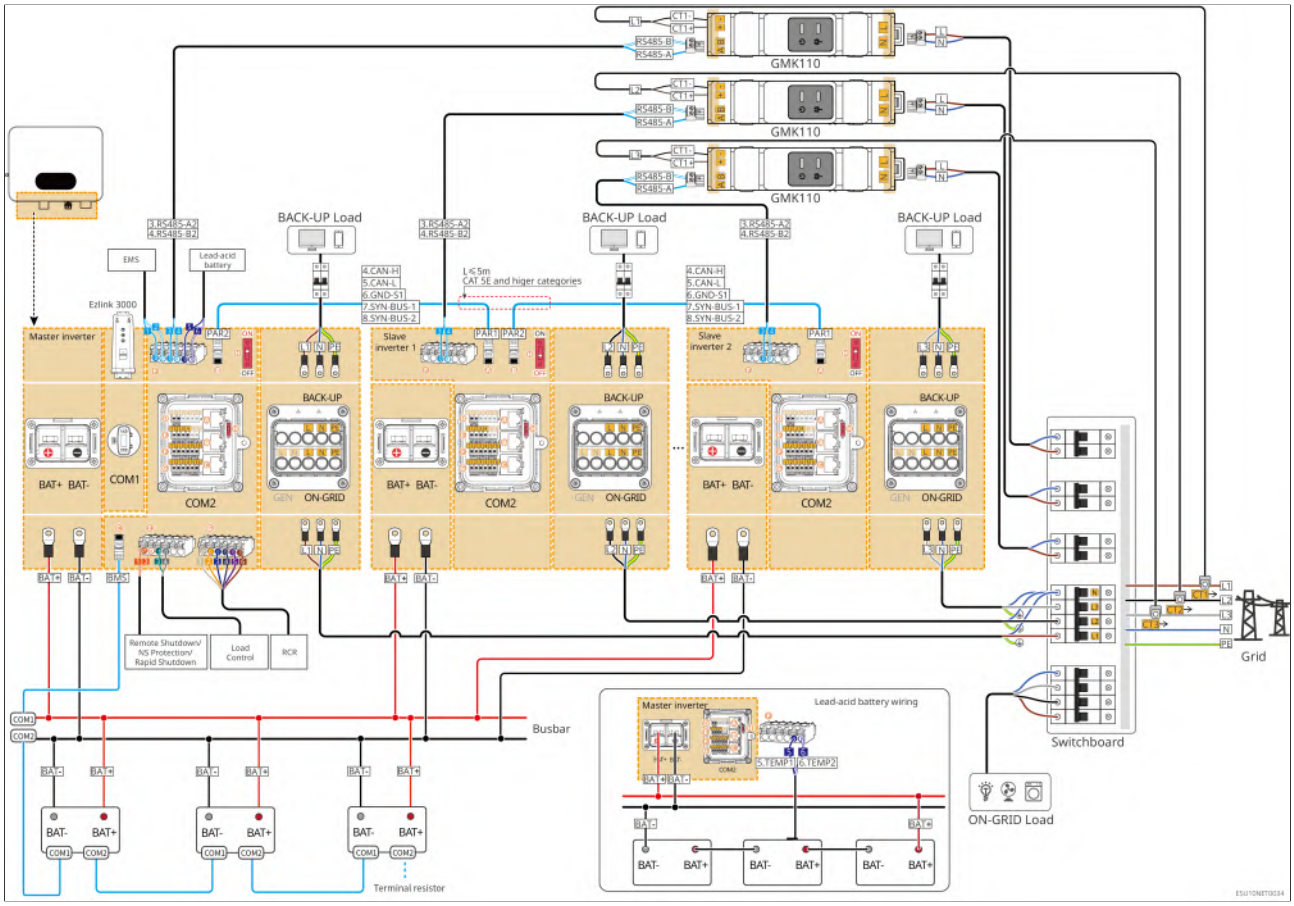


Figure31 Scenario of Each Phase Connected to a Single-phase Load Individually

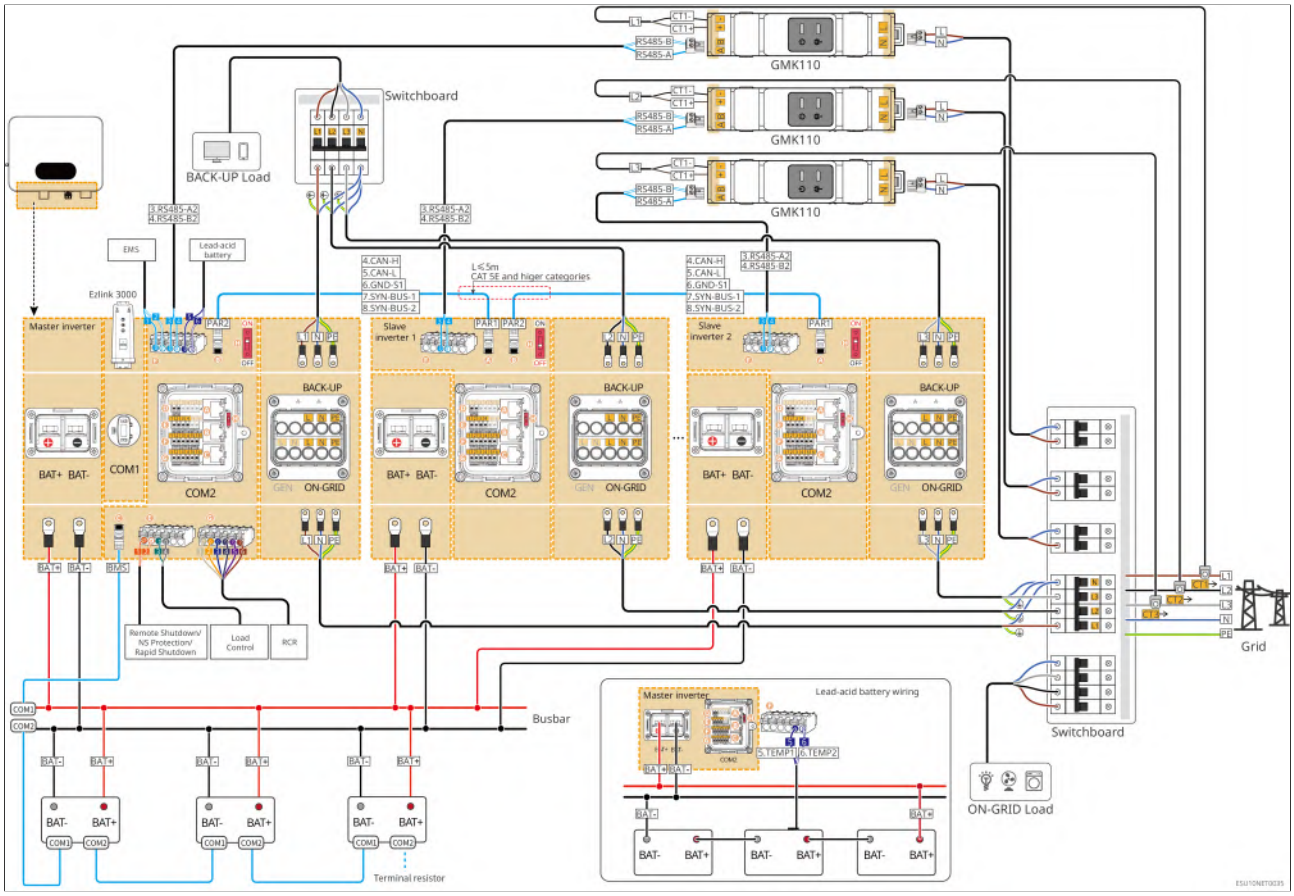


Figure32 Scenario of Three-phase Load Connection

5.3 Materials 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 be safely disconnected from the grid in abnormal situations, connect an AC circuit breaker on the AC side of the inverter. Select an appropriate AC circuit breaker in accordance with local regulations.
- After the inverter is powered on, the BACK-UP AC port is live. If maintenance is required for the BACK-UP load, power off the inverter; otherwise, electric shock may occur.
- 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	Notes
1	ON-GRID Circuit Breaker	Rated Current ≥ 90 A, Nominal Voltage ≥ 230 V	Customer-supplied

No.	Circuit Breaker	Recommended Specifications	Notes
2	Battery switch	Optional according to local laws and regulations • GW8000-ES-C10: Rated Current ≥ 160 A, Nominal Voltage ≥ 60 V • GW10K-ES-C10: Rated Current ≥ 200 A, Nominal Voltage ≥ 60 V • GW12K-ES-C10: Rated Current ≥ 250 A, Nominal Voltage ≥ 60 V	Customer-supplied
3	GEN circuit breaker	• GW8000-ES-C10: Rated Current ≥ 63 A, Nominal Voltage ≥ 230 V • GW10K-ES-C10, GW12K-ES-C10: Rated Current ≥ 75 A, Nominal Voltage ≥ 230 V	Customer-supplied
4	BACK-UP load circuit breaker	Rated Current ≥ 90 A, Nominal Voltage ≥ 230 V	Customer-supplied
5	Residual Current Protection Device	Optional according to local laws and regulations • Type A • ON-GRID side*1: 300mA • BACK-UP side: 30 mA	Customer-supplied

*1: The inverter has a built-in general-purpose current-sensing residual current monitoring unit. Once 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 this protection device be a Type A RCD with a residual operating current not less than 300 mA (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 with a residual operating current meeting the requirements may be selected in accordance with local regulations. For example, in Chile, local regulations require the installation of an RCD with a residual operating current not greater than 30 mA between the inverter and the grid for inverters of 5 kVA and below. However, note that due to PV panels, RCDs with smaller residual operating currents are more prone to nuisance tripping under adverse environments such as rainy weather.

5.3.2 Cable Preparation

No.	cable	Recommended Specifications	Acquisition method
1	Inverter Protection Grounding Conductor	• Single-core outdoor copper cable • Conductor cross-sectional area: S = 10 mm²	Customer-supplied
2	Battery Protection Grounding Conductor	• Single-core outdoor copper cable • Conductor cross-sectional area: ◦ LX A5.0-10：4mm²-6mm² ◦ LX A5.0-30：10mm² ◦ LX U5.4-L：4mm²-6mm² ◦ LX U5.4-20：4mm²-6mm² ◦ LX U5.0-30：10mm² ◦ GW14.3-BAT-LV-G10：10mm² ◦ GW16.1-BAT-LV-G10：10mm² ◦ GW5.0-BAT-LVI-G10、GW10.0-BAT-LV-G10：10mm²	• Customer-supplied • LX A5.0-30, LX A5.0-10: Accessory acquisition (optional) • GW14.3-BAT-LV-G10: For some models, 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 mm²-6 mm² • Cable outer diameter: 5.9 mm-8.8 mm	Customer-supplied

No.	cable	Recommended Specifications	Acquisition method
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 inverter, battery, busbar, and Mix Parallel Unit: see5.6.Connecting Battery Cables(Page 157)for the table listed in the chapter	• Customer-supplied • LX U5.0-30: Available for purchase from GoodWe • LX A5.0-30, LX A5.0-10: Accessory acquisition (optional) • GW14.3-BAT-LV-G10: For some models, battery DC cables are shipped with the battery accessories • GW16.1-BAT-LV-G10： ◦ DC cable between inverter and battery: Included as standard ◦ DC cable between batteries: Available for purchase from GoodWe

No.	cable	Recommended Specifications	Acquisition method
5	AC cable	• Inverter AC input/output cables (BACKUP/GRID): ◦ Conductor cross-sectional area: 16 mm^2 or 4 AWG ◦ Multi-core outdoor copper-core cable outer diameter: 23.6 mm-24.8 mm ◦ Single-core outdoor copper-core cable outer diameter: 9.5 mm-9.9 mm • Generator power cables (GEN): ◦ Conductor cross-sectional area: 10 mm^2 or 6 AWG ◦ Multi-core outdoor copper-core cable outer diameter: 20 mm-21 mm ◦ Single-core outdoor copper-core cable outer diameter: 8.3 mm-8.7 mm	Customer-supplied
6	Smart meter power cable	• Outdoor copper-core cable • Conductor cross-sectional area: 1 mm^2	Customer-supplied

No.	cable	Recommended Specifications	Acquisition method
7	Battery communication cable	Standard shielded network cable of CAT 5E or higher and shielded RJ45 connectors Applicable to the following cables: • Communication cable between batteries • Communication cable between combiner box and battery • Communication cable between Mix Parallel Unit and battery • Communication cable between Mix Parallel Unit and inverter	• Customer-supplied • LX A5.0-10, LX A5.0-30: Accessory acquisition (optional) • GW14.3-BAT-LV-G10: ◦ Communication cable between inverter and battery: Partially included as standard ◦ Communication cable between batteries: self-provided, cable length ≤2 m • GW16.1-BAT-LV-G10: ◦ Communication cable between inverter and battery: Included as standard ◦ Communication cable between batteries: self-provided, cable length ≤1 m • Mix Parallel Unit: Accessory Acquisition (Standard)

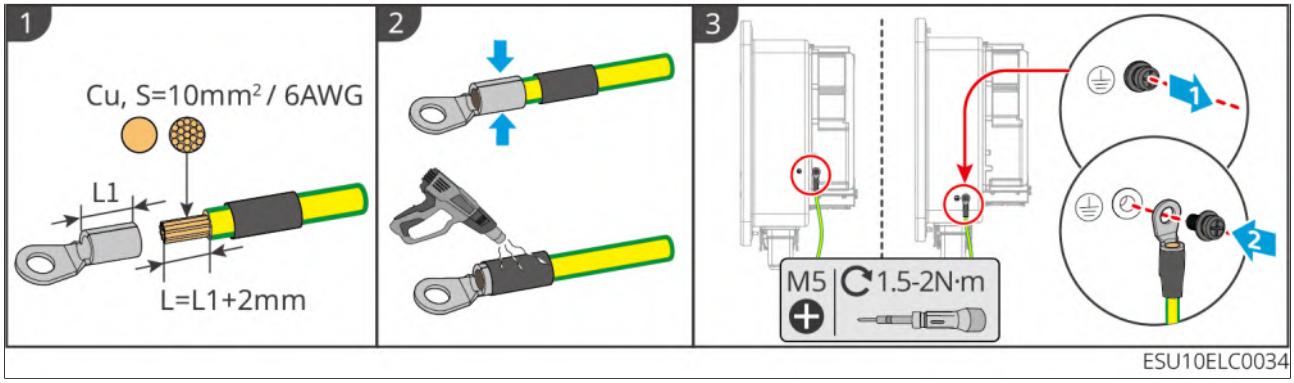
No.	cable	Recommended Specifications	Acquisition method
8	Energy meter RS485 communication cable	• Shielded twisted pair • Conductor cross-sectional area: 0.2 mm^2-0.4 mm^2	Customer-supplied
9	Inverter parallel communication cable	CAT 5E or higher standard shielded network cable and shielded RJ45 connectors	Customer-supplied
10	Remote Shutdown / Rapid Shutdown ON/NS Protection communication cable	• Copper-core twisted pair • Conductor cross-sectional area: 0.2 mm^2-0.4 mm^2	Customer-supplied
11	EMS communication cable/ EV charger communication cable	CAT 5E or higher standard shielded network cable and shielded RJ45 connectors	Customer-supplied

5.4 Connect the Protection Ground Wire

⚠WARNING

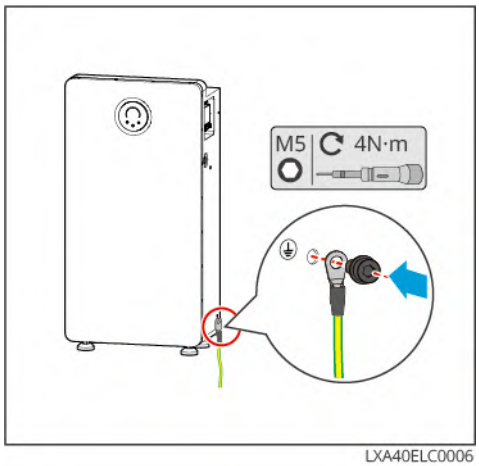
- The Protection grounding of the chassis enclosure cannot replace the Protection ground wire of the AC output port. When wiring, ensure that the Protection ground wires at both locations are reliably connected.
- When multiple devices are used, ensure that the Protection grounding points of all device chassis enclosures are equipotentially bonded.
- To improve the corrosion resistance of the terminals, after the Protection ground wire is connected and installed, it is recommended to apply silicone or paint to the exterior of the grounding terminal for protection.
- When installing the device, the Protection ground wire must be installed first; when removing the device, the Protection ground wire must be removed last.

Inverter



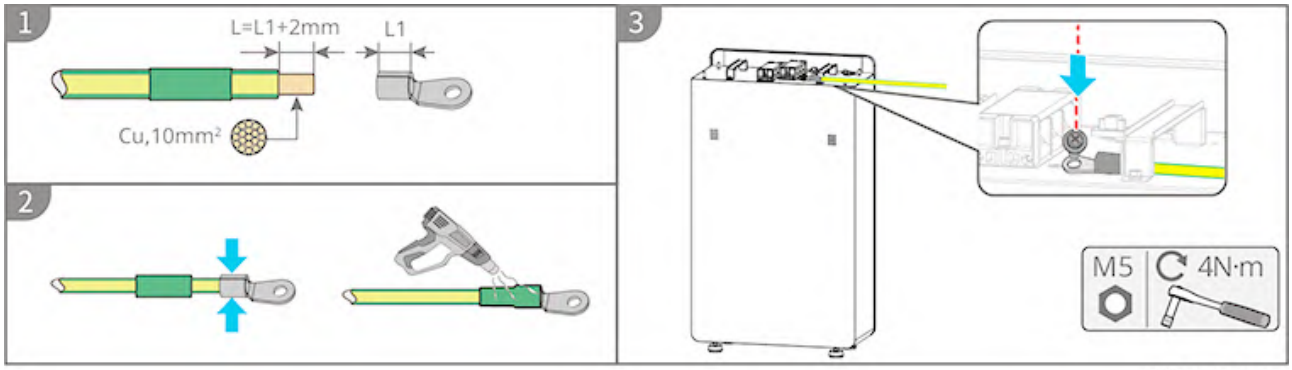
Battery

GW16.1-BAT-LV-G10



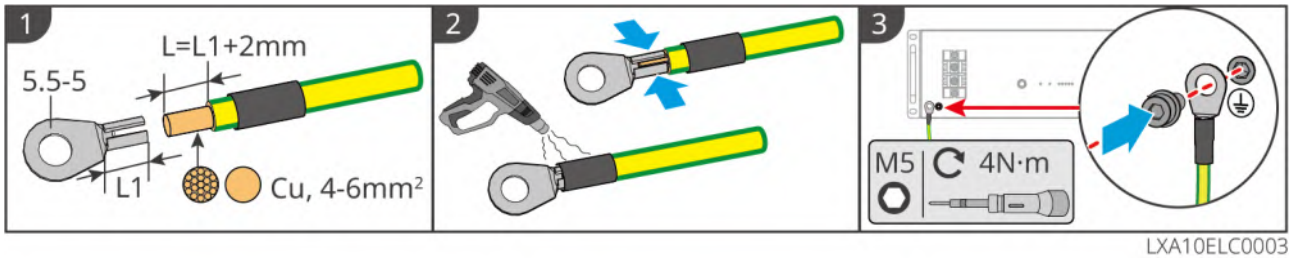
GW14.3-BAT-LV-G10

- If the grounding cable is shipped with the battery accessories, use the shipped cable; no crimping is required.



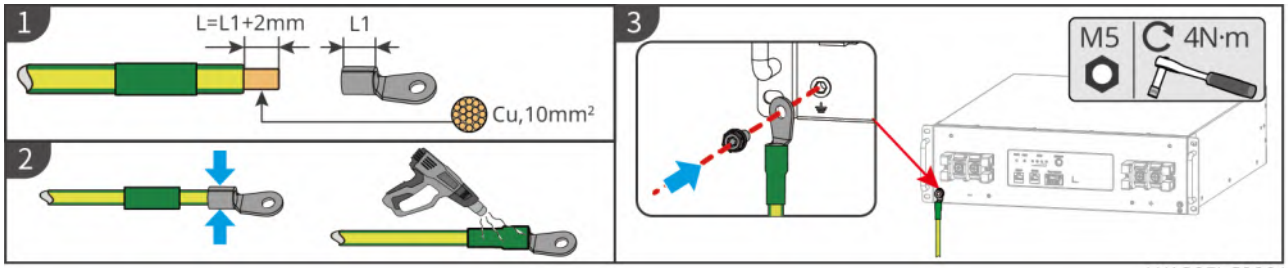
LXA10ELC0014

LX A5.0-10



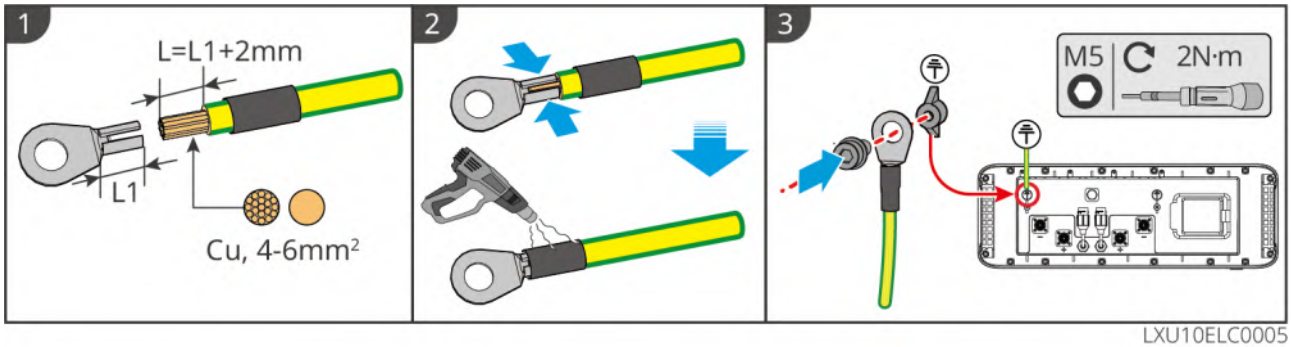
LXA10ELC0003

LX A5.0-30



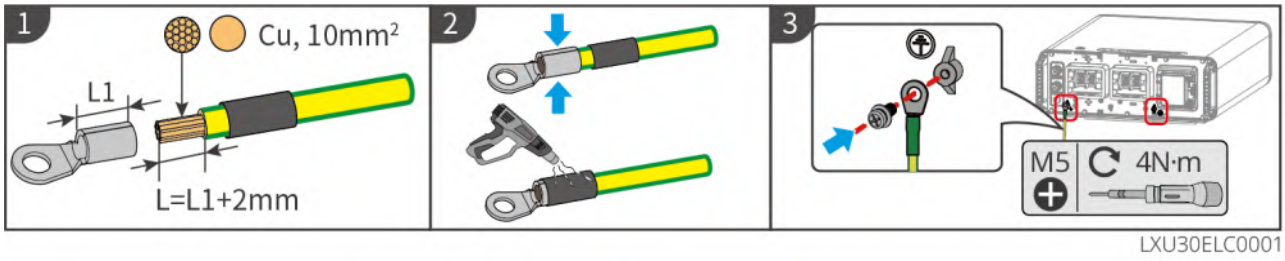
LXA30ELC0001

LX U5.4-L、LX U5.4-20

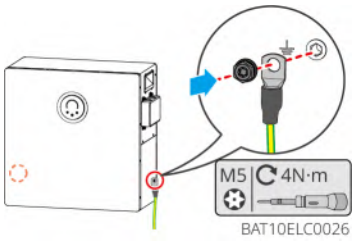


LXU10ELC0005

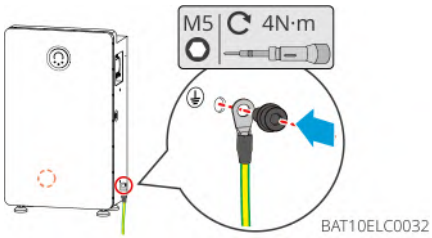
LX U5.0-30



GW5.0-BAT-LVI-G10



GW10.0-BAT-LV-G10



5.5 Connect PV Cables

DANGER

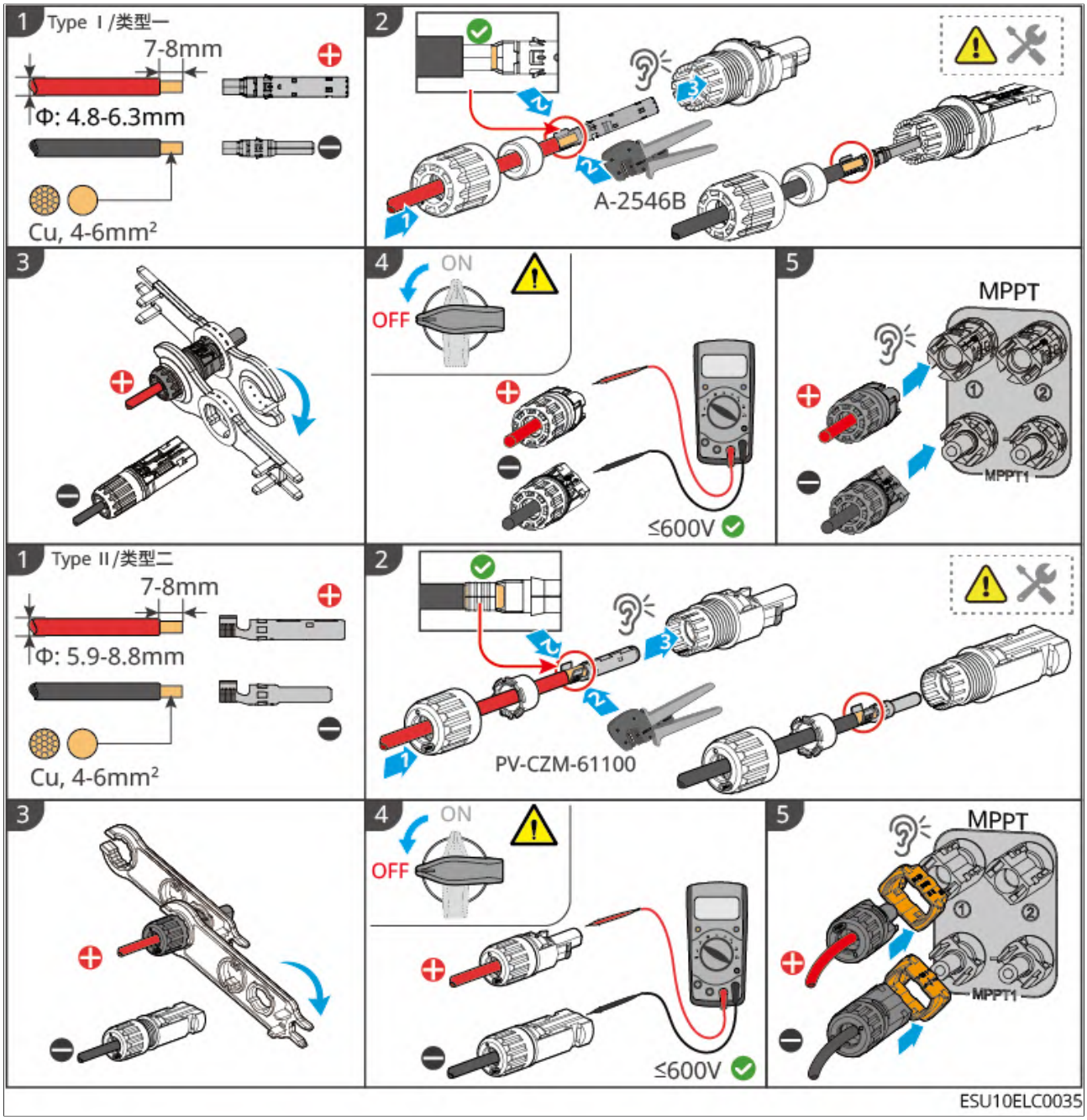
- Do not connect the same PV string to multiple inverters; otherwise, the inverter may be damaged.
- Before connecting the PV strings to the inverter, confirm the following information; otherwise, it may cause permanent damage to the inverter and, in severe cases, may cause a fire, resulting in personal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

WARNING

- 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/30 mA).
- After the DC cables are connected, ensure that the cable connections are tight and not loose.
- Use a multimeter to measure the positive and negative poles of the DC cables to ensure that the polarity is correct and no reverse connection occurs; and that the voltage is within the allowed range.

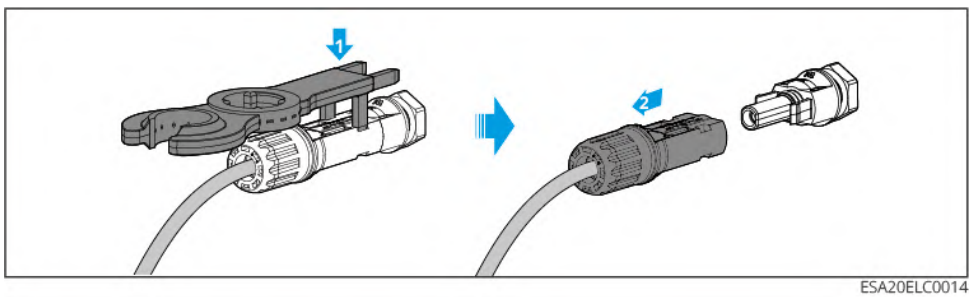
NOTE

- 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.
- PV voltage operation and power limiting strategy:
  1. Recommended range: When the battery is connected, PV voltage < 490 V is recommended; battery power will not be limited.
  2. Linear derating: In the PV voltage range of 490 V to 530 V, the battery charge/discharge power decreases linearly from 100% to 0%.
  3. High-voltage standby: When PV voltage ≥ 560 V, the inverter enters standby; when the voltage drops below 560 V, it can resume operation, but the power is still limited by Rule 2.

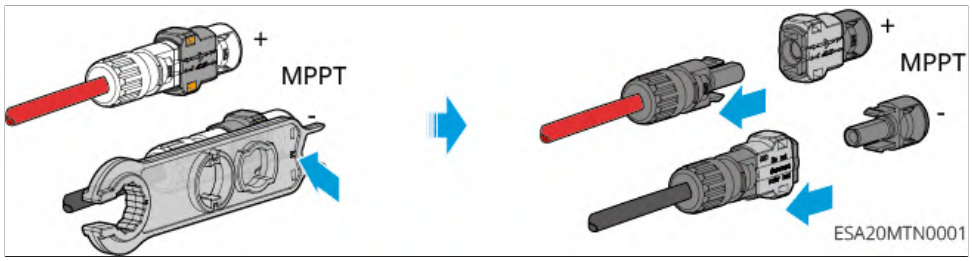


If you need to disassemble the PV terminals, refer to the following steps:

Type 1:



Type 2:



5.6 Connecting Battery Cables

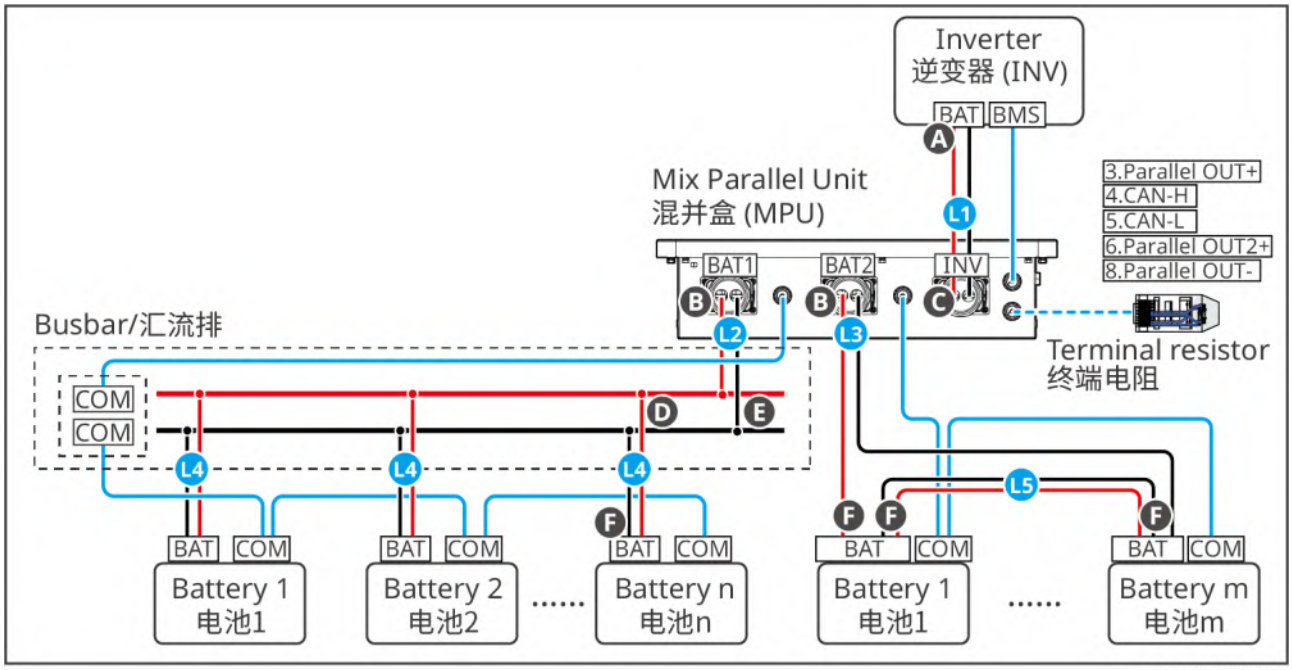
⚠DANGER

- Do not connect loads between the inverter and the battery.
- When connecting battery cables, use insulated tools to prevent accidental electric shock or causing a Battery Short Circuit.
- Ensure that the battery open-circuit voltage is within the allowed range of the inverter.
- Between the inverter and the battery, choose whether to configure a DC Switch according to local laws and regulations.

NOTE

- 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. Communication ports must not be cross-paired.
- The battery wiring method supported by the BAT2 port of the Mix Parallel Unit is the same as that of BAT1.

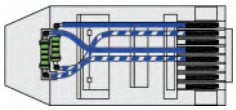
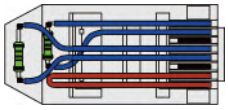
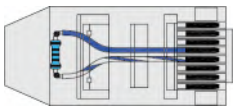
Refer to the following table for recommended cables between the inverter, battery, busbar, and Mix Parallel Unit:



Battery Model	L1 Inverter → Mix Parallel Unit power cable	L2 Mix Parallel Unit → Busbar power cable	L3 Mix Parallel Unit → Battery power cable	L4 Busbar → Battery power cable	L5 Power cable between batteries	Inverter → Busbar power cable	Power cable for direct connection between inverter and battery
LX A5.0-10	70mm²	70mm²	25mm²	25mm²	25mm²	70mm²	
LX A5.0-30	70mm²	70mm²	35mm²	50mm²	50mm²		
LX U5.0-30	/	/	/	25mm²	50mm²		

Battery Model	L1 Inverter → Mix Parallel Unit power cable	L2 Mix Parallel Unit → Busbar power cable	L3 Mix Parallel Unit → Battery power cable	L4 Busbar → Battery power cable	L5 Power cable between batteries	Inverter → Busbar power cable	Power cable for direct connection between inverter and battery
GW14.3-BAT-LV-G10	70mm²	70mm²	70mm²	70mm²	70mm²		
GW16.1-BAT-LV-G10	70mm²	70mm²	50mm²	50mm²	50mm²		
GW5.0-BAT-LVI-G10 GW10.0-BAT-LV-G10	/	/	/	25mm²	25mm²		
*1: When the inverter is directly connected to the battery, the power cable should be selected according to the recommended specifications; if the directly connected battery model is GW16.1-BAT-LV-G10, only 50mm² cable is supported; if the directly connected battery model is GW14.3-BAT-LV-G10, only 70mm² cable is supported; if the directly connected battery models are GW5.0-BAT-LVI-G10 and GW10.0-BAT-LV-G10, only 25mm² cable is supported, and the port maximum continuous charge/discharge current is the battery maximum charge/discharge current.							

Termination Resistor Usage Instructions:

Termination Resistor Appearance	Battery Type	PIN Description
	LX U5.4-20、LX A5.0-10、GW5.0-BAT-LVI-G10、GW10.0-BAT-LV-G10	PIN1/2 and PIN4/5 are each short-circuited with a 120Ω resistor
	LX U5.0-30, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10 (GW Combiner Box)	PIN1/2 and PIN4/5 are each short-circuited with a 120Ω resistor, and the 7/8 harness is short-circuited
	LX U5.4-L	PIN4/5 is short-circuited with a 120Ω resistor
	LX U5.0-30, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10,, GW5.0-BAT-LVI-G10, GW10.0-BAT-LV-G10 (Third-Party Busbar)	PIN1/2 and PIN4/5 are each short-circuited with a 120Ω resistor, and the 6/8 harness is short-circuited

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	
6	Parallel OUT2+	Parallel OUT2+	Busbar Identification

PIN	COM1	COM2	Description
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 Inverter Communication or Battery Parallel Cluster 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

LX A5.0-10 Communication Port Definitions

PIN	COM1	COM2	Description
1	-	-	Reserved
2	-	-	
3	Parallel OUT+	Parallel OUT+	Parallel Communication Port
4	CAN_1H	CAN_1H	Connect to Inverter Communication or Battery Parallel Cluster Communication Port
5	CAN_1L	CAN_1L	
6	-	-	Reserved
7	-	-	
8	Parallel OUT-	Parallel OUT-	Parallel Communication Port

LX U5.4-L, LX U5.4-20 Communication Port Definitions

PIN	COM1	COM2	Description
1	RS485A	RS485A	RS485 Communication

2	RS485B-	RS485B-	
3	CAN_H	CAN_H	Parallel Communication Port
4	CAN_L	CAN_L	Connect to Inverter Communication or Battery Parallel Cluster Communication Port
5	-	-	Reserved
6	-	-	Reserved
7	-	-	Reserved
8	-	-	Reserved

LX U5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10 Communication Port Definitions

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 Inverter Communication or Battery Parallel Cluster 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

GW5.0-BAT-LVI-G10, GW10.0-BAT-LV-G10 Communication Port Definitions

PIN	COM1	COM2	Description
1	RS485A	RS485A	Reserved
2	RS485B	RS485B	
3	-	-	-
4	CAN_H	CAN_H	Connect to Inverter Communication or Battery Parallel Cluster Communication Port
5	CAN_L	CAN_L	
6	Parallel OUT2+	Parallel OUT2+	Battery Parallel Cluster Communication Port

PIN	COM1	COM2	Description
7	-	-	Reserved
8	Parallel OUT-	Parallel OUT-	Battery Parallel Cluster Communication Port

The Battery Qty connected to the system via the Mix Parallel Unit varies depending on the busbar, battery, or inverter model.
The corresponding maximum number of connected batteries is shown in the following table:

Description of Battery Parallel Cluster Quantity in the System			
*1: The two BAT ports of the Mix Parallel Unit support connection to different busbars. If you need to expand the battery parallel cluster quantity, you can connect to other supported busbars. *2：m+n≤30			
Battery Model	Inverter	ES Uniq	
	Mix Parallel Unit	BAT1(m)	BAT2(n)
LX A5.0-10	Daisy Chain	≤15	≤15
	BCB-11-WW-0*1	≤6	≤6
	BCB-22-WW-0*1	≤12	≤12
	BCB-32-WW-0	≤15	≤15
	Third-party Busbar	≤15	≤15
LX A5.0-30	Daisy Chain*2	≤30	≤30
	BCB-22-WW-0*1	≤6	≤6
	BCB-32-WW-0	≤15	≤15

Description of Battery Parallel Cluster Quantity in the System			
	Third-party Busbar*2	≤30	≤30
GW14.3-BAT-LV-G10	Daisy Chain*2	≤30	≤30
	BCB-32-WW-0	≤15	≤15
	Third-party Busbar*2	≤30	≤30
GW16.1-BAT-LV-G10	Daisy Chain*2	≤30	≤30
	BCB-32-WW-0	≤15	≤15
	Third-party Busbar*2	≤30	≤30

Battery System Wiring Diagram

LX A5.0-10: Battery Daisy Chain Connection Method

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

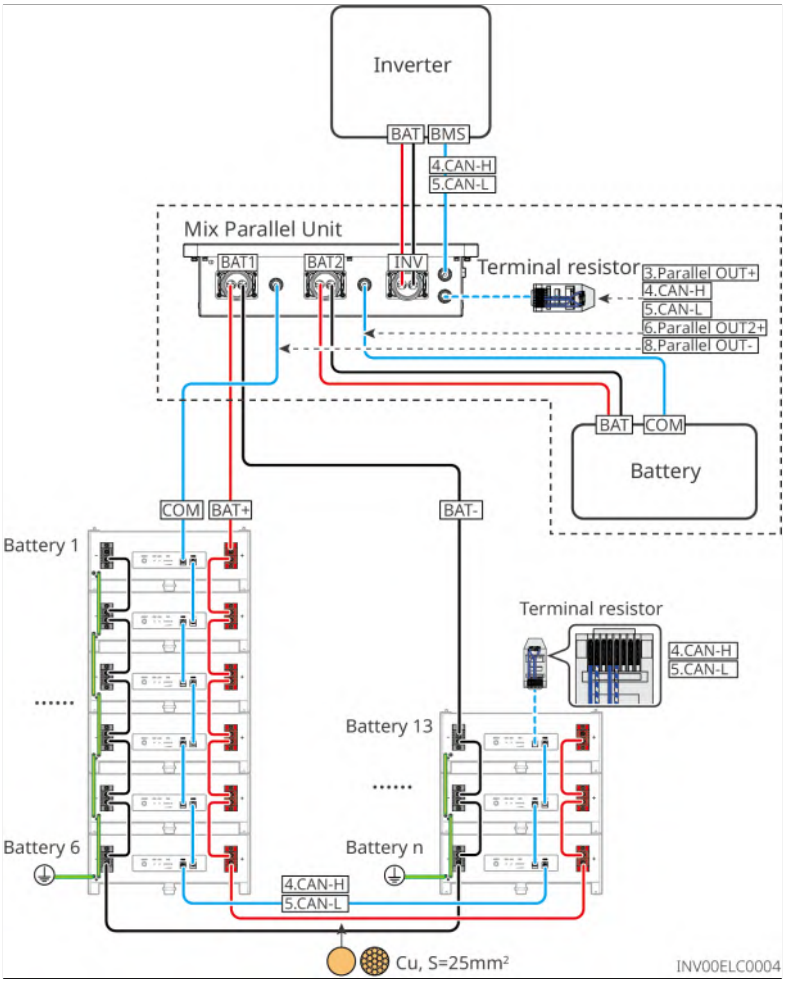


Figure33 LX A5.0-10: Battery Daisy Chain Connection Method

LX A5.0-10: Battery Connection Method with Combiner Box BCB-11-WW-0

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

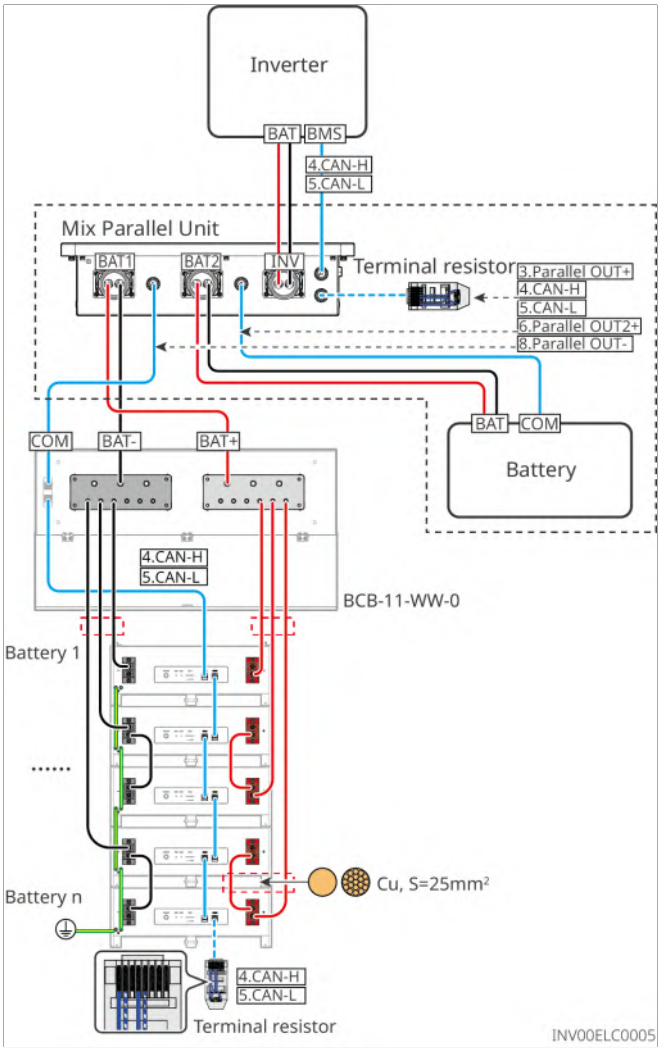


Figure34 LX A5.0-10: Battery Connection Method with Combiner Box BCB-11-WW-0

LX A5.0-10: Battery Connection Method with Combiner Box BCB-22-WW-0

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

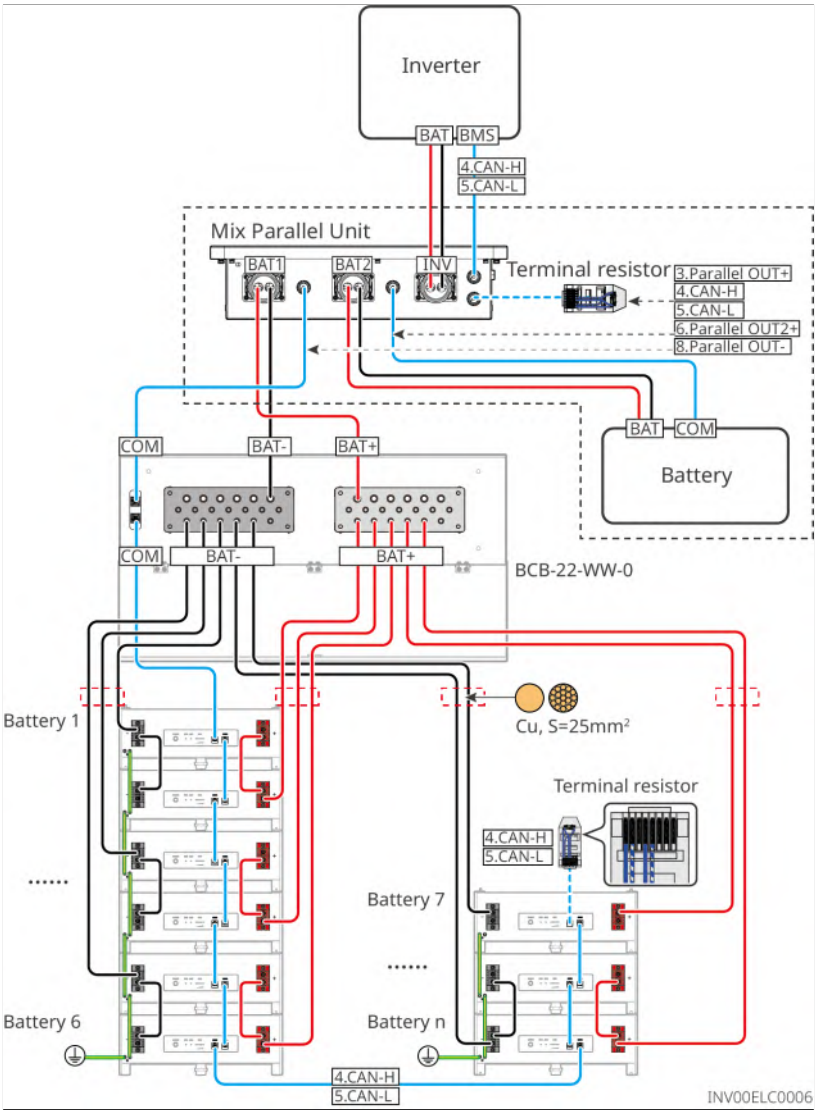


Figure35 LX A5.0-10: Battery Connection Method with Combiner Box BCB-22-WW-0

LX A5.0-10: Battery Connection Method with Combiner Box BCB-32-WW-0

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

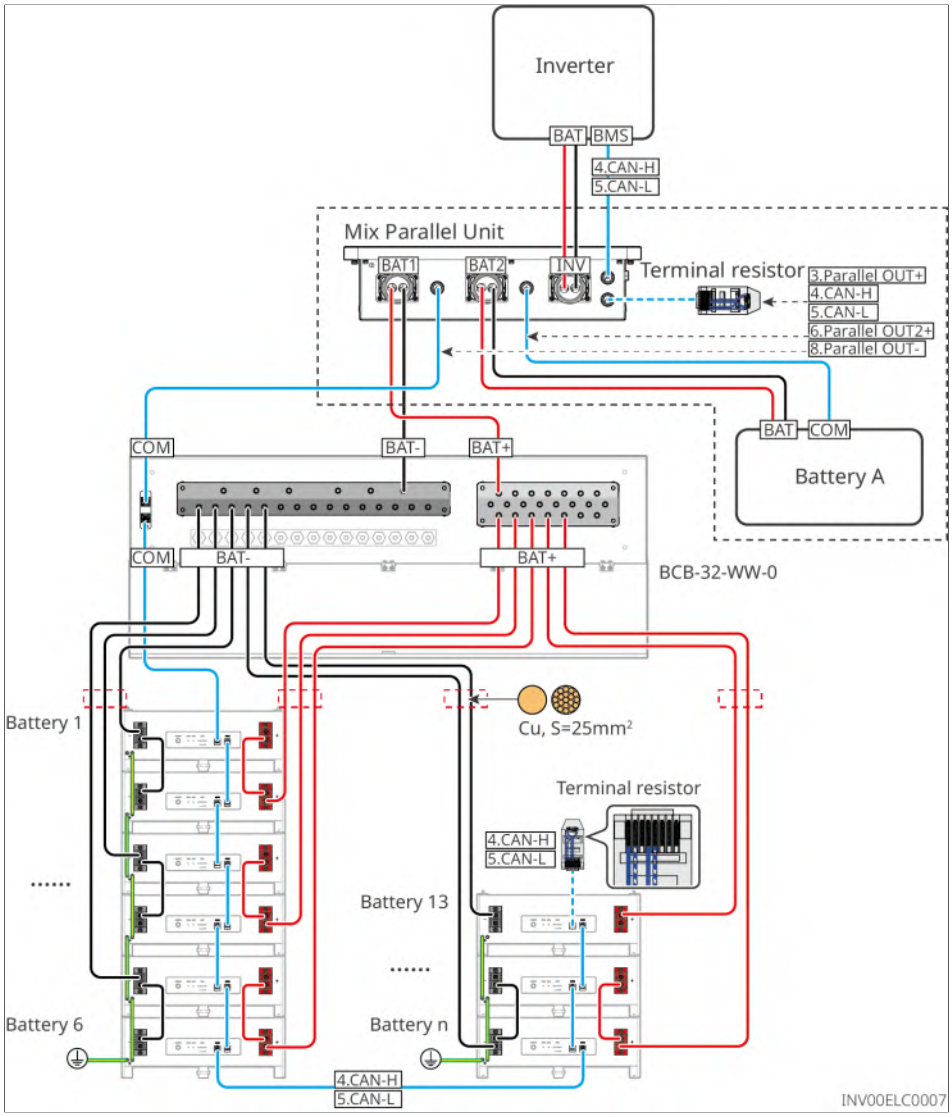


Figure36 LX A5.0-10: Battery Connection Method with Combiner Box BCB-32-WW-0

LX A5.0-30: Daisy Chain Connection Method

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

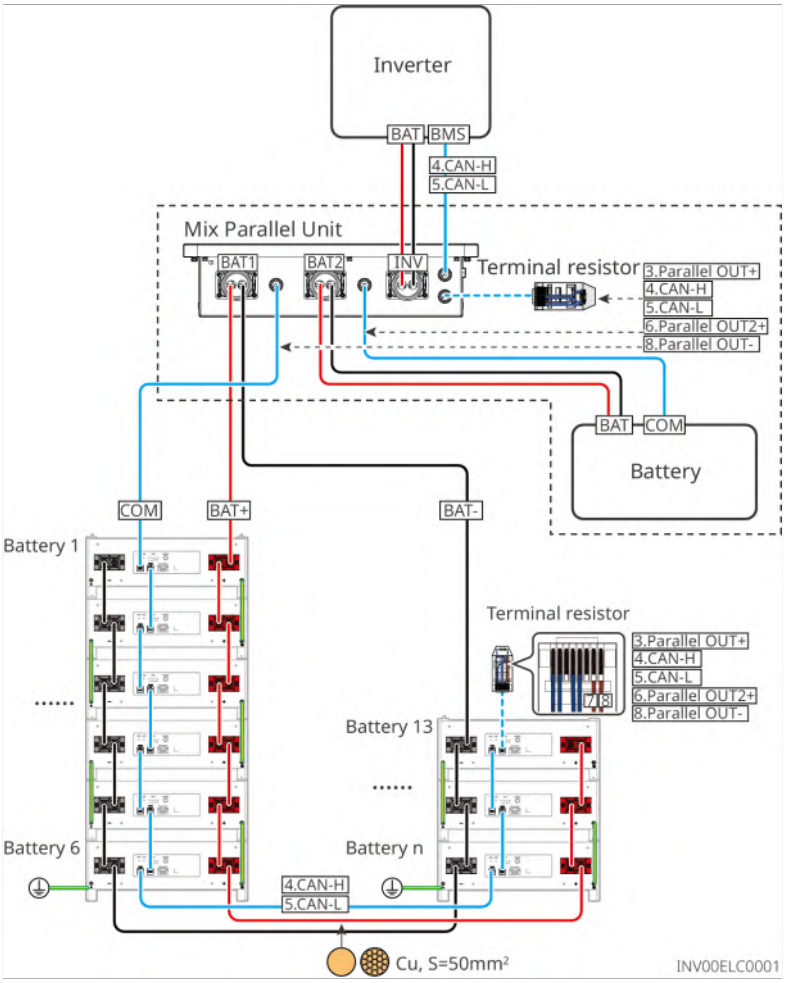


Figure37 LX A5.0-30: Daisy Chain Connection Method

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

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

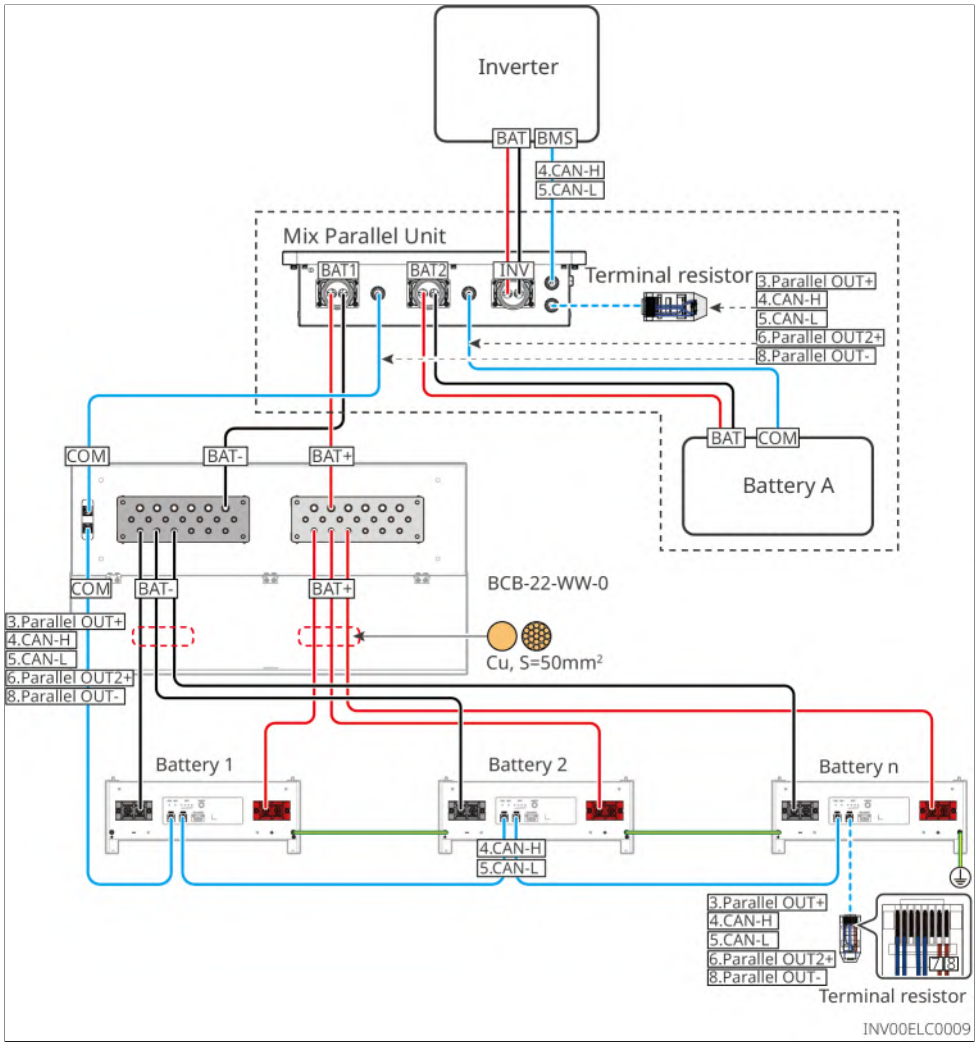


Figure38 LX A5.0-30: Connection Method with Combiner Box BCB-22-WW-0

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

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

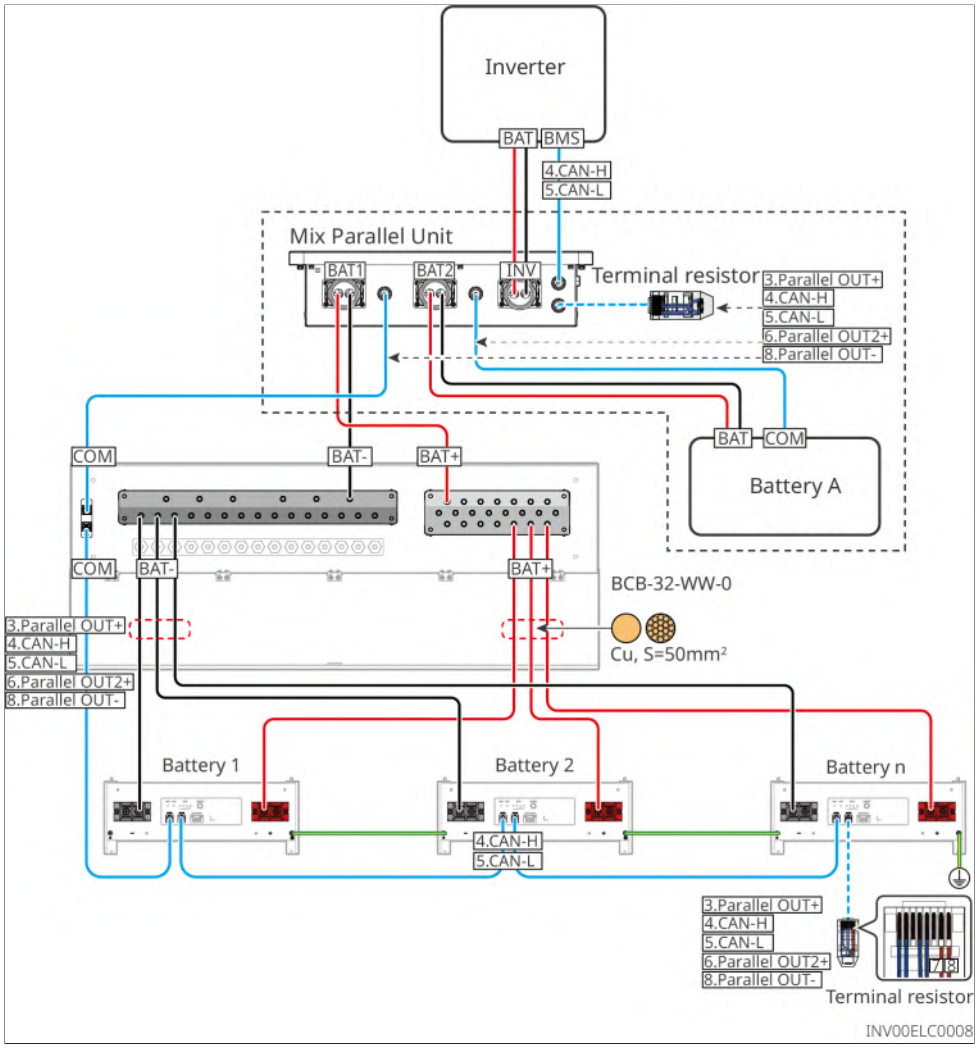


Figure39 LX A5.0-30: Connection method with combiner box BCB-32-WW-0

GW14.3-BAT-LV-G10: When batteries are directly connected to 2 single-output inverters, the wiring diagram is as follows:

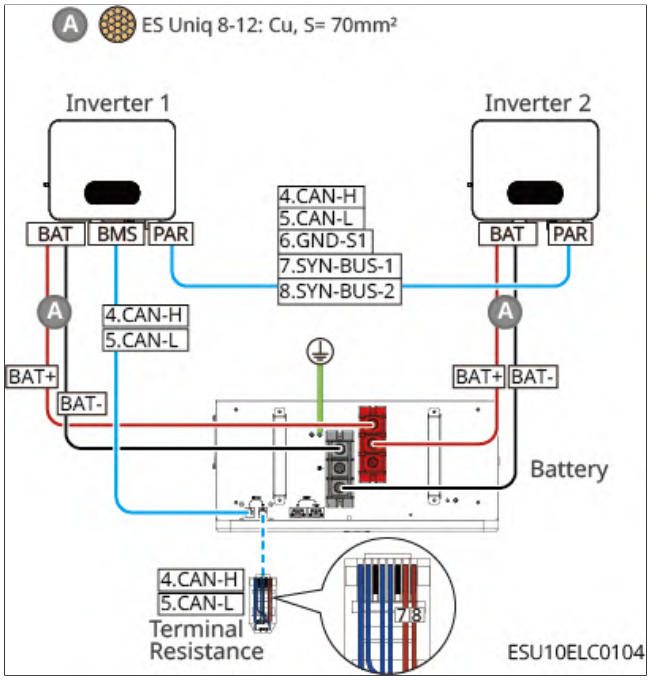


Figure40 GW14.3-BAT-LV-G10: Batteries directly connected to 2 single-output inverters

GW14.3-BAT-LV-G10: When batteries are daisy-chained to one single-output inverter, the wiring diagram is as follows:

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

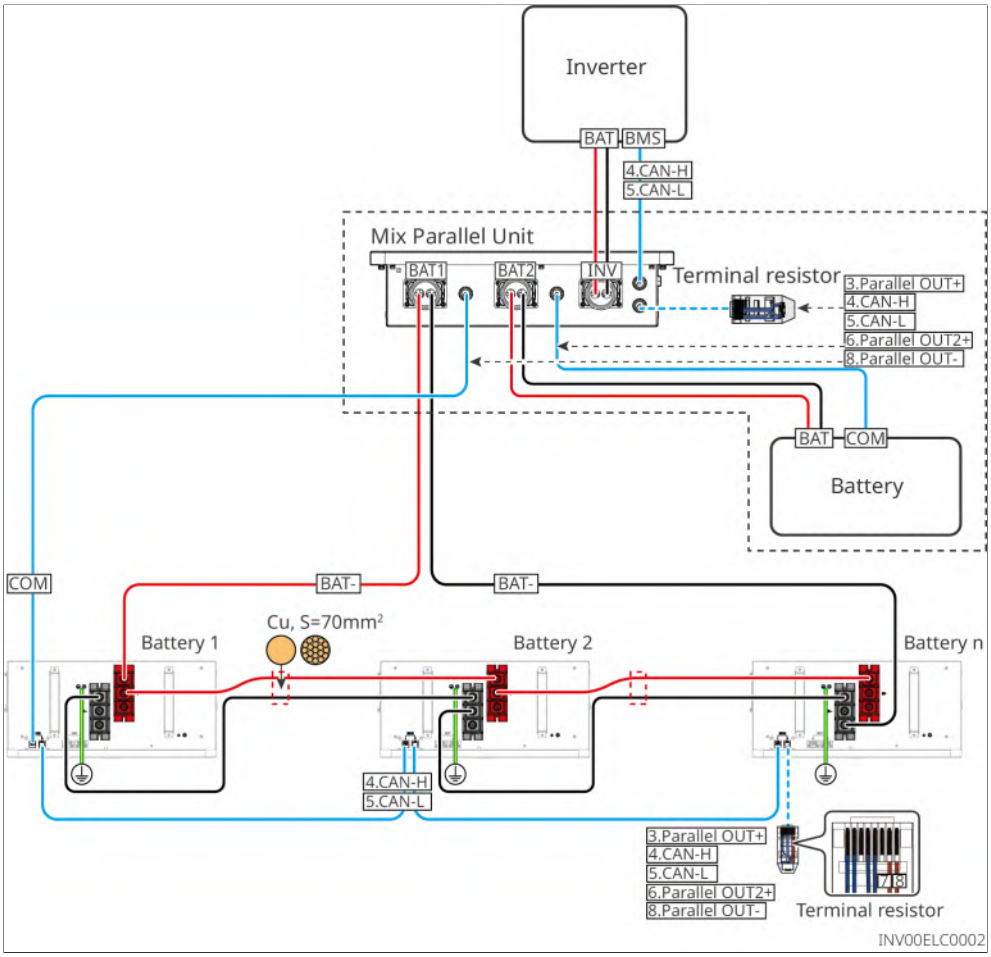


Figure41 GW14.3-BAT-LV-G10: Batteries daisy-chained to one single-output inverter

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

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

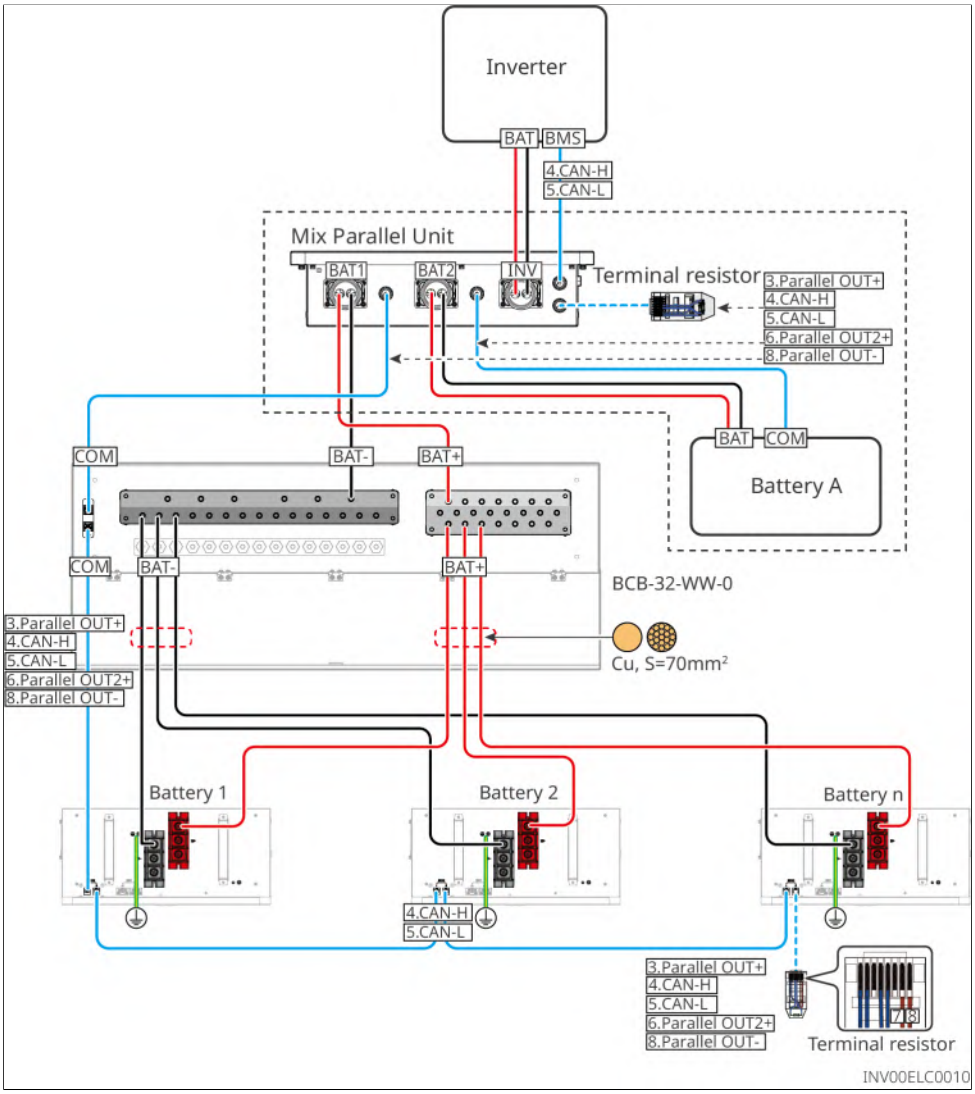


Figure42 GW14.3-BAT-LV-G10: Paired with combiner box (BCB-32-WW-0)

GW16.1-BAT-LV-G10: Batteries daisy-chained to inverter:

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

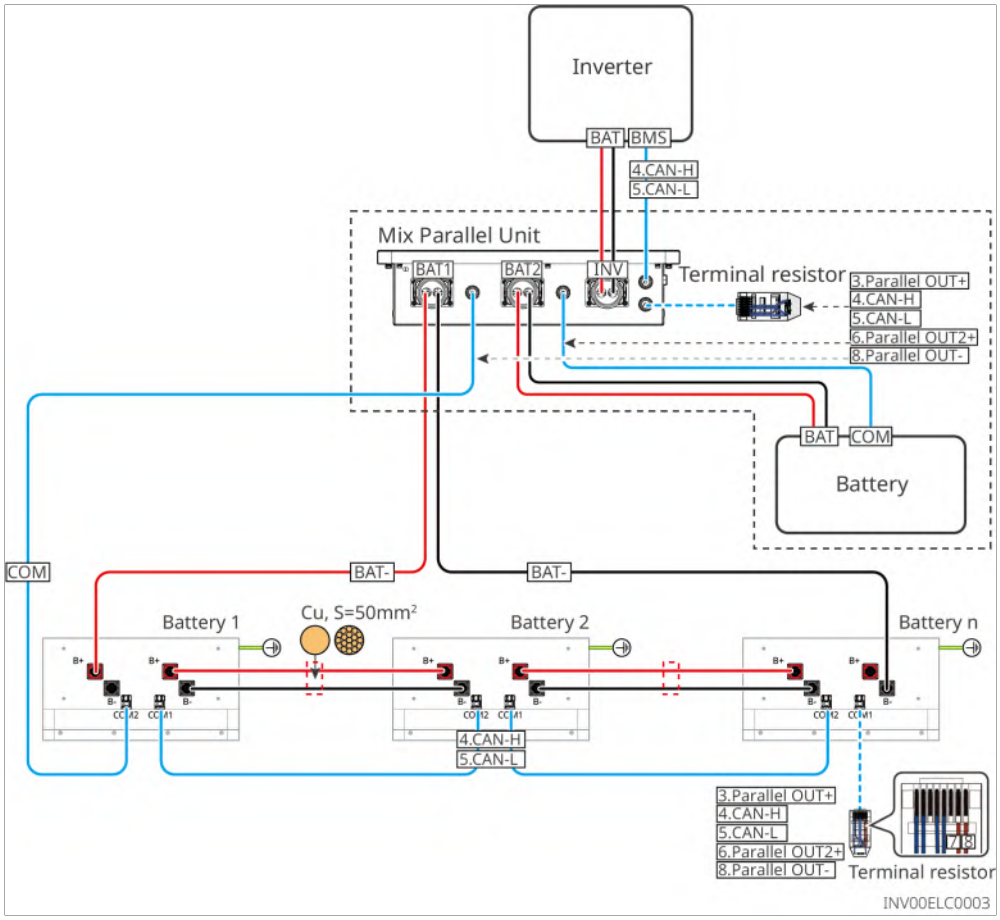


Figure43 GW16.1-BAT-LV-G10: Batteries daisy-chained to inverter

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

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

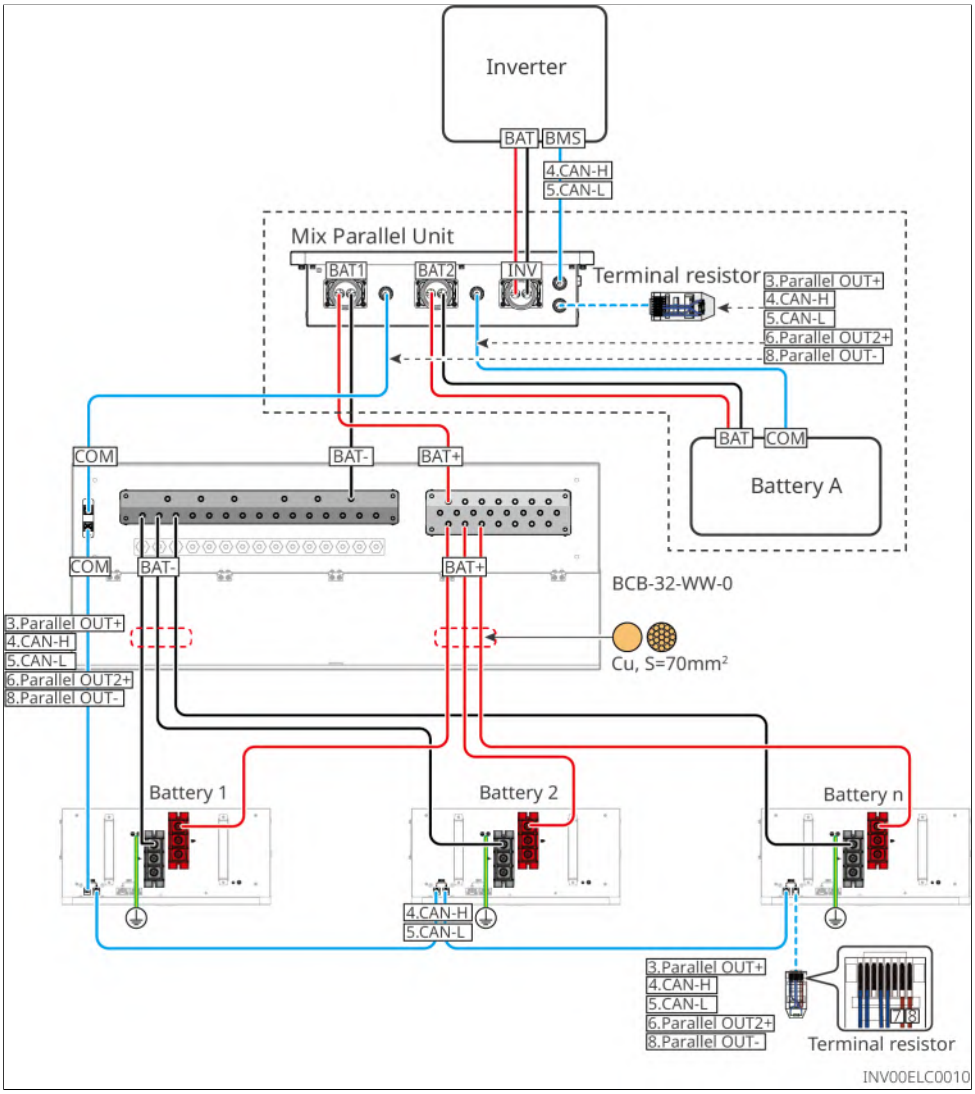


Figure44 GW16.1-BAT-LV-G10: Paired with combiner box (BCB-32-WW-0)

LX U5.4-L, LX U5.4-20: Daisy-chain connection method

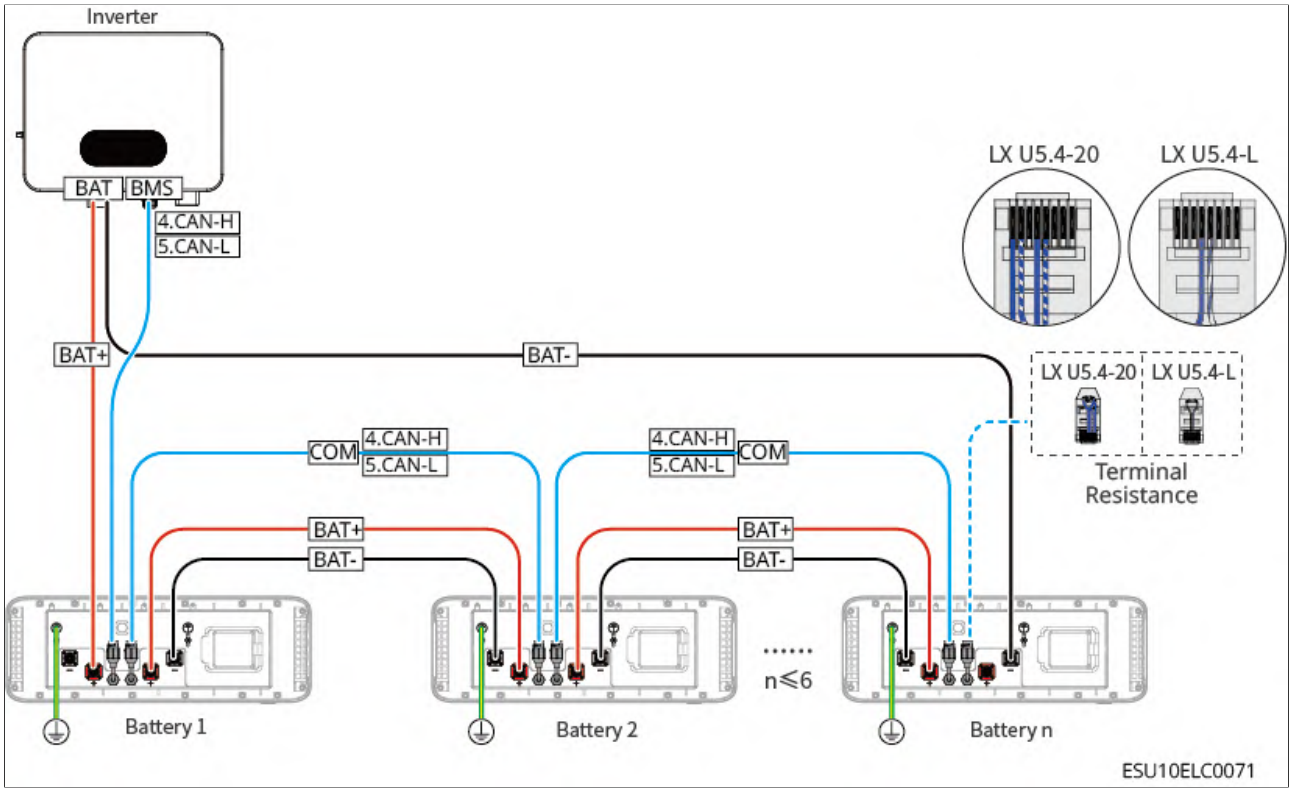


Figure45 LX U5.4-L, LX U5.4-20: Daisy-chain connection method

LX U5.0-30: Daisy-chain connection method

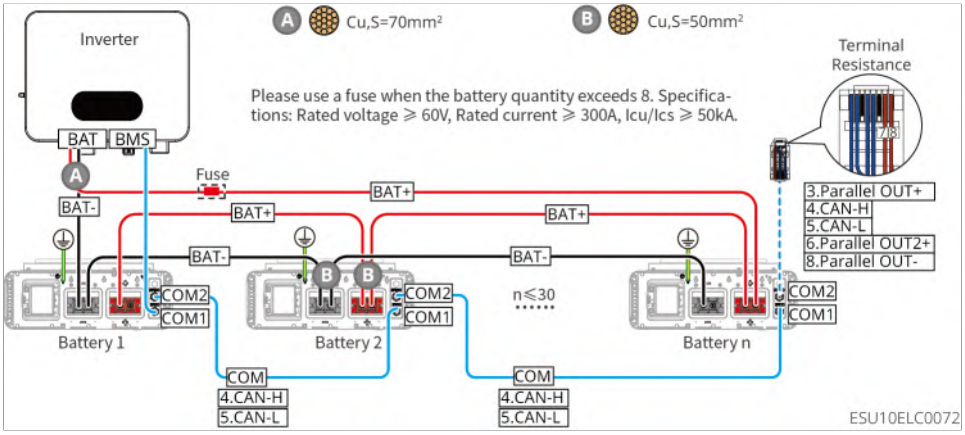


Figure46 LX U5.0-30: Daisy-chain connection method

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

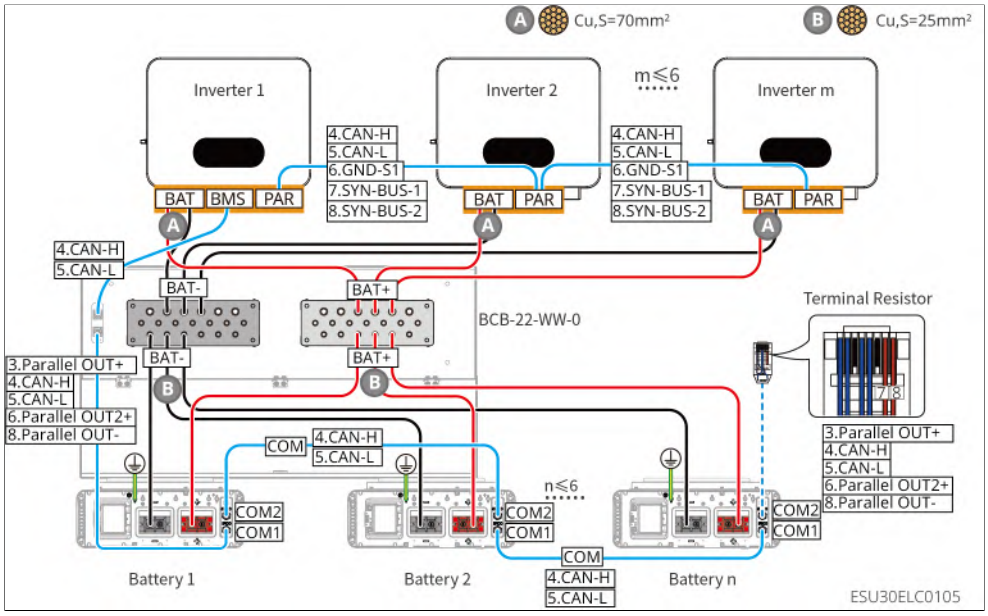


Figure47 LX U5.0-30: When Battery Qty ≤6, battery connection method with BCB-22-WW-0

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

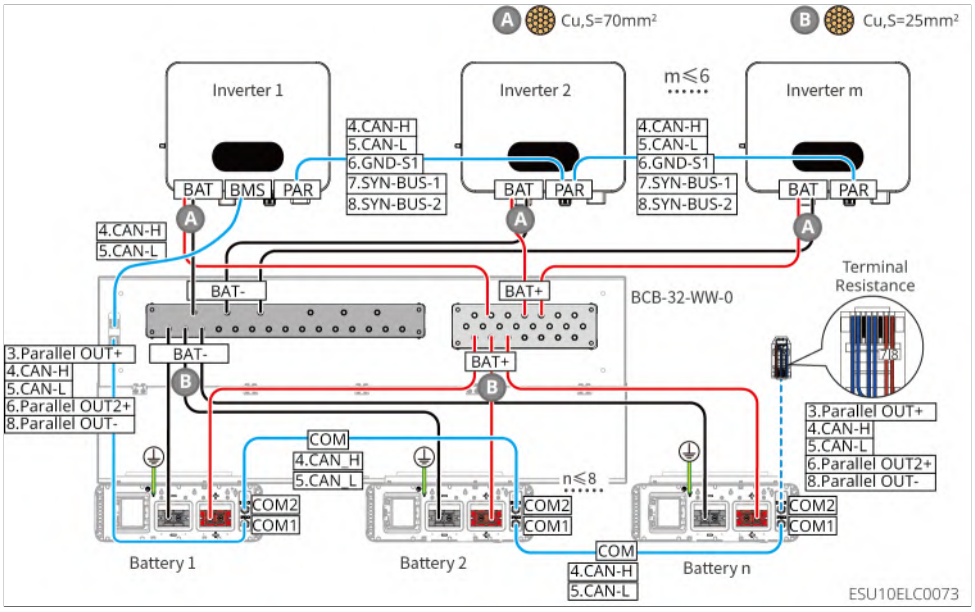


Figure48 LX U5.0-30: When Battery Qty ≤8, battery connection method with BCB-32-WW-0

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

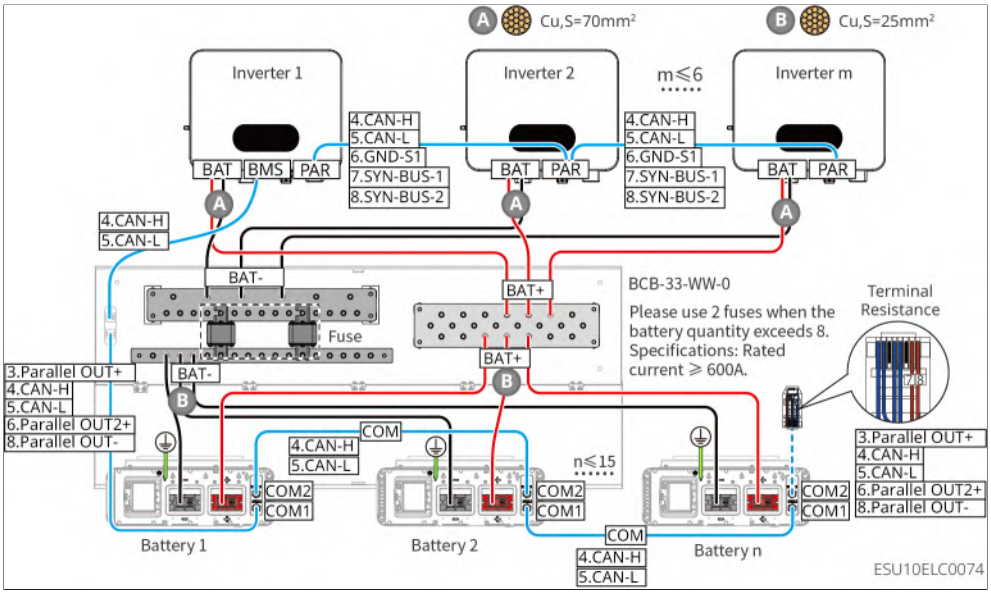


Figure49 LX U5.0-30: When Battery Qty ≤15, battery connection method with combiner box BCB-33-WW-0

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

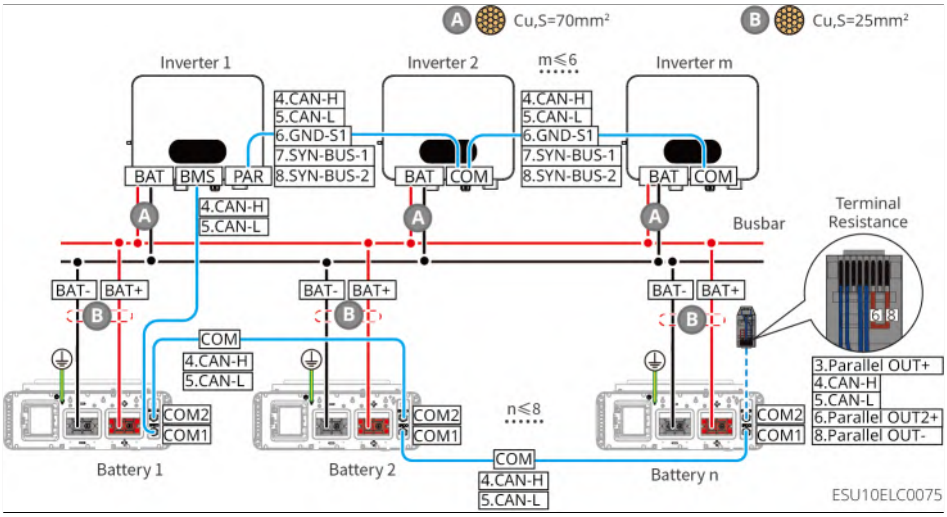


Figure50 LX U5.0-30: When Battery Qty ≤8, battery connection method with third-party busbar

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

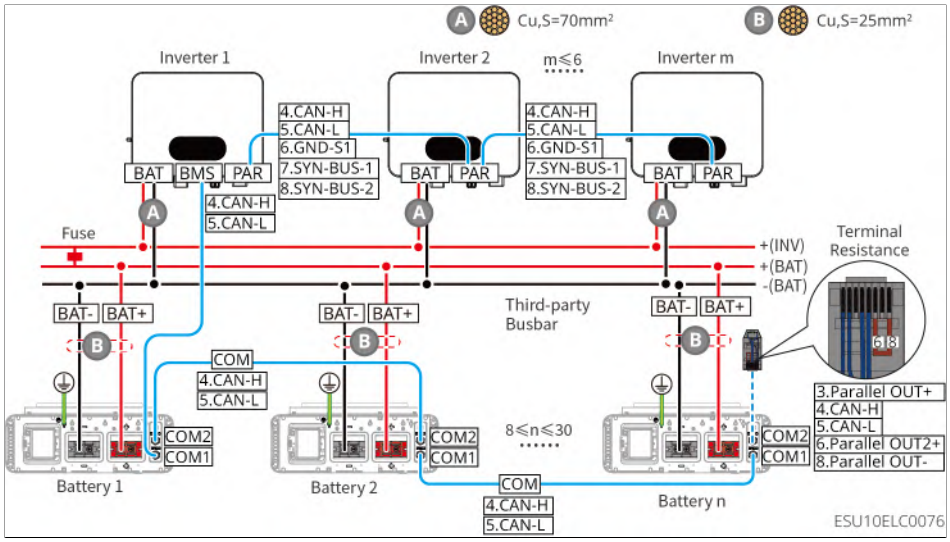


Figure51 LX U5.0-30: When Battery Qty is greater than 8, battery connection method with third-party busbar

GW5.0-BAT-LVI-G10

- Daisy-chain connection method: maximum connection of 1 inverter and 3 batteries

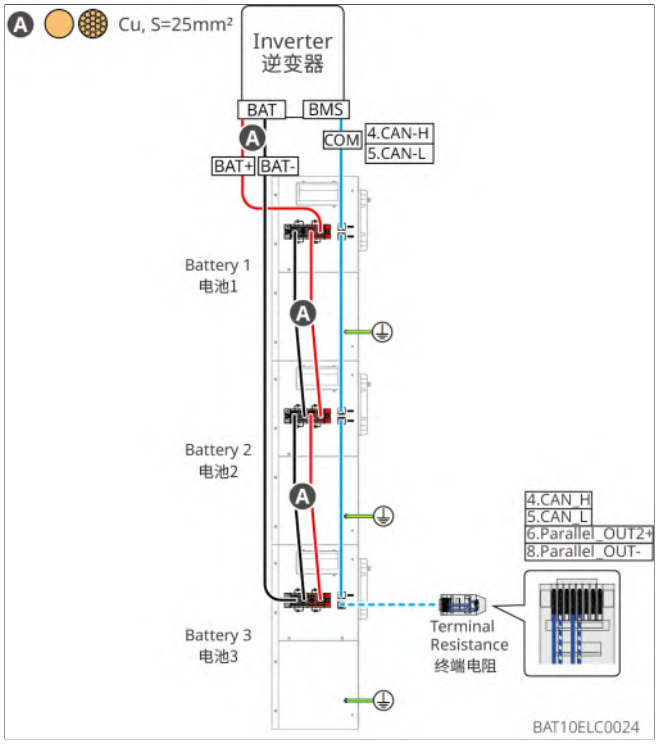


Figure52 GW5.0-BAT-LVI-G10: Daisy-chain connection method

- Third-party busbar wiring method: maximum connection of 10 inverters and 8 batteries

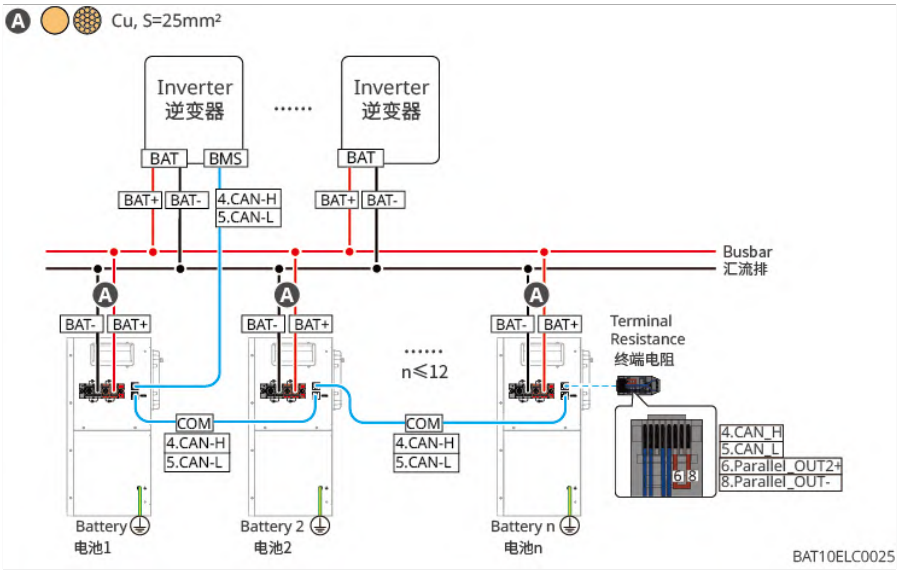


Figure53 GW5.0-BAT-LVI-G10: Third-party busbar wiring method

GW10.0-BAT-LV-G10

- Daisy-chain connection method: maximum connection of 1 inverter and 3 batteries

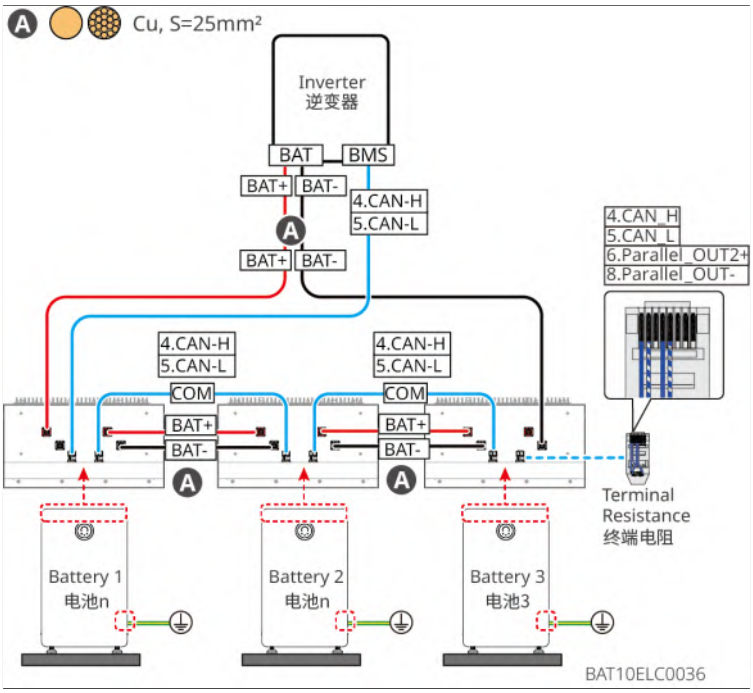


Figure54 GW10.0-BAT-LV-G10: Daisy-chain connection method

- Third-party busbar wiring method: maximum connection of 10 inverters and 8 batteries

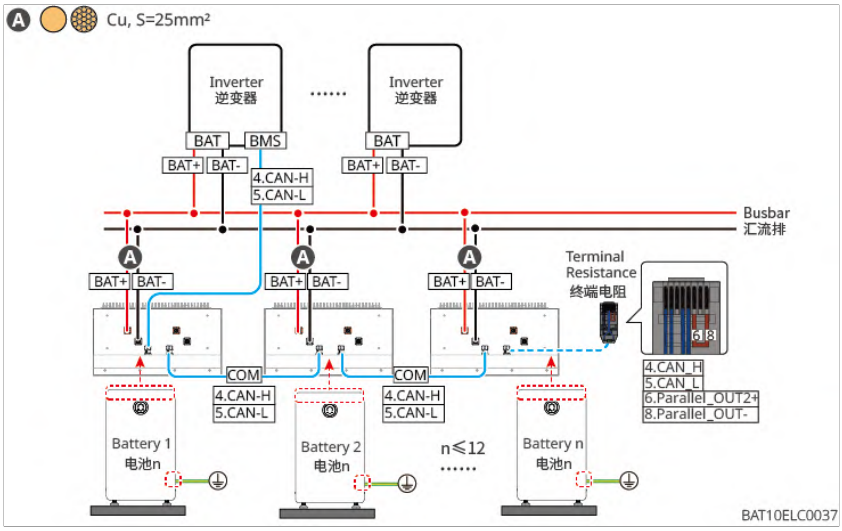


Figure55 GW10.0-BAT-LV-G10: Third-party busbar wiring method

When inverters are connected in parallel, battery connection method using the GW combiner box:

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10
- Battery B: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10, LX U5.0-30

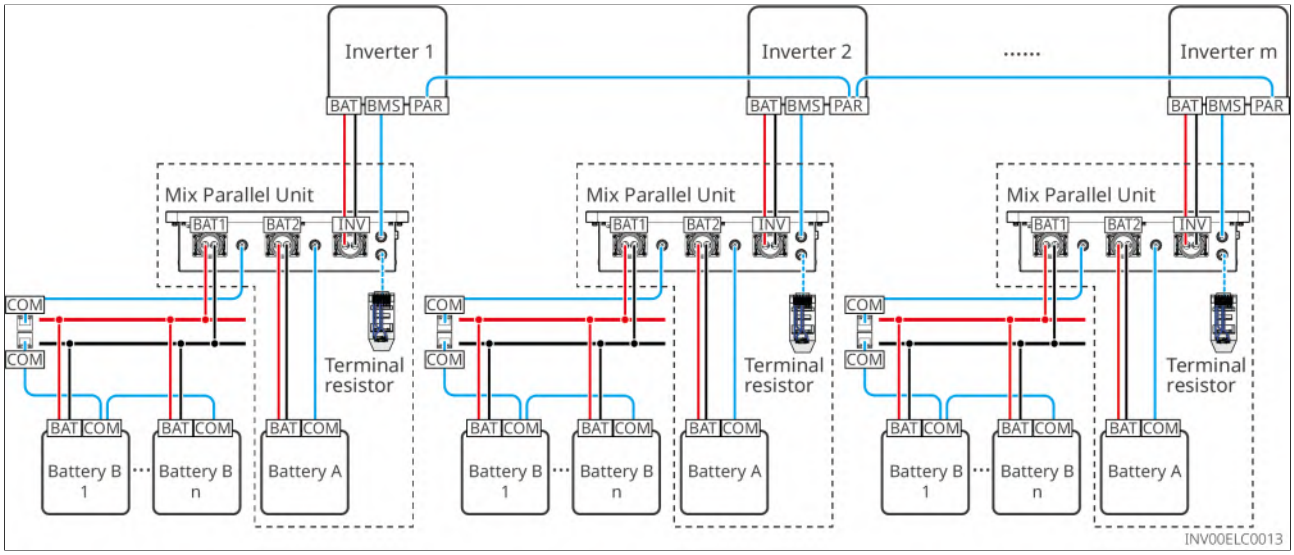


Figure56 When inverters are connected in parallel, with the GW combiner box

When inverters are connected in parallel, the batteries are used with a third-party busbar. The wiring diagram is as follows:

- Battery A: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10
- Battery B: LX A5.0-10, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10

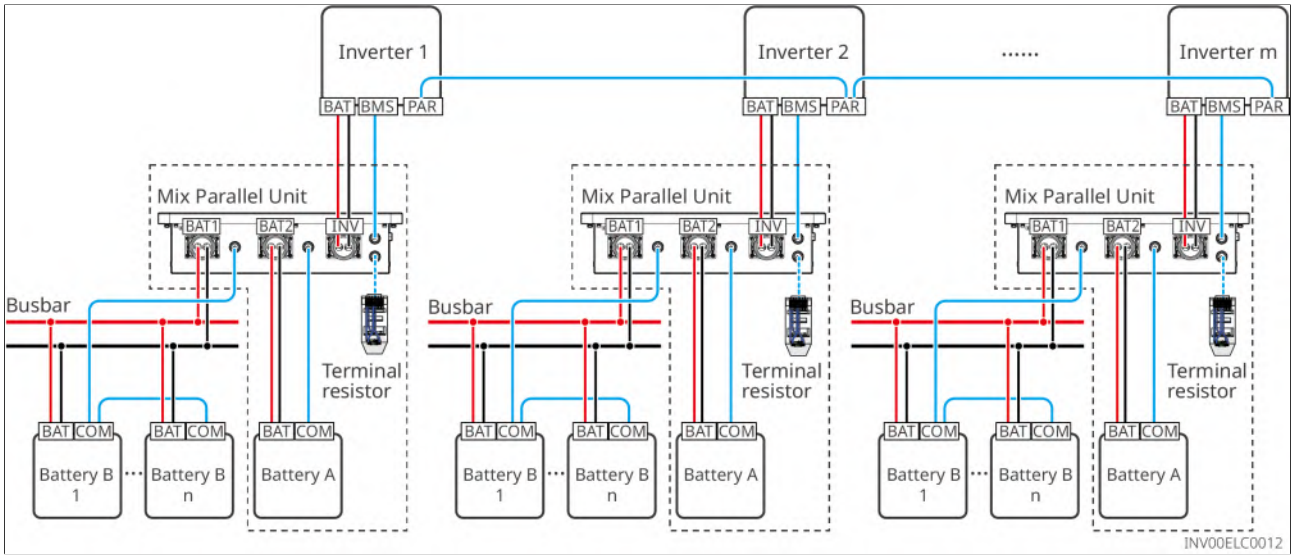


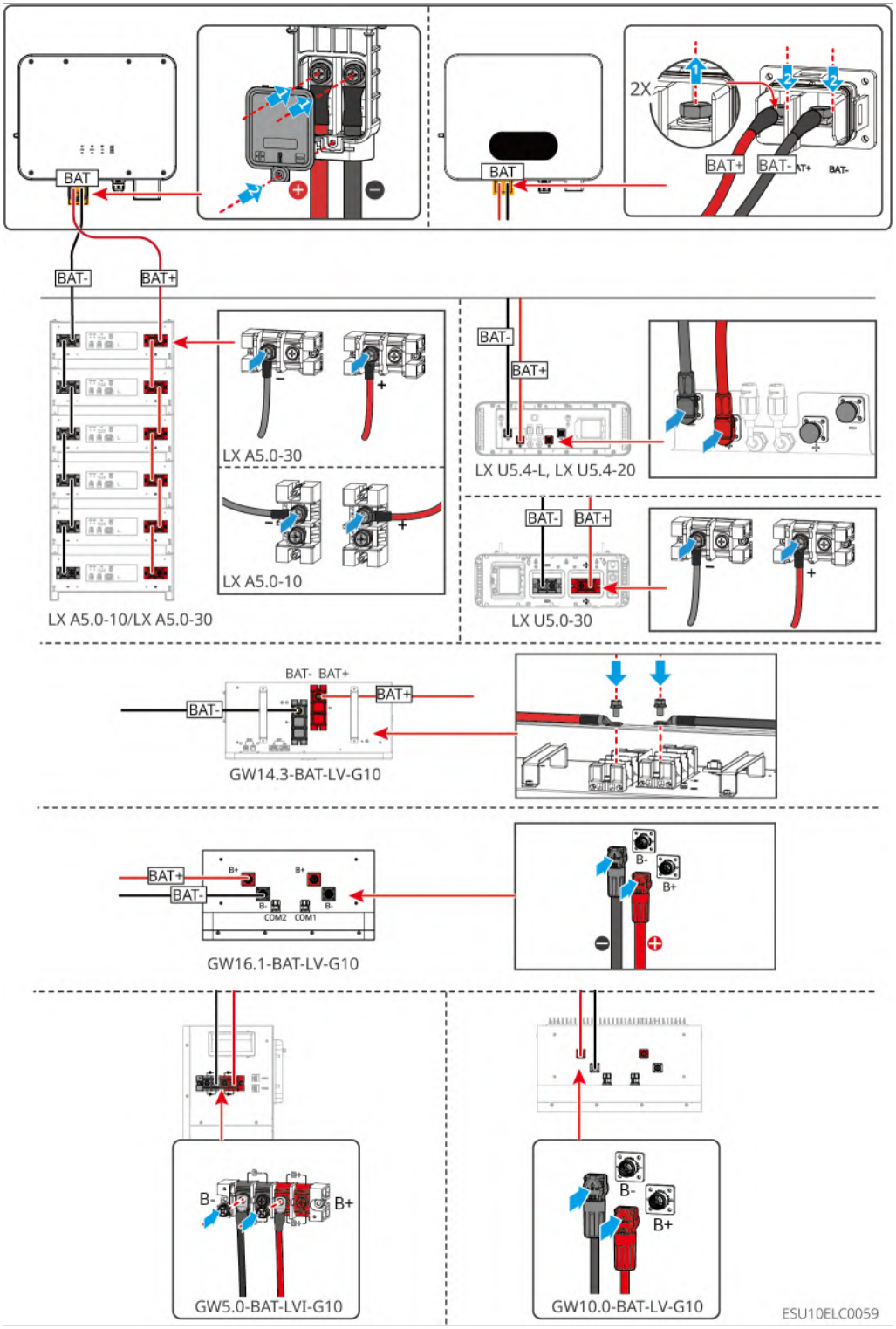
Figure57 When inverters are connected in parallel, the batteries are used with a third-party busbar

5.6.1 Connect the Inverter and Battery Power Cables

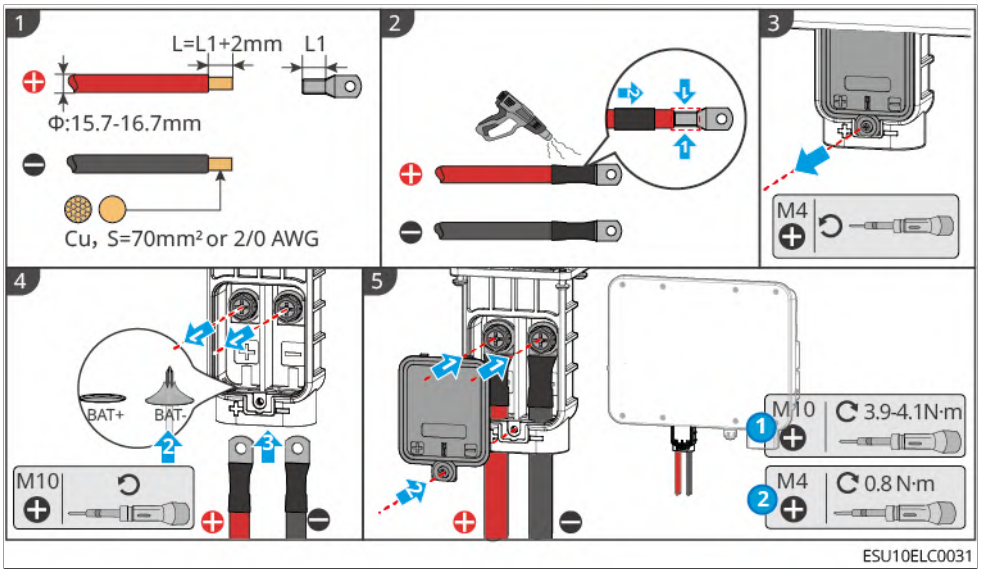
⚠WARNING

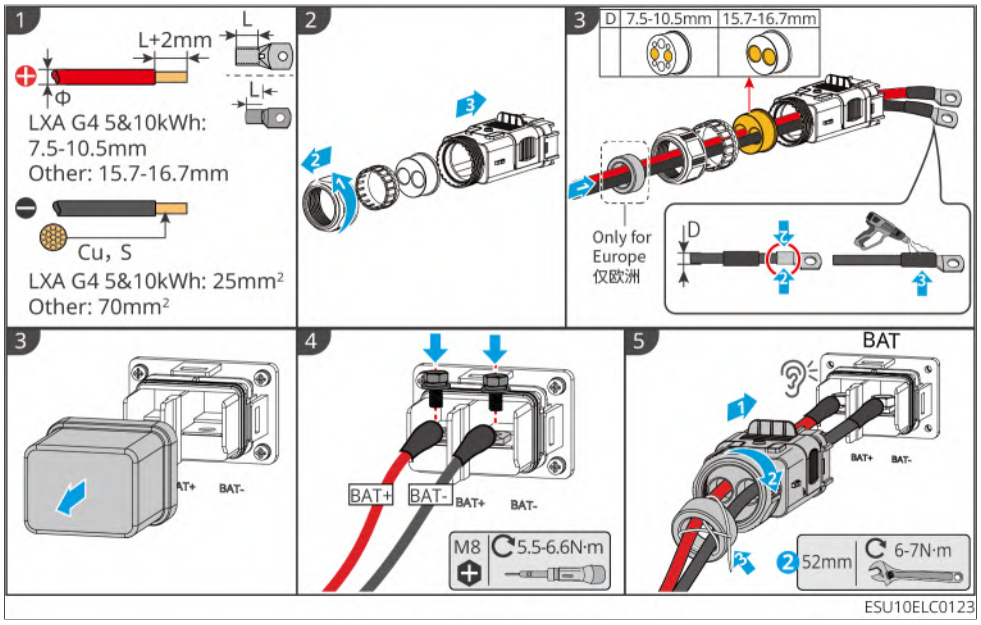
- Use a multimeter to measure the positive and negative poles of the DC cables to ensure that the polarity is correct and no reverse connection occurs; and that the voltage is within the allowed range.
- During wiring, the battery cables must exactly match the BAT+, BAT-, and grounding ports of the battery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

Overview of inverter and battery power cables



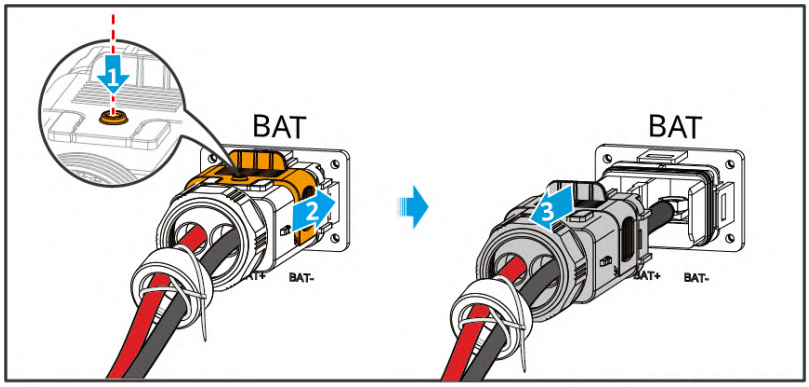
Inverter-side cable preparation





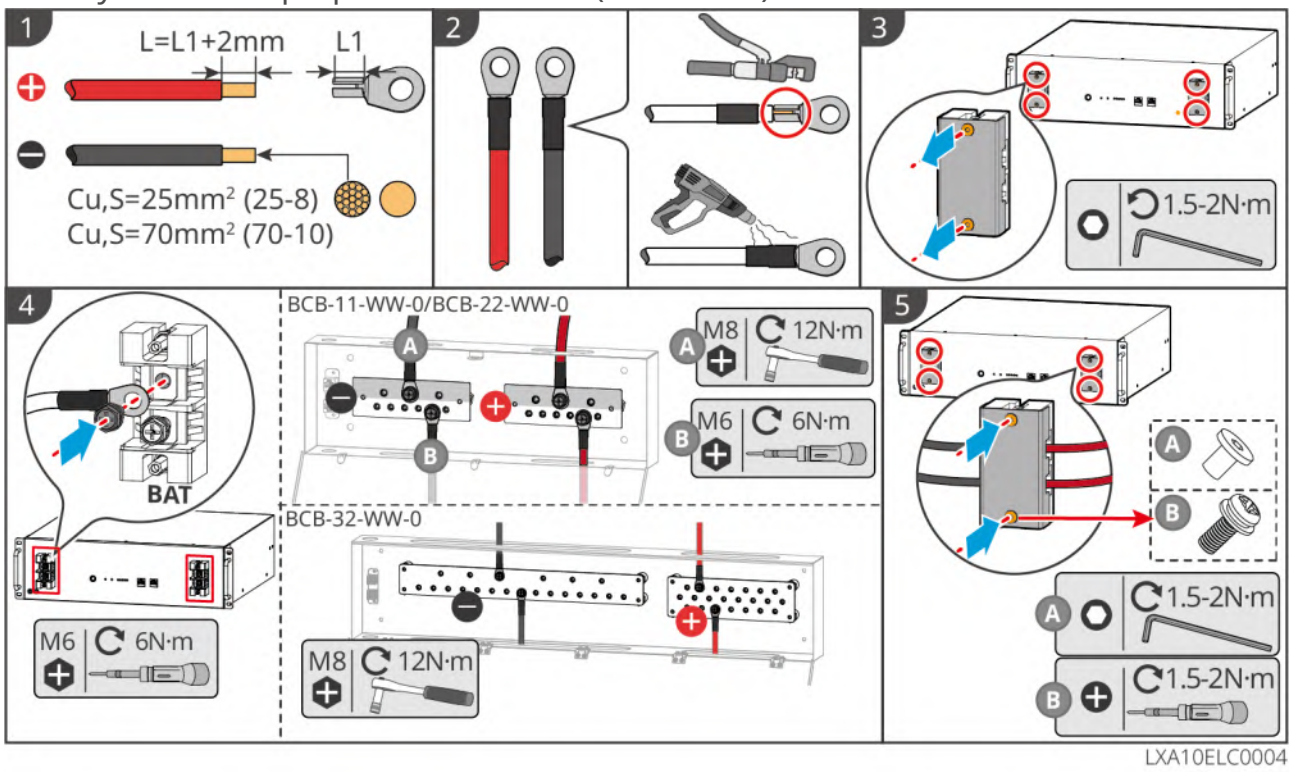
- For some models, the battery terminal screws are shipped fastened to the battery terminals. Determine whether the screws need to be unscrewed according to actual conditions.

Inverter battery cover removal method (optional)



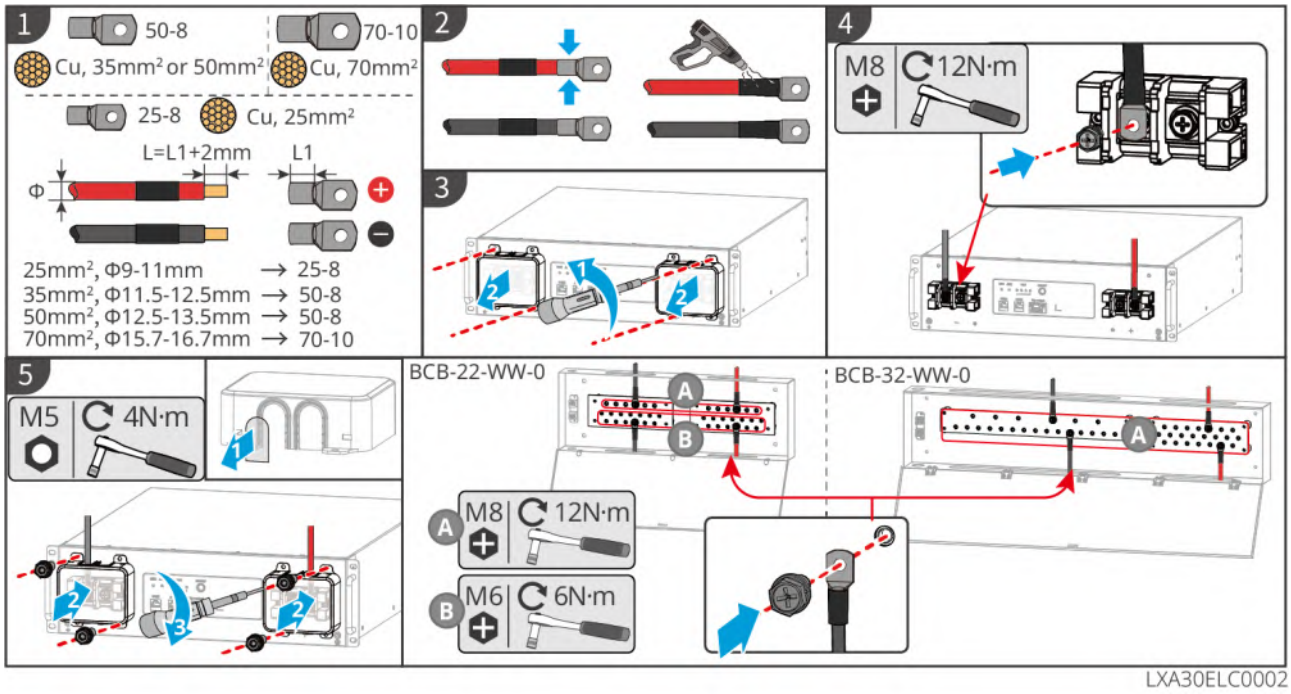
ESU10ELC0098

Battery-side cable preparation method (LX A5.0-10)

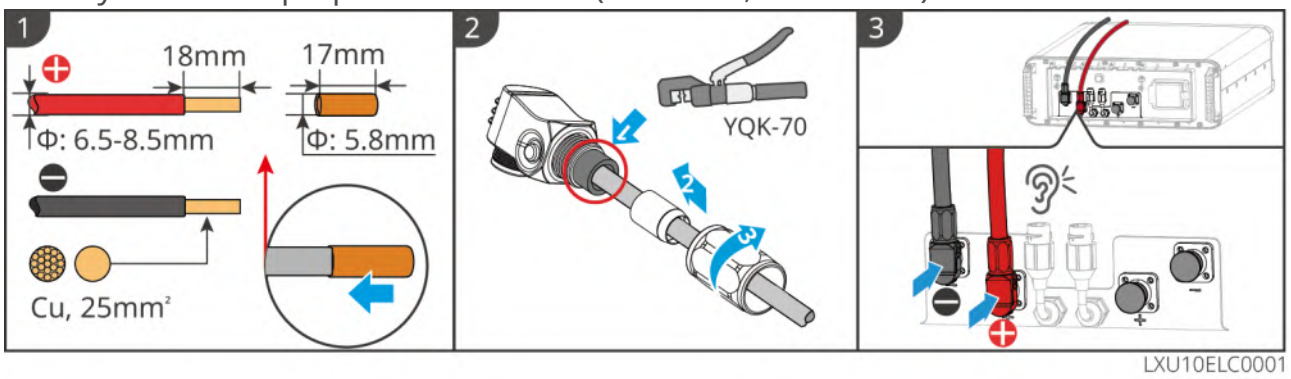


LXA10ELC0004

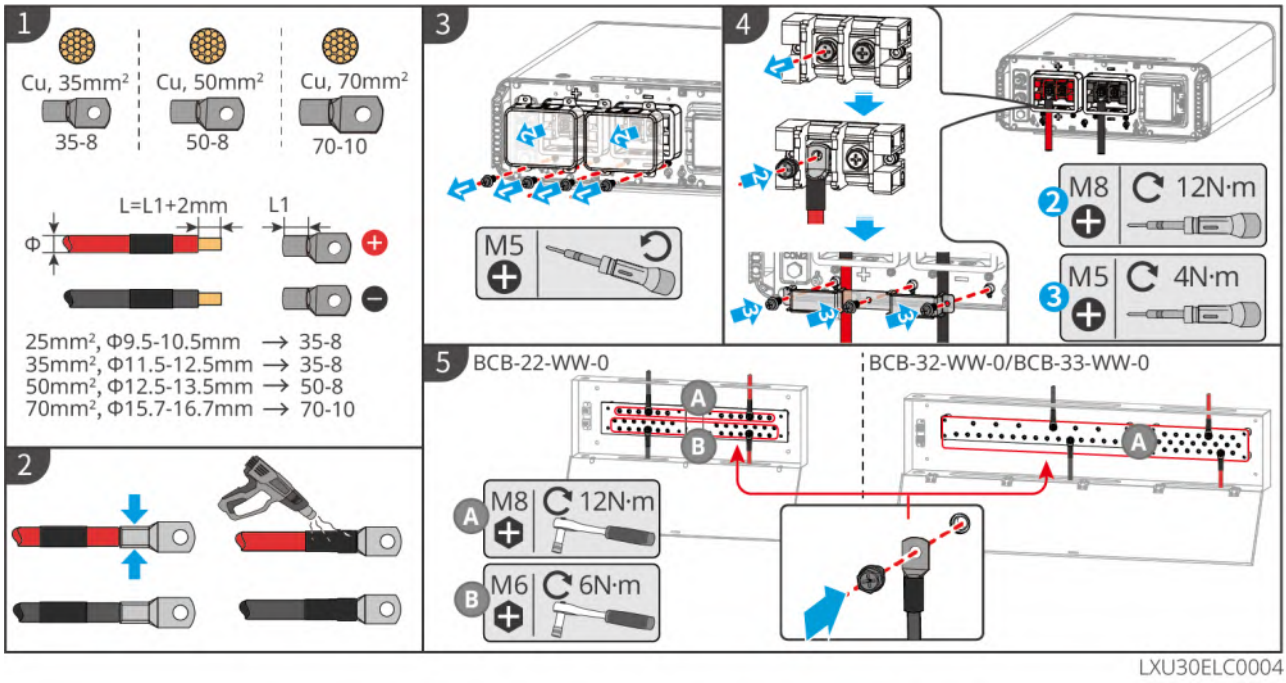
Battery-side cable preparation method (LX A5.0-30)



Battery-side cable preparation method (LX U5.4-L, LX U5.4-20)



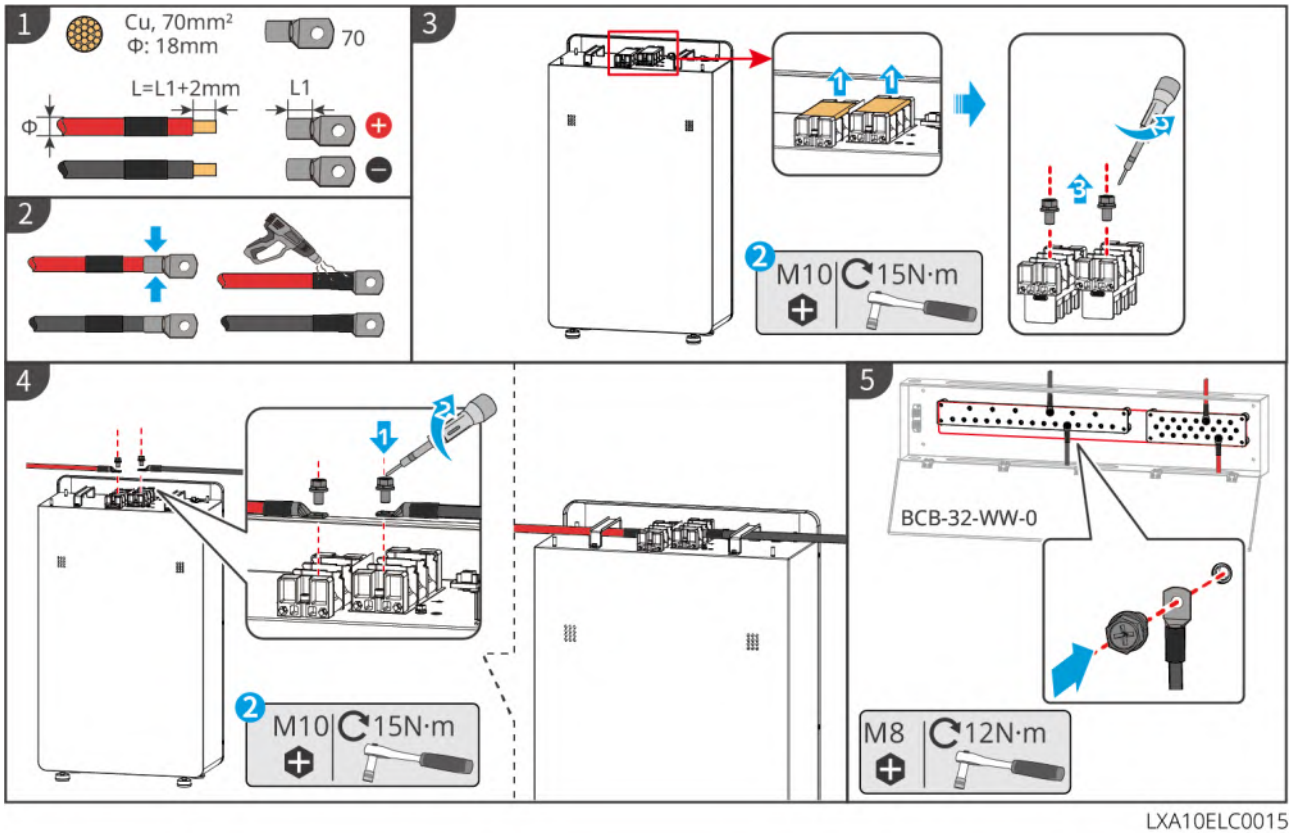
Battery-side cable preparation method (LX U 5.0-30)



LXU30ELC0004

Battery-side cable preparation method (GW14.3-BAT-LV-G10)

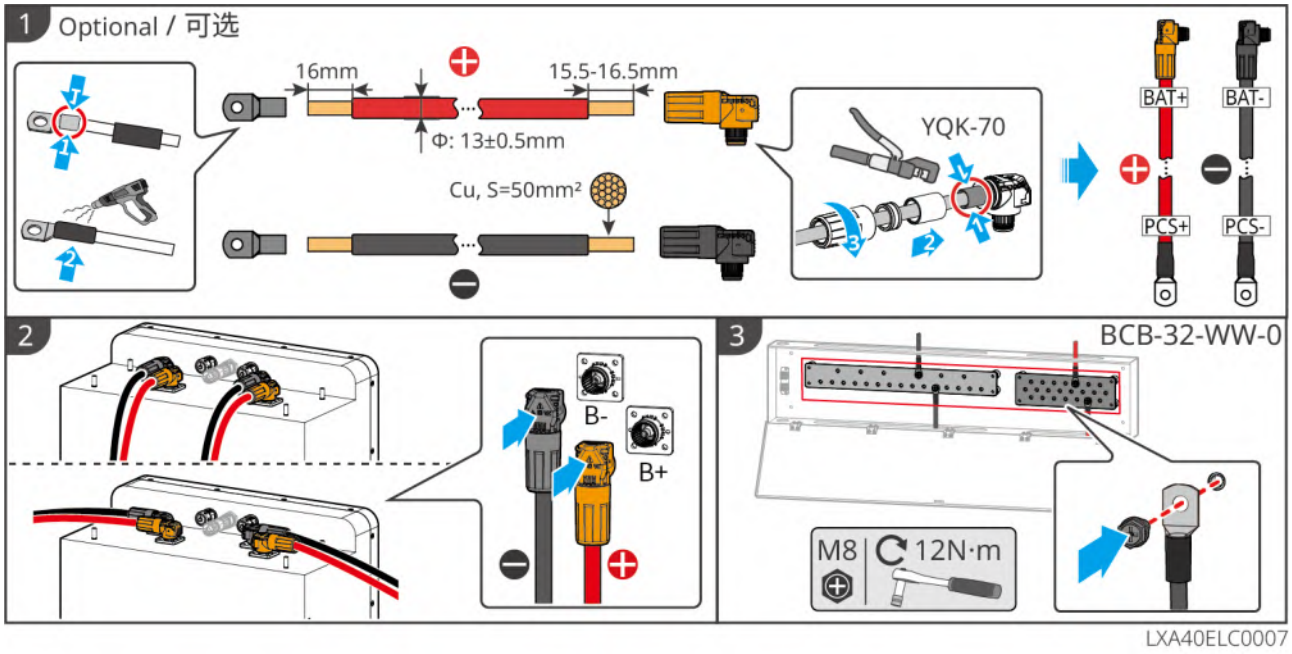
- GW14.3-BAT-LV-G10: If power cables are shipped with the battery accessories, use the shipped cables; crimping is not required.



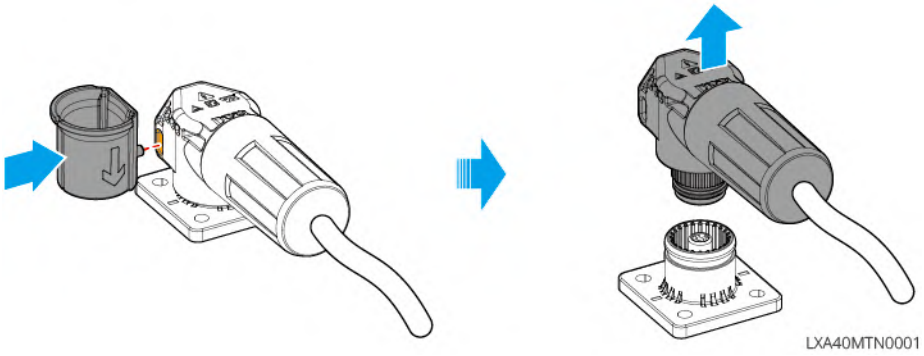
LXA10ELC0015

Battery-side cable preparation method (GW16.1-BAT-LV-G10)

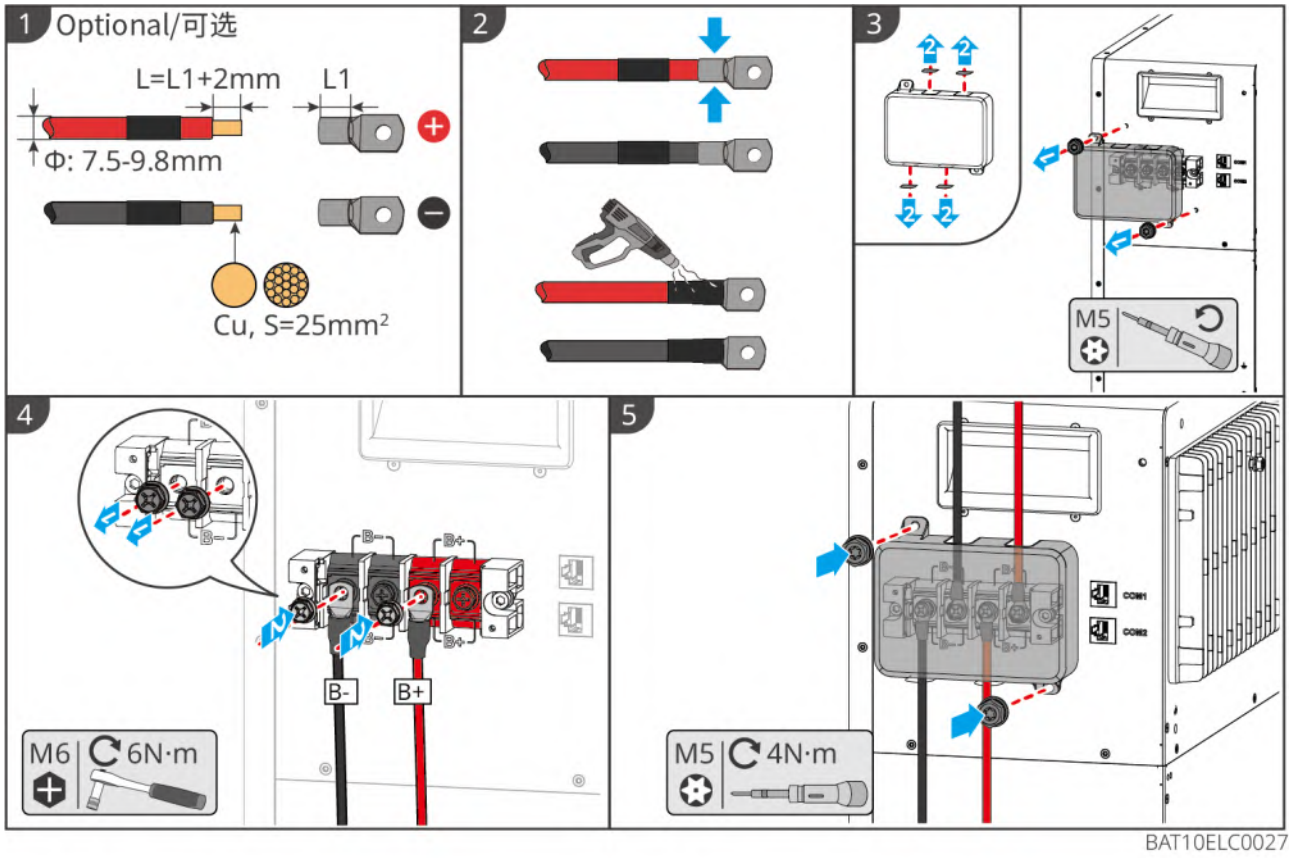
- The battery is shipped with 1 m positive and negative power cables between the inverter and battery. If the cable length is insufficient during actual wiring, prepare your own cables and crimp them according to the following steps. After the cables are made, connect the battery quick-connect terminal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



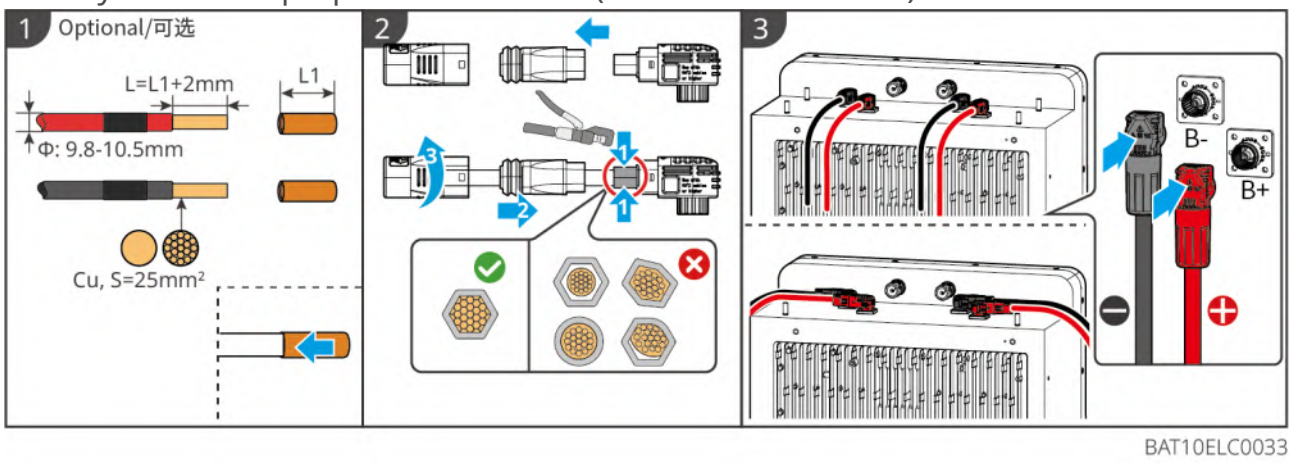
Unlocking method for the battery DC quick-connect terminal (optional)



Battery-side cable preparation method (GW5.0-BAT-LVI-G10)



Battery-side cable preparation method (GW10.0-BAT-LV-G10)



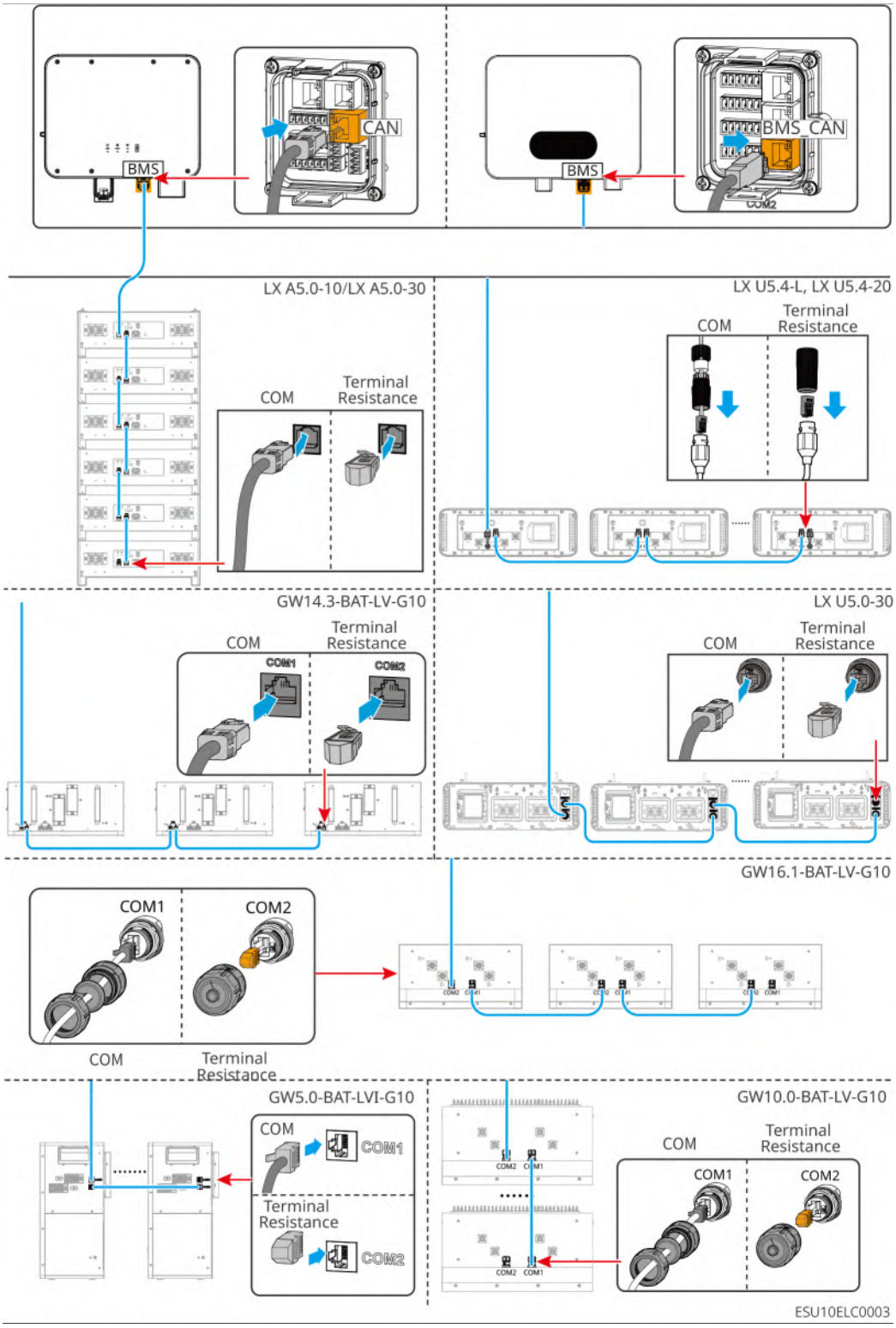
5.6.2 Connect the Inverter and Battery Communication Cable

NOTE

The inverter is shipped with a BMS battery communication cable. It is recommended to use the BMS battery communication cable shipped with the inverter. If the supplied communication cable cannot meet the requirements, prepare your own shielded network cable and shielded RJ45 connectors. When crimping, only crimp PIN4 and PIN5 of the RJ45 connector; otherwise, communication failure may occur.

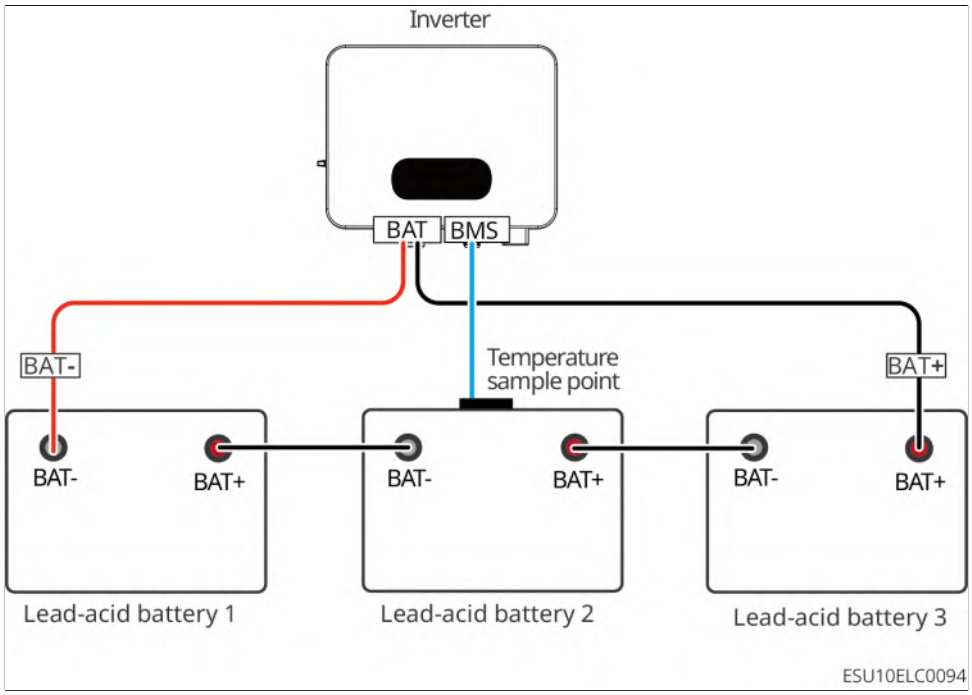
Instructions for BMS communication connection between the inverter and battery:

Inverter port	Connect to battery port	Port definitions	Description
BMS(CAN)	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


BMS
CAN
BMS
BMS
CAN
COM2
LX A5.0-10/LX A5.0-30
COM
Terminal Resistance
LX U5.4-L, LX U5.4-20
COM
Terminal Resistance
GW14.3-BAT-LV-G10
COM
Terminal Resistance
COM1
COM2
LX U5.0-30
COM
Terminal Resistance
GW16.1-BAT-LV-G10
COM1
COM2
COM
Terminal Resistance
GW5.0-BAT-LVI-G10
COM
COM1
Terminal Resistance
COM2
GW10.0-BAT-LV-G10
COM
Terminal Resistance
COM1
COM2
ESU10ELC0003

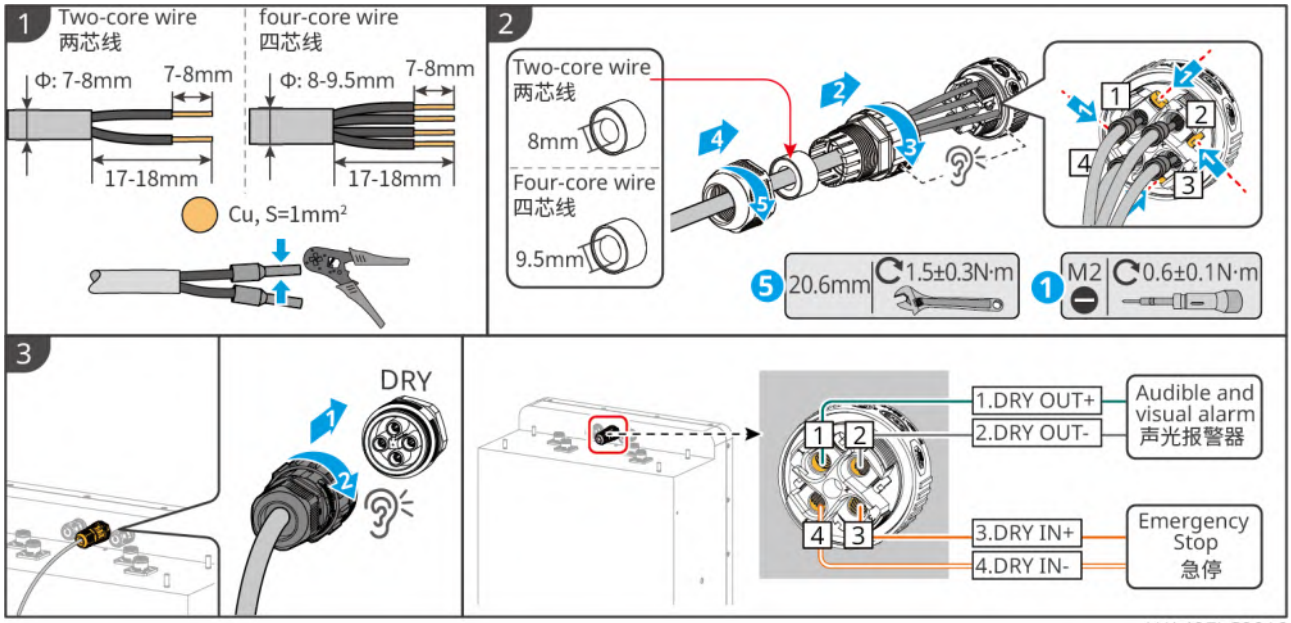
NOTE

- 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 lead-acid battery in the middle.
- To provide better 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.



5.6.3 Connect Battery Communication Cable

GW16.1-BAT-LV-G10：

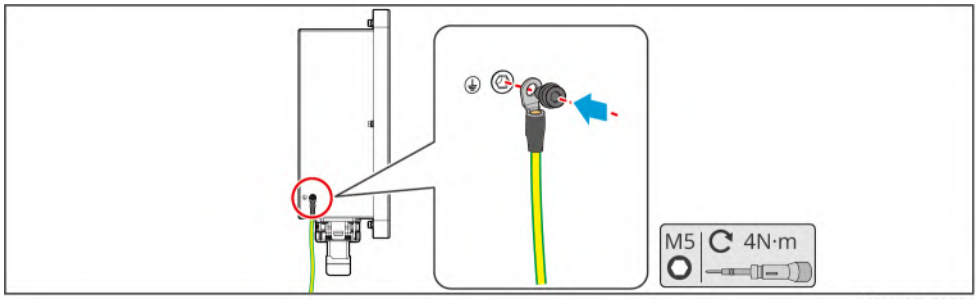


Communication Function Description

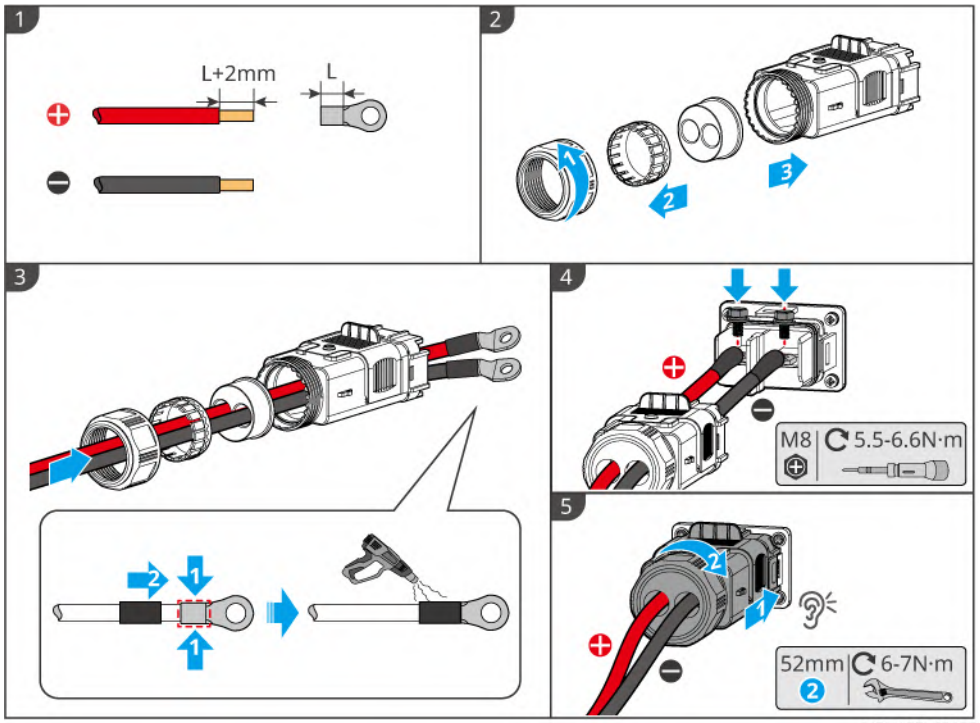
Port	Function	Description
1-2	Fire-fighting Action Signal Communication Port	Dry Contact Output Signal Port, Normally NO (Normally Open State) The DO contact rating is 5 V @ 10 mA. Connect the audible and visual alarm cable to trigger an external audible and visual alarm device.
3-4	EPO Signal Communication Port	Dry contact input signal interface, normally NO (normally open). The DI contact rating is 5V@10mA. Connect an external EPO switch to de-energize the battery system in the event of a fire.

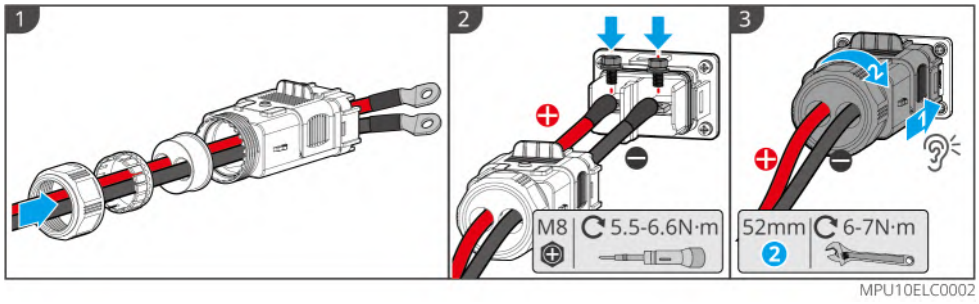
5.7 Connect the Mix Parallel Unit Cables

5.7.1 Connect the Mix Parallel Unit Grounding Cable

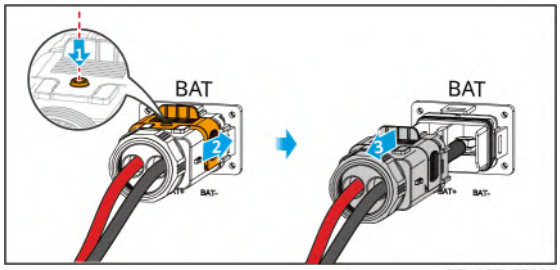


5.7.2 Connect the Mix Parallel Unit Power Cable



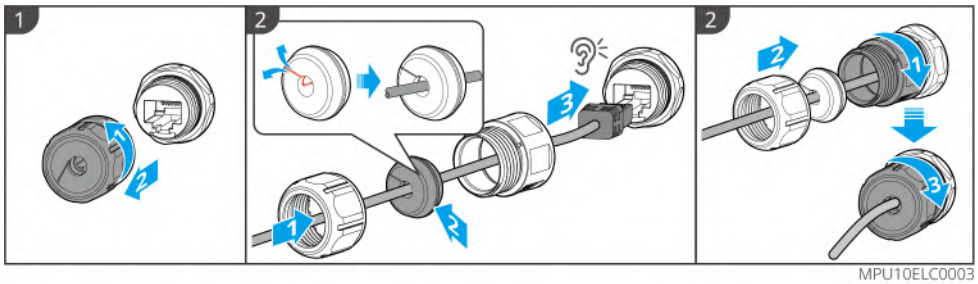


Removal method for the Mix Parallel Unit power terminal cover (optional)



ESU10ELC0095

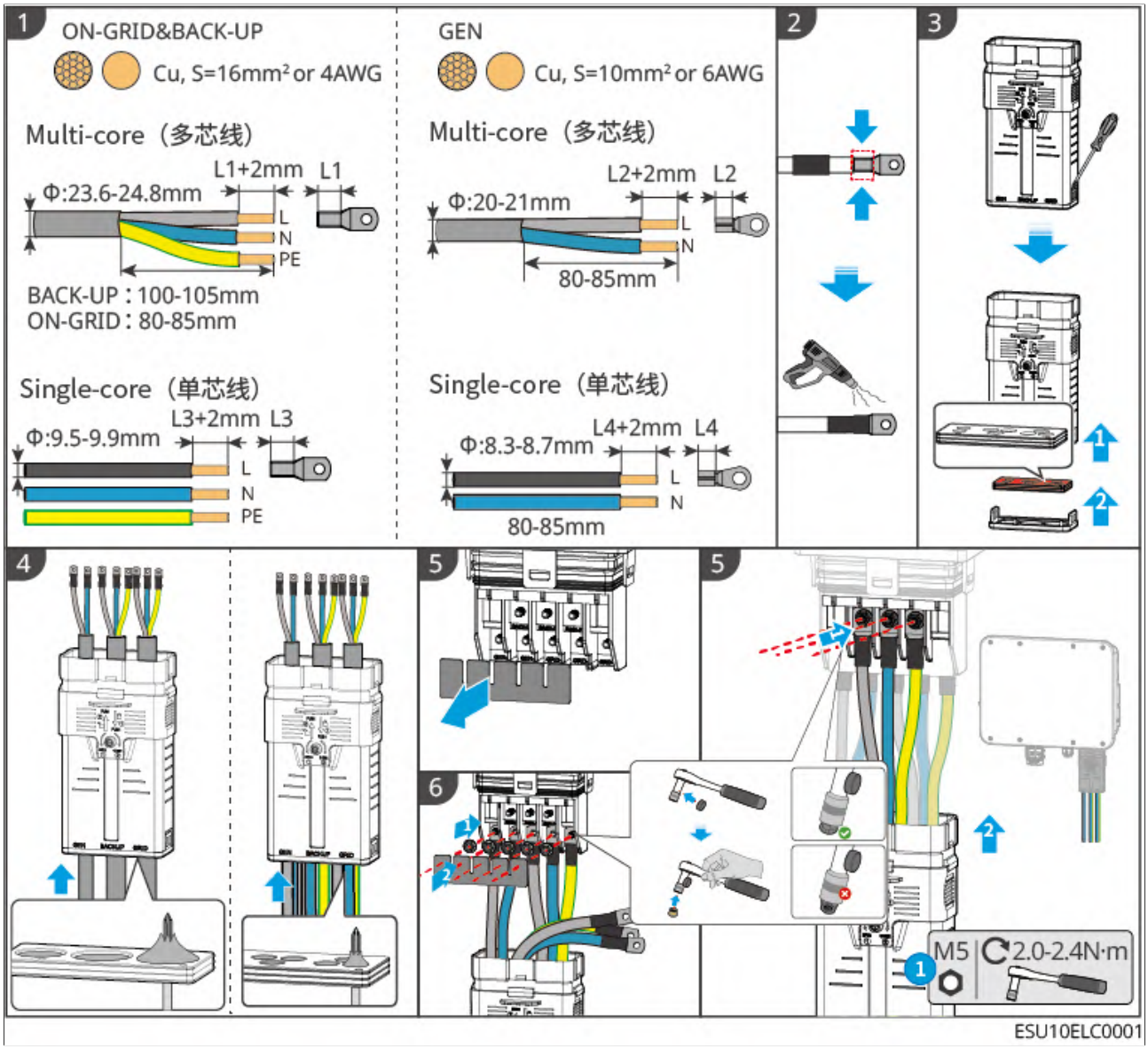
5.7.3 Connect the Mix Parallel Unit Communication Cable

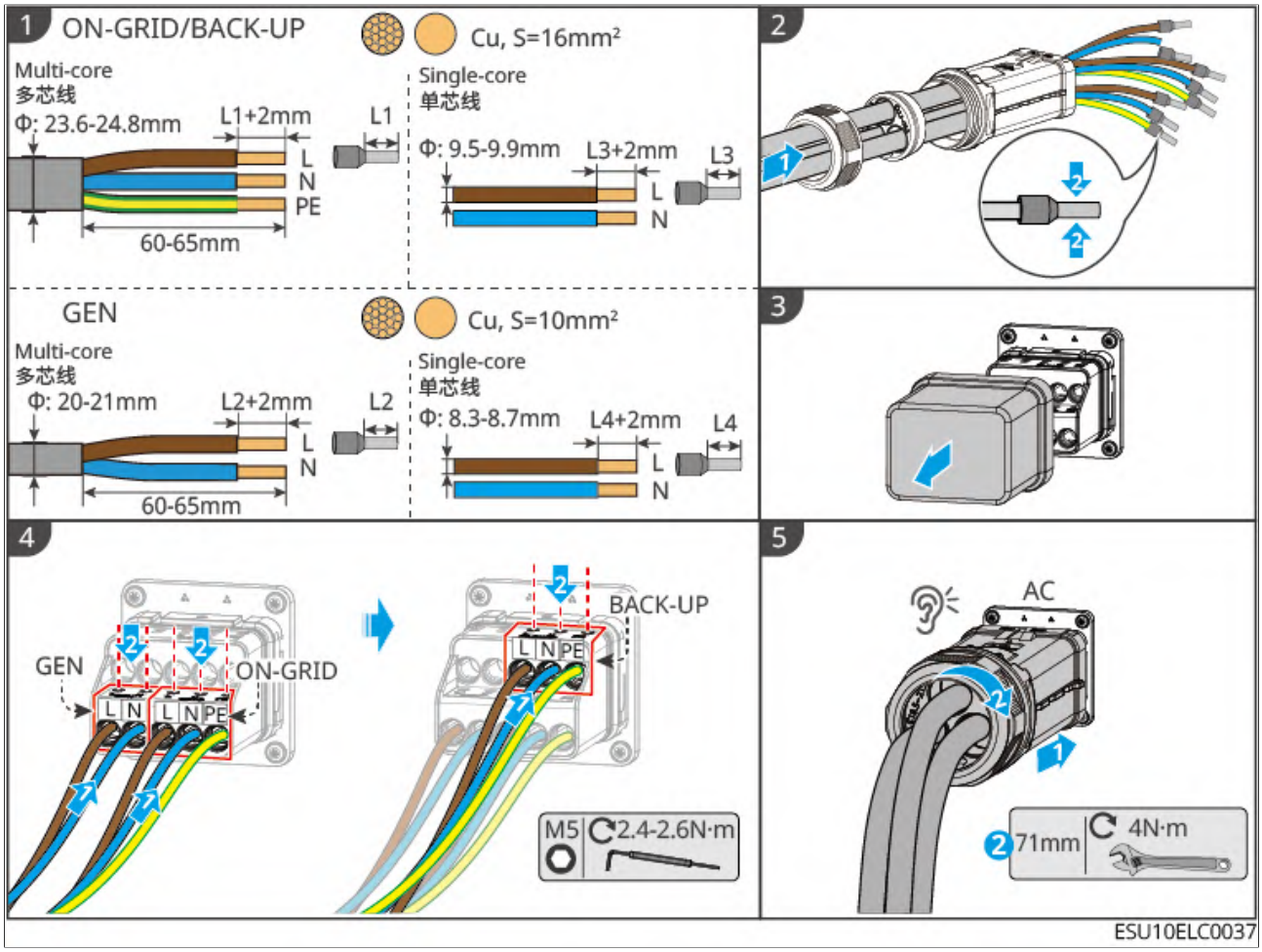

MPU10ELC0003

5.8 Connecting AC Cables

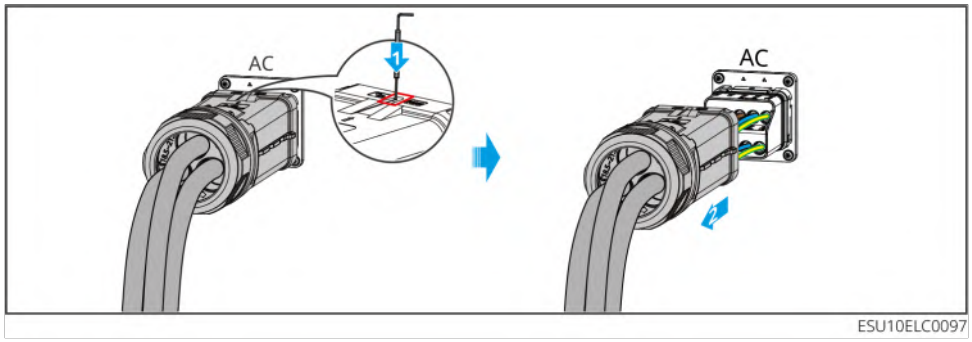
⚠WARNING

- The inverter has an integrated Residual Current Monitoring unit (RCMU) to prevent residual current from exceeding the specified value. When the inverter detects a leakage current greater than the allowed value, it will quickly disconnect from the grid.
- When wiring, the AC cables must completely match the AC terminals "BACKUP", "ON-GRID", "GEN", and the grounding port. If the cables are connected incorrectly, it will cause equipment damage.
- Ensure that the wire cores are fully inserted into the terminal wiring holes with no exposed parts.
- Ensure that the insulation board at the AC terminals is securely clamped with no looseness.
- Ensure that the cables are securely connected; otherwise, during equipment operation, the terminal block may overheat and cause equipment damage.


1
ON-GRID&BACK-UP
Cu, S=16mm² or 4AWG
Multi-core（多芯线）
L1+2mm L1
Φ:23.6-24.8mm
L
N
PE
BACK-UP：100-105mm
ON-GRID：80-85mm
Single-core（单芯线）
L3+2mm L3
Φ:9.5-9.9mm
L
N
PE
GEN
Cu, S=10mm² or 6AWG
Multi-core（多芯线）
L2+2mm L2
Φ:20-21mm
L
N
80-85mm
Single-core（单芯线）
L4+2mm L4
Φ:8.3-8.7mm
L
N
80-85mm
2
3
4
5
5
6
M5
2.0-2.4N·m
ESU10ELC0001



Inverter AC cover removal method (optional)



5.9 Connecting Meter Cables

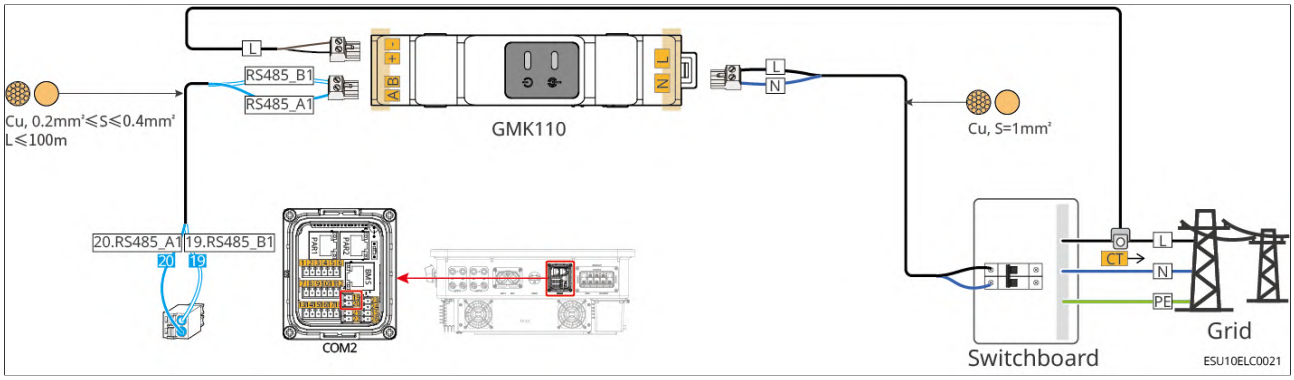
NOTE

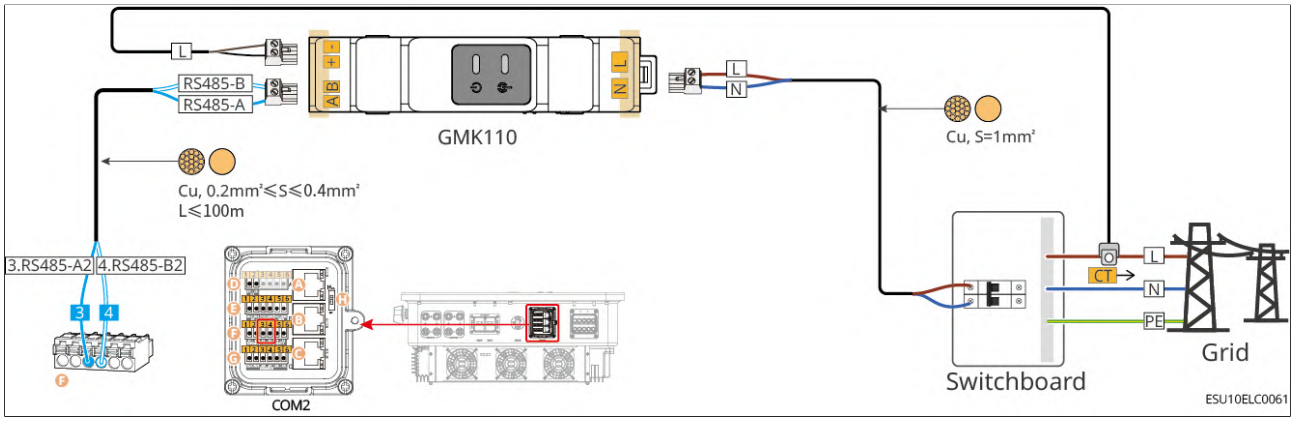
- If multiple inverters need to be used, please consult the manufacturer to purchase an electric meter separately.
- Ensure that the CT connection direction and phase sequence are correct; otherwise, the monitoring data may be incorrect.
- Ensure that each cable is correctly connected, tightened, and not loose. Improper wiring may cause poor contact or damage the electric meter.
- In areas at risk of lightning, 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.

GMK110 meter wiring

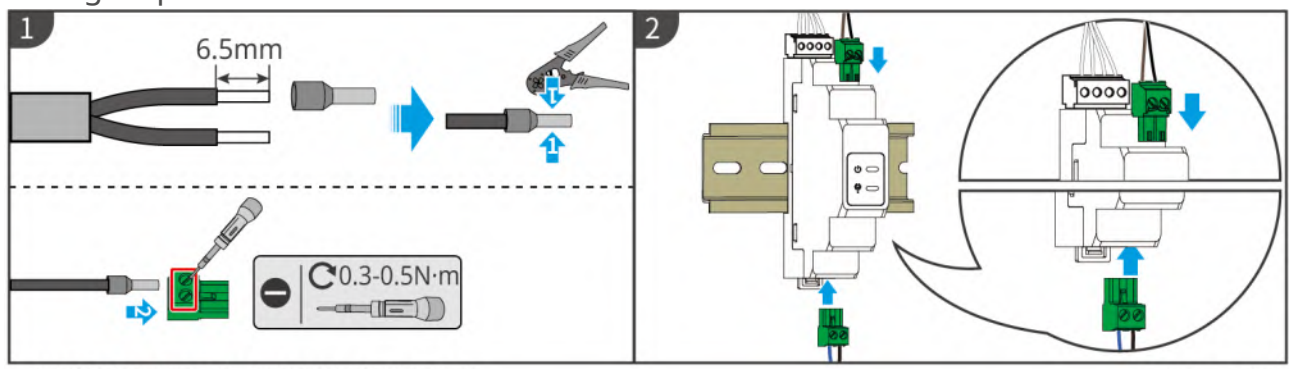
NOTE

- The outer diameter of the AC power line must be smaller than the CT aperture to ensure that the AC power line 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 electric 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 the same.



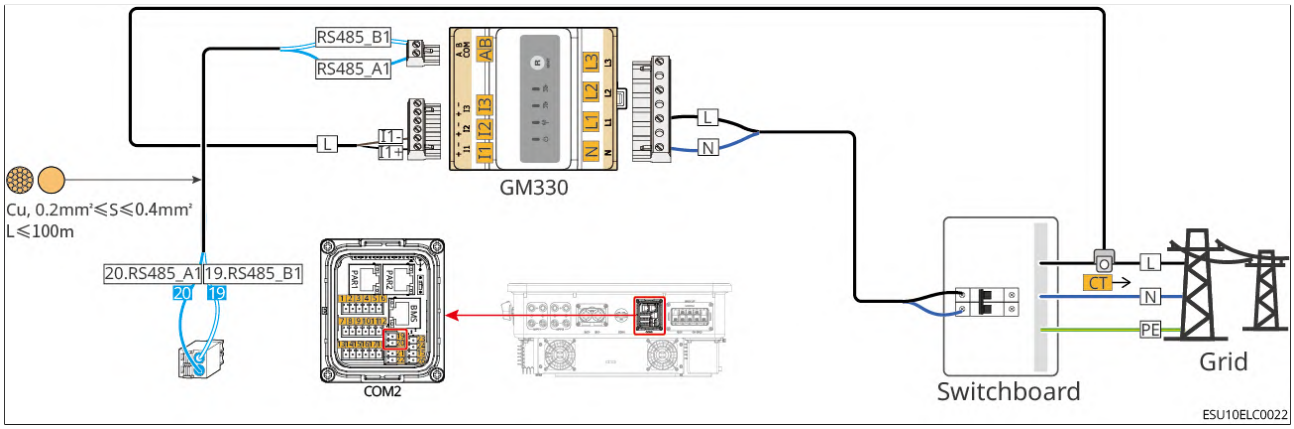


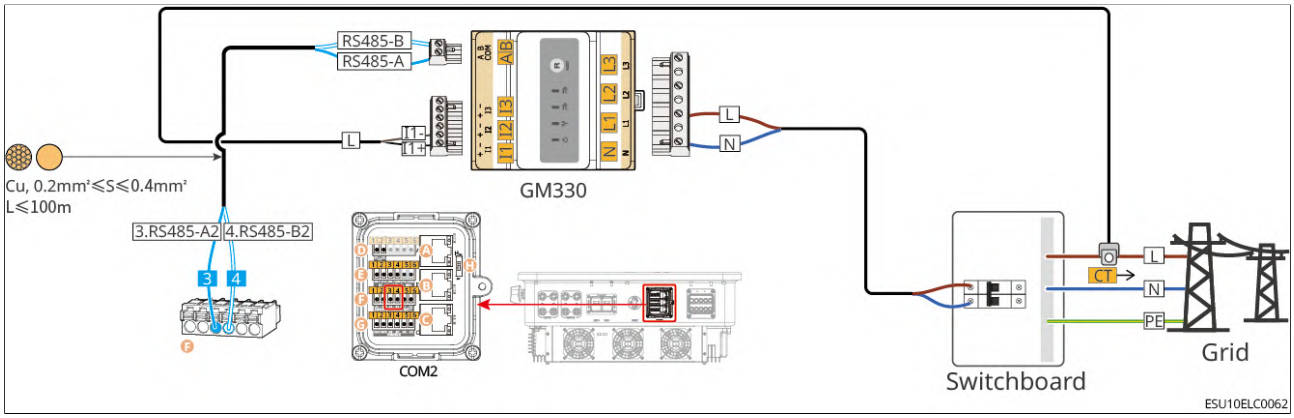
Wiring steps



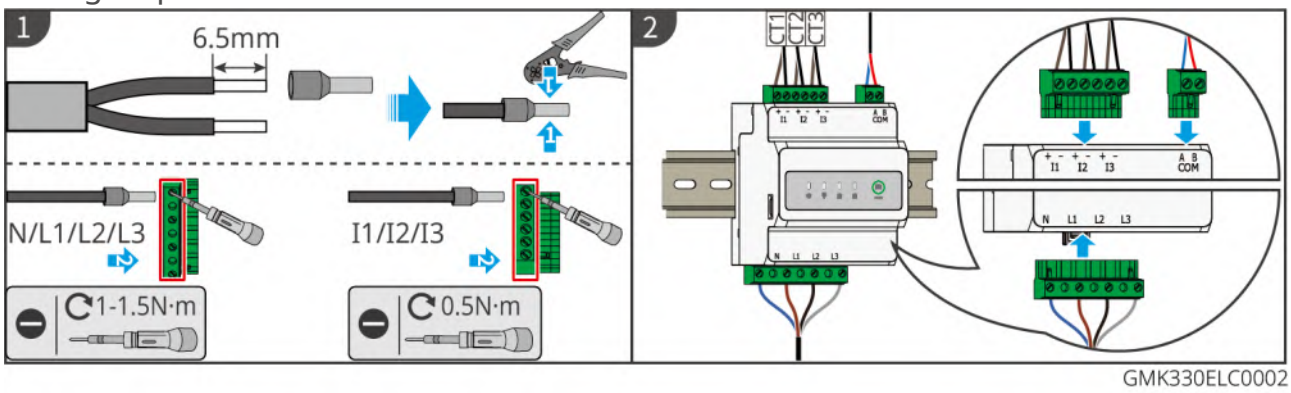
▶ GMK110: CT x 1; GMK110D: CT x 2

GM330 meter wiring

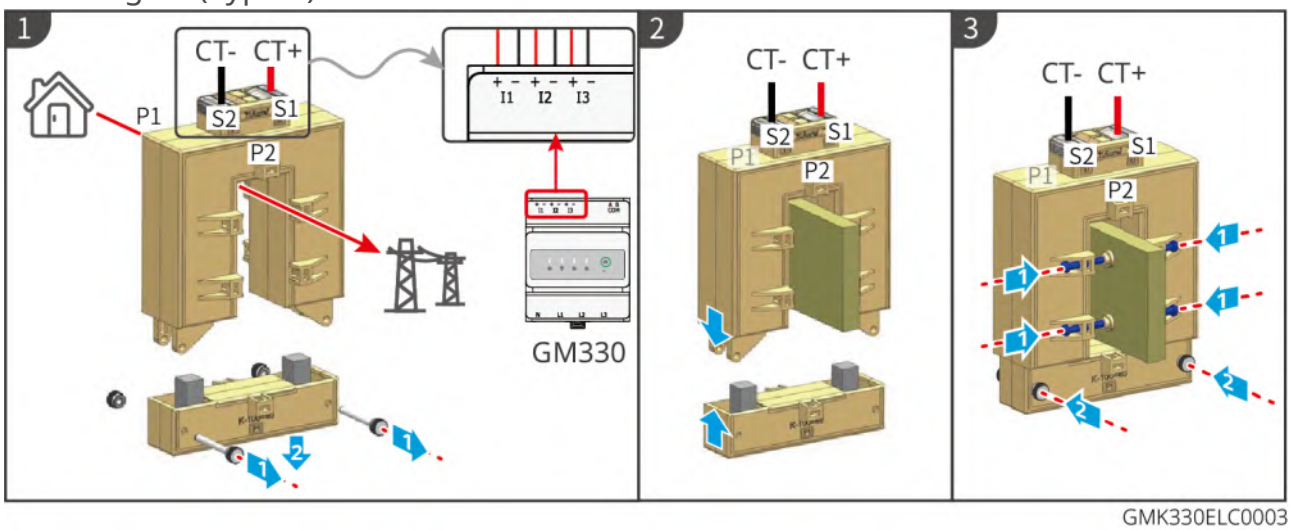




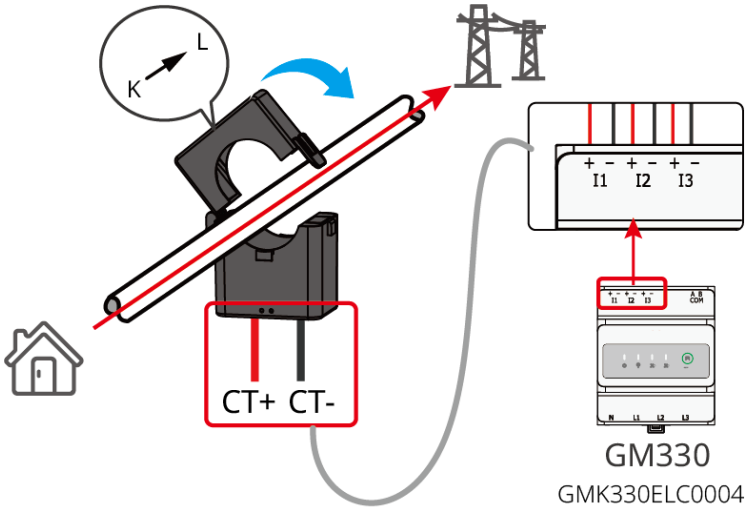
Wiring steps



Installing CT (Type 1)



Installing CT (Type 2)



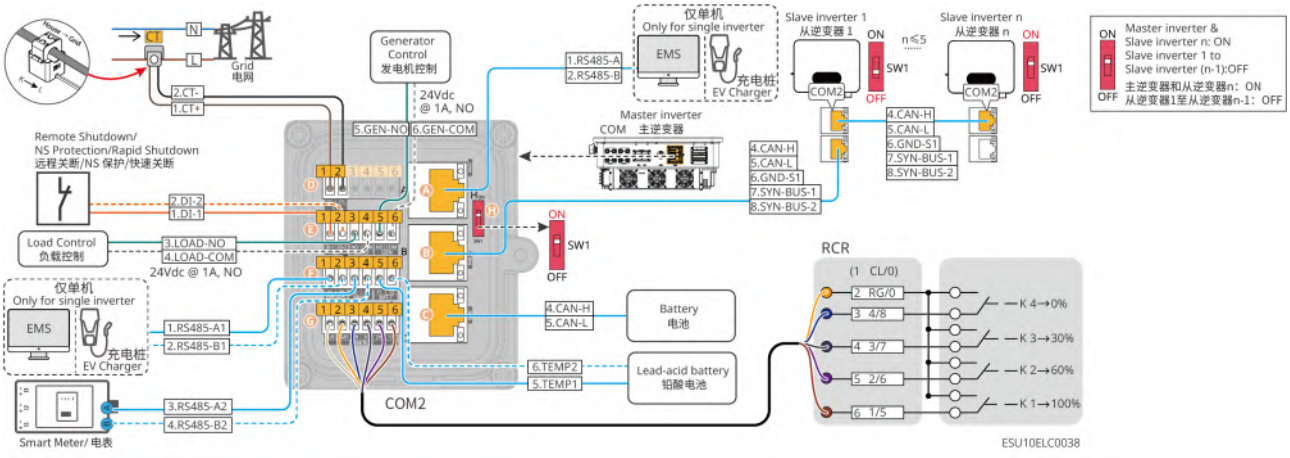
5.10 Connecting Inverter Communication Cable

NOTE

- The inverter communication function is optional; please select according to the actual use scenario.
- The inverter supports connecting to a mobile phone or WEB interface via Bluetooth, WiFi, LAN, or 4G communication to set device-related parameters, view device operating information and error information, and stay informed of system status in a timely manner.
- In a single-unit system, install WiFi/LAN Kit-20, 4G Kit-CN-G20, and 4G Kit-CN-G21 communication modules. When the system contains multiple inverters in Parallel Networking, the master inverter must be equipped with an Ezlink3000 module for networking.
- If the Remote Shutdown function is required, after wiring is completed, enable this function in the App.
- If the inverter is Not Connected to a Remote Shutdown device, do not enable this function in the App; otherwise, the inverter cannot operate in grid-connected mode.
- In a parallel system, if the Remote Shutdown function is to be implemented, connect the communication cable to the master inverter; otherwise, the function will not take effect.

Communication Function Description

Type 1

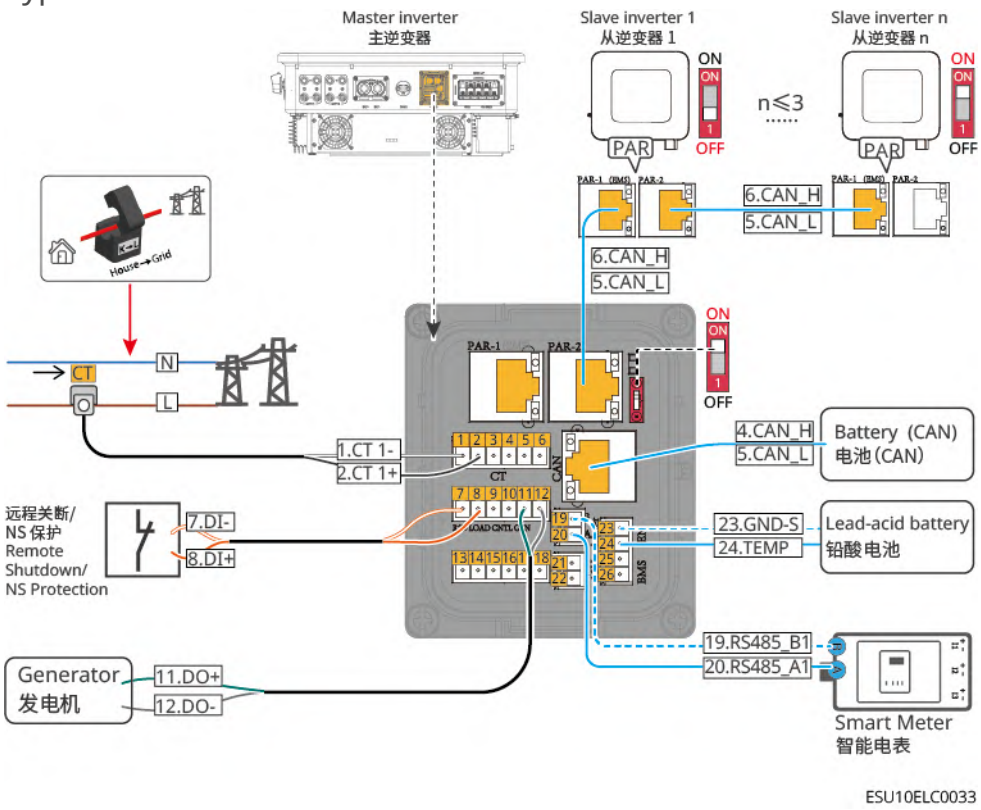


Port (Silkscreen)		Function	Description
A	PAR1	Parallel Communication Port 1 EMS Communication Port (PAR-1&EMS) or EV Charger Communication Port	• CAN and BUS: Parallel Communication Port. In Parallel Networking, CAN communication is used to connect to other inverters; the BUS is used to control the On/Off-grid status of each inverter in the parallel system. • RS485: When used to connect to third-party EMS devices or EV chargers that support RS485 communication. In parallel scenarios, connecting third-party EMS devices and EV chargers is not supported.
B	PAR2	Parallel Communication Port 2 （PAR-2）	When used for parallel communication, it supports using CAN communication to connect to other inverters; the BUS is used to control the On/Off-grid status of each inverter in the parallel system.
C	BMS	Battery BMS Communication	When connected to a lithium-ion battery, it is used to connect the BMS communication cable of the battery system and supports CAN signal communication.
D	CT	CT Connection Port	Connect the CT communication cable.

Port (Silkscreen)		Function	Description
E	DI	Remote Shutdown/NS Protection	Provides a signal control port to control the device for Remote Shutdown or to implement NS Protection. Remote Shutdown Function: • When an unexpected event occurs, the device can be controlled to stop operating. • The Remote Shutdown device must be a normally closed switch.
	LOAD	Load Control	• Supports dry contact signal connection to implement functions such as load control. The DO contact rating is 24Vdc @1A, NO/COM normally open contact. • Supports SG Ready heat pump integration and controls the heat pump via dry contact signals. • Supported operating modes: ◦ Operating Mode 2 (Signal: 0:0): Energy-saving Mode. In this mode, the heat pump operates in Energy-saving Mode. ◦ Operating Mode 3 (Signal: 0:1): Switch-on Recommendation. In this mode, the heat pump increases hot water reserves to store heat while maintaining current operation.
	GEN	Generator start/stop control port	Supports connection to Diesel Generator Control signal DO contact capacity is 24Vdc @1A, NO/COM normally open contact
F	EMS485	EMS communication port	When used to connect third-party EMS devices or EV chargers, RS485 communication is supported. In parallel scenarios, connecting third-party EMS devices and EV chargers is not supported. Note: EMS in PAR-1 & EMS ports is the same line.

Port (Silkscreen)		Function	Description
	Meter	Meter communicatio n	Supports connecting to external smart meter via RS485 communication
	BAT-T	Lead-acid temperature measurement port	Used to connect the temperature sensor cable for lead-acid temperature measurement
G	DRM/R CR	RCR	RCR (Ripple Control Receiver): Provides RCR signal control port, meeting grid dispatch requirements in Europe and other regions.
H	SW1	Parallel DIP switch	In multi-unit parallel scenarios, set the parallel DIP switches of the first and last inverters to ON, and the others to OFF

Type II

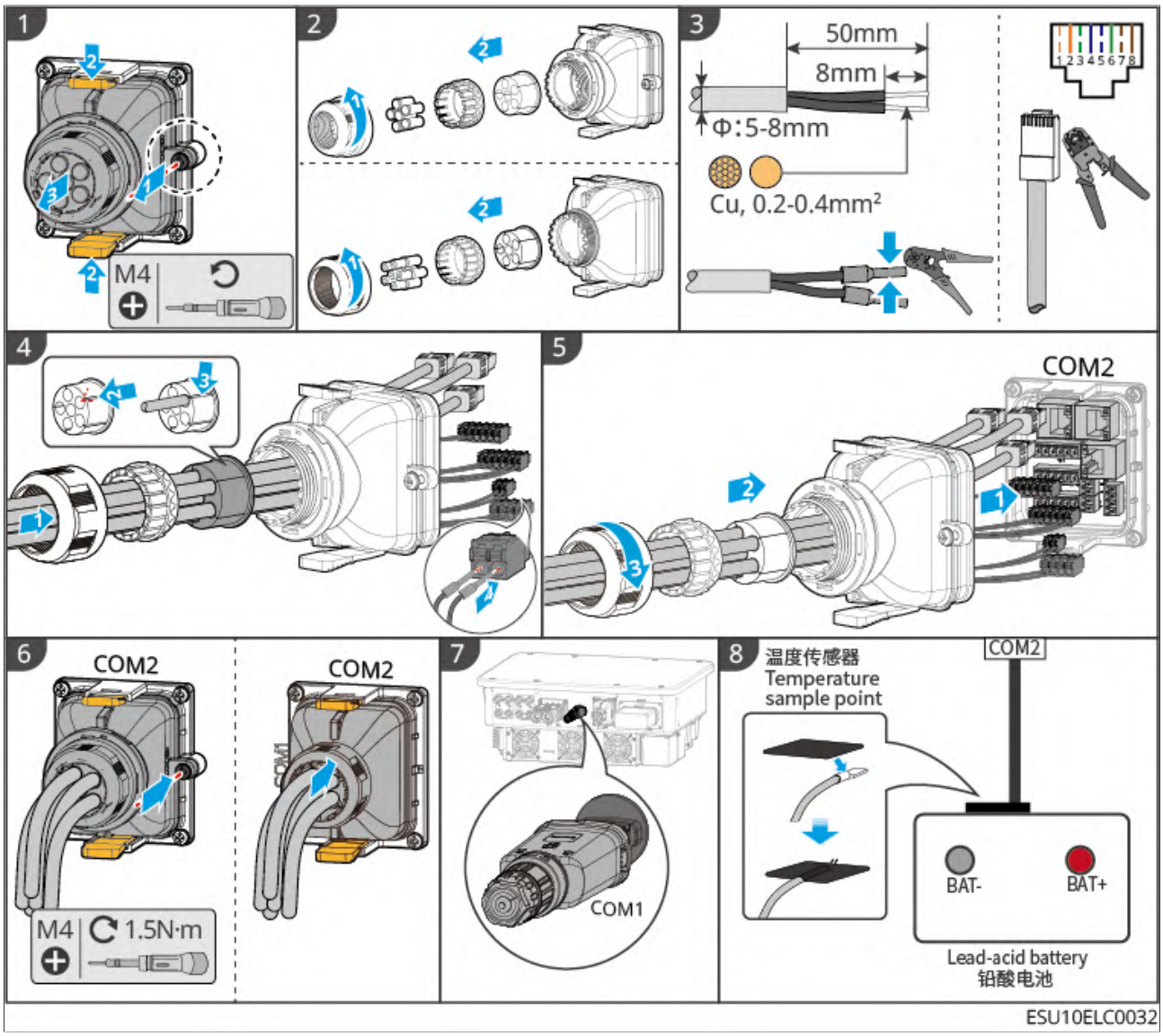


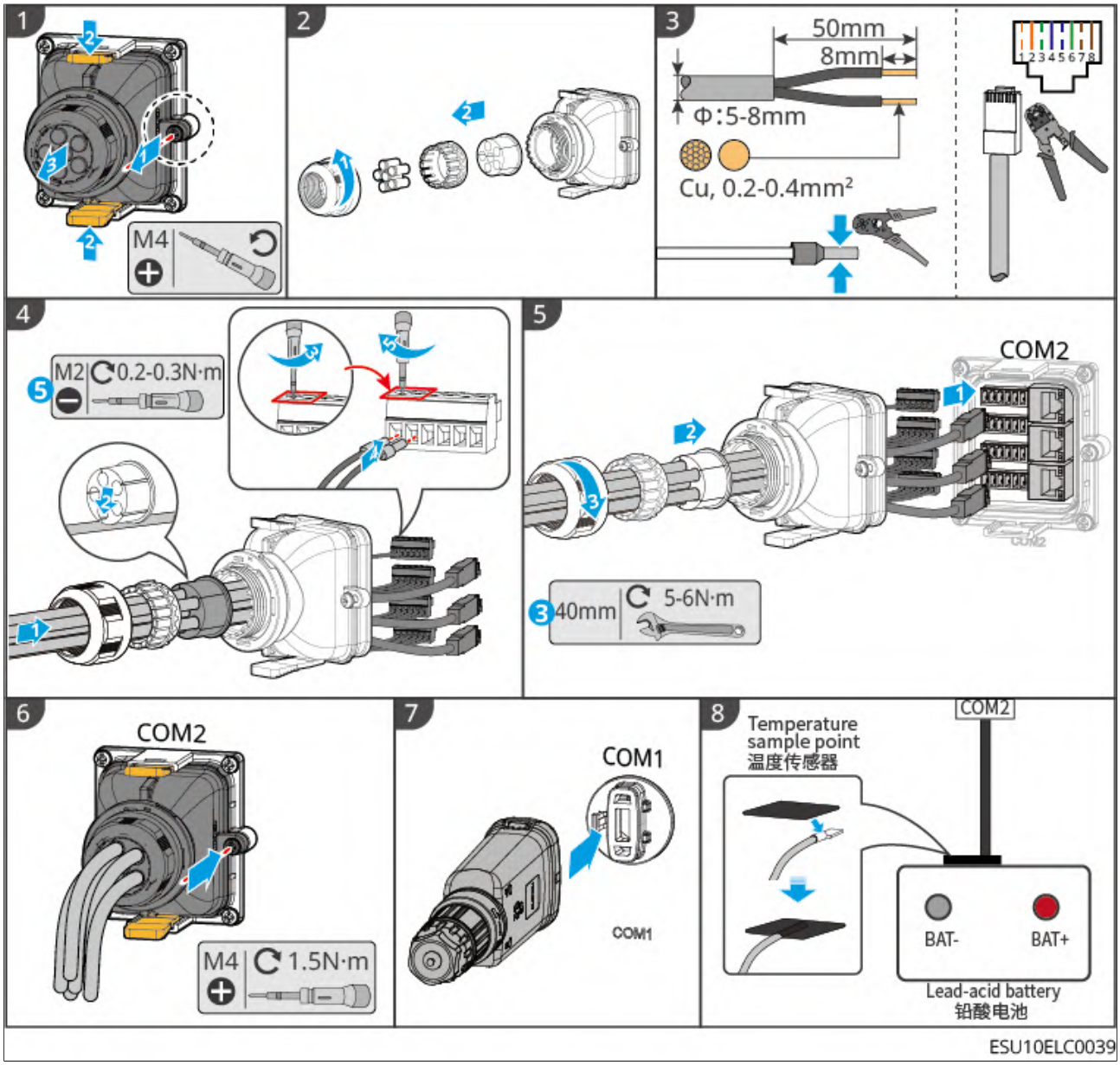
Port	Function	Description
1-2	CT	Connect the CT communication cable.
7-8	Remote Shutdown/NS Protection	Provides a signal control port to control the device's Remote Shutdown or implement NS Protection Function.
9-10	Reserved	-
11-12	GEN port	Used to control the generator. Only applicable in single inverter scenario.
13-18	Reserved	-
19-20	Meter communication	Supports connecting to external smart meter via RS485 communication
23-24	Lead-acid temperature measurement port	Used to connect the temperature sensor cable for lead-acid temperature measurement.
PAR-1	Parallel Communication Port 1	EV charger communication port
PAR-2	Parallel Communication Port 2	When used for parallel communication, it supports using CAN communication to connect to other inverters; the BUS is used to control the On/Off-grid status of each inverter in the parallel system.
CAN	Battery BMS Communication	When connected to a lithium-ion battery, it is used to connect the BMS communication cable of the battery system and supports CAN signal communication.

Method for connecting communication cables

NOTE

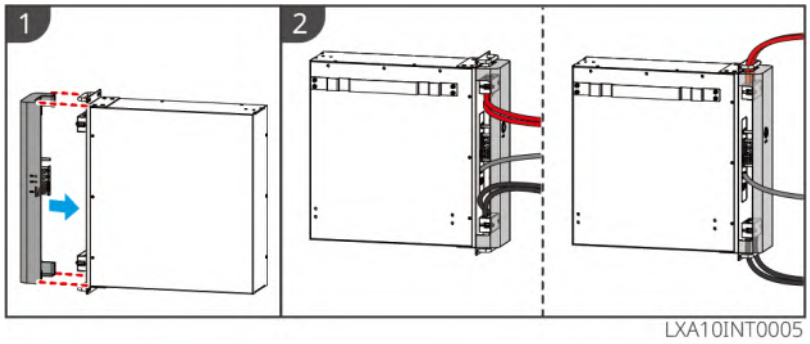
- The inverter supports connection via Bluetooth, WiFi, LAN, and 4G communication module (China version) to a mobile phone or WEB interface to set device-related parameters, view device operation information and error information, and keep abreast of system status.
- In a single-unit system, install WiFi/LAN Kit-20 and 4G Kit-CN-G20 communication modules. When the system includes multiple inverters for Parallel Networking, the main inverter needs to be installed with an Ezlink3000 module for networking.



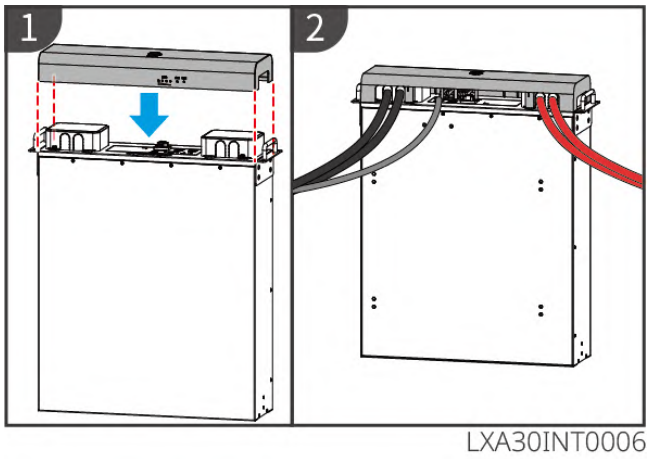


5.11 Install the Battery Protection Cover

5.11.1 LX A5.0-10

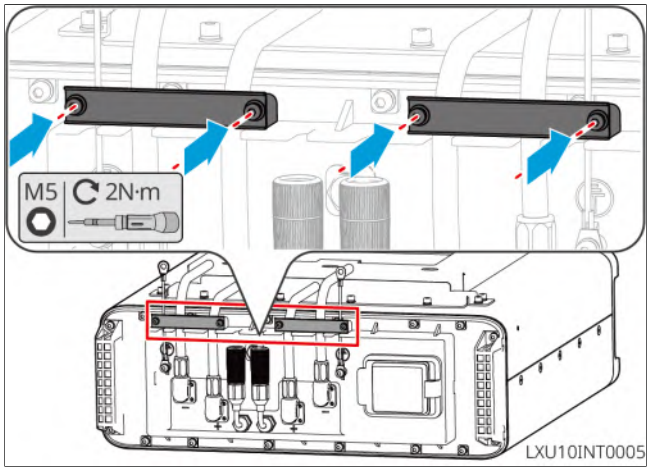


5.11.2 LX A5.0-30

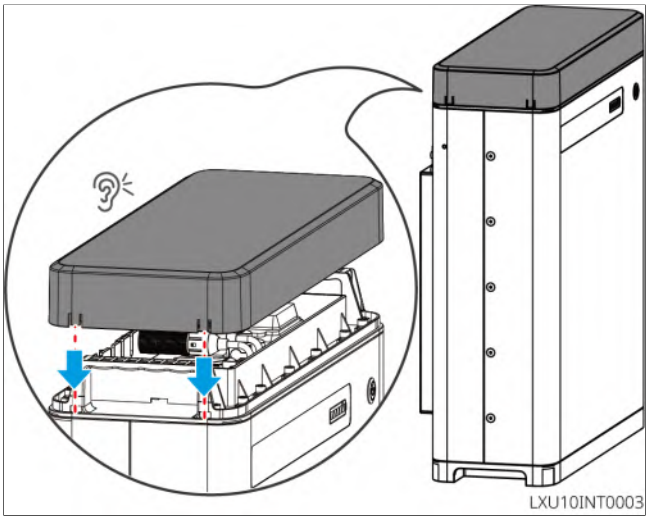


5.11.3 LX U5.4-L、LX U5.4-20

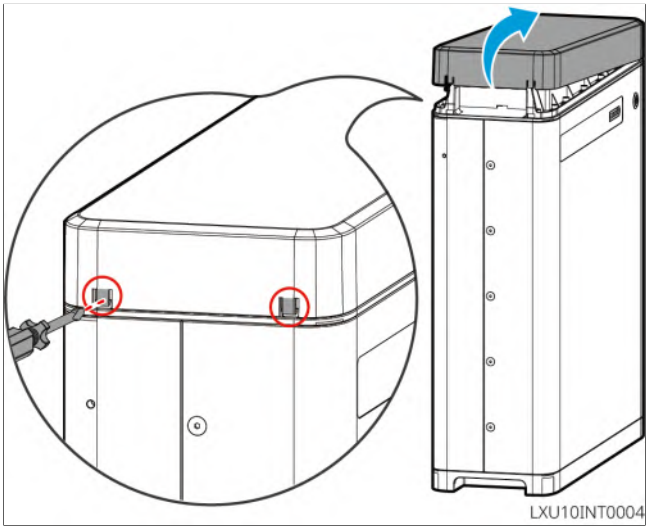
Step 1: Install the harness fixing plate



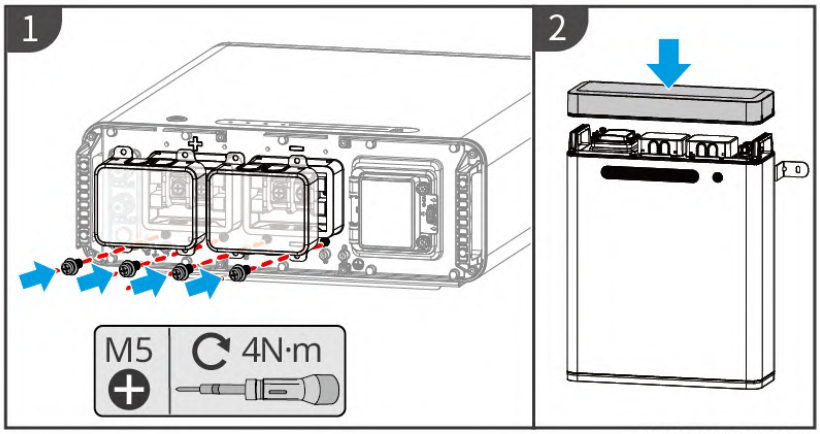
Step 2: Install the Plastic Upper Cover



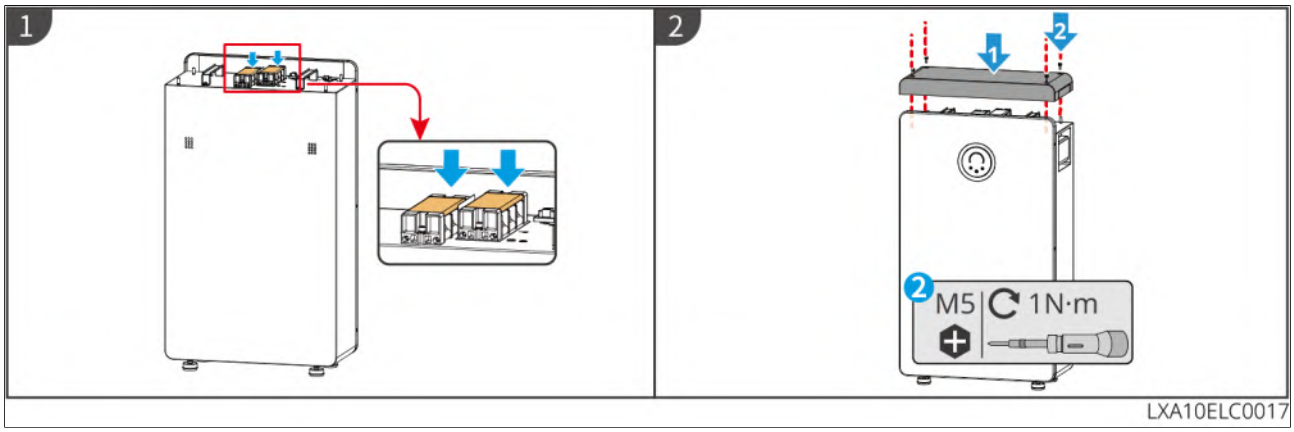
- To remove the upper cover, use a flat-head screwdriver to gently pry up the two clips on one side, and then remove the plastic upper cover.



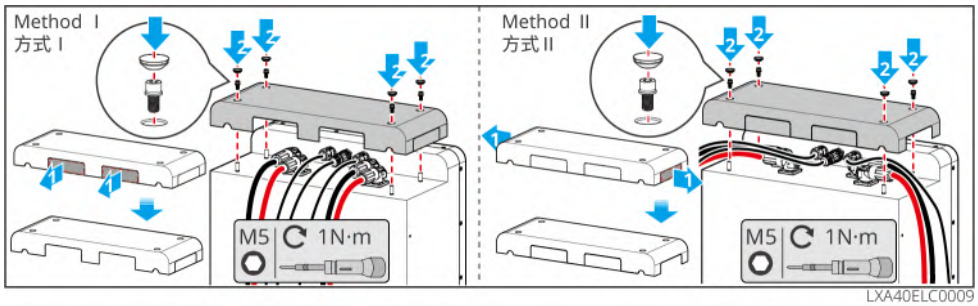
5.11.4 LX U5.0-30



5.11.5 GW14.3-BAT-LV-G10



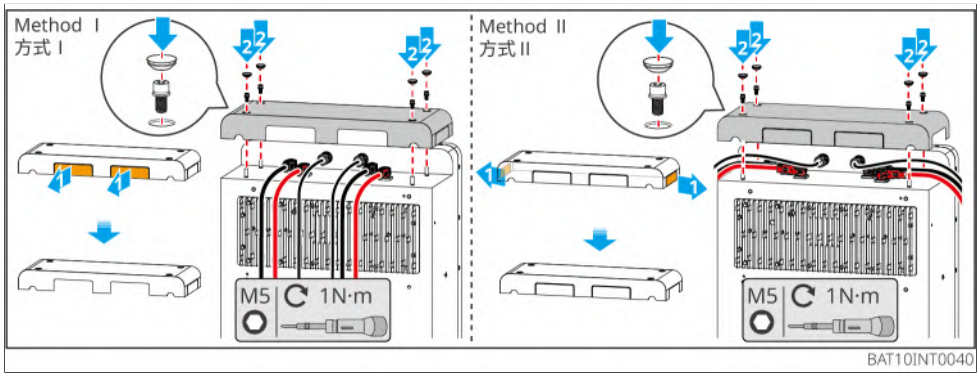
5.11.6 GW16.1-BAT-LV-G10



5.11.7 GW10.0-BAT-LV-G10

NOTE

After completing the battery system wiring, be sure to install the decorative cover; select the corresponding decorative cover installation solution according to the on-site cable routing method.



6 System Trial Run

6.1 Pre-Power-on Check

No.	Check Items
1	The equipment is installed securely, the installation location is convenient for operation and maintenance, the installation space is convenient for ventilation and heat dissipation, and the installation environment is clean and tidy.
2	The Protection ground wire, DC cable, AC cable, communication cable, and terminating resistor are correctly and securely connected.
3	Cables are tied in accordance with routing requirements, reasonably distributed, and free from damage.
4	For unused cable entries and ports, be sure to use the terminals provided with the accessories for reliable connection, and ensure they have been sealed.
5	Ensure that used cable entries are sealed.
6	The voltage and frequency at the inverter's grid-connection point meet the grid-connection requirements.

6.2 System Power-On

⚠WARNING

- When there are multiple inverters in the system, ensure that all slave inverters are powered on from the AC side within one minute after the master inverter is powered on from the AC side.
- Battery Black Start Application Scenarios:
  - The inverter must be activated via the battery.
  - When no inverter is present, charge/discharge management of the battery is required, etc.
- After the battery system is started, ensure that the inverter and battery system communicate normally within 15 minutes. If normal communication between the inverter and battery system cannot be established, the battery system switch will automatically open, and the battery system will be powered off.
- When multiple batteries are connected in parallel clusters in the system, starting any one battery during the first power-on can wake up all batteries. After the batteries are powered off and then powered on again, each battery must be restarted one by one; or after leaving them idle for 15 minutes, start any one battery to wake up all batteries.

Power-On Procedure

1. (Select according to local regulations) Close the switch between the inverter and the battery.
2. Start the battery system.
   a. LX A5.0-10, LX A5.0-30: Briefly press the battery system switch for ≤ 2 s.
   b. LX U5.4-L, LX U5.4-20, LX U5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10, GW10.0-BAT-LV-G10: Close the integrated circuit breaker of the battery system and briefly press the battery system button.
   c. GW5.0-BAT-LVI-G10: Briefly press all battery multifunction buttons for ≤ 1 s.
3. Close the inverter's DC Switch.
   a. (Select according to local regulations) Close the circuit breaker between the PV modules and the inverter.
4. Close the GRID circuit breaker.
5. Close the BACK-UP circuit breaker.
6. (Optional) Close the GEN circuit breaker.
7. (Screenless model only) Close the inverter's off-grid control switch.

Battery Black Start

1. Close the battery system switch.
2. Starting the Battery:
   a. LX A5.0-10, LX A5.0-30, LX U5.0-30: Briefly 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.
   b. 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.
   c. GW5.0-BAT-LVI-G10: Briefly press all battery multifunction buttons for 1 s, then briefly press any one battery multifunction button for 1 s.
   d. GW10.0-BAT-LV-G10: Close all battery integrated circuit breakers, briefly press all battery multifunction button indicators for 1 s, then briefly press any one battery multifunction button for 1 s.
3. Close the inverter's DC Switch.
4. (Select according to local regulations) Close the circuit breaker between the PV modules and the inverter.
5. Close the GRID circuit breaker.
6. Close the BACK-UP circuit breaker.
7. (Optional) Close the GEN circuit breaker.

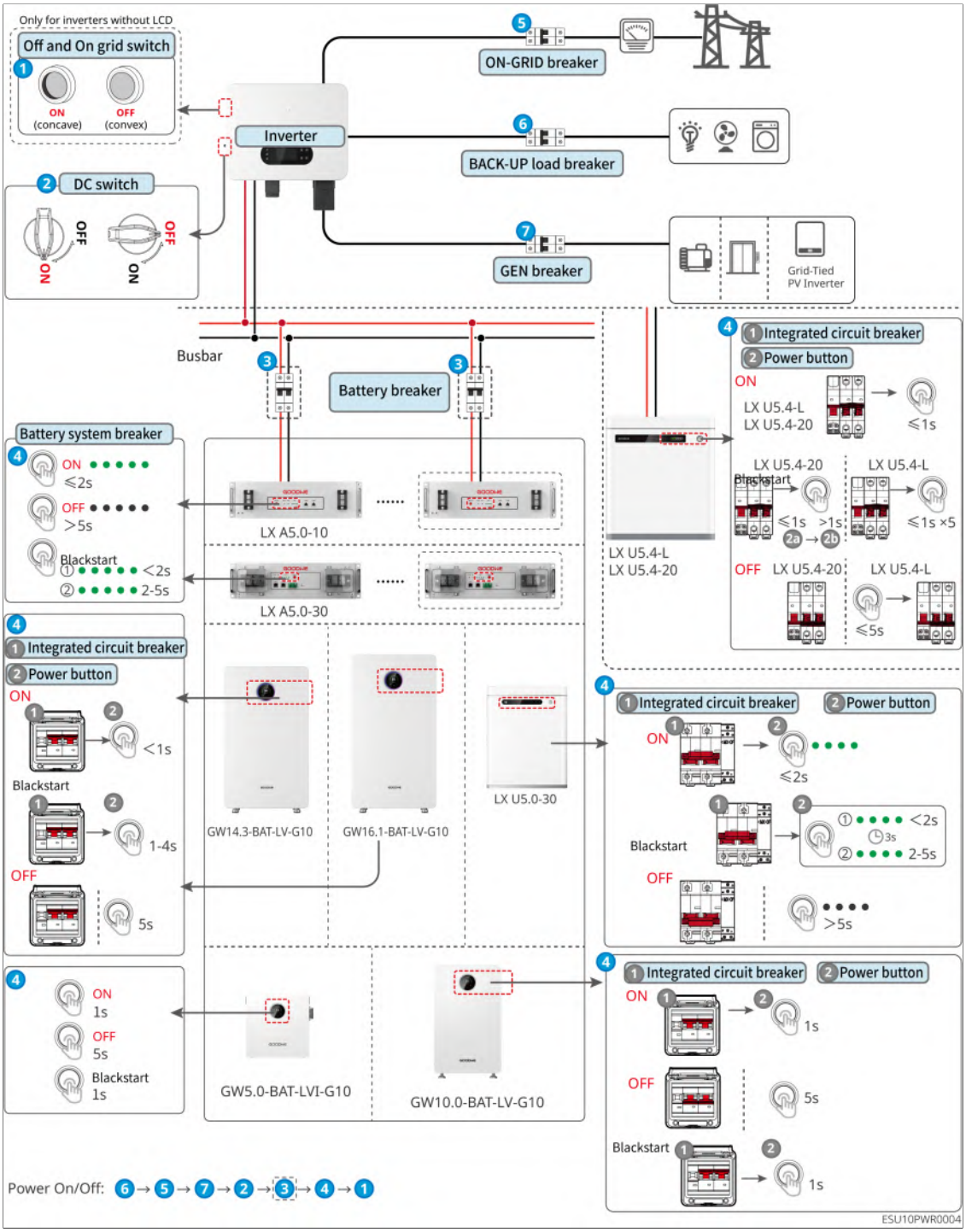


Figure58 Single-unit system

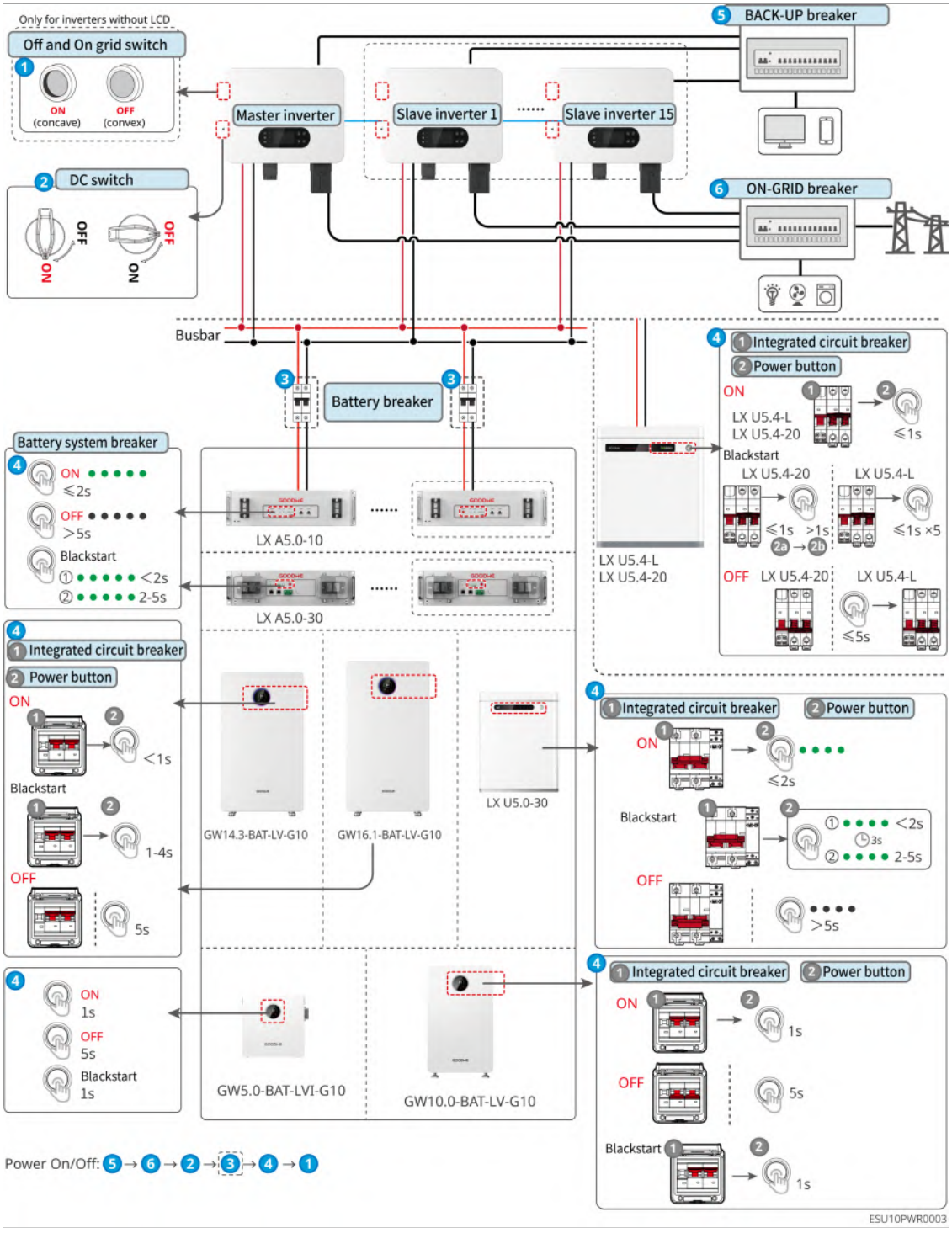


Figure59 Parallel system

6.3 Indicator Light Introduction

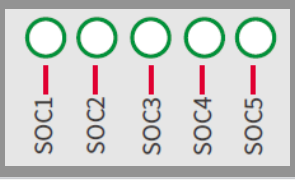
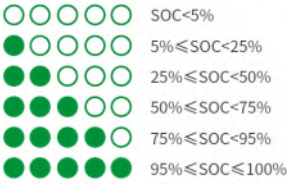
6.3.1 Inverter Indicator Lights

Indicator lights	Status	Description
		The inverter is starting up 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
		LCD ON: The inverter is powered on and in standby mode LCD OFF: The inverter is powered off
		Grid abnormal; the inverter BACK-UP port power supply is normal
		Grid normal; the inverter BACK-UP port power supply is normal
		No power supply at the BACK-UP port
		Inverter monitoring module is resetting
		No connection established between the inverter and the communication terminal
		Communication fault between the communication terminal and the cloud server
		Inverter monitoring is normal
		Inverter monitoring module is not started

6.3.2 Battery Indicator Lights

6.3.2.1 LX A5.0-10

Normal State

SOC indicator 	RUN indicator 	Battery System Status
The SOC indicator indicates the battery system state of charge 	Green flashing 1 time/s	The battery system is in standby state
	Green flashes 2 times/s	The battery system is in idle state
	Solid green	The battery system is in charging state
The highest SOC indicator flashes 1 time/s • When 5%≤SOC<25%, SOC1 flashes • When 25%≤SOC<50%, SOC2 flashes • When 50%≤SOC<75%, SOC3 flashes • When 75%≤SOC<95%, SOC4 flashes • When 95%≤SOC≤100%, SOC5 flashes	Solid green	The battery system is in discharging state

Abnormal State

ALM indicator 	Battery System Status	Description
Red flashes 1 time/s	The battery system generates an alarm	After the battery system generates an alarm, the battery system will perform a self-check. Wait for the battery system self-check to complete; the battery system will enter the normal operating state or fault state.

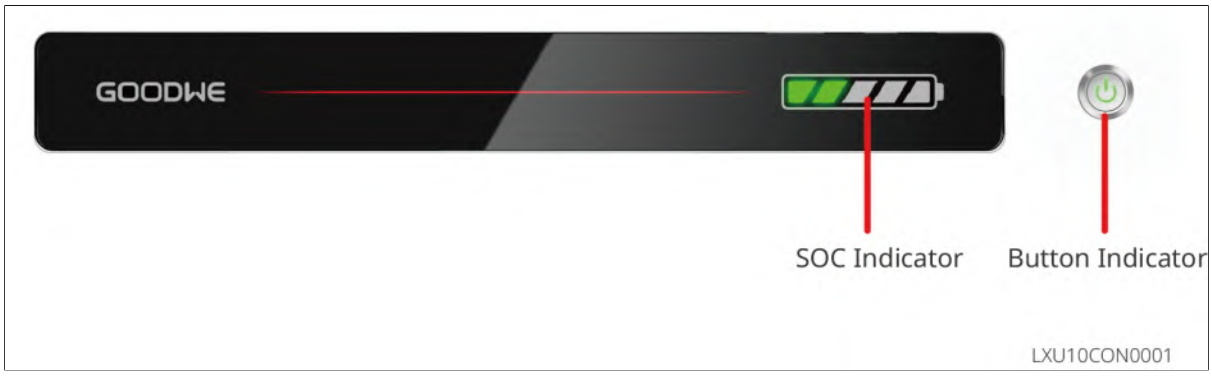
ALM indicator 	Battery System Status	Description
Solid red	The battery system has a fault	Determine the fault type based on the SOC indicator display pattern, and handle it according to the methods recommended in the fault handling section.

6.3.2.2 LX A5.0-30、LX U5.0-30

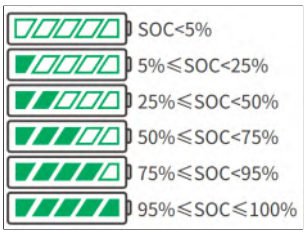
Indicator lights		System status
	No green indication on the SOC indicator	SOC=0%
	The first SOC indicator shows green	0% < SOC≤25%
	The second SOC indicator shows green	25% < SOC≤50%
	The third SOC indicator shows green	50% < SOC≤75%
	The fourth SOC indicator shows green	75% < SOC≤100%
 RUN indicator	Solid green	The battery system is operating normally
	Green flashing 1 time/s	The battery system is in standby state
	Green flashing 3 times/s	PCS Comm Loss
	Slow flashing	After the battery system generates an alarm, it will perform a self-check. Wait for the self-check to complete; it will then change to normal operating state or fault state.

Indicator lights		System status
ALM indicator	Solid red	Determine the fault type based on the SOC indicator display pattern, and handle it according to the methods recommended in the fault handling section.

6.3.2.3 LX U5.4-L

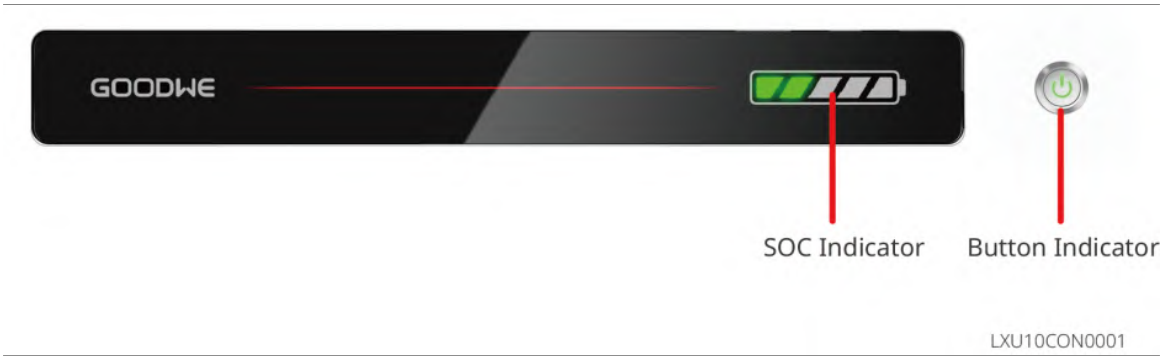


Normal State

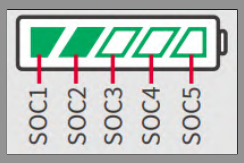
SOC indicator	Button indicator light	Battery System Status
The SOC indicator indicates the battery system state of charge 	Green flashing 1 time/s	The battery system is in standby state

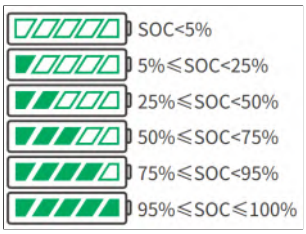
The highest SOC indicator flashes 1 time/s, and the other green indicators remain on • When 5%≤SOC<25%, SOC1 flashes • When 25%≤SOC<50%, SOC2 flashes • When 50%≤SOC<75%, SOC3 flashes • When 75%≤SOC<95%, SOC4 flashes • When 95%≤SOC≤100%, SOC5 flashes	Solid green	The battery system is operating normally

6.3.2.4 LX U5.4-20



Normal State

SOC indicator	Button indicator light	Battery System Status
		

The SOC indicator indicates the battery system state of charge 	Green flashing 1 time/s	The battery system is in standby state
The highest SOC indicator flashes 1 time/s, and the other green indicators remain on • When 5%≤SOC<25%, SOC1 flashes • When 25%≤SOC<50%, SOC2 flashes • When 50%≤SOC<75%, SOC3 flashes • When 75%≤SOC<95%, SOC4 flashes • When 95%≤SOC≤100%, SOC5 flashes	Solid green	The battery system is operating normally

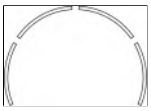
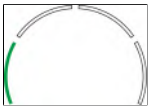
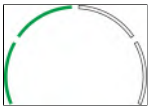
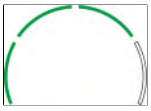
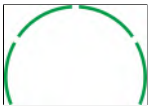
Abnormal State

Button indicator light 	Battery System Status	Description
The red light flashes once per second	The battery system generates an alarm	Determine the fault type based on the SOC indicator display pattern, and handle it according to the methods recommended in the fault handling section.
Solid red	The battery system has a fault	Determine the fault type based on the SOC indicator display pattern, and handle it according to the methods recommended in the fault handling section.

6.3.2.5 GW14.3-BAT-LV-G10

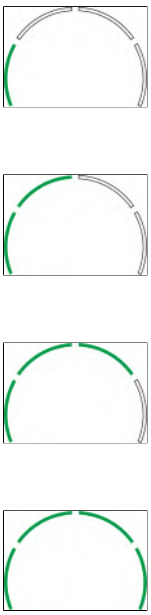


Normal State

Indicator Light Name	Indicator Light Status		Corresponding Other Light Status	System status
SOC indicator	 	SOC Indicator Light Steady Green	/	SOC=0% 0% < SOC≤25% 25% < SOC≤50% 50% < SOC≤75% 75% < SOC≤100%
	  	SOC Indicator Light Flashing Green		The battery system is in discharging state

Indicator Light Name	Indicator Light Status		Corresponding Other Light Status	System status
Running Indicator Light + Touch Button		Steady White	 Blue-Purple Breathing Light	System Operating Normally
		Flashing White	 Blue-Purple Running Light	System Preparing
Communication Light		Steady White	/	PCS Communication Normal

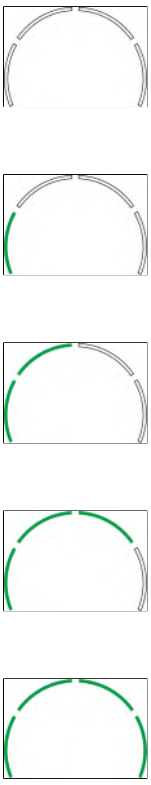
Abnormal State

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

6.3.2.6 GW16.1-BAT-LV-G10

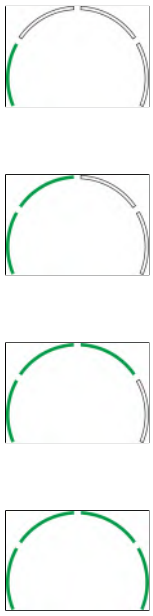


Normal State

Indicator Light Name	Indicator Light Status		Corresponding Other Light Status	System status
SOC indicator		SOC Indicator Light Steady Green	/	SOC=0% 0% < SOC≤25% 25% < SOC≤50% 50% < SOC≤75% 75% < SOC≤100%
		SOC Indicator Light Flashing Green		The battery system is in discharging state
Running Indicator Light + Touch Button		Steady White	 Blue-Purple Breathing Light	System Operating Normally
		Flashing White	 Blue-Purple Running Light	System Preparing

Indicator Light Name	Indicator Light Status		Corresponding Other Light Status	System status
Communication Light		Steady White	/	PCS Communication Normal

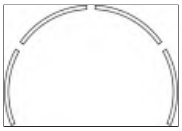
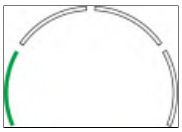
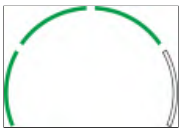
Abnormal State

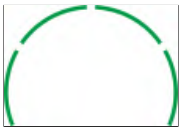
Indicator Light Name	Indicator Light Status		Corresponding Other Light Status	System status
SOC indicator		SOC Indicator Light Steady Green	 Flashing Red  Off  Solid red	Determine the fault type based on the SOC indicator display pattern, and handle it according to the methods recommended in the fault handling section.
Communication Light		Off	/	PCS Comm Loss
System Alarm Light		Steady White	/	System alarm and undervoltage fault levels 2, 3, and 4

6.3.2.7 GW5.0-BAT-LVI-G10、GW10.0-BAT-LV-G10

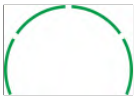


Normal State

Indicator Light Name	Indicator Light Status		System status
SOC indicator		SOC indicator off	SOC=0%
		SOC indicator green segments steady on	0% < SOC≤25%
			25% < SOC≤50%
			50% < SOC≤75%

Indicator Light Name	Indicator Light Status		System status
			75% < SOC≤100%
	SOC Indicator Light Flashing Green		The battery system is in discharging state
Running Indicator Light + Touch Button		Steady White	System Operating Normally
		Flashing White	System Preparing
Communication Light		Steady White	PCS Communication Normal

Abnormal State

Indicator Light Name	Indicator Light Status		Corresponding Other Light Status	System status
SOC indicator		SOC indicator green segments steady on	 Off  Solid red	Level 3 and above system fault Determine the fault type based on the SOC indicator display pattern, and handle it according to the methods recommended in the fault handling section.

Indicator Light Name	Indicator Light Status		Corresponding Other Light Status	System status
Communication Light		Off	/	PCS Comm Loss
System Alarm Light		Steady White	/	Level 2 system alarm and undervoltage faults levels 2, 3, and 4

6.3.3 Mix Parallel Unit Indicator Light

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

6.3.4 Smart Meter Indicator Lights

6.3.4.1 GMK110

Type	Status	Description
Power indicator	Solid On	Meter is powered on
	Off	Meter is powered off
Communication indicator	Flashing	Meter communication is normal
	Off	Meter communication abnormal or no communication

6.3.4.2 GM330

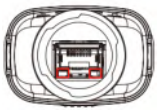
Type	Status	Description
Power indicator	Solid On	Meter powered on, no RS485 communication
	Flashing	Meter powered on, RS485 communication normal
	Off	Meter is powered off
Communication indicator	Off	Reserved
	Flashing	Press and hold Reset button ≥5s; Power indicator and Import/Export Energy indicator flash: Meter reset
Import/Export Energy indicator	Solid On	Import energy from the grid
	Flashing	Export Energy to the grid
	Off	No import, no Export Energy
	Reserved	

6.3.5 Smart Dongle Indicator Lights

6.3.5.1 WiFi/LAN Kit-20

Indicator lights	Status	Description
Power indicator		Solid On: Smart Communication Stick is powered on.
		Off: Smart Communication Stick is not powered on.

Indicator lights	Status	Description
Communication indicator		Solid On: Communication in WiFi mode or LAN mode is normal.
		Single flash: Smart Communication Stick Bluetooth signal is enabled, waiting to connect to the App.
		Two flashes: Smart Communication Stick is Not Connected to the router.
		Four flashes: Smart Communication Stick communicates normally with the router, but is Not Connected to the server.
		Six flashes: Smart Communication Stick is identifying connected devices.
		Off: Smart Communication Stick is undergoing a software reset or is not powered on.

Indicator lights	Color	Status	Description
LAN port communication indicator 	Green	Solid On	100 Mbps wired network connection is normal.
		Off	• Ethernet cable Not Connected. • 100 Mbps wired network connection abnormal. • 10 Mbps wired network connection is normal.
	Yellow	Solid On	10/100 Mbps wired network connection is normal, with no communication data transmission/reception.
		Flashing	Communication data transmission/reception in progress.
		Off	Ethernet cable Not Connected.

Button	Description
Reload	Press and hold for 0.5–3 seconds; the Smart Communication Stick will reset.

Button	Description
	Press and hold for 6–20 seconds; the Smart Communication Stick will restore factory settings.

6.3.5.2 4G Kit-CN-G20 & 4G Kit-CN-G21

Indicator lights	Status	Description
Power indicator		Solid On: Smart Communication Stick is powered on.
		Off: The Smart Communication Stick is not powered on.
Communication indicator		Steady On: The Smart Communication Stick is connected to the server, and communication is normal.
		Two Flashes: The Smart Communication Stick is Not Connected to the base station.
		Four Flashes: The Smart Communication Stick is connected to the base station, but Not Connected to the server.
		Six Flashes: Communication between the Smart Communication Stick and the inverter is disconnected.
		Off: Smart Communication Stick is undergoing a software reset or is not powered on.

Button	Description
Reload	Press and hold for 0.5–3 seconds; the Smart Communication Stick will restart.
	Press and hold for 6–20 seconds; the Smart Communication Stick will restore factory settings.

6.3.5.3 Ezlink3000

Indicator Light/Silkscreen	Color	Status	Description
	Blue		Flashing = The Communication Stick is operating normally.

Indicator Light/Silkscreen	Color	Status	Description
Power indicator			Off = The Communication Stick is powered off.
Communication indicator	Green		Steady On = The Communication Stick is connected to the server.
			Double Flash = The Communication Stick is Not Connected to the router.
			Four Flashes = The Communication Stick is connected to the router, but Not Connected to the server.
RELOAD	-	-	• Short press for 1–3 seconds to restart the Communication Stick. • Long press for 6–10 seconds to restart the Communication Stick. Quickly double-click to enable the Bluetooth signal (lasts only 5 minutes).

7 System Commissioning

7.1 Introduction to Commissioning Methods

For inverter models without a screen, users need to use the APP to set parameters. For inverter models with a screen, users can set parameters via the APP or through the LCD screen.

7.2 Configuration via LCD

7.2.1 LCD Introduction

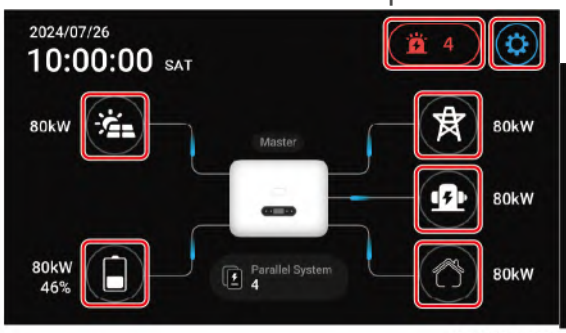
Through the LCD screen, users can:

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

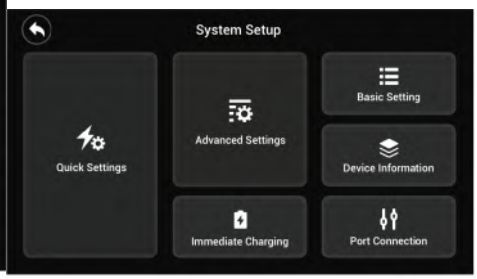
LCD Interface Introduction

The LCD supports both touch and button operation.

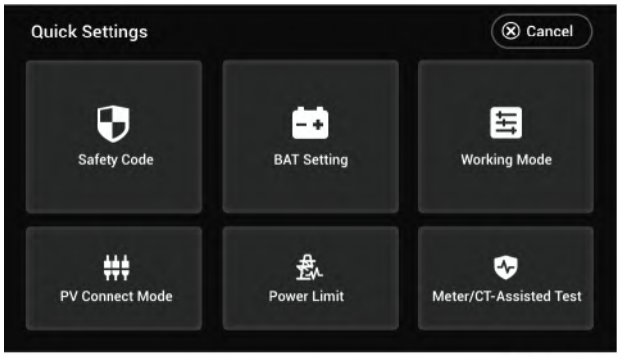




ESU10DSC0006



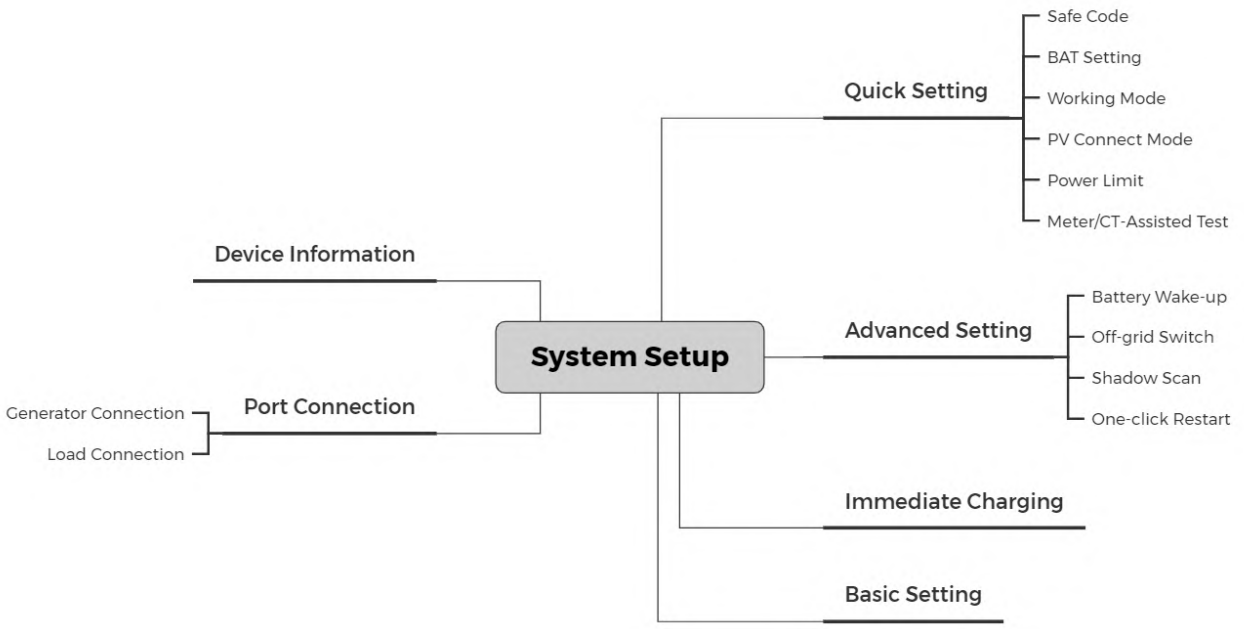
ESU10CON0007



ESU10CON0008

Name/Icon	Description
	Up
	Down
	Confirm
	• Short press: exit the page •  and  press and hold simultaneously for 5s: restart the device
	Used to view PV current, voltage, and Energy Generation information.
	Used to view battery model, status, and other information.
	Used to view inverter alarm and fault information.
	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 screen
Cancel	Return to the previous menu
Next	Go to the next settings page
Back	Return to the previous settings page

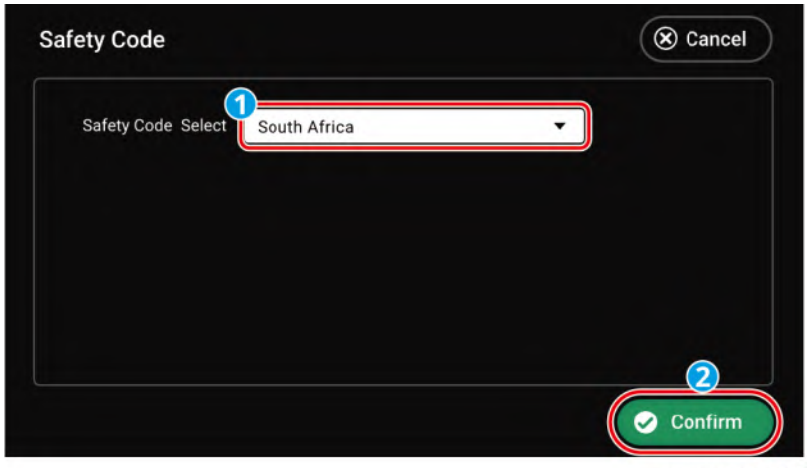
LCD settings interface structure



7.2.2 Quick Settings

Set Safety Code

1. On the main screen, tap > Quick Settings > Safe Code to enter the parameter settings screen.
2. Please set the parameters according to actual conditions.
3. After settings are complete, click Confirm. When the interface displays Confirm OK, the parameters are set successfully.



ESU10CON0009

Parameter Name	Safety Code	Description

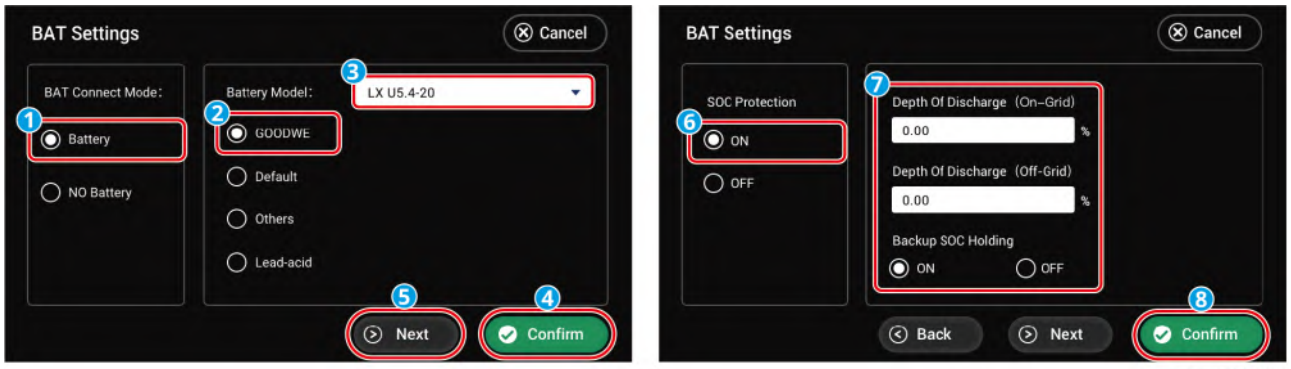
Safety Code select	South Africa	Select the corresponding safety code according to the country or region where the device is located.
	Pakistan	
	Argentina	
	Philippines	
	60Hz Default	
	50Hz Default	
	IEC61727 60Hz	

Set Battery Parameters

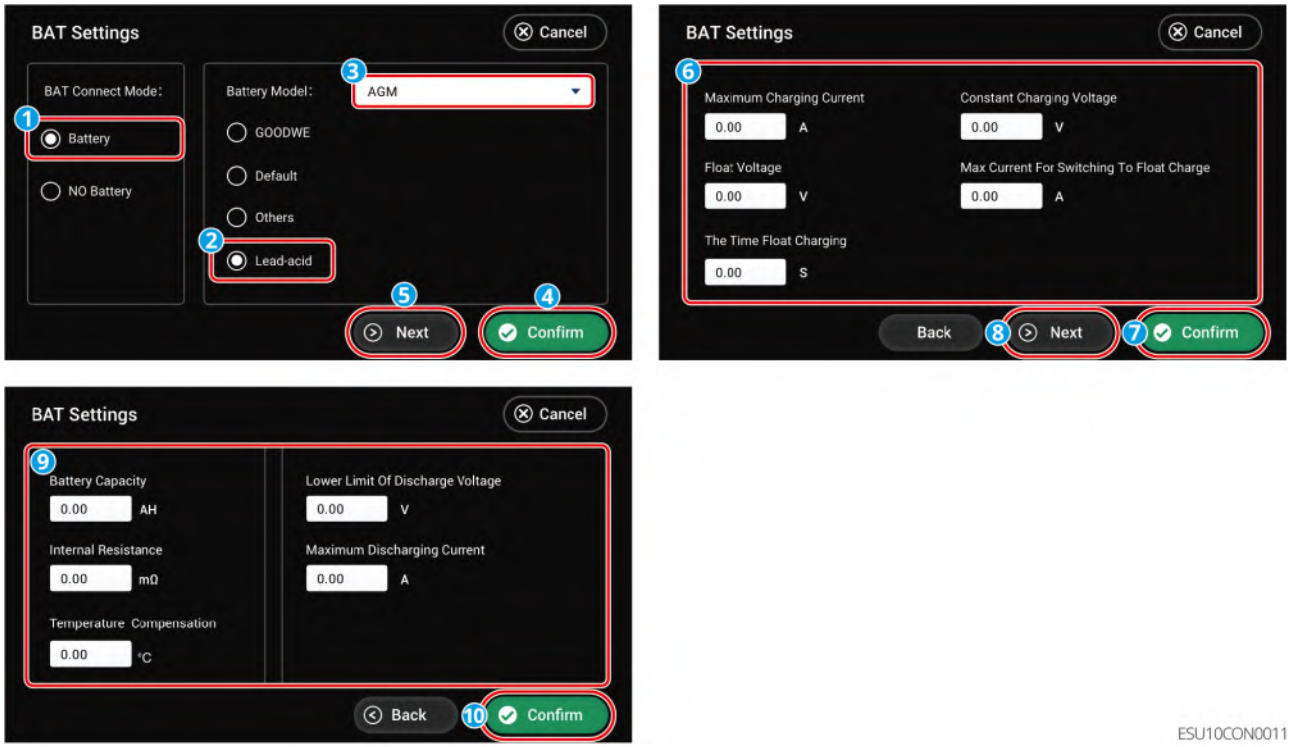
1. On the main screen, tap ⚙ > Quick Settings > BAT Setting to enter the parameter settings screen.
2. Please set the parameters according to actual conditions.
3. After settings are complete, click Confirm. When the interface displays Confirm OK, the parameters are set successfully.

NOTE

Please ensure Confirm is clicked on each page to make the parameters take effect; otherwise, the system will run with default parameters.



ESU10CON0010



General Data Settings

BAT Connection Mode	Type	Description
Battery	GOODWE	If the lithium battery connected in the system is of the GoodWe brand, select GOODWE and select the correct model. If the GOODWE battery model actually used is not in the options, set it using the App.
	Default	If the third-party lithium battery model connected in the system is not in this list, select according to the actual situation: • Lithium 50Ah • Lithium 100Ah
	Others	If the third-party lithium battery model connected in the system is in this list, select the correct model according to the actual situation.

	Lead acid	If the battery connected in the system is a lead-acid battery, select Lead acid and select the correct lead-acid type. Currently, GEL, AGM, and Flooded are supported.
NO Battery	No battery connected in the system	
BAT Setting	Configure according to the battery actually connected in the system.	

Lithium Battery Parameter Settings

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

Lead-Acid Battery Parameter Settings

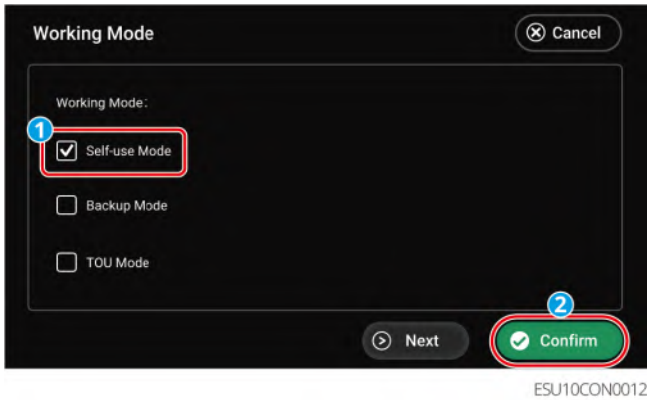
Parameter Name	Description
Maximum Charging Current	Battery charging defaults to constant charging mode; It is necessary to set the maximum charging voltage and maximum Charging Current in this mode; set them according to the battery technical parameters.
Constant Charging Voltage	
Float Voltage	When 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 is higher than 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 according to the battery technical parameters.
Maximum Discharging Current	Set according to the battery technical parameters. The greater 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 settings screen.
2. Please set the parameters according to actual conditions.
3. After settings are complete, click Confirm. When the interface displays Confirm OK, the parameters are set successfully.

NOTE
Please ensure Confirm is clicked on each page to make the parameters take effect; otherwise, the system will run with default parameters.



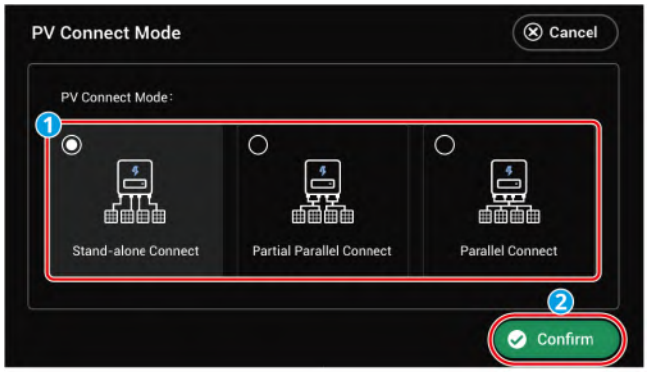
ESU10CON0012

Parameter Name	Description

Self-use Mode		When Working Mode Settings is set to Self-use Mode, Back-up Mode and TOU Mode can be enabled simultaneously. Select according to the actual situation. Working mode operation priority: Back-up Mode > TOU Mode > Self-use Mode.
Back-up Mode	Charging From Grid	Enable this function to allow the system to purchase power from the grid.
	Rated Power	The percentage of the inverter Rated Power used when purchasing power from the grid.
TOU Mode	Time	Between 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 (%)	Percentage of the inverter's Rated Power during charging or discharging.
	Bat (%)	Charging stops after the battery level reaches the set SOC. If you need to set the stop SOC for battery discharge, please 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.

Set PV Access Mode

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

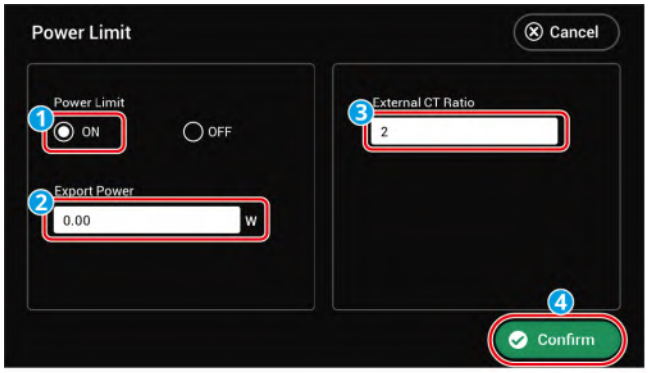


ESU10CON0015

Parameter Name	Description
Stand-alone Connect	PV strings are connected to the inverter-side MPPT ports in a one-to-one correspondence.
Partial Parallel Connect	When one PV string is connected to multiple MPPT ports on the inverter side, other PV modules are also 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 Power Limit

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



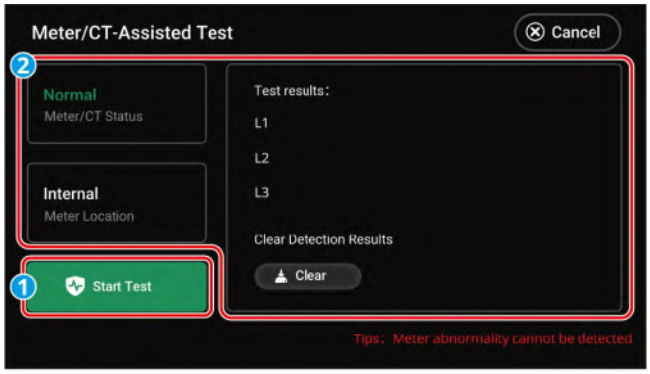
ESU10CON0016

Parameter Name	Description

Power Limit	When Output Power Limit is required according to the grid standard requirements of certain countries or regions, enable this function.
Export Power	Set according to the actual Maximum Power that can be fed into the grid.
External CT Ratio	Set as the ratio of the primary side current to the secondary side current of the external CT. • Built-in meter or GMK110: No need to set CT ratio. The default CT ratio is 120A/40mA. • GM330: The CT can be purchased from GoodWe or by yourself. CT ratio requirement: nA/5A • nA: CT primary side input current, n ranges from 200 to 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 setting interface.
2. Tap Start Test to start detection. After detection is complete, judge the detection result according to the on-screen prompts.

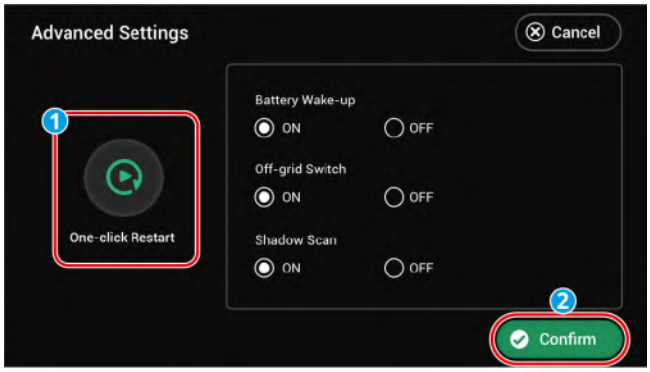


ESU10CON0026

7.2.3 Set Advanced Parameters

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

the parameters are set successfully.



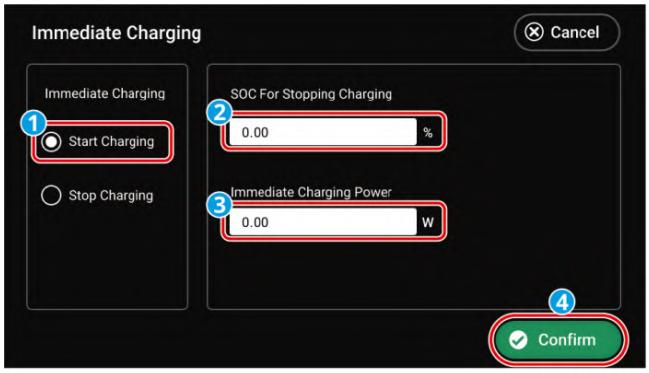
ESU10CON0020

Parameter Name	Description
One-click restart	Use this function to quickly restart the inverter.
Battery Wake-up	After enabling, when the battery shuts down due to undervoltage Protection, the battery can be awakened. If there is a circuit breaker between the lithium battery and the inverter, ensure that the circuit breaker is in the closed state. After enabling, the output voltage of the battery port is about 60V.
Off-grid Switch	In off-grid mode, the off-grid control switch controls the on/off of the inverter's off-grid function. In grid-tied mode, this function does not take effect. 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, you can clear the off-grid Overload time and restart off-grid output.
Shadow Scan	When the PV panels are severely shaded, enabling the shadow scan function can optimize the inverter's power generation Efficiency.

7.2.4 Set Immediate Charging

1. On the main screen, tap ⚙ > Immediate Charging to enter the parameter setting interface.
2. Please set the parameters according to actual conditions.

3. After settings are complete, click Confirm. When the interface displays Confirm OK, the parameters are set successfully.

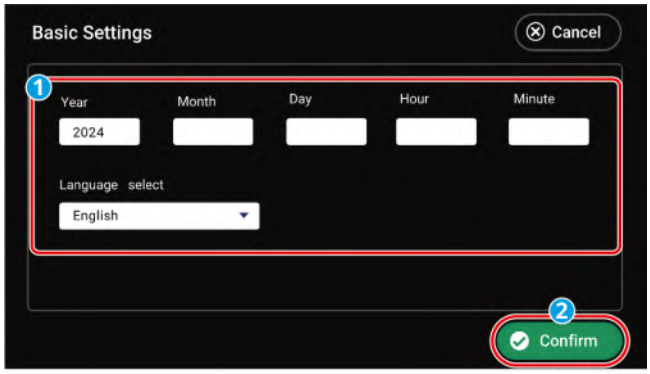


ESU10CON0021

Parameter Name	Description
Immediate Charging	After enabling, the grid immediately charges the battery. Only takes effect once. Please select enable or stop according to actual needs.
SOC For Stopping Charging	When Immediate Charging is enabled, charging the battery will stop when the battery SOC reaches the charge cut-off SOC.
Immediate Charging Power	When Immediate Charging is enabled, the percentage of charging power relative to the inverter Rated Power. For example, for an inverter with a Rated Power of 10 kW, when set to 60, the charging power is 6 kW.

7.2.5 Set General Data

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

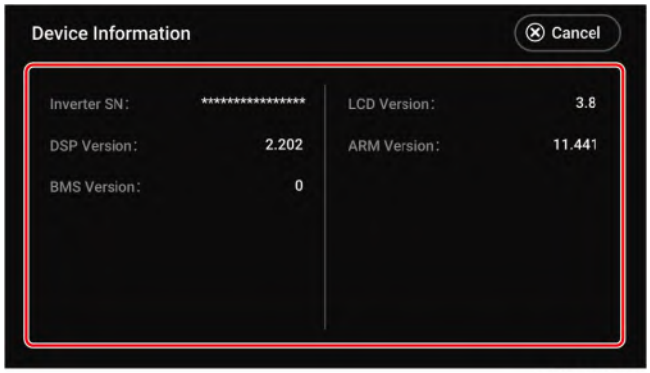


ESU10CON0027

7.2.6 View Device Information

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

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



ESU10CON0028

7.2.7 Set Port Connection

NOTE
In microgrid mode, if you need to set relevant parameters of the grid-tied inverter, please connect to the APP for configuration.

Set Port Connection for Generator

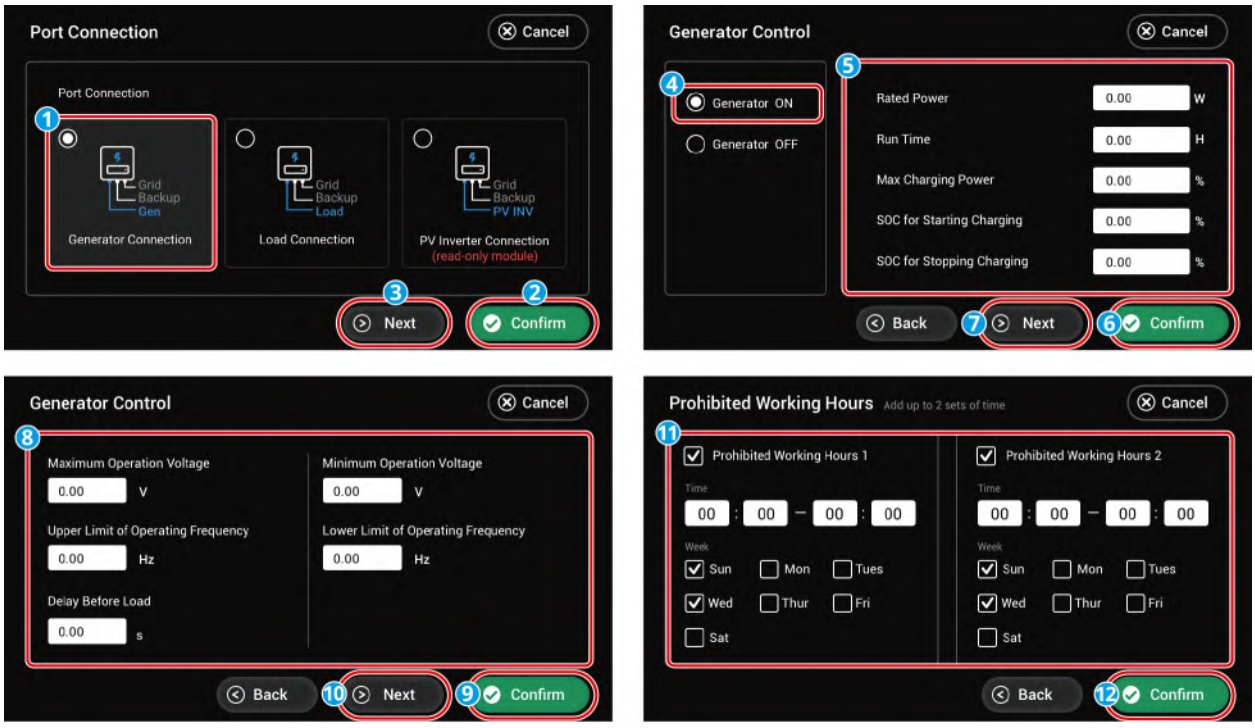
1. On the main screen, tap ⚙ > Port Connection to enter the parameter setting

screen.

2. Please set the parameters according to actual conditions.
3. After settings are complete, click Confirm. When the interface displays Confirm OK, the parameters are set successfully.

NOTE

Please ensure Confirm is clicked on each page to make the parameters take effect; otherwise, the system will run with default parameters.



No.	Parameter Name	Description
1	Generator ON/OFF	Control the start/stop of the generator. Only for 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 connection.
4	Max Charging Power	Set the Max. Charging Power for the generator to charge the battery.

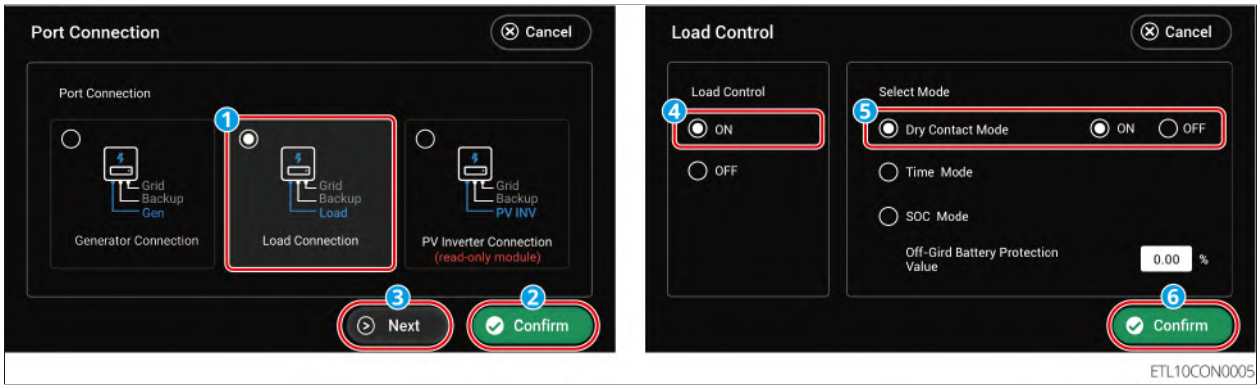
5	SOC for Starting Charging	Set the start SOC for the generator to charge the battery. When the battery SOC is lower than the set value, the generator will charge the battery.
6	SOC for Stopping Charging	Set the SOC at which the generator stops charging the battery. When the battery SOC reaches the set 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 limit of the generator operating frequency.
10	Lower Limit Of Operating Frequency	Set the lower limit of the generator operating frequency.
11	Delay Before Load	No-load warm-up time before the generator is loaded.
12	Prohibited Working Hours	Please set the generator prohibited working time according to actual conditions.

Set Port Connection for Load Control

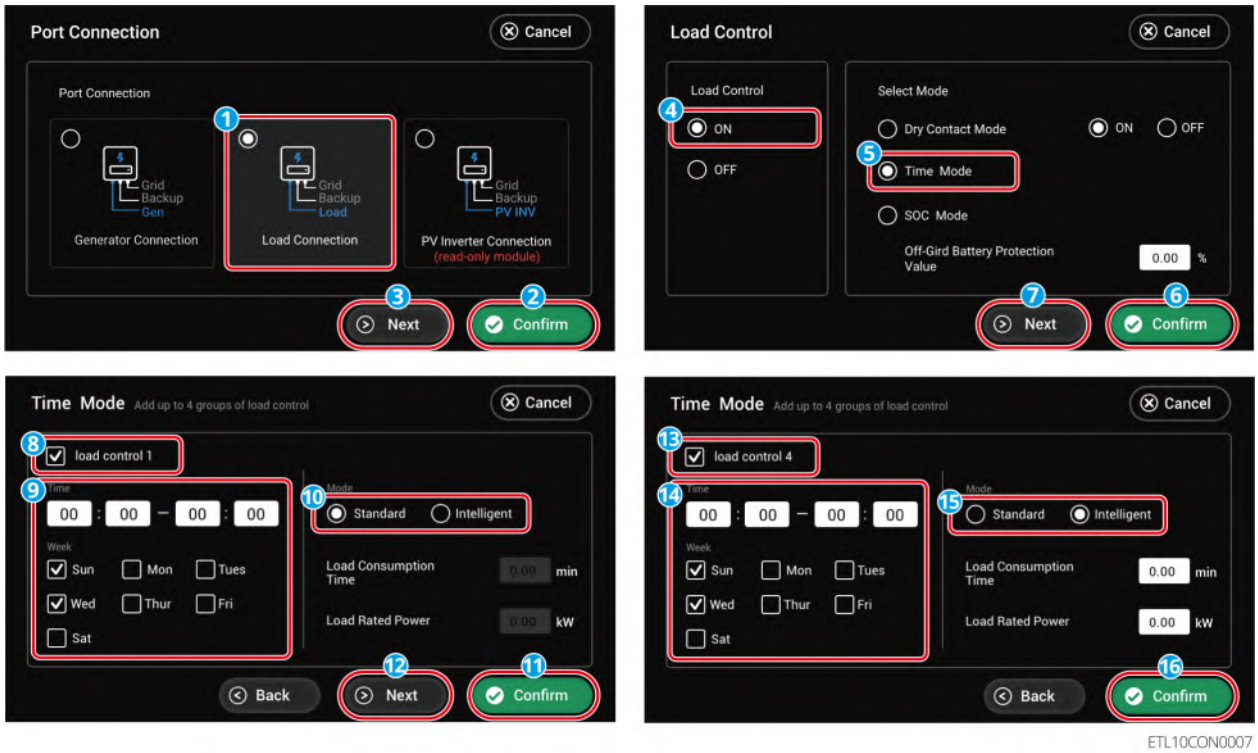
1. On the main screen, tap > Port Connection to enter the parameter setting screen.
2. Please set the parameters according to actual conditions.
3. After settings are complete, click Confirm. When the interface displays Confirm OK, the parameters are set successfully.

NOTE
Please ensure Confirm is clicked on each page to make the parameters take effect; otherwise, the system will run with default parameters.

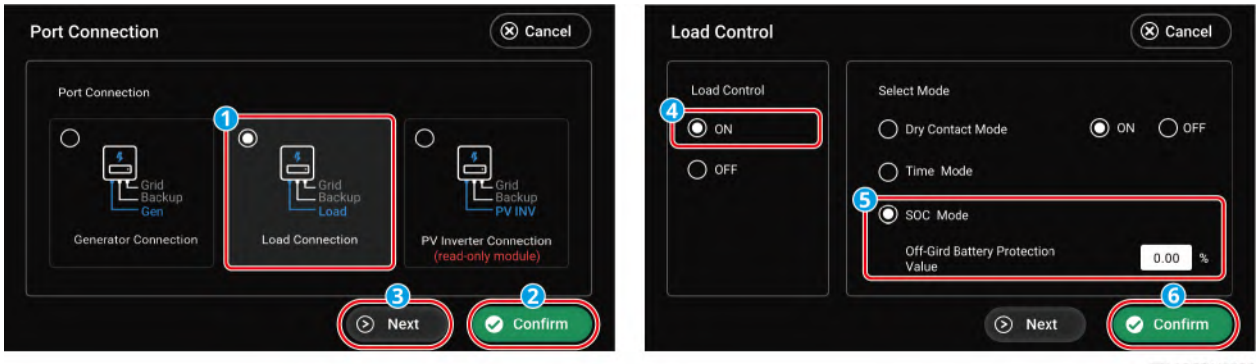
Dry Contact Mode



Time Mode



SOC Mode



No.	Parameter Name	Description
1	Load Control ON/OFF	Set load control function on/off
2	Dry Contact Mode	ON: When the switch status is selected as 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, power to the load will be automatically supplied or cut off. You can select Standard Mode or Smart Mode.
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 load Rated Power, it starts supplying power to the load.
6	Load Consumption Time	The minimum running time after the load is turned on, to prevent the load from frequently switching on and off 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, it starts 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 the relay can control whether to supply power to the load.
9	Off-Grid Battery Protection Value	In off-grid mode, if an Overload is detected at the BACK-UP terminal or the battery SOC value is lower than the off-grid battery Protection setting, power supply to the load connected to the relay port can be stopped. Please set the off-grid battery Protection value according to actual needs.

8 System Commissioning and Plant Monitoring

8.1 Set Inverter Parameters via the App.

SEMS+ App is a software used for remote plant monitoring or local device commissioning. It supports installers or owners:

- Remotely monitor plant operating status and set plant and device operating parameters.
- Connect to devices locally to view device operating status and set device parameters.

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

SEMS+ App User Manual

8.1.1 Download and Install SEMS+ App

Phone requirements

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

Download methods
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 phone's home screen.
- 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 plant's operating status without opening the App.

8.2 Plant Monitoring via SEMS+ WEB

SEMS+ WEB is a monitoring platform that can communicate via WiFi 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, refer toSEMS+ WEB User Manual。



SEMS+ WEB User Manual

9 System Maintenance

9.1 System Power-Off

⚠DANGER

- When performing operation and maintenance on devices in the system, please power off the system. Operating devices with power on may cause equipment damage or electric shock hazards.
- After the device is powered off, it takes some time for internal components to discharge. Please wait according to the time required on the label until the device is fully discharged.
- To restart the battery, use the air switch power-on method to 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 will power off all batteries.

NOTE

- The circuit breakers between the inverter and the battery, and 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 automatically close after being opened. If the battery system switch is not used for a long time, secure it with screws.

Power-Off Procedure

1. Disconnect the ON-GRID circuit breaker.
2. Disconnect the BACK-UP circuit breaker.
3. (Optional) Disconnect the GEN circuit breaker.
4. (Select according to local regulations) Disconnect the switch between the inverter and the battery.

5. Power off the battery system:
   a. LX A5.0-10, LX A5.0-30, GW5.0-BAT-LVI-G10: Long press the battery multi-function button for more than 5 seconds to power off all batteries.
   b. LX U5.4-L, LX U5.4-20: Close the battery system integrated circuit breaker or long press the battery system button for ≤5 seconds; the battery system integrated circuit breaker will automatically open, and all batteries will power off.
   c. LX U5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10, GW10.0-BAT-LV-G10: Long press the battery system button for ≥5 seconds; the battery system integrated circuit breaker will automatically open, and all batteries will power off.
6. (Select according to local regulations) Disconnect the circuit breaker between the PV modules and the inverter. Disconnect the inverter's DC Switch.
7. (Only for models without screen) Disconnect the inverter's off-grid control switch.

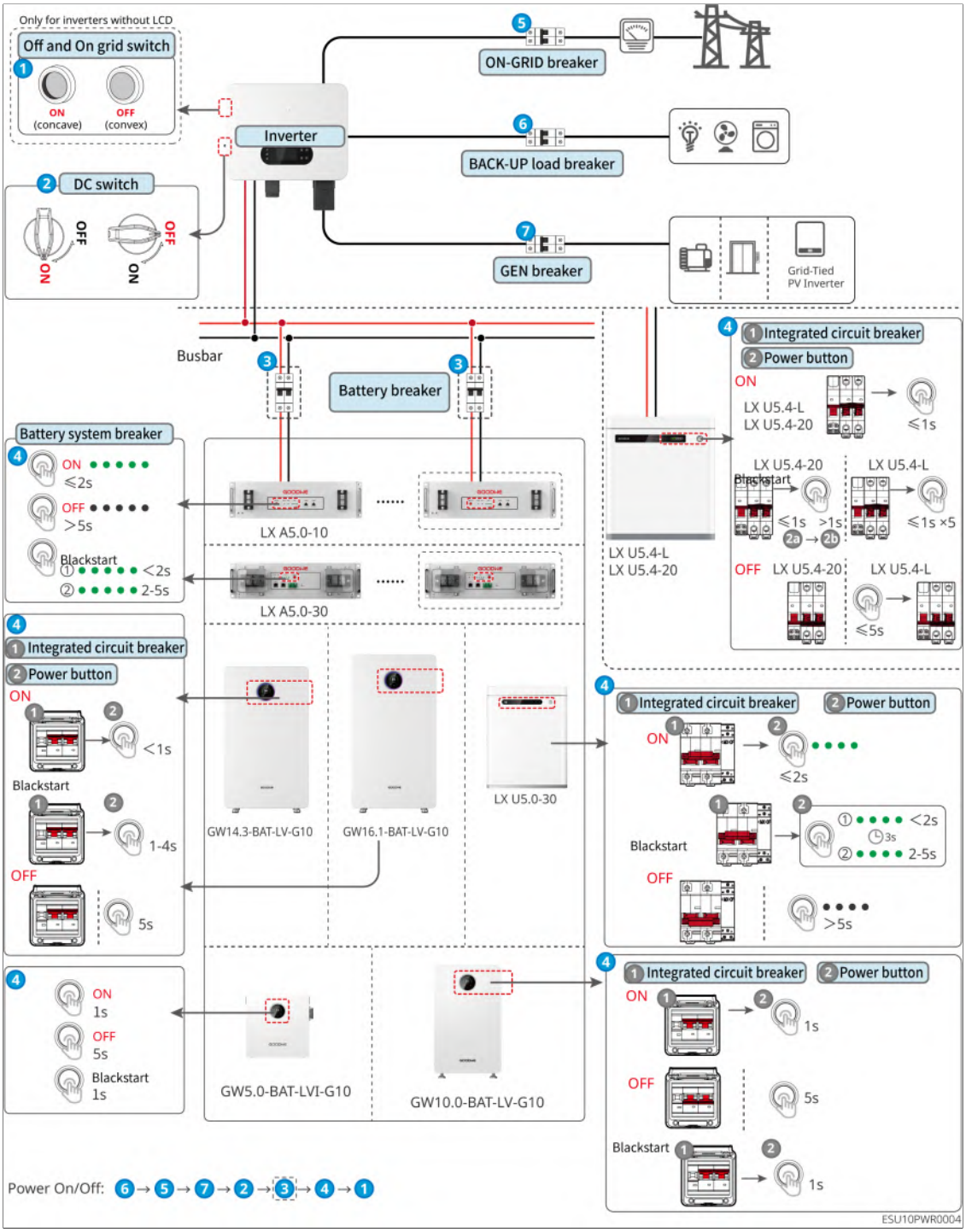


Figure60 Single-unit system

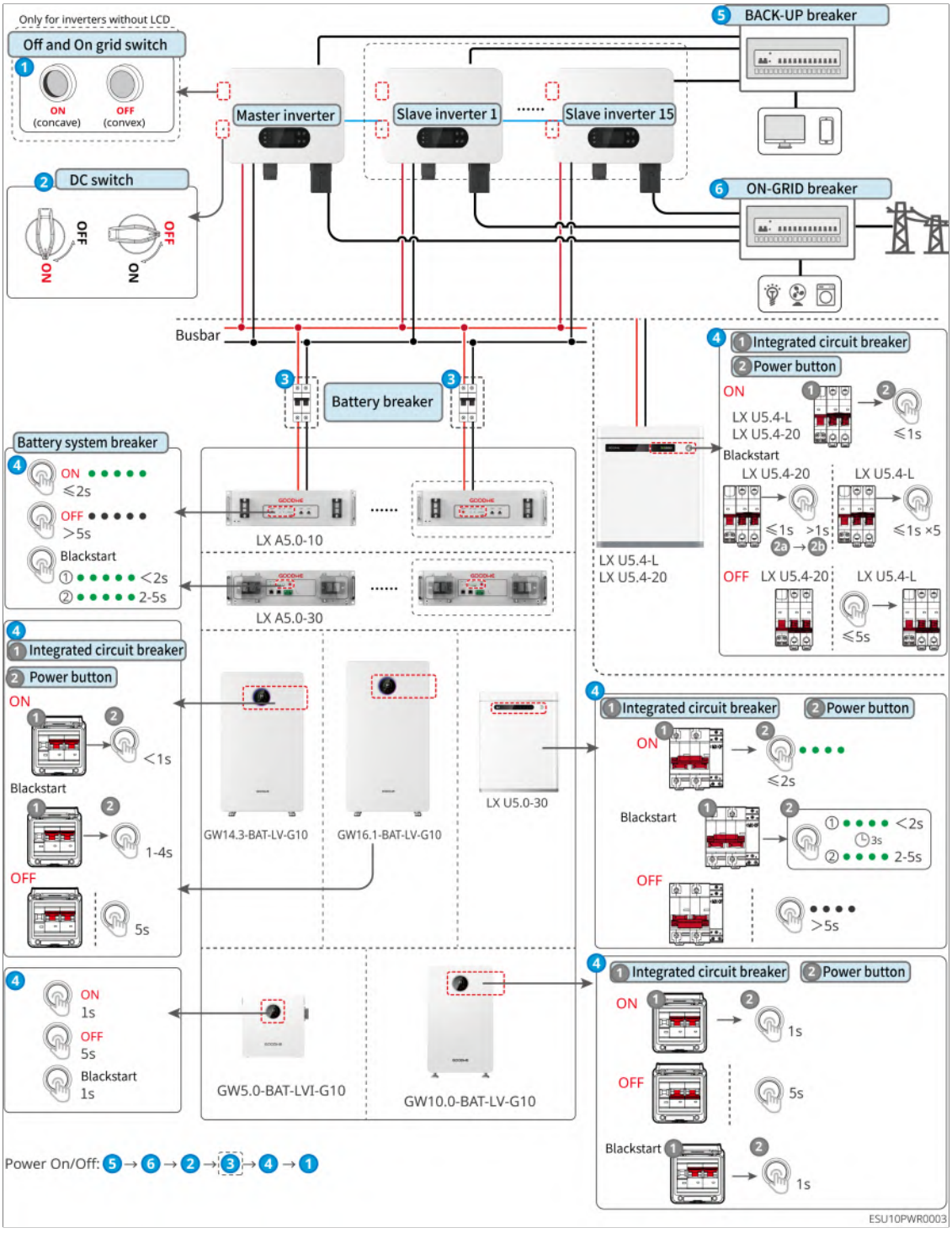


Figure61 Parallel system

9.2 Equipment Removal

DANGER

- Ensure that the device is powered off.
- Wear personal protective equipment when operating the equipment.
- When removing wiring terminals, use standard removal tools to avoid damaging the terminals or equipment.
- Unless otherwise specified, the equipment disassembly procedure is the reverse of the installation procedure and will not be described again in this document.

1. De-energize the system.
2. Label the cables connected in the system to identify their 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 wires.
4. Remove devices such as the Smart Dongle, inverter, battery, and smart meter.
5. Store the equipment properly. If it will be put into service later, ensure that the storage conditions meet the requirements.

9.3 Equipment Disposal

If 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 household waste.

9.4 Periodic Maintenance

WARNING

- If any problem that may affect the battery or energy storage inverter system is found, contact after-sales personnel. Unauthorized disassembly is prohibited.
- If the internal copper wire of a conductive cable is exposed, do not touch it. High voltage hazard. Contact after-sales personnel. Unauthorized disassembly is prohibited.
- If other emergencies occur, contact after-sales personnel immediately, perform operations under their guidance, or wait for after-sales personnel to perform operations on site.

Maintenance Item	Maintenance Method	Maintenance Cycle	Maintenance Purpose
System Cleaning	Check the heat sink, fan, and air inlet/outlet for foreign objects and dust. Check whether the installation space meets the requirements, and check whether debris has accumulated around the equipment.	Once every 6 months	Prevent heat dissipation failures.
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	Confirm the stability of the equipment installation.
Electrical Connections	Check whether the electrical connections are loose, whether the cable appearance is damaged, and whether exposed copper is present.	Once every 6 months to once a year	Confirm electrical connection reliability.

Maintenance Item	Maintenance Method	Maintenance Cycle	Maintenance Purpose
Sealing performance	Check whether the sealing of the equipment cable entry holes meets requirements. If there are excessively large gaps or the holes are not sealed, reseal them.	Once/year	Confirm that the machine is sealed and the waterproof performance is intact.
Battery maintenance	If the battery has not been used or fully charged for a long time, it is recommended to charge the battery periodically.	Once/15 days	Protection of battery service life.

9.5 Fault

NOTE
The fault content in this manual is updated from time to time. Faults vary slightly among different models. Please refer to the real-time display of the device for details.

9.5.1 View Fault/Alarm Details

All fault and alarm details of the energy storage system are displayed in**SolarGo App**、**SEMS+ App, SEMS+ WEB**and the LCD screen. If your product is abnormal and no related fault information is seen in**SolarGo App**、**SEMS+ App, SEMS+ WEB**or the LCD screen, please contact the after-sales service center.

- LCD screen

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

- SolarGo App

Go to [Home] > [Parameters] > [Alarm] to view energy storage system alarm information.

- SEMS+ App

1. Open the SEMS+ App and log in with any account.
2. On the home page, click "Alarm" to view alarm information for all plants in the account

- 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 Troubleshooting Methods

Please troubleshoot faults according to the following methods. If the troubleshooting methods do not help, please contact the after-sales service center.
When contacting the after-sales service center, please collect the following information to help resolve the issue quickly.

1. Product information, such as serial number, software version, device installation time, fault occurrence time, fault occurrence frequency, etc.
2. Device installation environment, such as weather conditions, whether the PV modules are shaded or have shadows, etc. For the installation environment, 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 a problem not listed occurs in the system, or if the problem or abnormality still cannot be prevented even after following the instructions, immediately stop system operation and immediately contact your dealer.

No.	Fault	Corrective Measures
1	Unable to find the wireless signal of the smart communication stick	1. Ensure that no other devices are connected to the wireless signal of the smart communication stick. 2. Ensure that the App has been updated to the latest version. 3. Ensure that the smart communication stick is properly powered, and the blue indicator is blinking or steadily on. 4. Ensure that the smart device is within the communication range of the smart communication stick. 5. Refresh the device list in the App. 6. Restart the inverter.
2	Unable to connect to the wireless signal of the smart communication stick	1. Ensure that no other devices are connected to the wireless signal of the smart communication stick. 2. Restart the inverter or communication stick, and try to connect to the wireless signal of the smart communication stick again. 3. Ensure encrypted Bluetooth pairing is successful.
3	 The Ezlink indicator blinks twice	1. Ensure the router is turned on. 2. When using LAN communication, ensure that the LAN cable is properly connected and the communication configuration is correct. Enable or disable the DHCP function as needed. 3. When using Wi-Fi communication, ensure that the Wi-Fi Network connection is normal and the wireless signal strength meets the requirements. Enable or disable the DHCP function as needed.

No.	Fault	Corrective Measures
4	 The Ezlink indicator blinks four times	1. Please ensure that the communication stick is properly connected to the router via WiFi or LAN, and that the router can access the Internet normally. 2. If the problem persists, please contact the after-sales service center.
5	 Ezlink indicator is off	Please ensure that the inverter is powered on. If the problem persists, please contact the after-sales service center.
6	 Ezlink indicator is off	Please ensure that the inverter is powered on.
7	Unable to find the router SSID	1. Place the router closer to the smart communication stick, or add a WiFi repeater to enhance the WiFi signal. 2. Reduce the number of devices connected to the router.
8	After all configurations are complete, the smart communication stick 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 stick, or add a WiFi repeater to enhance the WiFi signal.
9	After all configurations are complete, the smart communication stick fails to connect to the server	Restart the router and the inverter.

9.5.2.2 Inverter Fault

9.5.2.2.1 Fault Handling (Fault Codes F01-F40)

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F01	Grid Power Outage	1. Grid power outage. 2. The AC line or AC Switch is disconnected.	1. The alarm automatically disappears after grid power supply is restored. 2. Check whether the AC line or AC Switch is disconnected.
F02	Grid Overvoltage Protection	The grid voltage is higher than the allowable range, or the high-voltage Duration exceeds the high voltage ride-through setpoint.	1. If it occurs occasionally, it may be 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 setpoint also needs to be modified after obtaining the consent of the local power operator. 3. If it cannot recover for a long time, check whether the AC-side circuit breaker and output cable are connected properly.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F03	Grid Undervoltage Protection	The grid voltage is lower than the allowable range, or the Low Voltage Duration exceeds the Low Voltage Ride-Through setpoint.	1. If it occurs occasionally, it may be 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 setpoint also needs to be modified after obtaining the consent of the local power operator. 3. If it cannot recover for a long time, check whether the AC-side circuit breaker and output cable are connected properly.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F04	Grid Rapid Overvoltage Protection	Abnormal grid voltage detection or ultra-high voltage triggers the fault.	1. If it occurs occasionally, it may be 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 setpoint also needs to be modified after obtaining the consent of the local power operator. 3. If it cannot recover for a long time, check whether the AC-side circuit breaker and output cable are connected properly.
F05	10minOvervoltage	Within10minthe grid voltage sliding average exceeds the range specified by safety regulations.	Check whether the grid voltage operates at a relatively high voltage for a long time. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, contact your local power operator. If yes, you also need to modify the Grid10minOvervoltage protection point.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F06	Grid Overfrequency	Grid abnormal: The actual grid frequency is higher than the local grid standard requirements.	1. If it occurs occasionally, it may be 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 your local power operator. If yes, you also need to modify the Grid Overfrequency protection point after obtaining consent from the local power operator.
F07	Grid Underfrequency	Grid abnormal: The actual grid frequency is lower than the local grid standard requirements.	1. If it occurs occasionally, it may be 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 your local power operator. If yes, you also need to modify the Grid Underfrequency protection point after obtaining consent from the local power operator.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F08	Grid Frequency Instability	Grid abnormal: The actual grid frequency change rate does not comply with the local grid standard.	1. If it occurs occasionally, it may be 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 your local power operator.
F09	Anti-islanding Protection	The grid has been disconnected; the grid voltage is maintained due to the presence of the load. According to safety code Protection requirements, stop grid connection.	1. If it occurs occasionally, it may be 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 your local power operator.
F10	Voltage Ride-Through Undervoltage Fault	Grid abnormal: The duration of Grid Voltage Abnormal exceeds the time specified for high/low voltage ride-through.	1. If it occurs occasionally, it may be 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 and frequency are within the allowable range and stable. If not, contact your local power operator.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F11	HVRT Overvoltage	Grid abnormal: The duration of Grid Voltage Abnormal exceeds the time specified for high/low voltage ride-through.	1. If it occurs occasionally, it may be 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 and frequency are within the allowable range and stable. If not, contact your local power operator.
F12	30mAGfciProtection	The input-to-ground insulation impedance becomes low during inverter operation.	1. If it occurs occasionally, it may be caused by a sporadic external line abnormality. After the fault is cleared, normal operation will resume and no manual intervention is 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	The input-to-ground insulation impedance becomes low during inverter operation.	1. If it occurs occasionally, it may be caused by a sporadic external line abnormality. After the fault is cleared, normal operation will resume and no manual intervention is 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	Fault Handling Suggestion
F14	150mAGfciProtection	The input-to-ground insulation impedance becomes low during inverter operation.	1. If it occurs occasionally, it may be caused by a sporadic external line abnormality. After the fault is cleared, normal operation will resume and no manual intervention is 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	GfciSlow Change Protection	The input-to-ground insulation impedance becomes low during inverter operation.	1. If it occurs occasionally, it may be caused by a sporadic external line abnormality. After the fault is cleared, normal operation will resume and no manual intervention is 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	High DC Component: The DC component of the inverter output current is higher than the allowable range specified by safety regulations or the machine default.	1. If the abnormality is caused by an external fault, the inverter will automatically resume normal operation after the fault disappears, and no manual intervention is required. 2. If this alarm occurs frequently and affects the normal power generation of the plant, please contact your distributor or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F17	DCIProtection Level2	High DC Component: The DC component of the inverter output current is higher than the allowable range specified by safety regulations or the machine default.	1. If the abnormality is caused by an external fault, the inverter will automatically resume normal operation after the fault disappears, and no manual intervention is required. 2. If this alarm occurs frequently and affects the normal power generation of the plant, please contact your distributor or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F18	Low Insulation Resistance	1. The PV string is short-circuited to protective 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. Battery port line-to-ground Low Insulation Resistance.	1. Check the impedance of the PV string/battery port to protective ground. If a short circuit occurs, identify the short-circuit point and rectify it. 2. Check whether the inverter's protective ground conductor 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 reset the inverter's“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 the alarm notification method is set, alarm information can be sent to the customer by email.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F19	Grounding Abnormal	1. The inverter's protective ground conductor is Not Connected. 2. When the output of the PV string is grounded, no isolation transformer is connected on the inverter output side.	1. Please confirm whether the inverter's protective ground conductor is Not Connected properly. 2. In the scenario where the output of the PV string is grounded, please confirm whether an isolation transformer is connected on the inverter output side.
F20	Hard Power Limit Protection	Abnormal Load Fluctuation	1. If the abnormality is caused by an external fault, the inverter will automatically resume normal operation after the fault disappears, and no manual intervention is required. 2. If this alarm occurs frequently and affects the normal power generation of the plant, please contact your distributor or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
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 firmware version error	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
		MasterDSPcanmodule error, SlaveDSP1canmodule error or SlaveDSP2canmodule error: 1. Frame format error 2. Parity error 3. can busoffline 4. HardwareCRCcheck error 5. When transmitting (receiving), the control bit is receive (transmit) 6. Transmission to an unauthorized unit	
F22	Generator waveform detection fault		
F23	Generator Abnormal Connection		
F24	Generator Voltage Low		
F25	Generator Voltage High		

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F26	Generator Frequency Low	1. When the generator is Not Connected, this fault will be displayed continuously; 2. When the generator is operating, failure to meet generator safety regulations will trigger this fault.	1. When the generator is not connected, ignore this fault; 2. It is normal for this fault to occur when the generator has a fault. 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 at the same time and meet the safety regulation requirements, the grid has priority for grid connection, and the system will operate in grid-connected state.
F27	Generator Frequency High		
F28	ParallelI/OSelf-check Abnormal	Parallel communication cable is not securely connected or 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	Grid wires of some machines are reversed relative to others	Reconnect the grid wires.
F30	AC HCT check Abnormal	AC sensor sampling abnormal	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F31	GFCI HCT Check Abnormal	Leakage current sensor sampling abnormal	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F32	Inverter Internal Failure	Inverter fault detected	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F33	FlashR/W Abnormal	Possible causes: flashcontent has changed;flashlifespan exhausted;	1. Upgrade to the latest firmware; 2. Contact the distributor or after-sales service center.
F34	AFCI Check Failure	During the Arc Failure self-check, the Arc Failure module did not detect an Arc Failure as expected.	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F35	Cabinet Overtemperature	Cabinet Overtemperature, possible causes: 1. Insufficient ventilation at the inverter installation location. 2. Ambient Overtemperature. 3. Internal fan operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permissible ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature, 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	Fault Handling Suggestion
F36	Bus Overvoltage	BUSovervoltage, possible causes: 1. PVvoltage too high; 2. InverterBUSvoltage sampling abnormal; 3. The isolation performance of the dual-split transformer at the rear end of the inverter is poor, causing two inverters to affect each other during grid connection; one inverter reports DC overvoltage when connecting to the grid;	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F37	PVInput Overvoltage	PVinput voltage 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 exceed the inverter's 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's maximum operating voltage. After the PV array is configured correctly, the inverter alarm automatically disappears.
F38	PVContinuous Hardware Overcurrent	1. Improper module configuration 2. Hardware damage	Disconnect the AC output side switch and DC input side switch,5minutes later close the AC output side switch and DC input side switch. If the fault still exists, 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 DC input side switch,5minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F40, F98	String Reverse Connection(String1-n) n: Determine according to the actual Number of Strings of the inverter	PVString Reverse Connection	Check whether the strings are connected in reverse.

9.5.2.2.2 Troubleshooting (Fault Codes F41-F80)

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F41	Generator Port Overload	1. The off-grid side output exceeds the requirements specified in the datasheet 2. Off-grid side short circuit 3. Off-grid terminal voltage too low 4. When used as a high-load port, the high load exceeds the requirements specified in the datasheet.	Use data to verify the off-grid side output voltage, current, power, and other data, and determine the cause of the issue.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F42, F164,F165	DC Arcing Failure(String1-n) n: Determine according to the actual Number of Strings of the inverter	1. DC-side connection terminal loose; 2. DC-side connection terminal has poor contact; 3. DC cable conductor damaged causing poor contact	1. After the machine 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 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 and frequency are within the allowable range and stable. If not, contact your local power operator.
F44	Grid Phase Loss	Grid abnormality: single-phase voltage sag on the grid.	1. If it occurs occasionally, it may be 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 and frequency are within the allowable range and stable. If not, contact your local power operator.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F45	Grid Voltage Imbalance	Grid phase voltage difference is too large.	1. If it occurs occasionally, it may be 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 and frequency are within the allowable range and stable. If not, contact your local power operator.
F46	Grid Phase Sequence Failure	Inverter and grid wiring abnormality: wiring is not in positive phase sequence.	1. Check whether the inverter and grid wiring is in positive phase sequence. After the wiring is correct (e.g., swap any two live wires), the fault automatically disappears. 2. If the wiring is correct but the fault persists, please contact the distributor or after-sales service center.
F47	Grid Rapid Shutdown Protection	Quickly shut down the output after detecting a Grid Power Outage condition.	The fault automatically disappears after grid power supply is restored.
F48	Grid Neutral Wire Loss (Splitgrid)	Split-phase Grid Neutral Wire Loss	1. The alarm automatically disappears 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	Detect output phase line toPEimpedance, and find out the location with low impedance and repair it.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F50	DCVProtection Level1	Abnormal Load Fluctuation	1. If the abnormality is caused by an external fault, the inverter will automatically resume normal operation after the fault disappears, and no manual intervention is required. 2. If this alarm occurs frequently and affects the normal power generation of the plant, please contact your distributor or after-sales service center.
F51	DCVProtection Level2	Abnormal Load Fluctuation	
F52	Leakage current (GFCI) Multiple fault shutdown	North American safety regulations require that after multiple faults, automatic recovery is not allowed; manual reset is required or wait24hto recover	Please check whether the PV string's impedance to ground is too low.
F53	DC Arc Failure (AFCI) Multiple fault shutdown	North American safety regulations require that after multiple faults, automatic recovery is not allowed; manual reset is required or wait24hto recover	1. After the machine 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	Fault Handling Suggestion
F54	External communication link disconnected	Communication with external devices of the inverter is lost. Possible causes include power supply issues for peripherals, mismatched Communication Protocols, or no corresponding peripherals configured.	Make the judgment 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 of the inverter.	Turn off some off-grid loads to reduce the inverter's off-grid output power.
F56	Back-upOutput Overvoltage	Prevent load damage caused by inverter output overvoltage.	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 forBoxto switch relays takes too long	1. Check whetherBoxis operating normally; 2. Check whetherBoxcommunication wiring is correct;
F58	CTLoss	CTconnection cable disconnected (Japanese safety regulation requirement)	Check whetherCTwiring is correct;

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F59	ParallelCAN Comm Abnormal	Parallel communication cable is not securely connected, or some machines are offline.	Check whether all machines are powered on and whether the parallel communication cables are securely connected.
F60	ParallelBack-upLine Reversed	Some machines'backuplines are reversed with others	Reconnectbackuplines.
F61	Inverter Soft Start Failure	Inverter Soft Start Failure during off-grid cold start	Check whether the machine's inverter module is damaged.
F62	AC HCT Failure	HCTSensor Abnormal	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F63	GFCI HCT Failure	GFCI HCT Sensor Abnormal	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F64	Inverter Internal Failure	Inverter fault detected	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F65	AC Terminal Overtemperature	AC Terminal Overtemperature, possible causes: 1. Insufficient ventilation at the inverter installation location. 2. Ambient Overtemperature. 3. Internal fan operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permissible ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature, 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. Insufficient ventilation at the inverter installation location. 2. Ambient Overtemperature. 3. Internal fan operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permissible ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature, 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	Fault Handling Suggestion
F67	BoostModule Overtemperature	BoostModule Overtemperature, possible causes: 1. Insufficient ventilation at the inverter installation location. 2. Ambient Overtemperature. 3. Internal fan operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permissible ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature, 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	AC Capacitor Overtemperature, possible causes: 1. Insufficient ventilation at the inverter installation location. 2. Ambient Overtemperature. 3. Internal fan operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permissible ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature, 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 causes: 1. IGBTShort Circuit 2. Inverter Sampling Circuit Abnormal	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F70	PV IGBTOpen Circuit	1. Software issue causing no PWM output: 2. Drive circuit abnormal: 3. IGBTOpen Circuit	
F71	NTCAbnormal	NTCTemperature Sensor Abnormal	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F72	PWM Abnormal	PWMAbnormal Waveform	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F73	CPUInterrupt Abnormal	CPUInterrupt Abnormal	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F74	Microelectronic Fault	Function Safety Abnormality Detected	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F75	PV HCTFault	boostCurrent Sensor Abnormal	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F76	1.5VRef Abnormal	Reference Circuit Fault	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, 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 DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F79	CPLDComm Failure	CPLDandDSPcommunication content error or timeout	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F80	Model Recognition Fault	Fault related to Model Recognition Error	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, 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	Fault Handling Suggestion
F81	P-Bus Overvoltage	BUSovervoltage, possible causes: 1. PVvoltage too high; 2. InverterBUSvoltage sampling abnormal; 3. The isolation performance of the dual-split transformer at the rear end of the inverter is poor, causing two inverters to affect each other during grid connection; one inverter reports DC overvoltage when connecting to the grid;	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F82	N-Bus Overvoltage		
F83	Bus Overvoltage (AuxiliaryCPU1)		

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F84	P-Bus Overvoltage (AuxiliaryCPU1)	BUSovervoltage, possible causes: 1. PVvoltage too high; 2. InverterBUSvoltage sampling abnormal; 3. The isolation performance of the dual-split transformer at the rear end of the inverter is poor, causing two inverters to affect each other during grid connection; one inverter reports DC overvoltage when connecting to the grid;	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F85	N-Bus Overvoltage (AuxiliaryCPU1)		
F86	Bus Overvoltage (AuxiliaryCPU2)		Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F87	P-Bus Overvoltage (AuxiliaryCPU2)		

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F88	N-Bus Overvoltage (AuxiliaryCPU2)	BUSovervoltage, possible causes: 1. PVvoltage too high; 2. InverterBUSvoltage sampling abnormal; 3. The isolation performance of the dual-split transformer at the rear end of the inverter is poor, causing two inverters to affect each other during grid connection; one inverter reports DC overvoltage when connecting to the grid;	
F89	P-Bus Overvoltage(CPLD)		Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F90	N-Bus Overvoltage(CPLD)	BUSovervoltage, possible causes: 1. PVvoltage too high; 2. InverterBUSvoltage sampling abnormal; 3. The isolation performance of the dual-split transformer at the rear end of the inverter is poor, causing two inverters to affect each other during grid connection; one inverter reports DC overvoltage when connecting to the grid;	
F91	FlyCap Software Overvoltage	FlyCap Overvoltage, Possible Causes: 1. PVvoltage too high; 2. Inverter FlyCap voltage sampling abnormal;	Disconnect the AC output side switch and DC input side switch,5minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F92	FlyCap Hardware Overvoltage		

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F93	FlyCap Undervoltage	FlyCap Undervoltage, Possible Causes: 1. PVenergy insufficient; 2. Inverter FlyCap voltage sampling abnormal;	Disconnect the AC output side switch and DC input side switch,5minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F94	FlyCap Precharge Failure	FlyCap Precharge Failure, Possible Causes: 1. PVenergy insufficient; 2. Inverter FlyCap voltage sampling abnormal;	Disconnect the AC output side switch and DC input side switch,5minutes later close the AC output side switch and DC input side switch. If the fault still exists, 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 DC input side switch,5minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F96, F97	String Overcurrent(String1-n) n: Determine according to the actual Number of Strings of the inverter	Possible causes: 1. String overcurrent; 2. String Current Sensor Abnormal	Disconnect the AC output side switch and DC input side switch,5minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F99, F100	String Loss(String1-n) n: Determine according to the actual Number of Strings of the inverter	String Fuse Open (if present)	Check whether the fuse is open.
F101	Battery1Precharge fault	Battery1Precharge Circuit Failure (Precharge Resistor Burnt 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 they are not consistent, contact your dealer or after-sales service center.
F102	Battery1Relay Failure	Battery1relay fails to operate normally.	After the battery is powered on, check whether the battery relay works and whether a closing sound is heard. If it does not operate, contact your dealer or after-sales service center.
F103	Battery1Connection overvoltage	Battery1connection voltage exceeds the rated range of the machine.	Confirm whether the Battery Voltage is within the rated range of the machine.
F104	Battery2Precharge fault	Battery2Precharge Circuit Failure (Precharge Resistor Burnt 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 they are not consistent, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F105	Battery2Relay Failure	Battery2relay fails to operate normally.	After the battery is powered on, check whether the battery relay works and whether a closing sound is heard. If it does not operate, contact your dealer or after-sales service center.
F106	Battery2Connection overvoltage	Battery2connection voltage exceeds the rated range of the machine.	Confirm whether the Battery Voltage is within the rated range of the machine.
F107	On-grid PWM Sync Failure	Carrier Synchronization Exception during Grid Connection	1. Check whether the synchronization cable connection is normal. 2. Check whether the master-slave settings are normal; 3. Disconnect the AC output side switch and DC input side switch,5 minutes later, close the AC output side switch and DC input side switch. If the fault persists, contact your dealer or after-sales service center.
F108	DSPCommunication Failure	-	-
F109	ExternalSTSFault	Inverter andSTSconnection cable abnormal	Check whether the harness connection wire sequence between the inverter andSTScorresponds one-to-one in order.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F110	Export Limit Protection	1. Inverter reports an error and disconnects from the grid. 2. meterCommunication unstable 3. Reverse current condition occurs	1. Check whether the inverter has other error messages. If yes, take targeted measures; 2. Check whethermeterconnection is reliable; 3. If this alarm occurs frequently and affects the normal power generation of the plant, please contact your distributor or after-sales service center.
F111	BypassOverload	-	-
F112	Black Start Failure	-	-
F113	Offgrid AC Ins Volt High	-	-
F114	Relay Failure2	Relay abnormality, cause: 1. Relay abnormality (relay short circuit) 2. Relay sampling circuit abnormal. 3. AC side wiring abnormal (loose connection or short circuit may exist)	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F115	SVGPrecharge Disabled	SVGPrecharge Hardware Failure	Contact the distributor or after-sales service center.
F116	SVGSVG PIDPrevention Failure	PIDHardware Abnormality	

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F117	DSPVersion Error	DSPSoftware Version Error	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F118	MOSContinuous Overvoltage	1. Software issue causes the inverter drive to be turned off earlier than the flyback drive: 2. Inverter drive circuit abnormality prevents turn-on: 3. PVvoltage too high; 4. Mosvoltage sampling abnormal;	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F119	Bus Short Circuit Fault	Hardware damage	If aBUSshort-circuit fault occurs, the inverter remains disconnected from the grid, contact your dealer or after-sales service center.
F120	Bus Sampling Abnormality	1. BUSvoltage sampling hardware fault	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F121	DCSample Abnormal	1. BUSvoltage sampling hardware fault 2. Battery Voltage sampling hardware fault 3. DcrlyRelay Failure	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, 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	Fault Handling Suggestion
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,4channelsPV are connected to the same PV module 2. Partial Parallel Mode: i.e.,AACCmode,PV1andPV2are same-source connected,PV3andPV4are same-source connected 3. Independent Mode: i.e.,ABCDmode(non-same-source），PV1、PV2、PV3、PV4are connected independently,4channelsPVare each connected to one PV module IfPVactual Access Mode and the	Check whetherPVAccess Mode is set correctly (ABCD、AACC、AAAA), then setPVAccess Mode 1. Confirm whether each actually connectedPVis correctly connected; 2. IfPVis correctly connected, check viaAPPor the screen 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 "PVAccess Mode" to the mode consistent with the actual situation; after setting, disconnectPVandACpower supply and restart; 4. After setting, if the current "PVAccess Mode" is consistent with the actual Access Mode but this fault is still reported, please contact the distributor or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
		device-setPVAccess Mode do not match, this fault will be reported	
F123	Multi-channelPVPhase Error	PVInput Mode Setting Error	Check whetherPVAccess Mode is set correctly (ABCD、AACC、AAAA), then setPVAccess Mode 1. Confirm whether each actually connectedPVis correctly connected; 2. IfPVis correctly connected, check viaAPPor the screen 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 "PVAccess Mode" to the mode consistent with the actual situation; after setting, disconnectPVandACpower supply and restart; 4. After setting, if the current "PVAccess Mode" is consistent with the actual Access Mode but this fault is still reported, please contact the distributor or after-sales service center.
F124	Battery1Reverse Connection Fault	Battery1Reverse Polarity	Check whether the positive and negative poles of the battery and the machine wiring terminals are consistent.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F125	Battery2Reverse Connection Fault	Battery2Reverse Polarity	Check whether the positive and negative poles of the battery and the machine wiring terminals are consistent.
F126	Battery Abnormal Connection	Battery Abnormal Connection	Check whether the battery is working normally.
F127	BAT Overtemperature	Battery overtemperature. Possible causes: 1. Insufficient ventilation at the inverter installation location. 2. Ambient Overtemperature. 3. Internal fan operating abnormally.	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F128	Ref Voltage Abnormal	Reference Circuit Fault	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F129	Cabinet Under Temperature	Cabinet Under Temperature. Possible cause: ambient temperature is too low.	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F130	ACSideSPDFault	AC-side SPD failure	ReplaceAC-side SPD.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F131	DCSideSPDFault	DC-side SPD failure	ReplaceDC-side SPD.
F132	Internal Fan Abnormal	Internal Fan Abnormal, possible causes: 1. Fan power supply abnormal; 2. Mechanical fault(locked rotor）; 3. Fan aging damage.	Disconnect the AC output side switch and DC input side switch,5 minutes later close the AC output side switch and DC input side switch. If the fault still exists, contact your dealer or after-sales service center.
F133	External Fan Abnormal	External Fan Abnormal, possible causes: 1. Fan power supply abnormal; 2. Mechanical fault(locked rotor）; 3. Fan aging damage.	
F134	PIDAbnormal	PIDhardware fault orPVovervoltage causesPIDpause	PVovervoltage-inducedPIDpause warning requires no action.PIDhardware faults can be cleared by turning off thePIDswitch and then turning it on to clear thePIDfault. Replace thePIDdevice.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F135	Trip-Switch Trip Warning	Possible causes: Overcurrent orPVreverse connection caused the trip switch to trip;	Contact the dealer or after-sales service center; the trip cause is the occurrence ofPVshort circuit or reverse connection. Check whether there is a historicalPVshort-circuit warning or historicalPVreverse-connection warning. If so, service personnel need to check the correspondingPVcondition. After inspection confirms no fault, the trip switch can be manually closed, and the warning can be cleared via theAPPinterface by clearing historical faults.
F136	HistoricalPV IGBT short-circuit warning	Possible causes: Overcurrent caused the trip switch to trip;	Contact the dealer or after-sales service center; maintenance personnel must, according to the historicalPVshort-circuit warning subcode, check whether theBoosthardware and external strings where the short circuit occurred are faulty; after inspection confirms no fault, the warning can be cleared via theAPPinterface by clearing historical faults.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F137, F138	HistoricalPVreverse-connection warning(String1-n) (n: determined according to the actual Number of Strings of the inverter)	Possible causes: The occurrence ofPVreverse connection caused the trip switch to trip;	Contact the dealer or after-sales service center; maintenance personnel must, according to the historicalPVreverse-connection warning subcode, check whether the corresponding strings are reverse-connected, and check whether thePVpanel configuration has a voltage difference; after inspection confirms no fault, the warning can be cleared via theAPPinterface by clearing historical faults.
F139	FlashR/W Error	Possible causes: 1. Flashcontent has changed; 2. Flashlifespan exhausted;	1. Upgrade to the latest firmware; 2. Contact the distributor or after-sales service center.
F140	Meter Comm Loss	This warning may be reported only after the Power Limit function is enabled. Possible causes: 1. Meter not connected; 2. Incorrect wiring of the communication cable between the meter and the inverter.	Check the meter wiring and connect the meter correctly. After checking, if the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F141	PVType Identification Failure	PVPanel Identification Hardware Abnormality	Contact the distributor or after-sales service center.
F142	PV String Mismatch	PVString Mismatch, under the sameMPPT, the two strings have different open-circuit voltage configurations.	Check the open-circuit voltages of the two strings and connect 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 whetherCTwiring.
F144	CTReversed	CTReversed	Check whetherCTwiring.
F145	PE Loss	PE Not Connected	Check the PE.
F146	PV String Terminal Overtemperature(String 1~8)	37176registerPVterminal temperature alarm subcode1is set	-
F147	PV String Terminal Overtemperature(String 9~16)	37177registerPVterminal temperature alarm subcode2is set	-
F148	PV String Terminal Overtemperature(String 17~20)	37178registerPVterminal temperature alarm subcode3is set	-

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F149	HistoricalPVreverse-connection warning(String33~48)	Possible causes: The occurrence ofPVreverse connection caused the trip switch to trip;	Contact the dealer or after-sales service center; maintenance personnel must, according to the historicalPVreverse-connection warning subcode, check whether the corresponding strings are reverse-connected, and check whether thePVpanel configuration has a voltage difference; after inspection confirms no fault, the warning can be cleared via theAPPinterface by clearing historical faults.
F150	Battery1Voltage Low	Battery Voltage is lower than the set value	-
F151	Battery2Voltage Low	Battery Voltage is lower than the set value	-
F152	Low Voltage of Battery Power	Battery is not in charging mode, and the voltage is lower than the shutdown voltage.	-
F153	Battery1Voltage High	-	-
F154	Battery2Voltage High	-	-

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F155	Online Low Insulation Resistance	1. The PV string is short-circuited to protective 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 strings to protective earth. If a short circuit occurs, rectify the short-circuit point. 2. Check whether the inverter's protective ground conductor is correctly connected. 3. If it is confirmed that the impedance is indeed lower than the default value in rainy weather, reconfigure the Insulation Impedance Protection Point.
F156	Micro-grid Overload Warning	backupterminal input current is too high	Occasional occurrence requires no action; if this alarm occurs frequently, contact the dealer or after-sales service center.
F157	Manual Reset	-	-
F158	Generator Phase Sequence Abnormal	-	-
F159	Multiplexed Port Configuration Abnormal	Multiplexed(Generator）port is configured as micro-grid or large load, but a generator is actually connected.	Use theAPPto change the multiplexed(Generator）port configuration.
F160	EMSForced Off-grid	EMSissues a forced off-grid command, but the off-grid function is not enabled.	Enable the off-grid function.

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
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.	Switch to the corresponding safety standard according to the actual Type of Electrical Supply System.
F163	Grid Phase Instability	Grid abnormality: the rate of change of grid voltage phase does not comply with the local grid standard.	1. If it occurs occasionally, it may be 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 your local power operator.
F166	PV Terminal Overtemperature	PV Terminal Overtemperature, possible causes: 1. Insufficient ventilation at the inverter installation location. 2. Ambient Overtemperature. 3. Internal fan operating abnormally.	

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F167	AC Terminal Overtemperature Warning	AC Terminal Overtemperature, possible causes: 1. Insufficient ventilation at the inverter installation location. 2. Ambient Overtemperature. 3. Internal fan operating abnormally.	1. Check whether the ventilation at the inverter installation location is adequate and whether the ambient temperature exceeds the maximum permissible ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature, improve the ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact your dealer or after-sales service center.
F168	Bat Terminal Overtemperature	Bat Terminal Overtemperature, possible causes: 1. Insufficient ventilation at the inverter installation location. 2. Ambient Overtemperature.	
F169	Bat Terminal Overtemperature Warning	Bat Terminal Overtemperature, possible causes: 1. Insufficient ventilation at the inverter installation location. 2. Ambient Overtemperature.	

Fault Code	Fault name	Fault Cause	Fault Handling Suggestion
F170	STS Overtemperature	STS Overtemperature, possible causes: 1. The STS installation location is not ventilated. 2. Ambient Overtemperature.	
F171	Inverter and Battery Wiring Abnormal	Abnormal power line connection between battery and inverter	Check whether the power line connection between the battery and inverter is normal.

9.5.2.2.5 Fault Symptom Handling

Fault name	Fault Cause	Fault Handling Suggestion
Generator Failure	1. If the generator is Not Connected, this fault will be displayed continuously 2. When the generator is running, failure to meet generator safety regulations will trigger this fault	1. If the generator is not connected, ignore this fault; 2. It is normal for this fault to occur when the generator is faulty. After the generator recovers, wait for a period of time; the fault will be automatically cleared; 3. This fault will not affect normal operation in off-grid mode. 4. When the generator and grid are connected at the same time and meet safety regulation requirements, the grid is prioritized for grid connection, and the system will operate in grid-connected state.

Fault name	Fault Cause	Fault Handling Suggestion
BMS Status Bit Error	BMS Module Failure	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 air 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.
PV Terminal Overtemperature	PV Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. Internal fan abnormal operation.	1. Check whether the ventilation at the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature occurs, improve the ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact your dealer or after-sales service center.
Bat Terminal Overtemperature	Bat Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature.	1. Check whether the ventilation at the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature occurs, improve the ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact your dealer or after-sales service center.

Fault name	Fault Cause	Fault Handling Suggestion
AC Terminal Overtemperature Warning	AC Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. Internal fan abnormal operation.	
Bat Terminal Overtemperature Warning	Bat Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature.	1. Check whether the ventilation at the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If there is no ventilation or Ambient Overtemperature occurs, improve the ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact your dealer or after-sales service center.
Three-phase on-grid fault	Three-phase external wiring error	Rewire.
External STS Failure	Inverter and STS connecting cable abnormal	Check whether the wire harness connection sequence between the inverter and the STS corresponds one-to-one in order.

Fault name	Fault Cause	Fault Handling Suggestion
Parallel Comm Timeout Shutdown	In parallel operation, if the slave unit exceeds400seconds without communicating to the master unit	Check whether the parallel communication harness is reliably connected, and check 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 system is connected to an inverter;
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 trigger,please contact the 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 automatically clears. 2. After the fault occurs, if a cluster-level Fire Fighting Failure is triggered, the air valve will automatically close, and the air valve status will be confirmed within 30 s to ensure that cluster-level fire fighting performs Protection in an enclosed space. 3. Please contact your dealer or after-sales service center.

Fault name	Fault Cause	Fault Handling Suggestion
The air valve open command of the combustible gas device is inconsistent with the feedback signal	The control signal for opening the air valve is inconsistent with the feedback signal	1. Check that the wiring harness signal connection has no issues. 2. Please contact your dealer or after-sales service center.
One-click shutdown and stop	Check via the App whether the one-click shutdown function is enabled	Disable one-click shutdown.
Offline shutdown	-	-
Remote shutdown	-	-
On-Grid SPD Fault	-	1. Try restarting the machine and observe whether the fault is cleared; 2. If the fault cannot be cleared 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 cannot be cleared after restarting, please contact your dealer or after-sales service center.

Fault name	Fault Cause	Fault Handling Suggestion
Child Node Communication Failure	Internal Comm Abnormal	1. Try restarting the machine and observe whether the fault is cleared; 2. If the fault cannot be cleared 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 cannot be cleared after restarting, please contact your dealer or after-sales service center.
Combustible Gas Detection Device Communication Failure	1. The combustible gas equipment was not properly configured at the factory so that the 485 address is 2. 2. Abnormal communication link between the combustible gas equipment 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 equipment is 2; if not, modify it; 4. If the fault cannot be cleared after restarting, please contact your dealer or after-sales service center.

Fault name	Fault Cause	Fault Handling Suggestion
DG Communication Failure	Abnormal communication link between the control board and the DG	1. Check the link communication harness and observe whether the fault disappears; 2. Try restarting the machine and observe whether the fault disappears; 3. If the fault cannot be cleared after restart, please contact your dealer or after-sales service center.
Battery Over Voltage	1. Single cell voltage too high 2. Voltage sampling line abnormal	Record the fault symptom, restart the battery, wait a few minutes, and confirm whether the fault disappears. If the problem still exists after restart, please contact the after-sales service center.
	1. Battery total voltage too high 2. Voltage sampling line abnormal	
Battery Undervoltage	1. Single cell voltage too low 2. Voltage sampling line abnormal	
	1. Battery total voltage too low 2. Voltage sampling line abnormal	
Battery Overcurrent	1. Charging Current too high, battery current limiting abnormal: sudden changes in temperature and voltage values 2. Inverter response abnormal	

Fault name	Fault Cause	Fault Handling Suggestion
	Battery discharge current too high	
Battery Overtemperature	1. Ambient Overtemperature 2. Temperature sensor abnormal	
Battery Undertemperature	1. Ambient temperature too low 2. Temperature sensor abnormal	
Battery Terminal Overtemperature	Terminal temperature too high	

Fault name	Fault Cause	Fault Handling Suggestion
Battery Imbalance	1. Excessive temperature difference. At different stages, the battery limits battery power, i.e., limits charge and discharge current. Therefore, this problem generally rarely occurs. 2. Cell capacity degradation, resulting in excessive internal resistance; during Overcurrent, the temperature rise is large, leading to a large temperature difference. 3. Poor welding of cell tabs causes the cell to heat up too quickly under Overcurrent. 4. Temperature sampling issue; 5. Power cable connection loose	

Fault name	Fault Cause	Fault Handling Suggestion
	1. Inconsistent degree of cell aging 2. Slave board chip issues can also cause excessive cell voltage difference; 3. Slave board balancing issues can also cause excessive cell voltage difference 4. Caused by wiring harness issues	
Insulation Resistance	Insulation resistance damaged	Check whether the ground wire is properly connected, restart the battery. If the problem still exists after restart, please contact the after-sales service center.
Pre-charging Failure Fault	Pre-charging Failure	Indicates that during pre-charging, the voltage across the pre-charge MOS always exceeds the specified threshold. After shutting down and restarting, observe whether the fault persists, and check whether the wiring is correct and whether the pre-charge MOS is damaged.
Sampling Line Fault	Battery sampling line poor contact or disconnected	Check the wiring, restart the battery. If the problem still exists after restart, please contact the after-sales service center.
	Cell voltage sampling line poor contact or disconnected	Check the wiring, restart the battery. If the problem still exists after restart, please contact the after-sales service center.

Fault name	Fault Cause	Fault Handling Suggestion
	Cell temperature sampling line poor contact or disconnected	
	Dual-channel current comparison error too large, or current sampling line circuit abnormal	
	Dual-channel voltage comparison error too large, or MCU-to-AFE voltage comparison error too large, or voltage sampling line circuit abnormal	
	Temperature sampling line circuit abnormal or poor contact/disconnection	
	Overvoltage level 5 or overtemperature level 5; three-terminal fuse blown	Three-stage fuse blown; 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 transistor temperature exceeds the specified threshold. Shut down and leave it for 2 h until the temperature recovers.

Fault name	Fault Cause	Fault Handling Suggestion
Shunt Overtemperature	Shunt Overtemperature	This fault indicates that the shunt tube temperature exceeds the specified threshold. Shut down and leave it for 2 h until the temperature recovers.
BMS1 Other Fault 1 (Residential Energy Storage)	Relay or MOS open circuit	1. Upgrade the software, shut down and leave it 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 leave it 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
	Abnormal battery system return harness, causing the interlock signal to fail to form a loop	Check whether the terminal resistor is installed correctly
	Abnormal communication between BMS and PCS	1. Confirm whether the communication cable interface definition between the inverter and the connected battery is correct; 2. Contact the after-sales service center, check the background data, and observe whether the inverter and battery software are correctly matched.

Fault name	Fault Cause	Fault Handling Suggestion
	Abnormal communication harness between the BMS main control and slave control	1. Check the wiring and restart the battery; 2. Upgrade the battery. If the problem still exists after restart, contact the after-sales service center.
	Main negative inter-chip communication lost	
	Air switch and shunt trip abnormal	1. Shut down and leave it for 5 minutes; after restart, check whether the fault persists; 2. Observe whether the communication pins of the blind-mate connectors at the bottom of the PACK and PCU are loose or skewed;
	MCU self-test failed	Upgrade the software and restart the battery. If the problem still exists after restart, contact the after-sales service center.
	1. Software version too low or BMS board damaged 2. The number of parallel inverters is large, causing excessive impact on the battery during pre-charging	1. Upgrade the software and observe whether the fault persists 2. If it is a parallel operation scenario, black-start the battery first, then start the inverter

Fault name	Fault Cause	Fault Handling Suggestion
	MCU internal fault	Upgrade the software and restart the battery. This is generally to check whether the MCU or external components are damaged. If the problem still exists after restart, contact the after-sales service center.
	Main control current exceeds the specified threshold	1. Shut down and let stand for 5 minutes; after restarting, check whether the fault persists; 2. Check whether the inverter power is set too high, causing it to exceed the bus load;
	Cells of parallel-connected battery clusters are inconsistent	Confirm whether the cells of the parallel-connected battery clusters are consistent
	Reverse connection of positive and negative poles of parallel-connected battery clusters	Check whether the positive and negative poles of the parallel-connected battery clusters are reversely connected
	Severe overtemperature, overvoltage, etc., triggering the fire protection system	Contact the after-sales service center.
Air Conditioner Failure	Air conditioner abnormal failure	Try restarting the system. If the fault is not cleared, contact the after-sales service center.
	Cabinet door not closed	Check whether the cabinet door is properly closed

Fault name	Fault Cause	Fault Handling Suggestion
	Supply voltage too high	Confirm whether the supply voltage meets the air conditioner input voltage requirements; after confirming compliance, power on again.
	Insufficient supply voltage	
	No voltage input	
	Unstable supply voltage	
	Unstable compressor voltage	Try restarting the system. If the fault is not cleared, contact the after-sales service center.
	Poor sensor contact or damage	
	Air conditioner fan abnormal	
BMS1 Other Fault 2 (Residential ESS Type)	Abnormal voltage or current inside DCDC	Refer to the specific DC Failure details.
	DCDC Overload or excessively high heat sink temperature, etc.	
	Abnormal cell sampling or inconsistent aging degree	Please contact the after-sales service center.
	Fan operation not performed normally	Please contact the after-sales service center.
	Output port screws loose or poor contact	1. Shut down the battery, check the wiring and output port screws. 2. After confirmation, restart the battery and observe whether the fault persists. If it does, please contact the after-sales service center.

Fault name	Fault Cause	Fault Handling Suggestion
	The battery has been in use for too long or the cells are severely damaged	Please contact the after-sales service center to replace the pack.
	1. Software version too low or BMS board damaged 2. The number of parallel inverters is large, causing excessive impact on the battery during pre-charging	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 they are inconsistent, please contact the after-sales service center.
	Thermal management board communication disconnected	1. Shut down and leave it for 5 minutes; after restart, 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	Fault Handling Suggestion
DCDC Failure	Output port voltage too high	Check the output port voltage. If the output port voltage is normal and the fault still cannot clear 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 SOC 90% or leave it idle for 2 h. If this is ineffective and the fault still exists after restart, please contact the after-sales service center.
	Heat sink temperature too high	Leave the battery idle for 1 h until the heat sink temperature drops. If this is ineffective and the fault still exists after restart, please contact the after-sales service center.
	Battery discharge current too high	Check whether the load exceeds the battery's discharge capability. Turn off the load or stop the PCS for 60 s. If this is ineffective and the fault still exists after restart, please contact the after-sales service center.
	The positive and negative poles of the output port power harness are reversely connected to the parallel battery cluster or PCS	Turn off the battery manual switch, check whether the output port wiring is correct, and restart the battery.

Fault name	Fault Cause	Fault Handling Suggestion
	Output power relay cannot close	Check whether the output port wiring is correct and whether there is a short circuit. If this is ineffective and the fault still exists after restart, please contact the after-sales service center.
	Power device temperature too high	Leave the battery idle for 1 h until the temperature of the power devices inside the battery drops. If this is ineffective and the fault still exists after restart, please contact the after-sales service center.
	Relay stuck	If the fault still exists after restart, please contact the after-sales service center.
Battery Rack Circulating Current Failure	1. Cell imbalance 2. First power-on without full-charge calibration	Record the fault symptom, restart the battery, wait a few minutes, and confirm whether the fault disappears. If the problem still exists after restart, please contact the after-sales service center.
BMS1 Other Fault 3 (Large-Scale Storage)	Linux module communication error	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, contact the after-sales service center.
	Excessive cell temperature rise	Cell abnormality. Contact after-sales service 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, contact the after-sales service center.

Fault name	Fault Cause	Fault Handling Suggestion
	1. Abnormal daisy-chain communication within the battery cluster 2. Inconsistent cell aging levels between battery clusters	1. Check the pack contact condition in a single battery cluster 2. Check the usage of each battery cluster, such as cumulative charge/discharge capacity, cycle count, etc. 3. Please contact the after-sales service center.
	High humidity inside the pack	-
	Fuse blown	Contact after-sales service to replace the pack.
	Low battery level	Charge the battery.
BMS1 Other Fault 4 (Large-Scale Storage)	Air circuit breaker abnormality	Contact after-sales service to replace the pack.
	External device abnormality	Contact after-sales service to replace the pack.
Contactor Failure 1	-	-
Contactor Failure 2	-	-
Overload Protection (Ksic)	Continuous Overload (Exceeding 690 kVA) 10s	Please contact the after-sales service center.
Overload Protection (Smart Port)	Continuous Overload (Exceeding 690 kVA) 10s	Please contact the after-sales service center.

Fault name	Fault Cause	Fault Handling Suggestion
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	Connect the meter to the slave	Set the unit connected to the meter as the master
Slave AC On Timeout with Master	1. Incorrect slave address setting 2. Loose slave communication cable	1. Check whether the slave address is duplicated 2. Check whether the parallel communication cable is loose

9.5.2.3 Battery Fault (LX A5.0-10)

🔴When the battery ALM indicator is red, identify and troubleshoot the fault by combining the SOC indicator status.

No.	SOC indicator	Fault name	Corrective Measures
1	○○○○●	Battery Overvoltage	Power off and leave it for 2 h. If the problem persists after restart, contact the after-sales service center.
2	○○○●○	Battery Undervoltage	Please contact the after-sales service center.

No.	SOC indicator	Fault name	Corrective Measures
3	○○○●●	High Cell Temperature	Power off and leave it for 2 h. If the problem persists after restart, contact the after-sales service center.
4	○○●○○	Charging Low Temperature	Power off and wait for the temperature to recover. If the problem persists after restart, contact the after-sales service center.
5	○○●○●	Discharging Low Temperature	Power off and wait for the temperature to recover. If the problem persists after restart, contact the after-sales service center.
6	○○●●○	Charging Overcurrent	Restart the battery. If the problem still exists after restart, contact the after-sales service center
7	○○●●●	Discharging Overcurrent	Restart the battery. If the problem still exists after restart, contact the after-sales service center
8	○●○○○	Insulation Resistance Too Low	Please contact the after-sales service center.
9	○●○○●	Excessive Temperature Difference	Power off and leave it for 2 h. If the problem persists after restart, contact the after-sales service center.
10	○●○●●	Excessive Cell Voltage Difference	After restarting the battery, leave it for 12 h. If the problem persists, contact the after-sales service center.
11	○●●○○	Cell Inconsistency	Please contact the after-sales service center.
12	○●●○●	Harness Abnormality	Restart the battery. If the problem still exists after restart, contact the after-sales service center
13	○●●●○	MOS Fails to Close	Restart the battery. If the problem still exists after restart, contact the after-sales service center
14	○●●●●	MOS Fails to Close	Restart the battery. If the problem still exists after restart, contact the after-sales service center

No.	SOC indicator	Fault name	Corrective Measures
15	●○○○○	Parallel Cluster Fault	Check whether the battery model matches. If it does not match, contact the after-sales service center.
16	●○○○●	Interlock Signal Fault	Check whether the terminal resistor is installed correctly. If the problem persists after restart, contact the after-sales service center.
17	●○○●○	BMU Communication Fault	Restart the battery. If the problem still exists after restart, contact the after-sales service center
18	●○○●●	MCU Internal Comm Failure	Restart the battery. If the problem still exists after restart, contact the after-sales service center
19	●○●○○	Air Circuit Breaker Sticking Fault	Please contact the after-sales service center.
20	●○●○●	Pre-charging Failure Fault	Restart the battery. If the problem still exists after restart, contact the after-sales service center
21	●○●●○	MOS Overtemperature Fault	Power off and leave it for 2 h. If the problem persists after restart, contact the after-sales service center.
22	●○●●●	Combiner Box Overtemperature Failure	Power off and leave it for 2 h. If the problem persists after restart, contact the after-sales service center.
23	●●○○○	Reverse Connection Fault	Please contact the after-sales service center.
24	●●●●●	Microelectronic Fault	Please contact the after-sales service center.

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

Alarm status

●When the battery ALM indicator is red, identify and troubleshoot the fault by combining the SOC indicator status.

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, please confirm whether the communication cable between the battery and the inverter is reliably connected and communication is normal. 2. Power off 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 battery's real-time 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 threshold], power off the battery or upgrade the firmware, and restart to confirm whether the fault persists. 3. If the fault is not cleared, please contact after-sales service.
3	○○●○	Battery Overtemperature Battery Undertemperature Battery Terminal Overtemperature	Shut down and leave standing for 60 minutes, wait for temperature recovery. If the problem still exists after restart, contact the after-sales service center

No.	SOC indicator	Fault name	Corrective Measures
4	○●○○	Battery Imbalance	Shut down and leave standing for 30 minutes. If the problem still exists after restart, contact the after-sales service center
		SOH Too Low Fault	
5	●○●●	Pre-charging Failure Fault	1. Confirm whether the battery output terminals and inverter are connected in reverse polarity 2. Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
6	○●○●	Sampling Line Fault	Confirm whether the battery switch is closed. If the battery switch is already closed and the problem still exists, contact the after-sales service center
7	●●○○	Relay or MOS Overtemperature Shunt Overtemperature	Shut down and leave standing for 30 minutes. If the problem still exists after restart, contact the after-sales service center
		BMS Other Fault: Output Port Overtemperature Fault	1. Check whether the battery power cable is securely tightened Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
8	○●●○	Other Protection: MOS Cannot Be Closed	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
9	○●●●	Other Protection: MOS Sticking	

No.	SOC indicator	Fault name	Corrective Measures
10	●○○○	Other Protection: Parallel Cluster Fault	1. Confirm whether the type and installation position of the terminal resistor are correct 2. Confirm whether the communication cable between batteries and the communication cable between the battery and inverter are securely connected and communication is normal 3. If the fault is not cleared, please contact the after-sales service center.
11	○○○○	Other Protection: Communication with Inverter Lost	1. Confirm whether the communication cable between batteries and the communication cable between the battery and inverter are securely connected 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 type and installation position of the terminal resistor are correct 2. Confirm whether the communication cable between batteries and the communication cable between the battery and inverter are securely connected and communication is normal 3. Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
13	●○●○	Other Protection: Air Switch Sticking Fault	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center

No.	SOC indicator	Fault name	Corrective Measures
14	●●○●	Other Protection: Software Failure	Restart the battery. If the problem still exists after restart, contact the after-sales service center
15	●●●○	Other Protection: Hardware Overcurrent Fault	
16	●●●●	Other Protection: Microelectronics Fault	
		Heating Film Three-Terminal Abnormality	1. Upgrade Software 2. Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center

9.5.2.5 Battery Fault (LX U5.4-L)



SOC indicator	Fault name	Corrective Measures
	Abnormal Temperature Difference	Power off and wait2 hours. If the problem persists, contact the after-sales service center.
	High temperature	
	Low-temperature discharge	Power off, wait for the temperature to rise, and restart the battery. If the problem persists, contact the after-sales service center.

	Charging Overcurrent	Restart the battery. If the problem persists, contact the after-sales service center.
	Discharging Overcurrent	
	Battery Overvoltage	
	Battery Undervoltage	When charging conditions are available,press the button switch 5 times consecutively within 10 seconds to charge the battery, and wait for the voltage to rise until it returns to normal.
	Low-temperature charging	Power off, wait for the temperature to rise, and restart the battery. If the problem persists, contact the after-sales service center.
	Excessive cell voltage difference	Power off and wait2 hours, then restart the battery. If the problem persists, contact the after-sales service center.

Fault status



SOC indicator	Fault name	Corrective Measures
	Temperature sensor failure	Restart the battery. If the problem persists, contact the after-sales service center.
	MOSFET failure	
	Circuit breaker open error	Reclose the circuit breaker. If the problem persists, contact the after-sales service center.
	Slave communication lost	Power off, check the communication cable, and restart the battery. If the problem persists, contact the after-sales service center.
	NoSN error	Please contact the after-sales service center.
	Master communication lost	Power off, check the inverter communication cable connection, and restart the battery. If the problem persists, contact the after-sales service center.
	Software version mismatch	Please contact the after-sales service center.

	Multiple master error	After power off,turn on all batteries within 30s
	MOSFET over-temperature error	Power off and wait2 hours. If the problem persists, contact the after-sales service center.
	Inverter communication interrupted	Power off, check the communication cable connection, and restart the battery. If the problem persists, contact the after-sales service center.

9.5.2.6 Battery Fault (LX U5.4-20)

Alarm status

When the battery button indicator light is red and flashes once per second, use the SOC indicator light status to locate and troubleshoot the alarm.

No.	SOC indicator	Description
1		The battery system handles it automatically. You can usethe SolarGo APP to view specific alarm information.
2		
3		
4		
5		
6		

Fault status

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

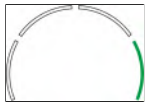
Button indicator light	SOC indicator	Fault name	Corrective Measures

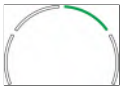
Red light steady on		Battery Overvoltage	Shut down and let it stand2h, restart the battery. If the problem is not resolved, contact the after-sales service center
Red light flashingonce per second		Battery Undervoltage	Please contact the after-sales service center.
Red light steady on		High Cell Temperature	Shut down and let it stand2h, restart the battery. If the problem is not resolved, contact the after-sales service center
		Charging Low Temperature	Shut down and wait for the temperature to recover, restart the battery. If the problem is not resolved, Please contact the after-sales service center.
		Discharging Low Temperature	
		Charging Overcurrent	Restart the battery. If the problem persists, contact the after-sales service center.
		Discharging Overcurrent	
		Excessive Temperature Difference	Shut down and let it stand2h, restart the battery. If the problem is not resolved, contact the after-sales service center
		Excessive Cell Voltage Difference	After restarting the battery, let it stand12h, if the problem is not resolved, contact the after-sales service center
		Harness Abnormality	Restart the battery. If the problem persists, contact the after-sales service center.
		MOS Fails to Close	
		MOS sticking	
		Parallel Cluster Fault	Check whether the battery model matches. If it does not match, contact the after-sales service center.
		BMU Communication Fault	Restart the battery. If the problem persists, contact the after-sales service center.

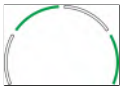
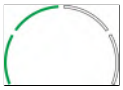
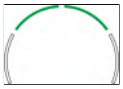
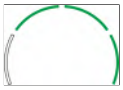
		MCU Internal Comm Failure	
		Air Circuit Breaker Sticking Fault	Please contact the after-sales service center.
		Pre-charging Failure Fault	Restart the battery. If the problem persists, contact the after-sales service center.
		MOSFET overtemperature fault	Shut down and let it stand2h, restart the battery. If the problem is not resolved, contact the after-sales service center
		Combiner Box Overtemperature Failure	Shut down and let it stand2h, restart the battery. If the problem is not resolved, contact the after-sales service center
		Microelectronic Fault	Please contact the after-sales service center.

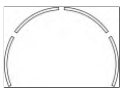
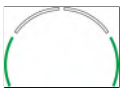
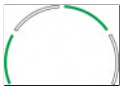
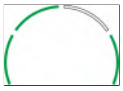
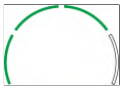
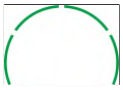
9.5.2.7 Battery Fault (GW14.3-BAT-LV-G10)

When the battery alarm indicator light turns red , the outer ring running light flashes red , when the running light is off, use the SOC indicator light status to locate and troubleshoot the fault.

No.	SOC indicator	Fault name	Corrective Measures
1		Battery Over Voltage	

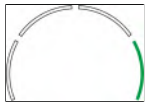
		Battery Undervoltage	1. Check via the App whether the inverter Charging Current limit is 0. If it is 0, confirm whether the communication cable connection between the battery and the inverter is reliable and communication is normal 2. Power off and leave it for 5 minutes; after restart, confirm whether the fault persists 3. If the fault does not clear, 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 Discharge Current Limit value. Please contact the after-sales service center 2. If it is lower, power off the battery or upgrade the firmware, then restart and confirm whether the fault continues to occur 3. If the fault does not clear, please contact after-sales service
3		Battery Overtemperature	Shut down and leave standing for 60 minutes, wait for temperature recovery. If the problem still exists after restart, contact the after-sales service center
		Battery Undertemperature	
		Battery Terminal Overtemperature	
4		Battery Imbalance	Shut down and leave standing for 30 minutes. If the problem still exists after restart, contact the after-sales service center
		SOH Too Low Fault	

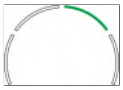
5		Pre-charging Failure Fault	1. Check whether the battery output terminals and the inverter are connected in reverse. 2. Power off and let stand for 5 minutes. If the problem persists after restart, please contact the after-sales service center.
6		Sampling Line Fault	Confirm whether the battery circuit breaker is closed. If the battery circuit breaker is already closed and the problem persists, please contact the after-sales service center.
7		Relay or MOS Overtemperature	Shut down and leave standing for 30 minutes. If the problem still exists after restart, contact the after-sales service center
		Output port over-temperature	1. Check whether the battery power cables are securely locked. 2. Power off and let stand for 5 minutes. If the problem persists after restart, please contact the after-sales service center.
8		MOS Fails to Close	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
9		MOS sticking	
10		Parallel Cluster Fault	1. Confirm whether the type of terminating resistor used and the installation position 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, please contact the after-sales service center

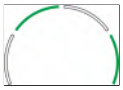
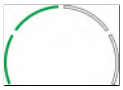
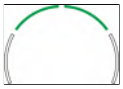
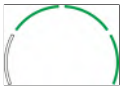
11		Software and hardware version mismatch	Restart the battery. If the problem still exists after restart, contact the after-sales service center
12		BMU Communication Fault	
13		Air Circuit Breaker Sticking Fault	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
14		Software Failure	Restart the battery. If the problem still exists 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. Power off and let stand for 5 minutes. If the problem persists after restart, please contact the after-sales service center.

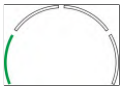
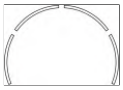
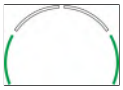
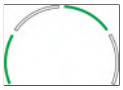
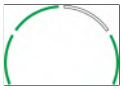
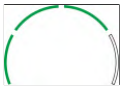
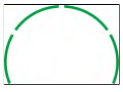
9.5.2.8 Battery Fault (GW16.1-BAT-LV-G10)

When the battery alarm indicator light turns red , the outer ring running light flashes red , when the running light is off, use the SOC indicator light status to locate and troubleshoot the fault.

No.	SOC indicator	Fault name	Corrective Measures
1		Battery Over Voltage	

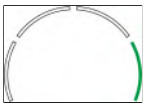
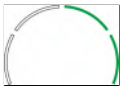
		Battery Undervoltage	1. Check via the App whether the inverter Charging Current limit is 0. If it is 0, confirm whether the communication cable connection between the battery and the inverter is reliable and communication is normal 2. Power off and leave it for 5 minutes; after restart, confirm whether the fault persists 3. If the fault does not clear, 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 Discharge Current Limit value. Please contact the after-sales service center 2. If it is lower, power off the battery or upgrade the firmware, then restart and confirm whether the fault continues to occur 3. If the fault does not clear, please contact after-sales service
3		Battery Overtemperature	Shut down and leave standing for 60 minutes, wait for temperature recovery. If the problem still exists after restart, contact the after-sales service center
		Battery Undertemperature	
		Battery Terminal Overtemperature	
4		Battery Imbalance	Shut down and leave standing for 30 minutes. If the problem still exists after restart, contact the after-sales service center
		SOH Too Low Fault	

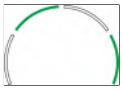
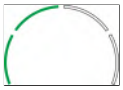
5		Pre-charging Failure Fault	1. Check whether the battery output terminals and the inverter are connected in reverse. 2. Power off and let stand for 5 minutes. If the problem persists after restart, please contact the after-sales service center.
6		Sampling Line Fault	Confirm whether the battery circuit breaker is closed. If the battery circuit breaker is already closed and the problem persists, please contact the after-sales service center.
7		Relay or MOS Overtemperature	Shut down and leave standing for 30 minutes. If the problem still exists after restart, contact the after-sales service center
		Output port over-temperature	1. Check whether the battery power cables are securely locked. 2. Power off and let stand for 5 minutes. If the problem persists after restart, please contact the after-sales service center.
8		MOS Fails to Close	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
9		MOS sticking	

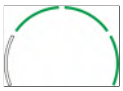
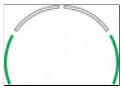
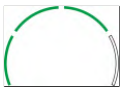
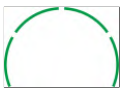
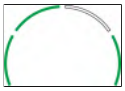
10		Parallel Cluster Fault	1. Confirm whether the type of terminating resistor used and the installation position are correct. 2. Confirm whether the communication cable between batteries and the communication cable between the battery and the inverter are reliably connected and communication is normal. 3. Confirm via the battery SN code whether the battery cells in the parallel cluster are consistent 4. If the fault is not cleared, contact the after-sales service center
11		Software and hardware version mismatch	Restart the battery. If the problem still exists after restart, contact the after-sales service center
12		BMU Communication Fault	
13		Air Circuit Breaker Sticking Fault	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
14		Software Failure	Restart the battery. If the problem still exists 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. Power off and let stand for 5 minutes. If the problem persists after restart, please contact the after-sales service center.

9.5.2.9 Battery Fault (GW5.0-BAT-LVI-G10)

When the battery alarm indicator light turns red , locate and troubleshoot the fault based on the SOC indicator display status.

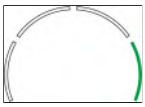
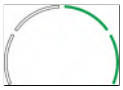
No.	SOC indicator	Fault name	Corrective Measures
1		Battery Over Voltage	1. Check via the App whether the inverter Charging Current limit is 0. If it is 0, confirm whether the communication cable connection between the battery and the inverter is reliable and communication is normal 2. Power off and leave it for 5 minutes; after restart, confirm whether the fault persists 3. If the fault does not clear, please 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 real-time battery current is greater than the Charging Current limit or Discharge Current Limit value. Please contact the after-sales service center 2. If it is lower, power off the battery or upgrade the firmware, then restart and confirm whether the fault continues to occur 3. If the fault does not clear, please contact after-sales service
3		Battery Overtemperature	Shut down and leave standing for 60 minutes, wait for temperature recovery. If the problem still exists after restart, contact the after-sales service center
		Battery Undertemperature	

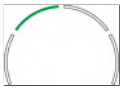
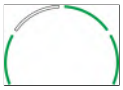
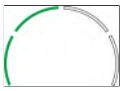
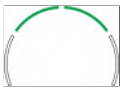
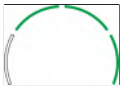
No.	SOC indicator	Fault name	Corrective Measures
		Battery Terminal Overtemperature	
4		Battery Imbalance	Shut down and leave standing for 30 minutes. If the problem still exists after restart, contact the after-sales service center
		SOH Too Low Fault	
5		Pre-charging Failure Fault	1. Check whether the battery output terminals and the inverter are connected in reverse. 2. Power off and let stand for 5 minutes. If the problem persists after restart, please contact the after-sales service center.
6		Sampling Line Fault	Confirm whether the battery circuit breaker is closed. If the battery circuit breaker is already closed and the problem persists, please contact the after-sales service center.
7		Relay or MOS Overtemperature	Shut down and leave standing for 30 minutes. If the problem still exists after restart, contact the after-sales service center
		Output port over-temperature	1. Check whether the battery power cables are securely locked. 2. Power off and let stand for 5 minutes. If the problem persists after restart, please contact the after-sales service center.
8		MOS Fails to Close	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
		Heating module MOS open circuit	
9		MOS sticking	

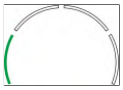
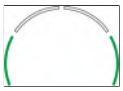
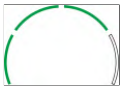
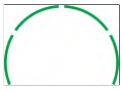
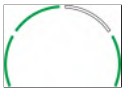
No.	SOC indicator	Fault name	Corrective Measures
		Heating module MOS stuck closed	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
10		Parallel Cluster Fault	1. Confirm whether the type of terminating resistor used and the installation position 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 cluster are consistent 4. If the fault is not cleared, contact the after-sales service center
11		BMU Communication Fault	Restart the battery. If the problem still exists after restart, contact the after-sales service center
12		Hardware Overcurrent Fault DCDC Failure	Restart the battery. If the problem still exists after restart, contact the after-sales service center
13		Microelectronic Fault Abnormal cell temperature	Restart the battery. If the problem still exists after restart, contact the after-sales service center
14		MCU Communication Loss Fault	Restart the battery. If the problem still exists after restart, contact the after-sales service center

9.5.2.10 Battery Fault (GW10.0-BAT-LV-G10)

When the battery alarm indicator light turns red , locate and troubleshoot the fault based on the SOC indicator display status.

No.	SOC indicator	Fault name	Corrective Measures
1		Battery Over Voltage	1. Check via the App whether the inverter Charging Current limit is 0. If it is 0, confirm whether the communication cable connection between the battery and the inverter is reliable and communication is normal 2. Power off and leave it for 5 minutes; after restart, confirm whether the fault persists 3. If the fault does not clear, please 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 real-time battery current is greater than the Charging Current limit or Discharge Current Limit value. Please contact the after-sales service center 2. If it is lower, power off the battery or upgrade the firmware, then restart and confirm whether the fault continues to occur 3. If the fault does not clear, please contact after-sales service
3		Battery Overtemperature	Shut down and leave standing for 60 minutes, wait for temperature recovery. If the problem still exists after restart, contact the after-sales service center
		Battery Undertemperature	

		Battery Terminal Overtemperature	
4		Battery Imbalance	Shut down and leave standing for 30 minutes. If the problem still exists after restart, contact the after-sales service center
		SOH Too Low Fault	
5		Pre-charging Failure Fault	1. Check whether the battery output terminals and the inverter are connected in reverse. 2. Power off and let stand for 5 minutes. If the problem persists after restart, please contact the after-sales service center.
6		Sampling Line Fault	Confirm whether the battery circuit breaker is closed. If the battery circuit breaker is already closed and the problem persists, please contact the after-sales service center.
7		Relay or MOS Overtemperature	Shut down and leave standing for 30 minutes. If the problem still exists after restart, contact the after-sales service center
		Output port over-temperature	1. Check whether the battery power cables are securely locked. 2. Power off and let stand for 5 minutes. If the problem persists after restart, please contact the after-sales service center.
8		MOS Fails to Close	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
		Heating module MOS open circuit	
9		MOS sticking	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center
		Heating module MOS stuck closed	

10		Parallel Cluster Fault	1. Confirm whether the type of terminating resistor used and the installation position 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 cluster are consistent 4. If the fault is not cleared, contact the after-sales service center
11		BMU Communication Fault	Restart the battery. If the problem still exists after restart, contact the after-sales service center
12		Hardware Overcurrent Fault DCDC Failure	Restart the battery. If the problem still exists after restart, contact the after-sales service center
13		Microelectronic Fault Abnormal cell temperature	Restart the battery. If the problem still exists after restart, contact the after-sales service center
14		MCU Communication Loss Fault EPO fault	Restart the battery. If the problem still exists after restart, contact the after-sales service center
15		Air Circuit Breaker Sticking Fault	Shut down and leave standing for 5 minutes. If the problem still exists after restart, contact the after-sales service center

9.5.2.11 Mix Parallel Unit Fault

No.	Fault name	Corrective Measures
1	Parallel Cluster Fault	Confirm the actual number of parallel battery clusters. If >30, remove 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 overtemperature	Shut down and let it 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	Main 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 box 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 box is loose or has poor contact. Shut down the parallel system and restart the parallel box. 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 box is loose or has poor contact. Shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
8	PCS Comm Loss	Check whether the communication cable between the inverter and the parallel box is loose or has poor contact. Shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.

No.	Fault name	Corrective Measures
9	Parallel box 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 box 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 box MOS overtemperature fault	Shut down and let it 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 box wiring abnormality	Check whether the communication cable and power cable wire sequences of the batteries under the parallel box match. Shut down the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.

10 Technical Specifications

10.1 Inverter Technical Specifications

Technical Data	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Battery Input Data			
Battery Type*1	Li-Ion/Lead-acid	Li-Ion/Lead-acid	Li-Ion/Lead-acid
Nominal Battery Voltage (V)	48	48	48
Battery Voltage Range (V)	40~60	40~60	40~60
Start-up Voltage (V)	44.2	44.2	44.2
Number of Battery Input	1	1	1
Max. Continuous Charging Current (A)	160	200	240
Max. Continuous Discharging Current (A)	160	200	240
Max. Charge Power (kW)	8.0*3	10.0*3	12.0*3
Max. Discharge Power (kW)	8.8*3	11.0*3	13.2*3
PV String Input Data			
Max. Input Power (kW)	16.0	20.0	24.0
Max. Input Voltage (V)*4	600	600	600
MPPT Operating Voltage Range (V)*5	60~550	60~550	60~550
MPPT Voltage Range at Nominal Power (V)	180~500	170~500	200~500

Technical Data	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Start-up Voltage (V)	58	58	58
Nominal Input Voltage (V)	360	360	360
Max. Input Current per MPPT (A)	32/16*6	32/32*6	32/32*6
Max. Short Circuit Current per MPPT (A)	48/24	48/48	48/48
Max. Backfeed Current to The Array (A)	0	0	0
Number of MPPT Trackers	2	2	2
Number of Strings per MPPT	2/1	2/2	2/2
AC Output Data (On-grid)			
Nominal Output Power (kW)	8.0	10.0	12.0
Nominal Apparent Power Output to Utility Grid (VA)	8.0	10.0	12.0
Max. AC Active Power (W)*7*8	8.8	11.0	13.2
Max. Apparent Power Output to Utility Grid (VA)*7*8	8.8	11.0	13.2
Nominal Power at 40℃ (W)	8.0	10.0	12.0
Max. Power at 40℃ (Including AC Overload) (W)*8	8.0	10.0	12.0
Nominal Apparent Power from Utility Grid (VA)	8.0	10.0	12.0

Technical Data	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Max. Apparent Power from Utility Grid (kVA)	16.5	16.5	16.5
Nominal Power at 40℃ (kW)	8.0	10.0	12.0
Max. Power at 40℃ (Including AC Overload) (kW)	8.0	10.0	12.0
Nominal Output Voltage (V)	220/230/240	220/230/240	220/230/240
Output Voltage Range (V)	170~280	170~280	170~280
Nominal AC Grid Frequency (Hz)	50/60	50/60	50/60
AC Grid Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Max. AC Current Output to Utility Grid (A)	40.0	50.0	60.0
Max. AC Current From Utility Grid (A)	75.0	75.0	75.0
Nominal AC Current From Utility Grid (A)	36.4 at 220V 34.8 at 230V 33.3 at 240V	45.5 at 220V 43.5 at 230V 41.7 at 240V	54.5 at 220V 52.2 at 230V 50.0 at 240V
Max. Output Fault Current (Peak and Duration) (A)	105A，3us	145A，3us	145A，3us
Inrush Current (Peak and Duration) (A)	105A，3us	145A，3us	145A，3us
Nominal Output Current (A)	36.4 at 220V 34.8 at 230V 33.3 at 240V	45.5 at 220V 43.5 at 230V 41.7 at 240V	54.5 at 220V 52.2 at 230V 50.0 at 240V

Technical Data	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)
Max. Total Harmonic Distortion	<3%	<3%	<3%
Maximum Output Overcurrent Protection (A)	105	145	145
Type of Voltage (a.c. or d.c.)	a.c.	a.c.	a.c.
AC Output Data (Back-up)			
Back-up Nominal Apparent Power (kVA)	8.0	10.0	12.0
Max. Output Apparent Power without Grid(kVA)	8.8(16000, 10s)	1.1(20000, 10s)	1.32(24000, 10s)
Max. Output Apparent Power with Grid (kVA)	16.5	16.5	16.5
Nominal Output Current (A)	36.4/34.8/33.3	45.5/43.5/41.7	54.5/52.2/50.0
Max. Output Current without Grid(A)	40	50	60
Max. Output Current with Grid(A)	75	75	75
Max. Output Fault Current (Peak and Duration) (A)	105A, 3us	145A, 3us	145A, 3us
Inrush Current (Peak and Duration) (A)	105A, 3us	145A, 3us	145A, 3us

Technical Data	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Maximum Output Overcurrent Protection (A)	105	145	145
Nominal Output Voltage (V)	220/230/240	220/230/240	220/230/240
Nominal Output Frequency (Hz)	50/60	50/60	50/60
Output THDv (@Linear Load)	<3%	<3%	<3%
Switching from Grid Connected Mode to Standalone Mode	<10ms	<10ms	<10ms
Switching from standalone mode to Grid connected mode	<10ms	<10ms	<10ms
AC Data (Generator)			
Nominal Apparent Power from AC generator (kVA)	8.0	10.0	12.0
Max. Apparent Power from AC generator (VA)	8.8	11.0	13.2
Nominal Intput Voltage (V)	220/230/240	220/230/240	220/230/240
Input Voltage Range (V)	170~280	170~280	170~280
Nominal AC generator Frequency (Hz)	50/60	50/60	50/60
AC generator Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Max. AC Current From AC generator (A)	50.0	54.5	54.5

Technical Data	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Nominal AC Current From AC generator (A)	36.4 at 220V 34.8 at 230V 33.3 at 240V	45.5 at 220V 43.5 at 230V 41.7 at 240V	54.5 at 220V 52.2 at 230V 50.0 at 240V
Efficiency			
Max. Efficiency	97.6%	97.6%	97.6%
European Efficiency	96.2%	96.2%	96.2%
CEC Efficiency	96.2%	96.2%	96.2%
Max. Battery to AC Efficiency	95.5%	95.5%	95.5%
MPPT Efficiency	99.9%	99.9%	99.9%
Protection			
PV String Current Monitoring	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated
DC Surge Protection	Type III	Type III	Type III
AC Surge Protection	Type III	Type III	Type III
AFCI	Optional	Optional	Optional
Rapid Shutdown	Optional	Optional	Optional

Technical Data	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Remote Shutdown	Integrated	Integrated	Integrated
General Data			
Operating Temperature Range (℃)	-35~+60	-35~+60	-35~+60
Operating Environment	Outdoor	Outdoor	Outdoor
Storage Temperature (℃)	-40~+85	-40~+85	-40~+85
Relative Humidity	0~95%	0~95%	0~95%
Max. Operating Altitude (m)	3000	3000	3000
Cooling Method	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling
User Interface	LCD, WLAN+APP	LCD, WLAN+APP	LCD, WLAN+APP
Communication with BMS	CAN	CAN	CAN
Communication	RS485, WiFI+LAN+Bluetooth	RS485, WiFI+LAN+Bluetooth	RS485, WiFI+LAN+Bluetooth
Communication Protocols	Modbus-RTU、Modbus-TCP	Modbus-RTU、Modbus-TCP	Modbus-RTU、Modbus-TCP
Weight (kg)	27.0	29.0	29.0
Dimension (W×H×D mm)	560*444.5*226	560*444.5*226	560*444.5*226
Noise Emission (dB)	<45	<45	<45
Topology	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W)	<10	<10	<10
Ingress Protection Rating	IP66	IP66	IP66
DC Connector	MC4,OT Terminal	MC4, OT Terminal	MC4, OT Terminal
AC Connector	OT Terminal	OT Terminal	OT Terminal
Environmental Category	4K4H	4K4H	4K4H

Technical Data	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Pollution Degree	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I
The Decisive Voltage Class (DVC)	Battery: A PV: C AC: C Com: A	Battery: A PV: C AC: C Com: A	Battery: A PV: C AC: C Com: A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	SMS(Slip-mode frequency) +AFD	SMS(Slip-mode frequency) +AFD	SMS(Slip-mode frequency) +AFD
Type of Electrical Supply System	single phase	single phase	single phase
Country of Manufacture	China	China	China
Certification			
Grid Standards	EN 50549-1&-10, NTS TYPE A, UNE 217001, UNE 217002, IEC 61727, IEC 62116, NRS 097-2-1:2017 Ed 2.1, ANRE 208, G99, G100		
Safety Regulation	IEC 62109-1, IEC 62109-2		
EMC	IEC 62920, IEC 61000, EN 300328,EN 301489,EN IEC 62311,EN 62479		

*1：The Li-Ion battery usually contain two mainstream type: LFP battery.

*3：When the PV input voltage is higher than 490V, the battery charging and discharging power will be gradually limited, and the power limitation will be lifted after the input voltage is lowered.

*4：When the input voltage is 580V-600V, the inverter will enter standby mode, and the voltage returns to 580V to enter the normal operation state.

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

*6: The maximum input current per string is 16A. Or For the MPPT with two strings, the current of each string is 16A.

*7: For Sri Lanka, Max. Output Power (kW) is 8.0kW for GW8000-ES-C10, 10.0kW for GW10K-ES-C10, and 12.0kW for GW12K-ES-C10.

*8: For Brazil and Chile, the max. AC output power is Pn, such as the max. AC output

power of GW8000-ES-C10 is 8000W(VA).

10.2 Battery Technical Specifications

10.2.1 LX A5.0-10

Technical Specifications	LX A5.0-10	2*LX A5.0-10	n*LX A5.0-10
Usable Energy (kWh)*1	5	10	n×5
Battery Module	LX A5.0-10：51.2V 5.0kWh		
Number of Modules	1	2	n
Cell Type	LFP（LiFePO4）		
Nominal Voltage (V)	51.2		
Operating Voltage Range (V)	47.5~57.6		
Rated Charge/Discharge Current (A)*2	60	120	n×60*3
Rated Charge/Discharge Power (kW)*2	3	6	n×3*3
Operating Temperature Range (℃)	Charging: 0 ~ +50; Discharging: -10 ~ +50		
Relative Humidity	0~95%		
Max. Operating Altitude (m)	3000		
Communication	CAN		
Weight (kg)	40	80	n×40
Dimensions (W × H × D mm)	Single LX A5.0-10 module: 442×133×420 (excluding handle); 483×133×452 (including handle)		
Ingress Protection Rating	IP21		
Storage Temperature (°C)	0 ~ +40 (≤1 year); -20 ~ 0 (≤1 month); -40 ~ 45 (≤1 month)		
Mounting Method	Cabinet mounting/Floor stacking/Wall mounting		
Cycle Efficiency*4	95%		

Technical Specifications		LX A5.0-10	2*LX A5.0-10	n*LX A5.0-10
Cycle Life*5		≥5000		
Standards and Certification	Safety	IEC62619，IEC 63056，IEC62040-1，INmetro		
	EMC	EN IEC61000-6-1，EN IEC61000-6-2，EN IEC61000-6-3，EN IEC61000-6-4		
	Transport	UN38.3，ADR		

*1: Measured with a new battery at 100% depth of discharge, 25±2℃ temperature range, and 0.2C charge/discharge conditions; usable energy may vary depending on the inverter.
*2: Rated charge/discharge current and power are affected by temperature and SOC status.
*3: Under the condition that battery parallel connection is achieved using the combiner box mounting accessory.
*4: New battery, within 2.5~3.65 V range, 25±2℃ temperature range, under 0.2C/0.2C charge/discharge conditions. Cell achieves 94%~95% under 0.6C/0.6C charge/discharge conditions.
*5: Cell, within 2.87~3.59 V range, 25±2°C temperature range, reaches 70% EOL under 0.6C/0.6C charge/discharge conditions.
n: Max. 15.

10.2.2 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

Technical Parameters	LX A5.0-30
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
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%

Technical Parameters	LX A5.0-30
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.

10.2.3 LX U5.4-L

Technical Specifications	LX U5.4-L	2*LX U5.4-L	3*LX U5.4-L	4*LX U5.4-L	5*LX U5.4-L	6*LX U5.4-L
Rated Capacity (kWh)*1	5.4	10.8	16.2	21.6	27	32.4
Usable Capacity (kWh)*2	4.8	9.6	14.4	19.2	24	28.8
Cell Type	LFP（LiFePO4）					
Cell Configuration	16S1P	16S2P	16S3P	16S4P	16S4P	16S4P
Nominal Voltage (V)	51.2					
Operating Voltage Range (V)	48~57.6					
Max. Continuous Discharging Current (A)*3	50	100				
Max. Discharging Power (kW)*3	2.88	5.76				
Short-circuit Current	2.323kA@1.0ms					

Communication		CAN					
Weight (kg)		57	114	171	228	285	342
Dimensions (W×D×H mm)		505×570×175（LX U5.4-L）					
Operating Temperature (°C)		Charging: 0 ~ +50 / Discharging: -10 ~ +50					
Storage Temperature (°C)		-20~+40 (≤1 month) / 0~+35 (≤1 year)					
Humidity		0~95%					
Altitude (m)		2000					
Ingress Protection Rating		IP65					
Mounting Method		Wall-mounted or floor-standing installation					
Cycle Efficiency		93.0%					
Cycle Number*4		≥4000 @0.5/0.5C					
Standards and Certification	Safety	IEC62619，IEC 62040，CEC					
	EMC	CE，RCM					
	Transport	UN38.3					
Safe Service Life (years)		≥25					
*1: Test conditions: cell voltage 2.5~3.65V, new battery charge and discharge at +25±2°C, 0.5C; usable capacity may vary with different inverters; *2: Test conditions: 0.5C charge and discharge at +25±2°C, 90% DOD; *3: Rated charge/discharge current and power are affected by temperature and SOC status; *4: Based on cell 0.5C@25±2°C charge/discharge, EOL reaches 80%.							

10.2.4 LX U5.4-20

Technical Specifications	LX U5.4-20	2*LX U5.4-20	3*LX U5.4-20	4*LX U5.4-20	5*LX U5.4-20	6*LX U5.4-20
Rated Capacity (kWh)*1	5.4	10.8	16.2	21.6	27	32.4
Cell Type	LFP（LiFePO4）					

Cell Configuration		16S1P	16S2P	16S3P	16S4P	16S5P	16S6P
Nominal Voltage (V)		51.2					
Operating Voltage Range (V)		47.5~57.6					
Max. Continuous Discharging Current (A)*2		50	100				
Max. Discharging Power (kW)*2		2.56	5.12				
Short-circuit Current		2.323kA@1.0ms					
Communication		CAN，RS485					
Weight (kg)		57	114	171	228	285	342
Dimensions (W×D×H mm)		505×570×175（LX U5.4-20）					
Operating Temperature (°C)		Charging: 0 ~ +50 / Discharging: -10 ~ +50					
Storage Temperature (°C)		-20~+40 (≤1 month) / 0~+35 (≤1 year)					
Humidity		0~95%					
Altitude (m)		2000					
Ingress Protection Rating		IP65					
Mounting Method		Wall-mounted or floor-standing installation					
Cycle Efficiency		95.0%					
Cycle Number*3		≥4000 @0.5/0.5C					
Standards and Certification	Safety	IEC62619，IEC 63056，IEC 62040，CEC					
	EMC	CE，RCM					
	Transport	UN38.3					
Safe Service Life (years)		≥25					

*1: Test conditions: cell voltage 2.5~3.65V, new battery charge and discharge at +25±2°C, 0.5C; usable capacity may vary with different inverters
*2: Rated charge/discharge current and power are affected by temperature and SOC status
*3: Based on cell 0.5C@25±2°C charge/discharge, EOL reaches 80%

10.2.5 LX U5.0-30

Technical Parameters	LX U5.0-30
Nominal Battery Energy (kWh)	5.12
Usable Energy (kWh)*1	5
Cell Type	LiFePO4
Nominal Voltage (V)	51.2
Operating Voltage Range (V)	43.2~58.24
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) (℃)	0<T≤55
TDsch (Discharging Temperature Range) (℃)	-20<T≤55
Ambient Temperature（℃）	0 < T≤40（Recommend 10 < T≤30）
	Optional heating：-20 < T≤40（Recommend 10 < T≤30）
Relative Humidity	5~95%
Maximum Storage Time	12 Months（maintenance-free）
Max. Operating Altitude (m)	4000

Technical Parameters	LX U5.0-30
Heating	Optional
Fire Suppression	Optional, Aerosol
Unit Weight (kg)	50
Unit Dimensions（W*H*D mm）	460*580*160
Enclosure Protection Rating	IP65
Applications	On Grid / On Grid + Backup / off Grid
Scalability	30P
Mounting Method	Wall Mounted / Grounded
Round-trip Efficiency*1	≥96%
Cycle Life	> 6000 @25±2℃ 0.5C 70%SOH 90%DOD
Safety	VDE2510-50、IEC62619、IEC62040、N140、IEC63056
EMC	EN IEC61000-6-1, EN IEC61000-6-2, EN IEC61000-6-3, EN IEC61000-6-4
Transportation	UN38.3、ADR
Environment	ROHS
*1 Test conditions: 100% DOD, 0.2C charge & discharge at 25°C±2℃, at the beginning of life. *2 The system's working current and power values will be related to temperature and State of Charge (SOC). *3 Max charge / discharge current values may be variant with different inverter models.	

10.2.6 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

Technical Data	GW14.3-BAT-LV-G10
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)
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)

Technical Data		GW14.3-BAT-LV-G10
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)
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.

10.2.7 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

Technical Data	GW16.1-BAT-LV-G10
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
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)

Technical Data		GW16.1-BAT-LV-G10
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 ）
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.

10.2.8 GW5.0-BAT-LVI-G10

Technical Data	GW5.0-BAT-LVI-G10
Battery Type	LFP ($LiFePO_4$)

Technical Data	GW5.0-BAT-LVI-G10
Rated Capacity (Ah)	314
Rated Energy (kWh)	5.0
Usable Energy (kWh)*1	≥4.6
Nominal Voltage (Battery) (V)	16
Voltage Range (Battery) (V)	14.35~18.05
Max.Input current(System) (A)	46
Max. Output current (System) (A)	50
Operating Voltage Range (System) (V)	45~60
Max. Input Power (System) (kW)*2	2.5
Max. Output Power (System) (kW)*2	2.5
Peak Output Power (System) (kW)*2	3.75kW (3s) 3.25kW (10s)
Charging Temperature Range (°C)	0~ +55
Discharging Temperature Range (°C)	-20~ +55
Relative Humidity	5-85%
Max. Operating Altitude (m)	4000
Communication	CAN
Weight (kg)	≤40
Useable Extinguishing Agent	CO_2, H_2O
Crucial Material	$LiFePO_4$, C, Cu, $LiPF_6$, Al, $(C_3H_6)_n$
Ingress Protection	IP20

Technical Data		GW5.0-BAT-LVI-G10
Protective Class		I
Dimensions (W×H×D mm)		485*450*233
Storage Temperature (℃)		-20 ~45
Max. Storage time		-20-35℃≤12months 35-45℃ ≤ 6 months
Scalability		≤12P
Mounting Method		Wall-Mounted, Floor-Mounted, Stack
Cycle Life		≥10000
Country of Manufacture		China
Standard and Certification	Safety	IEC 62619，IEC 63056，IEC 60730
	EMC	EN IEC 61000-6-1, EN IEC 61000-6-2, EN IEC 61000-6-3, EN IEC 61000-6-4
	Transportation	UN38.3 , MSDS
*1: Test Conditions: 100% DOD (battery voltage range 2.87–3.61 V); GW5.0-BAT-LVI-G10 battery system were tested under 1.25 kW charge/discharge power (25±2°C) (system in early service life). Available energy is based on the initial design value. Actual available energy may vary depending on charge/discharge rates, environmental conditions (such as temperature), and transportation and storage factors. *2: Max.Input Power/Max.Output Power/Peak Output Power derating will occur related to Temperature and SOC. *3: Based on test data under specific laboratory conditions.		

10.2.9 GW10.0-BAT-LV-G10

Technical Data	GW10.0-BAT-LV-G10
Battery Type	LFP ($LiFePO_4$)

Technical Data	GW10.0-BAT-LV-G10
Rated Capacity (Ah)	314
Rated Energy (kWh)	10.0
Usable Energy (kWh)*1	≥9.2
Nominal Voltage(V) (Battery)	32
Operating Voltage Range(V) (System)	45~60
Voltage Range(V) (Battery)	28.70~36.10
Max.Input current(System) (A)	92
Max. Output current (System) (A)	100
Max. Input Power (System) (kW)*2	5
Max. Output Power (System) (kW)*2	5
Peak Output Power (System) (kW)*2	7.5kW (3s) 6.5kW (10s)
Charging Temperature Range (°C)	0~ +55 (standard) -20~ +55 (optional)
Discharging Temperature Range (°C)	-20~ +55
Relative Humidity	4-100%
Max. Operating Altitude (m)	4000
Communication	CAN
Weight (kg)	85
Useable Extinguishing Agent	CO_2, H_2O
Crucial Material	$LiFePO_4$, C, Cu, $LiPF_6$, Al, $(C_3H_6)_n$
Ingress Protection	IP65

Technical Data		GW10.0-BAT-LV-G10
Protective Class		I
Dimensions (W×H×D mm)		≤470*755*266
Optional Function Configuration		Heating / Aerosol fire
Storage Temperature (℃)		-20 ~45
Max. Storage time		-20-35℃≤12months 35-45℃ ≤ 6 months
Scalability		≤12P
Mounting Method		Wall-Mounted, Floor-Mounted, Stack
Cycle Life		≥10000
Country of Manufacture		China
Standard and Certification	Safety	IEC62619, IEC60730，IEC63056，CE
	EMC	EN IEC 61000-6-1, EN IEC 61000-6-2, EN IEC 61000-6-3, EN IEC 61000-6-4
	Transportation	UN38.3
*1: Test conditions, 100% DOD (cell 2.87~3.61V voltage range), GW10.0-BAT-LV-G10 based on 2.5kW 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. *2: Max.Input Power/Max.Output Power/Peak Output Power derating will occur related to Temperature and SOC. *3: 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
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 （°C）	-30~65
Relative Humidity	5%~95%
Max. Operating Altitude (m)	4000
Communication	CAN

Technical Data	GW12/2-MPU-LVO-G10
Number of input Communication ports	2
Number of output Communication ports	1
Weight (kg)	≤10kg
Dimensions (H×W×D mm)	332*537*132
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 GMK110

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

10.4.2 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

Technical Specifications		GM330
	CT Ratio	nA:5A
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 (W x H x D mm/in)	72x85x72/2.83x3.35×2.83
	Housing	4 modules
	Weight (g/lb)	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
Power Consumption (W)		≤2
Communication Interface		USB
Communication Parameters	Ethernet	10M/100Mbps adaptive
	Wireless	IEEE 802.11 b/g/n @2.4 GHz
	Bluetooth	Bluetooth V4.2 BR/EDR and Bluetooth LE standard
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、4G Kit-CN-G21

Technical Specifications		WiFi/LAN Kit-20
Output Voltage (V)		5
Power Consumption (W)		≤2
Communication Interface		USB
Communication Parameters	Ethernet	10M/100Mbps adaptive
	Wireless	IEEE 802.11 b/g/n @2.4 GHz
	Bluetooth	Bluetooth V4.2 BR/EDR and Bluetooth LE standard
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%

Technical Specifications	WiFi/LAN Kit-20
Max. Operating Altitude (m)	4000

10.5.3 Ezlink3000

Technical Specifications	Ezlink3000
General Parameters	
Connection Interface	USB
Ethernet Interface (Optional)	10/100Mbps adaptive, communication distance ≤100m
Mounting Method	Plug and Play
Indicator lights	LED Indicator
Dimensions (W * H * D mm)	49*153*32
Weight (g)	130
Ingress Protection Rating	IP65
Power Consumption (W)	≤2W (Typical)
Operating Mode	STA
Wireless Parameters	
Bluetooth Communication	Bluetooth 5.1
WiFi Communication	802.11 b/g/n (2.412GHz-2.484GHz)
Environmental Parameters	
Operating Temperature Range (℃)	-30 ~ +60
Storage Temperature Range (℃)	-30 ~ +70
Relative Humidity	0-100% (Non-condensing)
Maximum Operating Altitude (m)	4000

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. Tap Start Detection. After the detection is complete, view the detection result.

- Method 2:

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

11.1.2 How to Upgrade the Device Version

Through Firmware Info, you can view or upgrade the inverter's DSP version, ARM version, BMS version, and communication module software version. Some communication modules do not support software upgrade via the SolarGo App; please refer to the actual situation.

- **Upgrade Prompt:**

When the user opens the App, an upgrade prompt pops up 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.

- **Normal Upgrade:**

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

to complete the upgrade.

- **Forced Upgrade:**

The App pushes an upgrade notification. Users must perform the upgrade as prompted; otherwise, the App cannot be used. Follow the on-screen instructions to complete the upgrade.

11.2 Acronyms

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
Sr (from grid)	Nominal Apparent Power from Utility Grid	Grid Purchase Rated Apparent Power to Grid
Smax (from grid)	Max. Apparent Power from Utility Grid	Grid Purchase Max. Apparent Power to Grid
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

Abbreviation	English Description	Chinese Description
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
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

Abbreviation	English Description	Chinese Description
THDv	Total Harmonic Distortion of Voltage	Voltage Harmonics
C&I	Commercial & Industrial	Commercial and 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	Economy 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
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 Interrupter

Abbreviation	English Description	Chinese Description
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 Acquisition Unit
BCU	Battery Control Unit	Battery Control Unit
SOC	State of Charge	Battery State of Charge
SOH	State of Health	Battery State of Health
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	Safe State
DOD	Depth of discharge	Depth of Discharge

11.3 Terminology Explanation

- **Overvoltage Category Explanation**
  - **Overvoltage Category I**: Equipment connected to circuits with measures that limit transient overvoltages to a sufficiently low level.
  - **Overvoltage Category II**: Energy-consuming equipment supplied by a fixed distribution installation. Such equipment includes appliances, portable tools, and other household and similar loads. If special requirements for the reliability and suitability of such equipment exist, Voltage Category III shall be adopted.
  - **Overvoltage Category III**: Equipment in fixed distribution installations, for which the reliability and suitability of the equipment must meet special requirements. This includes switching devices in fixed distribution installations and industrial equipment permanently connected to fixed distribution installations.
  - **Overvoltage Category IV**: Equipment used at the supply end of distribution installations, including measuring instruments and primary overcurrent Protection devices, etc.
- **Explanation of Wet Location Categories**

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 Explanation:**
  - **Outdoor Inverter**: Ambient air temperature range -25°C to +60°C, suitable for environments with Pollution Degree 3;
  - **Indoor Type II Inverter**: Ambient air temperature range -25°C to +40°C, suitable for environments with Pollution Degree 3;
  - **Indoor Type I Inverter**: Ambient air temperature range 0°C to +40°C, suitable for environments with Pollution Degree 2;
- **Explanation of Pollution Degree Categories**
  - **Pollution Degree 1**: No pollution or only dry, non-conductive pollution;
  - **Pollution Degree 2**: Normally, only non-conductive pollution occurs. However, temporary conductive pollution caused by condensation must be considered occasionally;
  - **Pollution Degree 3**: Conductive pollution occurs, or non-conductive pollution becomes conductive due to condensation;
  - **Pollution Degree 4**: Persistent conductive pollution, e.g., pollution caused by conductive dust, rain, or snow.

11.4 Battery SN Code Meaning



The 11th to 14th digits 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 digits are the last two digits of the production year, e.g., 2023 is

represented by 23;

- The 13th digit is the production month, e.g., August is represented by 8; Specifically as follows:

Month	January to September	October	November	December
Month Code	1~9	A	B	C

- The 14th digit is the production date, e.g., the 8th is represented by 8; Numerals are preferred, e.g., 1-9 represent the 1st to 9th, A represents the 10th, and so on. Letters I and O are not used to avoid confusion. Specifically as follows:

Production Day	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Code	1	2	3	4	5	6	7	8	9

Production Day	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th
Code	A	B	C	D	E	F	G	H	J	K	L

Production Day	21st	22nd	23rd	24th	25th	26th	27th	28th	29th	30th	31st
Code	M	N	P	Q	R	S	T	U	V	W	X

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