V2.7 2026-08-30

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

Solutions Manual

GOODWE

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NOTICE

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

Preface

Overview

This document mainly introduces the product information, installation and wiring, configuration and commissioning, troubleshooting, and maintenance of an energy storage system consisting of an inverter, a battery system, and a smart meter. Before installing and using the product, please read this manual carefully, understand the 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 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: 8kW-12kW
Battery system	LX A5.0-10	Rated capacity: 5.0kWh, supports up to 15 parallel clusters
	LX A5.0-30	Rated capacity: 5.12kWh, supports up to 30 parallel clusters
	LX U5.4-L	Rated capacity: 5.4kWh, supports up to 6 parallel clusters
	LX U5.4-20	Rated capacity: 5.12kWh, supports up to 30 parallel clusters
	LX U5.0-30	
	GW14.3-BAT-LV-G10	Rated capacity: 14.3kWh, supports up to 30 parallel clusters
	GW16.1-BAT-LV-G10	Rated capacity: 16.1kWh, supports up to 30 parallel clusters
Battery Mix Parallel Unit	GW12/2-MPU-LVO-G10	Supports parallel cluster expansion between different battery models, with up to 30 batteries connected in parallel clusters

Product Type	Product Information	Description
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 single-unit scenarios, system operation information can be uploaded to the monitoring platform via WiFi or LAN signals
	4G Kit-CN-G20、4G Kit-CN-G21	System operation information can be uploaded to the monitoring platform via 4G signals.
	Ezlink3000	In parallel-unit scenarios, connect to the master inverter and upload system operation information to the monitoring platform via WiFi or LAN signals

Symbol Definitions

⚠DANGER
Indicates a highly potential hazard that, if not avoided, will result in death or serious injury.
⚠WARNING
Indicates a moderately potential hazard that, if not avoided, may result in death or serious injury.
⚠CAUTION
Indicates a low potential hazard that, if not avoided, may result in moderate or minor injury.
NOTICE
Emphasizes and supplements the content, and may also provide tips or tricks for optimal product use to help 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 strictly designed and tested in accordance with safety regulations. However, as electrical equipment, relevant safety instructions must be observed before performing 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 will be updated from time to time. Unless otherwise agreed, the document content shall not replace the safety precautions on the product label. All descriptions in this document are for guidance only.
- Read this document carefully before installing the equipment to understand the product and the precautions.
- All operations on the equipment must be performed by professional, qualified electrical technicians who are familiar with the relevant standards and safety regulations at the project location.
- When operating the equipment, use insulated tools and wear personal protective equipment to ensure personal safety. When touching electronic components, wear anti-static gloves, anti-static wrist straps, anti-static clothing, etc., to ensure the Protection of the equipment from electrostatic damage.
- Unauthorized disassembly or modification may cause equipment damage, and such damage 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 shall not be the responsibility of the equipment manufacturer. For more product warranty information, please visit the official website:https://www.goodwe.com/warrantyrelated.html.

1.2 Personnel Requirements

NOTICE

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

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

1.3 System Safety

DANGER

- Before making electrical connections, disconnect all upstream switches of the equipment to ensure the equipment is de-energized. Live operation is strictly prohibited, otherwise dangers such as electric shock may occur.
- For equipment supporting PV string access, the PV input has weak surge current withstand capability. Strictly prohibit using a DC voltage source to power on directly through the PV port. If power-on via the PV port is required, follow the steps below. Damage caused by improper operation is considered human-induced damage and is not covered by the product warranty.
  1. First, limit the output current of the DC voltage source to within the Max. Current from Grid allowed at the PV port.
  2. Then close the DC Switch of the inverter.
  3. Finally, slowly raise the output voltage of the DC source from zero to the target value at a rate of ≤50V/s.
- To prevent personal danger or equipment damage caused by live operation, a circuit breaker must be added on the voltage input side of the equipment.
- All operations such as transportation, storage, installation, operation, use, and maintenance shall comply with applicable laws, regulations, standards, and code requirements.
- The specifications of cables and components used for electrical connections shall comply with local laws, regulations, standards, and code requirements.
- Please use the cable connectors supplied with the package to connect the equipment cables. If connectors of other models are used, any resulting equipment damage is outside the scope of responsibility of the equipment manufacturer.
- Ensure that all cables of the equipment are connected correctly, firmly, and without looseness. Improper wiring may cause poor contact or damage to the equipment.
- The Protection earth wire of the equipment must be connected securely.
- For the Protection of the equipment and its components from damage during transportation, ensure that transport personnel have received professional training. During transportation, record the operation steps and keep the equipment balanced to avoid dropping the equipment.
- The equipment is heavy. Please deploy personnel according to the equipment Weight to prevent the equipment from exceeding the weight range that can be handled by personnel and injuring them.
- Ensure that the equipment is placed stably and does not tilt. Overturning of the equipment may cause equipment damage and personal injury.

⚠WARNING

- During equipment installation, avoid subjecting the wiring terminals to load-bearing, otherwise the terminals may be damaged.
- If the cable is subjected to excessive tensile force, poor connection may result. When wiring, leave a certain length of cable as a reserve before connecting it to the equipment wiring port.
- Cables of the same type should be bundled together. Cables of different types should be laid out at least 30 mm apart. Twisting or crossing them with each other is prohibited.
- Using cables in a high-temperature environment may cause aging or damage to the insulation layer. The distance between cables and heat-generating components or the periphery of heat source areas should be at least 30 mm.

1.3.1 PV String Safety

⚠WARNING

- Ensure that the module frame and mounting system are properly grounded.
- After completing the DC cable connections, ensure that the cable connections are tight and free from looseness. 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 there is no reverse connection; and that the voltage is within the allowable range.
- Use a multimeter to measure the DC cables to ensure that the positive and negative poles are correct and there is no reverse connection; 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.
- 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)/30mA).
- Do not connect the same PV string to multiple inverters; otherwise, it may cause damage to the inverter.
- PV modules used with the inverter must comply with IEC 61730 Class A standard.
- When the PV string input voltage or input current is too 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 grid connection specifications.
- On the AC side of the inverter, it is recommended to add Protection devices such as circuit breakers or fuses. The specification of the Protection device must be greater than 1.25 times the Max. Current of the inverter AC output.
- If the inverter triggers an Arc Failure alarm less than 5 times within 24 hours, the alarm can be automatically cleared. After the 5th Arc Failure alarm, the inverter shuts down for Protection. Only after the fault is cleared can the inverter operate normally.
- If no battery is configured in the PV system, the BACK-UP function is not recommended; otherwise, it may cause a risk of system power outage.
- When the grid voltage and frequency change, the inverter output power may be derated.

1.3.3 Battery Safety

⚠DANGER

- Before operating the equipment in the system, ensure that the equipment is powered off to avoid electric shock hazards. During operation of the equipment, all safety precautions in this manual and safety labels on the equipment must be strictly observed.
- Do not disassemble, modify, or repair the battery or control box without official authorization from the equipment manufacturer. Otherwise, there may be a risk of electric shock or equipment damage. Any losses caused thereby are not within the responsibility of the equipment manufacturer.
- Do not strike, pull, drag, squeeze, or step on the equipment, and do not place the battery in fire, otherwise there is a risk of battery explosion.
- Do not place the battery in high-temperature environments. Ensure that there are no heat sources near the battery and that it is not exposed to direct sunlight. If the ambient temperature exceeds 60°C, a fire may occur.
- If the battery or control box has obvious defects, cracks, damage, or other conditions, do not use it. Battery damage may cause electrolyte leakage.
- While the battery is in operation, do not move the battery system. If you need to replace or add batteries, contact the after-sales service center.
- 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 standard.

⚠WARNING

- Battery Current may be affected by factors such as temperature, humidity, and weather conditions, which may cause the battery to limit current and affect its load capacity.
- If the battery cannot start, contact the after-sales service center as soon as possible. Otherwise, the battery may be permanently damaged.
- Perform regular inspection and maintenance of the battery in accordance with the battery maintenance requirements.

Emergency Response Measures

- Battery Electrolyte Leakage
  If the battery module leaks electrolyte, avoid contact with the leaked liquid or gas. Electrolyte is corrosive; contact may cause skin irritation and chemical burns. If you accidentally come into contact with the leaked substance, perform the following operations:
  - Inhalation: Evacuate from the contaminated area and seek medical help immediately.
  - Eye contact: Rinse with clean water for at least 15 minutes and seek medical help immediately.
  - Skin contact: Thoroughly wash the affected area with soap and water, and seek medical help immediately.
  - Ingestion: Induce vomiting and seek medical assistance immediately.
- Fire
  - When the battery temperature exceeds 150°C, there is a risk of fire. If the battery catches fire, it may release toxic and hazardous gases.
  - To avoid fire, ensure that carbon dioxide (CO2), Novec 1230, or FM-200 fire extinguishers are available near the equipment.
  - When extinguishing a fire, do not use ABC dry powder fire extinguishers. Firefighters must wear protective clothing and self-contained breathing apparatus.
- Battery Fire Protection Activation
  For batteries equipped 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.
  - Preliminarily inspect the battery appearance for damage, deformation, leakage, or odor; inspect the battery enclosure, connectors, and cables.
  - Use a temperature sensor to measure the battery and ambient temperature to ensure there is no risk of overheating.
  - Isolate and label the damaged battery, and dispose of it properly in accordance with local regulations.

1.3.4 Electric Meter Safety

⚠WARNING

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

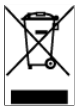
1.4 Explanation of Safety Symbols and Certification Marks

⚠DANGER

- After equipment installation, the labels and warning signs on the enclosure must be clearly visible. Covering, altering, or damaging them is prohibited.
- The following descriptions of the enclosure warning labels are for reference only. Refer to the actual labels on the equipment.

No.	Symbol	Meaning
1		There is a potential danger when the equipment is running. Take protective measures when operating the equipment.
2		High voltage danger. High voltage is present when the equipment is running. Before performing operations on the equipment, ensure that the equipment is de-energized.
3		The inverter surface is at high temperature. Do not touch it while the equipment is running; otherwise, burns may occur.
4		Use the equipment properly. Under extreme conditions, the equipment has a risk of explosion.

No.	Symbol	Meaning
5		The battery contains flammable materials. Beware of fire.
6		The equipment contains corrosive electrolyte. Avoid contact with leaked electrolyte or volatile gases.
7		Delayed discharge. After the device is powered off, wait 5 minutes until the device is fully discharged.
8		The device should be kept away from open flames or ignition sources.
9		The device should be kept away from areas accessible to children.
10		Do not extinguish with water.
11		After the battery system is wired or while it is in operation, do not lift the equipment.
12		Before operating the device, please read the product manual carefully.
13		During equipment operation, do not directly disconnect or plug/unplug DC terminals.
14		Personal protective equipment must be worn during installation, operation, and maintenance.

No.	Symbol	Meaning
15		The device must not be disposed of as household waste. Please dispose of the device in accordance with local laws and regulations, or return it to the manufacturer.
16		Protection grounding wire connection point.
17		Recycling symbol.
18		CE Certification mark.
19		TUV mark.
20		RCM mark.

1.5 European Declaration of Conformity

1.5.1 Equipment with Wireless Communication Function

Equipment with wireless communication function sold in the European market complies with the following directive requirements:

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

1.5.2 Equipment Without Wireless Communication Function (Except Battery)

Equipment without wireless communication function that can be sold in the European market complies with 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 sold in the European market comply with 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 company's battery products meet the hazardous substance limit requirements specified in this regulation.

For more EU declarations of conformity, please visit theofficial websiteto obtain them.

2 System Introduction

2.1 System Overview

The residential smart inverter solution integrates inverters, batteries, smart meters, smart communication sticks, and other devices. In the PV system, solar energy is converted into electrical energy to meet household electricity needs. The energy IoT devices in the system manage electrical equipment by identifying the overall power conditions in the system, thereby intelligently managing electricity for load consumption, storage in batteries, or output to the grid.

⚠WARNING

- Select the battery model based on the inverter and battery matching list. For battery requirements used in the same system, such as whether models can be mixed and whether capacities must be consistent, please refer to the user manual of the corresponding battery model or contact the battery manufacturer for related 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 will be updated from time to time. The matching relationship between inverters and IoT products can be found at: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 solutions for each scenario, please refer to:5.2.System Wiring Detail Diagram(Page 117)
- The energy storage system is not suitable for connecting equipment that relies on stable power supply, such as life-sustaining medical devices. Ensure that no personal injury can be caused when the system is powered off.
- In a completely off-grid inverter system, if the battery is in 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 fully discharged. Recommended measures are as follows:
  1. During off-grid operation, set the minimum SOC Protection threshold. It is recommended to set the off-grid battery SOC lower limit 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 a timely manner through external energy sources (such as 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 discharge the battery once every six months to calibrate SOC accuracy.

When the energy storage system is in off-grid state, it can supply the following loads for normal use:

Off-grid Load Capacity Description	
Inverter Model	GW8000-ES-C10 GW10K-ES-C10 GW12K-ES-C10
Single inductive load Rated Power (kVA)	2.2
Total inductive load Rated Power (kVA)	0.75*Pn
Note: • Pn: Rated output power of the inverter. • If the Rated Power of a single motor load is greater than or equal to the nominal value in the table above, a VFD/VSD needs to be configured; • For 2 or more units in parallel, the allowable total motor load Rated Power = Rated Power of a single motor load * number of parallel units * 80%.	

General Scenario

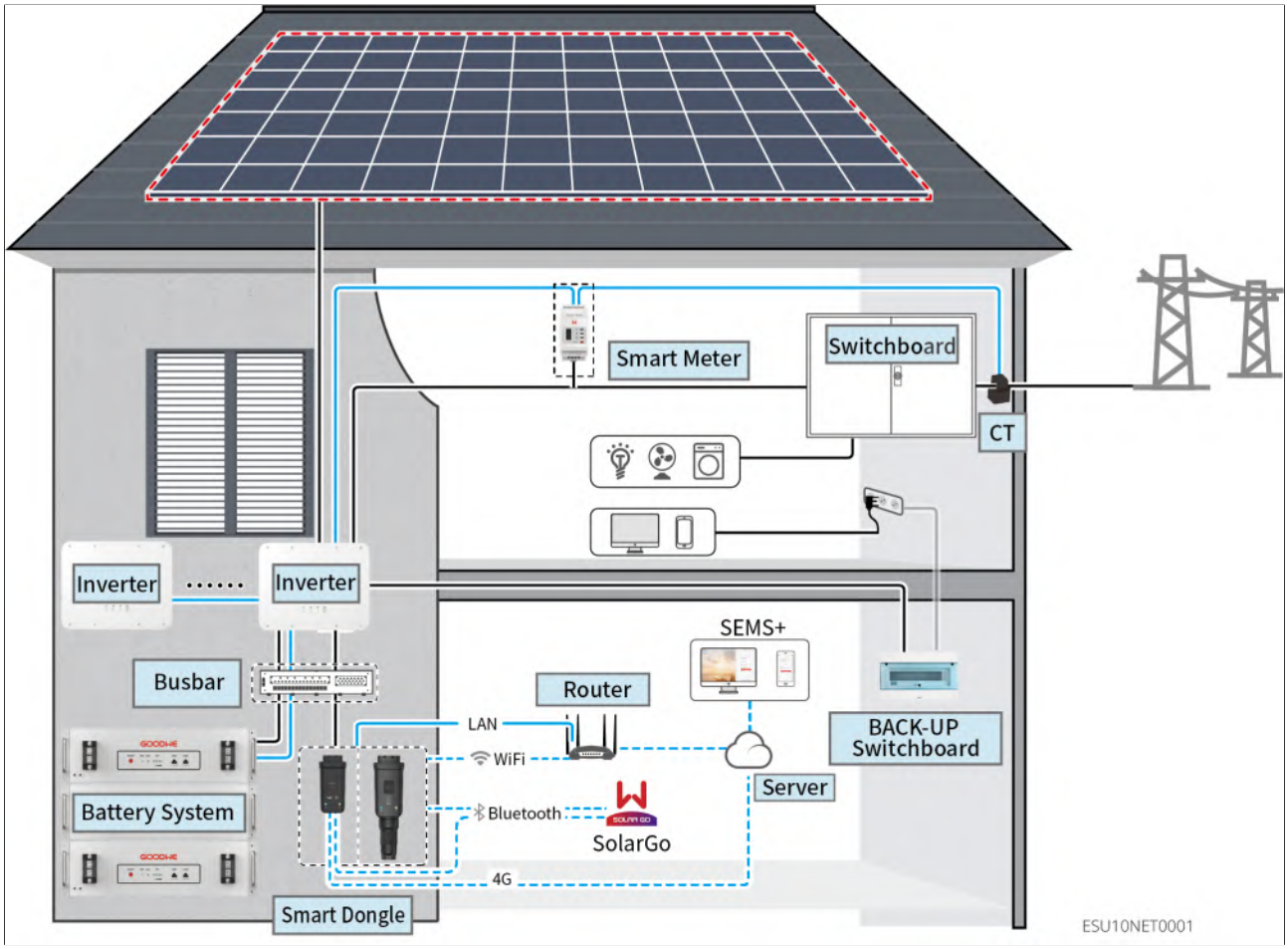


Figure1 General Scenario

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

Device Type	Model	Description
	LX U5.4-20	• The same system supports up to 6 parallel clusters. • The battery system does not support capacity expansion.
	LX U5.0-30	• The same system supports up to 30 parallel clusters. • Parallel cluster expansion between different models is currently not supported. For the same model, parallel cluster expansion is allowed within one year after purchase; after one year, it is not allowed.
	GW14.3-BAT-LV-G10	The same system supports up to 30 parallel clusters: • Products with SN code 25C or later support 30 parallel clusters by default. • For products before 25C, if 30 parallel clusters are required, please contact the GoodWe after-sales service center to Upgrade Firmware. • For viewing the product SN code, refer to11.4.SN Code Meaning(Page 362).
	GW16.1-BAT-LV-G10	The same system supports up to 30 parallel clusters.
	Lead-acid battery	• Supports connection of AGM, GEL, and Flooded lead-acid batteries. • Calculate the Battery Qty that can be connected in series based on the Battery Voltage of the lead-acid battery. The total Battery Voltage of the series-connected batteries must not exceed 60V.

Device Type	Model	Description
Combiner box	BCB-11-WW-0 BCB-22-WW-0 BCB-32-WW-0 BCB-33-WW-0 (Purchased from GoodWe) Third-party busbar	Please select the combiner box according to the charge/discharge capacity of the inverters, the load size, and the charge/discharge capacity of the batteries in the system. • BCB-11-WW-0: ◦ When used with LX A5.0-10, the battery system supports a maximum operating current of 360A, an operating power of 18kW, and a maximum of 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 720A, an operating power of 36kW, and a maximum of 6 inverters and 12 batteries. ◦ When used with LX A5.0-30, the battery system supports a maximum operating current of 720A, an operating power of 36kW, and a maximum of 6 inverters and 6 batteries. ◦ When used with LX U5.0-30, the battery system supports a maximum operating current of 720A, an operating power of 36kW, and a maximum of 6 inverters and 6 batteries. • BCB-32-WW-0: ◦ When used with LX A5.0-10, the battery system supports a maximum operating current of 720A, an operating power of 36kW, and a maximum of 6 inverters and 15 batteries. ◦ When used with LX A5.0-30, the battery system supports a maximum operating current of 720A, an operating power of

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

Device Type	Model	Description
Mix Parallel Unit	GW12/2-MPU-LVO-G10	• Mix Parallel Unit supports the following functions: ◦ Capacity expansion: The Mix Parallel Unit supports capacity expansion. If the customer purchased the batteries more than one year ago and needs to expand capacity, be sure to use the second port of the Mix Parallel Unit to add batteries of the same model. ◦ Parallel mixing: The two battery ports of the Mix Parallel Unit can be connected to batteries of different GW models. • It has two independent battery connection ports, each of which 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 in two branches; only batteries of the same model are allowed in a single branch. • The total number of batteries connected to the two ports shall not exceed 30 (i.e., BAT1 port battery quantity + BAT2 port battery quantity ≤ 30). • After the system is connected to the Mix Parallel Unit, the Max. Current to Grid at the INV port of the Mix Parallel Unit is limited by the battery with the smaller Max. Current from Grid among the two 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 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 parallel inverters 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 with a default CT ratio of 120A/40mA. • GMK110: When the built-in CT cable of the inverter is not long enough to reach the distribution board, an external GMK110 meter can be used to extend the length. The CT is not replaceable; CT ratio: 120A/40mA. • GM330: The CT can be purchased from GoodWe or purchased separately; CT ratio requirement: nA/5A. • nA: CT primary input current, n ranges from 200 to 5000. • 5A: CT secondary 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, use the WiFi/LAN Kit-20, 4G Kit-CN-G20, or 4G Kit-CN-G21 module. • For parallel operation, only the master inverter needs to be connected to Ezlink3000; slave inverters do not need a communication module. The Ezlink3000 firmware version must be 05 or above.
Large load	-	Supports SG Ready; large load specifications are as follows: 1. Total large load power < maximum output power of the GEN port 2. Large load power + BACK-UP power < AC Max. Input Power (grid)
Generator	-	The generator Nominal Voltage shall meet the Nominal Voltage of the inverter GEN port.

Microgrid Scenario

⚠WARNING

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

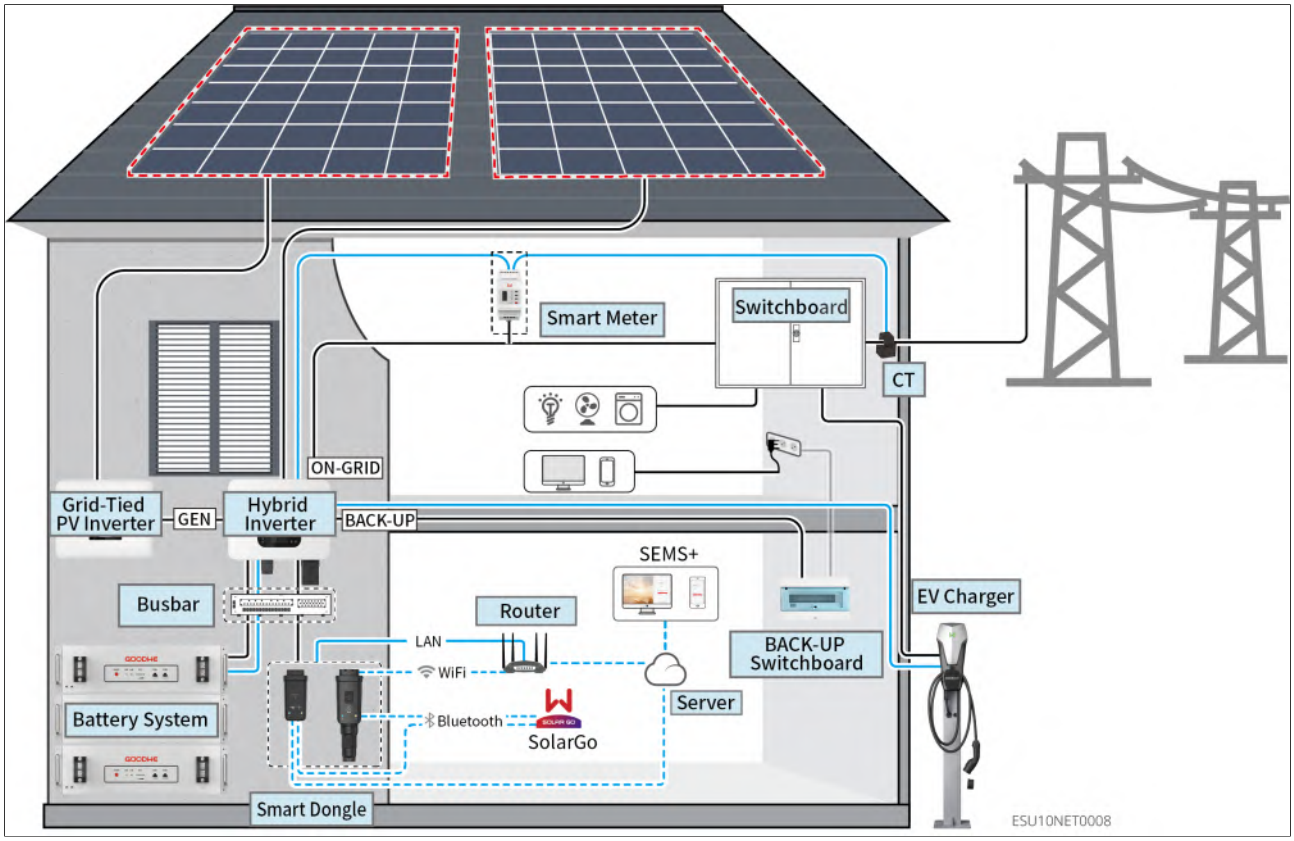


Figure2 Microgrid Scenario

Device Type	Model	Description
PV storage hybrid inverter	GW8000-ES-C10 GW10K-ES-C10 GW12K-ES-C10	• In a microgrid system, the inverter does not support parallel operation; only one inverter can be used in the system • Inverter version requirements: ◦ The ARM software version of the inverter is 15.494 or above. ◦ The DSP software version of the inverter is 07.65 or above. ◦ Some models do not support the microgrid function • Version requirements for supporting Mix Parallel Unit: ◦ The ARM software version of the inverter is 18.522 or above. ◦ The DSP software version of the inverter is 07.65 or above.
Battery system	LX A5.0-10	The same system supports up to 15 parallel clusters.
	LX A5.0-30	The same system supports up to 30 parallel clusters.
	LX U5.4-L LX U5.4-20	• The same system supports up to 6 parallel clusters. • The battery system does not support capacity expansion.
	LX U5.0-30	• The same system supports up to 30 parallel clusters. • Parallel cluster expansion between different models is currently not supported. For the same model, parallel cluster expansion is allowed within one year after purchase; after one year, it is not allowed.

Device Type	Model	Description
	GW14.3-BAT-LV-G10	The same system supports up to 30 parallel clusters: • Products with SN code 25C or later support 30 parallel clusters by default. • For products before 25C, if 30 parallel clusters are required, please contact the GoodWe after-sales service center to Upgrade Firmware. • For viewing the product SN code, refer to11.4.SN Code Meaning(Page 362).
	GW16.1-BAT-LV-G10	The same system supports up to 30 parallel clusters.
	Lead-acid battery	• Supports connection of AGM, GEL, and Flooded lead-acid batteries. • Calculate the Battery Qty that can be connected in series based on the Battery Voltage of the lead-acid battery. The total Battery 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	Please select the combiner box according to the charge/discharge capacity of the inverters, the load size, and the charge/discharge capacity of the batteries in the system. • BCB-11-WW-0: ◦ When used with LX A5.0-10, the battery system supports a maximum operating current of 360A, an operating power of 18kW, and a maximum of 3 inverters and 6 batteries. • BCB-22-WW-0: ◦ When used with LX A5.0-10, the battery

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

Device Type	Model	Description
		battery system supports a maximum operating current of 720A, an operating power of 36kW, and a maximum of 6 inverters and 15 batteries. • BCB-33-WW-0： ◦ When used with the LX U5.0-30, the battery system supports a maximum working current of 720A, a working power of 36kW, and connections of up to 6 inverters and 15 batteries. When Battery Qty exceeds 8, two fuses rated at 600A must be connected in parallel. • Third-party busbar: configure it according to the system power and current.

Device Type	Model	Description
Mix Parallel Unit	GW12/2-MPU-LVO-G10	• Mix Parallel Unit supports the following functions: ◦ Capacity expansion: The Mix Parallel Unit supports capacity expansion. If the customer purchased the batteries more than one year ago and needs to expand capacity, be sure to use the second port of the Mix Parallel Unit to add batteries of the same model. ◦ Parallel mixing: The two battery ports of the Mix Parallel Unit can be connected to batteries of different GW models. • It has two independent battery connection ports, each of which 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 in two branches; only batteries of the same model are allowed in a single branch. • The total number of batteries connected to the two ports shall not exceed 30 (i.e., BAT1 port battery quantity + BAT2 port battery quantity ≤ 30). • After the system is connected to the Mix Parallel Unit, the Max. Current to Grid at the INV port of the Mix Parallel Unit is limited by the battery with the smaller Max. Current from Grid among the two 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 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 parallel inverters 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 with a default CT ratio of 120A/40mA. • GMK110: When the built-in CT cable of the inverter is not long enough to reach the distribution board, an external GMK110 meter can be used to extend the length. The CT is not replaceable; CT ratio: 120A/40mA. • GM330: The CT can be purchased from GoodWe or purchased separately; CT ratio requirement: nA/5A. • nA: CT primary input current, n ranges from 200 to 5000. • 5A: CT secondary output current.
Communication module	• WiFi/LAN Kit-20 (standard) • 4G Kit-CN-G20 (China only) • 4G Kit-CN-G21 (China only)	For single-unit operation, use the WiFi/LAN Kit-20, 4G Kit-CN-G20, or 4G Kit-CN-G21 module.

Device Type	Model	Description
Grid-connected inverter	-	• GoodWe brand grid-connected inverters are recommended, and third-party grid-connected inverters are supported. • In a microgrid system, ensure that the rated output power of the grid-connected inverter is ≤ the rated output power of the hybrid inverter. • When the microgrid system is grid-connected, if power limiting is required, please ensure: ◦ The PV storage hybrid inverter must be configured in the SEMS+ APP**Set Power Limit Parameters**interface. For the grid-connected inverter, configure it according to the actual tool used. ◦ To ensure that the grid-connected inverter can continue generating, adjust the output power of the hybrid inverter in the SEMS+ APP**Microgrid Control Parameters**interface. • Note: Different grid-connected inverters have different output Power Control accuracy. Please set the grid-connected power limit parameter values according to the actual situation.

2.2 Product Introduction

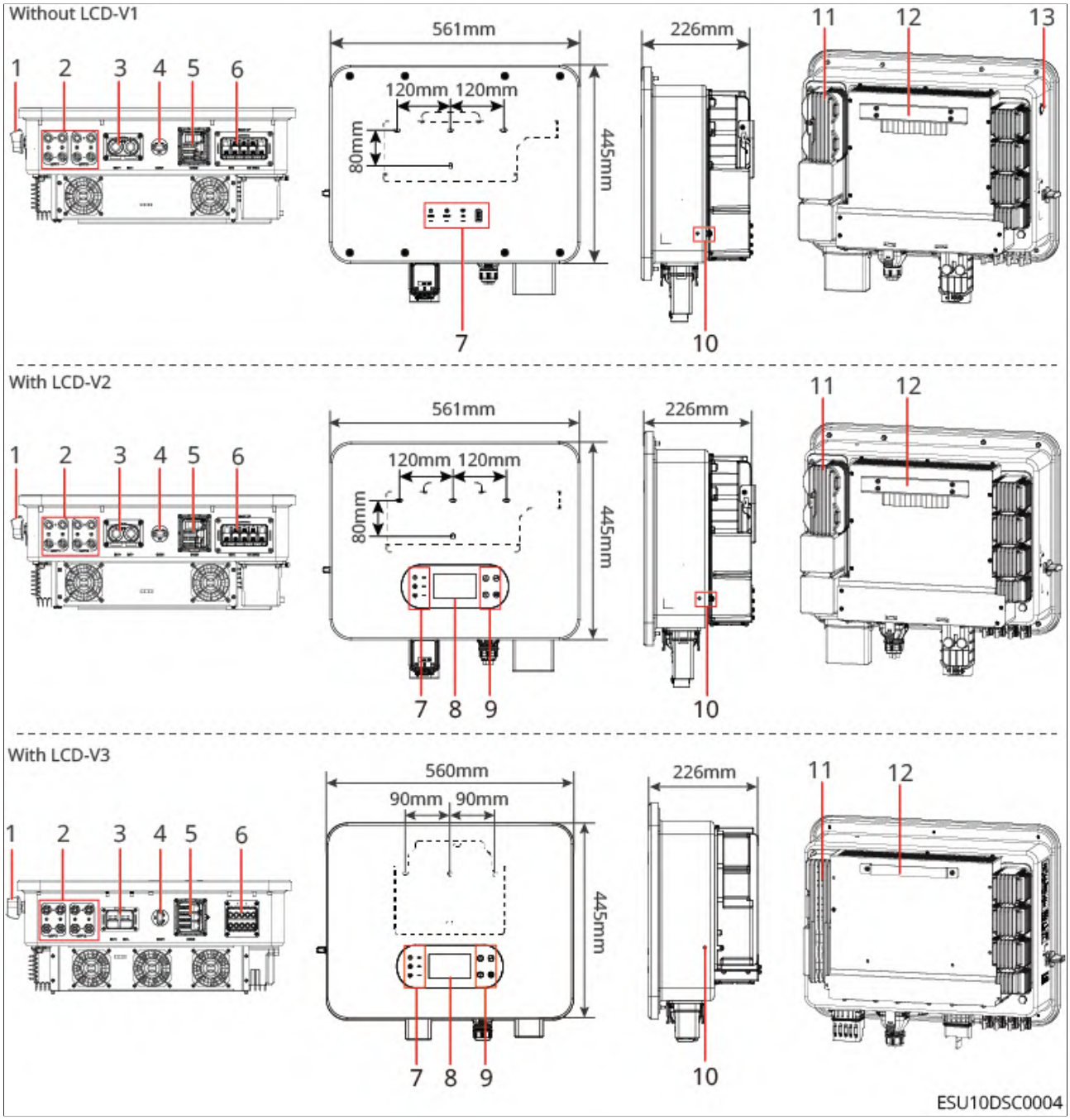
2.2.1 Inverter

In a PV system, the inverter controls and optimizes the energy flow through the integrated energy management system. The electricity generated by the PV system can be supplied to loads, stored in batteries, or fed into 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

NOTICE

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



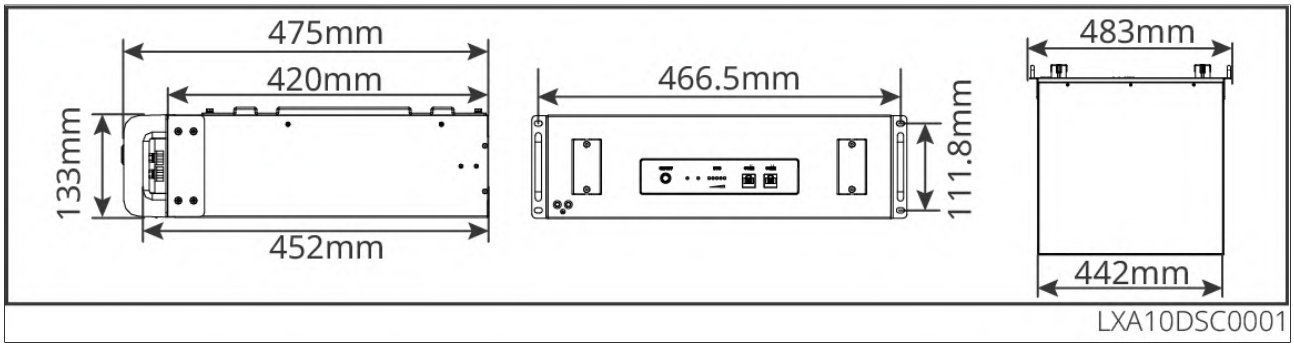
No.	Component / Silkscreen	Description
1	DC Switch	Controls the connection or disconnection of the DC input.
2	PV Input Terminal	Can be used to connect the DC input cables of PV modules.

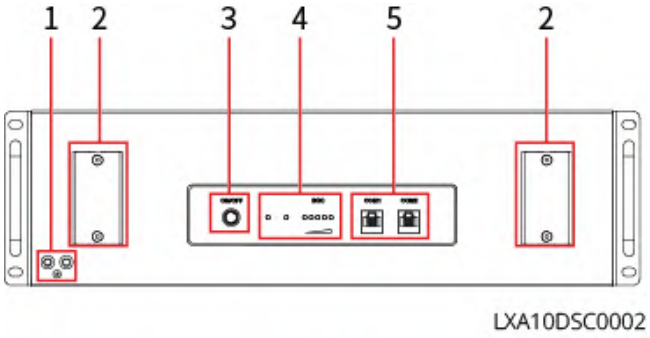
3	Battery Input Terminal	Can be used to connect the battery DC input cables.
4	Communication Module Port	A communication module can be connected. Select the module type according to actual requirements.
5	Communication Port	Can connect load control,CT,RS485, Remote Shutdown/Rapid Shutdown,DRED(Australia)/RCR(Europe), and other communication cables.
6	AC Output Port	AC output cables can be connected to connect the inverter to the grid.
7	Indicator light	Indicates the operating status of the inverter.
8	Display (optional)	View inverter-related data.
9	Buttons (optional)	Used together with the display to operate the inverter.
10	Grounding terminal	Connect the Protection ground wire.
11	Heat Sink	For heat dissipation of the inverter.
12	Wall-mounting bracket	Can be used to wall-mount the inverter.
13	Off-grid control switch (non-display model only)	Controls whether the inverter supports off-grid operation mode. • When the switch is pressed: the inverter supports off-grid operation mode. • When the switch is not pressed: the inverter does not support off-grid operation mode.

2.2.2 Battery

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

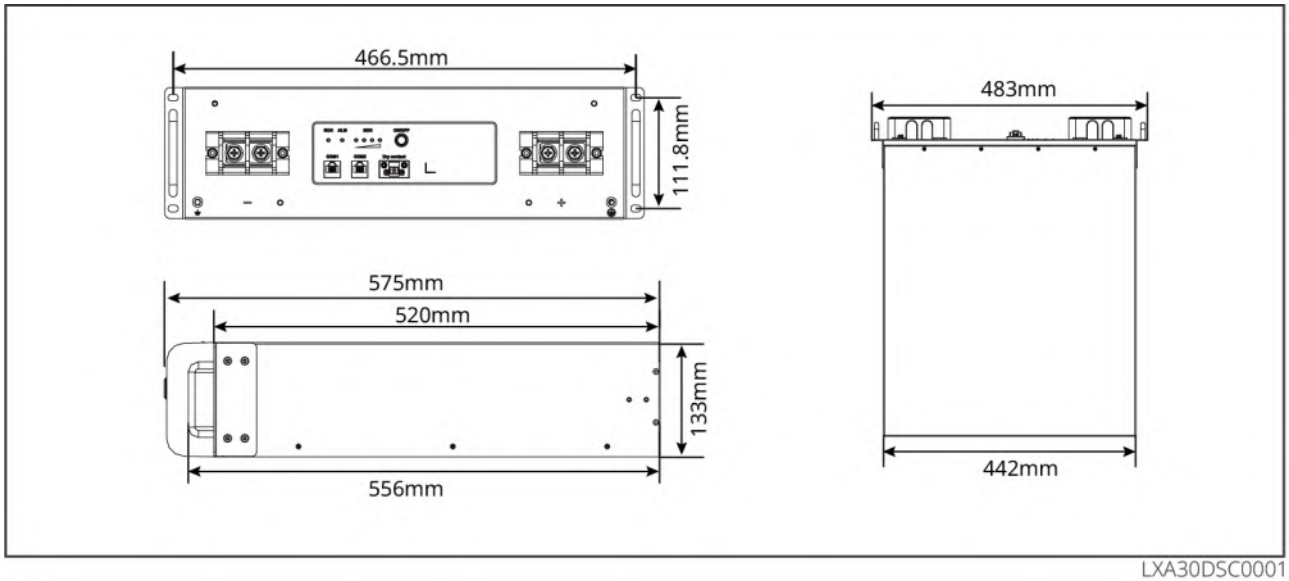
2.2.2.1 LX A5.0-10



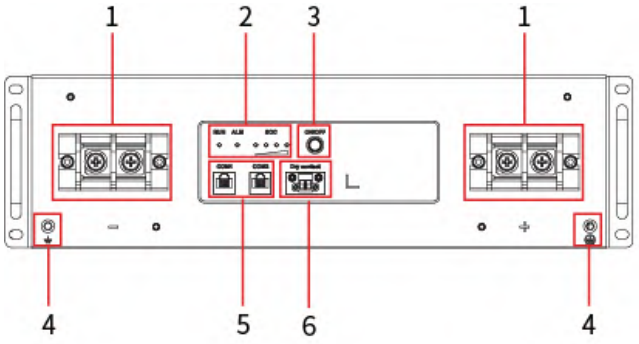


No.	Component / Silkscreen	Description
1	Protection grounding terminal	Connect the protection ground wire to the enclosure.
2	Battery DC port	Connect the battery DC input cable.
3	Battery system button	Used for battery power-up/power-down and black start.
4	Indicator light	Indicates the working status of the battery.
5	Communication Port	Connect the battery communication cable.

2.2.2.2 LX A5.0-30



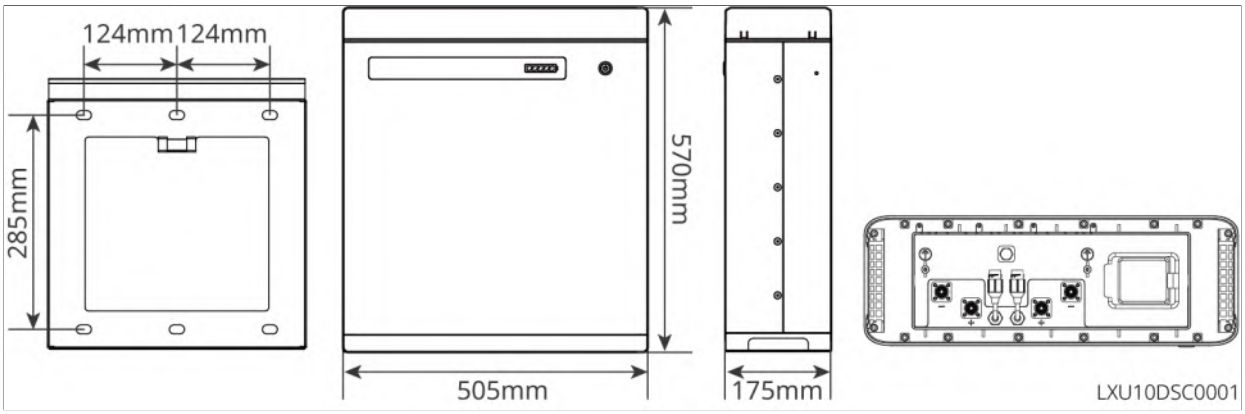
LXA30DSC0001

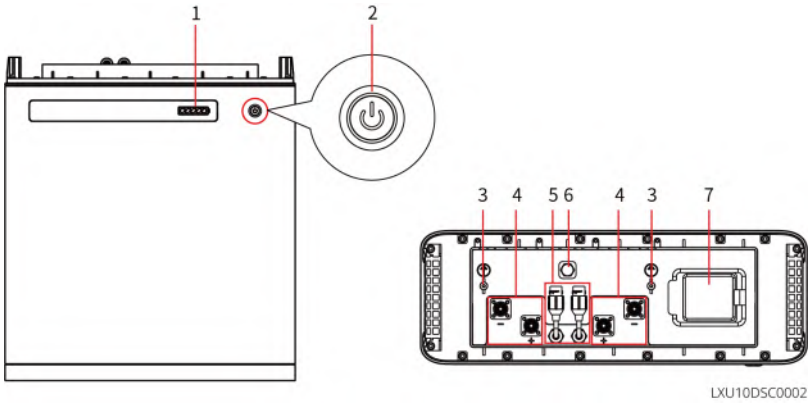


LXA30DSC0002

No.	Component / Silkscreen	Description
1	Battery DC port	Connect the battery DC input cable.
2	Indicator light	Indicates the working status of the battery.
3	Battery system button	Used for battery power-up/power-down and black start.
4	Protection grounding terminal	Connect the protection ground wire to the enclosure.
5	Communication Port	Connect the battery communication cable.
6	Dry contact	Reserved.

2.2.2.3 LX U5.4-L、LX U5.4-20

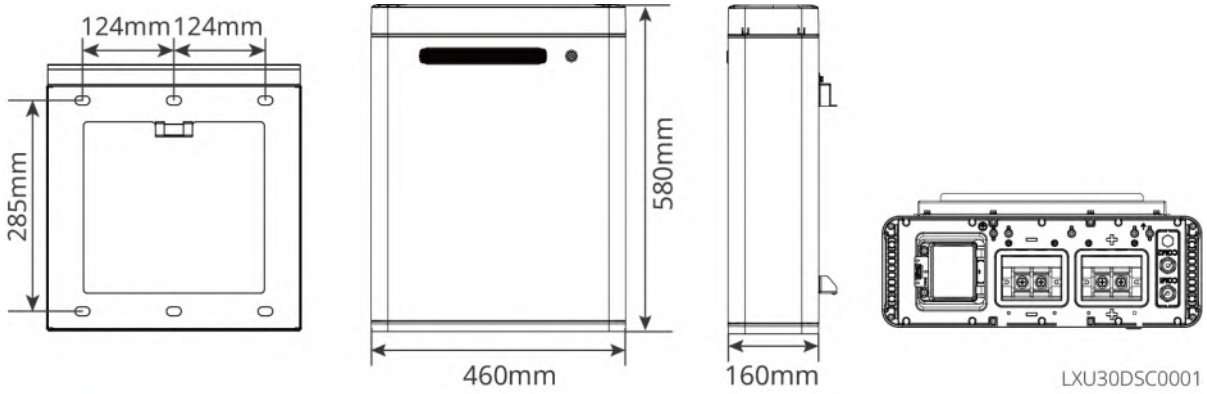


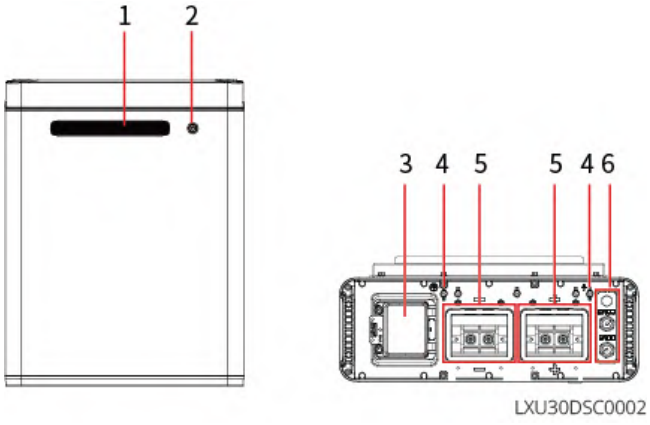


No.	Component / Silkscreen	Description
1	Indicator light	Indicates the working status of the battery.
2	Battery system button	Used for battery power-up/power-down and black start.
3	Protection grounding terminal	Connect the protection ground wire to the enclosure.
4	Battery DC port	Connect the battery DC input cable.
5	Communication Port	Connect the battery communication cable.

No.	Component / Silkscreen	Description
6	Explosion-proof vent valve	The explosion-proof vent valve balances the internal and external pressure of the battery to prevent explosion.
7	Battery circuit breaker	Used for battery power-up/power-down.

2.2.2.4 LX U5.0-30

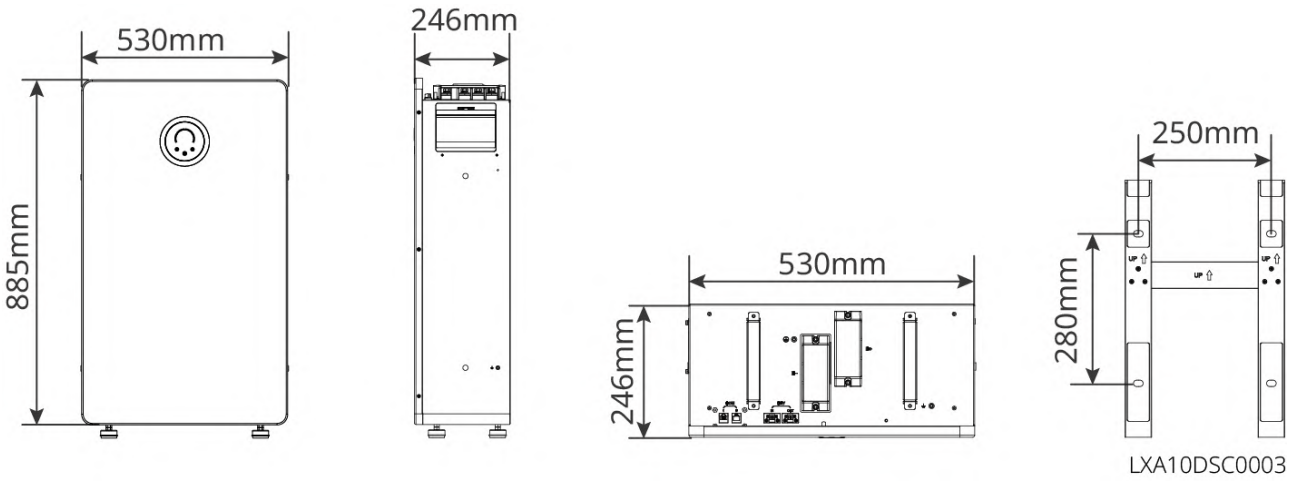


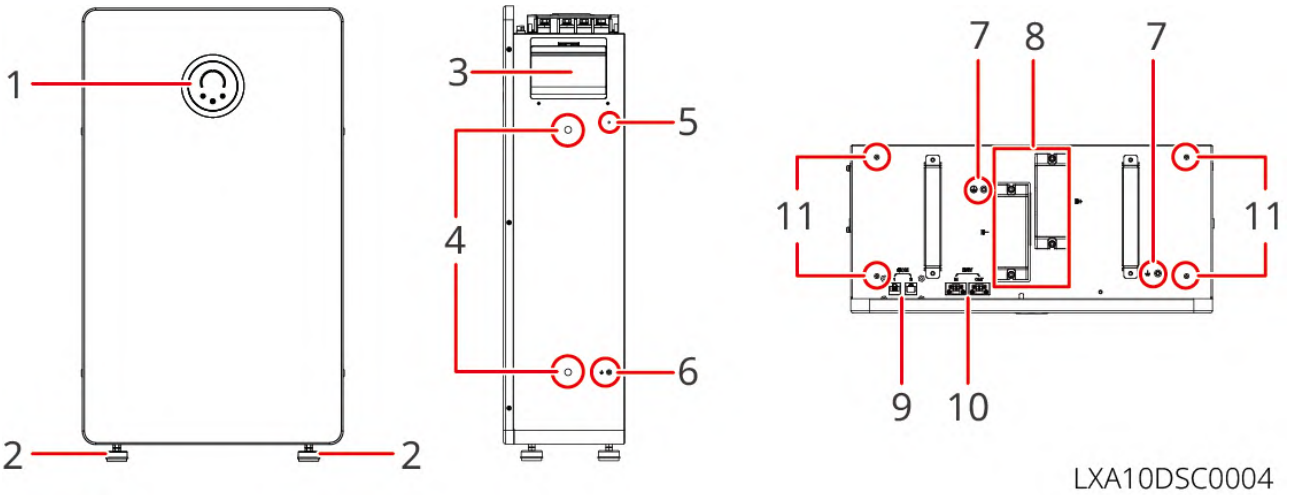


No.	Component / Silkscreen	Description
1	Indicator light	Indicates the working status of the battery.
2	Battery system button	Used for battery power-up/power-down and black start.
3	Battery circuit breaker	Used for battery power-up/power-down.

No.	Component / Silkscreen	Description
4	Protection grounding terminal	Connect the protection ground wire to the enclosure.
5	Battery DC port	Connect the battery DC input cable.
6	Communication Port	Connect the battery communication cable.

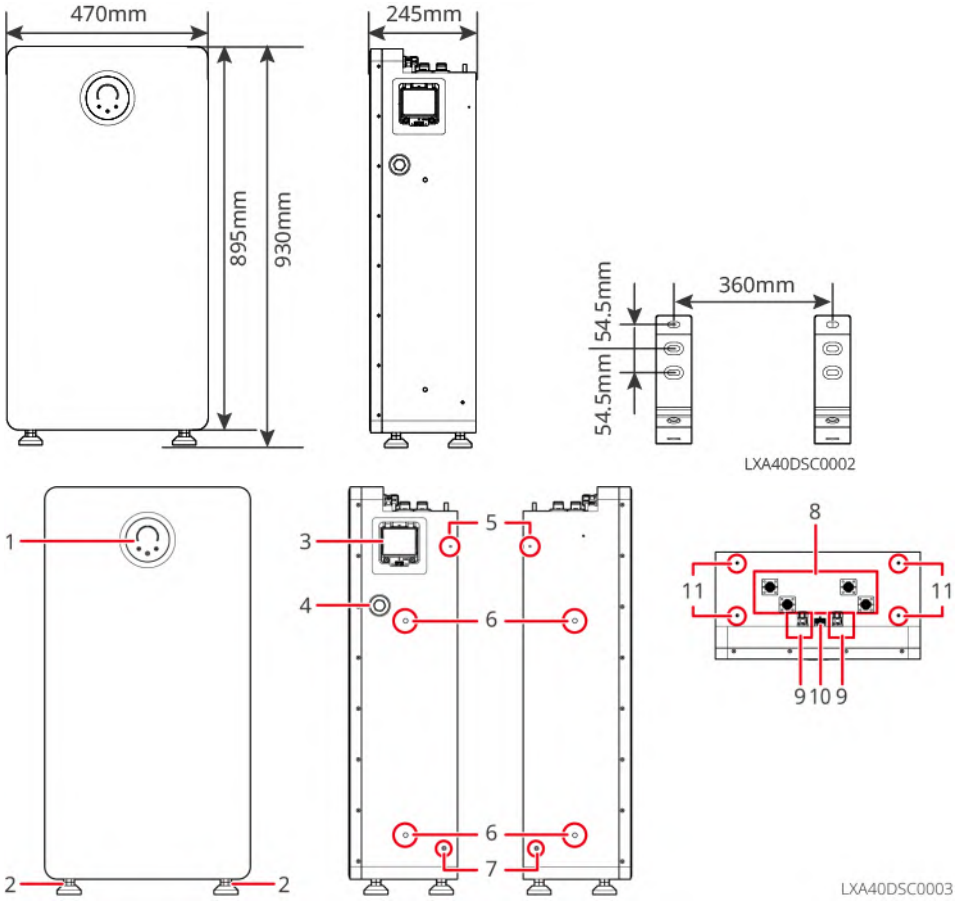
2.2.2.5 GW14.3-BAT-LV-G10





No.	Component / Silkscreen	Description
1	Indicator light	Indicates the working status of the battery.
2	Support feet	Supports the battery.
3	Battery circuit breaker	Used for battery power-up/power-down.
4	Lifting bar mounting hole	Used for installing the lifting bar. Used when manually handling the battery.
5	L-bracket mounting holes	Used to secure the battery to the wall.
6	Protection grounding terminal	Connect the enclosure Protection ground wire; reserved.
7	Protection grounding terminal	Connect the battery system Protection ground wire.
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.

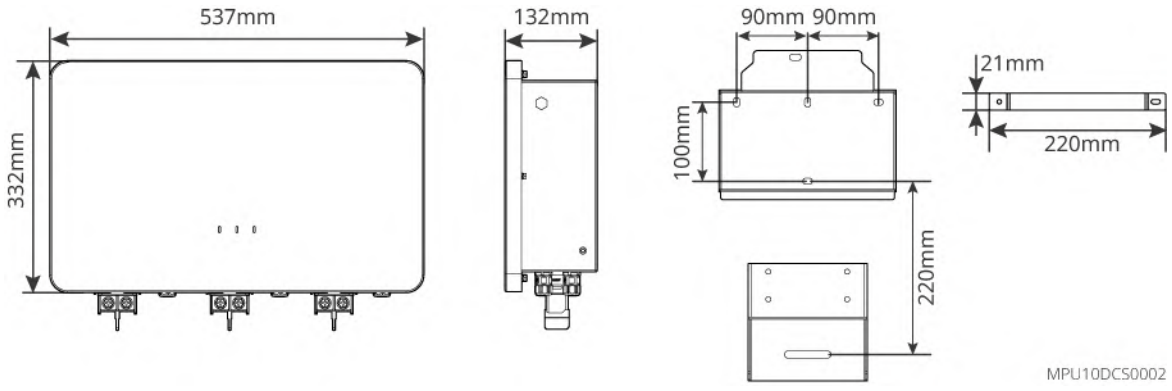
2.2.2.6 GW16.1-BAT-LV-G10

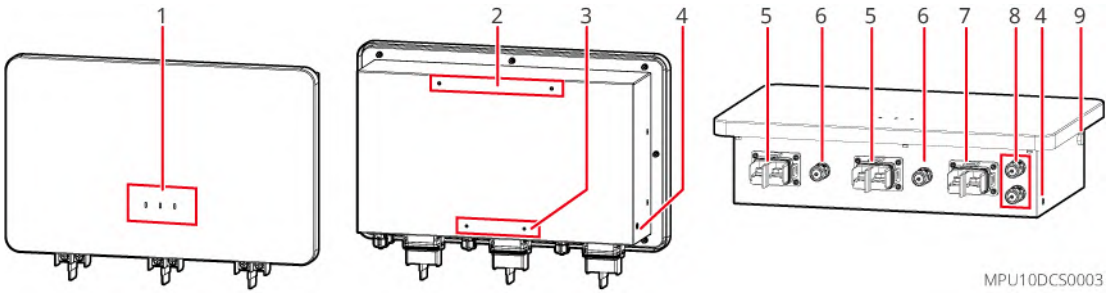


No.	Component / Silkscreen	Description
1	Indicator light	Indicates the working status of the battery.
2	Support feet	Supports the battery.
3	Battery circuit breaker	Used for battery power-up/power-down.
4	Explosion-proof vent valve	Balance the internal and external air pressure of the battery to prevent explosion.
5	Anti-tip bracket mounting hole	Used to secure the battery to the wall.
6	Lifting bar mounting hole	Used for installing the lifting bar. Used when manually handling the battery.
7	Protection grounding terminal	Connect the protection ground wire to the enclosure.

No.	Component / Silkscreen	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 devices, etc.
11	Decorative cover mounting holes	Used to secure the battery decorative cover.

2.2.3 Mix Parallel Unit



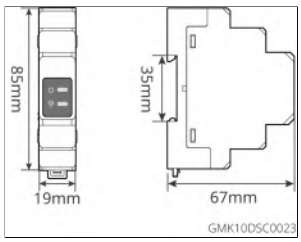
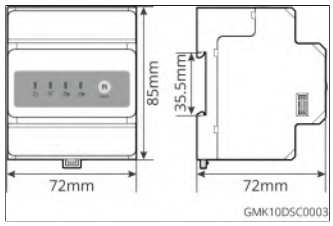
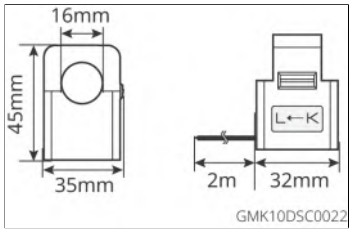


No.	Component / Silkscreen	Description
1	Indicator light	Indicates the working status of the Mix Parallel Unit.
2	Mounting hole positions for the wall-mounting bracket	Installation bracket for securing the Mix Parallel Unit.

No.	Component / Silkscreen	Description
3	Mounting hole positions for the enclosure mounting plate	Wall-mount bracket fixed-end hanger plate that can secure the Mix Parallel Unit.
4	Protection grounding terminal	Connect the protection ground wire to the enclosure.
5	DC port BAT1 DC port BAT2	DC cable connecting the battery to the Mix Parallel Unit.
6	Communication Port	Communication cable connecting the battery to the Mix Parallel Unit.
7	DC port INV	DC cable connecting the inverter to the Mix Parallel Unit.
8	Communication Port	Communication cable connecting the inverter to the Mix Parallel Unit.
9	Breathing valve	Balances 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.

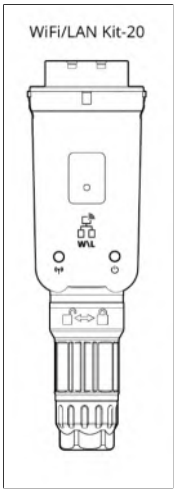
GMK110	GM330	CT
		

No.	Model	Application scenarios
1	GMK110	The CT is non-replaceable; CT ratio: 120A: 40mA

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

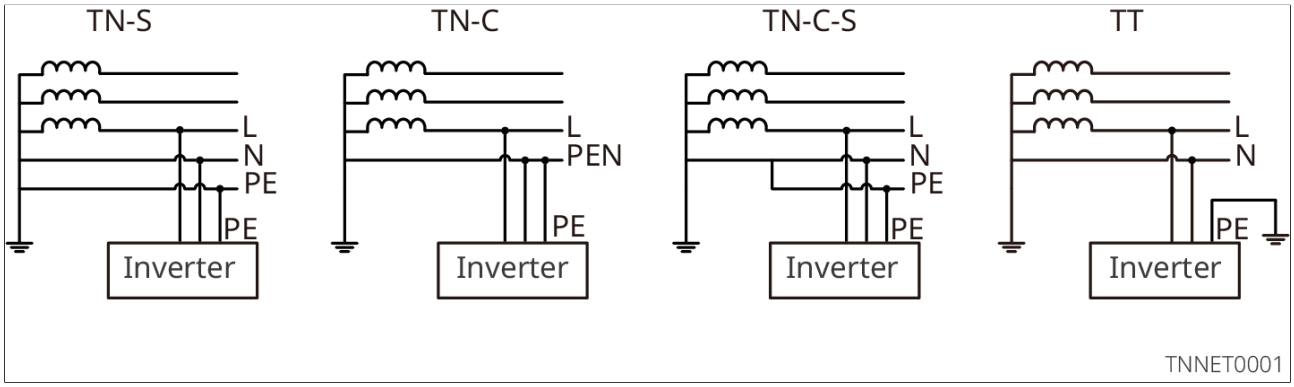
2.2.5 Smart Communication Stick

The Smart Communication Stick is mainly used to transmit various power generation data from the inverter to the SEMS+ remote monitoring platform in real time, and to connect the Smart Communication Stick via the SEMS+ App for local device commissioning.

No.	Model	Signal type	Application scenarios
1	WiFi/LAN Kit-20	Bluetooth, WiFi, LAN	Used for 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 Modes

NOTICE
After the First-time Installation of the GW14.3-BAT-LV-G10 and GW16.1-BAT-LV-G10 battery systems, a full battery charge will be automatically performed once, and upon completion, the system will switch to the configured operating mode.

Self-consumption Mode

- Basic mode of system operation.
- PV generation powers the load first. 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 cannot meet the load demand, the grid supplies the load.

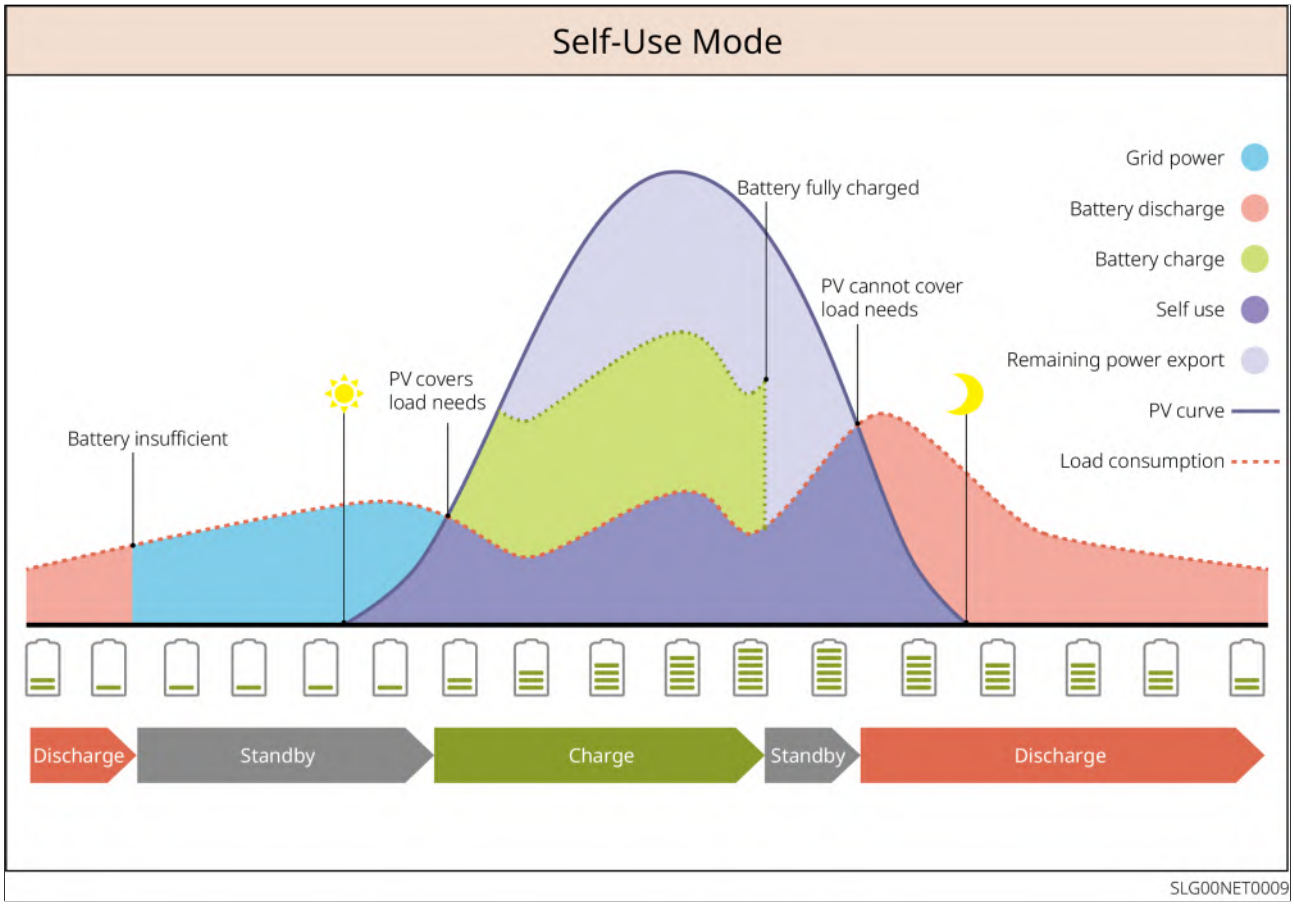


Figure3 **Self-consumption Mode**

Backup Mode

- Recommended for use in areas with unstable power grids.
- When a Grid Power Outage occurs, the inverter switches to off-grid working mode, and the battery discharges to supply power to the load, ensuring the BACK-UP load does not lose power; when the grid is restored, the inverter switches to grid-connected operation.
- To ensure that the battery SOC is sufficient to maintain normal operation of the system during off-grid operation, when the system is operating grid-connected, the battery will be charged to the backup power SOC using PV or grid purchased power. If charging the battery through grid purchased power is required, please confirm compliance with local grid laws and regulations.

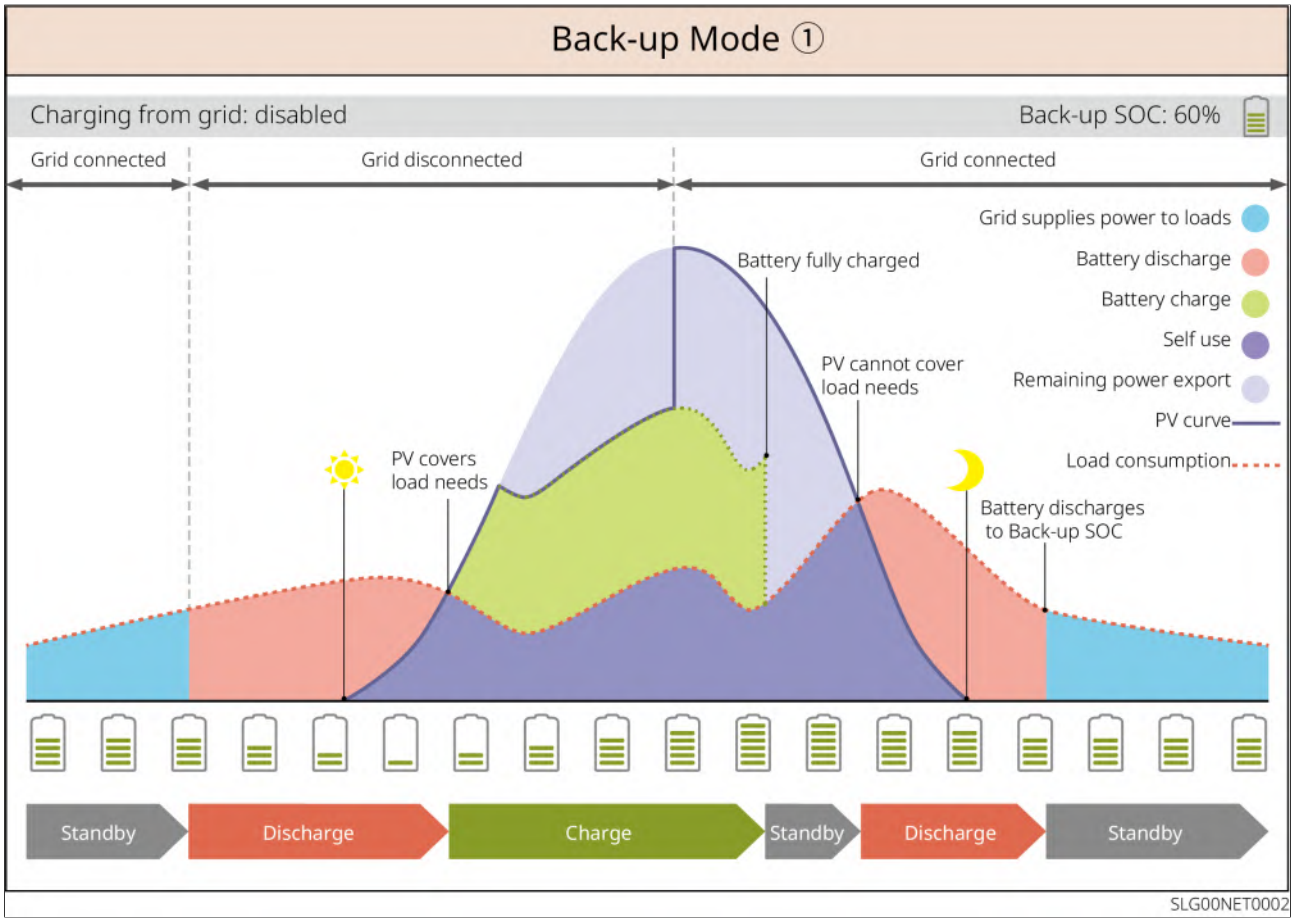


Figure4 **Backup Mode 1**

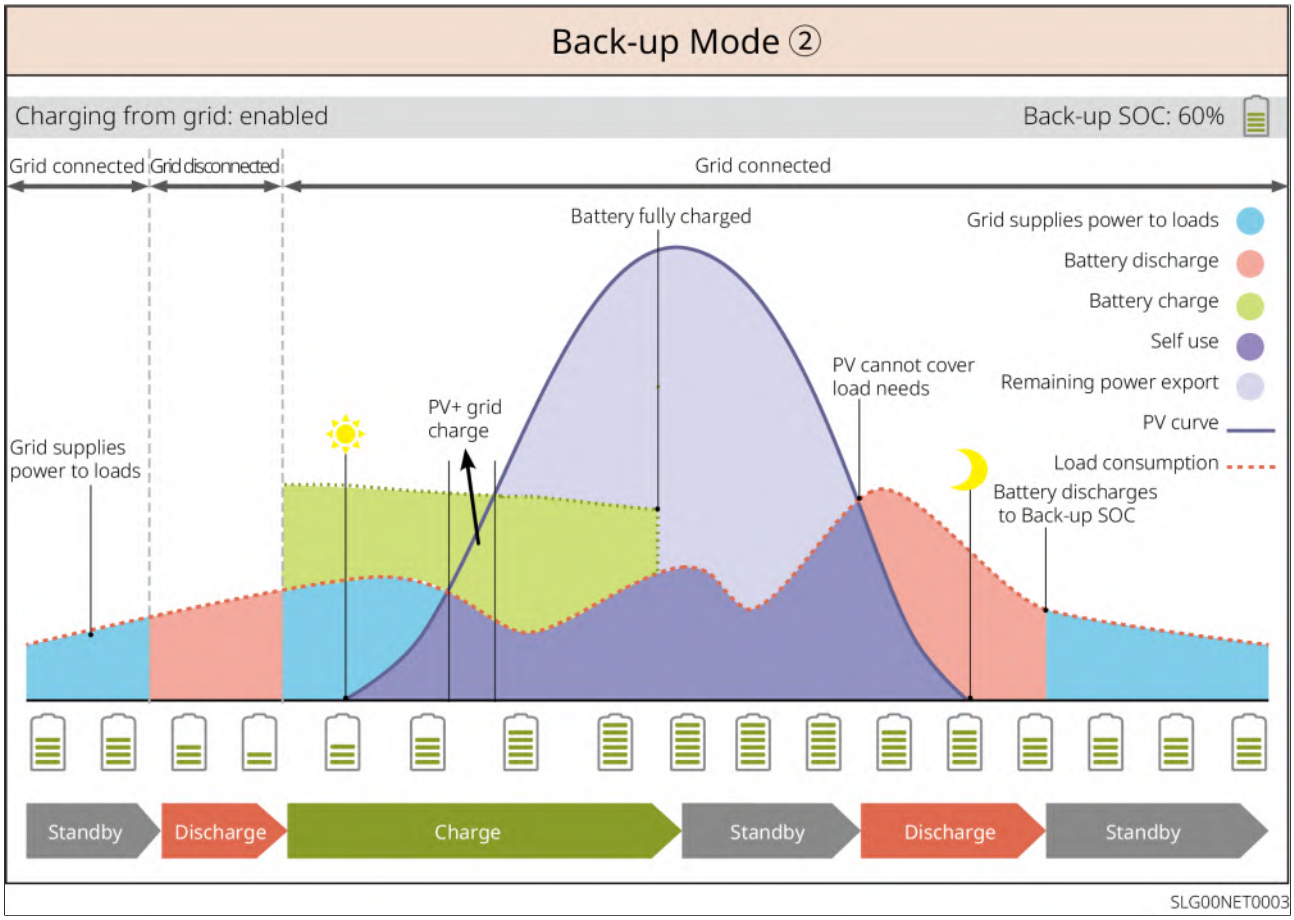


Figure5 **Backup Mode 2**

TOU mode

In compliance with local laws and regulations, set different time periods for buying electricity and exporting energy based on grid peak-valley Tariff differences.

For example, during off-peak Tariff periods, set the battery to charging mode and purchase electricity from the grid to charge it; during peak Tariff periods, set the battery to discharging mode to supply the load.

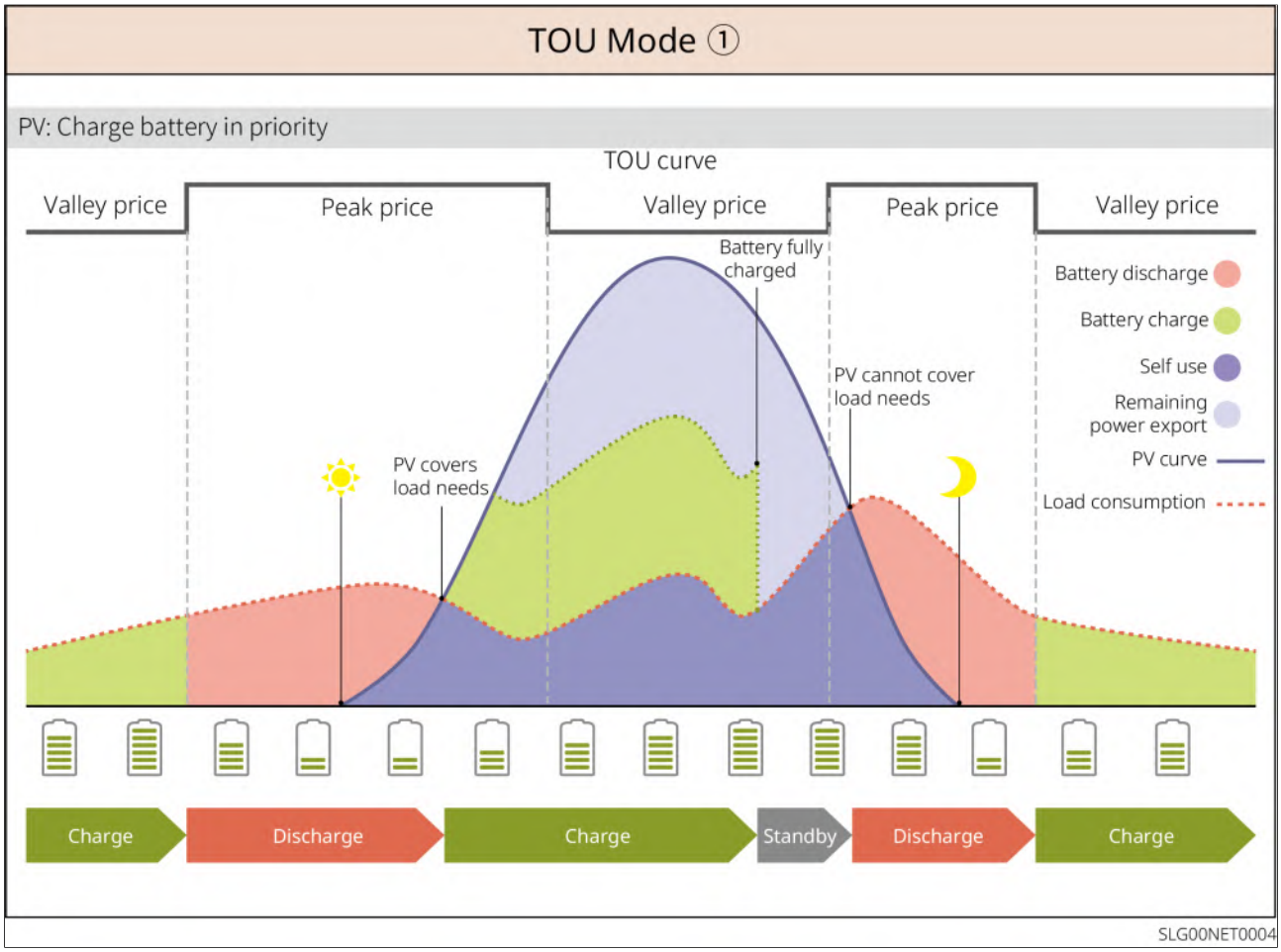


Figure6 **TOU Mode 1**

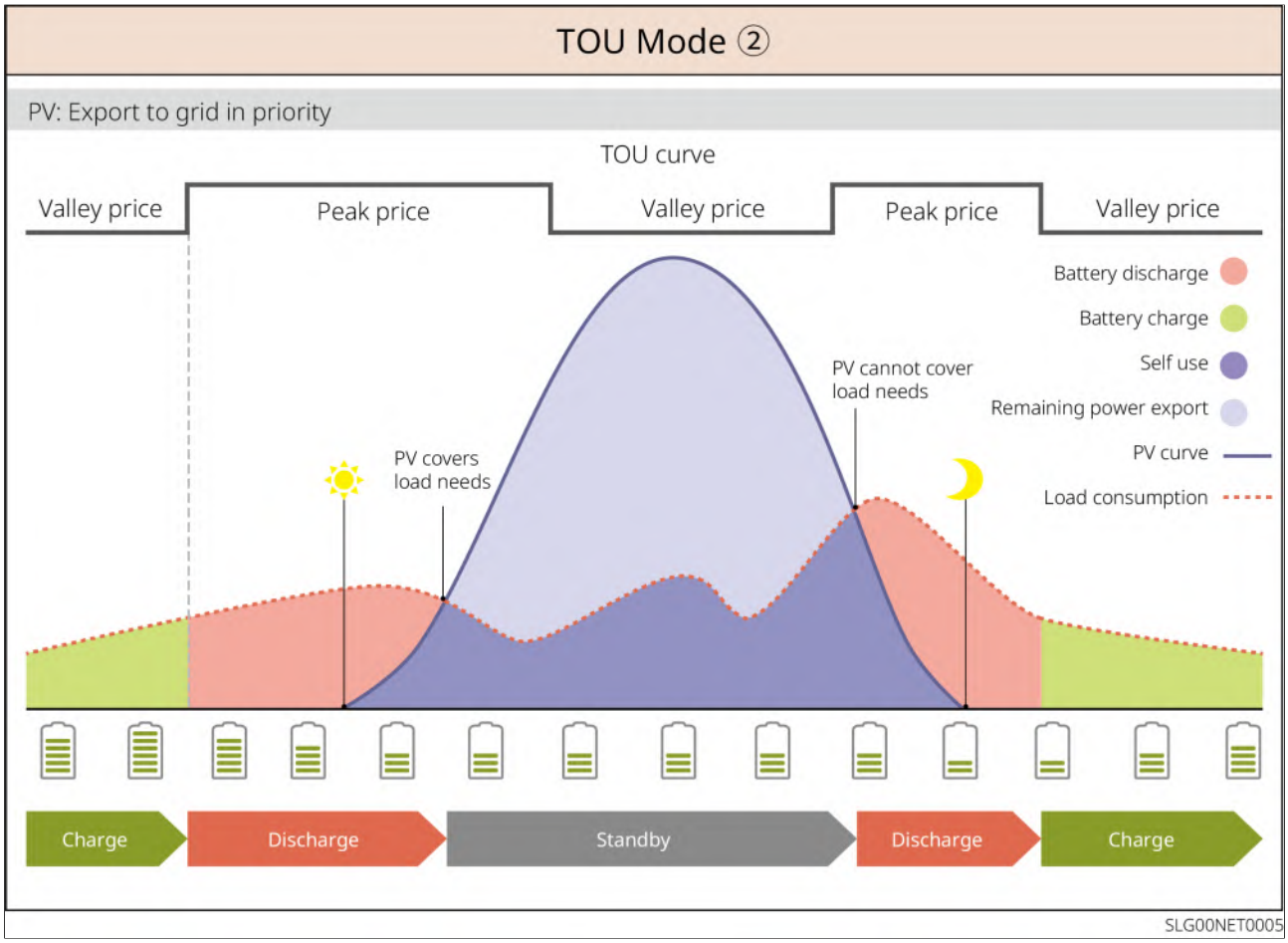


Figure7 **TOU Mode 2**

Off-grid Mode

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

- During the day, PV power generation supplies the load first, and excess power charges the battery.
- At night, the battery discharges to supply power to the load, ensuring the BACK-UP load does not lose power.
- Off-grid SOC recovery: After the system operates off-grid, the battery gradually recovers to the minimum SOC through photovoltaic generation or other power generation methods.

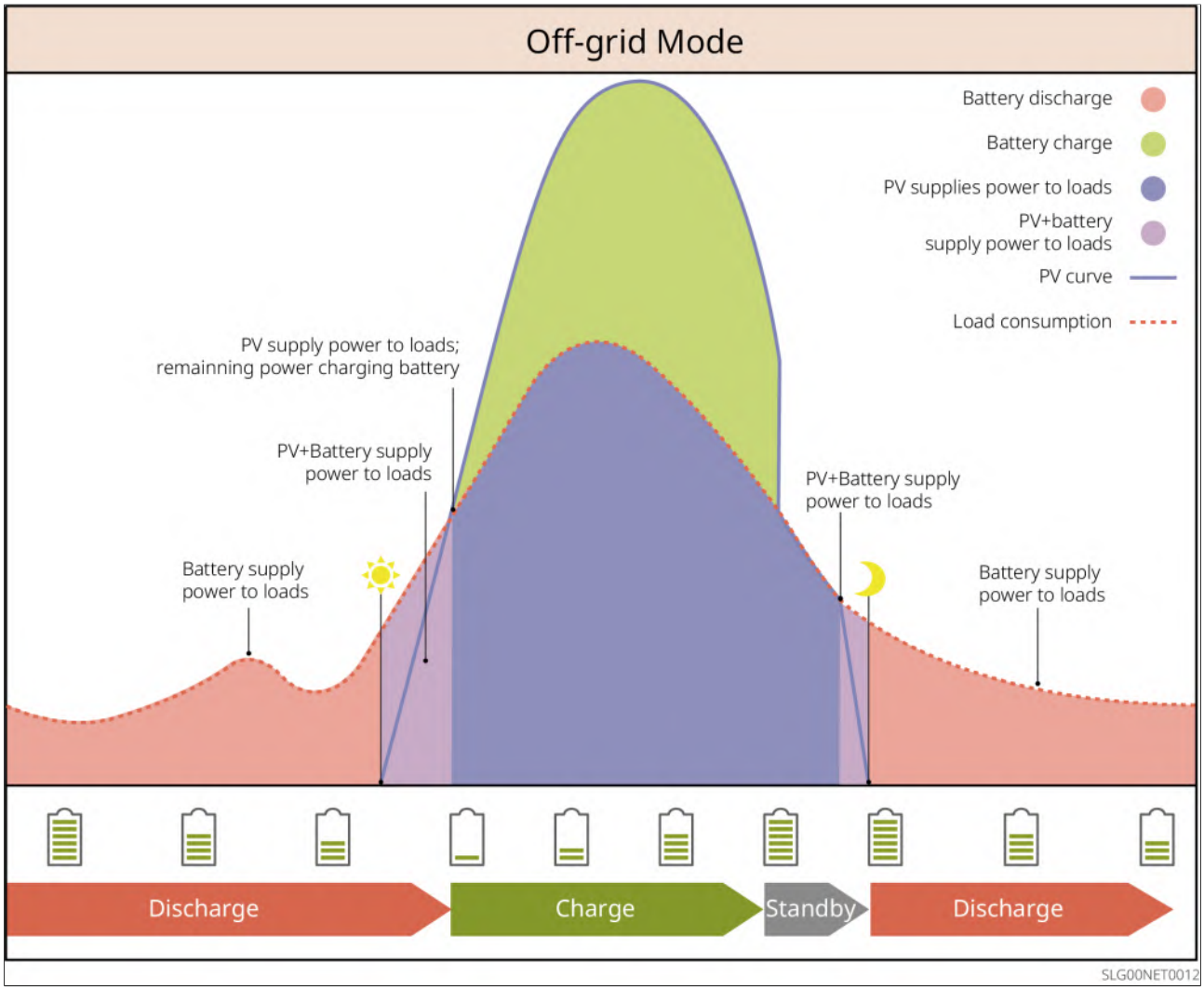


Figure8 **Off-grid Mode**

2.5 Features

AFCI

The inverter integrates an AFCI circuit Protection device for detecting Arc Fault (arc fauIt) and quickly cutting off the circuit upon detection, thereby preventing electrical fires.

Causes of Arc Fault:

- Connector connections in the PV system are damaged.
- Incorrect or damaged cable connections.
- Connector and cable aging.

Fault handling method:

1. When the inverter detects an arc fault, the fault type can be viewed via the inverter display or App.
2. If the inverter triggers faults fewer than 5 times within 24 hours, the machine will automatically resume grid-connected Protection after waiting 5 minutes. After the 5th Arc Fault, the fault must be cleared before the inverter can operate normally.

Load control

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

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

Rapid Shutdown (RSD)

In a Rapid Shutdown system, the Rapid Shutdown transmitter and receiver work together to achieve Rapid Shutdown of the system. The receiver maintains module output by receiving signals from the transmitter. The transmitter can be external or built into the inverter. In an emergency, the external trigger device can be enabled to stop the transmitter, 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
- Internal Transmitter
  - External trigger device: AC-side circuit breaker
  - Receiver models: GR-B1F-20, GR-B2F-20

https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_RSD-20_Quick-Installation-Guide-POLY.pdf

3 Equipment Inspection and Storage

3.1 Equipment Inspection

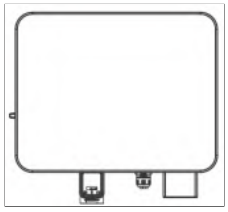
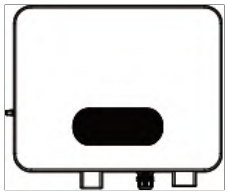
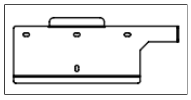
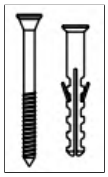
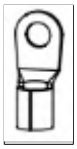
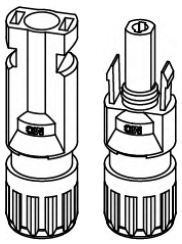
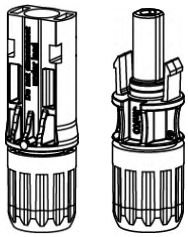
Before accepting the product, please carefully check the following:

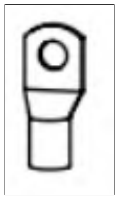
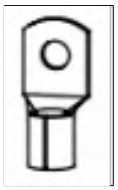
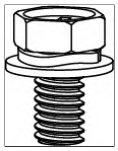
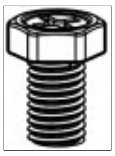
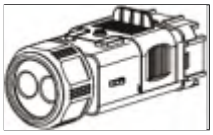
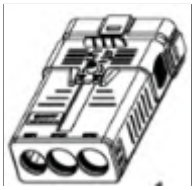
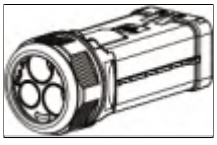
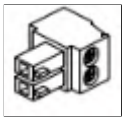
1. Check whether the outer packaging is damaged, such as deformation, openings, cracks, or other signs that may cause damage to the equipment inside the box. If damaged, do not open the packaging and contact your dealer.
2. When removing the GW14.3-BAT-LV-G10 and GW16.1-BAT-LV-G10 batteries, ensure that the packaging carton is intact. If the packaging is accidentally damaged and a return or exchange is required due to product quality issues, contact GoodWe after-sales service or a distributor to obtain a dedicated packaging carton.
3. Check whether the equipment model is correct. If there is any discrepancy, do not open the packaging and contact your dealer.

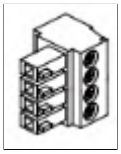
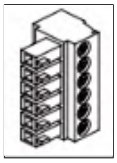
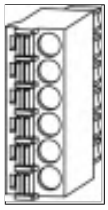
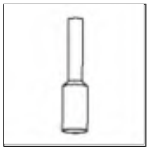
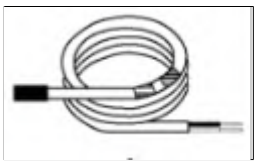
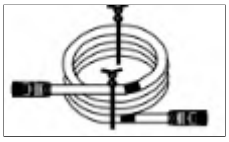
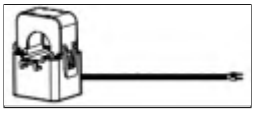
3.2 Deliverables

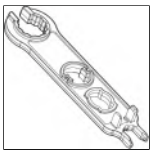
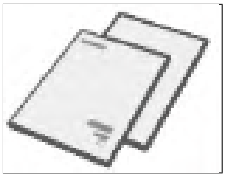
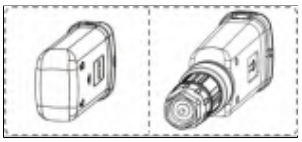
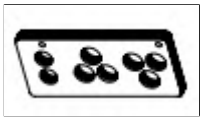
⚠WARNING
Check whether the type and quantity of deliverables are correct and whether the appearance is damaged. If damaged, contact your dealer. After the delivered item is removed from the packaging, do not place it on rough, uneven, or sharp surfaces to avoid paint peeling.

3.2.1 Inverter Delivered Items

Components	Description	Components	Description
 	Inverter x1 Supplied according to actual conditions.		Wall-mounting bracket x1 Supplied according to actual conditions.
	Expansion screws x4		Protection earth terminal: 1 or 3 Supplied 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

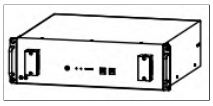
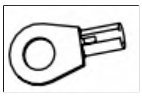
Components	Description	Components	Description
	Battery power connection terminal x 2 Used in some models		AC wiring terminal: 2 or 6 Supplied according to actual conditions.
 	Battery screw x 2 Supplied according to actual conditions.		Grounding screw x1 Used in some models
	Nut x8 Used in some models		Battery connector x1 Used in some models
 	AC Protection cover x1 Supplied according to actual conditions.		2-pin communication terminal x 2 Depending on the hardware board communication port, some models use this

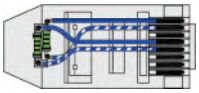
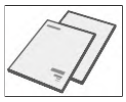
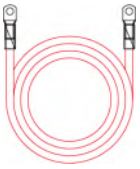
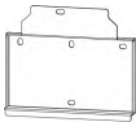
Components	Description	Components	Description
	4-pin communication terminal x 1 Depending on the hardware board communication port, some models use this	 	6-pin communication terminal: 2 or 3 or 4 Supplied according to the actual communication port of the hardware board
	AC pinhole terminal x10 Used in some models		Communication tubular terminal: 14 or 18 or 24 Supplied according to actual conditions.
	AC Protection cover unlocking tool x1 Used in 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

Components	Description	Components	Description
	PV terminal unlocking tool (Europe only) x 1		Product documentation x 1
	Communication module x1 Supplied according to actual conditions.		Ferrite core fixing cable ties x 2 Provided for models with ferrite cores
	Ferrite core x 1 Used in some models		Waterproof gasket x 1 Used in some models
	Magnet x 1 Used in some models		

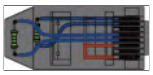
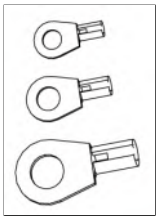
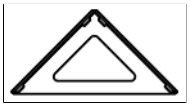
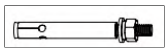
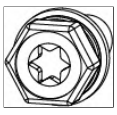
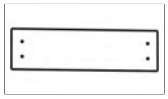
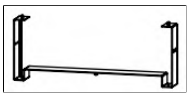
3.2.2 Battery Deliverables

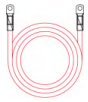
3.2.2.1 LX A5.0-10

Components	Description	Components	Description
	Battery module x 1		(25-8) Power cable OT terminals x 4 (5.5-5) Grounding OT terminals x 2
	M5 grounding screws x 2		Warning label x 1

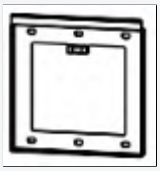
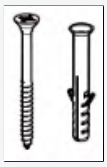
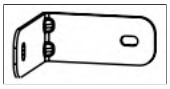
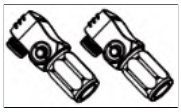
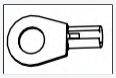
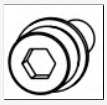
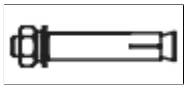
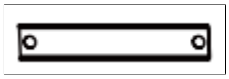
Components	Description	Components	Description
	Termination resistor x 1		Electrical label x 1
	M4*8 screws x 8 (optional) Provided when the bracket Mounting Method is selected		Battery brackets x 2 (optional) Provided when the bracket Mounting Method is selected
	Product documentation x 1		Negative power 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 hanger expansion screws (optional) x 4		Back hanger (optional) x 1
	Hanging bracket (optional) x 1		Hanging bracket screws (optional) x 4

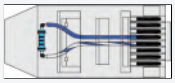
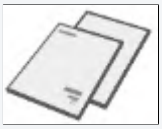
3.2.2.2 LX A5.0-30

Components	Description	Components	Description
	Battery module x 1		Termination resistor x 1 When connecting to a third-party busbar, this termination resistor must be installed on the battery.
	• M5 OT terminals x 2: recommended for connecting 10mm^{2}cable • M8 OT terminals x 4: recommended for connecting 50mm^{2}cable • M10 OT terminals x 2: recommended for connecting 70mm^{2}cable		M5*12 Grounding Screw x 2
	Mounting Bracket x 2 Supplied when the wall-mounted Mounting Method is selected		M6*70 Expansion Bolt x 4 Supplied when the wall-mounted Mounting Method is selected
	M5*12 Grounding Screw x 2 Supplied when the wall-mounted Mounting Method is selected		Marking Template x 1 Supplied when the wall-mounted Mounting Method is selected
	Battery brackets x 2 (optional) Supplied when the stacked Mounting Method is selected		M4*8 Screw x 8 Supplied when the stacked Mounting Method is selected

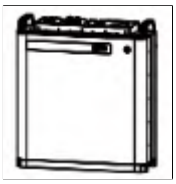
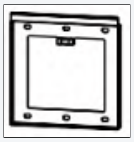
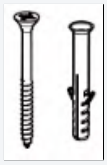
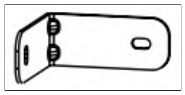
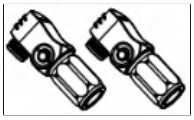
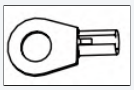
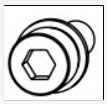
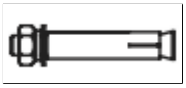
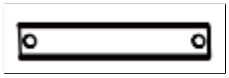
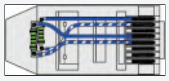
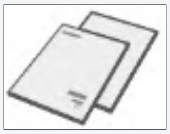
Components	Description	Components	Description
	Product documentation x 1		Negative power cable (optional) x 1
	Positive power cable (optional) x 1		Grounding cable (optional) x 1
	Communication cable (optional) x 1		Decorative cover (optional) x 1

3.2.2.3 Battery Deliverables (LX U5.4-L)

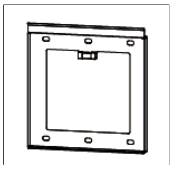
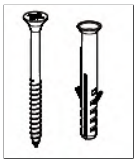
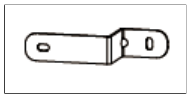
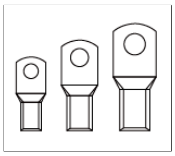
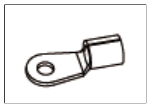
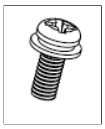
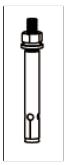
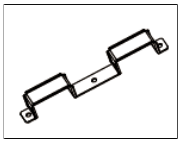
Components	Description	Components	Description
	Battery x 1		Plastic Top Cover x 1
	Wall-mounting bracket x 1		Expansion Screw x 2
	Anti-Tip Bracket x 2		Power connectors x 2
	Grounding terminals x 4		M5 combined bolts x 8
	M10 Expansion Bolt x 6		Wire harness fixing plate x 2

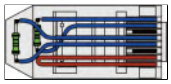
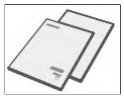
	Termination resistor x 1		Product documentation x 1

3.2.2.4 Battery Deliverables (LX U5.4-20)

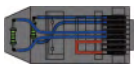
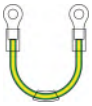
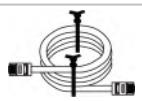
Components	Description	Components	Description
	Battery x 1		Plastic Top Cover x 1
	Wall-mounting bracket x 1		Expansion Screw x 2
	Anti-Tip Bracket x 2		Power connectors x 2
	Grounding terminals x 4		M5 combined bolts x 8
	M10 Expansion Bolt x 6		Wire harness fixing plate x 2
	Termination resistor x 1		Product documentation x 1

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

Components	Description	Components	Description
	Battery x 1		Plastic Top Cover x 1
	Wall Mount x 1		Expansion Screw x 2
	Anti-Tip Bracket x 2		• 35-8 OT Terminal x 4: recommended for 25mm2 or 35mm2 cables • 50-8 OT Terminal x 4: recommended for 50mm2 cable • 70-10 OT Terminal x 2: recommended for 70mm2 cable
	14-5 Grounding Terminal x 2		M5 Combination Bolt x 7
	M10 Expansion Bolt x 6		Wire Harness Fixing Plate x 1

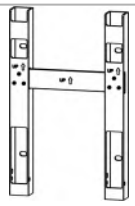
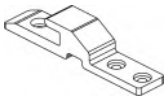
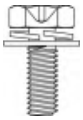
Components	Description	Components	Description
	Termination resistor x 1		Product documentation x 1

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

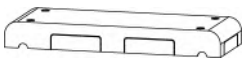
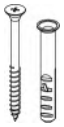
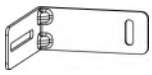
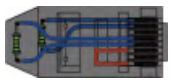
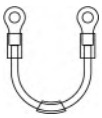
Components	Description	Components	Description
	Battery x 1		Cable cover x 1
	Lifting bar x 2 (Shipped with the box after October 2025)		Expansion screws x 2
	M5*16 Phillips hex head screws x 7		Wall anti-tip bracket x 2
	Termination resistor x 1		Grounding OT terminal x 1 (Shipped with the box before October 2025)
	DC OT terminals x 6 (Shipped with the box before October 2025)		Ground wire 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

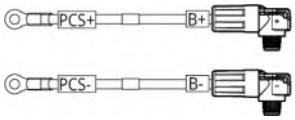
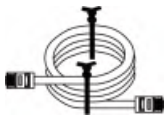
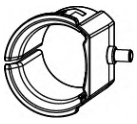
Optional accessories

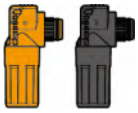
Components	Description	Components	Description

	Wall-mounting bracket x 1		Hooks x 4
	M5*16 Phillips hex head screws x 12		M10 expansion screws x 4

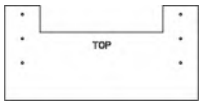
3.2.2.7 Battery Delivery Package (GW16.1-BAT-LV-G10)

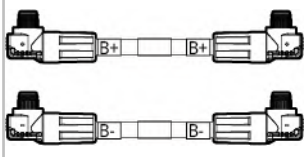
Components	Description	Components	Description
	Battery x 1		Decorative cover x 1
	Lifting bar x 2		Expansion screws x 2
	M5*12 hex socket screw x 7		Wall anti-tip bracket x 2
	Termination resistor x 1		Ground wire x 1

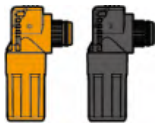
Components	Description	Components	Description
	Positive power cable x 1 Negative power cable x 1 • 1m cable: standard on some models • 2m cable: ◦ Overseas: standard on some models ◦ Domestic: none		Decorative cover rubber plugs x 4
	Communication cable x 1		Product documentation x 1
	Quick-connect terminal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

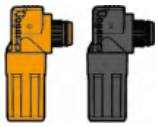
Components	Description	Components	Description
	Battery positive quick connector Battery negative quick connector • Domestic: standard on some models x 2 • Overseas: x 0		

Optional accessories

Components	Description	Components	Description
	Wall mounting bracket x 2		Positioning template x 1
	M10 expansion bolt x 6		M10*60 bolt x 2

Components	Description	Components	Description
	Positive power cable for battery parallel cluster x 1 Negative power cable for battery parallel cluster x 1		

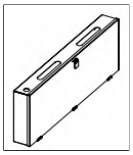
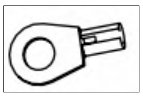
Components	Description	Components	Description
	Battery positive quick connector x 1 Battery negative quick connector x 1		SC50-8 OT terminal x 5
	Positive power cable x 1 Negative power cable x 1		

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

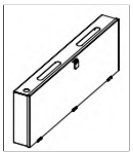
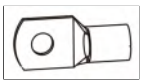
Components	Description	Components	Description
	Battery rollers x 4		

3.2.3 Busbar Box Deliverables

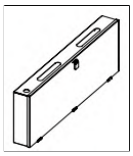
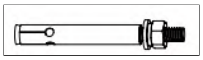
3.2.3.1 BCB-11-WW-0 (Optional)

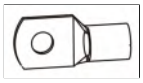
Components	Description	Components	Description
	BCB-11-WW-0 combiner box x 1		M6 expansion bolts x 4
	(25-8) OT terminals x 18 (70-10) OT terminals x 2	-	-

3.2.3.2 BCB-22-WW-0

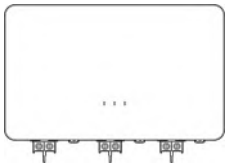
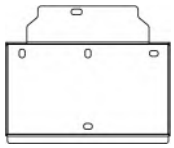
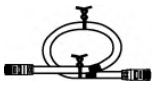
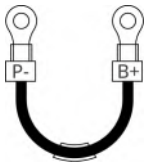
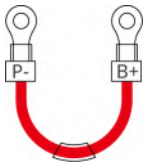
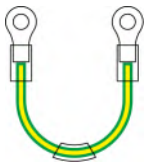
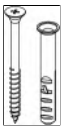
Components	Description	Components	Description
	BCB-22-WW-0 combiner box x 1		M6 expansion bolts x 4
	(25-8) OT terminals x 36 (70-10) OT terminals x 6	-	-

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

Components	Description	Components	Description
	BCB-32-WW-0, BCB-33-WW-0 combiner box x 1		M6 expansion bolts x 4

Components	Description	Components	Description
	(50-8) OT terminals x 30 (70-10) OT terminals x 6	-	-

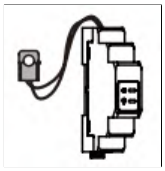
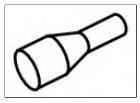
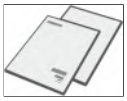
3.2.4 Mix Parallel Unit Deliverables

Components	Description	Components	Description
	Mix Parallel Unit x 1		Back mounting plate x 1
	Wall-mounting bracket x1		Wall-mount bracket fixed end x 1
	Power terminal connector x 3 M8 screws for power cables x 6		BMS communication cable x 1
	Negative power cable x 1		Positive power cable x 1
	Ground wire x 1		Expansion bolts x 5
	M5*12 hex socket head cap screw x 5		Tubular terminal for power cable at inverter battery port x 2

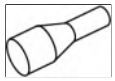
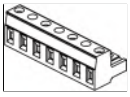
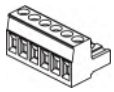
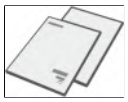
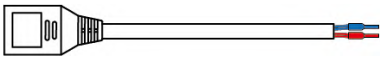
Components	Description	Components	Description
	Product documentation x 1		M8 OT terminal: • SC25-8: 2 • SC35-8: 2 • SC50-8: 2 • SC70-8: 6
	Flathead screwdriver x 1		

3.2.5 Smart Meter Deliverables

3.2.5.1 GMK110

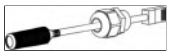
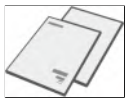
Components	Description	Components	Description
	Smart Meter and CT x 1		RS485 Communication Terminal x 1
	Voltage Input Side Terminal x 1		Ferrule Terminal x 4
	Screwdriver x 1		Product documentation x 1

3.2.5.2 GM330

Components	Description	Components	Description
	Smart Meter x 1		2-Pin Communication Terminal x 1
	Ferrule Terminal x 6		7PIN communication terminal x1
	6PIN communication terminal x1		RS485 Communication Terminal x 1
	Screwdriver x 1		Product documentation x 1
	2PINterminal andRJ45terminal adapter cable x 1	-	-

3.2.6 Smart Communication Stick

3.2.6.1 Ezlink3000

Components	Description	Components	Description
	Communication module x1		LAN cable connection port x1
	Product documentation x1		Unlocking tool x1 Some modules must be removed with a tool. If no tool is provided, 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 in accordance with the following requirements. After long-term storage, the equipment must be inspected and confirmed by professionals before it can be put into use 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 to have it inspected and tested by professionals before putting it 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 to have it inspected and tested by professionals before commissioning.
3. To ensure battery performance and service life, avoid long-term idle storage. Long-term storage may cause deep discharge of the battery, leading to irreversible chemical loss, capacity degradation, or even complete failure. It is recommended to use the battery promptly. If the battery requires long-term storage, perform maintenance according to the following requirements:

<table>
<tr><th>Battery model</th><th>Battery Storage Initial SOC Range</th><th>Recommended Storage Temperature</th><th>Charge/discharge maintenance cycle[1]</th><th>Battery maintenance method[2]</th></tr>
<tr><td>LX A5.0-10
n*LX A5.0-10</td><td>30%~40%</td><td>0~35℃</td><td>-20~0°C, ≤1 month
0~35°C, ≤6 months</td><td rowspan="5">For maintenance methods, please consult your dealer or after-sales service center.</td></tr>
<tr><td>LX A5.0-30</td><td>30%~40%</td><td>0~35℃</td><td>-20~35°C (<12 months)
35~+45°C (<6 months)</td></tr>
<tr><td>LX U5.4-L
LX U5.4-20
n*LX U5.4-20</td><td>30%~40%</td><td>0~35℃</td><td>-20~0°C, ≤1 month
0~35°C, ≤6 months
35~40°C, ≤1 month</td></tr>
<tr><td>LX U5.0-30</td><td></td><td></td><td></td></tr>
</table>

GW14.3-BAT-LV-G10	30%~40% 30%~40%	0~35℃ 0~35℃	-20~35°C, ≤12 months 35~45°C, ≤6 months	
GW16.1-BAT-LV-G10				

NOTICE

[1] The storage time is calculated from the SN date on the battery outer packaging. After the storage cycle is exceeded, charge/discharge maintenance is required. (Battery maintenance time = SN date + charge/discharge maintenance cycle). For the SN date viewing method, refer to:11.4.SN Code Meaning(Page 362).
[2] After the charge/discharge maintenance passes, if a Maintaining Label is affixed to the outer box, update the maintenance information on the Maintaining Label. If there is no Maintaining Label, record the maintenance time and battery SOC and keep the data properly for maintenance records.

Packaging requirements:

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

Environmental requirements:

1. Ensure that the equipment is stored in a cool place away from direct sunlight.
2. Ensure that the storage environment is clean, with appropriate temperature and humidity ranges, and free of condensation. If condensation appears on equipment ports, do not install the equipment.
3. Ensure that the equipment is stored away from flammable, explosive, corrosive, and other similar items.

Stacking requirements:

1. Ensure that the inverter stacking height and direction are arranged according to the label instructions on the packaging box.
2. Ensure that there is no risk of the stacked inverters toppling over.

4 Installation

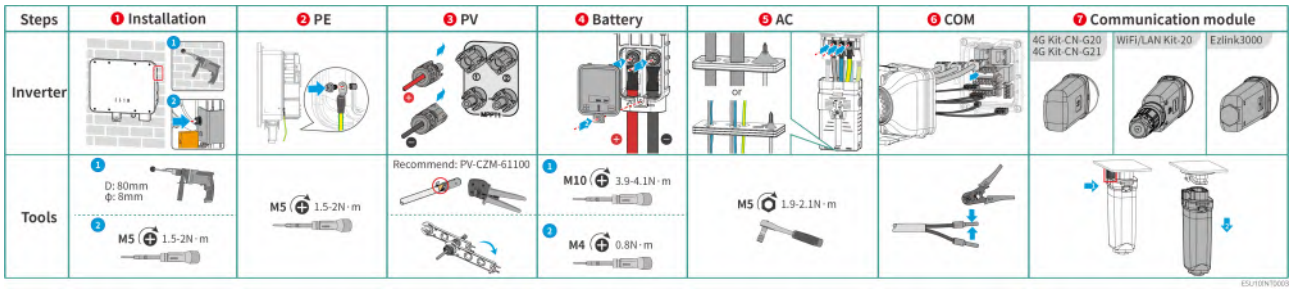
DANGER

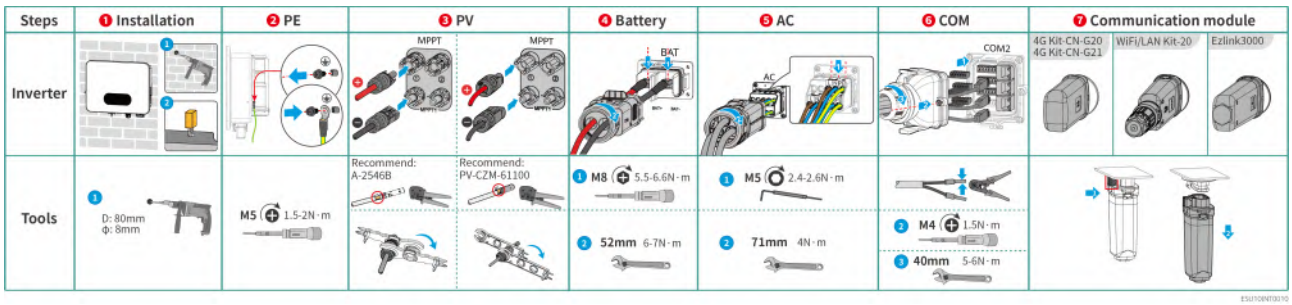
When installing the equipment and making electrical connections, use the delivery parts shipped with the unit; otherwise, equipment damage caused thereby is not covered by the warranty.

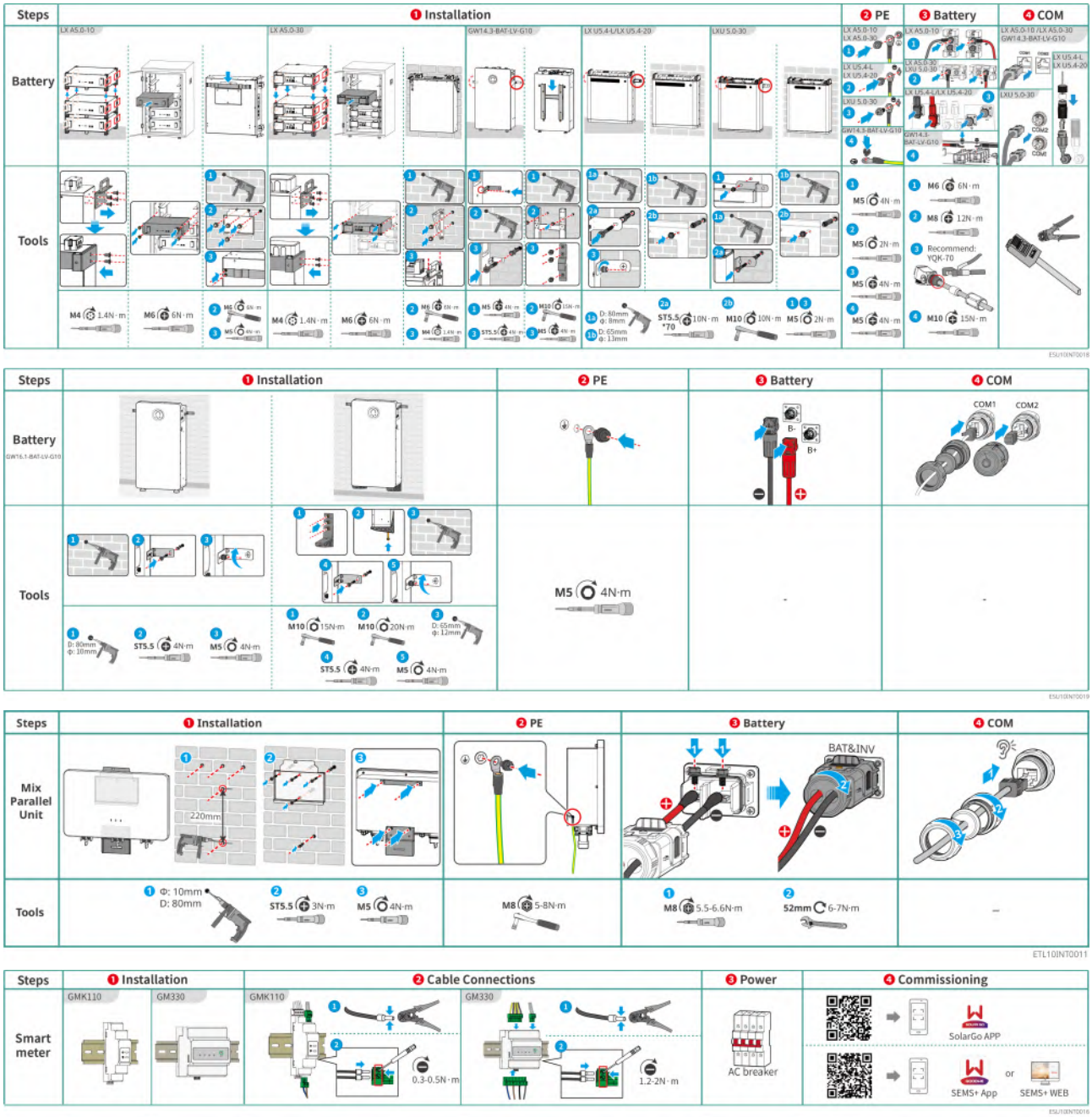
4.1 System Installation and Commissioning Process

DANGER

When installing the equipment and making electrical connections, use the delivery parts shipped with the unit; otherwise, equipment damage caused thereby is not covered by the warranty.







4.2 Installation Requirements

4.2.1 Installation Environment Requirements

1. The equipment must not be installed in flammable, explosive, corrosive, or similar environments.
2. The temperature and humidity of the equipment installation environment must be within the appropriate range.

3. The installation location must be out of the reach of children and should avoid positions where the equipment can be easily touched.
4. During inverter operation, the enclosure temperature may exceed 60°C. Do not touch the enclosure until it has cooled down to prevent burns.
5. The equipment should be installed away from direct sunlight, rain, snow accumulation, and other environmental conditions. It is recommended to install in a sheltered location, and a sunshade canopy can be built if necessary.
6. The installation space must meet the equipment's ventilation and heat dissipation requirements as well as operating space requirements.
7. The installation environment must meet the equipment's Ingress Protection Rating. The inverter, battery, and smart communication stick are suitable for indoor and outdoor installation; the meter is suitable for indoor installation.
8. The installation height of the equipment must facilitate operation and maintenance, ensuring that indicator lights and all labels are easy to view, and wiring terminals are easy to operate.
9. The installation altitude of the equipment is lower than the Max. Operating Altitude.
10. Before installing equipment outdoors in salt-damage areas, consult the equipment manufacturer. Salt-damage areas mainly refer to areas within 500 m from the coast. The affected area is related to sea breeze, precipitation, topography, and other conditions.
11. Keep away from strong magnetic fields to avoid electromagnetic interference. If radio stations or wireless communication devices below 30 MHz are present near the installation location, install the equipment as follows:
    - Inverter: Add a multi-turn ferrite core at the DC input or AC output lines of the inverter, or add a low-pass EMI filter; or keep a distance of more than 30 m between the inverter and wireless electromagnetic interference equipment.
    - Other equipment: The distance between the equipment and wireless electromagnetic interference equipment must exceed 30 m.
12. The DC and communication cables between the battery and the inverter must be less than 3 m in length. Ensure that the installation distance between the inverter and the battery meets the cable length requirements.
13. The installation and storage location should avoid areas with direct cold air flow, such as air conditioner vents. Excessive local temperature differences may cause condensation on the equipment, which may lead 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;

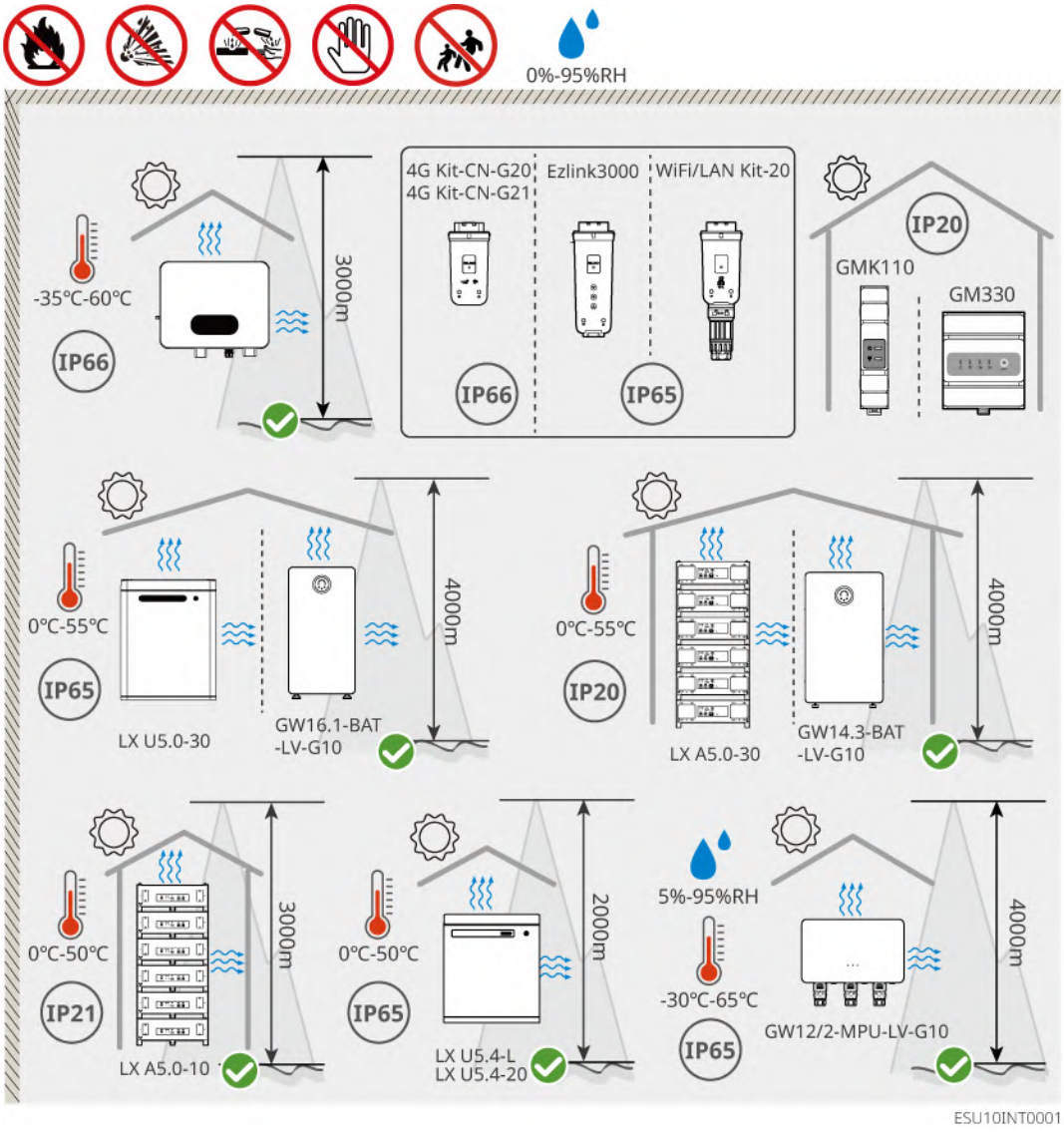
d. Prolonged condensation may accelerate equipment aging and shorten service life;

Installation advice: Choose a location with good ventilation and uniform temperature and humidity distribution for equipment installation, and ensure that the environment around the equipment meets the Operating Environment requirements specified by the manufacturer.

NOTICE

If installed in an environment below 0°C, the battery will be unable to continue charging and recover energy after being fully discharged, resulting in Battery Undervoltage protection.

- LX A5.0-30, LX U5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10: Charging temperature range: 0<T≤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 the optional heating film:
  - LX U5.0-30: Charging temperature range: -20<T≤55°C; Discharging temperature range: -20<T≤55°C

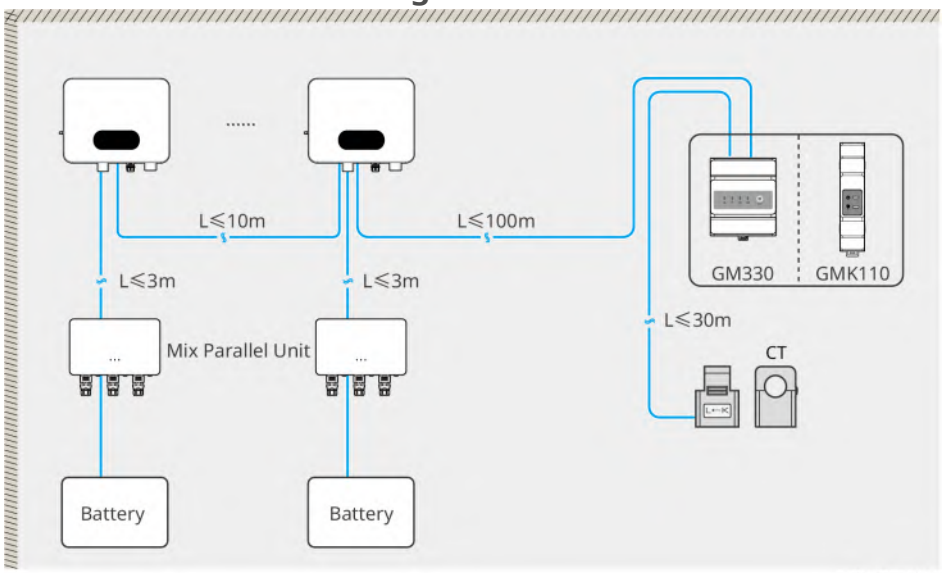


4.2.2 Installation Space Requirements

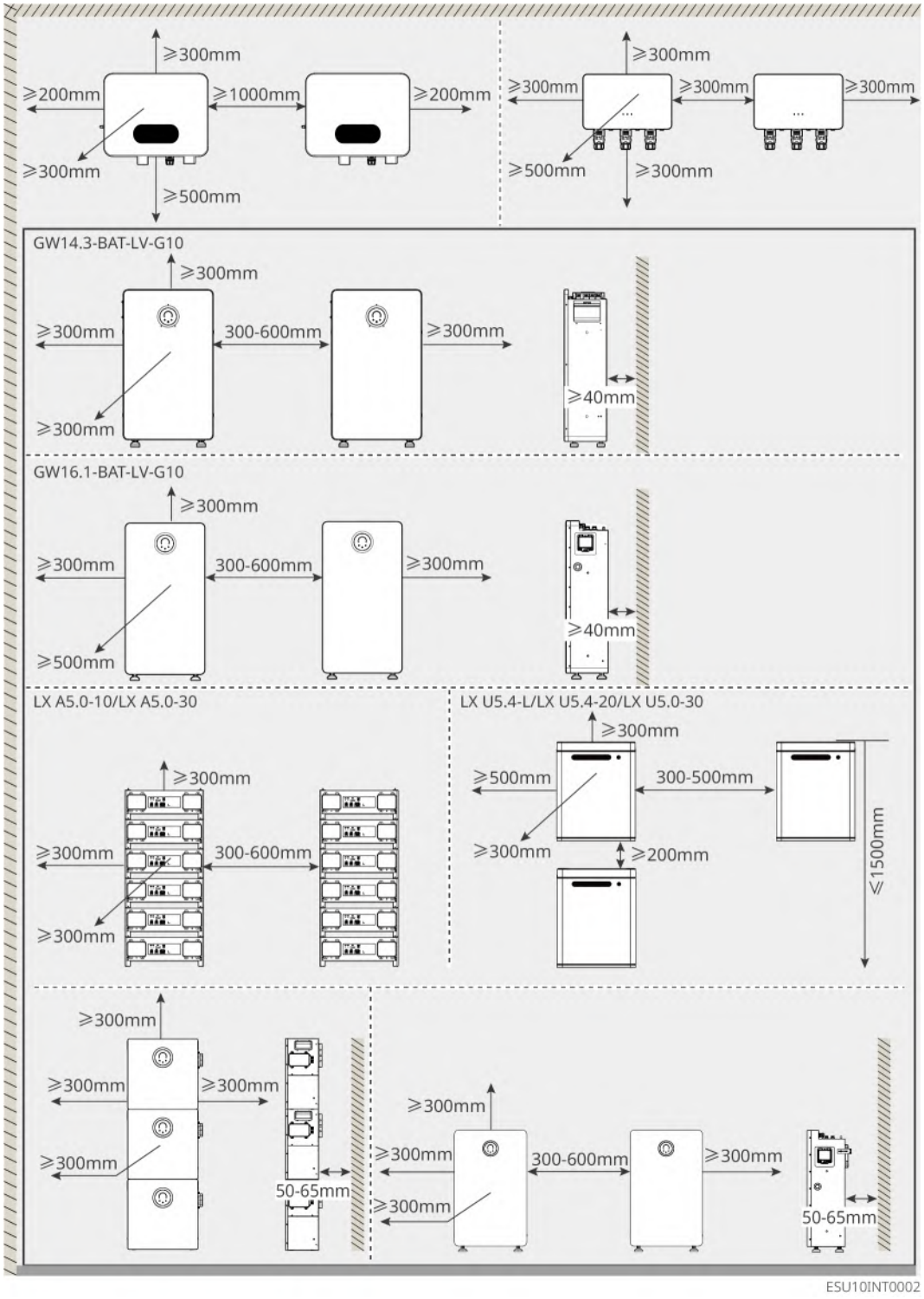
When installing equipment in the system, reserve adequate space around the equipment to ensure sufficient space for installation and heat dissipation.

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

Communication cable length



Installation space

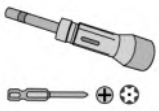


4.2.3 Tool Requirements

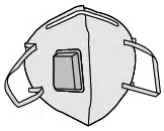
NOTICE

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

Installation tools

Tool type	Description	Tool type	Description
	Diagonal 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 Φ8mm)		Torque wrench M4、M5、M6、M8
	Rubber mallet		Socket wrench set
	Marker pen		Multimeter Measurement range ≤600V
	Heat shrink tubing		Heat gun
	Cable ties		Vacuum cleaner

Personal protective equipment

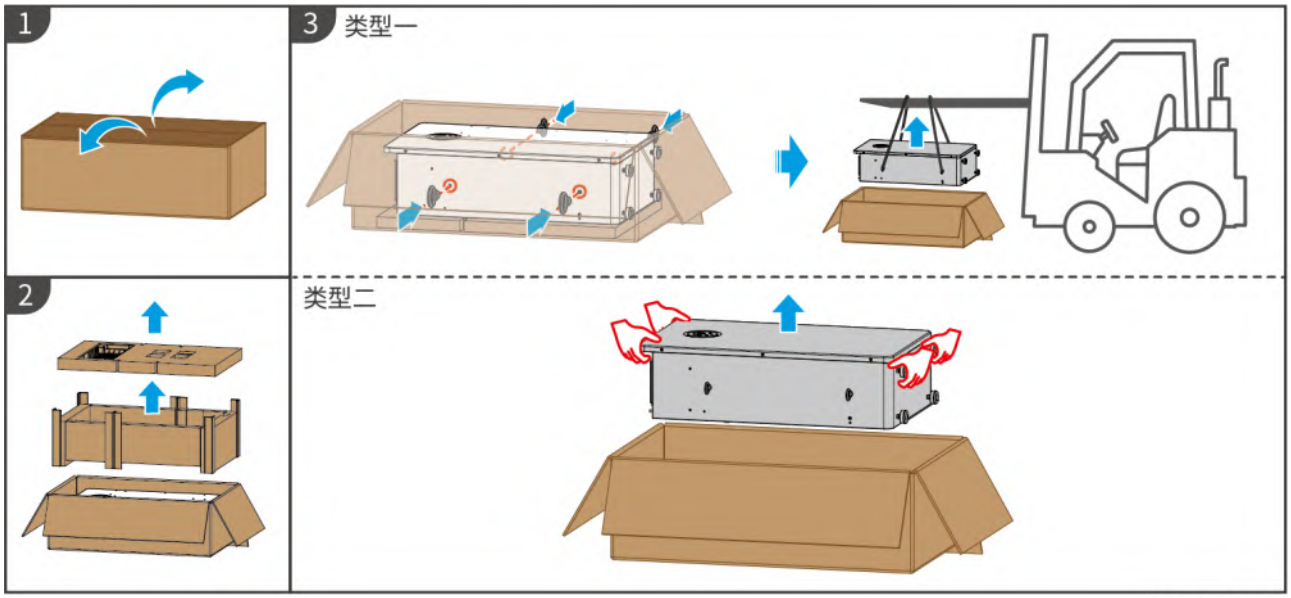
Tool type	Description	Tool type	Description
	Insulated gloves, protective gloves		Dust mask
	Safety goggles		Safety shoes

4.3 Equipment Handling

⚠CAUTION

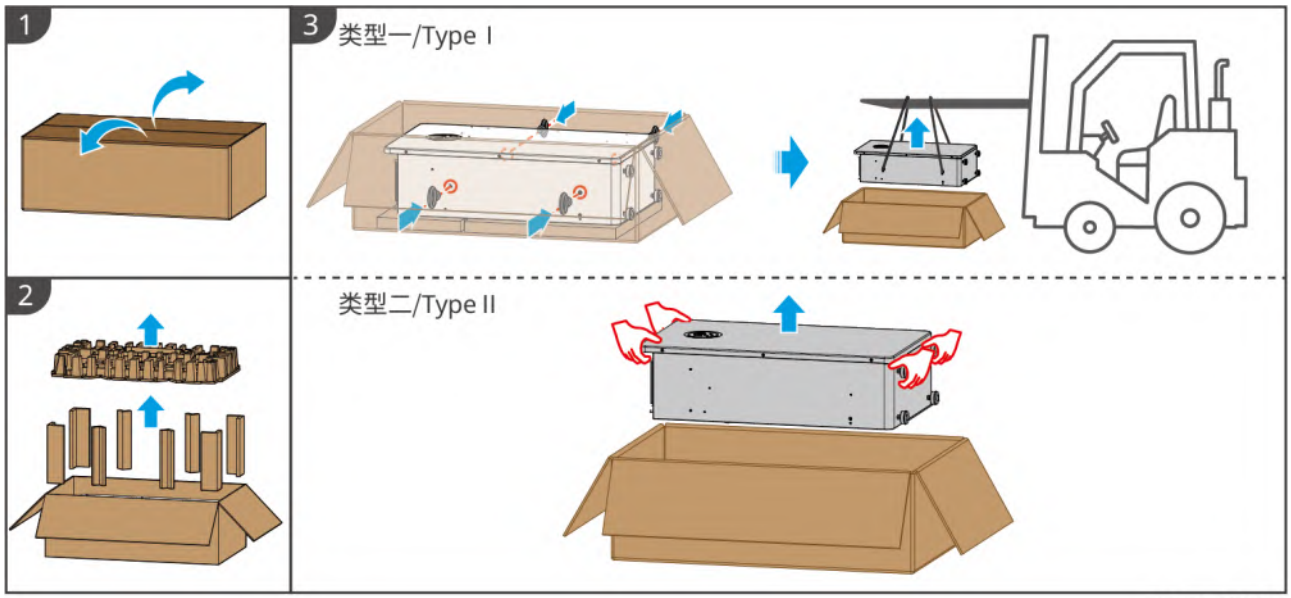
1. During transportation, transfer, installation, and other operations, the laws, regulations, and relevant standards of the country or region must be complied with.
2. Before installation, the equipment must be transported to the installation site. To avoid personal injury or equipment damage during transportation, please note the following:
3. Please assign appropriate personnel according to the equipment Weight to prevent the equipment from exceeding the manual handling weight range and injuring personnel.
4. Please wear safety gloves to avoid injury.
5. Please ensure the equipment remains balanced during handling to avoid falling.
6. The battery system can be removed from the packaging box using a crane or hoisting method and transported to the installation site.
   - Crane requirements (GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10): load capacity ≥180 kg
7. When moving the equipment by hoisting, use flexible slings or straps. Requirements for the lifting lugs and slings for GW14.3-BAT-LV-G10 and GW16.1-BAT-LV-G10:
   - Lifting rings: 4 M10 lifting rings, with load capacity ≥260 kg
   - Lifting sling: 1 piece, length ≥2.5 m, load capacity ≥600 kg

GW14.3-BAT-LV-G10：



LXA10INT0010

GW16.1-BAT-LV-G10:



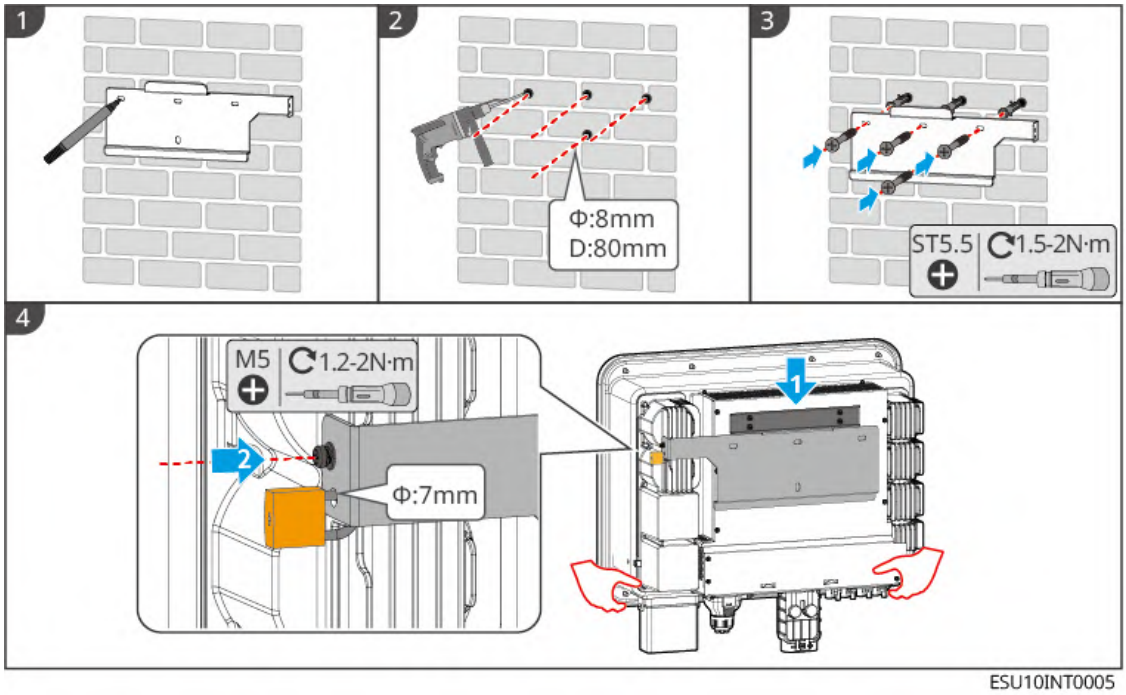
LXA40INT0005

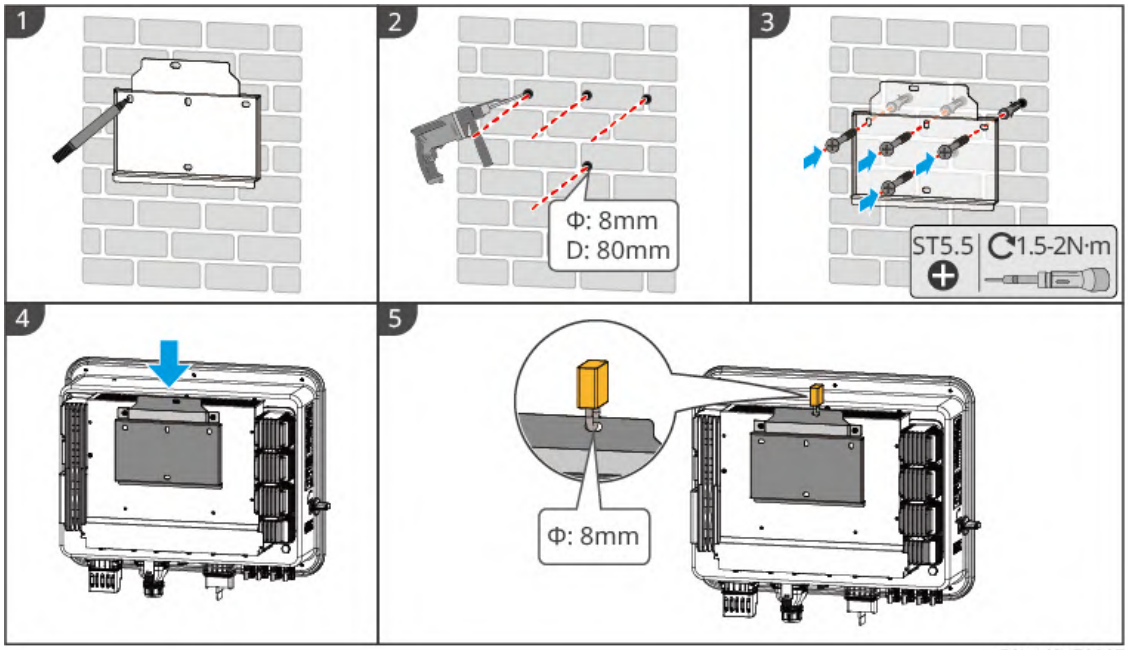
4.4 Install the Inverter

⚠CAUTION

- When drilling, ensure that the drilling positions avoid water pipes, cables, and other fixtures inside the wall to prevent danger.
- When drilling, wear safety goggles and a dust mask to avoid inhaling dust or getting it into your eyes.
- Ensure the inverter is securely installed to prevent it from falling and injuring personnel.

1. Place the mounting bracket horizontally against the wall and use a marker pen to mark the drilling positions.
2. Use an impact drill to drill the holes.
3. Secure the inverter mounting bracket to the wall using expansion screws.
4. Hang the inverter on the mounting bracket. After mounting, secure the bracket and the inverter with screws to ensure the inverter is installed firmly.





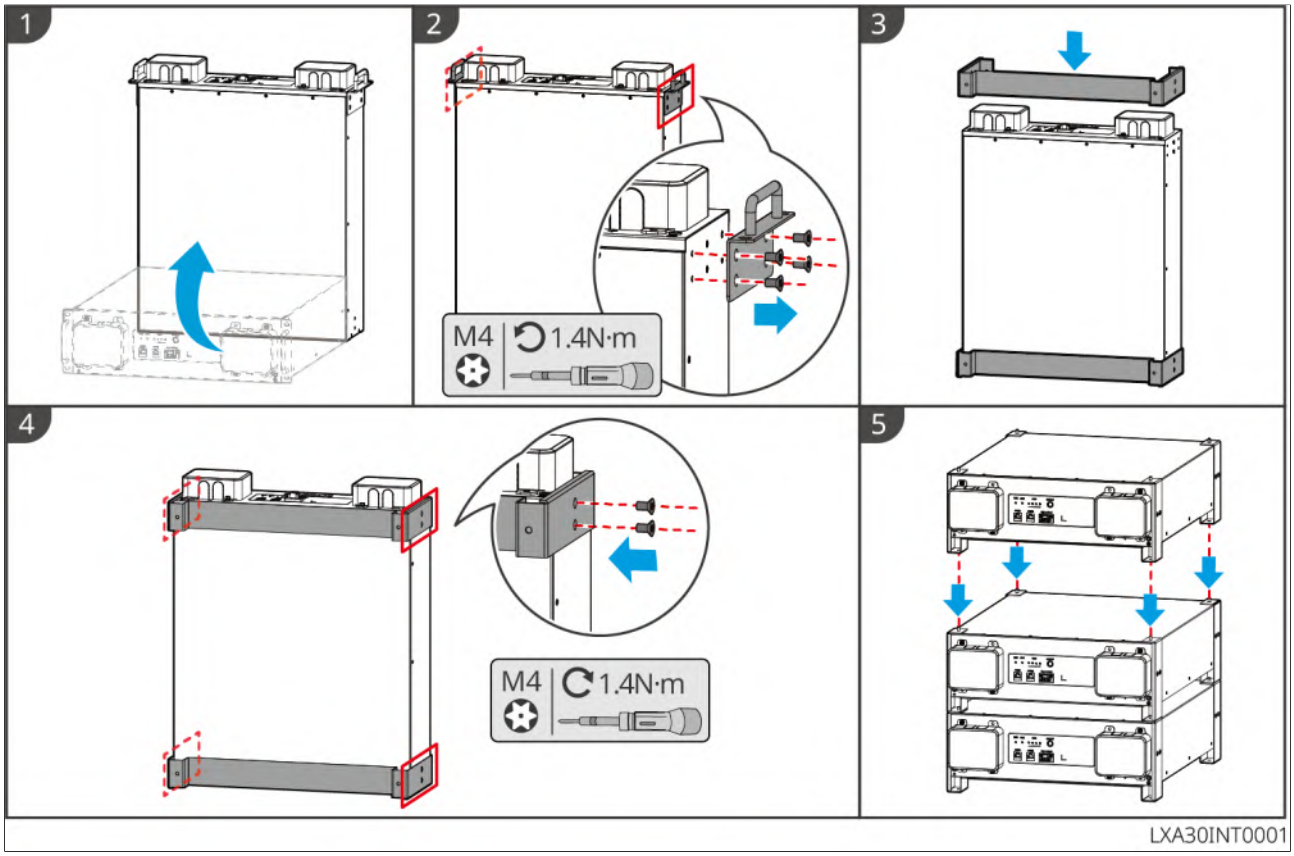
4.5 Install the Battery

4.5.1 LX A5.0-30

LX A5.0-30: Floor stacking

NOTICE
Up to 6 batteries can be stacked in floor stacking.

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

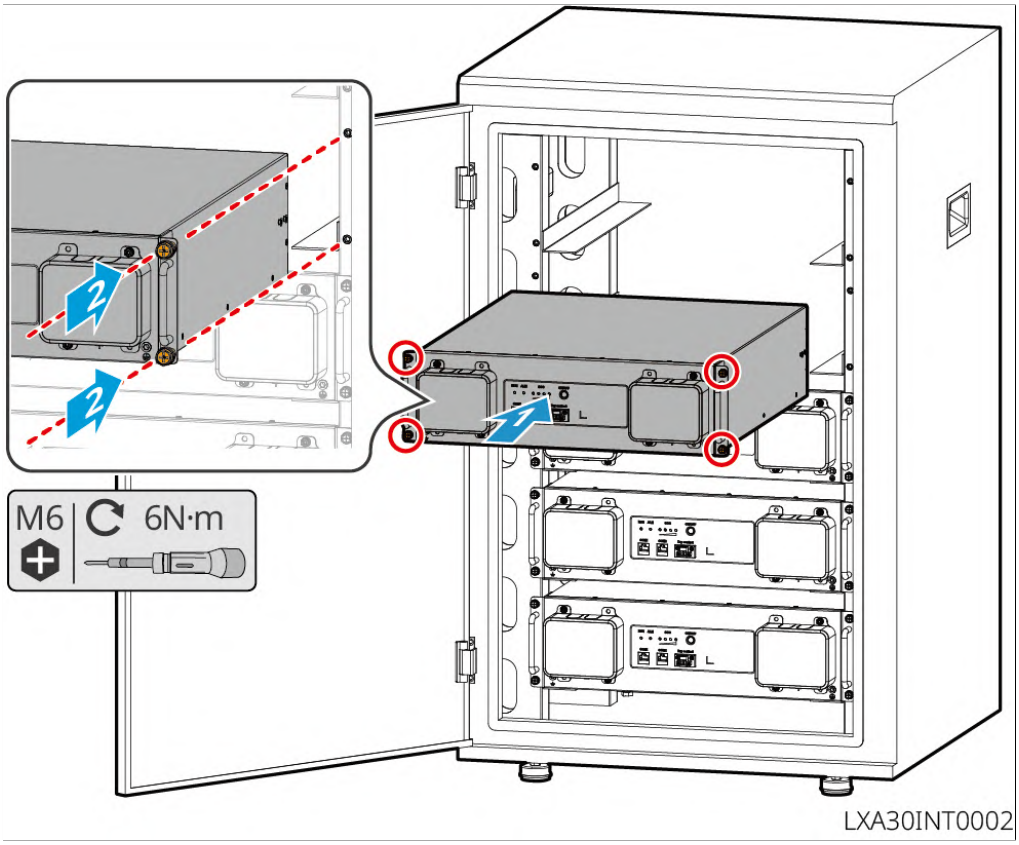


LX A5.0-30: Rack installation

NOTICE

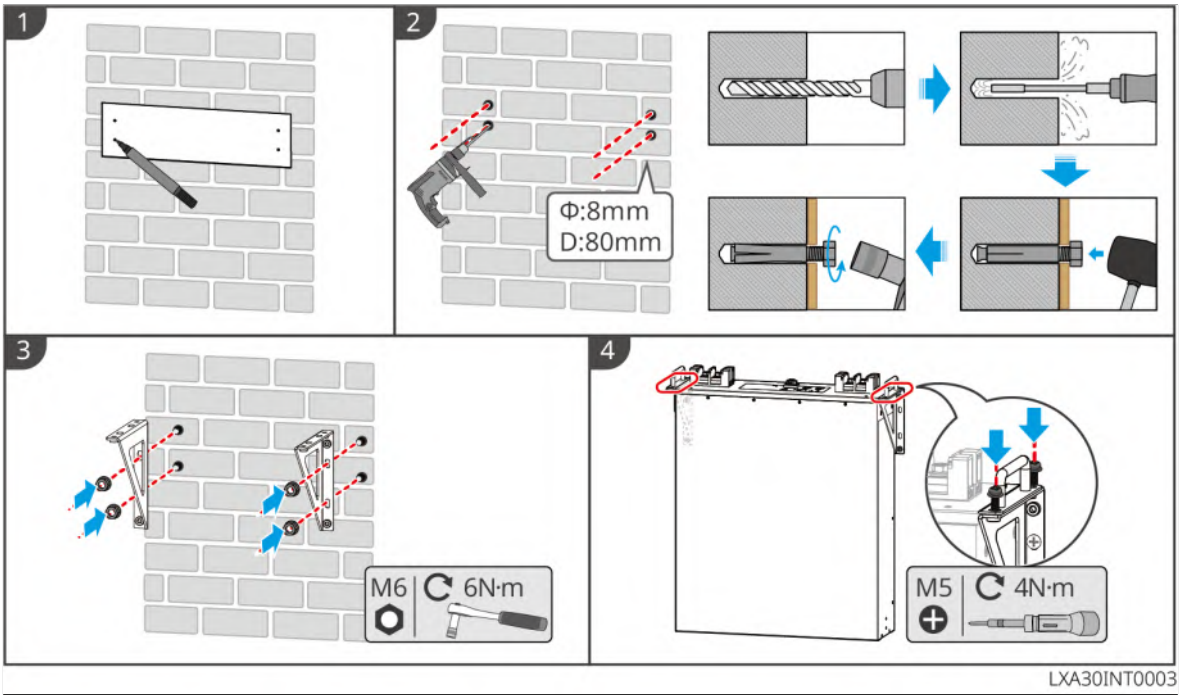
- Recommended for installation in a 19-inch standard rack. The length*width should be 600*800 mm or larger, and the height should be selected based on the battery thickness (133 mm) or larger.
- For rack installation, electrical labels and warning labels must be affixed to the front panel of any battery (these labels are shipped separately as accessories).

1. Place the battery on the rack rails and fasten the battery to the rack with screws at the handle positions.



LX A5.0-30: Wall-mounted installation

1. Determine the drilling positions according to the marking template and mark them with a marker pen.
2. Use an impact drill to drill holes.
3. Install the battery wall bracket.
4. Mount the battery on the wall bracket and fasten the battery and bracket together with screws.

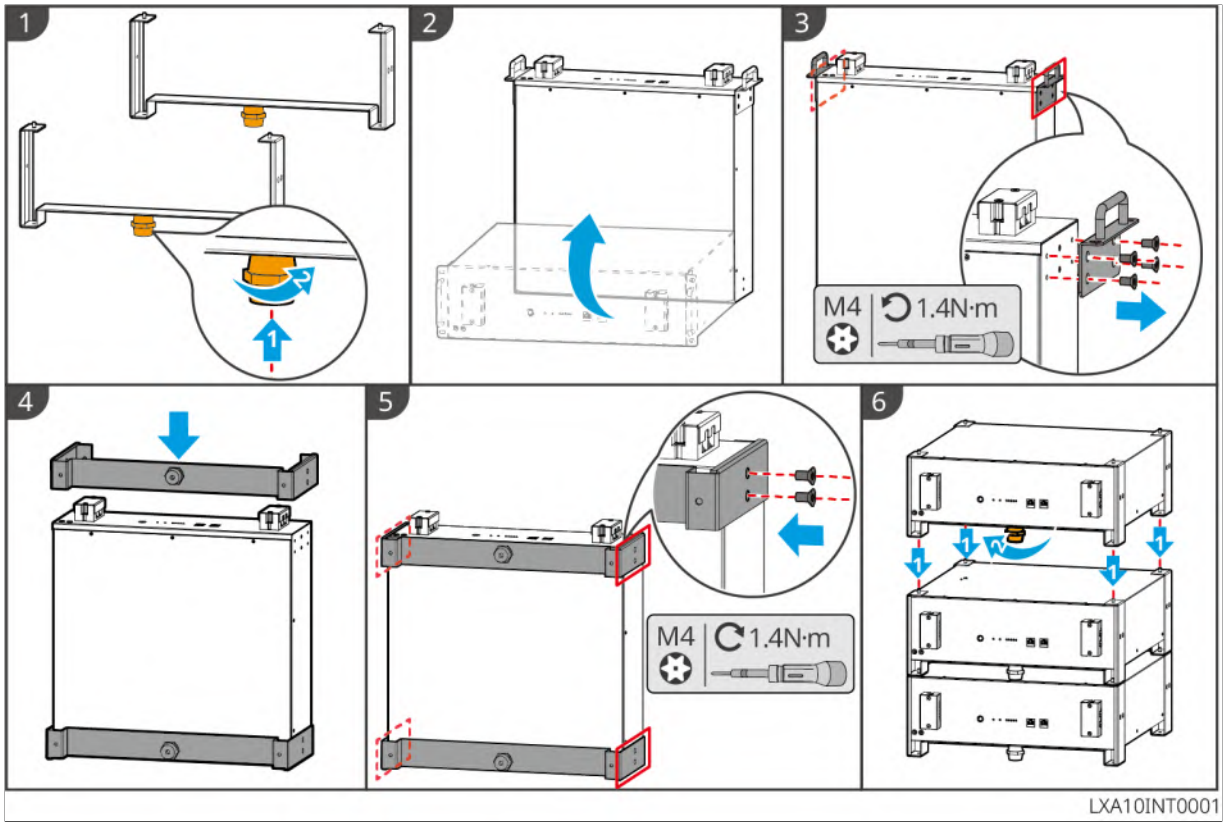


4.5.2 LX A5.0-10

LX A5.0-10: Floor stacking

NOTICE
Up to 6 batteries can be stacked in floor stacking.

1. Place the battery upright.
2. Place the bracket on the battery and remove the handle from the battery.
3. Place another bracket on the battery.
4. Secure the bracket to the battery with screws and lay the battery flat.
5. Stack and install multiple batteries.
   - 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.

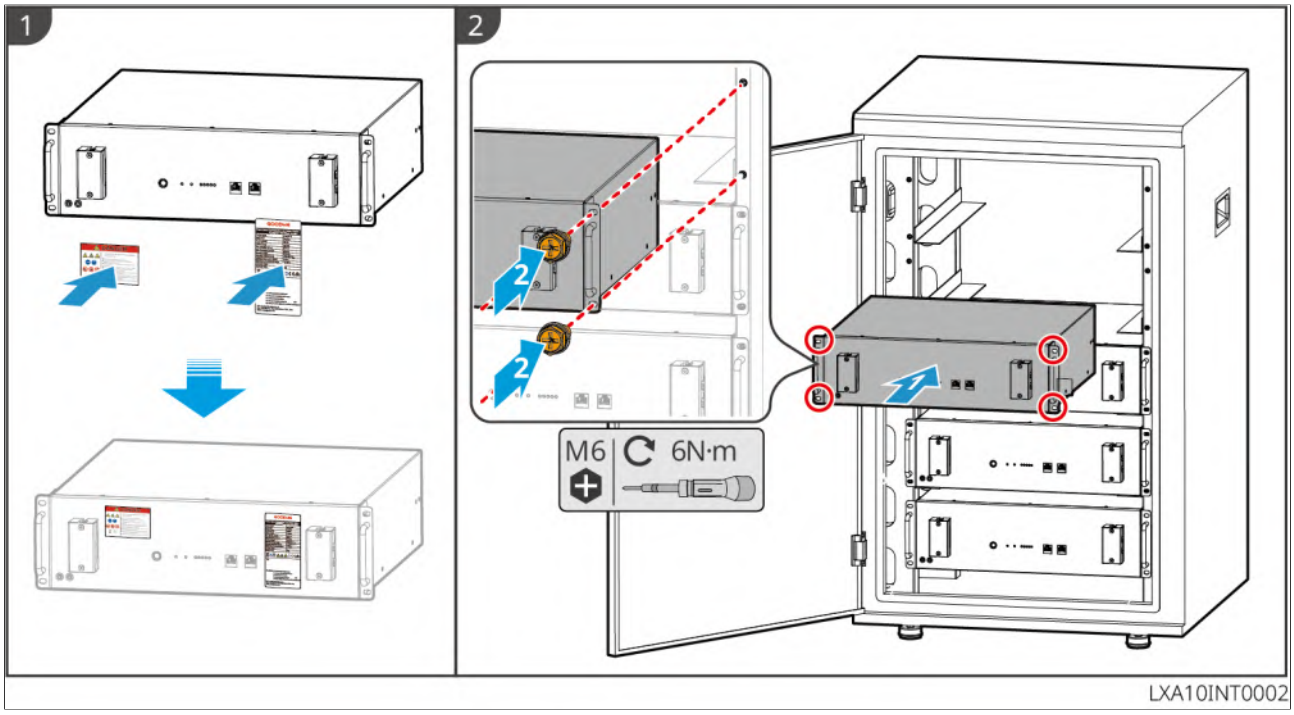


LX A5.0-10: Rack installation

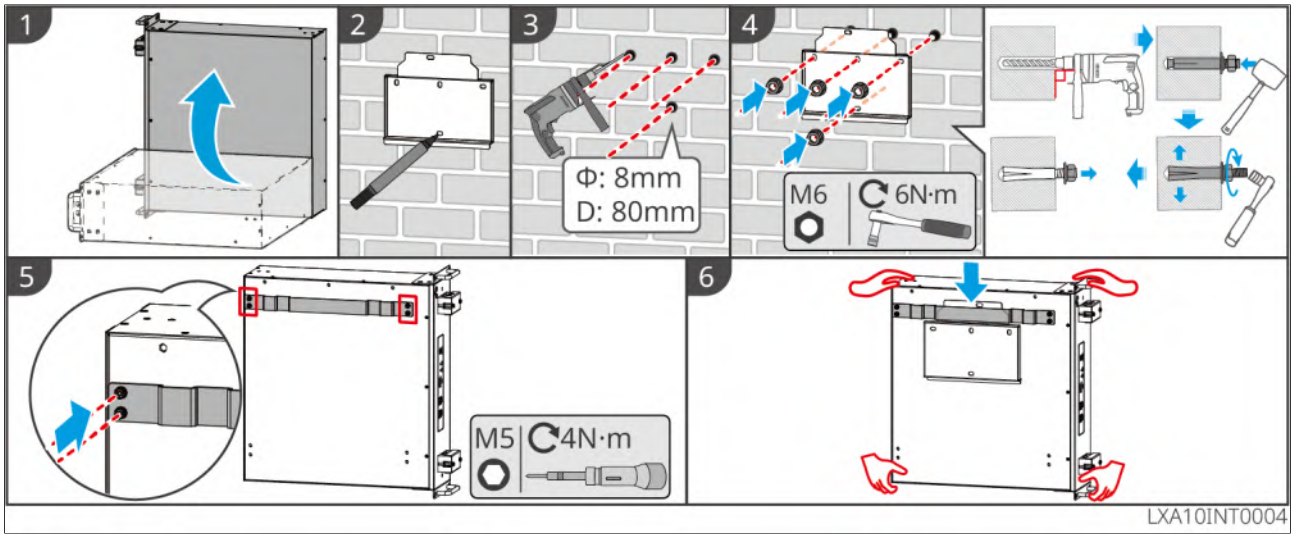
NOTICE

- A 19-inch standard rack is recommended. The physical length and width can be 600*800 mm or larger, and the height can be selected according to the number of batteries in parallel.
- For rack 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 label and warning label to any front panel position of the battery.
2. Place the battery on the rack rails and fasten the battery to the rack with screws at the handle positions.



LX A5.0-10: Wall-mounted installation



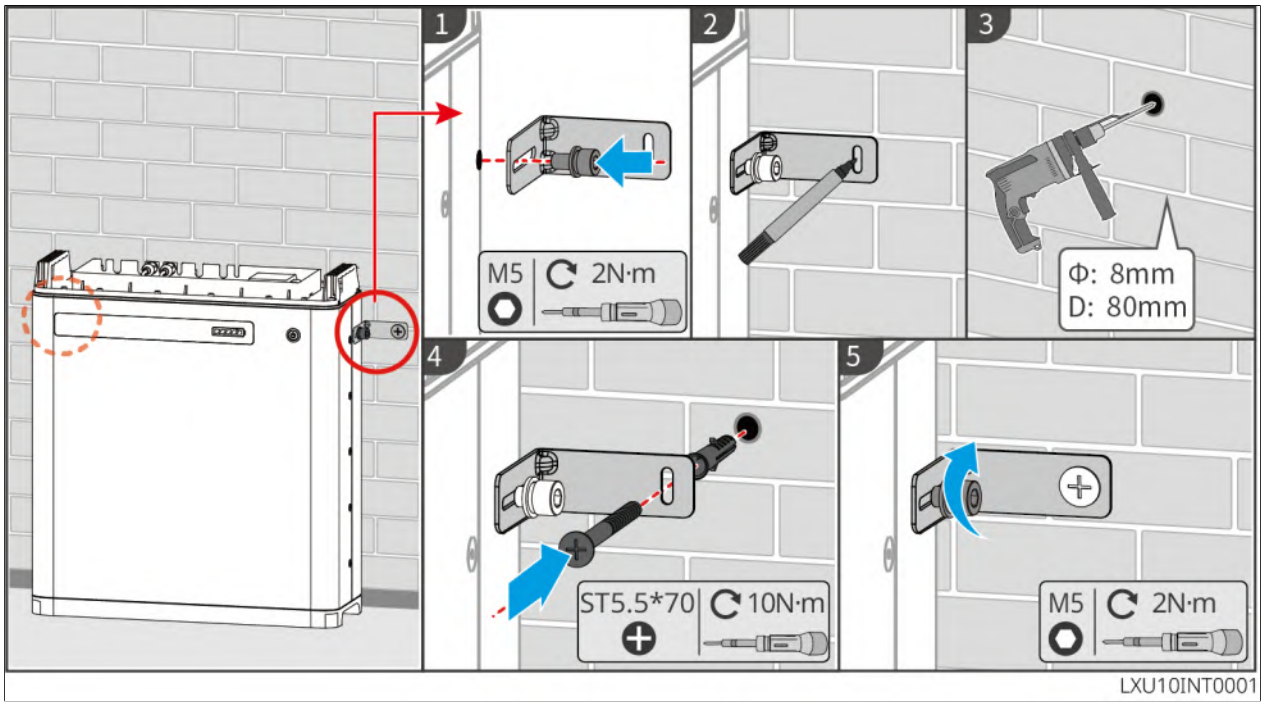
4.5.3 LX U5.4-L

LX U5.4-L: Floor-standing installation

NOTICE

If parallel operation is required, check and select batteries with similar production dates and the same gear number for 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 fits flush against the wall. Ensure it is placed securely, use a marker to mark the drilling positions, and move the battery away.
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.



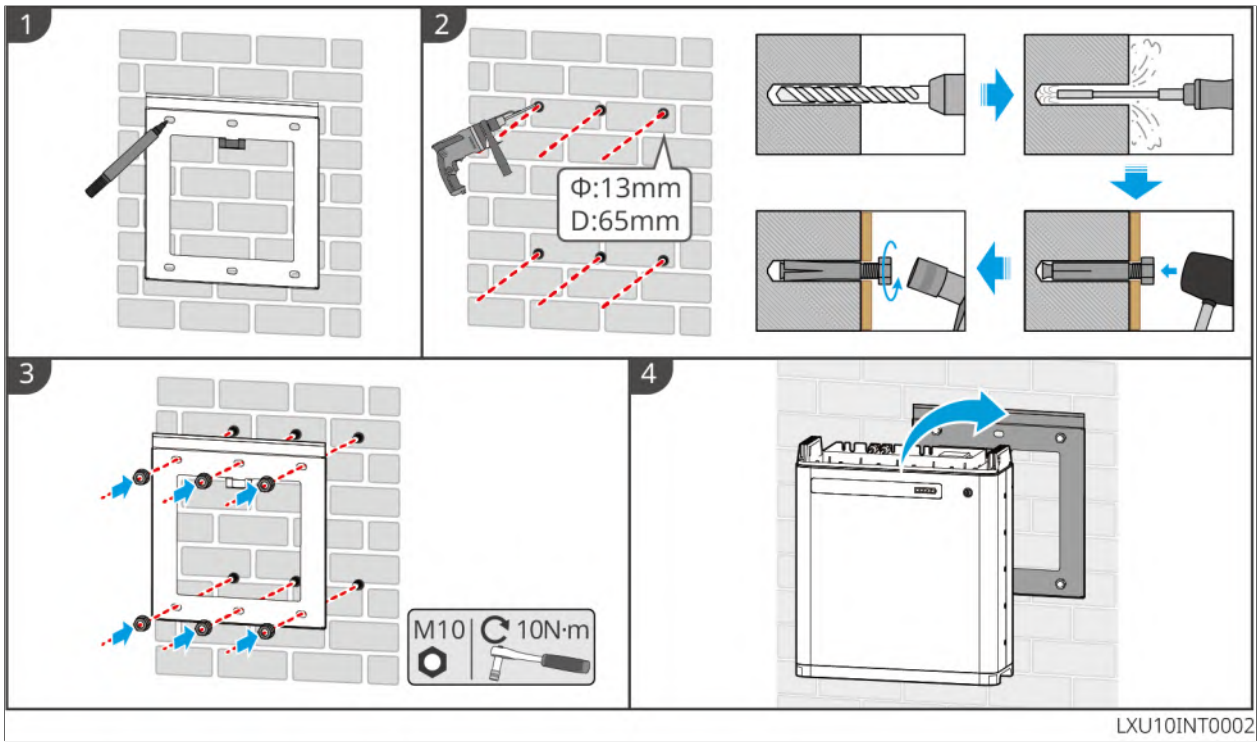
LX U5.4-L: Wall-mounted installation

NOTICE

Wall mounting requires two-person installation.

Step 1: Make the wall-mounting plate flush against the wall. Ensure it is placed securely, use a marker to mark the drilling positions, and remove the wall-mounting plate.
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: Mount the battery onto the back-mounting plate.

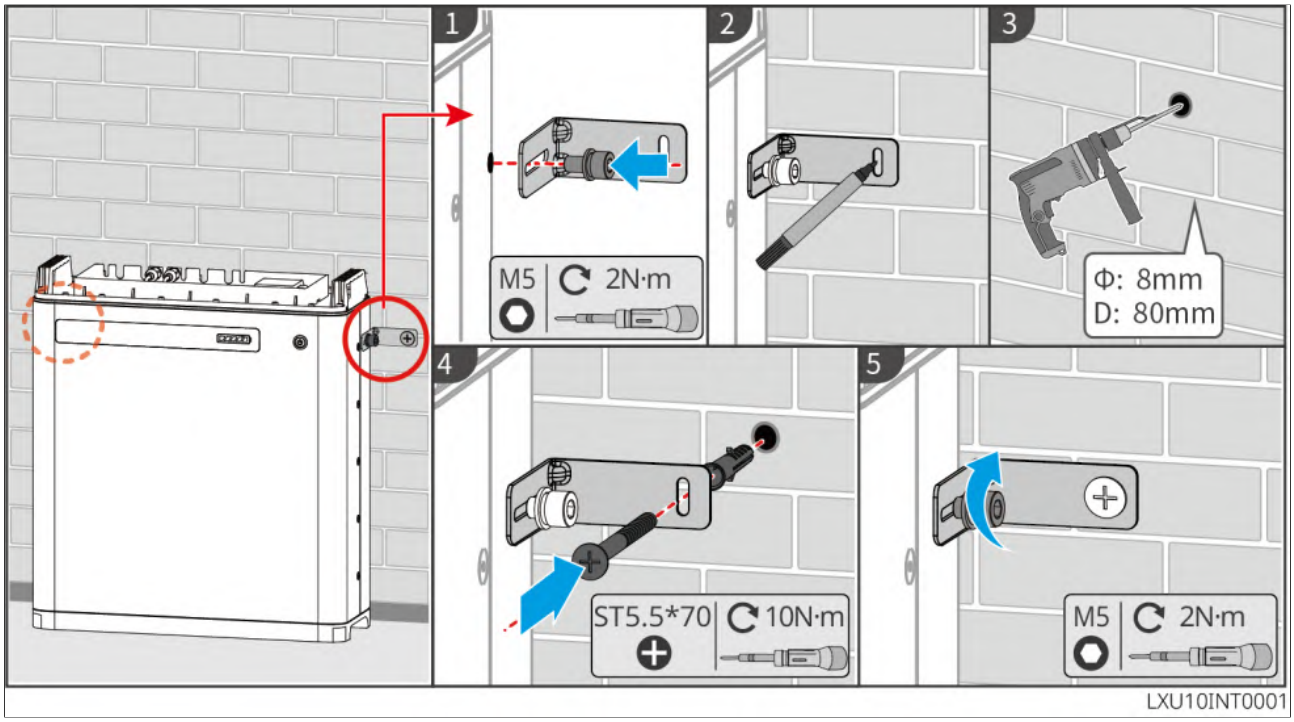


4.5.4 LX U5.4-20

LX U5.4-20: Floor-standing installation

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

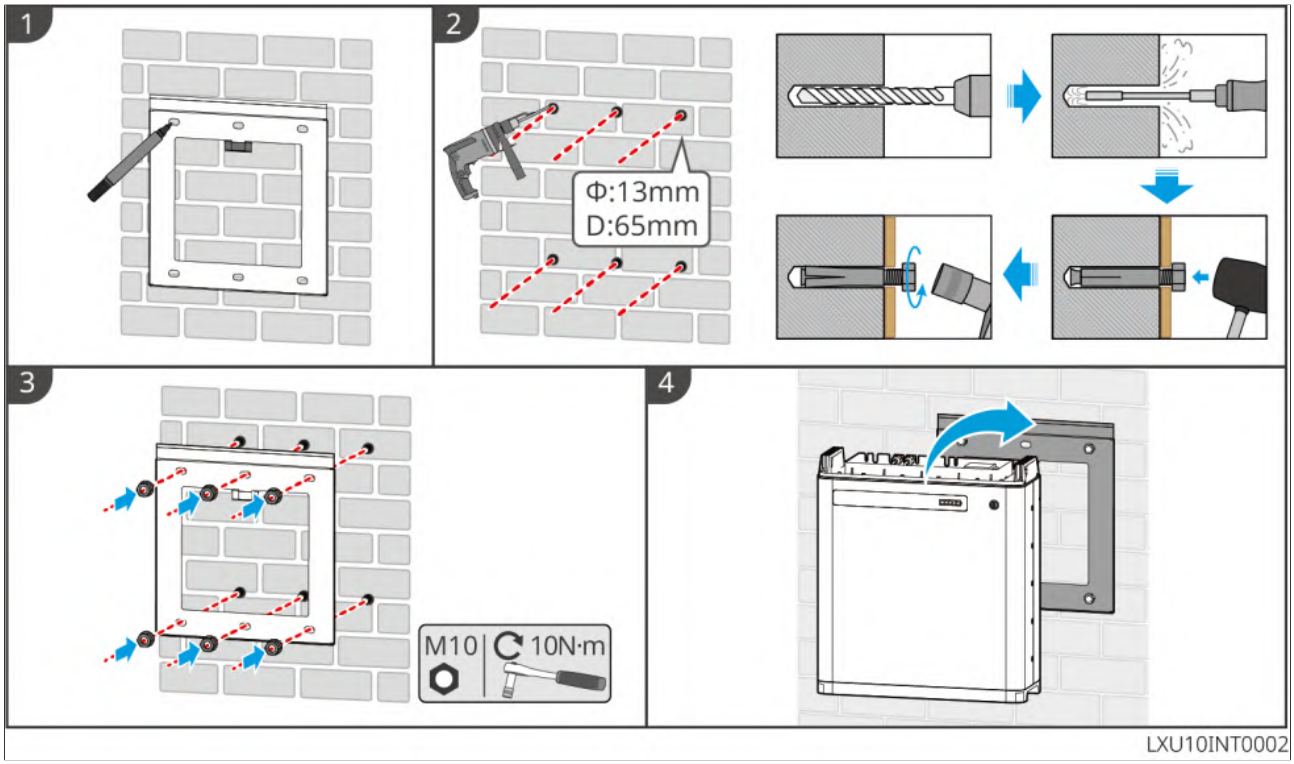
Step 1: Fasten the anti-tip bracket to the battery.
Step 2: Keep the battery parallel to the wall so that the anti-tip bracket fits flush against the wall. Ensure it is placed securely, use a marker to mark the drilling positions, and move the battery away.
Step 3: Use an impact drill to drill holes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



LX U5.4-20: Wall-mounted installation

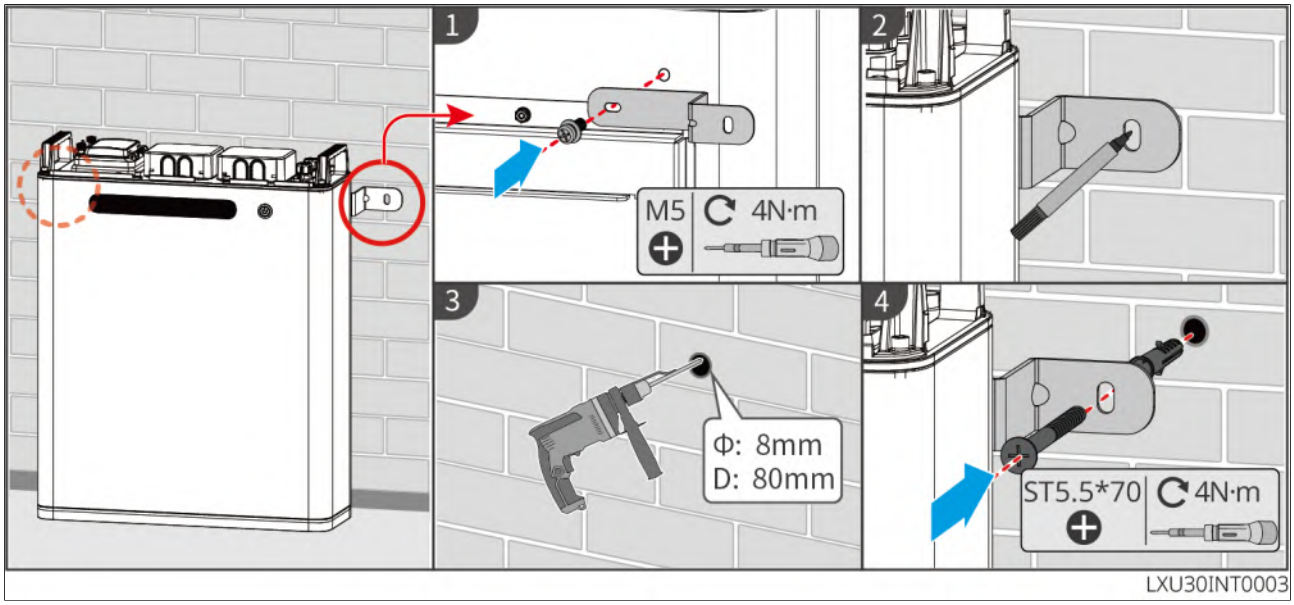
NOTICE
Wall mounting requires two-person installation.

Step 1: Make the wall-mounting plate 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: Secure the back-mounting plate.
Step 4: Mount the battery onto the back-mounting plate.

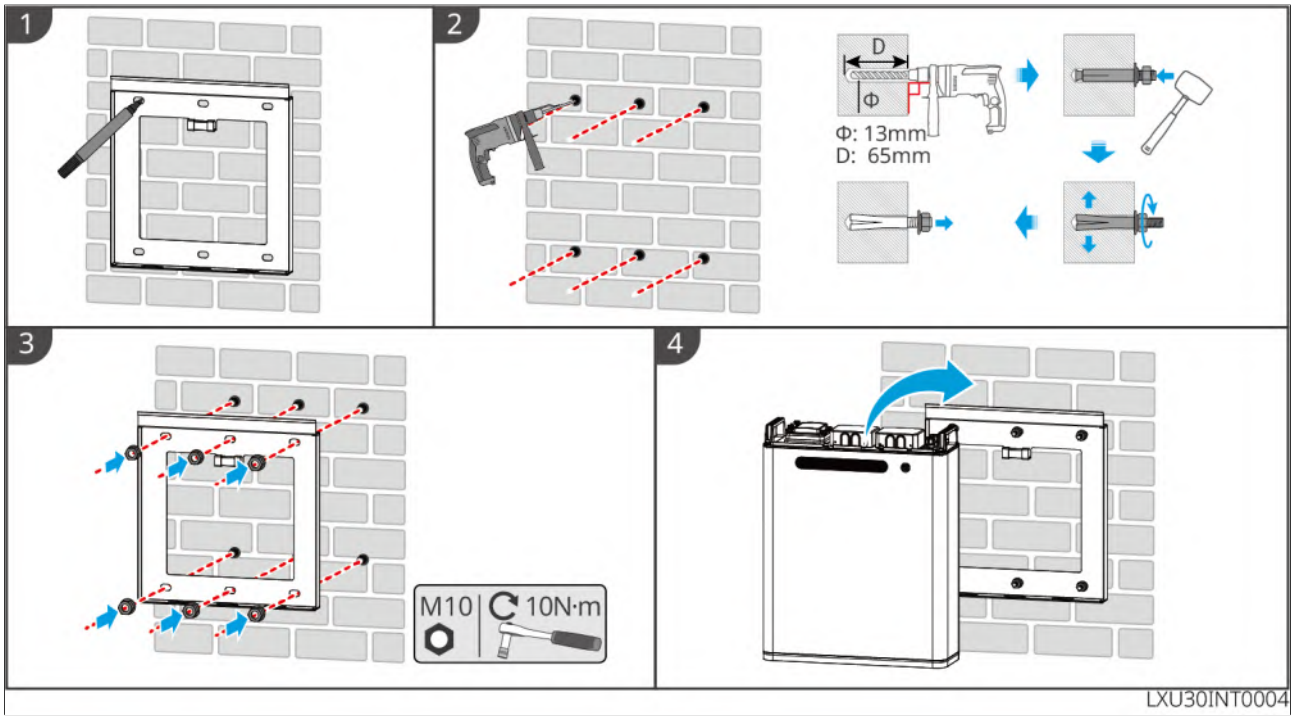


4.5.5 LX U5.0-30

LX U5.0-30: Floor-mounted installation



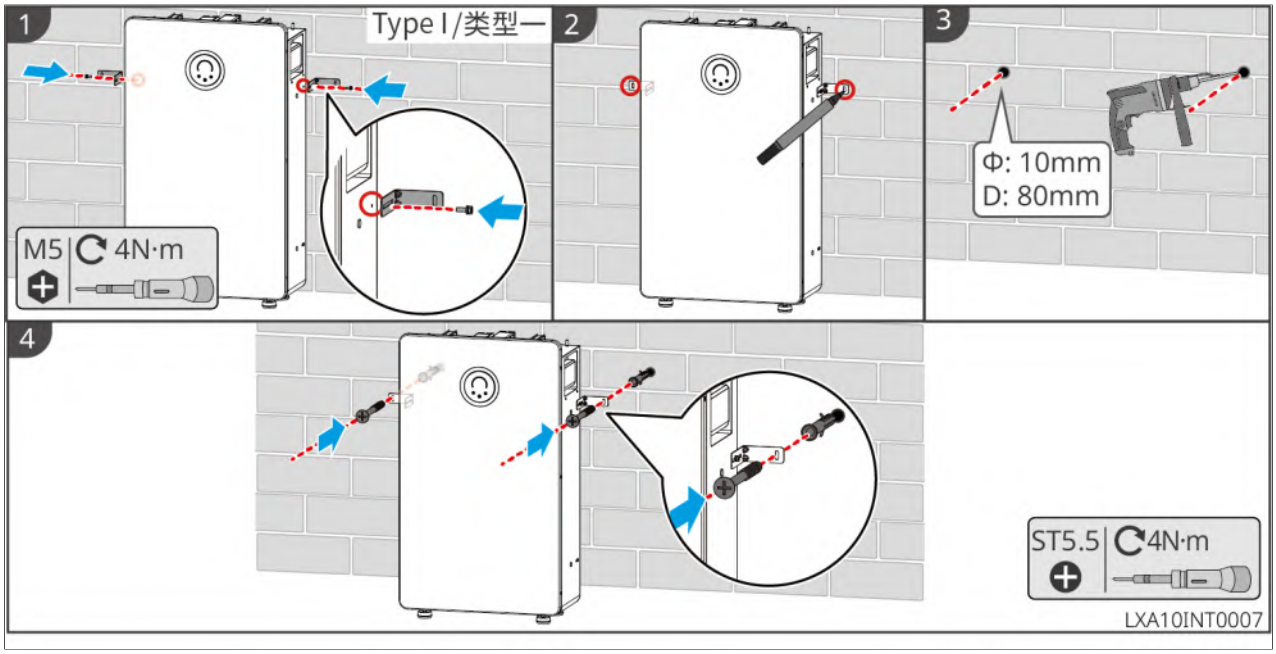
LX U5.0-30: Wall-Mounted Installation



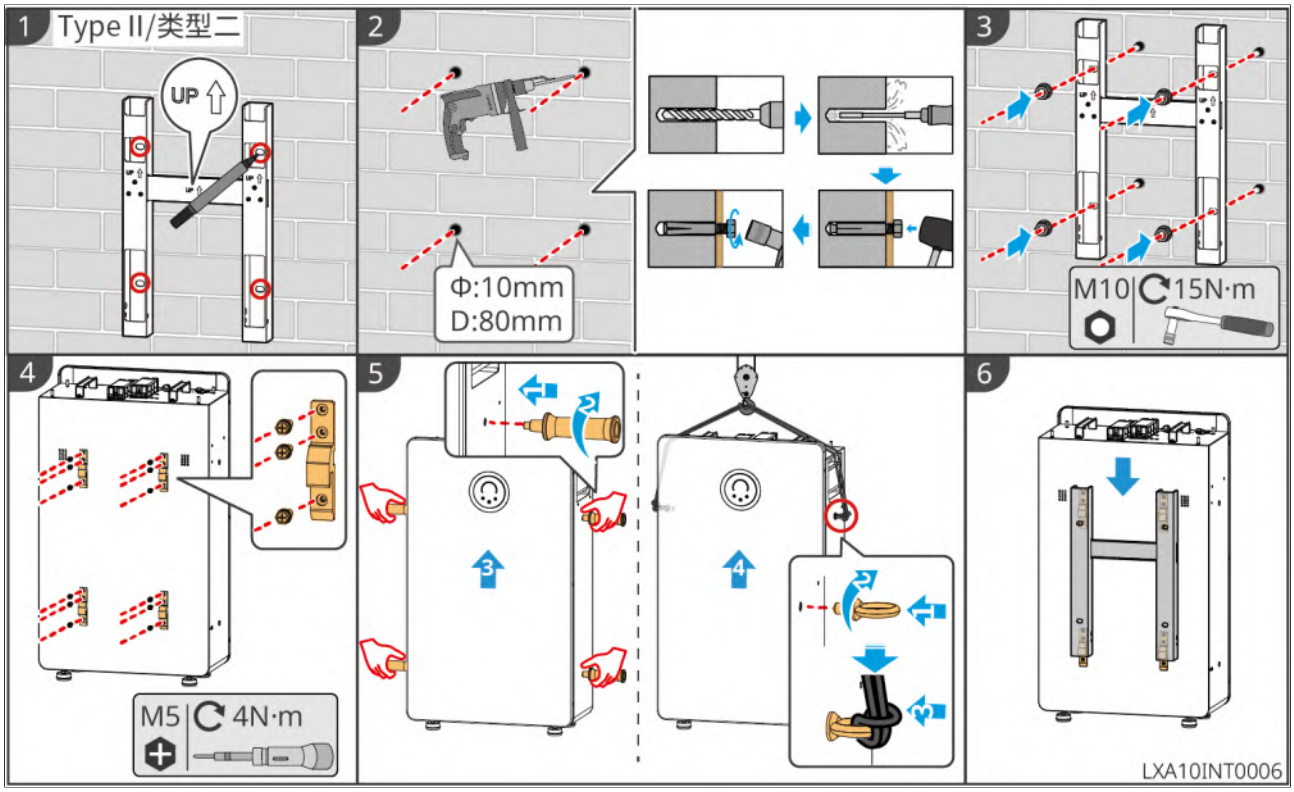
4.5.6 GW14.3-BAT-LV-G10

NOTICE
• Wall mounting requires two-person installation.

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



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

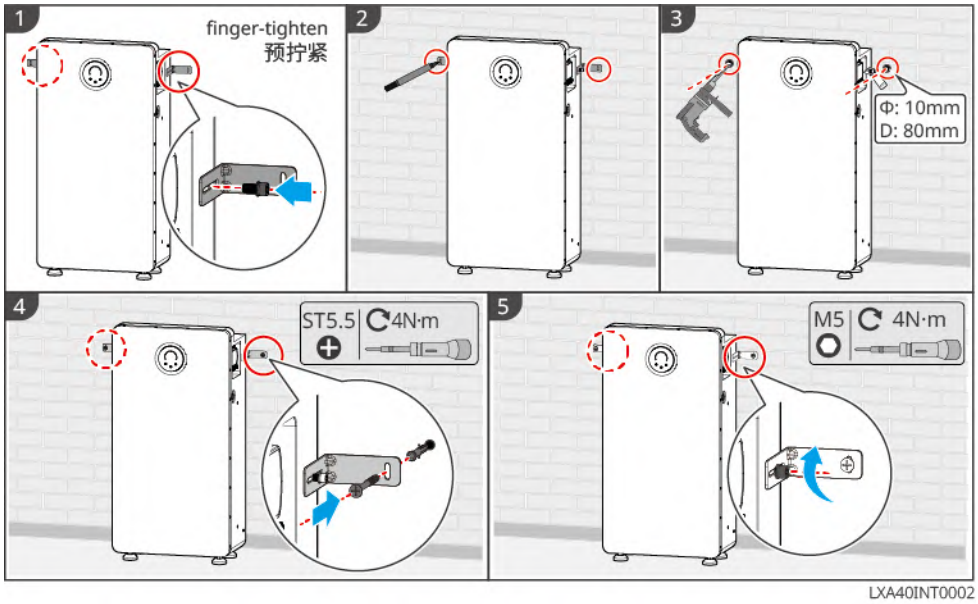


4.5.7 GW16.1-BAT-LV-G10

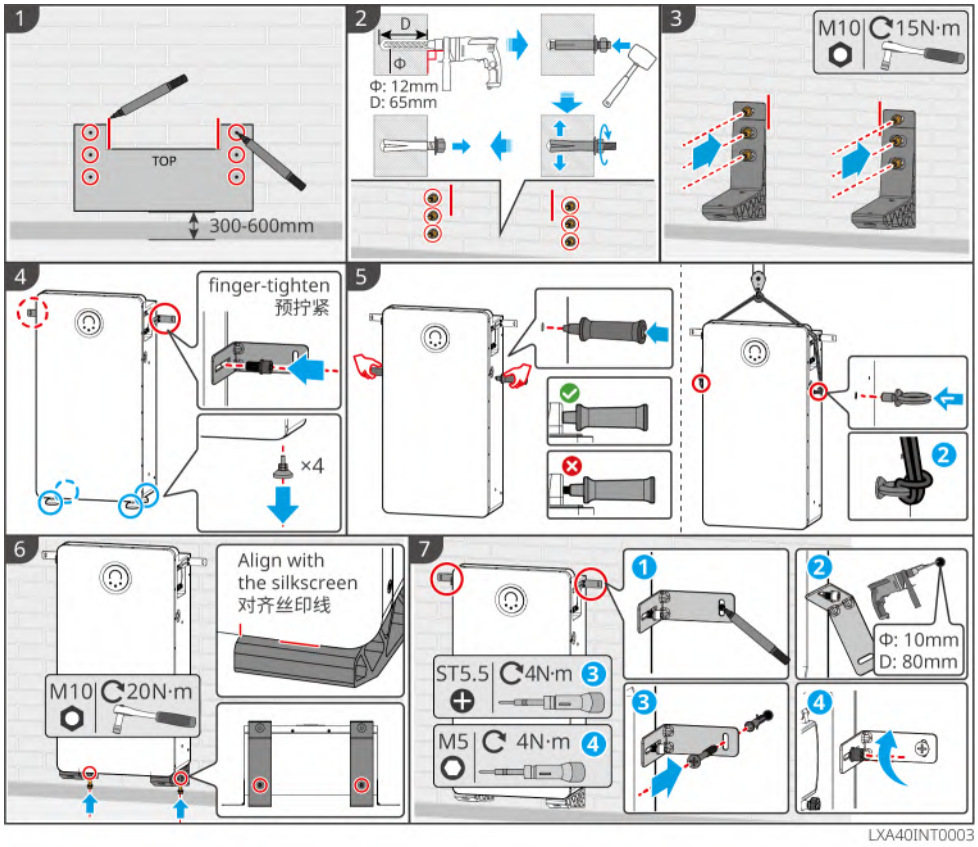
NOTICE

- Wall mounting requires two-person installation.

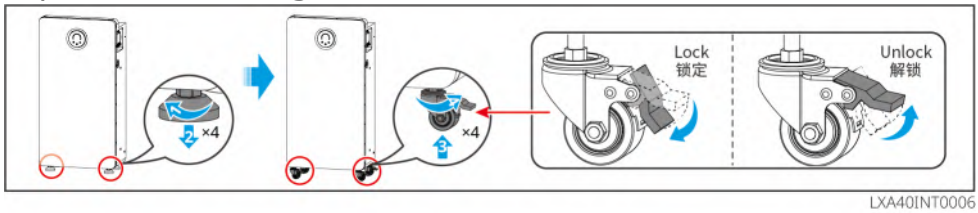
Floor-mounted installation



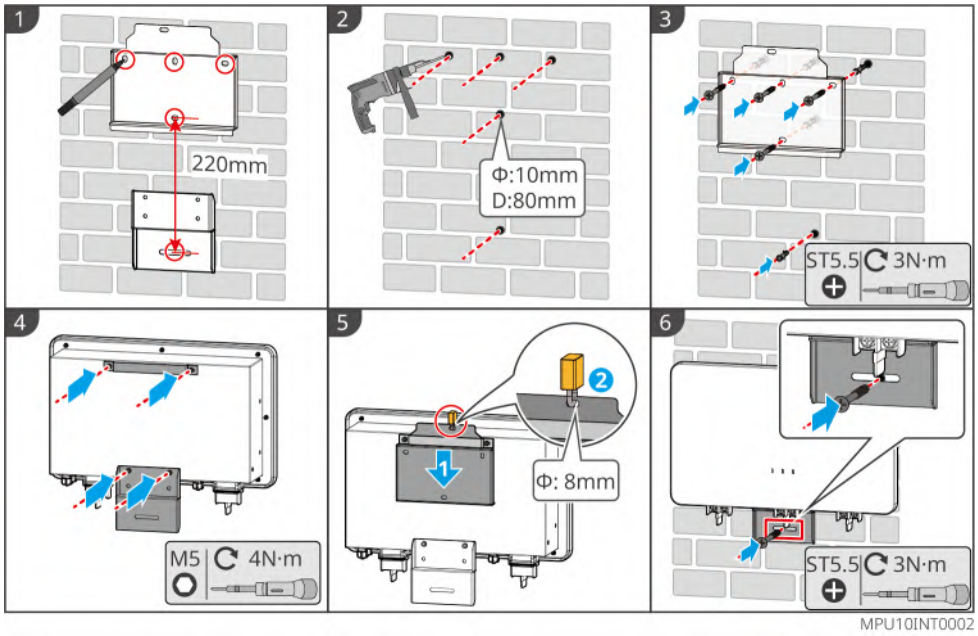
Wall-mounted installation



(Optional) mounting rollers



4.6 Install Battery Mix Parallel Unit

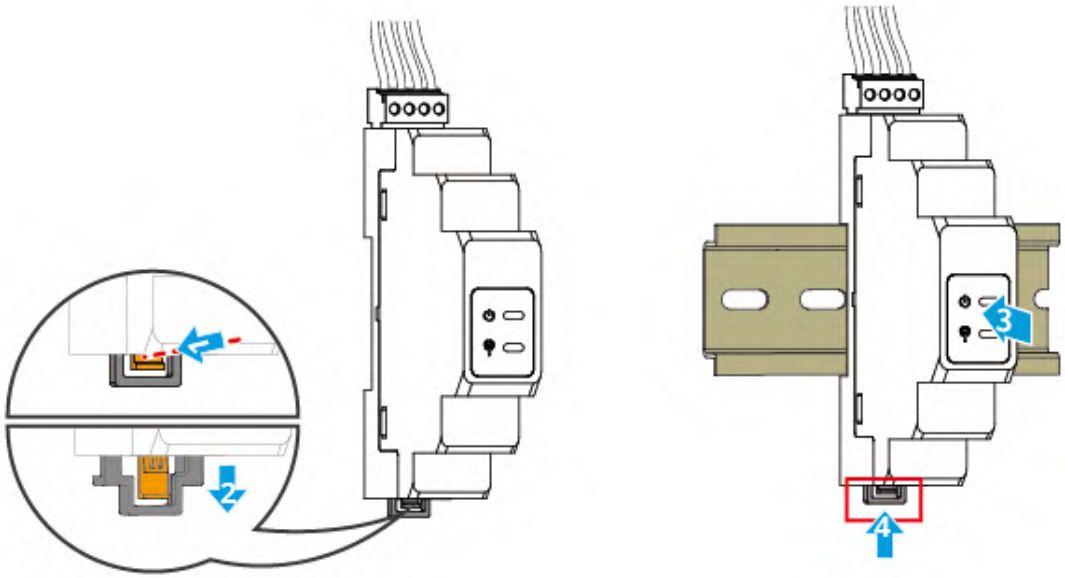


4.7 Install the Meter

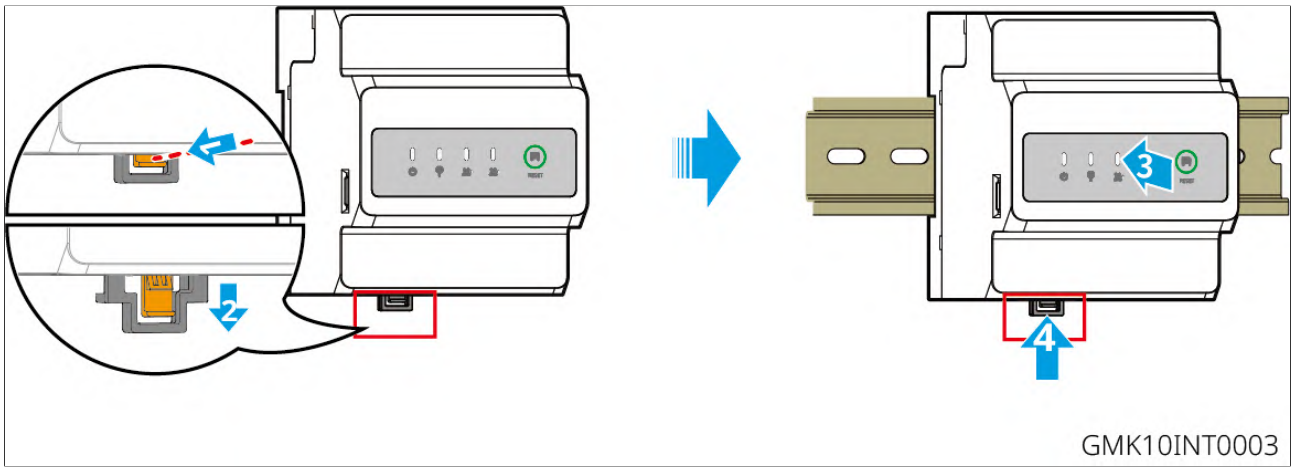
⚠WARNING

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

GMK110



GM330



5 System Wiring

⚠DANGER

- Cable installation, routing, and connection must comply with local laws, regulations, and code requirements.
- All operations during electrical connection, as well as the specifications of cables and components used, must comply with local laws and regulations.
- Before making electrical connections, disconnect the DC Switch and AC output switch of the equipment to ensure that the equipment is de-energized. Live operation is strictly prohibited, as electric shock and other hazards may otherwise occur.
- Cables of the same type should be bundled together and routed separately from cables of different types. Intertwining or crossing is prohibited.
- If the cable is subjected to excessive tension, poor connection may result. When wiring, leave some slack in the cable before connecting it to the inverter wiring terminals.
- When crimping wiring terminals, ensure that the cable conductor is in full contact with the terminal. Do not crimp the cable insulation together with the terminal; otherwise, the equipment may fail to operate, or may generate heat after operation due to unreliable connection, resulting in damage to the inverter terminal block.
- Unused cable passage holes and ports (including communication ports) must be reliably sealed using the dedicated terminals or plugs provided in the accessories included with the box. Otherwise
  the following risks may be caused:
  - Electric shock hazard: Open electrical ports may allow personnel to directly contact live parts, causing electric shock accidents.
  - Protection failure: Open ports allow dust, moisture, or foreign objects to enter, which may cause short circuits, fire, or equipment failure.

NOTICE

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

5.1 System Wiring Electrical Block Diagram

NOTICE

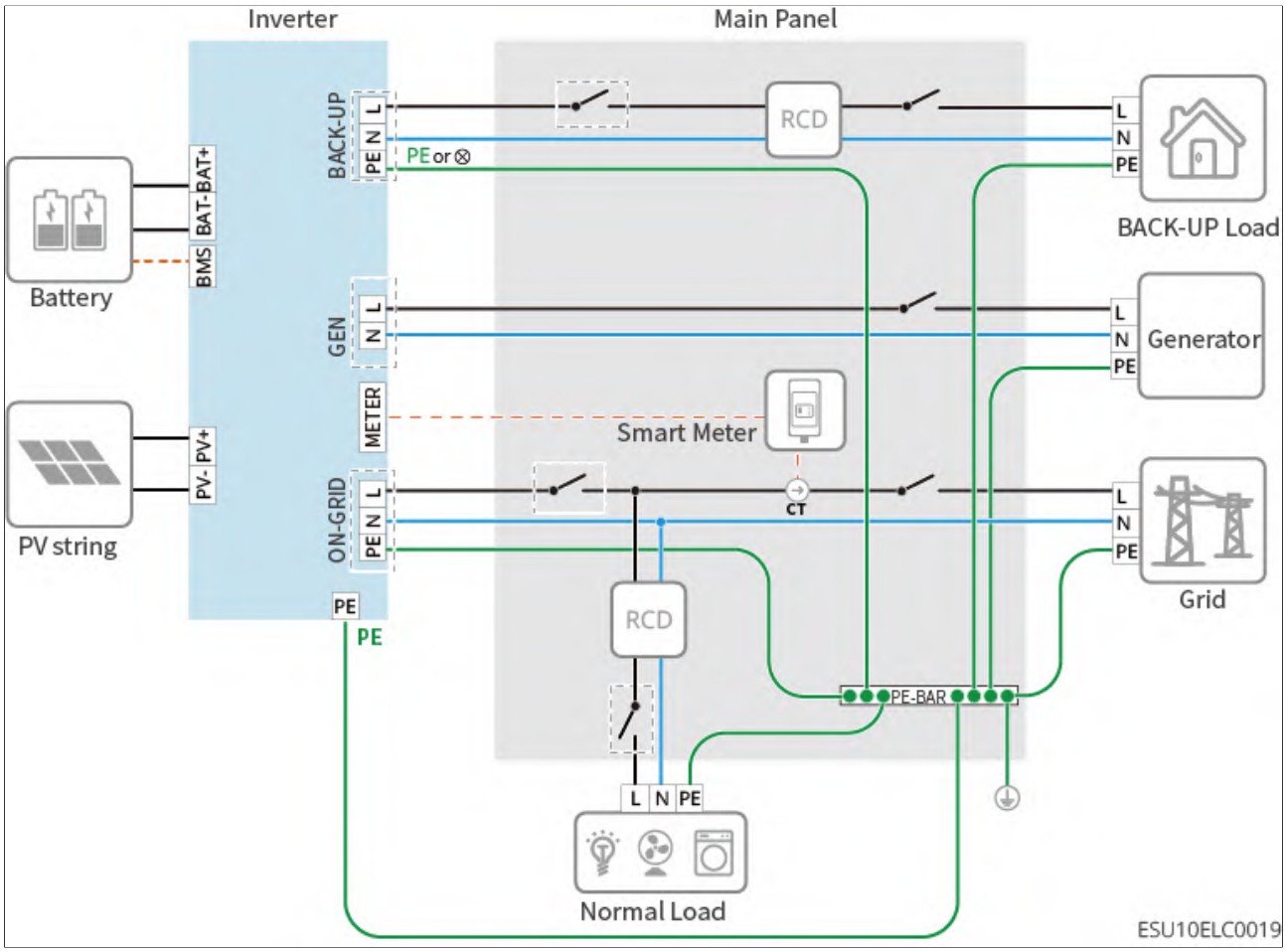
- According to regulatory requirements in different regions, the wiring methods for the N and PE wires of the inverter's ON-GRID and BACK-UP ports are different. Refer to local regulatory requirements for details.
- The inverter's ON-GRID AC port has a built-in relay. When the inverter is in off-grid mode, the built-in ON-GRID relay is in the open state; when the inverter is in grid-tied operation mode, the built-in ON-GRID relay is in the closed state.
- After the inverter is powered on, the BACK-UP AC port is live. If maintenance is required on BACK-UP loads, power off the inverter; otherwise, electric shock may occur.

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

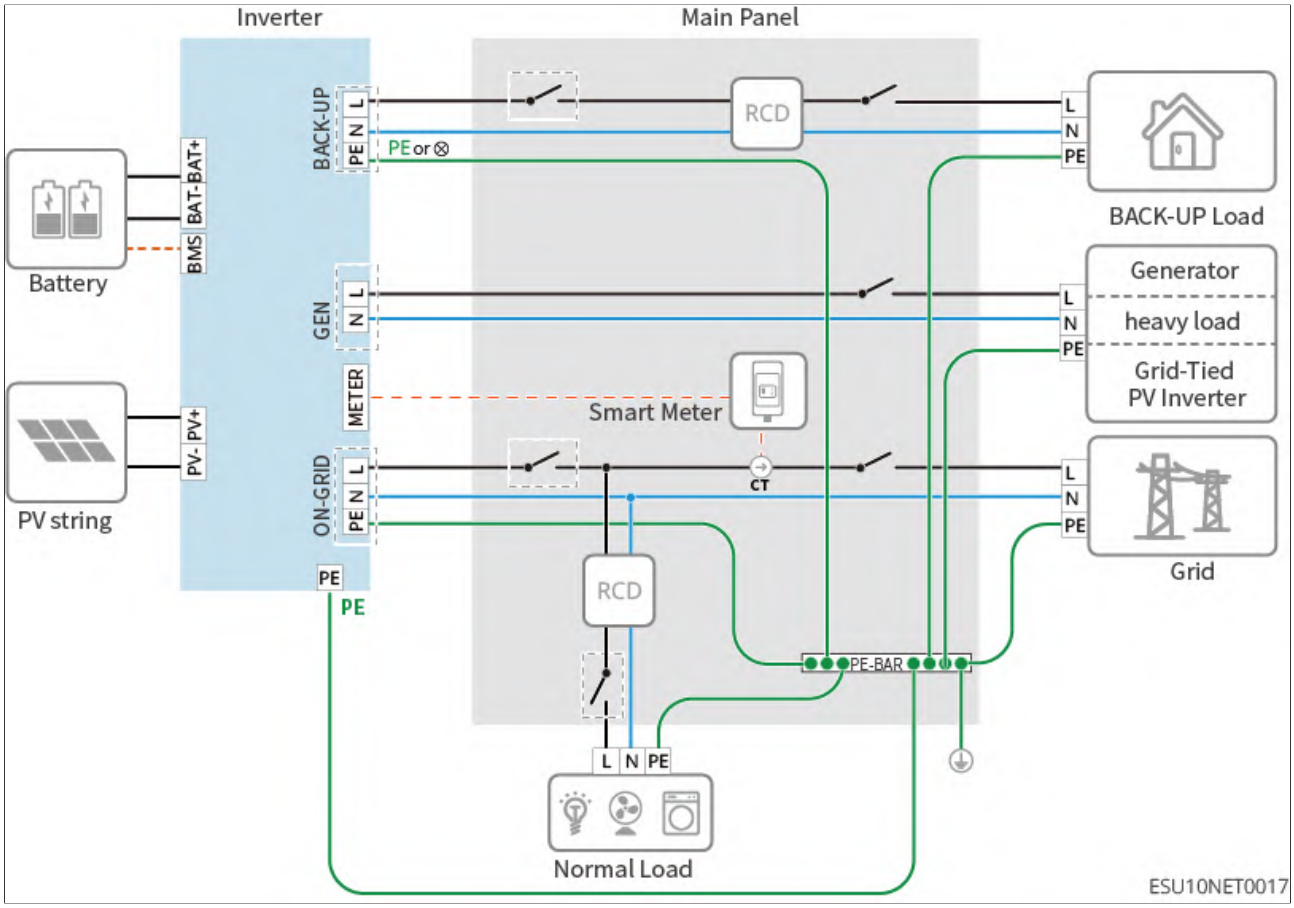
NOTICE

- Please ensure that the BACK-UP Protection ground wire is connected correctly and securely. Otherwise, the BACK-UP function may malfunction when a grid fault occurs.
- For regions other than Australia, New Zealand, etc., the following wiring methods apply:

General Scenario



Microgrid Scenario



5.2 Detailed System Wiring Diagram

5.2.1 Detailed Wiring Diagram for Single-Unit System

In single-unit scenarios, other meter specifications that meet the requirements, such as GM330, may also be used. Only the recommended types are shown here.

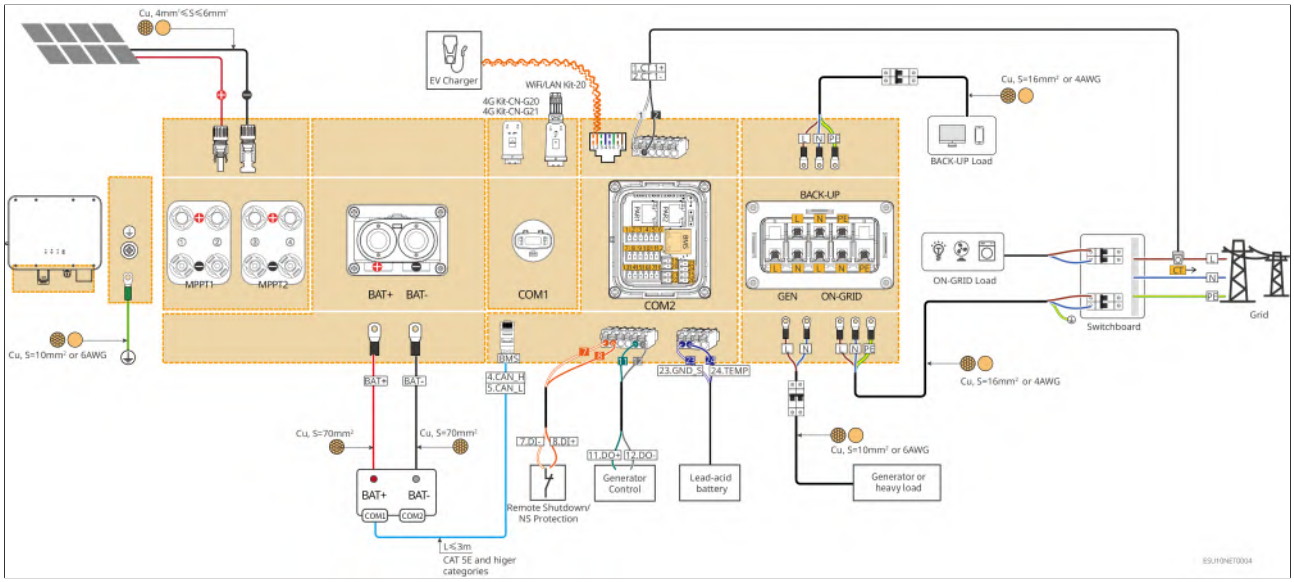


Figure9 Scenario 1 with built-in meter

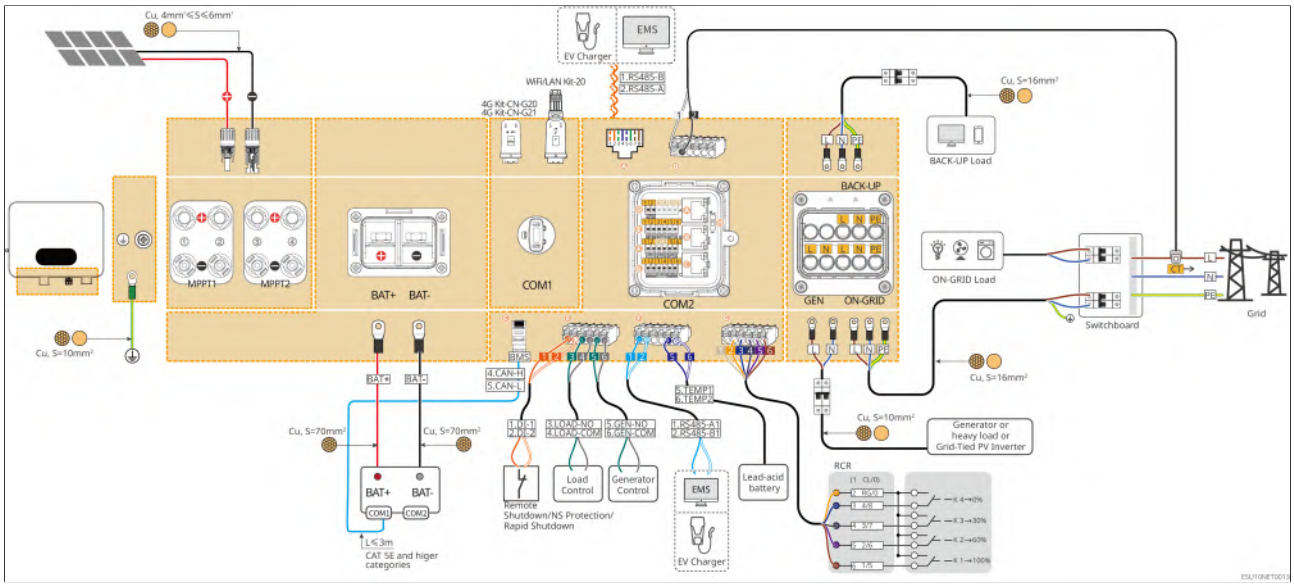


Figure10 Scenario 2 with built-in meter

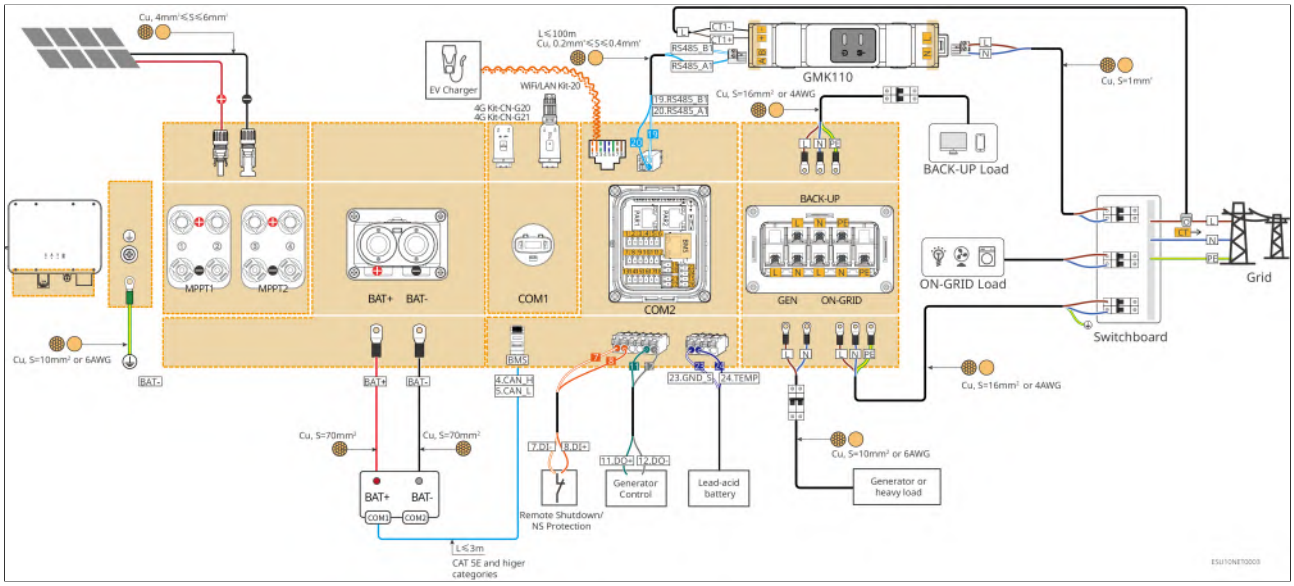


Figure11 Scenario 1 with GMK110

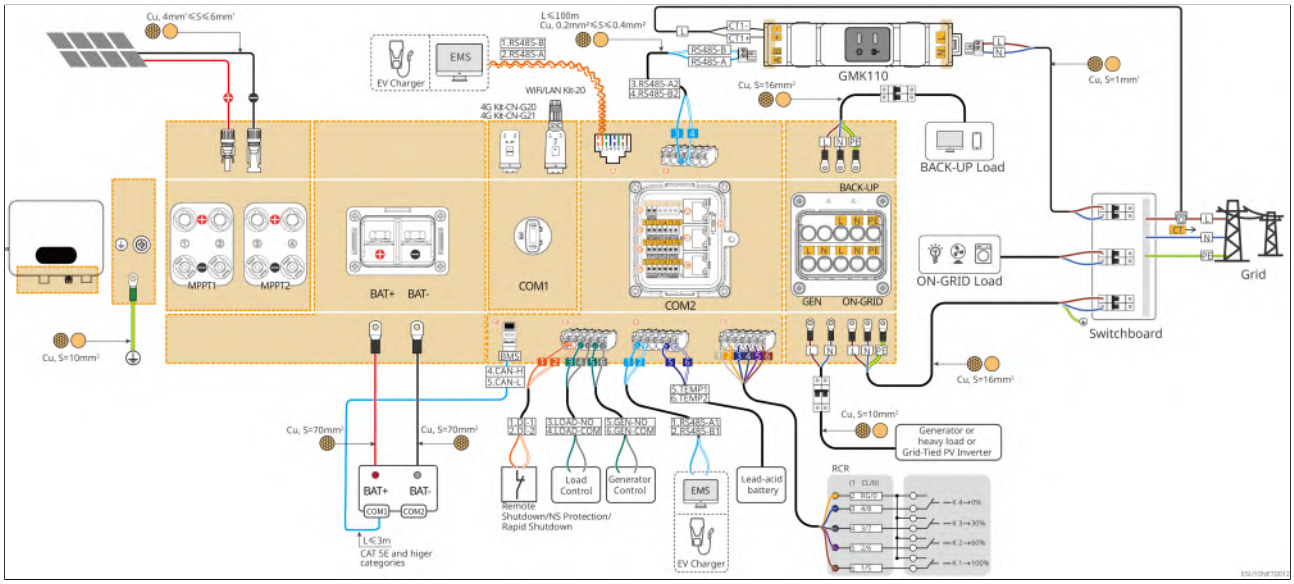


Figure12 Scenario 2 with GMK110

5.2.2 Detailed Wiring Diagram for Parallel System

NOTICE

- In parallel scenarios, the inverter connected to the Ezlink3000 smart communication stick and to the meter is the master inverter, and the others are slave inverters. Do not connect the 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 diagrams focus on wiring related to parallel operation. For wiring requirements of other ports, refer to the single-unit system.
- In parallel scenarios, when the inverter is not in busbar mode, each inverter can be connected to different battery models. For specific wiring methods, seeConnecting Battery Cables.

Battery busbar Access Mode when inverters are connected in parallel

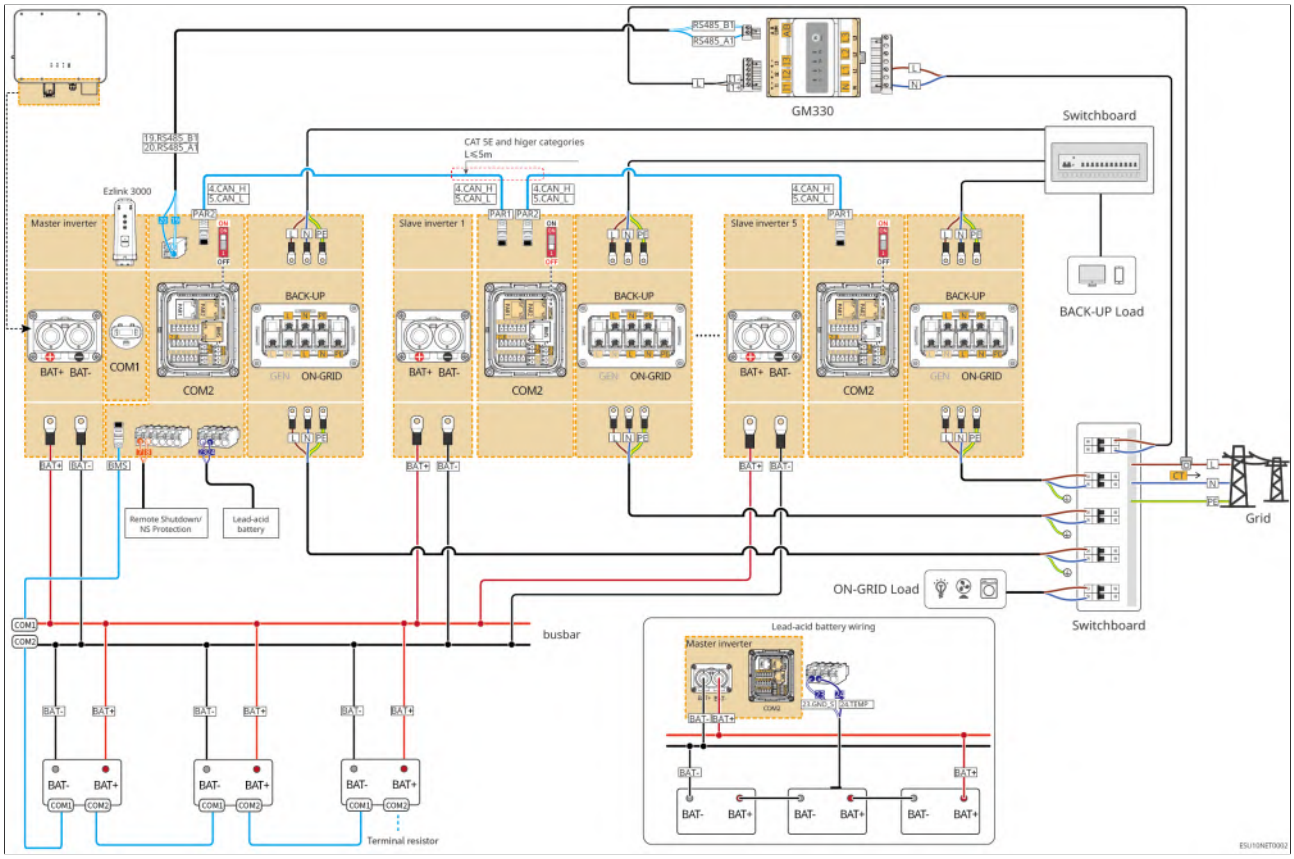


Figure13 Scenario 1 with GM330

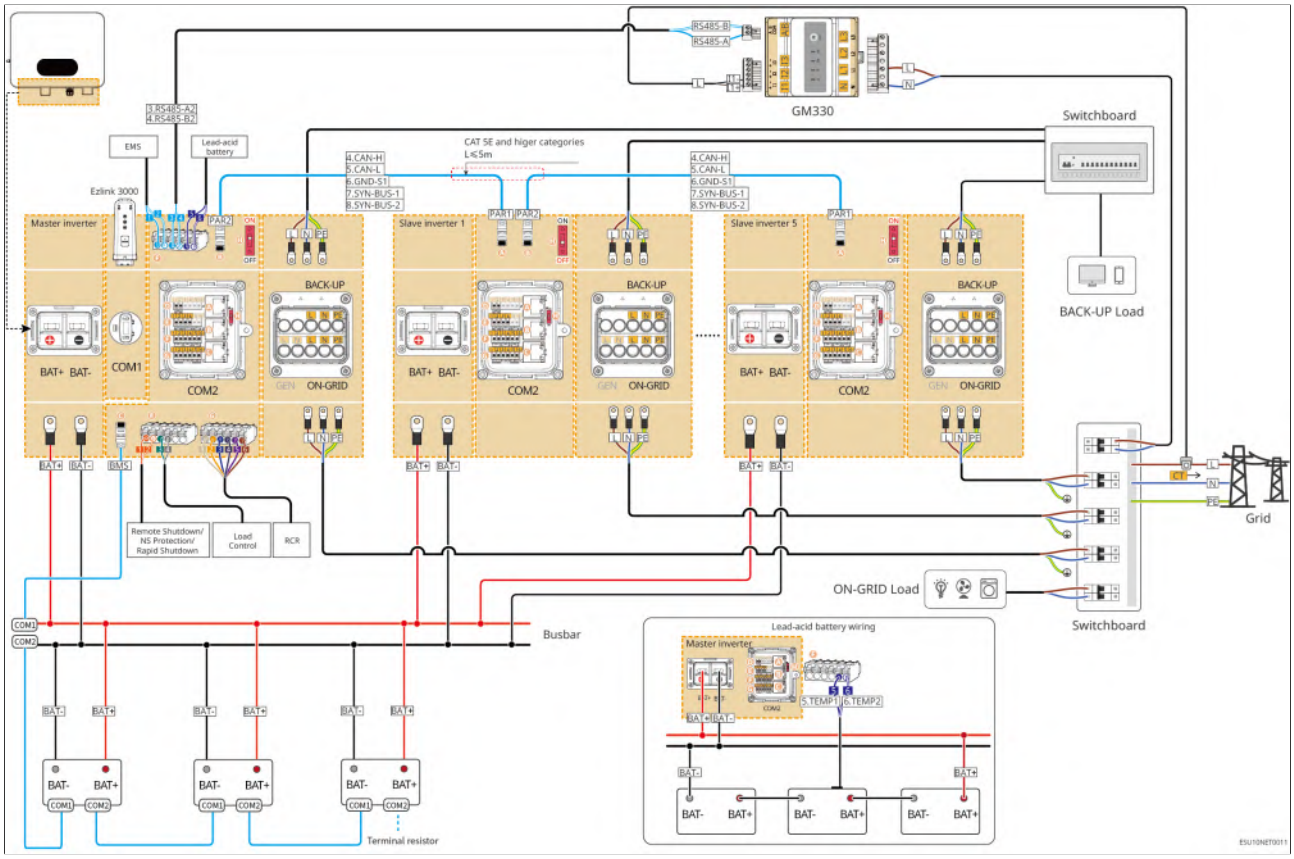


Figure14 With GM330 Scenario 2

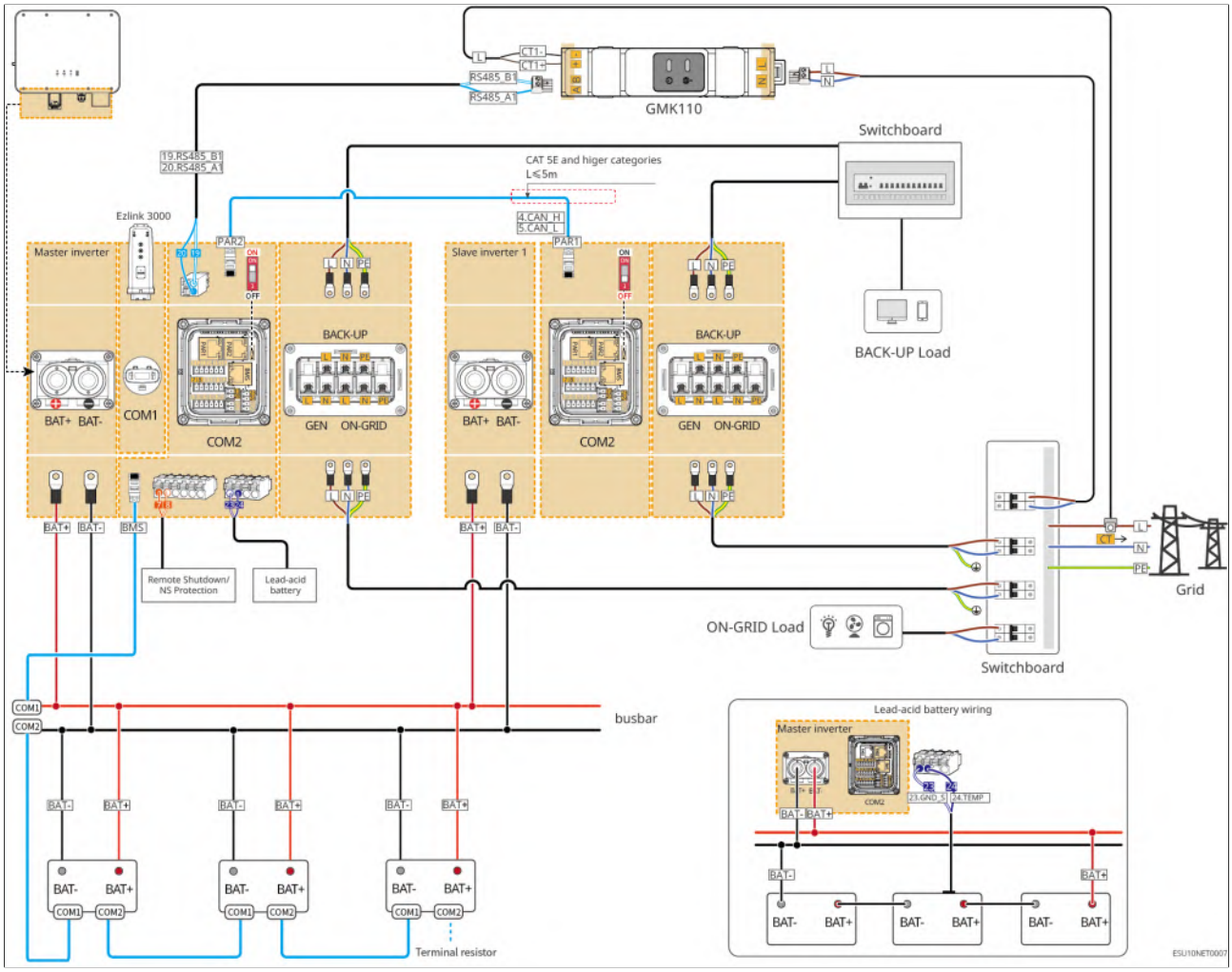


Figure15 Scenario 1 with GMK110

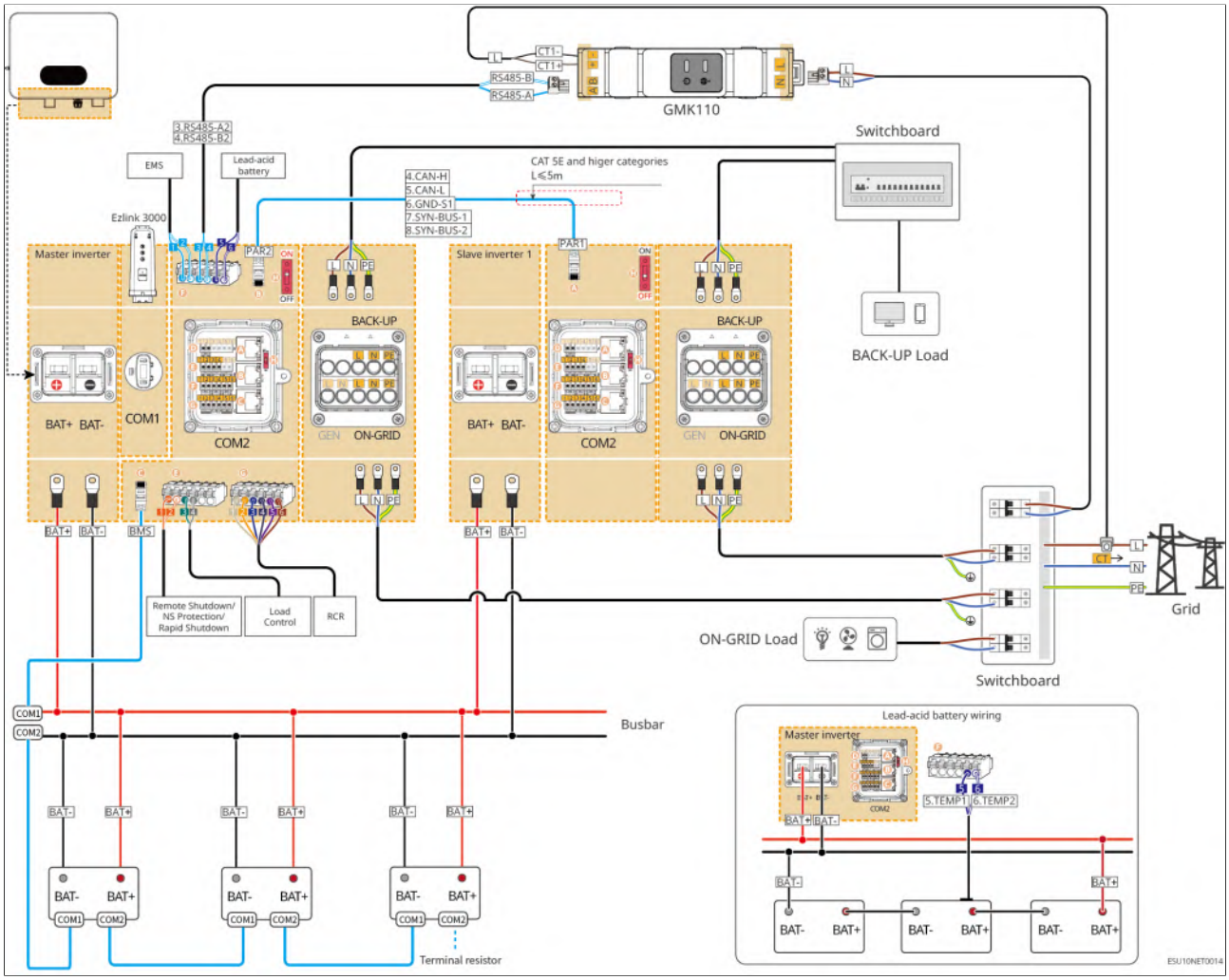


Figure16 Scenario 2 with GMK110

When inverters are in parallel operation, the battery is in non-busbar Access Mode.

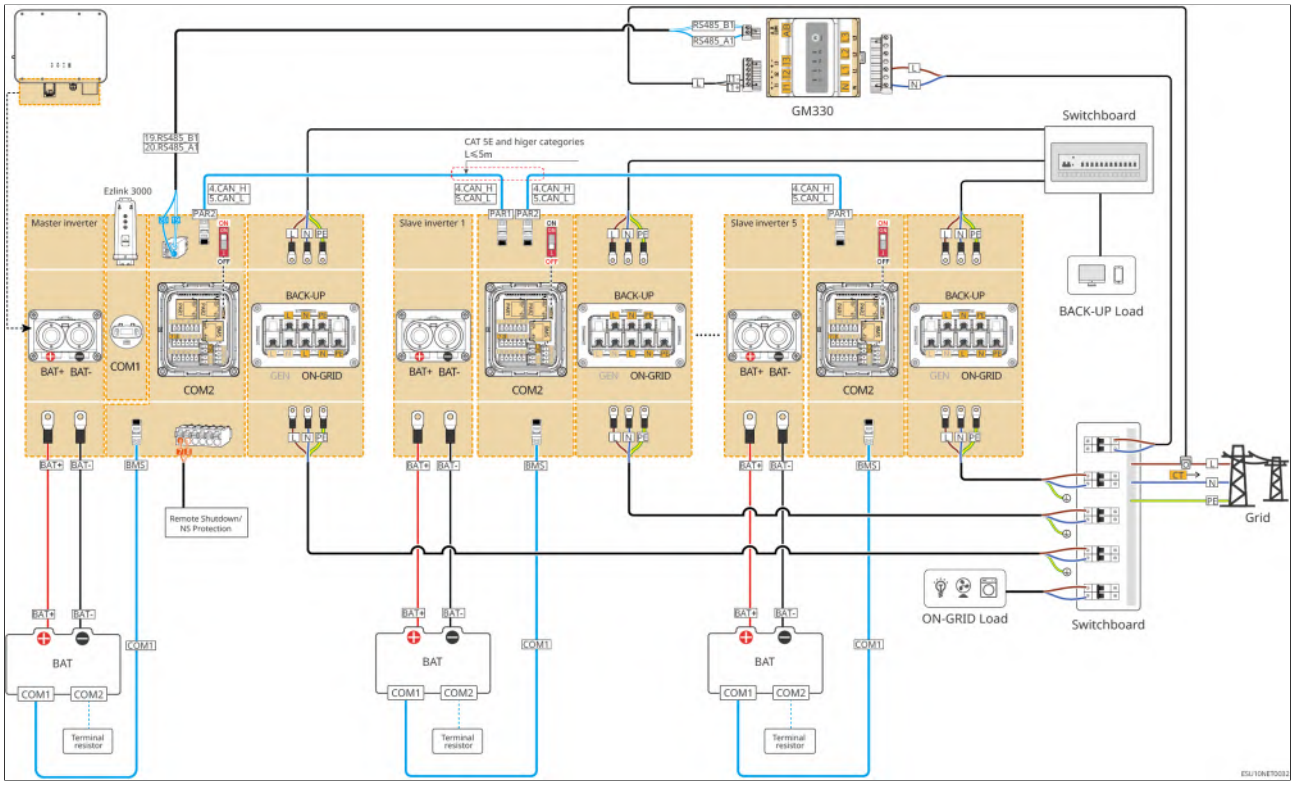


Figure17 Scenario 1 with GM330

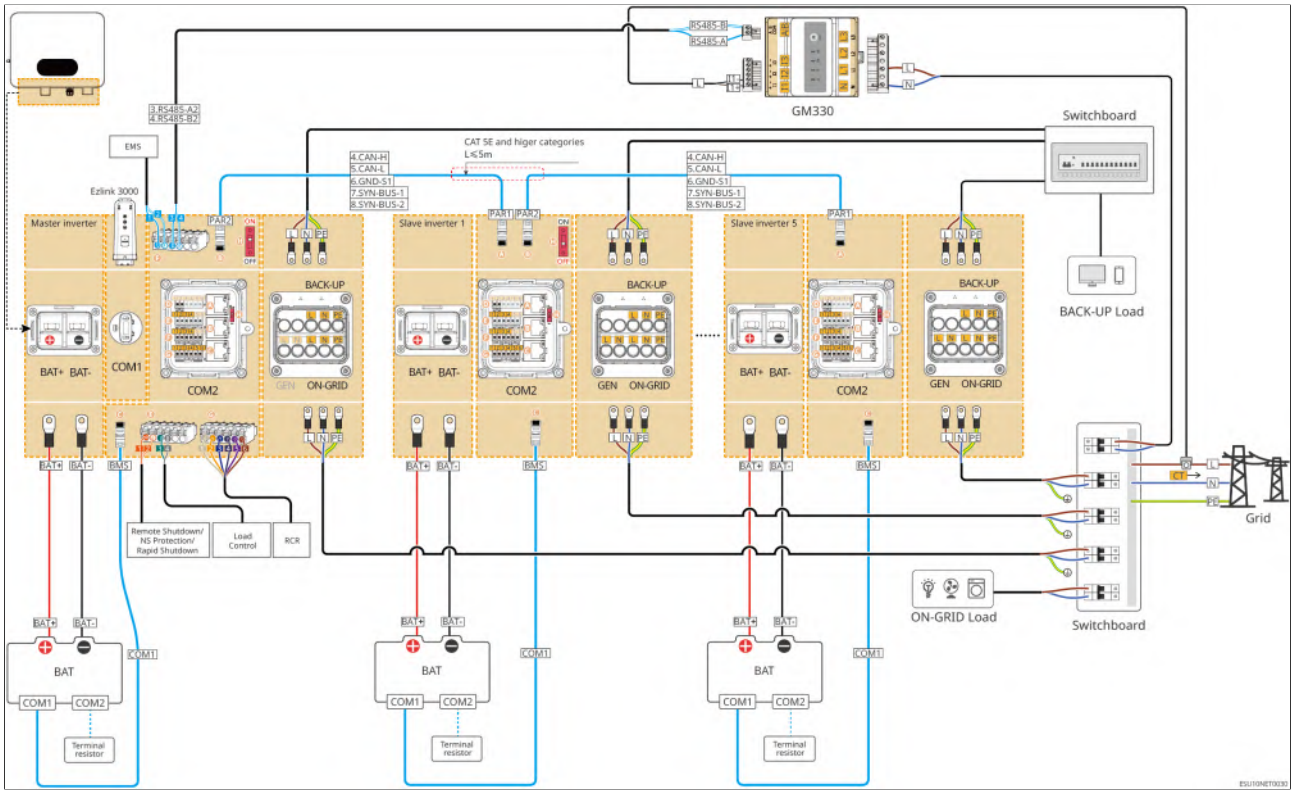


Figure18 With GM330 Scenario 2

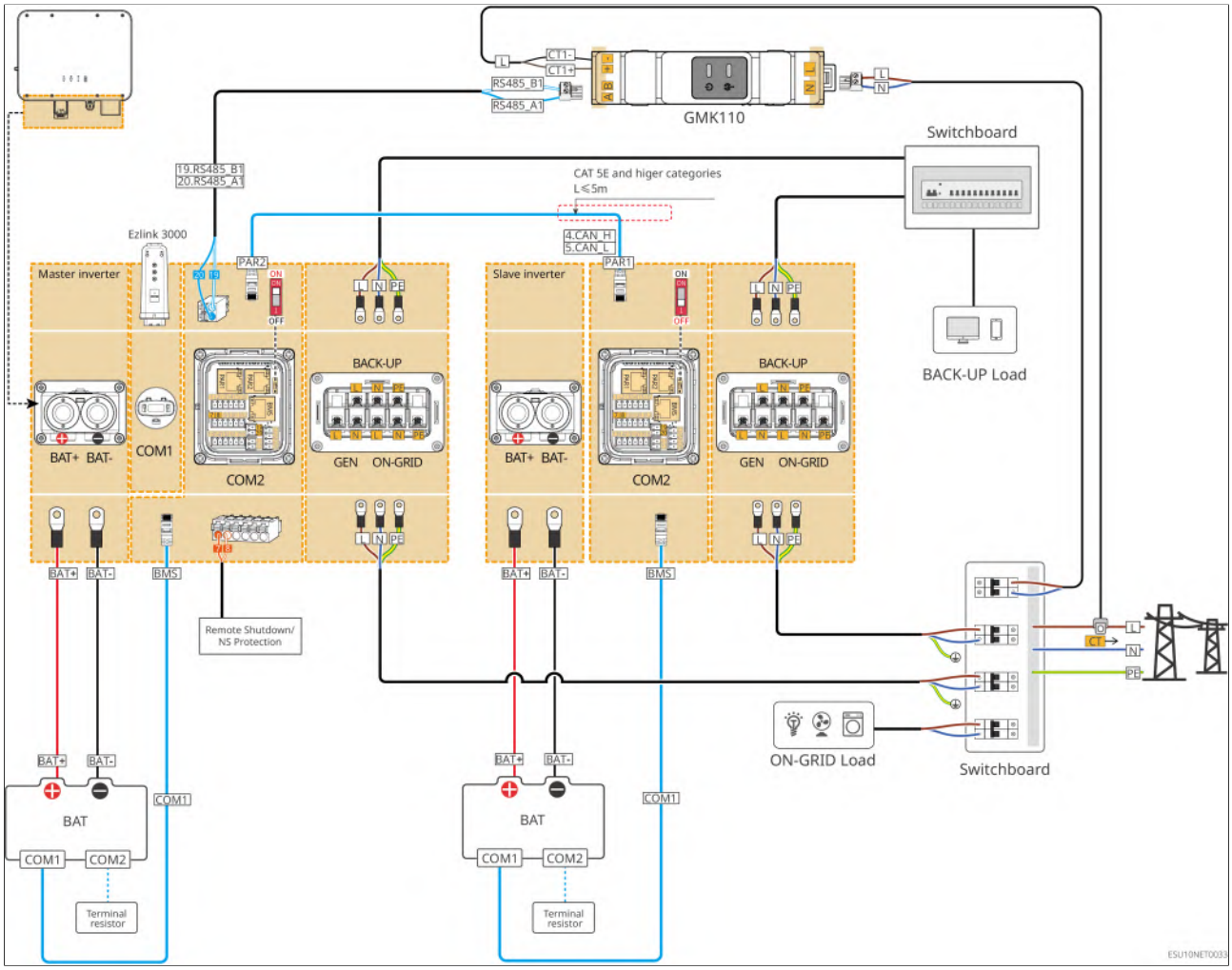


Figure19 Scenario 1 with GMK110

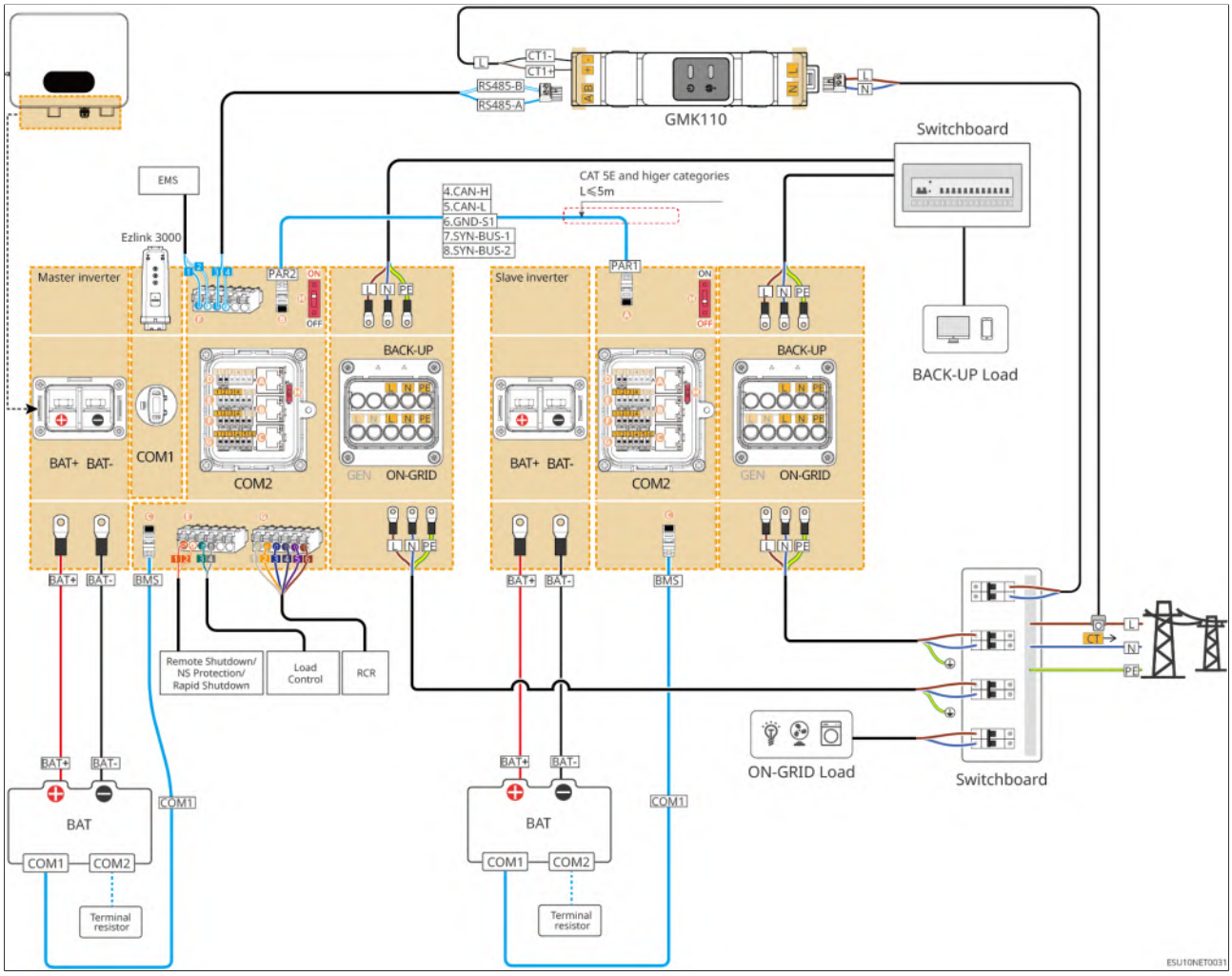


Figure20 Scenario 2 with GMK110

5.2.3 Detailed Wiring Diagram for Single-Phase Group Three-Phase System

NOTICE

- The ES UNIQ 8-12kW series inverters have different appearance types, all of which support single-phase group three-phase networking with the built-in meter and GMK110 meter, and all support scenarios where each phase is separately connected to single-phase loads or only three-phase loads are connected.
- The following scenario with the built-in meter and single-phase loads is only illustrated with one of the machine types; if you need to use GMK110 or connect three-phase loads, please refer to other wiring and networking diagrams.

Scenario with built-in meter

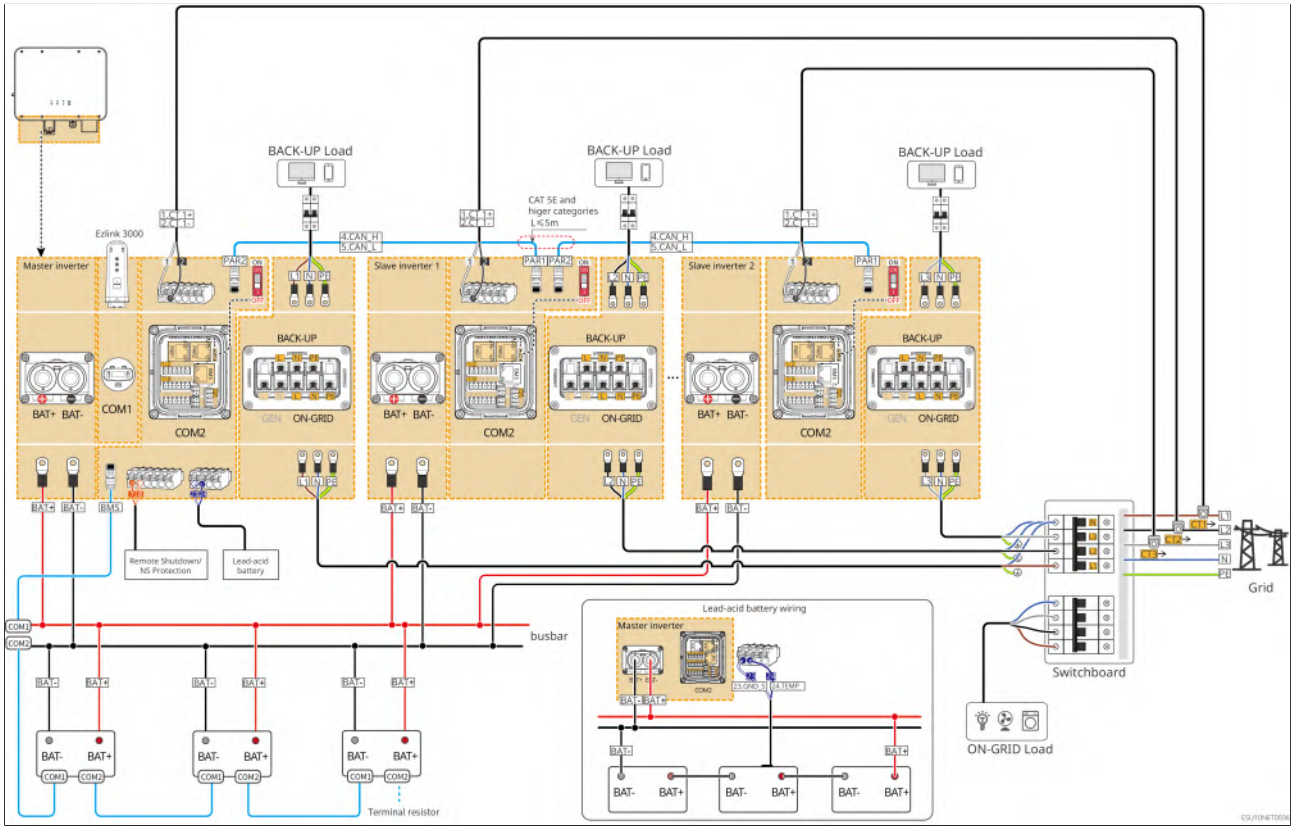


Figure21 Scenario where each phase is individually connected to single-phase loads

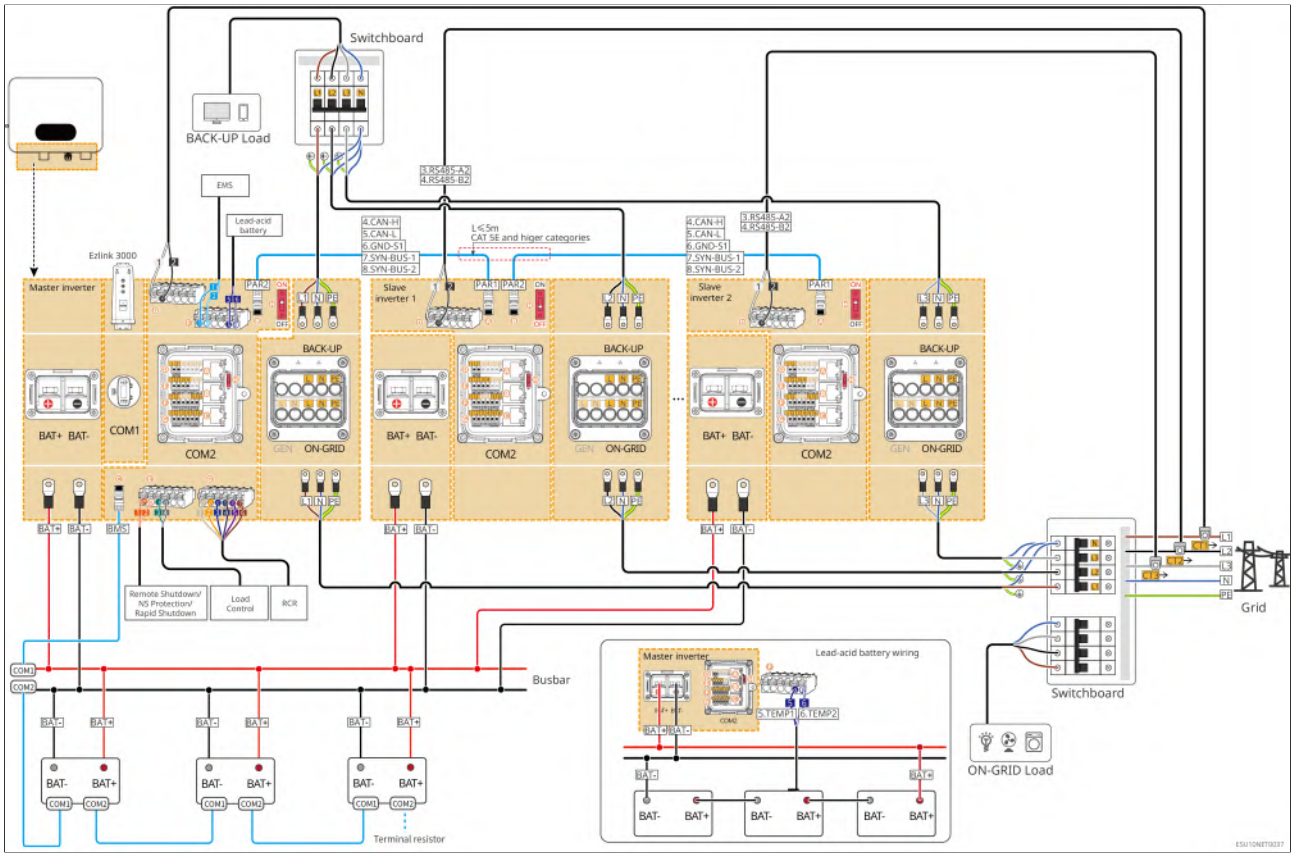


Figure22 Scenario with three-phase loads connected

Scenario with GMK110

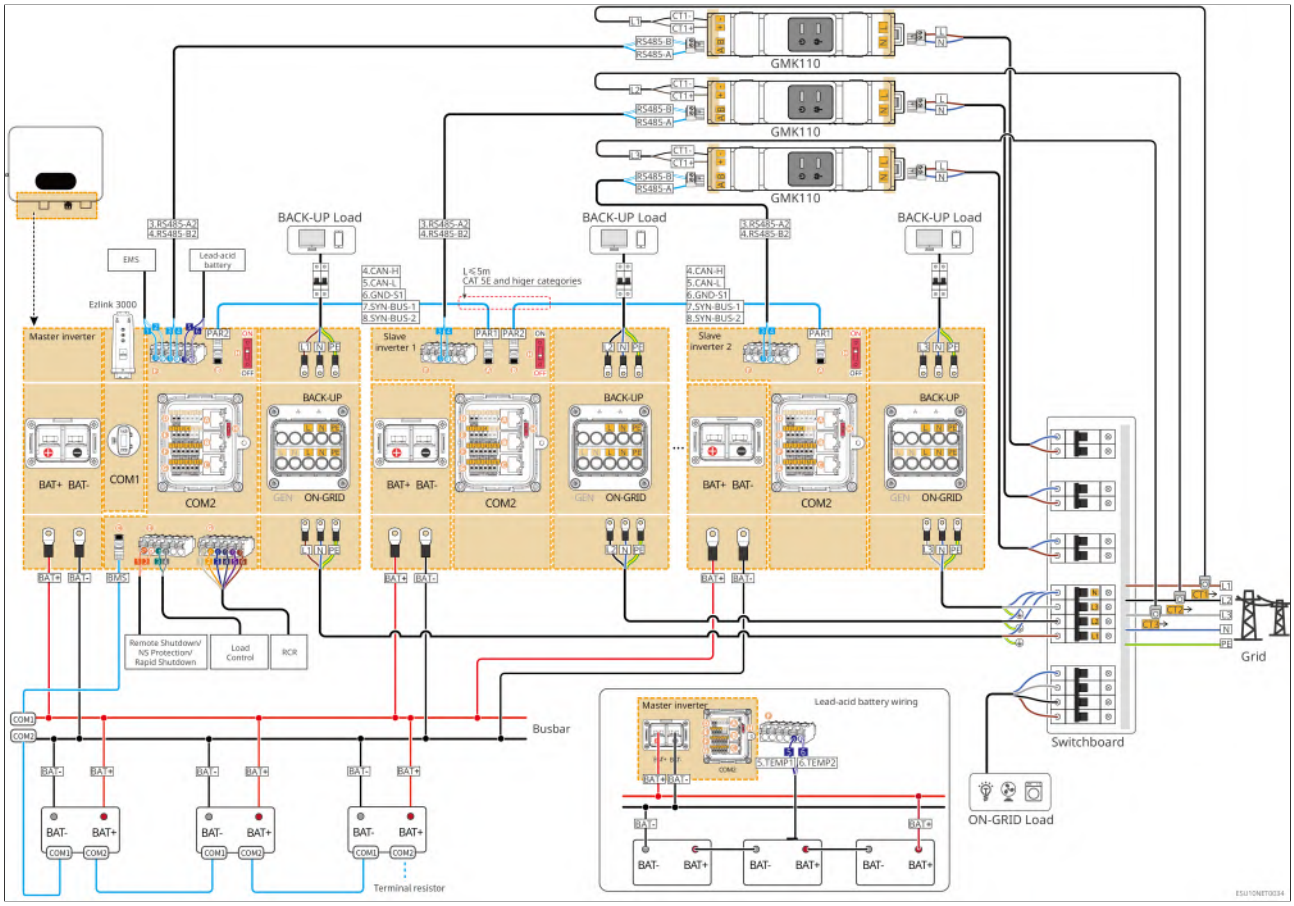


Figure23 Scenario where each phase is individually connected to single-phase loads

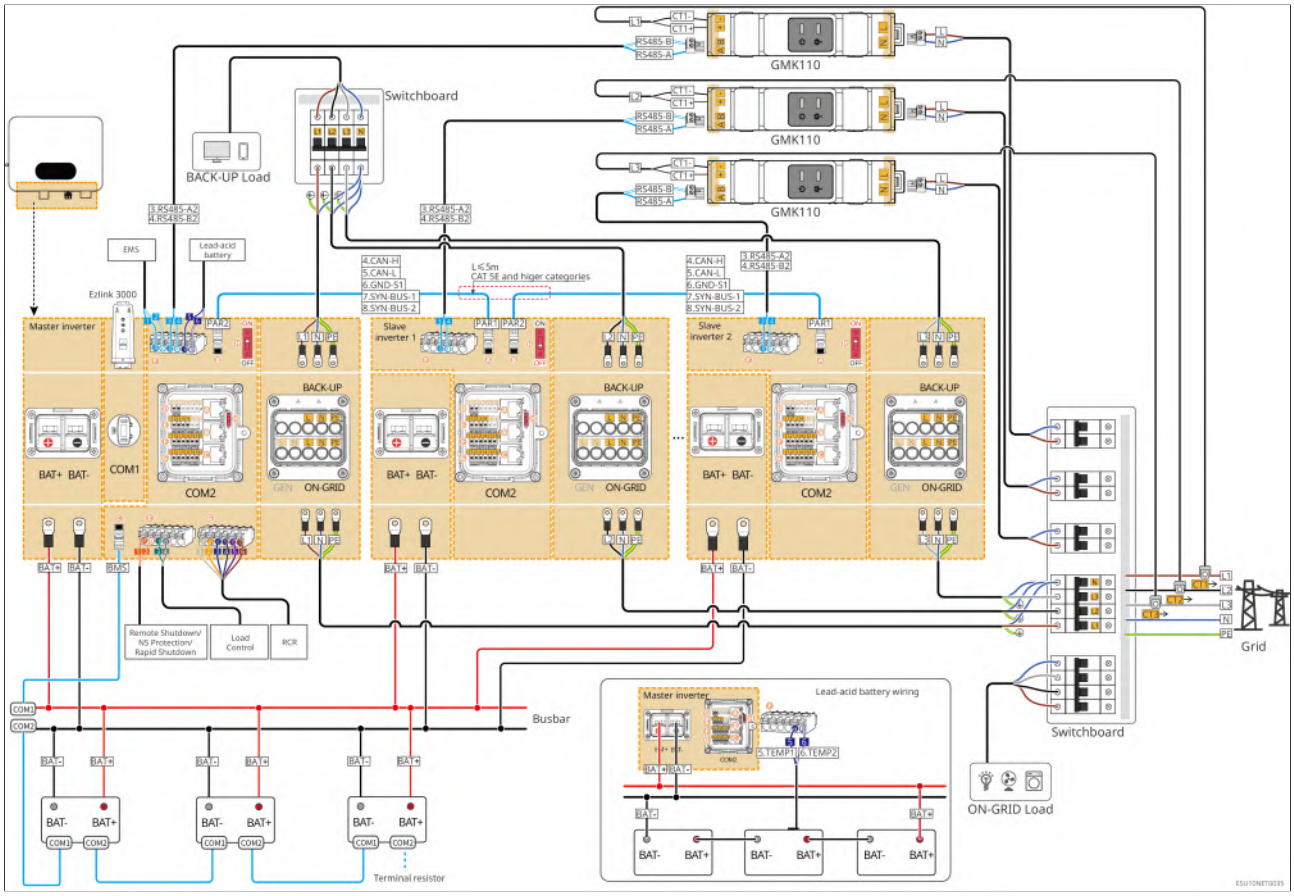


Figure24 Scenario with three-phase loads connected

5.3 Material Preparation

⚠WARNING

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

5.3.1 Switch Preparation

No.	Circuit Breaker	Recommended Specifications	Remarks
1	ON-GRID Circuit Breaker	Rated Current ≥ 90 A, Nominal Voltage ≥ 230 V	User-supplied

No.	Circuit Breaker	Recommended Specifications	Remarks
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	User-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	User-supplied
4	BACK-UP Load Circuit Breaker	Rated Current ≥ 90 A, Nominal Voltage ≥ 230 V	User-supplied
5	Leakage Current Protection Device	Optional according to local laws and regulations • Type A • ON-GRID side: 300mA • BACK-UP side: 30mA	User-supplied

5.3.2 Cable Preparation

No.	cable	Recommended Specifications	Acquisition Method
1	Inverter Protection Ground Wire	• Single-core outdoor copper cable • Conductor cross-sectional area: S=10mm²	User-supplied

No.	cable	Recommended Specifications	Acquisition Method
2	Battery Protection Ground Wire	• 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	• User-supplied • LX A5.0-30, LX A5.0-10: Accessory acquisition (optional) • GW14.3-BAT-LV-G10: For some units, grounding cable is shipped with battery accessories • GW16.1-BAT-LV-G10: Standard
3	PV DC cable	• Industry-standard outdoor PV cable • Conductor cross-sectional area: 4mm²-6mm² • Cable outer diameter: 5.9mm-8.8mm	User-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: 70mm² ◦ Cable outer diameter: 15.7mm-16.7mm • Cable requirements among inverter, battery, busbar, and Mix Parallel Unit: see5.6.Connecting Battery Cables(Page 144)chapter tables	• User-supplied • LX U5.0-30: Can be purchased from GoodWe • LX A5.0-30, LX A5.0-10: Accessory acquisition (optional) • GW14.3-BAT-LV-G10: For some units, battery DC cable is shipped with battery accessories • GW16.1-BAT-LV-G10： ◦ DC cable between inverter and battery: Standard ◦ DC cable between batteries: Can be purchased from GoodWe

No.	cable	Recommended Specifications	Acquisition Method
5	AC cable	• Inverter AC input/output cables (BACKUP/GRID): ◦ Conductor cross-sectional area: 16mm² or 4AWG ◦ Multi-core outdoor copper cable outer diameter: 23.6mm-24.8mm ◦ Single-core outdoor copper cable outer diameter: 9.5mm-9.9mm • Generator power cable (GEN): ◦ Conductor cross-sectional area: 10mm² or 6AWG ◦ Multi-core outdoor copper cable outer diameter: 20mm-21mm ◦ Single-core outdoor copper-core cable outer diameter: 8.3mm-8.7mm	User-supplied
6	Smart meter power cable	• Outdoor copper-core cable • Conductor cross-sectional area: 1mm²	User-supplied

No.	cable	Recommended Specifications	Acquisition Method
7	Battery communication cable	CAT 5E or higher standard shielded network cable and shielded RJ45 connector 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	• User-supplied • LX A5.0-10, LX A5.0-30: Accessories (optional) • GW14.3-BAT-LV-G10: ◦ Inverter-to-battery communication cable: standard on some models ◦ Battery-to-battery communication cable: user-supplied, cable length ≤2m • GW16.1-BAT-LV-G10: ◦ Inverter-to-battery communication cable: standard ◦ Battery-to-battery communication cable: user-supplied, cable length ≤1m • Mix Parallel Unit: Accessories (standard)
8	Meter RS485 communication cable	• Shielded twisted-pair cable • Conductor cross-sectional area: 0.2mm²-0.4mm²	User-supplied

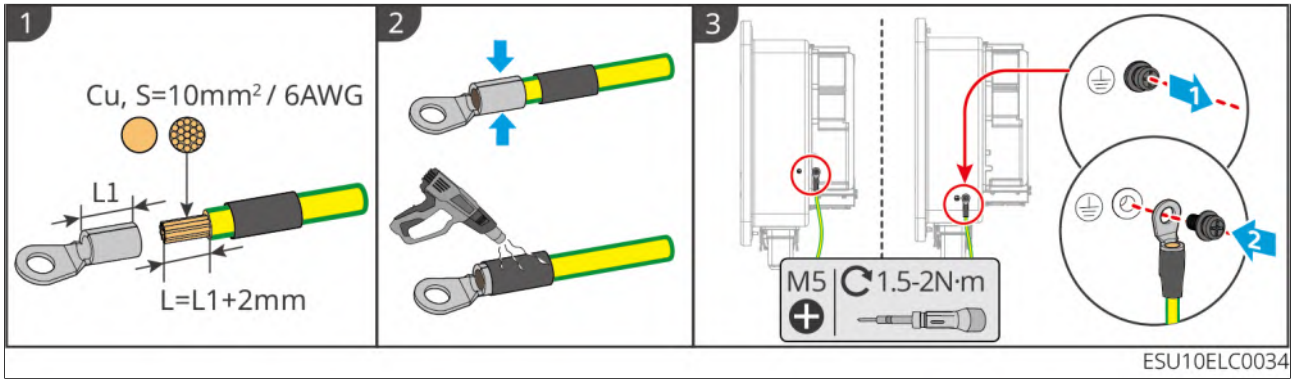
No.	cable	Recommended Specifications	Acquisition Method
9	Inverter parallel communication cable	CAT 5E or higher standard shielded network cable and shielded RJ45 connector	User-supplied
10	Remote Shutdown / Rapid Shutdown communication / NS Protection communication cable	• Copper-core twisted-pair cable • Conductor cross-sectional area: 0.2mm²-0.4mm²	User-supplied
11	EMS communication cable/ Charging pile communication cable	CAT 5E or higher standard shielded network cable and shielded RJ45 connector	User-supplied

5.4 Connect Protection Earth Wire

WARNING

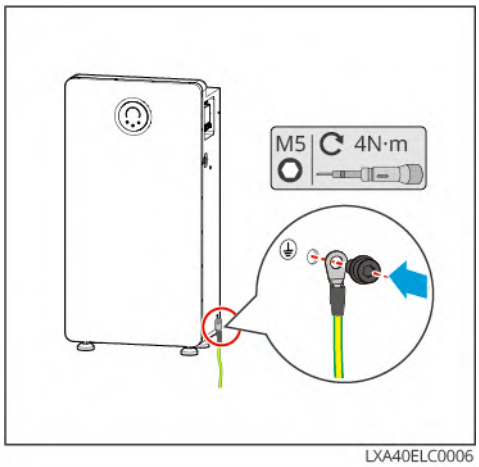
- The Protection grounding of the chassis enclosure cannot replace the Protection earth wire of the AC output port. When wiring, ensure that the Protection earth wires at both locations are reliably connected.
- For multiple devices, ensure that the Protection grounding points on all equipment chassis enclosures are connected at equal potential.
- To improve the corrosion resistance of the terminal, it is recommended to apply silicone or paint on the outside of the grounding terminal for protection after the Protection ground wire connection is installed.
- When installing equipment, the Protection ground wire must be installed first; when removing equipment, the Protection ground wire must be removed last.

Inverter



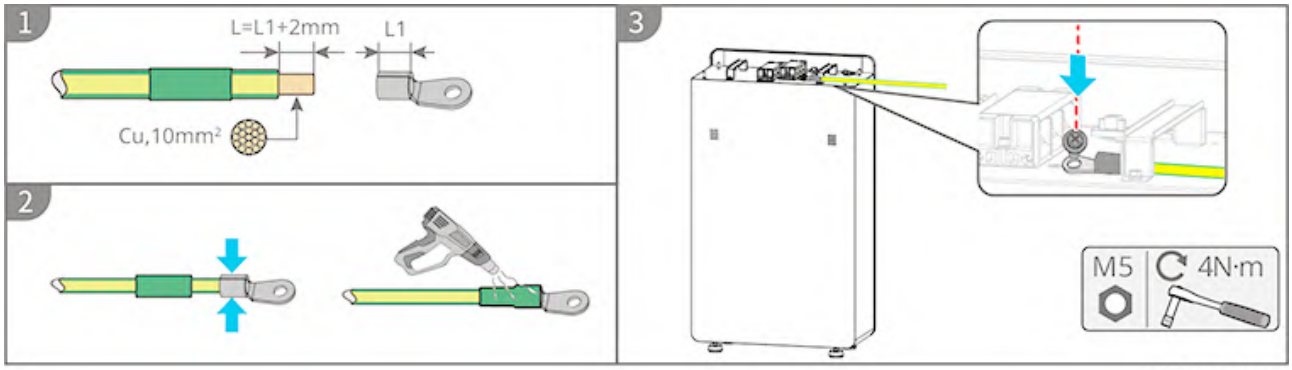
Battery

GW16.1-BAT-LV-G10



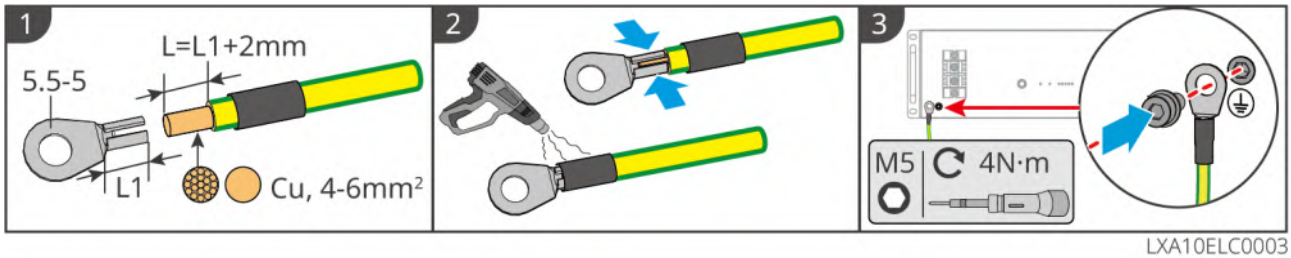
GW14.3-BAT-LV-G10

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



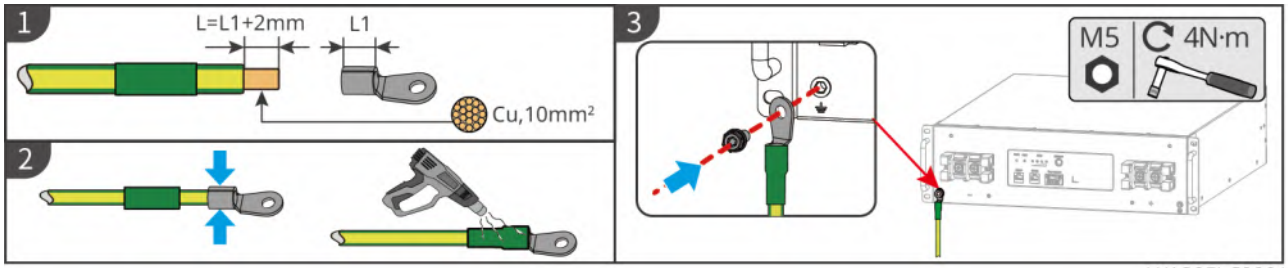
LXA10ELC0014

LX A5.0-10



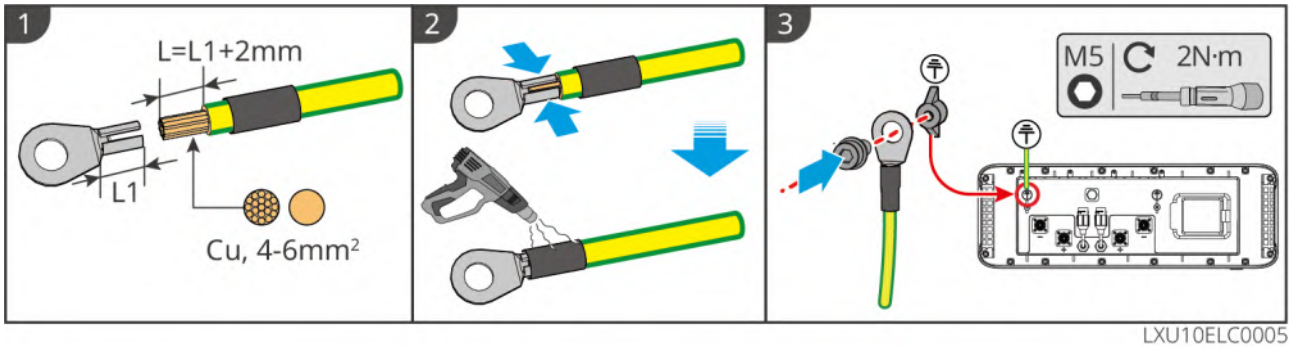
LXA10ELC0003

LX A5.0-30



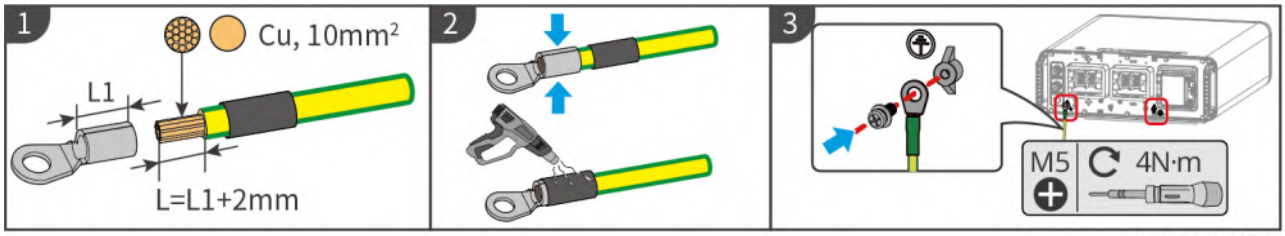
LXA30ELC0001

LX U5.4-L、LX U5.4-20



LXU10ELC0005

LX U5.0-30



LXU30ELC0001

5.5 Connect the PV Cables.

DANGER

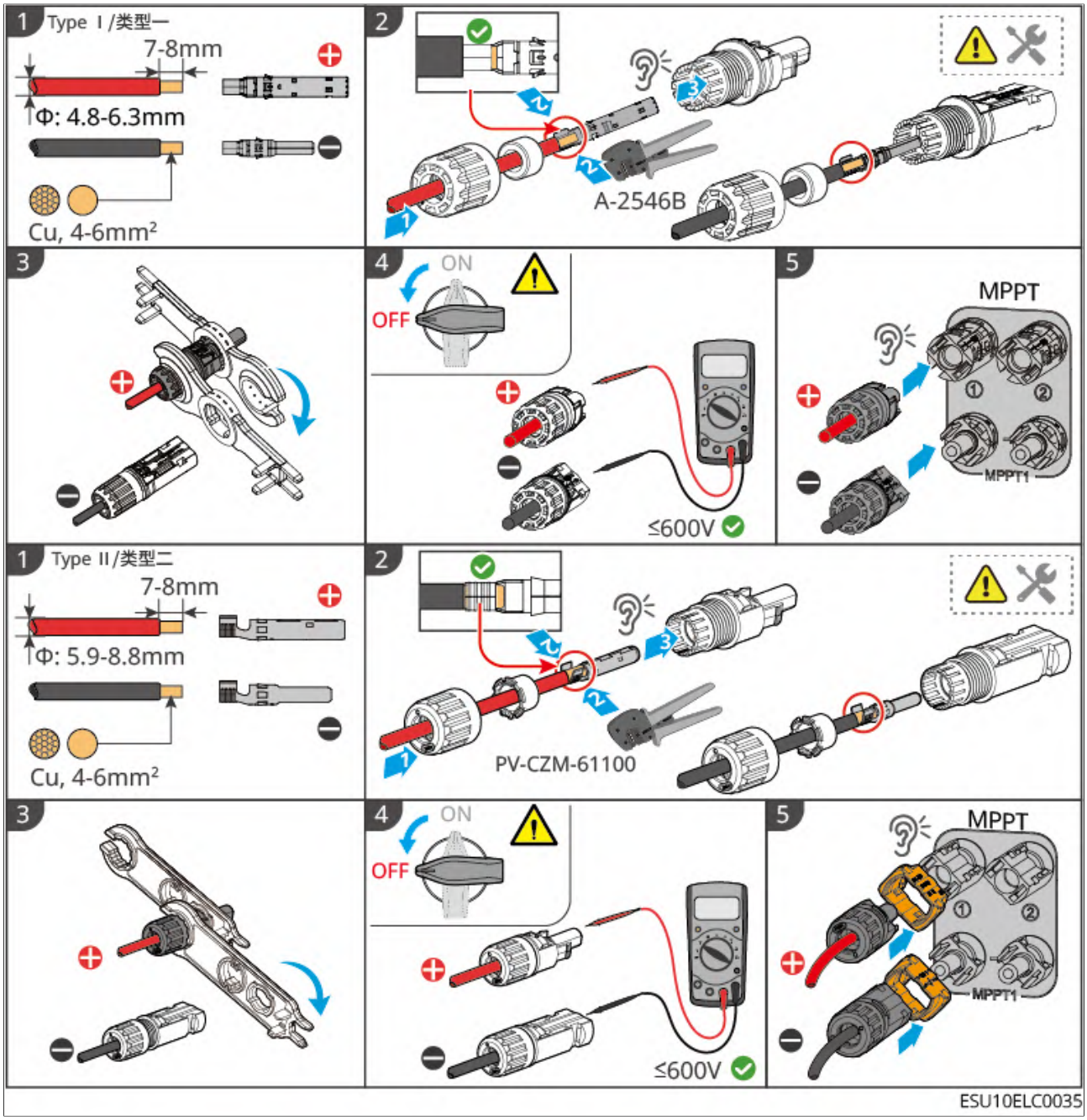
- Do not connect the same PV string to multiple inverters; otherwise, it may cause damage to the inverter.
- Before connecting PV strings to the inverter, confirm the following information. Otherwise, the inverter may be permanently damaged, and in severe cases, fire may occur causing personal injury and property loss.
  1. Please ensure that the Max. MPPT Short Circuit Current and Max. Input Voltage of each MPPT are within the allowable range of the inverter.
  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

- PV string output does not support grounding. Before connecting the PV string to the inverter, ensure that the minimum insulation resistance of the PV string to ground meets the minimum insulation impedance requirement (R = Max. Input Voltage / 30 mA).
- After completing the DC cable connections, 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 there is no reverse connection; and that the voltage is within the allowable range.

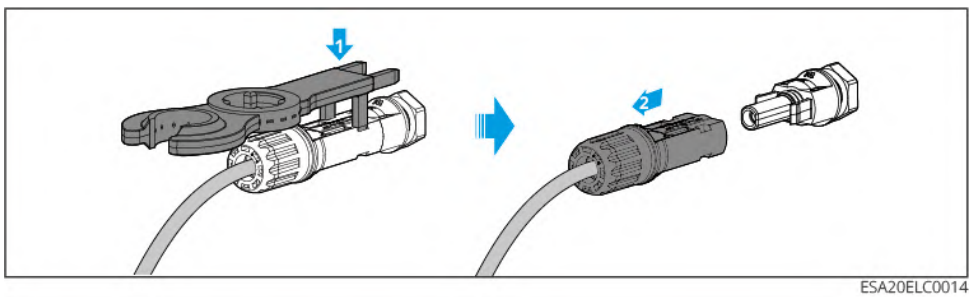
NOTICE

- The two PV strings in each MPPT must use the same module type, the same number of modules, the same tilt angle, and the same azimuth angle to ensure maximum Efficiency.
- PV voltage operation and power limiting strategy:
  1. Recommended range: When the battery is connected, it is recommended that the PV voltage be <490 V, so that the 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 is ≥560 V, the inverter enters standby; when the voltage drops below 560 V, operation can resume, but the power is still limited by Rule 2.

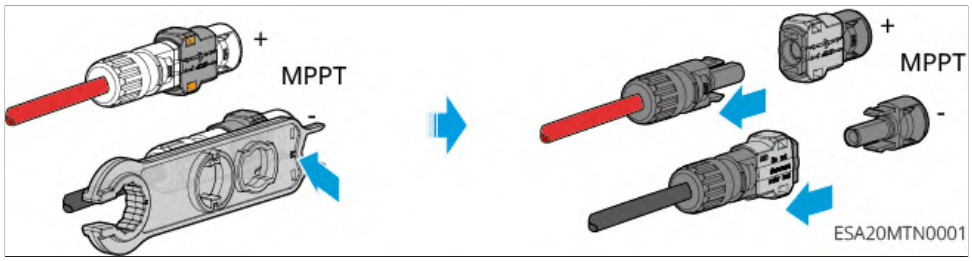


If you need to disassemble the PV terminal, refer to the following steps:

Type 1:



Type 2:



5.6 Connecting Battery Cables

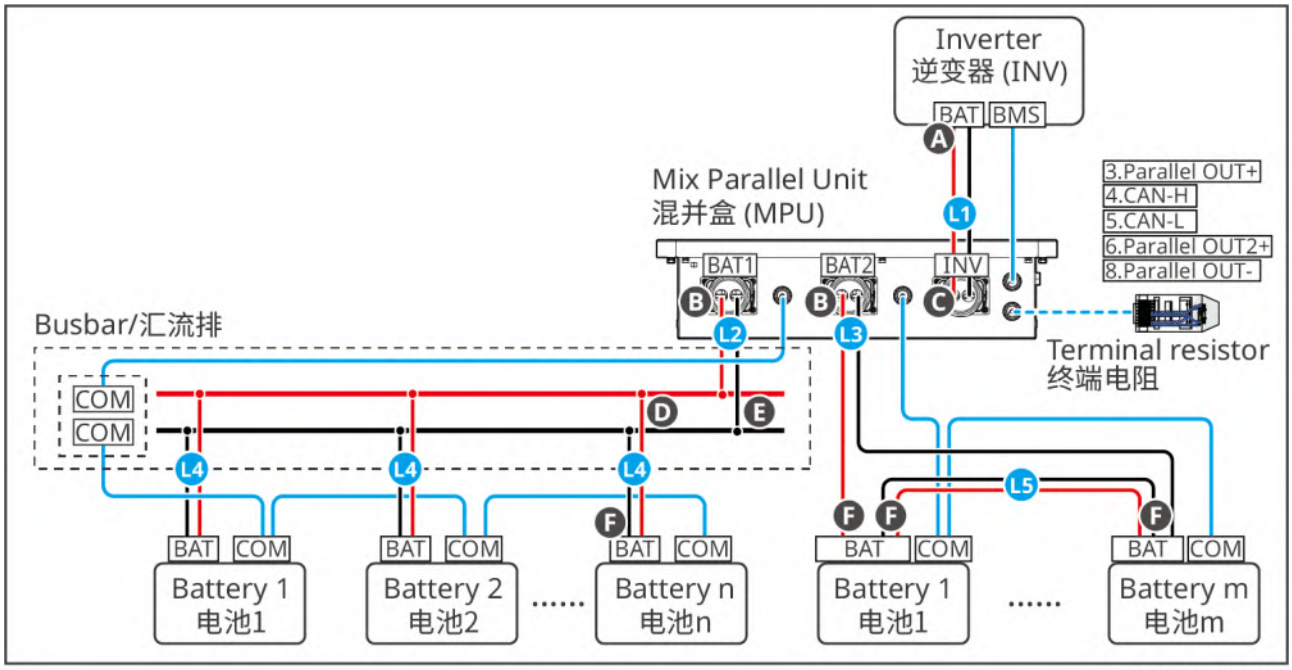
⚠DANGER

- In a single-unit system, do not connect the same Battery BANK to multiple inverters; otherwise, the inverters may be damaged.
- Do not connect loads between the inverter and the battery.
- When connecting battery cables, use insulated tools to prevent accidental electric shock or Battery Short Circuit.
- Ensure that the battery open-circuit voltage is within the allowable range of the inverter.
- According to local laws and regulations, choose whether to configure a DC Switch between the inverter and the battery.

NOTE

- When using a battery Mix Parallel Unit, 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 mixed.
- The BAT2 port of the Mix Parallel Unit supports the same battery wiring method as BAT1.

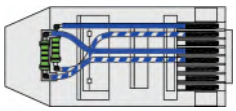
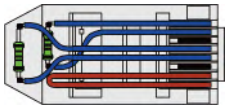
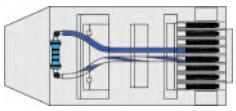
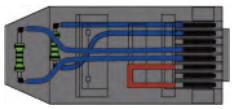
For the recommended cables among the inverter, battery, busbar, and Mix Parallel Unit, please refer to the following table:



L1: Inverter to Mix Parallel Unit power cable	L2: Mix Parallel Unit to busbar power cable	L4: Busbar to battery power cable	L5: Battery-to-battery power cable	L3: Mix Parallel Unit to battery power cable	Inverter to busbar power cable	Inverter-to-battery direct connection power cable*1
70mm²	70mm²	LX A5.0-10、LX U5.0-30：25mm² LX A5.0-30：50mm² GW14.3-BAT-LV-G10：70mm² GW16.1-BAT-LV-G10：50mm²	LX A5.0-10：25mm² LX A5.0-30、LX U5.0-30：50mm² GW14.3-BAT-LV-G10：70mm² GW16.1-BAT-LV-G10：50mm²	LX A5.0-10：25mm² LX A5.0-30：35mm² GW14.3-BAT-LV-G10：70mm² GW16.1-BAT-LV-G10：50mm² LX U5.0-30：N/A	70mm²	70mm²

L1: Inverter to Mix Parallel Unit power cable	L2: Mix Parallel Unit to busbar power cable	L4: Busbar to battery power cable	L5: Battery-to-battery power cable	L3: Mix Parallel Unit to battery power cable	Inverter to busbar power cable	Inverter-to-battery direct connection power cable*1
*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, and the maximum continuous charge/discharge current of the port is the maximum charge/discharge current of the battery.						

Terminating resistor usage description:

Terminating resistor outline	Battery Type	PIN descriptions
	LX U5.4-20、LX A5.0-10	Short a 120Ω resistor across PIN1/2 and PIN4/5 respectively.
	LX U5.0-30, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10 (GW busbar box)	Short a 120Ω resistor across PIN1/2 and PIN4/5 respectively, and short the 7/8 wire harness.
	LX U5.4-L	Short a 120Ω resistor across PIN4/5.
	LX U5.0-30, LX A5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10 (third-party busbar)	Short a 120Ω resistor across PIN1/2 and PIN4/5 respectively, and short the 6/8 wire harness.

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
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 Definition

PIN	COM1	COM2	Description
1	-	-	Reserved
2	-	-	
3	Parallel OUT+	Parallel OUT+	Parallel Communication Port
4	CAN_1H	CAN_1H	

PIN	COM1	COM2	Description
5	CAN_1L	CAN_1L	Connect to Inverter Communication or Battery Parallel Cluster Communication Port
6	-	-	Reserved
7	-	-	
8	Parallel OUT-	Parallel OUT-	Parallel Communication Port

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

PIN	COM1	COM2	Description
1	RS485A	RS485A	RS485 Communication
2	RS485B-	RS485B-	
3	CAN_H	CAN_H	Parallel Communication Port
4	CAN_L	CAN_L	Connect 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 Definition

PIN	COM1	COM2	Description
1	RS485A	RS485A	Reserved
2	RS485B-	RS485B-	
3	Parallel OUT+	Parallel OUT+	Parallel Communication Port
4	CAN_H	CAN_H	Connect 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

The Battery Qty connected to the system via the Mix Parallel Unit varies depending

on the model of busbar, battery, or inverter.
The corresponding maximum battery connection quantity is shown in the table below:

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 the battery parallel cluster quantity needs to be expanded, other supported busbars can be connected *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
	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

Description of Battery Parallel Cluster Quantity in the System			
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

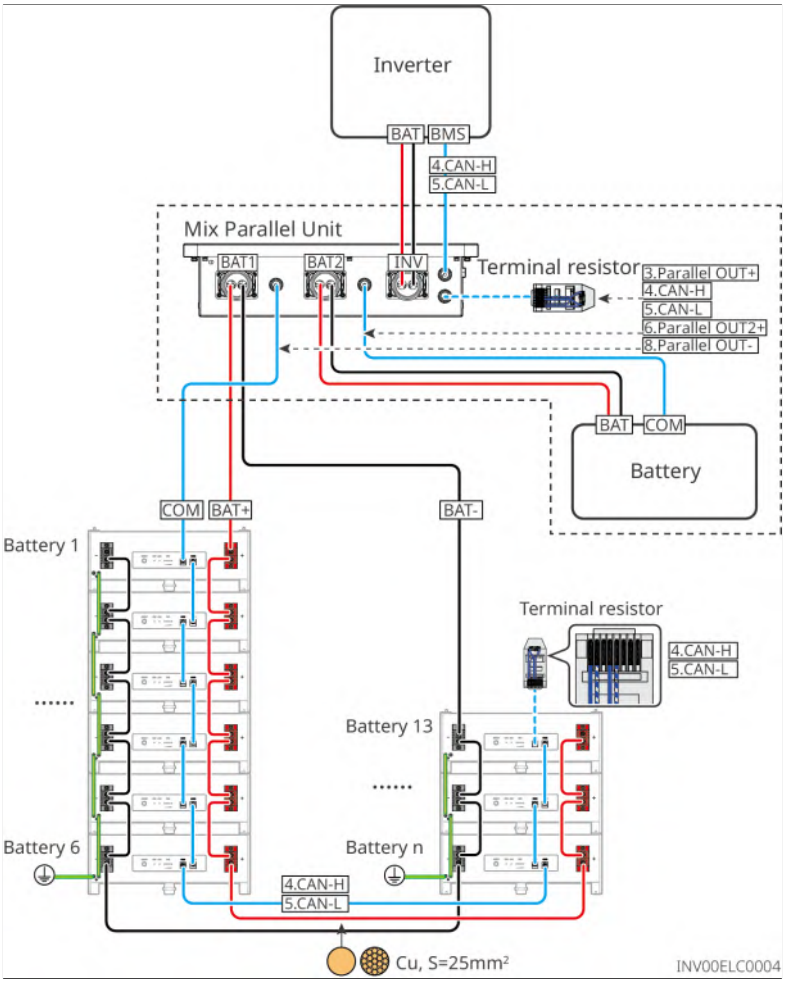


Figure25 LX A5.0-10: Battery Daisy-Chain Connection Method

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

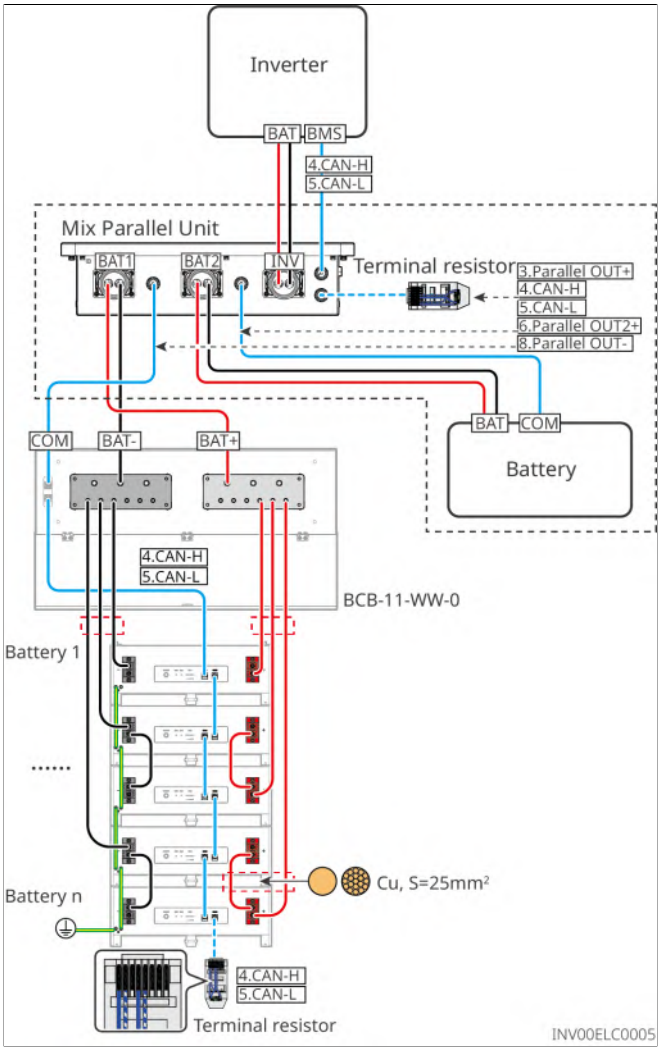


Figure26 LX A5.0-10: Battery Connection Method with Combiner Box BCB-11-WW-0

LX A5.0-10: Battery connection method using 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

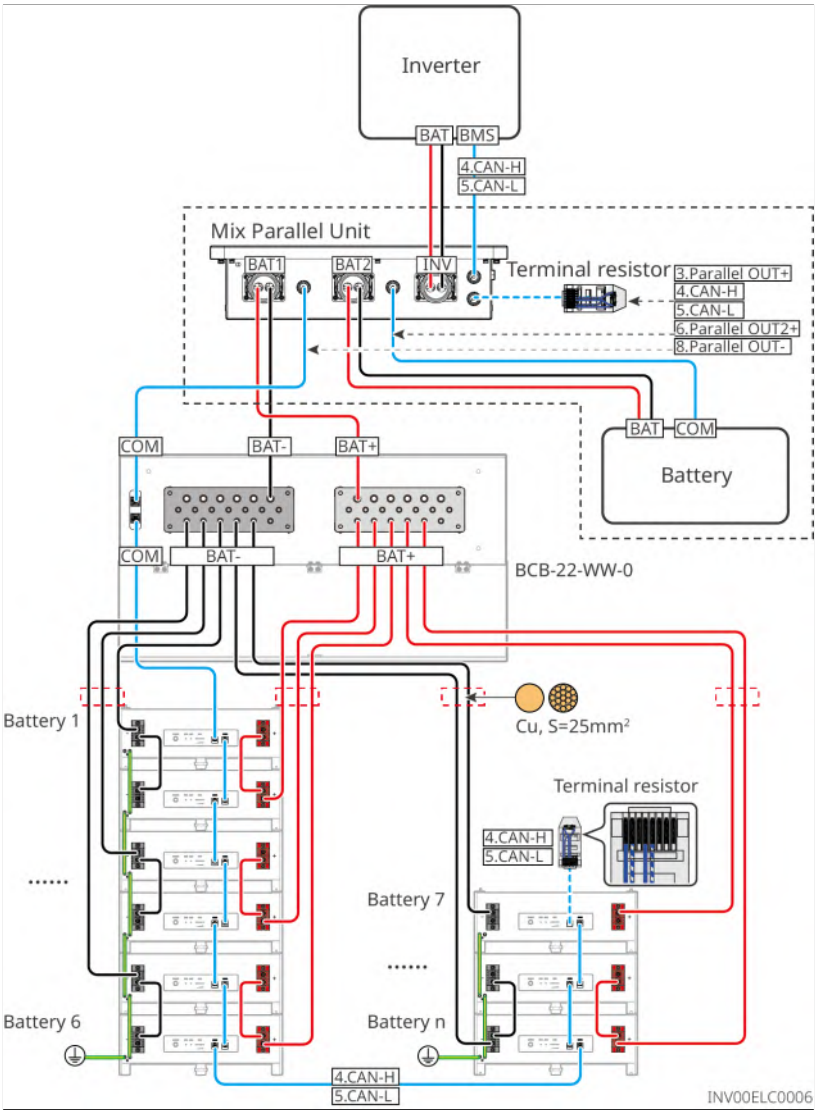


Figure27 LX A5.0-10: Battery connection method using combiner box BCB-22-WW-0

LX A5.0-10: Battery connection method using 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

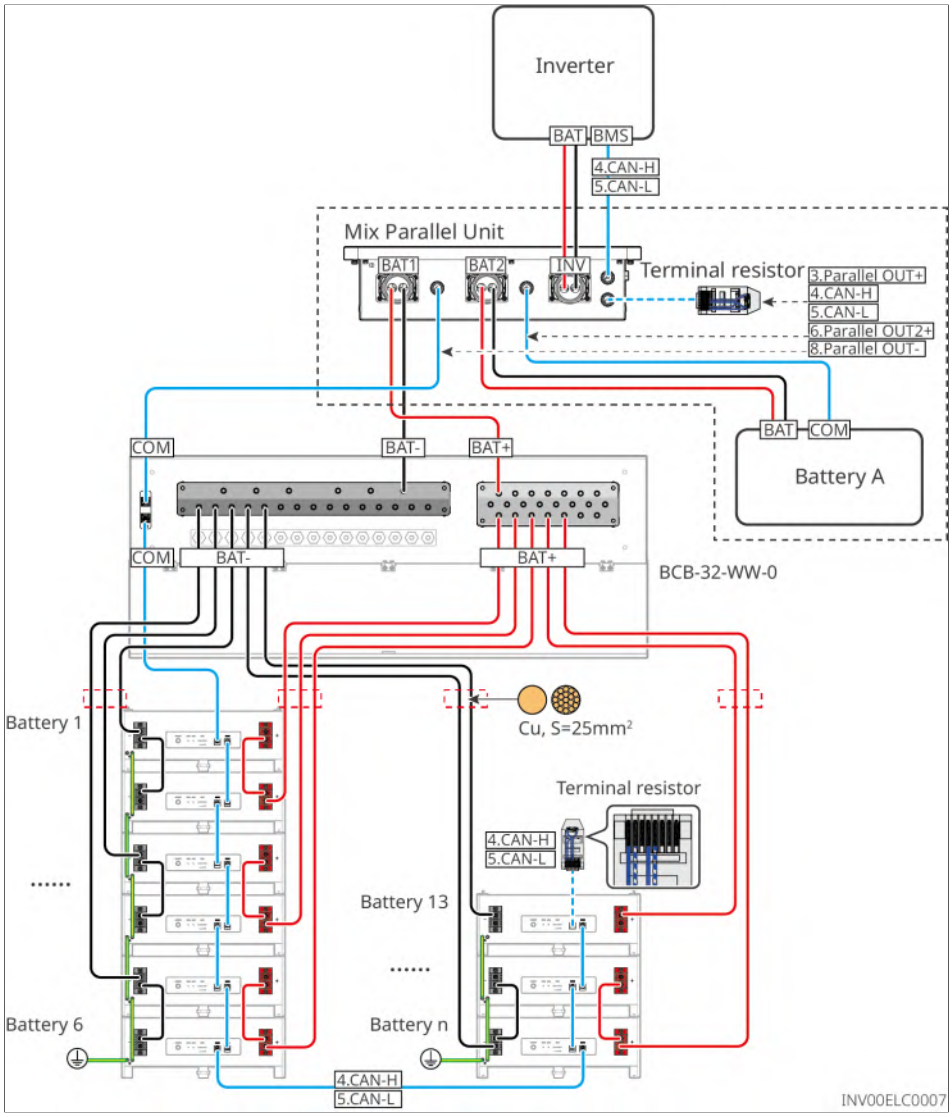


Figure28 LX A5.0-10: Battery connection method using combiner box BCB-32-WW-0

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

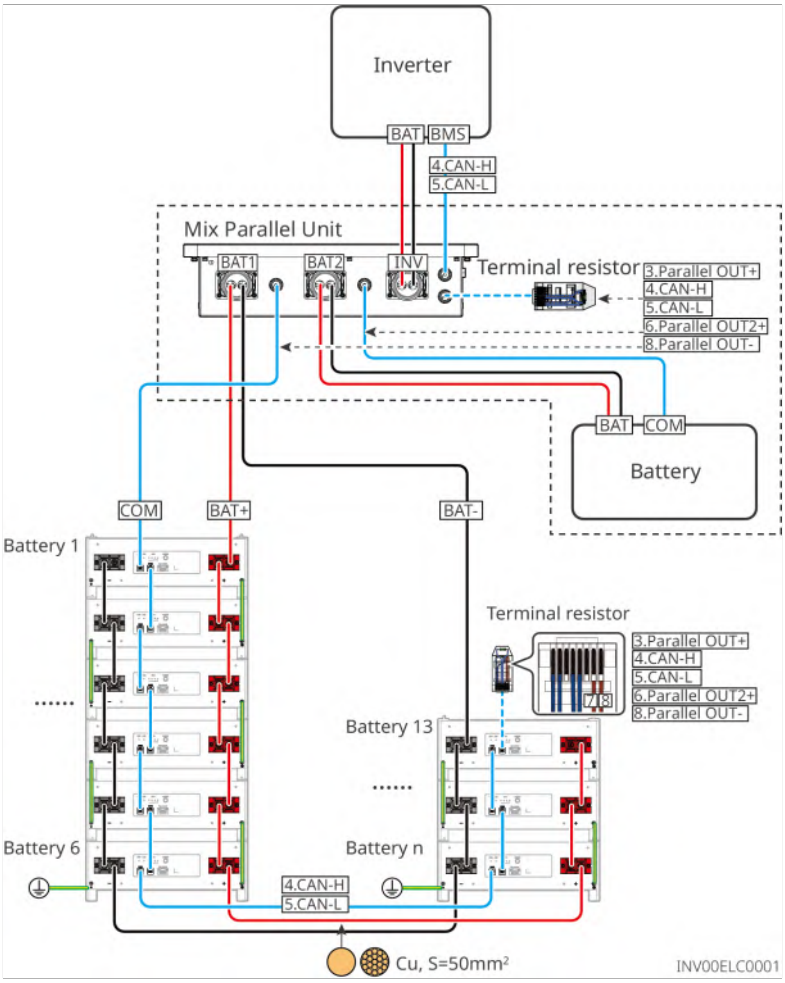


Figure29 LX A5.0-30: Daisy-chain connection method

LX A5.0-30: Connection method using 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

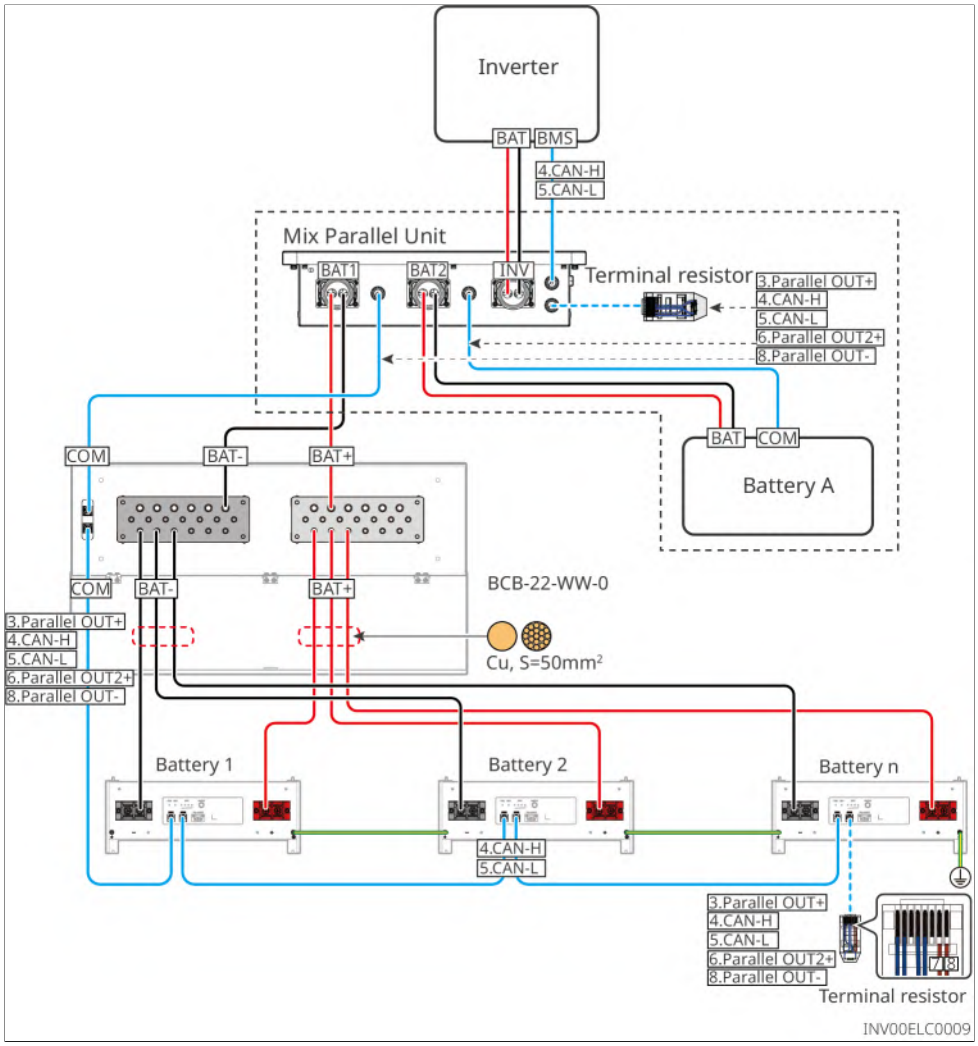


Figure30 LX A5.0-30: Connection method using combiner box BCB-22-WW-0

LX A5.0-30: Connection method using 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

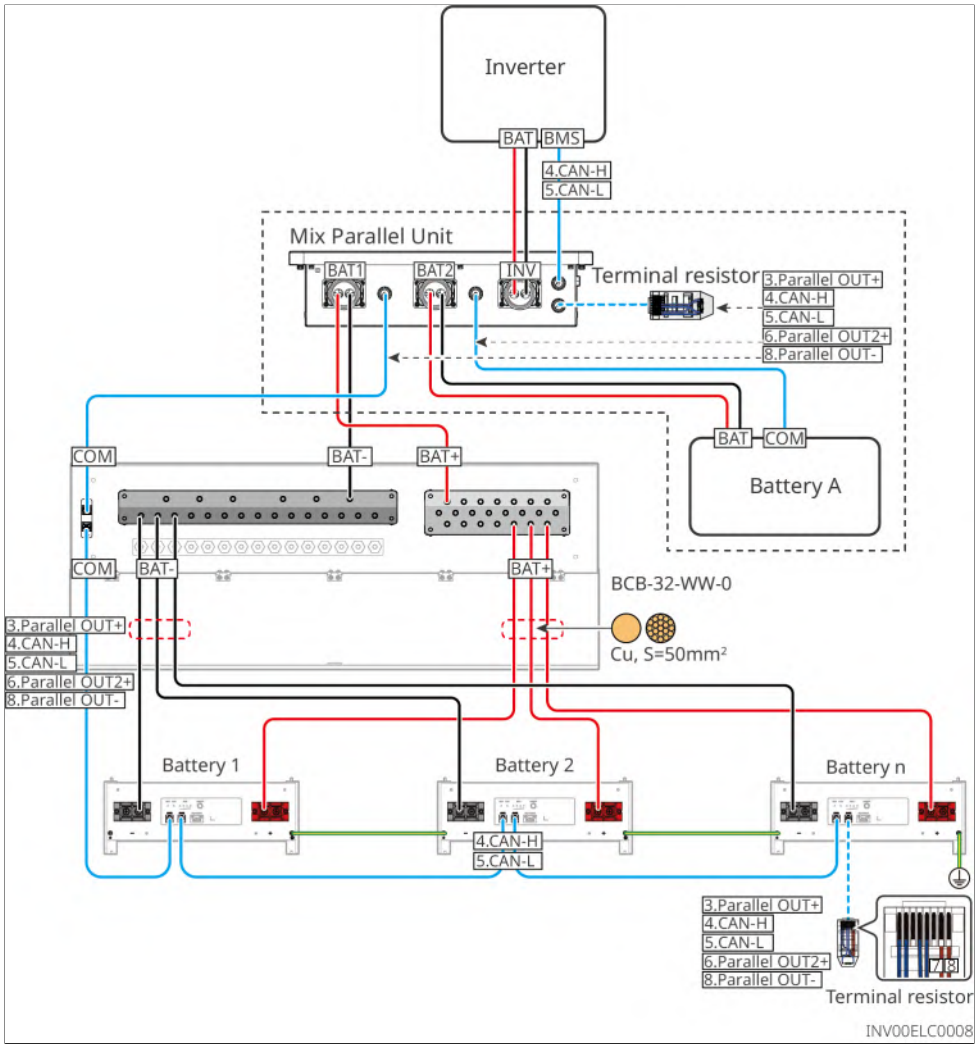


Figure31 LX A5.0-30: Connection method using combiner box BCB-32-WW-0

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

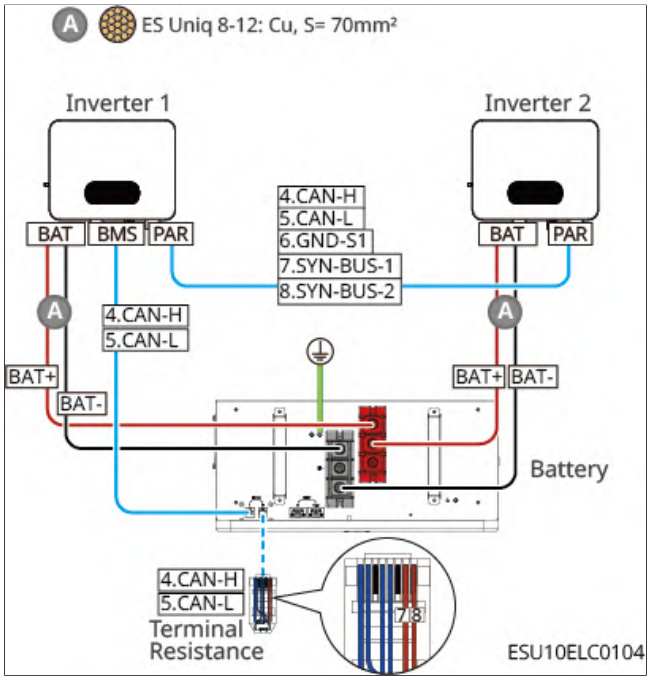


Figure32 GW14.3-BAT-LV-G10: Battery directly connected to two single-output inverters

GW14.3-BAT-LV-G10: When the battery is daisy-chain connected 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

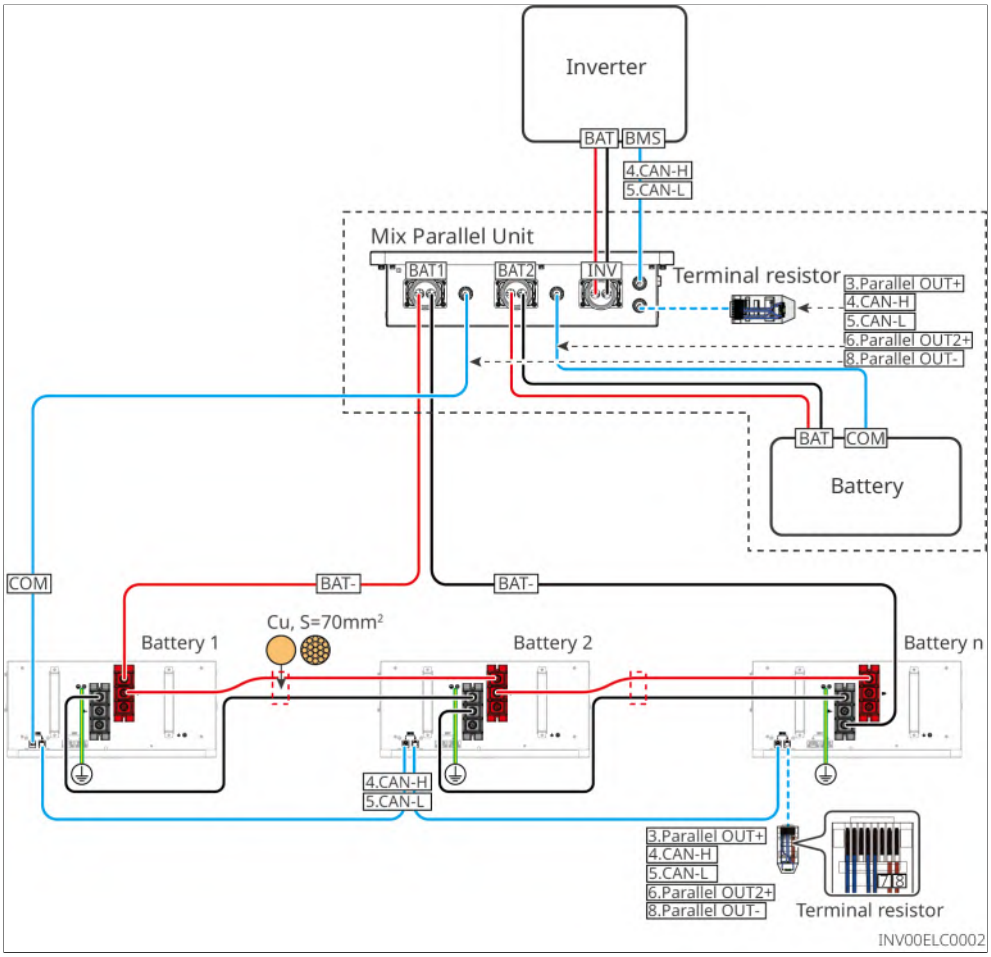


Figure33 GW14.3-BAT-LV-G10: Battery daisy-chain connected to a single-output inverter

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

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

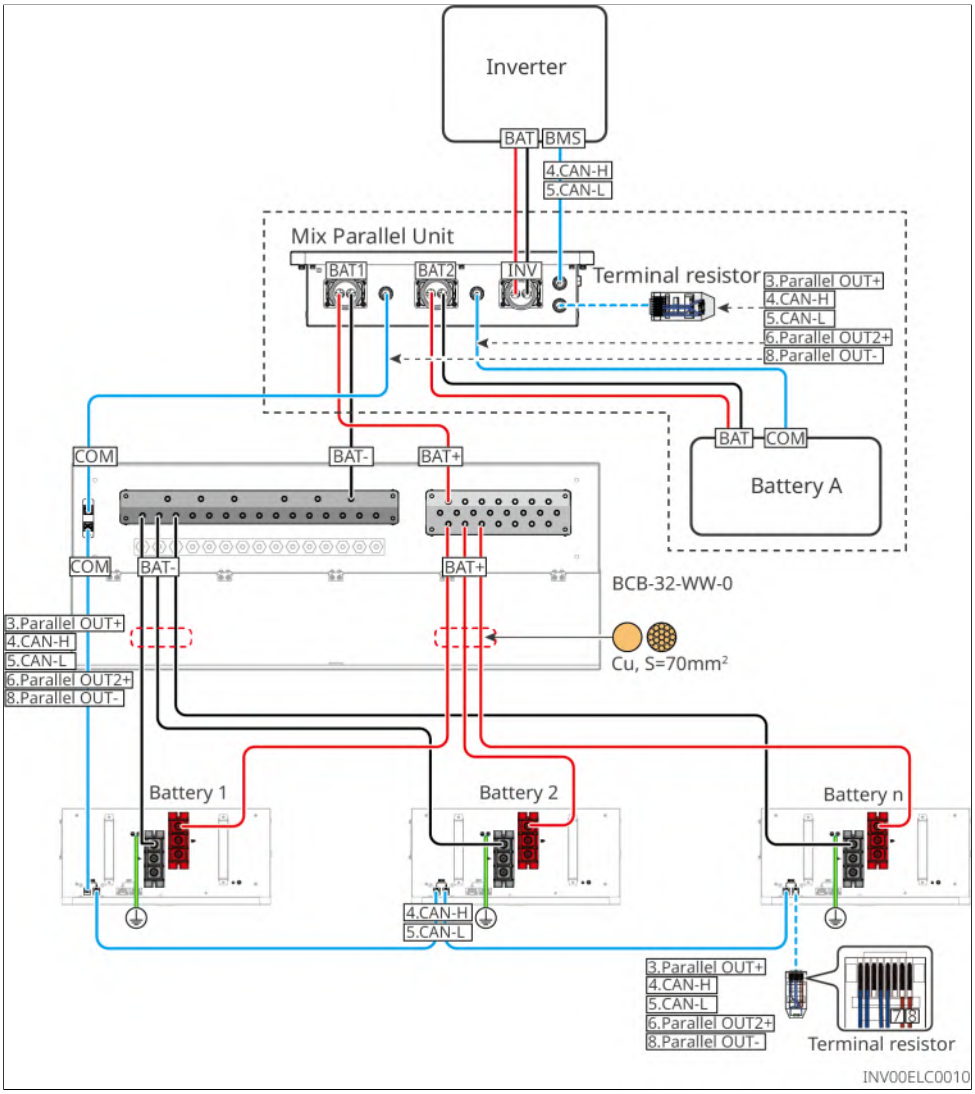


Figure34 GW14.3-BAT-LV-G10: With combiner box (BCB-32-WW-0)

GW16.1-BAT-LV-G10: Battery daisy-chain connection to the inverter:

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

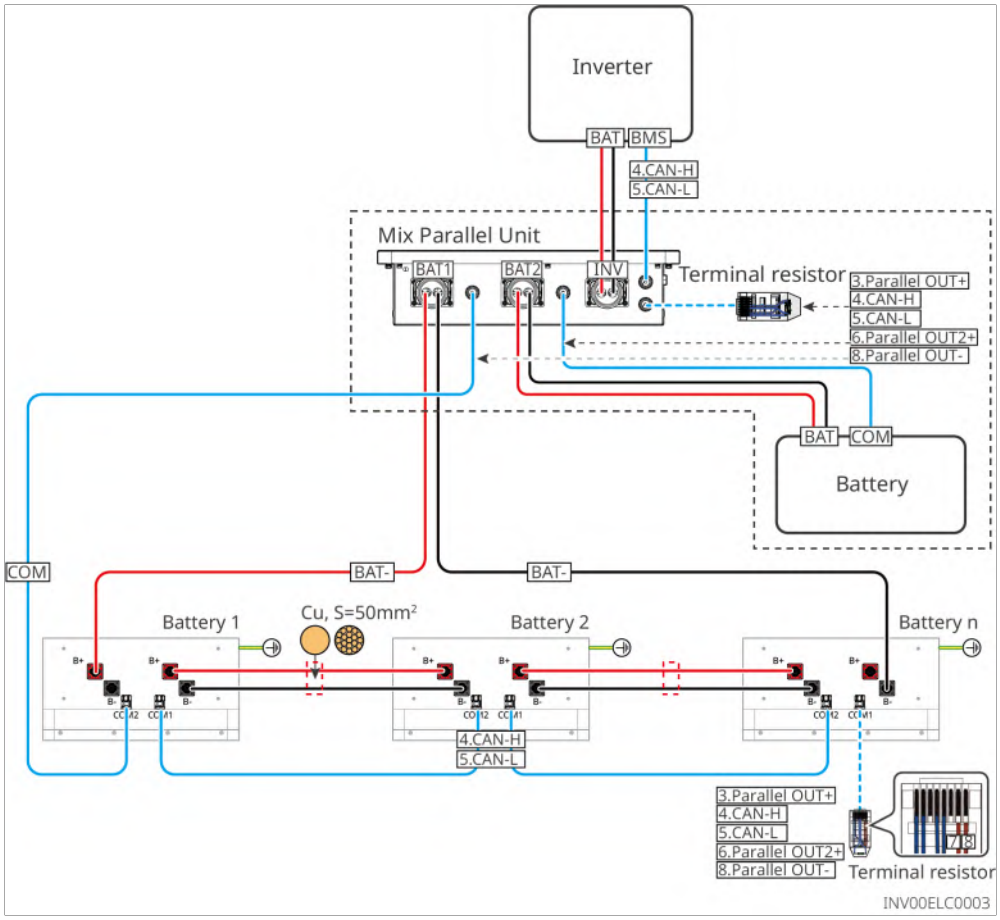


Figure35 GW16.1-BAT-LV-G10: Battery daisy-chain connection to the inverter

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

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

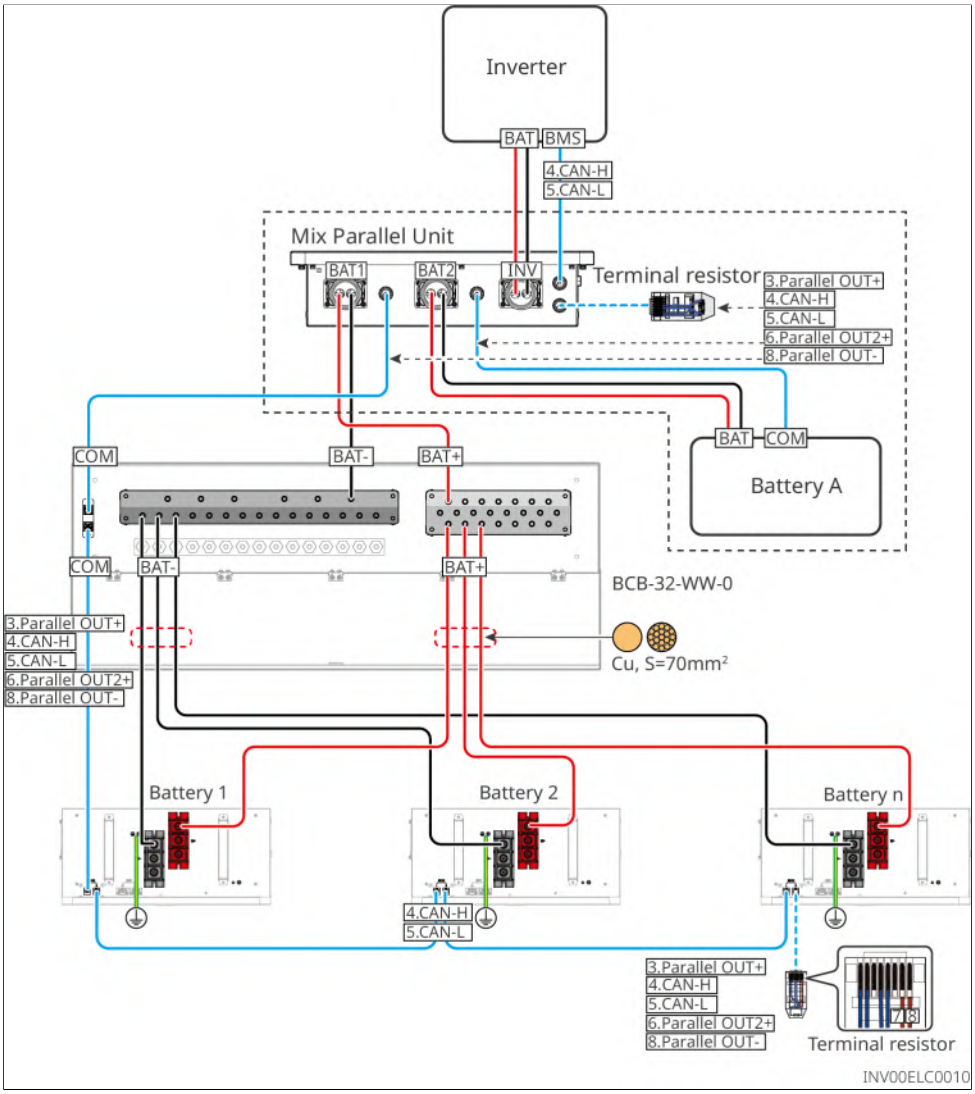


Figure36 GW16.1-BAT-LV-G10: With combiner box (BCB-32-WW-0)

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

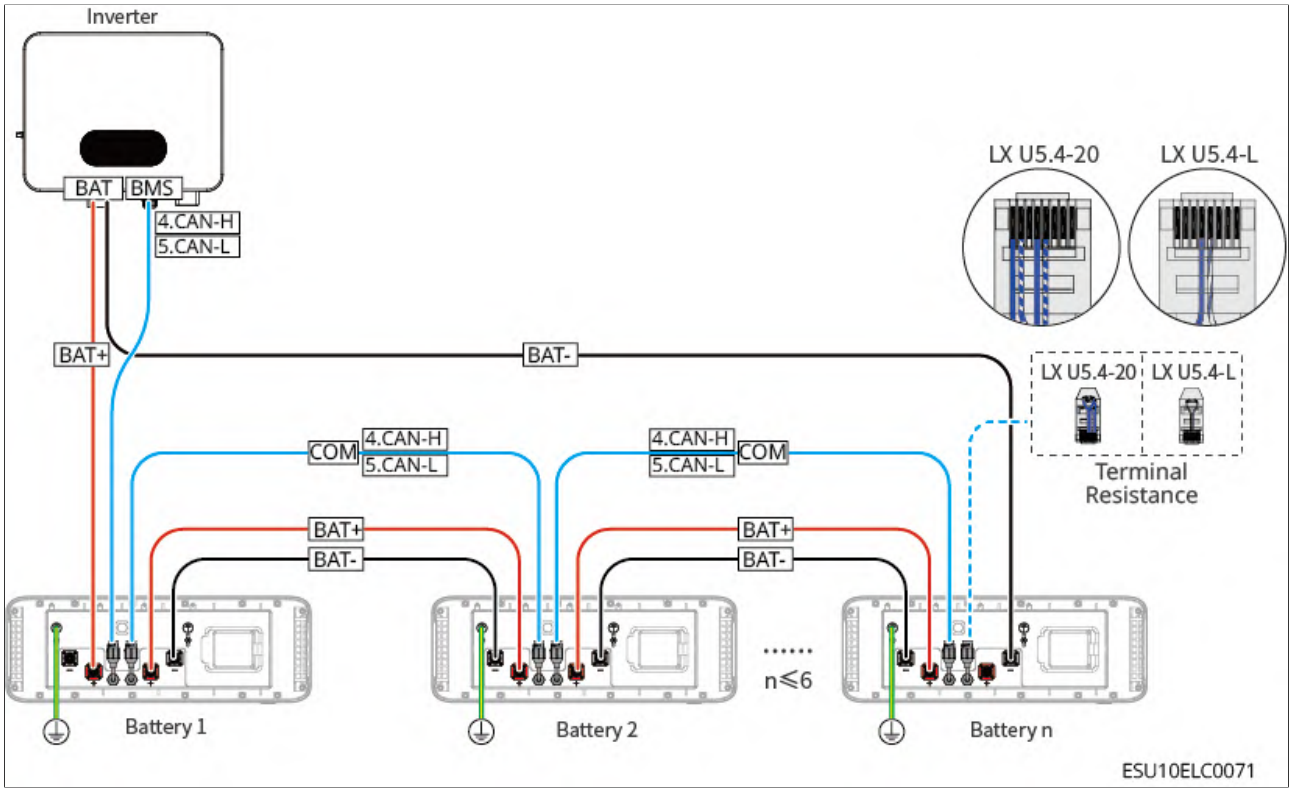


Figure37 LX U5.4-L, LX U5.4-20: Daisy-chain connection method

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

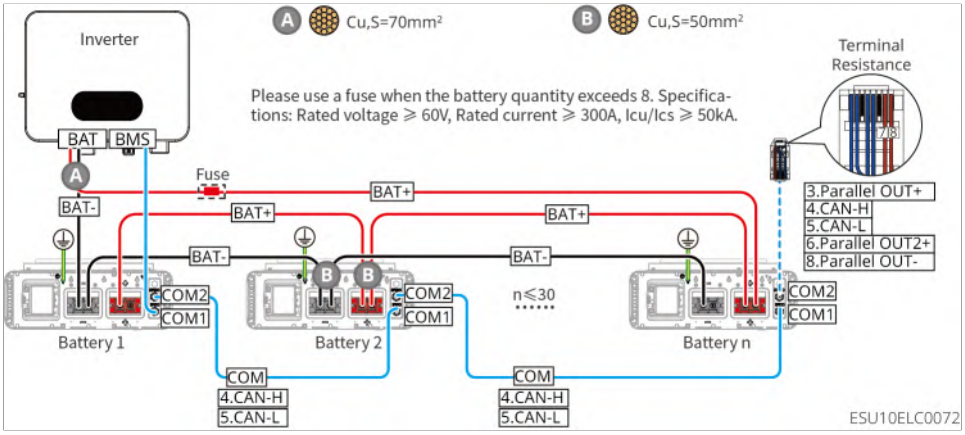


Figure38 LX U5.0-30: Daisy-chain connection method

LX U5.0-30: When Battery Qty ≤ 6 units, battery connection method using combiner box BCB-22-WW-0

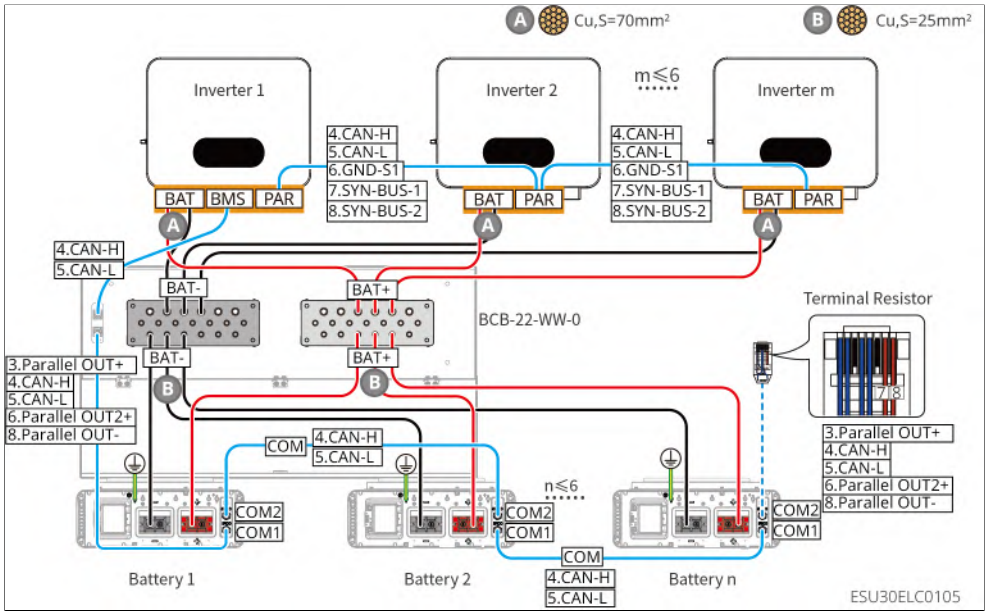


Figure39 LX U5.0-30: When Battery Qty ≤ 6 units, battery connection method using combiner box BCB-22-WW-0

LX U5.0-30: When Battery Qty ≤ 8 units, battery connection method using combiner box BCB-32-WW-0

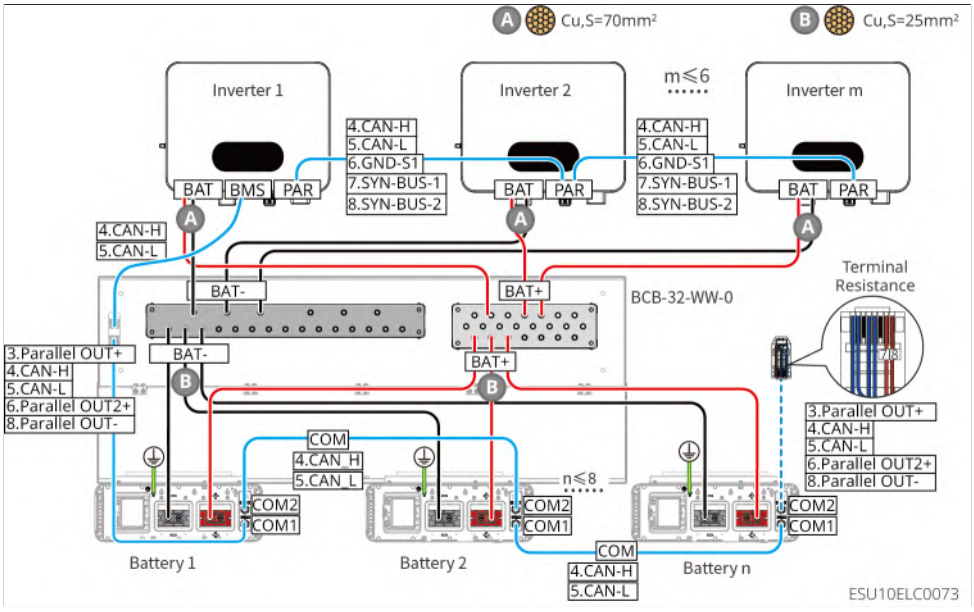


Figure40 LX U5.0-30: When Battery Qty ≤ 8 units, battery connection method using combiner box BCB-32-WW-0

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

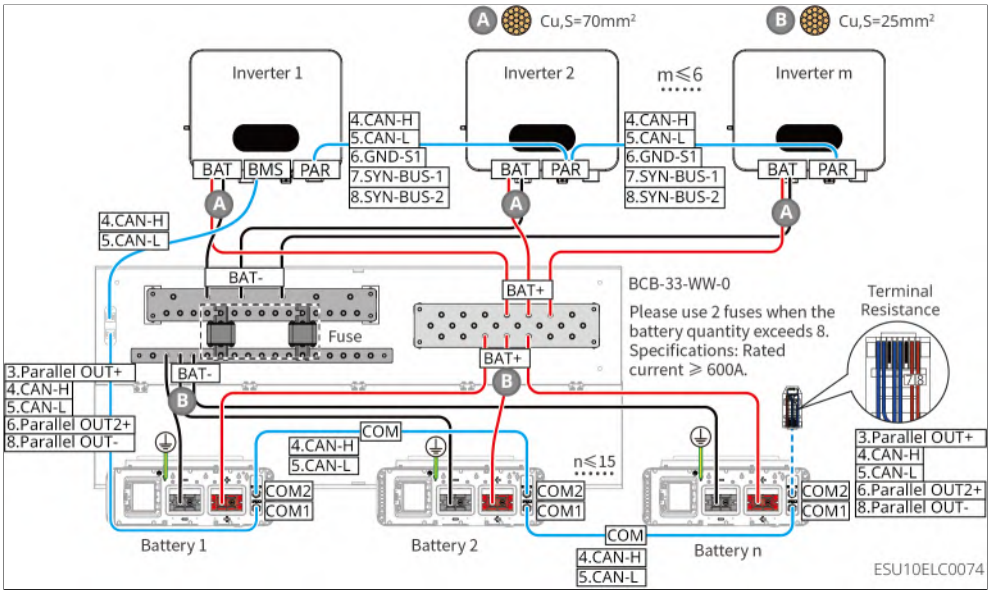


Figure41 LX U5.0-30: When Battery Qty ≤ 15 units, battery connection method using combiner box BCB-33-WW-0

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

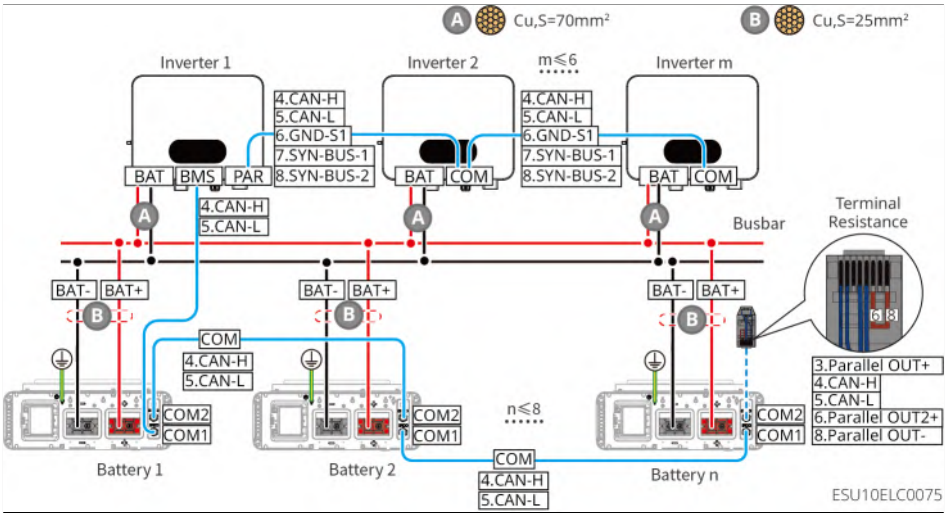


Figure42 LX U5.0-30: When Battery Qty ≤ 8 units, battery uses third-party busbar connection method

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

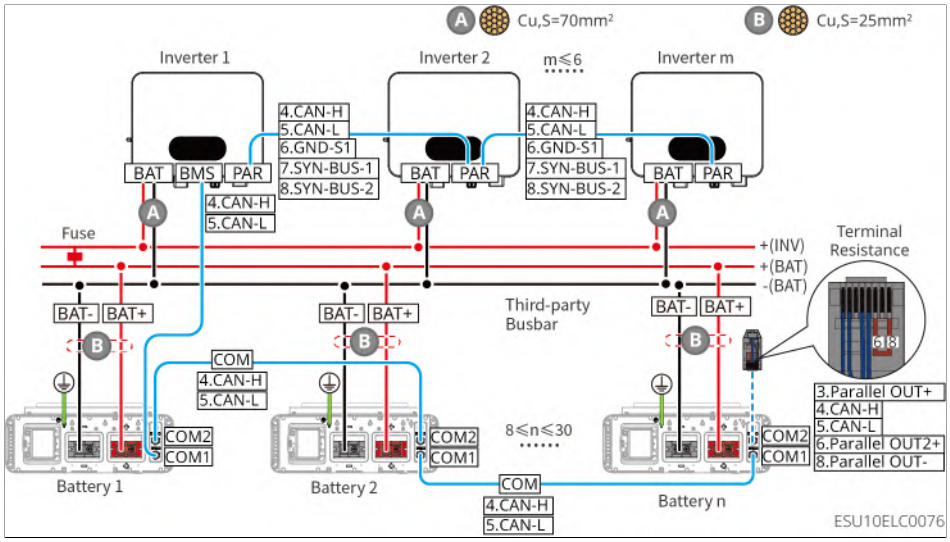


Figure43 LX U5.0-30: When Battery Qty is greater than 8 units, battery uses third-party busbar connection method

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

- 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

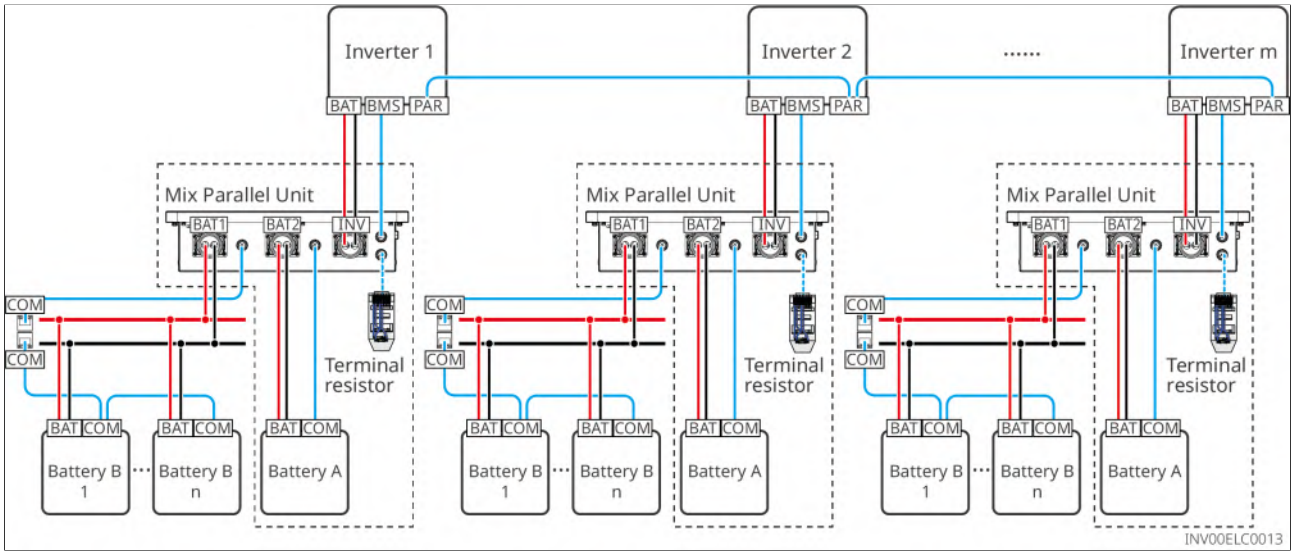


Figure44 When inverters are in parallel, use GW combiner box

When inverters are in parallel, batteries use third-party busbar, wiring diagram 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

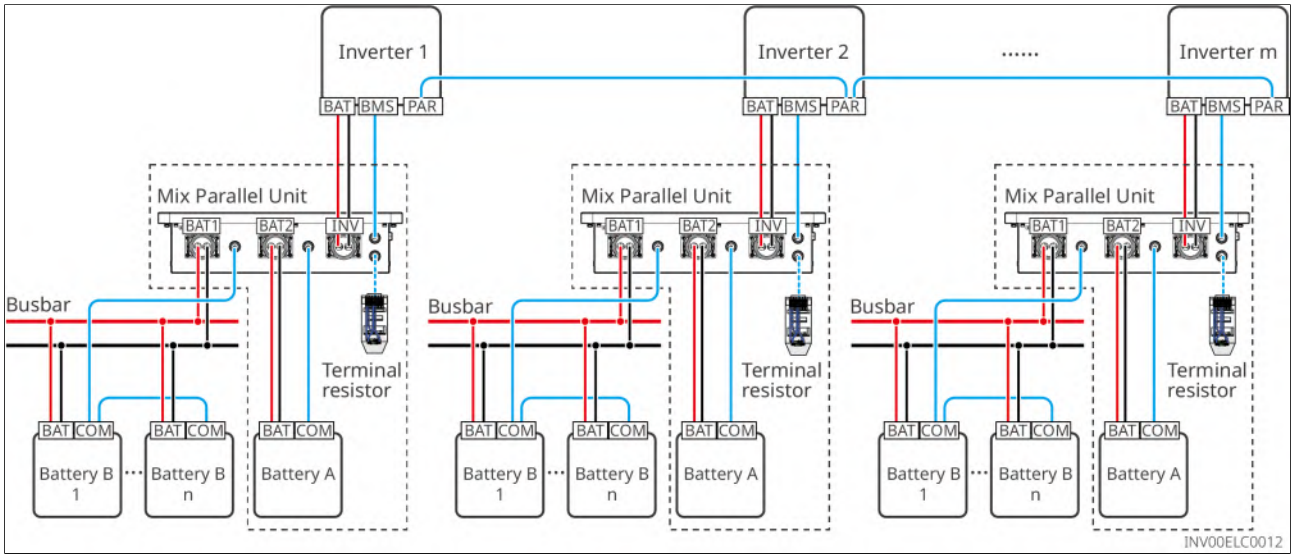


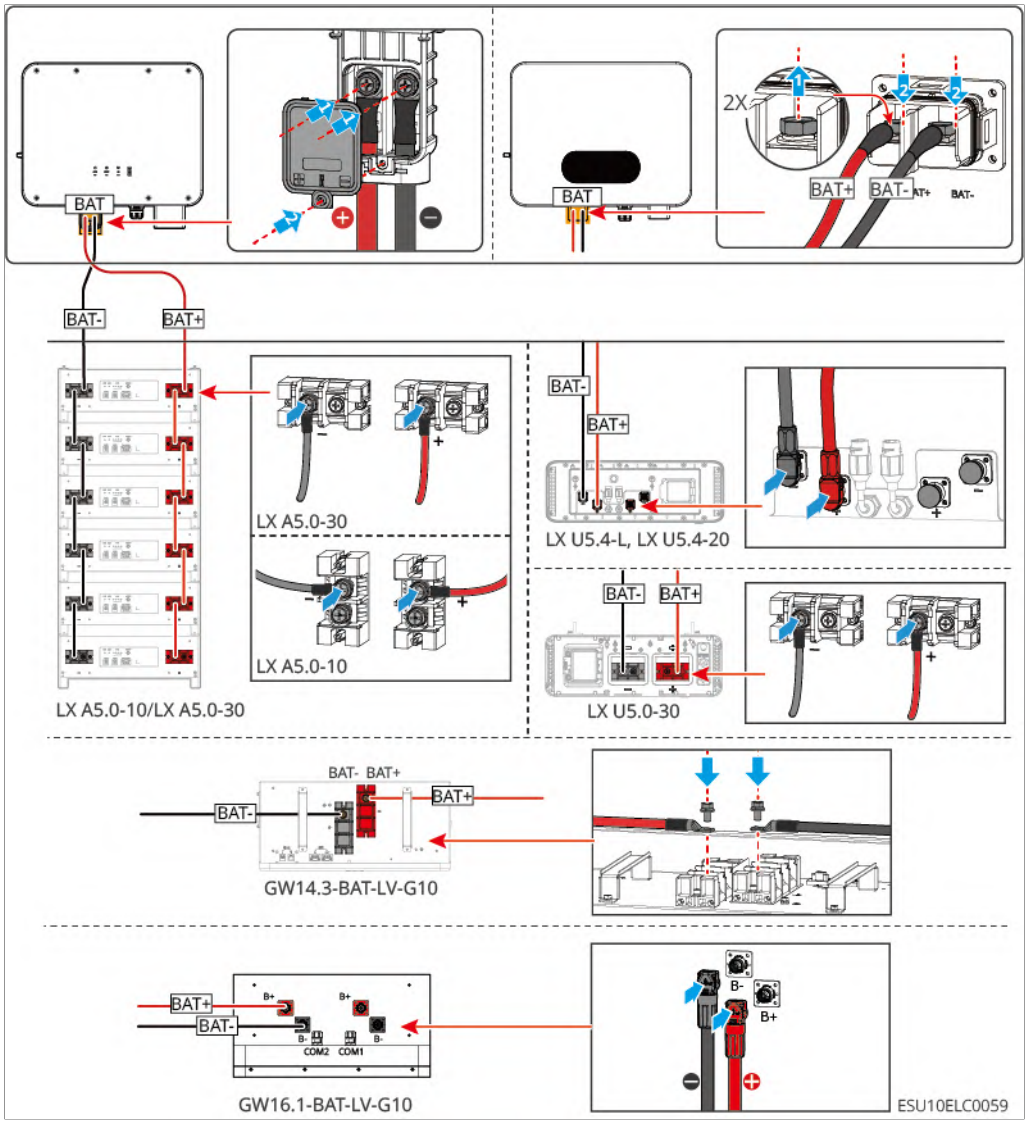
Figure45 When inverters are in parallel, batteries use third-party busbar

5.6.1 Connect the Inverter and Battery Power Cables

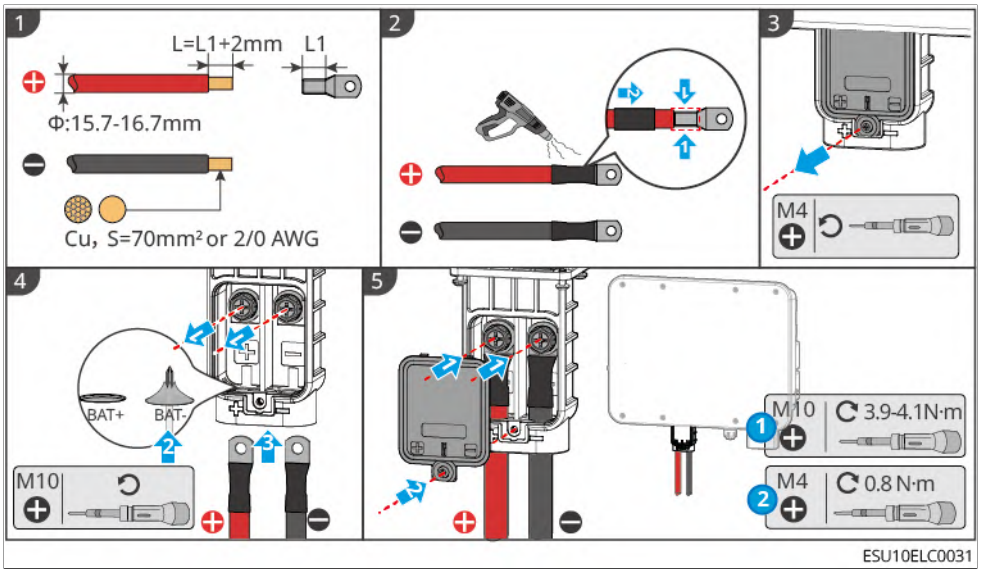
⚠WARNING

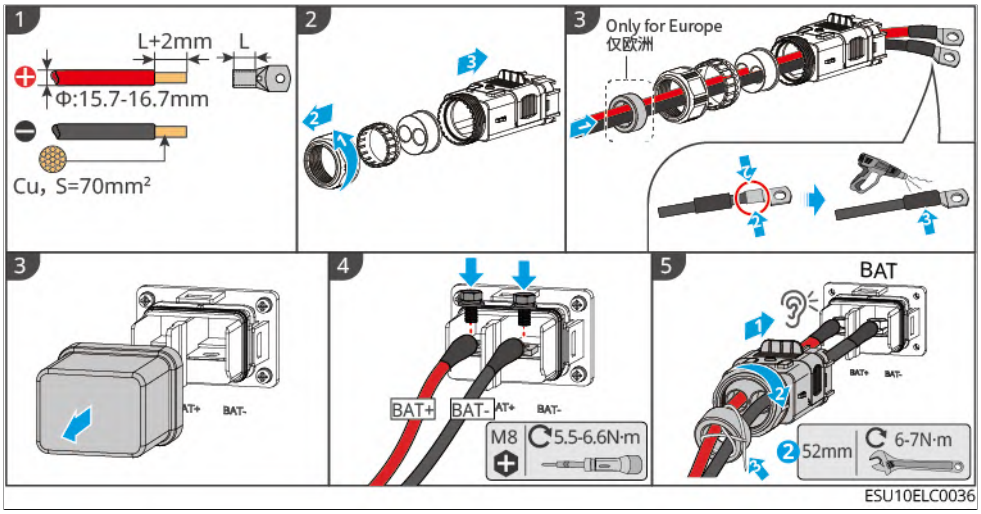
- Use a multimeter to measure the positive and negative poles of the DC cables to ensure that the polarity is correct and there is no reverse connection; and that the voltage is within the allowable range.
- When wiring, the battery cable must exactly match the "BAT+", "BAT-", and grounding ports on the battery terminal. If the cable is connected incorrectly, it will cause equipment damage.
- Ensure that the conductor core is fully inserted into the terminal wiring hole without any exposure.
- Ensure that the cable connection is secure; otherwise, the terminal may overheat during equipment operation 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



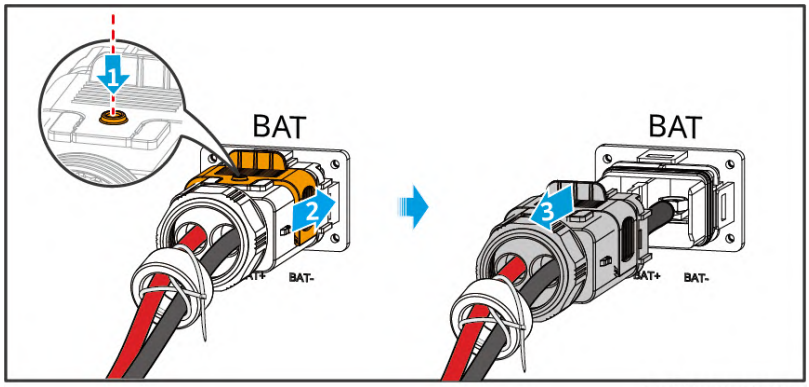
Cable preparation at the inverter end





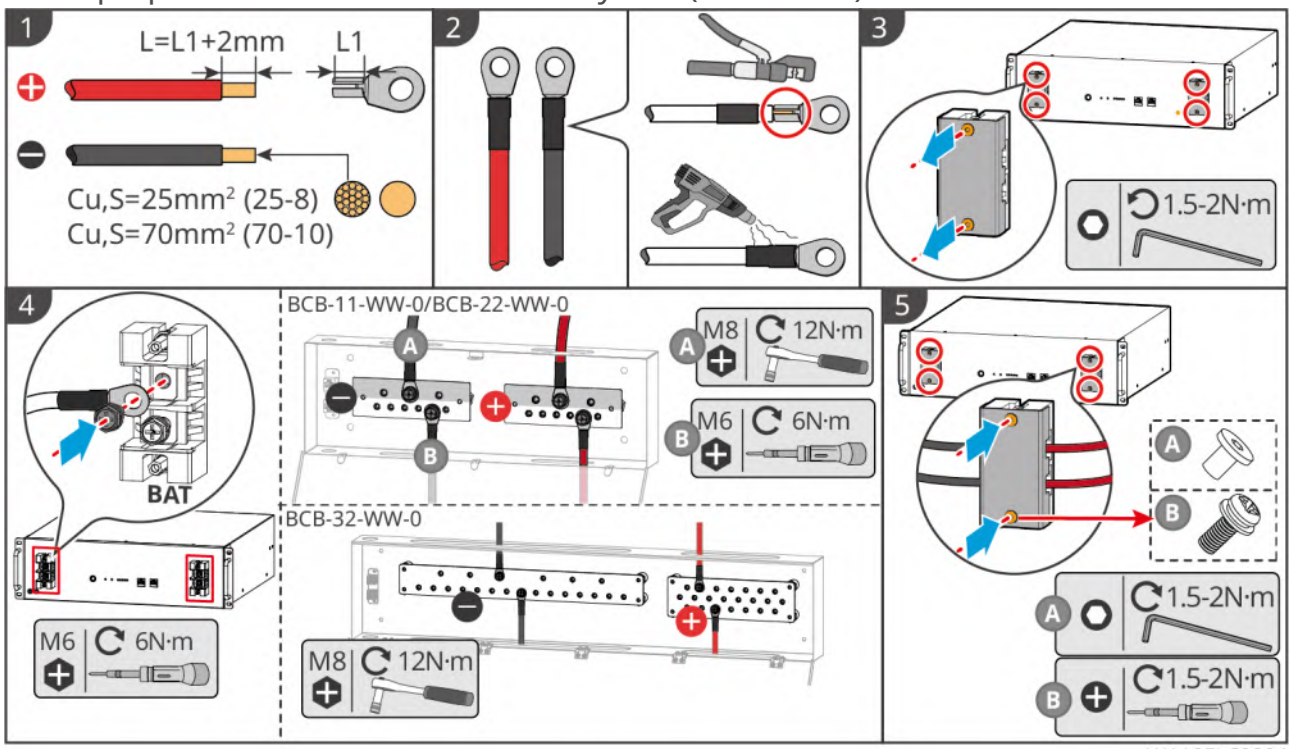
- For some models, the battery terminal screws are pre-fastened to the battery terminal when shipped. Determine whether to remove the screws based on actual conditions.

Method for removing the inverter battery cover (optional)



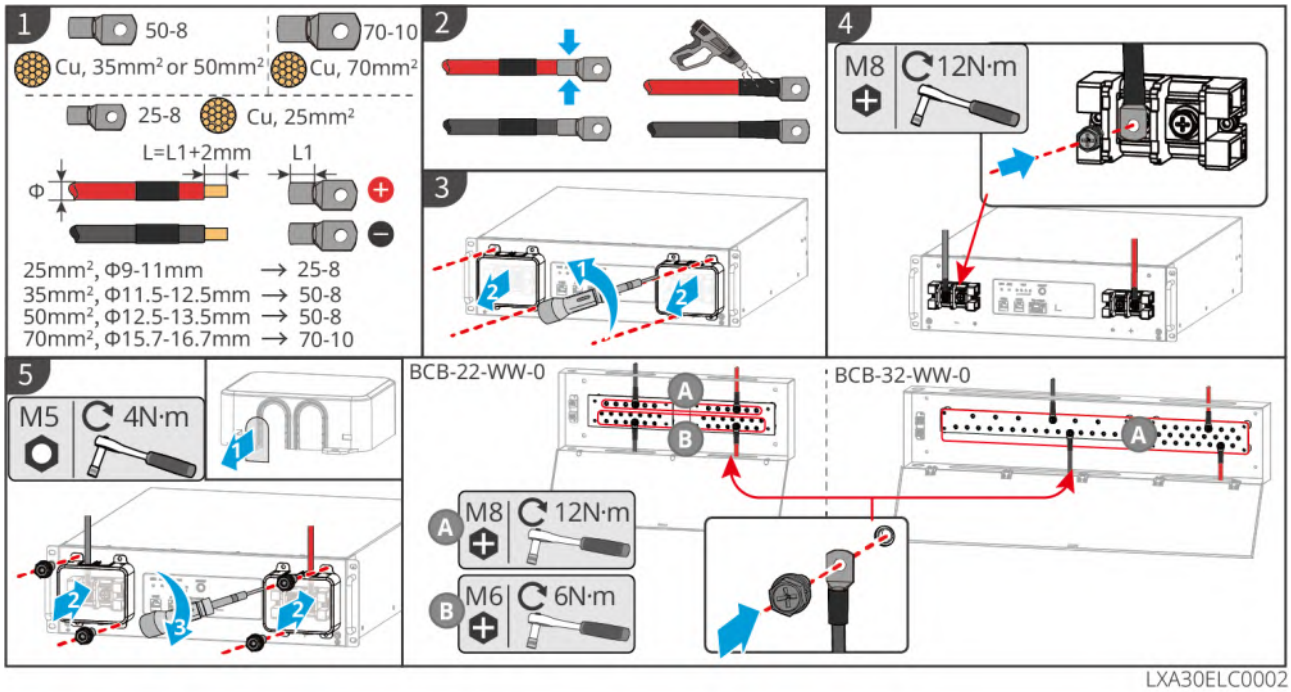
ESU10ELC0098

Cable preparation method at the battery end (LX A5.0-10)

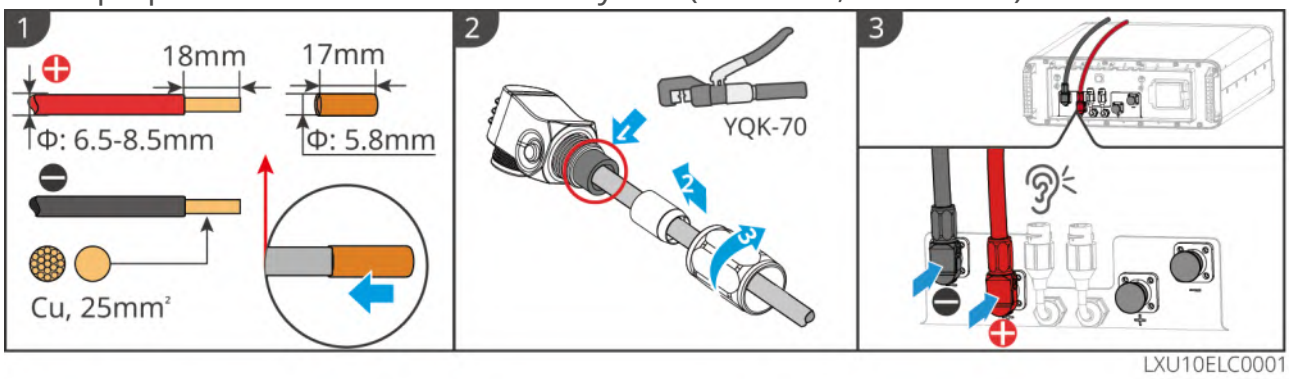


LXA10ELC0004

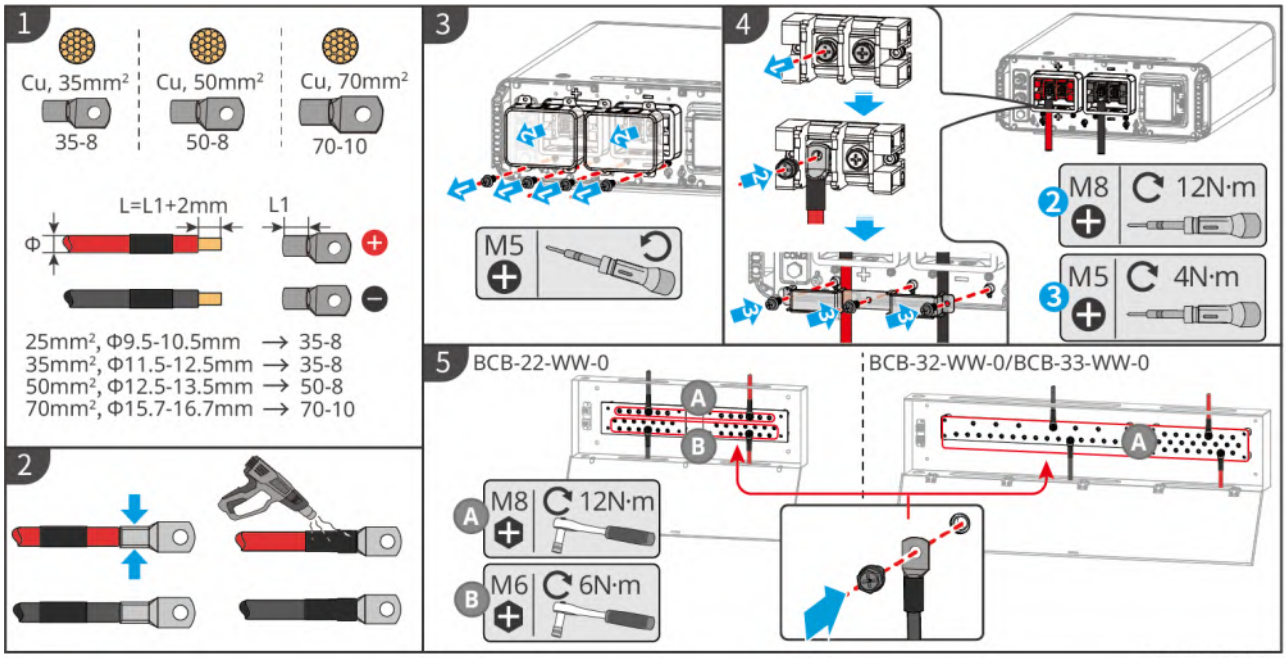
Cable preparation method at the battery end (LX A5.0-30)



Cable preparation method at the battery end (LX U5.4-L, LX U5.4-20)



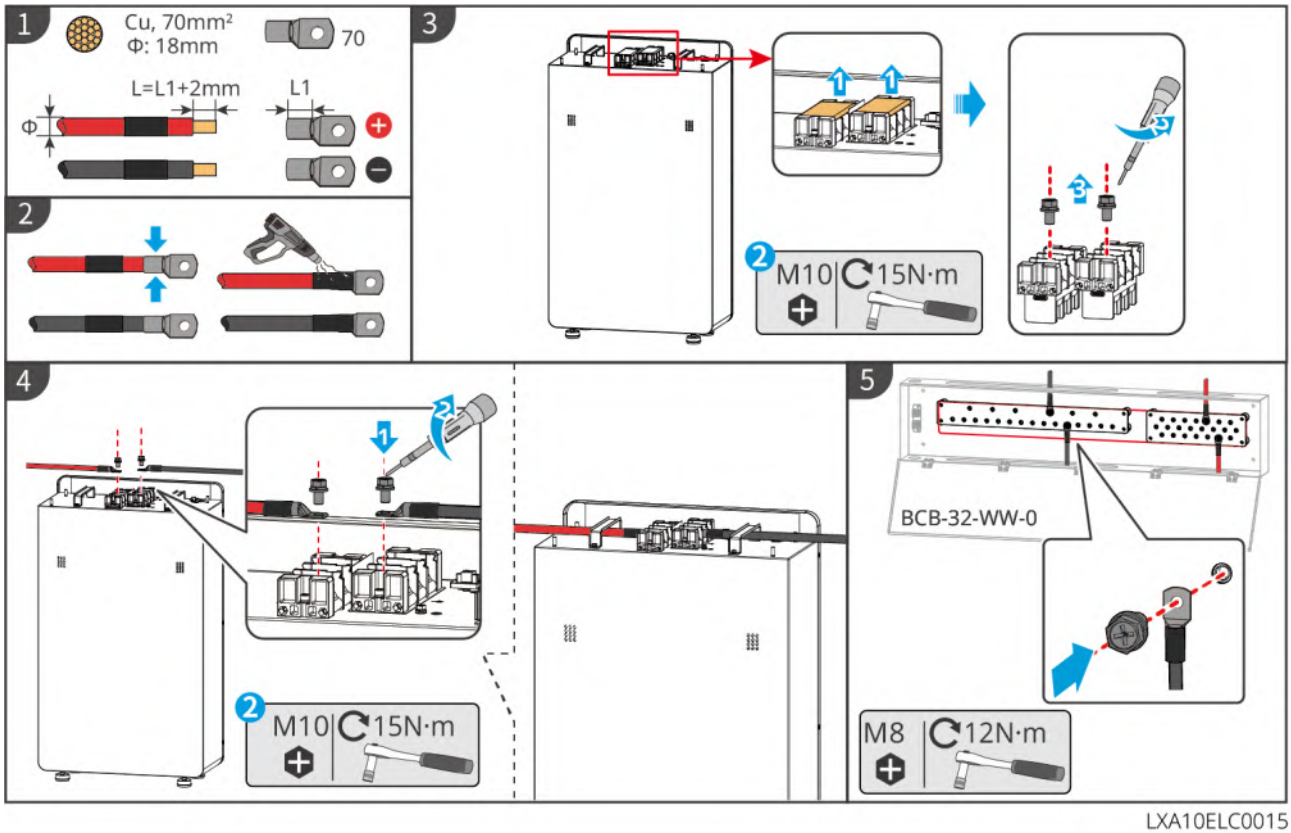
Cable preparation method at the battery end (LX U 5.0-30)



LXU30ELC0004

Battery-Side Cable Fabrication Method (GW14.3-BAT-LV-G10)

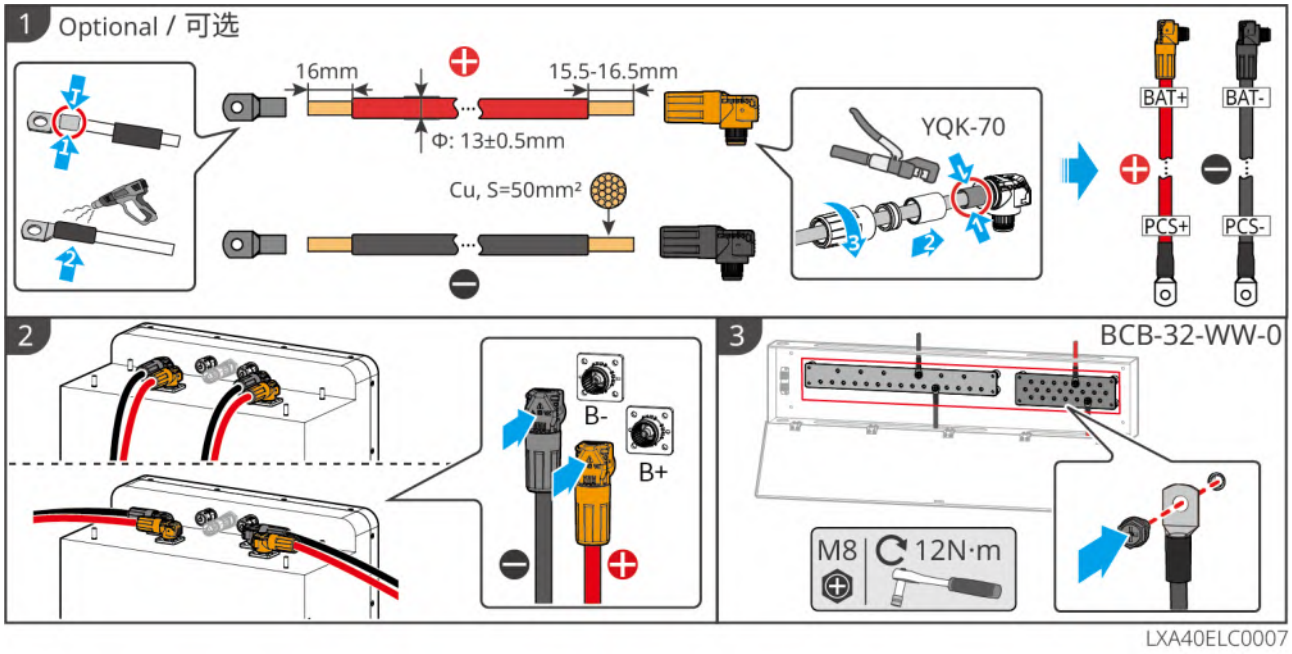
- GW14.3-BAT-LV-G10: If the power cable is shipped with the battery accessories, use the shipped cable; no crimping is required.



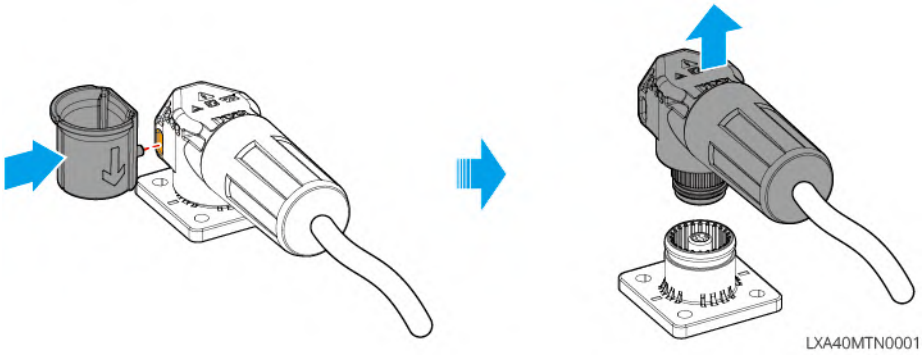
LXA10ELC0015

Battery-Side Cable Fabrication Method (GW16.1-BAT-LV-G10)

- The 1 m positive and negative power cables between the inverter and the battery are shipped with the battery. If the cable length is insufficient for the actual wiring, prepare your own cables and crimp them according to the following steps. After fabrication, insert the battery quick-connect terminal heads into the battery ports.



Battery DC Quick-Connect Terminal Unlocking Method (Optional)



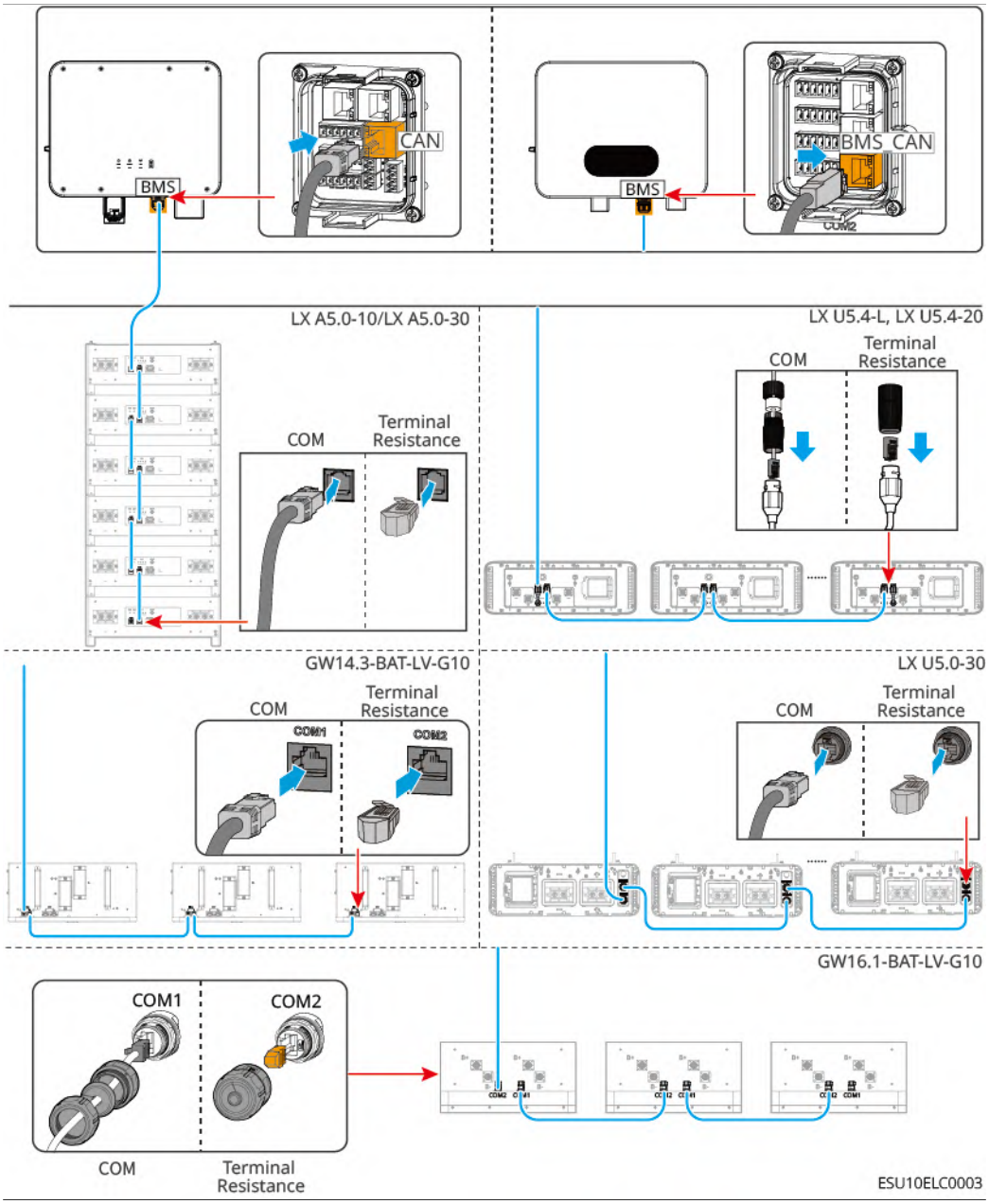
5.6.2 Connect the Inverter-to-Battery Communication Cable

NOTICE

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 connector. When crimping, only crimp PIN4 and PIN5 of the connector; otherwise, communication may fail.

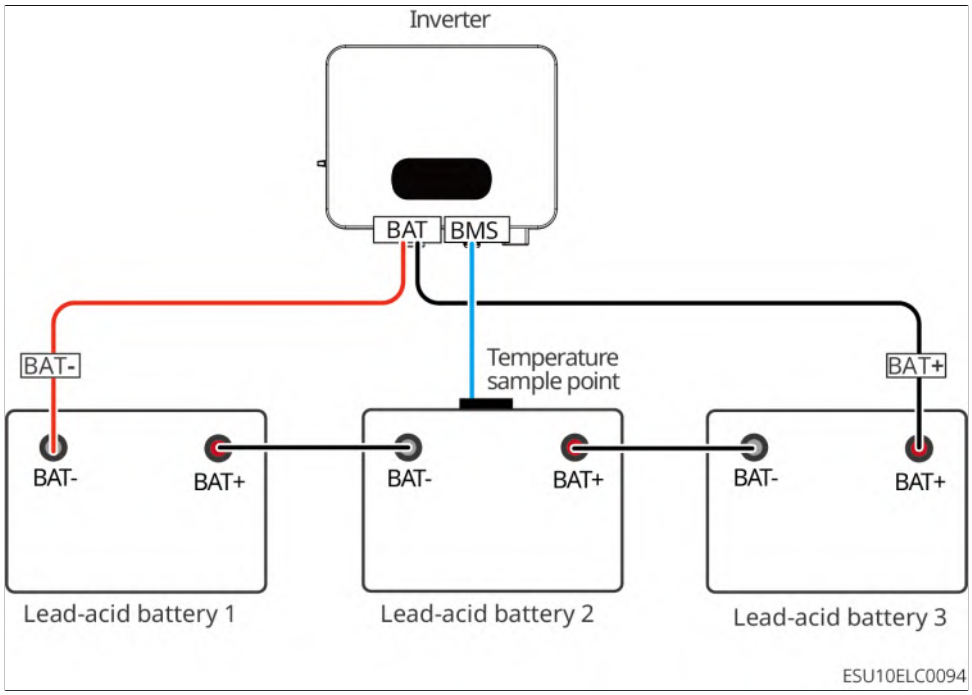
BMS Communication Connection between the Inverter and Battery:

Inverter Port	Connected to Battery Port	Port Definition	Description
BMS(CAN)	COM1	4: CAN_H 5: CAN_L	• CAN communication is used between the inverter and the 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
ESU10ELC0003

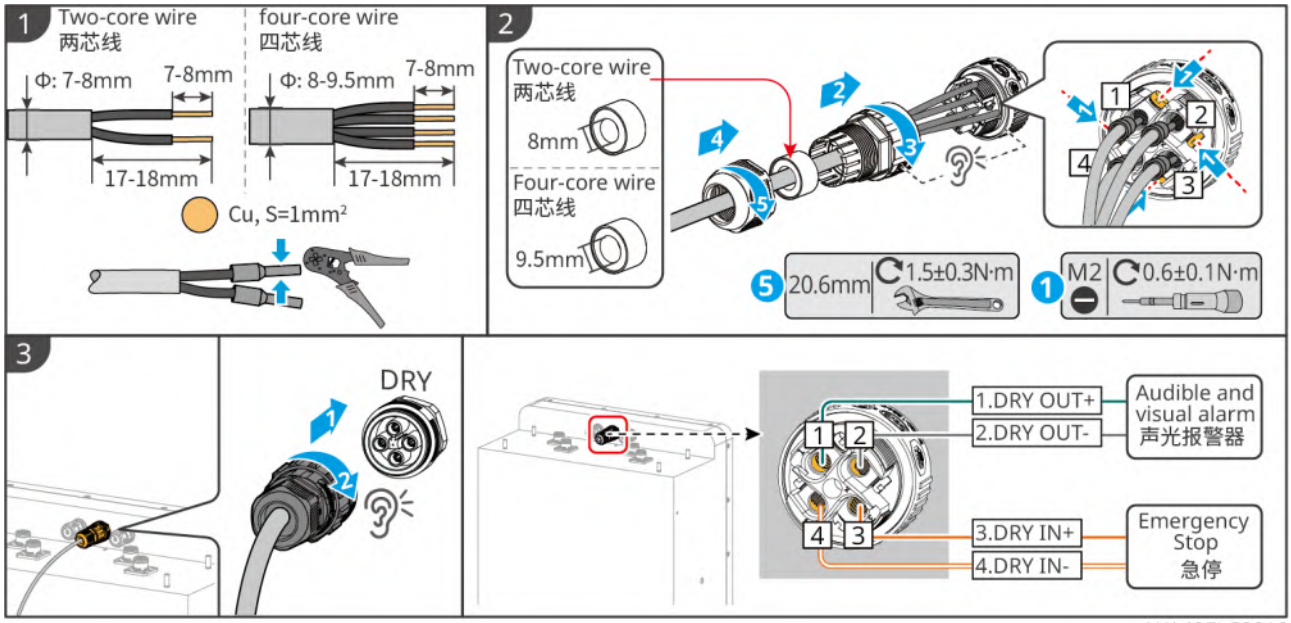
NOTICE

- When connecting the lead-acid battery temperature sensor cable, it is recommended to connect the temperature sensor cable at a location with poor heat dissipation. For example, when lead-acid batteries are placed side by side, secure the sensor to the lead-acid battery in the middle.
- For better Protection of 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：

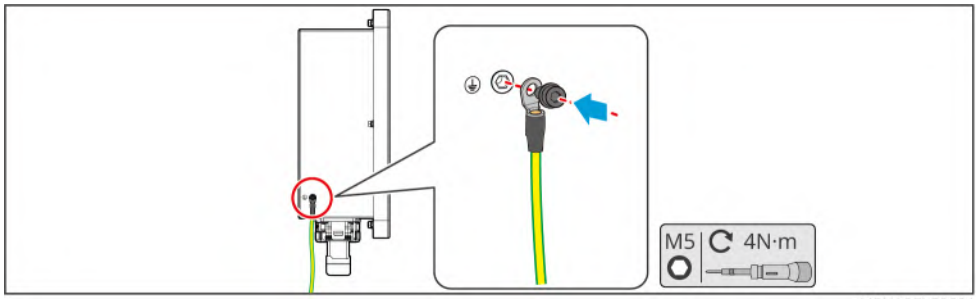


Communication Function Description

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

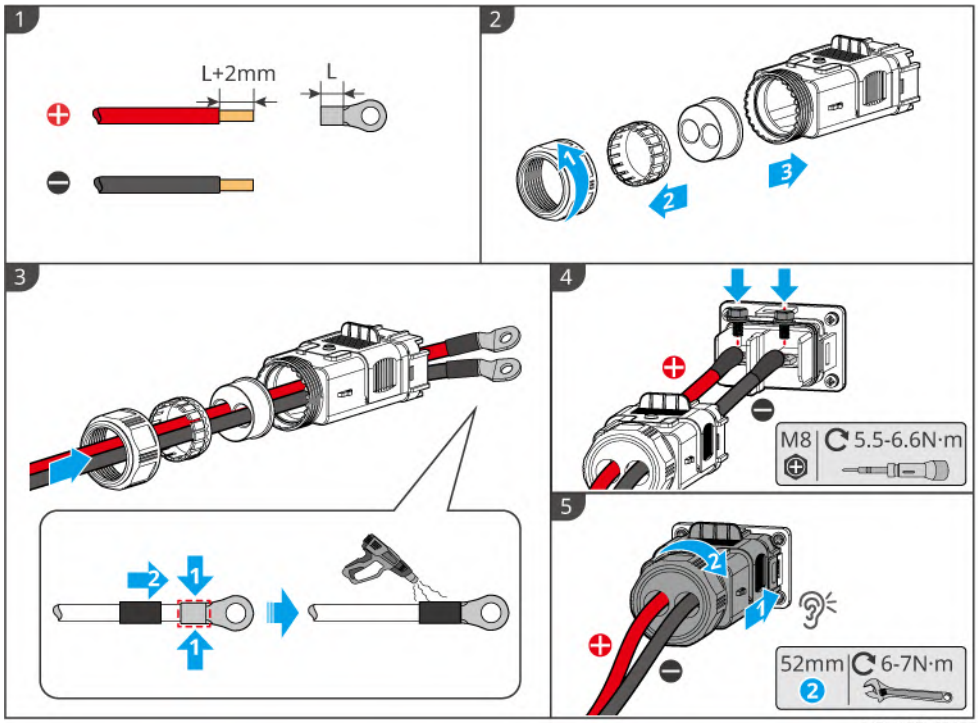
5.7 Connect the Mix Parallel Unit Cable

5.7.1 Connect the Mix Parallel Unit Grounding Cable



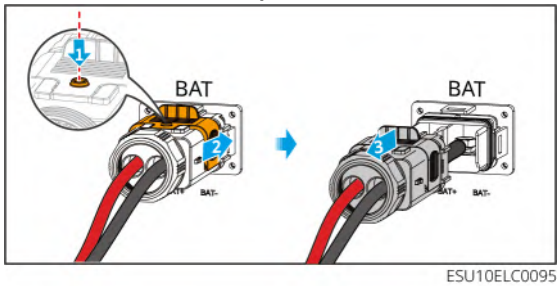
MPU10ELC0001

5.7.2 Connect the Mix Parallel Unit Power Cable



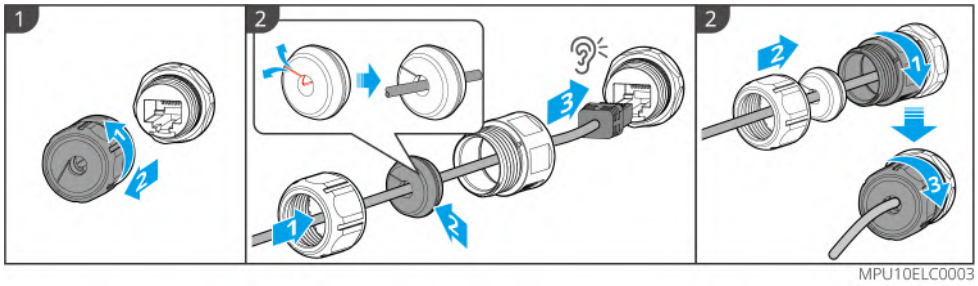
MPU10ELC0005

Mix Parallel Unit power terminal cover removal method (optional)



ESU10ELC0095

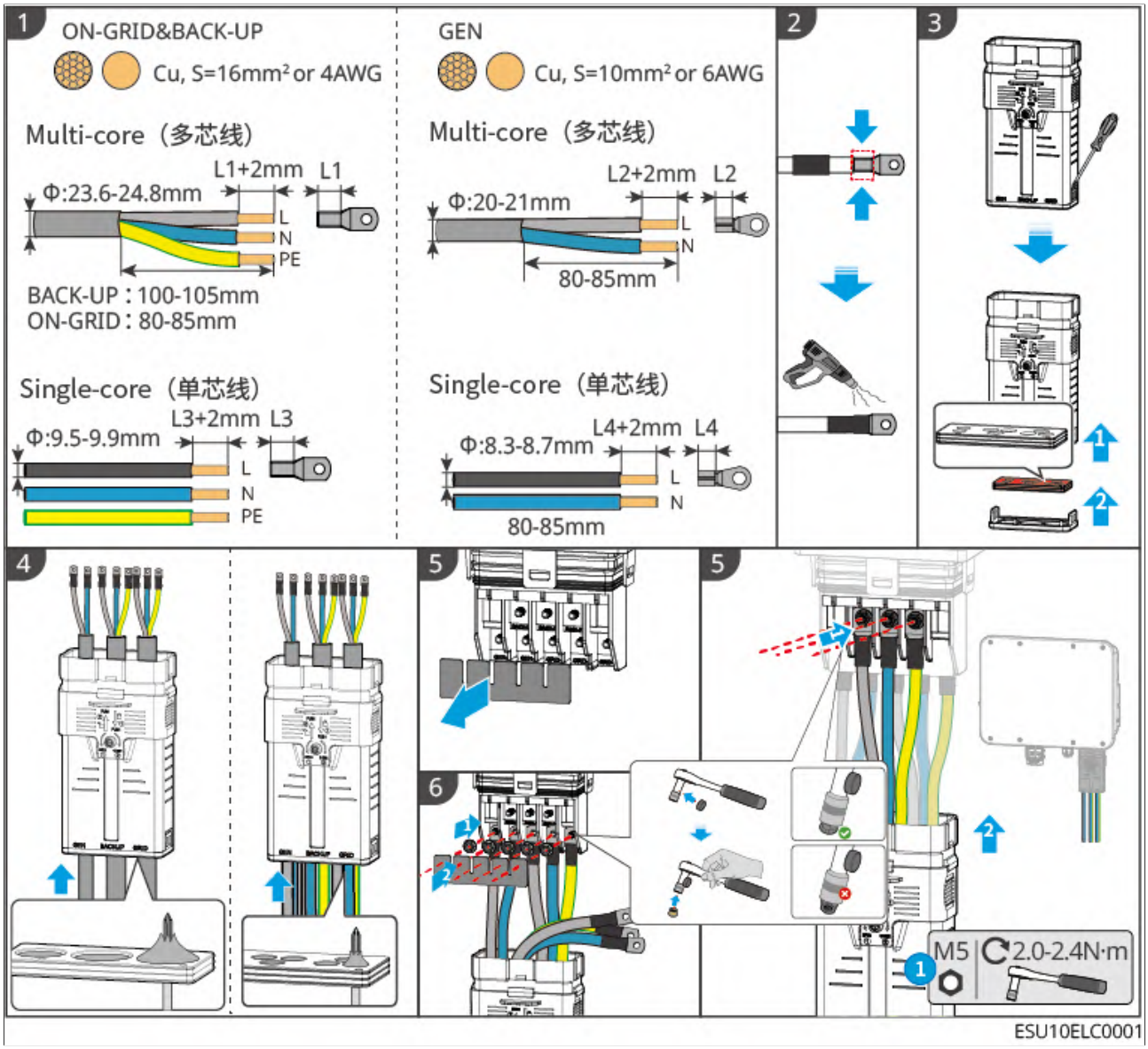
5.7.3 Connect the Mix Parallel Unit Communication Cable

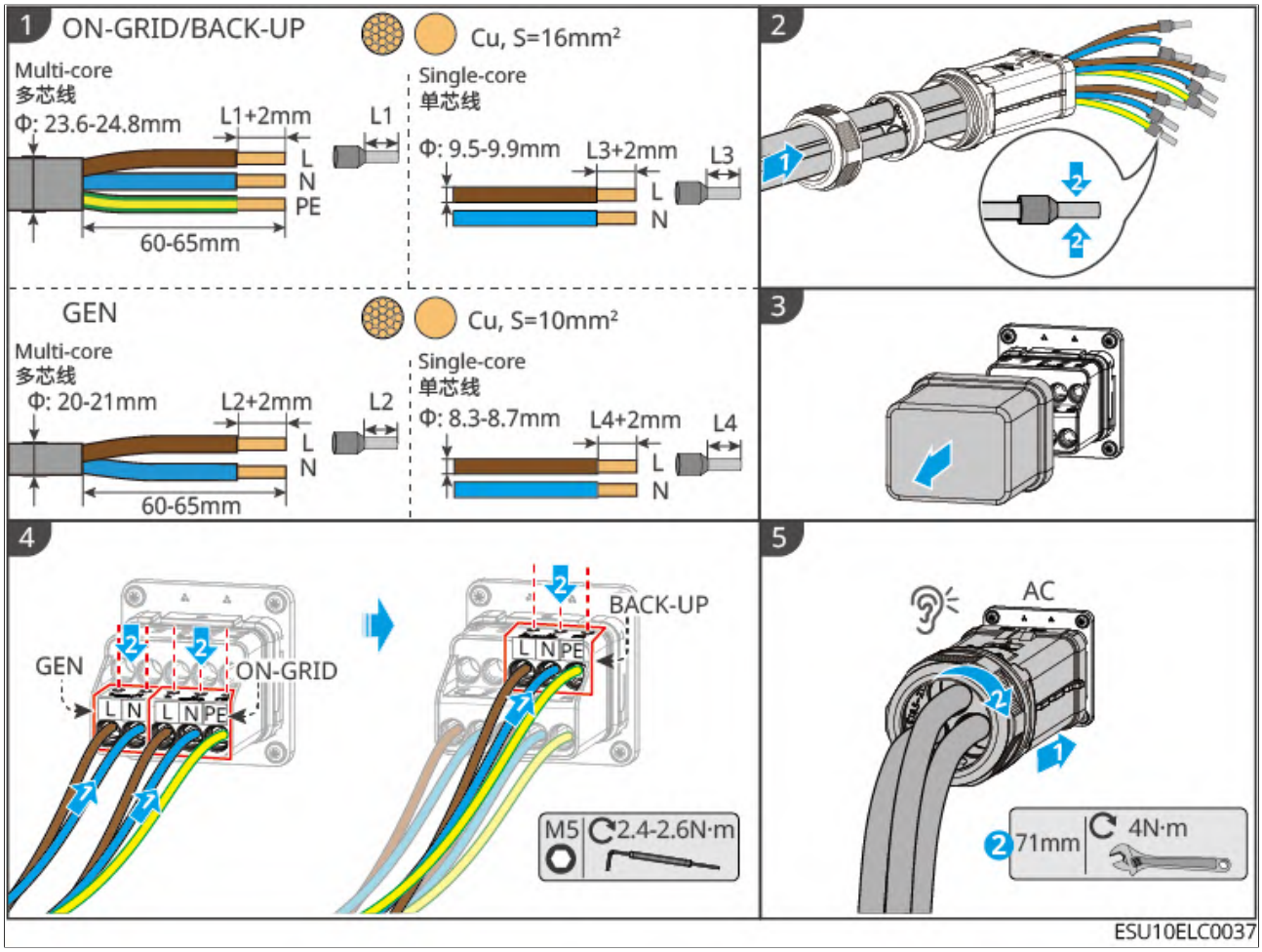


5.8 Connect the AC Cables

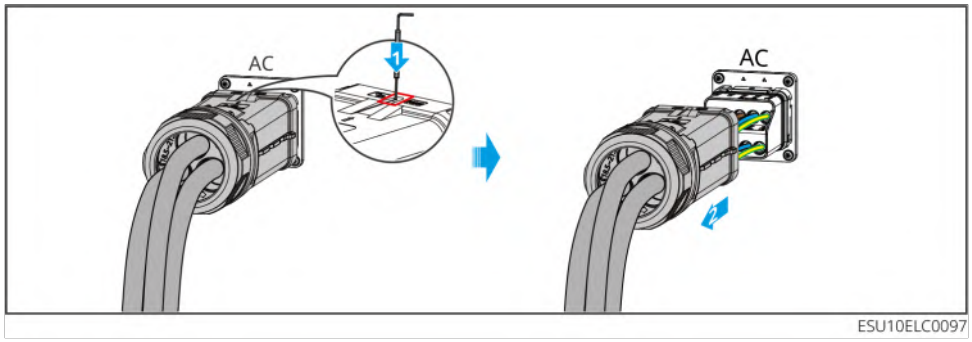
⚠WARNING

- The inverter integrates a Residual Current Monitoring Unit (RCMU) to prevent the residual current from exceeding the specified value. When the inverter detects a leakage current greater than the allowable value, it will quickly disconnect from the grid.
- When wiring, the AC cables must exactly match the "BACKUP", "ON-GRID", "GEN", and grounding ports of the AC terminal. Incorrect cable connections may cause equipment damage.
- Ensure that the conductor is fully inserted into the terminal wiring hole without any exposed portion.
- Ensure that the insulating plate at the AC terminal is clamped securely and is not loose.
- Ensure that the cable connections are tight; otherwise, the terminal may overheat during operation and cause equipment damage.


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

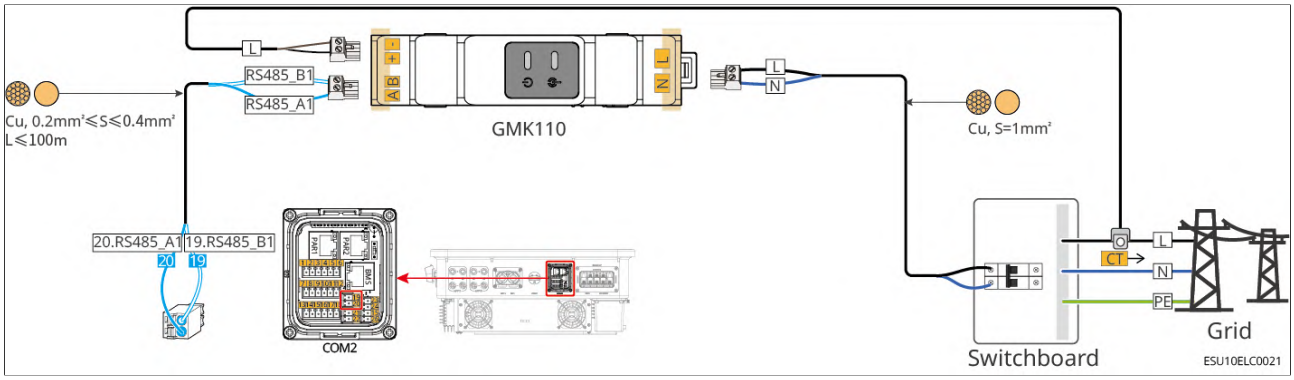
NOTICE

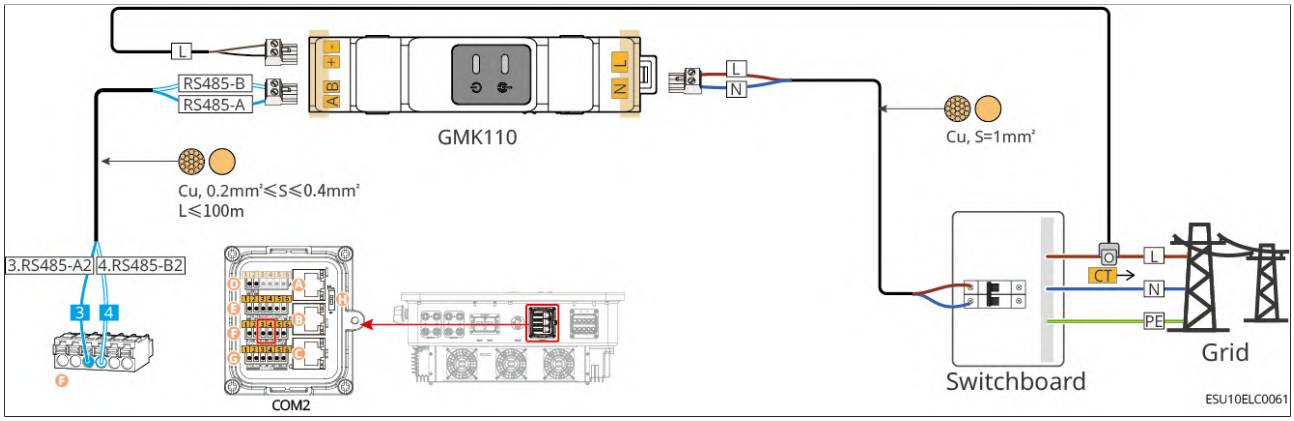
- If multiple inverters are required, please consult the manufacturer to purchase the meter separately.
- Ensure that the CT connection direction and phase sequence are correct; otherwise, the monitoring data may be inaccurate.
- Ensure that all cables are connected correctly, tightly, and without looseness. Improper wiring may cause poor contact or damage to the meter.
- In areas with lightning risk, if the meter cable length exceeds 10 m and the cable is not routed in a grounded metal conduit, it is recommended to install an external lightning protection device.

GMK110 Meter Wiring

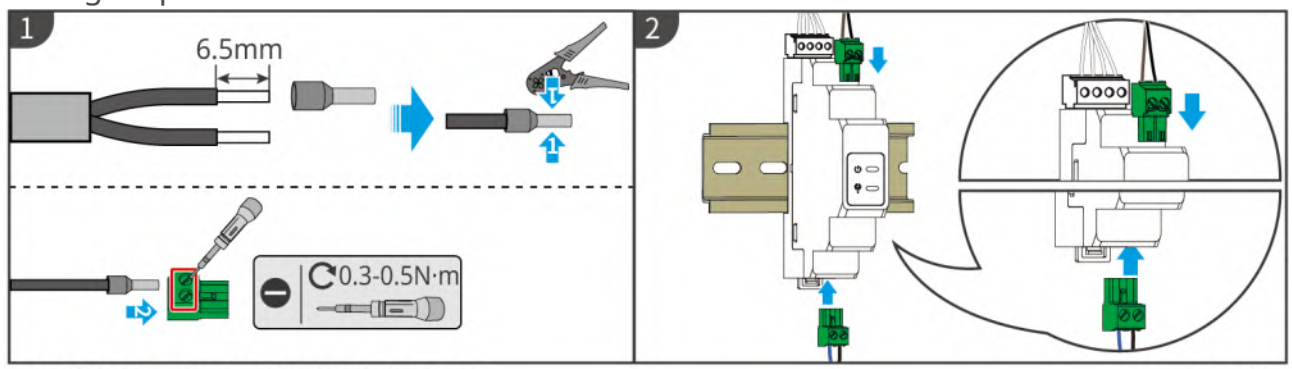
NOTICE

- The outer diameter of the AC power cable must be smaller than the CT aperture to ensure the AC power cable can pass through the CT.
- To ensure the current detection accuracy of the CT, the recommended CT cable length does not exceed 30 m.
- Do not use a network cable as the CT cable; otherwise, excessive current may damage the meter.
- The CTs provided by the equipment manufacturer vary slightly in size and appearance depending on the model, but the installation and wiring methods are the same.



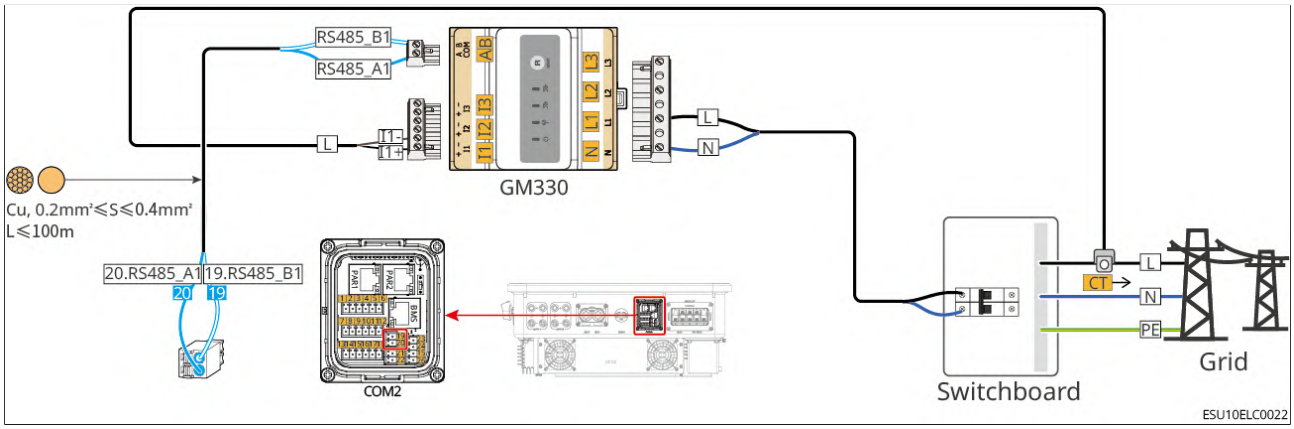


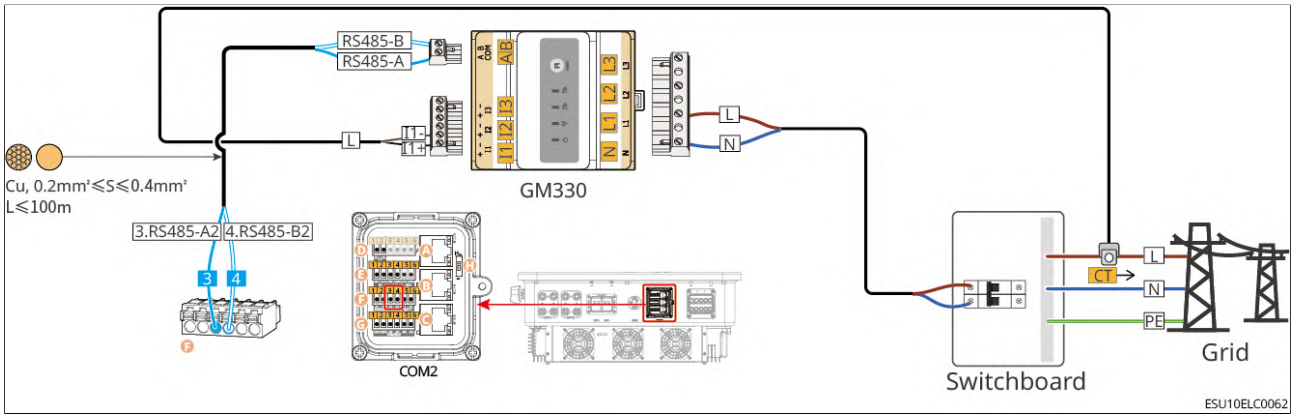
Wiring Steps



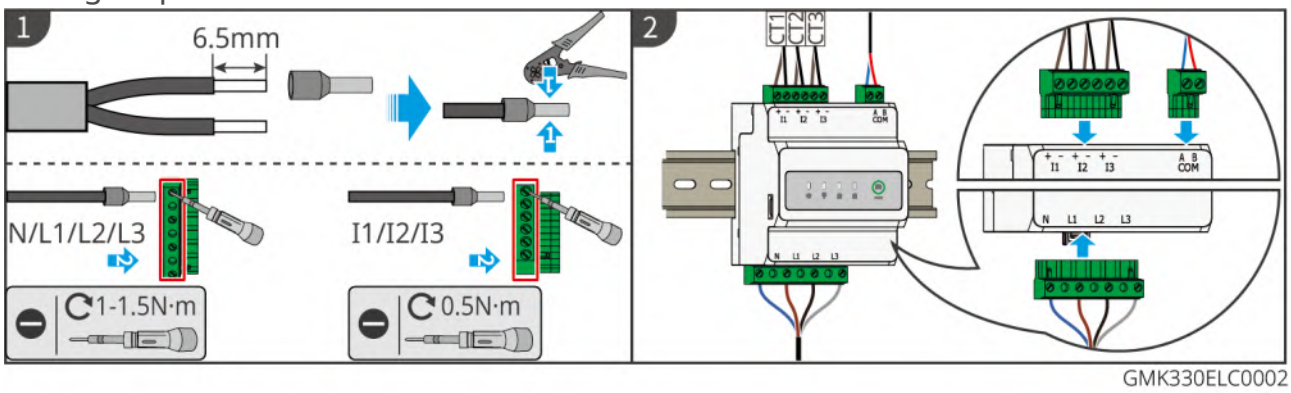
▶ GMK110: CT x 1; GMK110D: CT x 2

GM330 Meter Wiring

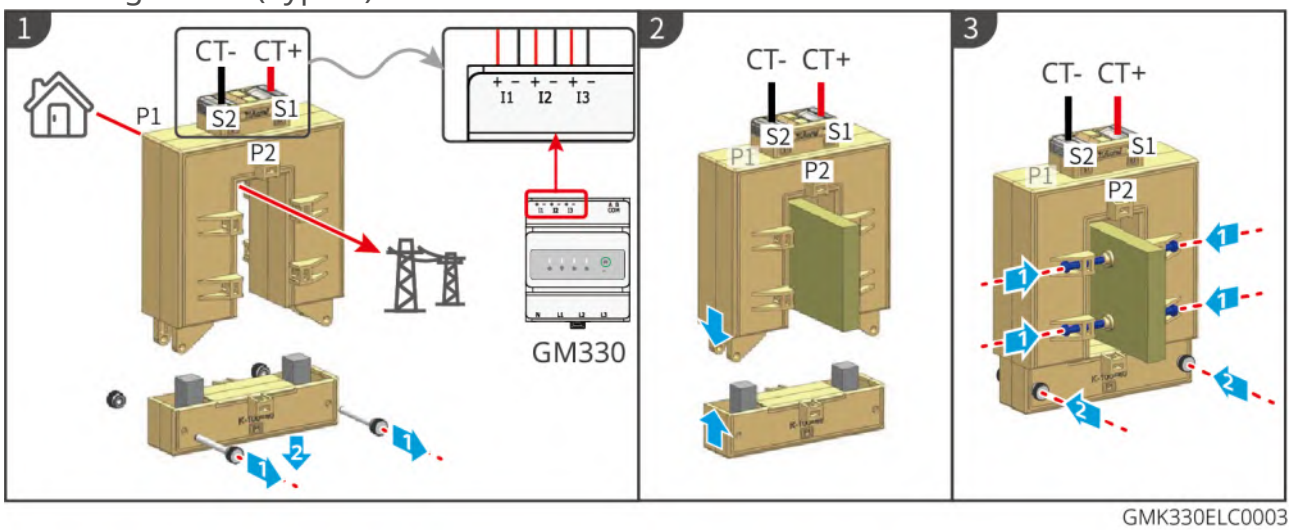




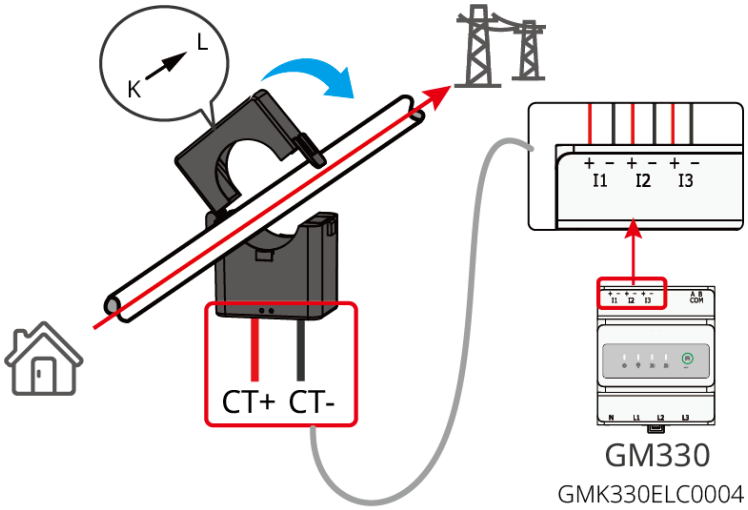
Wiring Steps



Installing the CT (Type 1)



Installing the CT (Type 2)



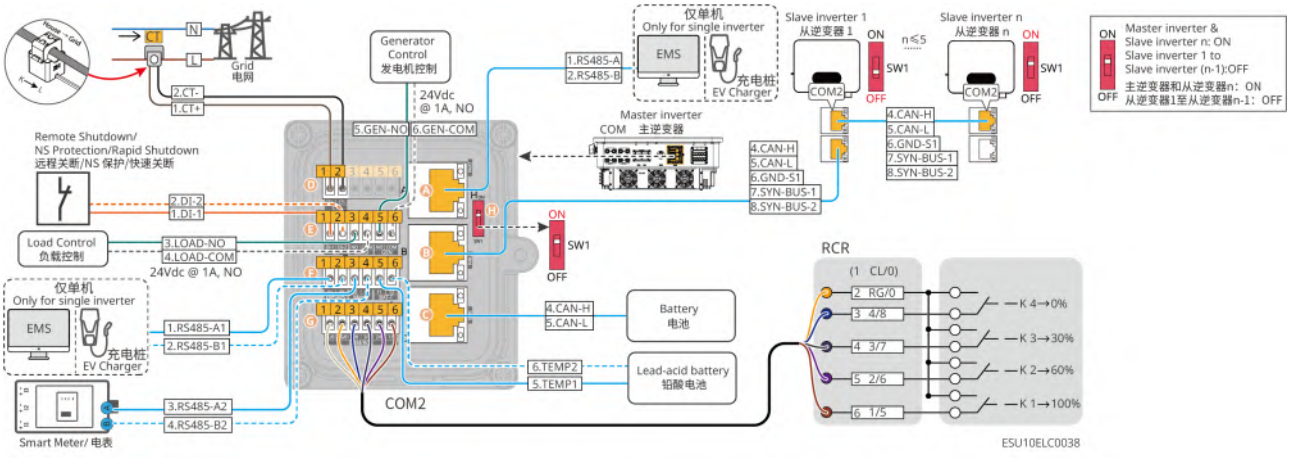
5.10 Connecting the Inverter Communication Cable

NOTICE

- The inverter communication function is optional; select it according to the actual application scenario.
- The inverter supports connection to a mobile phone or web interface via Bluetooth, WiFi, LAN, or 4G for setting device-related parameters and viewing device operating information and error messages, allowing timely understanding of system status.
- In a single-machine system, install the WiFi/LAN Kit-20, 4G Kit-CN-G20, and 4G Kit-CN-G21 communication modules. When the system contains multiple inverters for Parallel Networking, the master inverter must be equipped with an Ezlink3000 module for networking.
- If the Remote Shutdown function is required, enable it in the App after wiring is completed.
- 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, to implement the Remote Shutdown function, connect the communication cable to the master inverter; otherwise, the function will not take effect.

Communication Function Description

Type 1

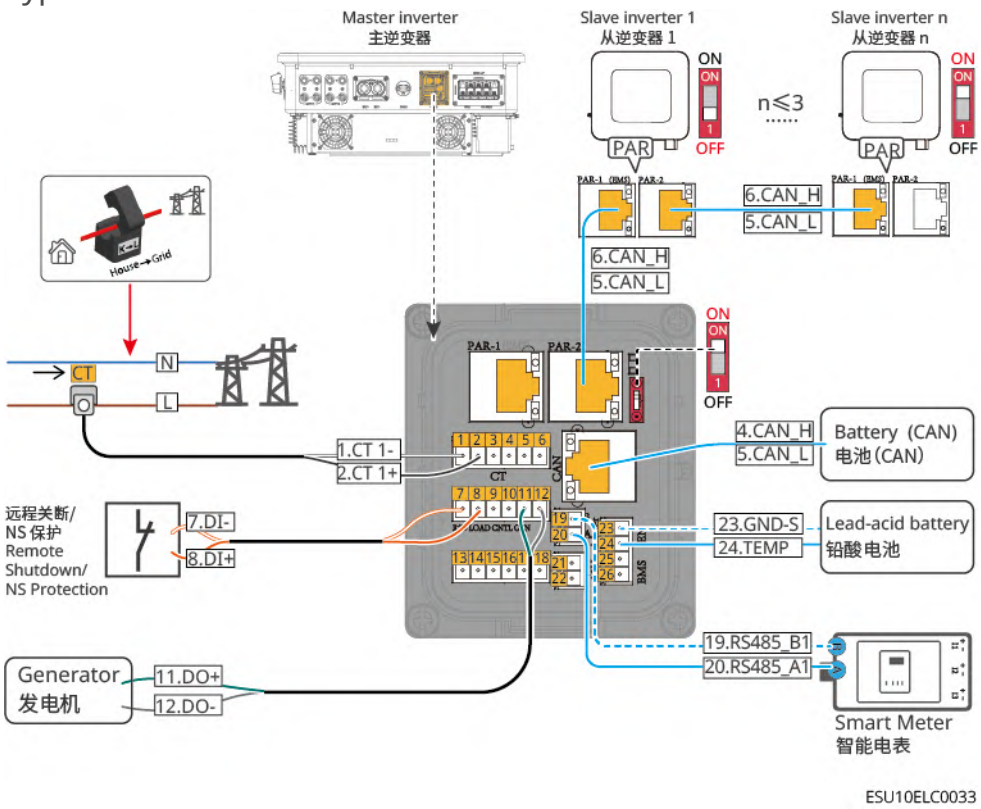


Port (Silkscreen)		Function	Description
A	PAR1	Parallel communication port 1 EMS communication port (PAR-1&EMS) or charging pile communication port	• CAN and BUS: Parallel communication port. In Parallel Networking, use CAN communication to connect other inverters; use the BUS line to control the On/Off-grid status of each inverter in the parallel system. • RS485: Used to connect third-party EMS devices or charging piles that support RS485 communication. Parallel scenarios do not support connecting third-party EMS devices and charging piles.
B	PAR2	Parallel communication port 2 （PAR-2）	When used for parallel communication, it supports using CAN communication to connect other inverters; use the BUS line to control the On/Off-grid status of each inverter in the parallel system.
C	BMS	Battery BMS Communication	When connecting lithium-ion batteries, it is used to connect the battery system BMS communication cable 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 device Remote Shutdown or implement NS Protection. Remote Shutdown function: • When an unexpected event occurs, the device can be controlled to stop working. • The Remote Shutdown device must be a normally closed switch.
	LOAD	Load control	• Supports connection to dry contact signals to realize load control and other functions. DO contact capacity: 24Vdc @1A, NO/COM normally open contact. • Supports SG Ready heat pump connection, and controls the heat pump through 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): Start recommendation. In this mode, the heat pump increases hot water storage while maintaining current operation to store heat.
	GEN	Generator start/stop control port	Supports connection to Diesel Generator Control signals. DO contact capacity: 24Vdc @1A, NO/COM normally open contact.
F	EMS485	EMS communication port	When used to connect third-party EMS devices or charging piles, RS485 communication is supported. In parallel connection scenarios, connection to third-party EMS devices and charging piles is not supported. Note: It is the same line as the EMS in the PAR-1 & EMS port.

Port (Silkscreen)		Function	Description
	Meter	Meter communicatio n	Supports connection to external smart meters via RS485 communication.
	BAT-T	Lead-acid temperature measurement port	Used to connect the temperature sensing wire for lead-acid temperature measurement.
G	DRM/R CR	RCR	RCR (Ripple Control Receiver): provides RCR signal control port to meet grid dispatch requirements in Europe and other regions.
H	SW1	Paralleling DIP switch	In multi-unit parallel operation scenarios, set the paralleling DIP switches of the first and last inverters to the ON position, and the other inverters to the OFF position.

Type 2

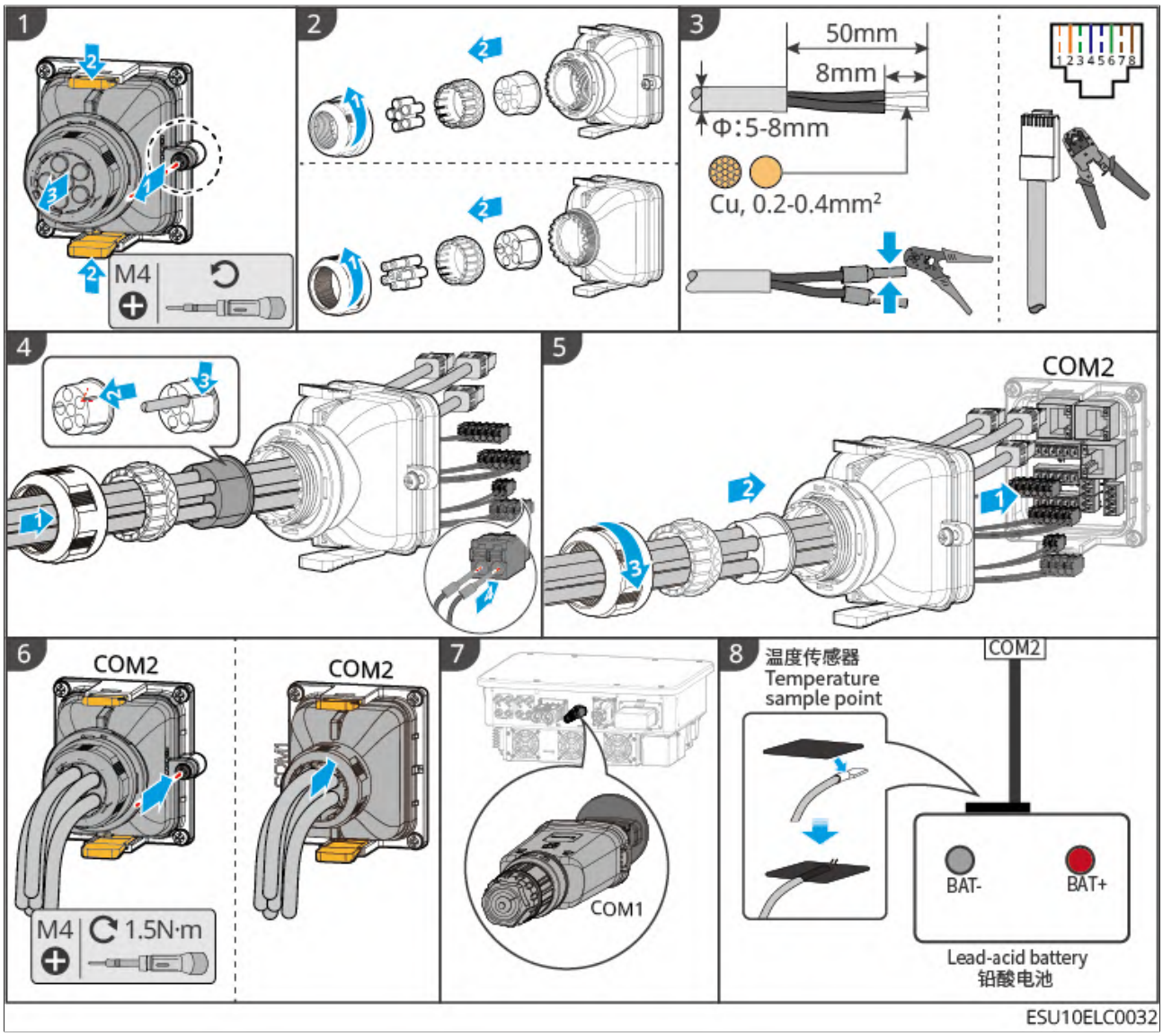


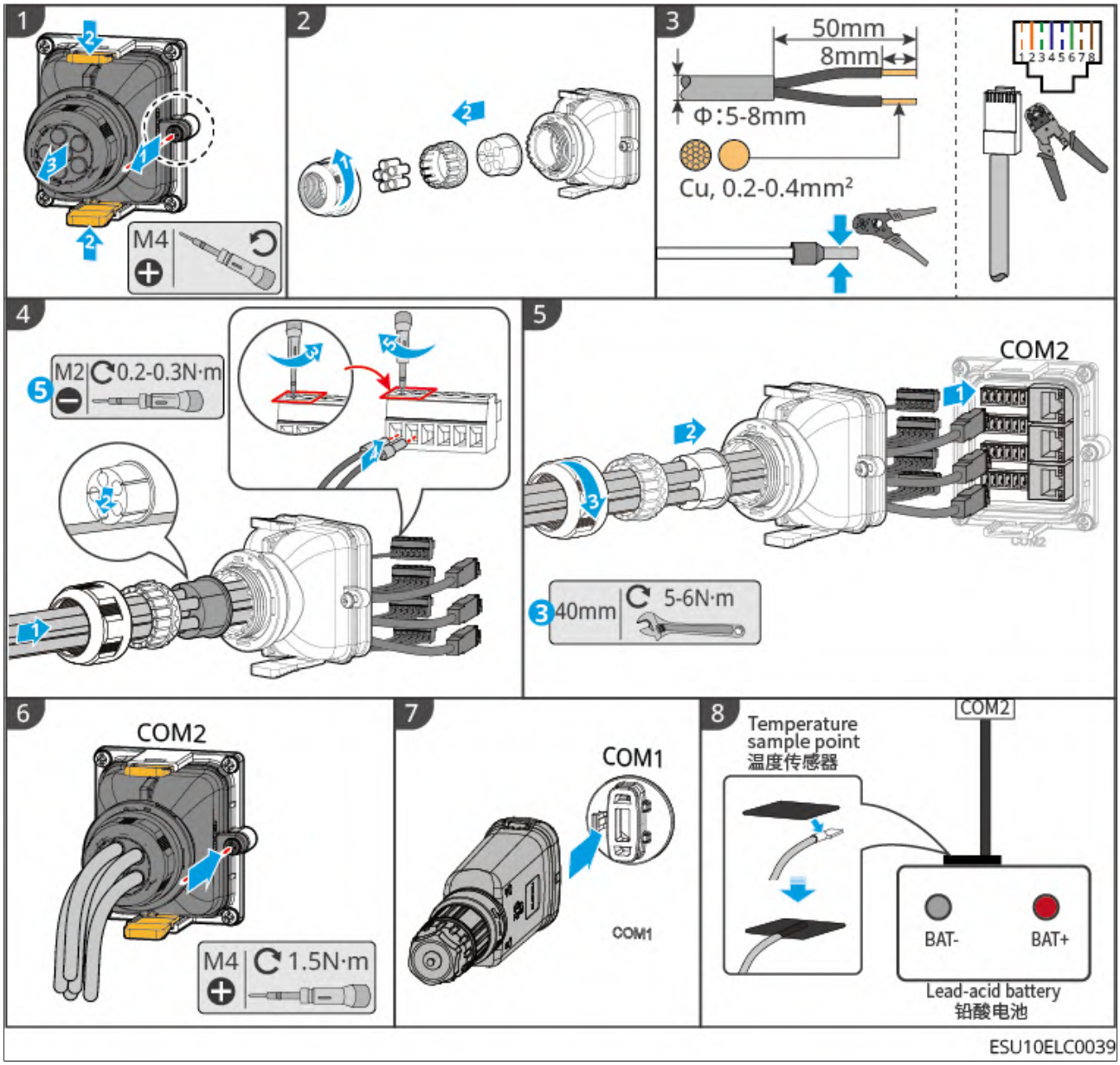
Port	Function	Description
1-2	CT	Connect the CT communication cable.
7-8	Remote Shutdown/NS Protection	Provides a signal control port to control Remote Shutdown of the device or to implement the NS Protection Function.
9-10	Reserved	-
11-12	GEN port	Used to control the generator. It can only be used in single-inverter scenarios.
13-18	Reserved	-
19-20	Meter communication	Supports connection to external smart meters via RS485 communication.
23-24	Lead-acid temperature measurement port	Used to connect the temperature sensing wire for lead-acid temperature measurement.
PAR-1	Parallel communication port 1	Charging pile communication port
PAR-2	Parallel communication port 2	When used for parallel communication, it supports using CAN communication to connect other inverters; use the BUS line to control the On/Off-grid status of each inverter in the parallel system.
CAN	Battery BMS Communication	When connecting lithium-ion batteries, it is used to connect the battery system BMS communication cable and supports CAN signal communication.

Communication Cable Connection Method

NOTICE

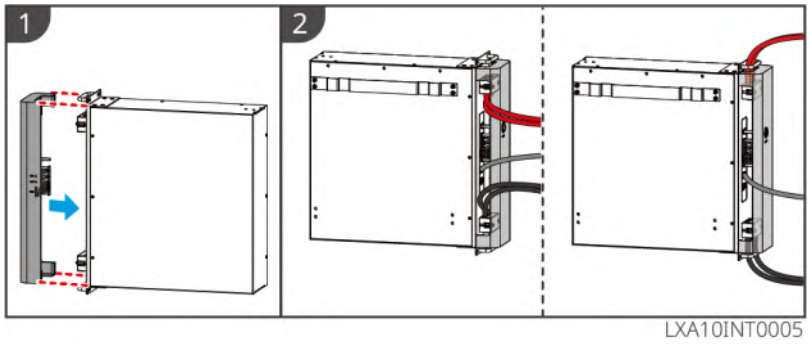
- The inverter supports connection to a mobile phone or web interface via Bluetooth, WiFi, LAN, and 4G communication modules (China version) to set device-related parameters, view device operation information and error information, and stay informed of the system status in a timely manner.
- In a single-unit system, install the WiFi/LAN Kit-20 or 4G Kit-CN-G20 communication module. When the system contains multiple inverters in Parallel Networking, the master inverter must be installed with the Ezlink3000 module for networking.



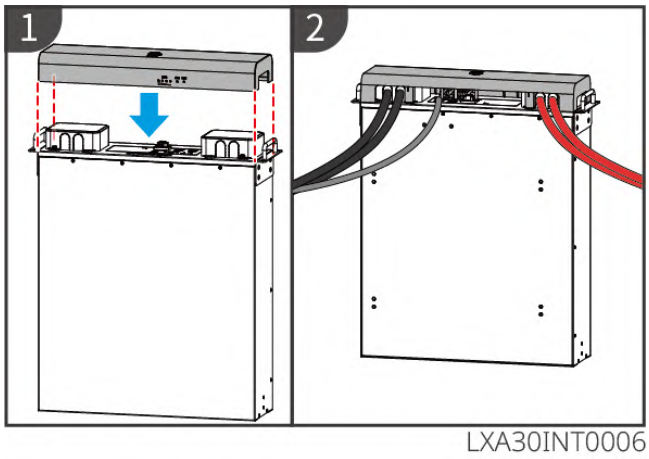


5.11 Install the Battery Protection Cover

5.11.1 LX A5.0-10

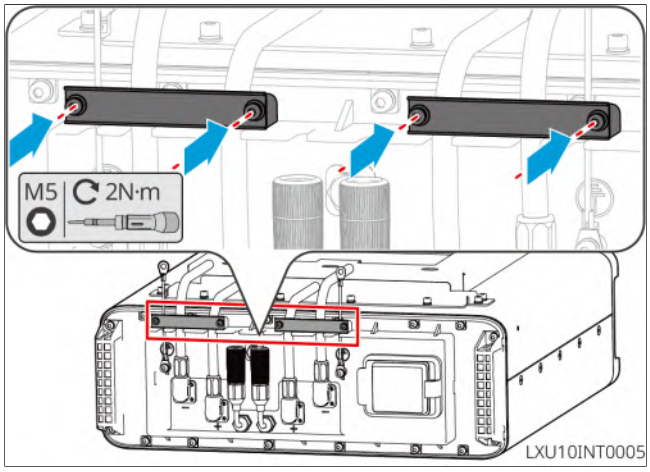


5.11.2 LX A5.0-30

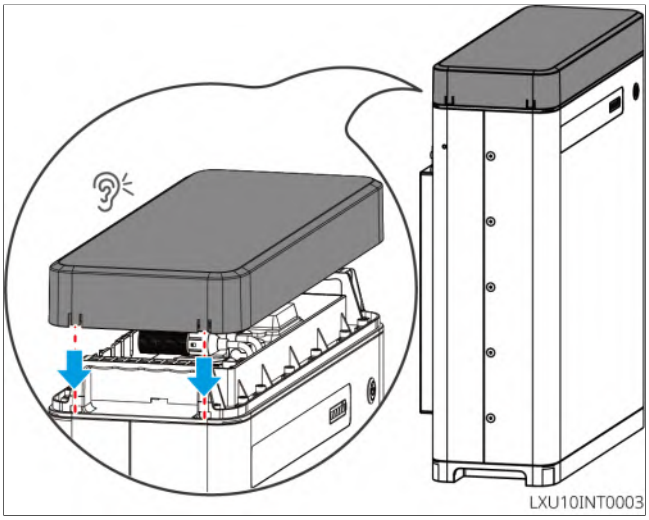


5.11.3 LX U5.4-L、LX U5.4-20

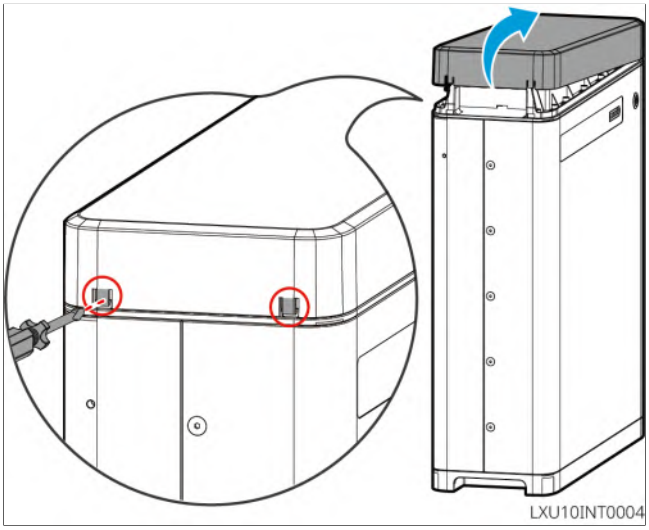
Step 1: Install the Wiring Harness Fixing Plate



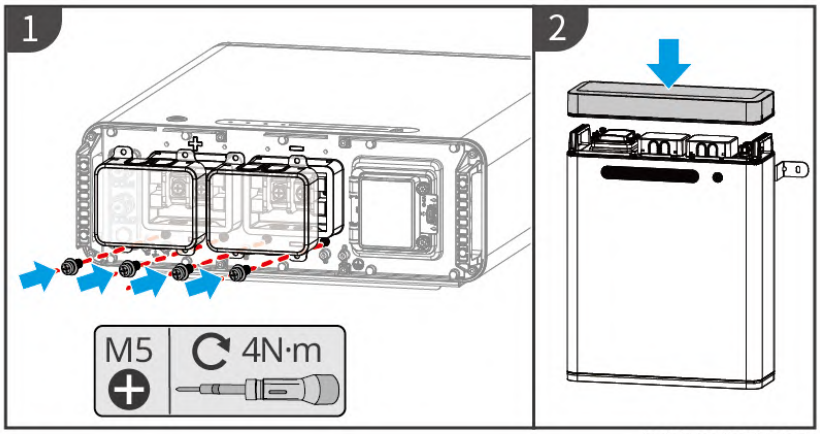
Step 2: Install the Plastic Top Cover



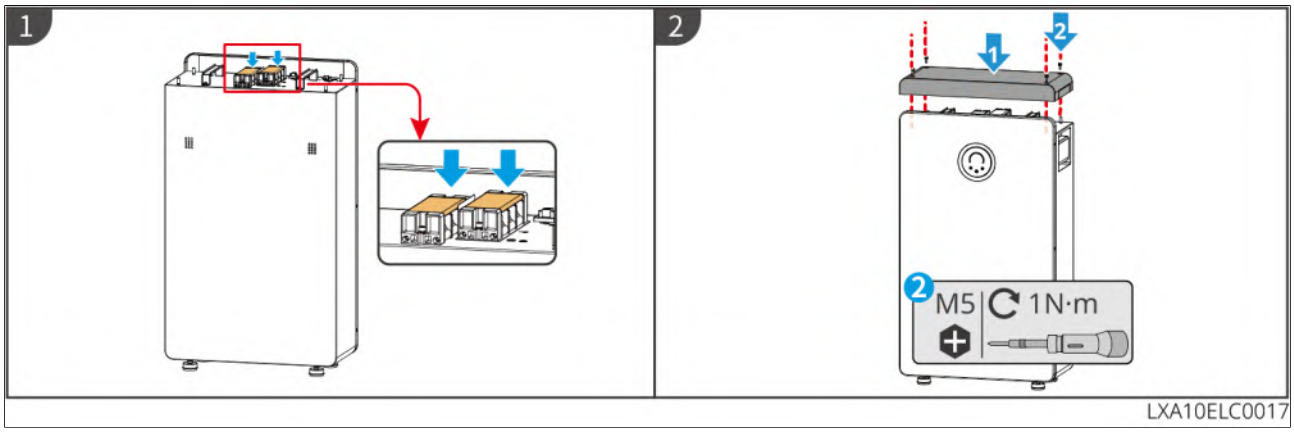
- If you need to remove the top cover, use a flat-head screwdriver to gently pry up the two clips on one side, and the plastic top cover can be removed.



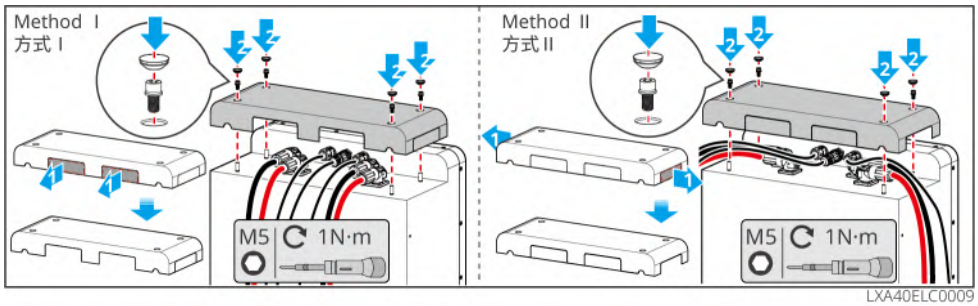
5.11.4 LX U5.0-30



5.11.5 GW14.3-BAT-LV-G10



5.11.6 GW16.1-BAT-LV-G10



6 System Trial Operation

6.1 Pre-Power-on Checks

No.	Check items
1	The equipment is firmly installed. The installation position is convenient for operation and maintenance. The installation space is conducive to ventilation and heat dissipation. The installation environment is clean and tidy.
2	The Protection earth wire, DC cables, AC cables, communication cables, and terminal resistors are connected correctly and securely.
3	Cable bundling complies with cable routing requirements, is reasonably distributed, and is free of damage.
4	Unused cable entry holes and ports must be reliably connected using the matching terminals provided in the accessories and have been sealed.
5	Ensure used cable entry holes are sealed.
6	The voltage and frequency at the grid connection point of the inverter 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 at the AC side within one minute after the master inverter is powered on at the AC side.
- Battery black start usage scenarios:
  - The inverter needs to be activated by the battery.
  - When there is no inverter, battery charge/discharge management and other operations need to be performed.
- After the battery system starts, ensure that communication between the inverter and the battery system is normal within 15 minutes. If the inverter and the battery system cannot communicate normally, the battery system switch will automatically open and the battery system will be powered off.
- When multiple battery clusters are connected in parallel in the system, starting any one battery will start all batteries.
  - GW14.3-BAT-LV-G10: To power up again after the battery is powered down, restart each battery one by one, or wait for 15 minutes and then start any one battery to start 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 less than or equal to 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: Close the battery system integrated circuit breaker and briefly press the battery system button.
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. (Only for models without a screen) Close the off-grid control switch of the inverter.

Battery Black Start

1. Close the battery system switch.
2. Start 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 forces discharge to activate the inverter.
   b. GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10: Press and hold the battery multi-function button for 1-4 seconds to start the battery system; forced battery discharge activates the inverter.
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.

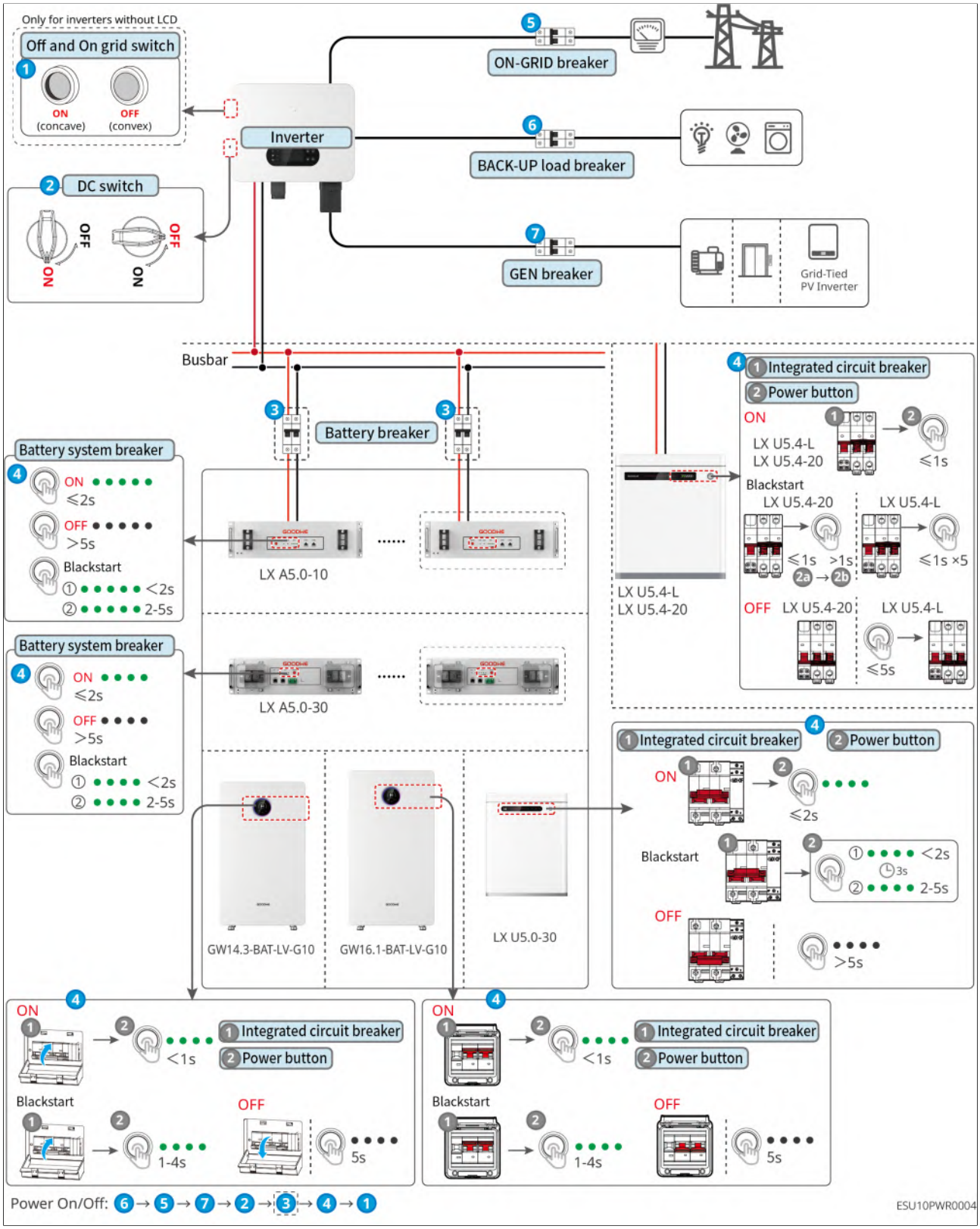


Figure46 Single-unit system

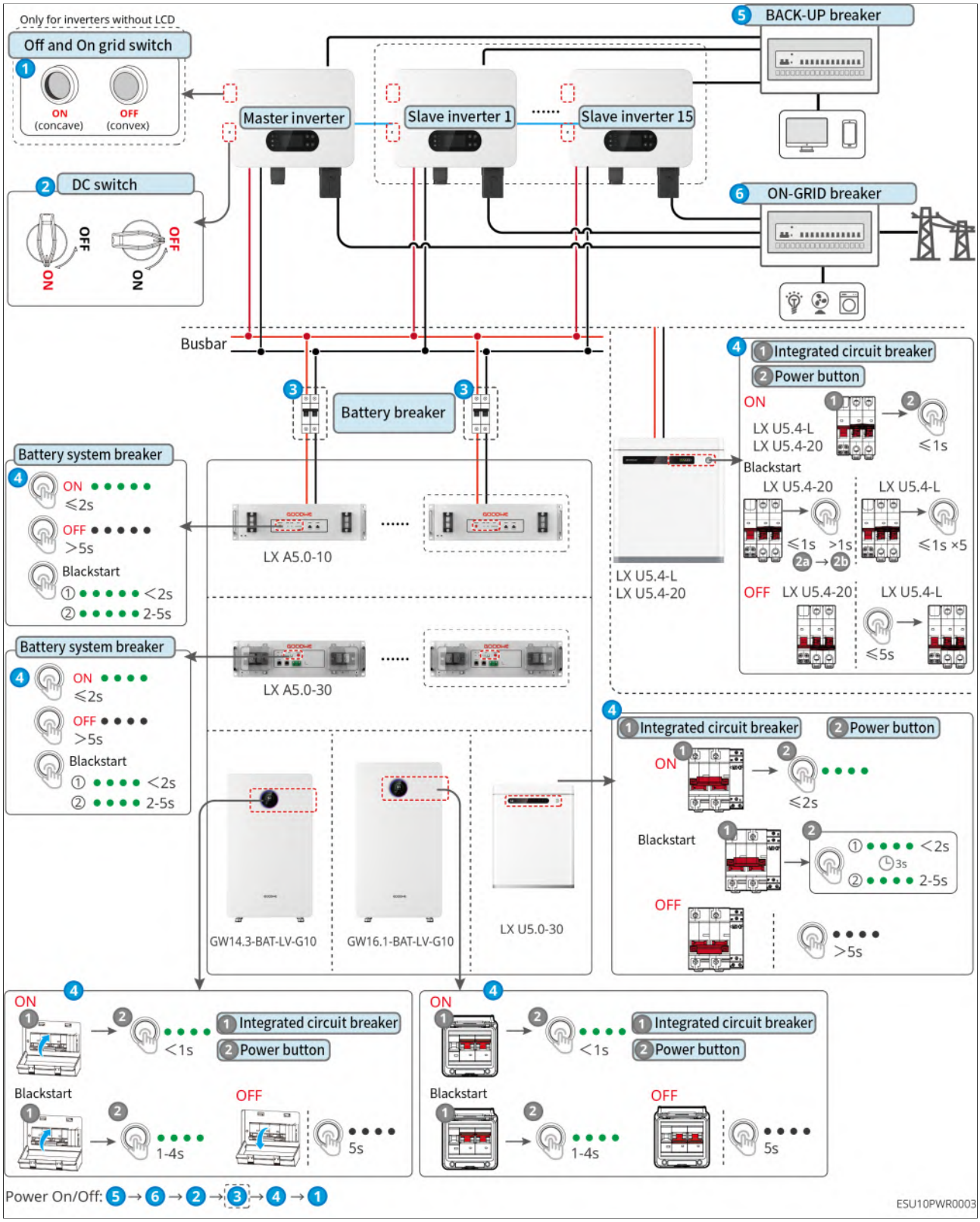


Figure47 Parallel system

6.3 Introduction to Indicator Lights

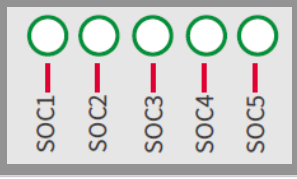
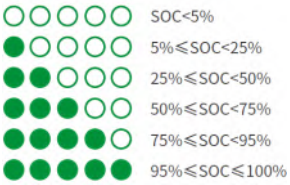
6.3.1 Inverter Indicator Light

Indicator light	Status	Description
		The inverter is starting up and is in self-test mode.
		The inverter is operating normally in grid-connected 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 is supplying power normally.
		Grid normal; the inverter BACK-UP port is supplying power normally.
		The BACK-UP port has no power supply.
		The inverter monitoring module is resetting.
		The inverter has not established a connection with the communication terminal.
		Communication failure between the communication terminal and the cloud server.
		Inverter monitoring is normal.
		The inverter monitoring module has not started.

6.3.2 Battery Indicator Light

6.3.2.1 LX A5.0-10

Normal state

SOC indicator 	RUN 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.
	Green flashes 2 times/s	The battery system is in the idle state.
	Steady green	The battery system is in the charging state.
The highest SOC indicator flashes once per second. • 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.	Steady green	The battery system is in the discharging state.

Abnormal state

ALM indicator	Battery system status	Description
Red flashes once per second.	The battery system has an alarm.	After the battery system generates an alarm, it will perform a self-check. Wait for the battery system self-check to complete, and the battery system will enter either the normal working state or the fault state.

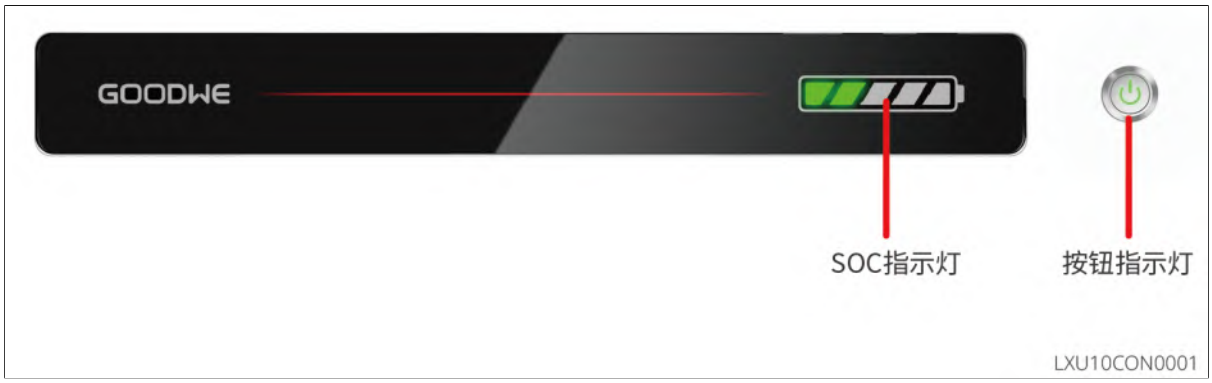
ALM indicator	Battery system status	Description
Solid red	The battery system has a fault.	Determine the type of fault that occurred based on the display pattern of the SOC indicator, and handle it according to the methods recommended in the fault handling chapter.

6.3.2.2 LX A5.0-30、LX U5.0-30

Indicator light		System status
	SOC indicator light shows no green	SOC=0%
	The first SOC indicator light shows green.	0% < SOC≤25%
	The second SOC indicator light shows green.	25% < SOC≤50%
	The third SOC indicator light shows green.	50% < SOC≤75%
	The fourth SOC indicator light shows green.	75% < SOC≤100%
RUN light	Steady 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 an alarm occurs in the battery system, it will perform a self-check. Wait for the self-check to finish, then it will transition to normal operating status or fault status.

Indicator light		System status
ALM indicator	Solid red	Determine the type of fault that occurred based on the display pattern of the SOC indicator, and handle it according to the methods recommended in the fault handling chapter.

6.3.2.3 LX U5.4-L

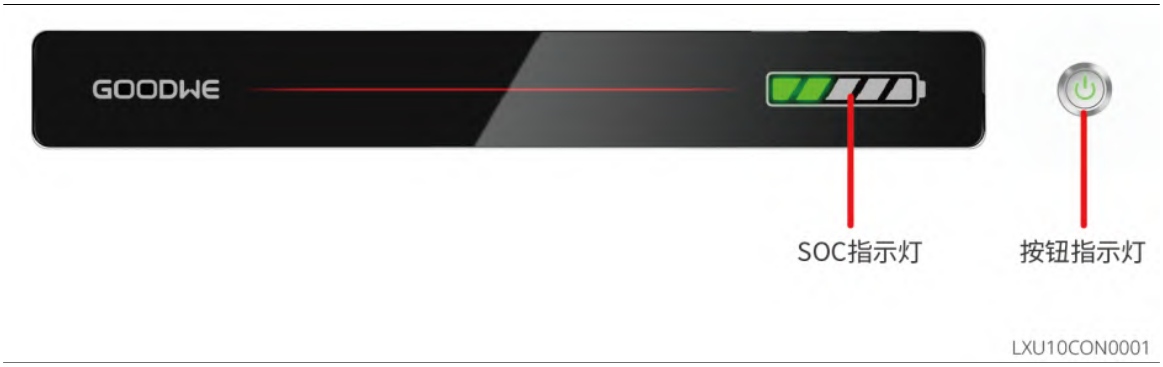


Normal state

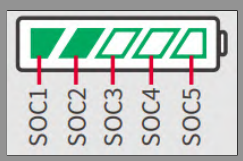
SOC indicator	Button indicator light	Battery system status
The SOC indicator indicates the battery system state of charge. SOC<5% 5%≤SOC<25% 25%≤SOC<50% 50%≤SOC<75% 75%≤SOC<95% 95%≤SOC≤100%	Green flashing 1 time/s	The battery system is in standby state.

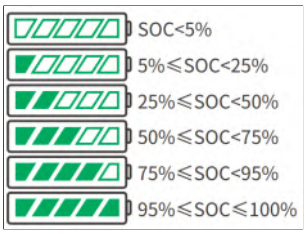
The highest SOC indicator flashes once per second, and the other green indicators remain solid on. • When 5% ≤ SOC < 25%, SOC1 flashes. • When 25% ≤ SOC < 50%, SOC2 flashes. • When 50% ≤ SOC < 75%, SOC3 flashes. • When 75% ≤ SOC < 95%, SOC4 flashes. • When 95% ≤ SOC ≤ 100%, SOC5 flashes.	Steady green	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 once per second, and the other green indicators remain solid 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.	Steady green	The battery system is operating normally.

Abnormal state

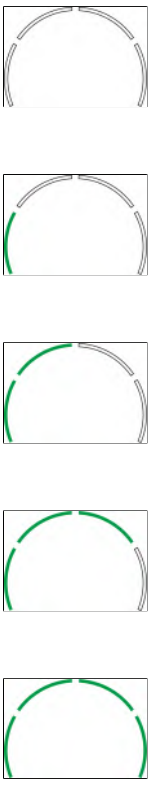
Button indicator light 	Battery system status	Description
The red light flashes once per second.	The battery system has an alarm.	Determine the type of fault that occurred based on the display pattern of the SOC indicator, and handle it according to the methods recommended in the fault handling chapter.

Solid red	The battery system has a fault.	Determine the type of fault that occurred based on the display pattern of the SOC indicator, and handle it according to the methods recommended in the fault handling chapter.

6.3.2.5 GW14.3-BAT-LV-G10

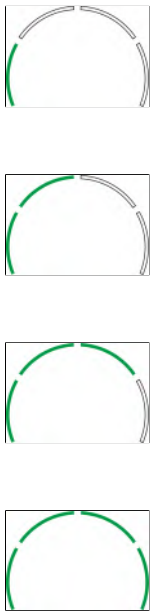
Normal state

Indicator Light Name	Indicator Light Status		Corresponding Status of Other Lights	System status
SOC indicator		SOC indicator light solid green	/	SOC=0% 0% < SOC≤25% 25% < SOC≤50% 50% < SOC≤75% 75% < SOC≤100%

Indicator Light Name	Indicator Light Status		Corresponding Status of Other Lights	System status
		SOC indicator light flashing green		The battery system is in the discharging state.
Operation indicator light + touch button		Solid white	Blue-purple Breathing Light	System operating normally
		Flashing white	Blue-purple chasing light	System initializing

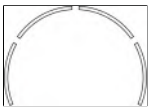
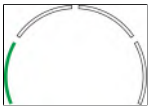
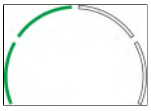
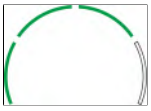
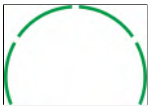
Indicator Light Name	Indicator Light Status		Corresponding Status of Other Lights	System status
Communication light		Solid white	/	PCS communication normal

Abnormal state

Indicator Light Name	Indicator Light Status		Corresponding Status of Other Lights	System status
SOC indicator		SOC indicator light solid green	Flashing red Off Solid red	Determine the type of fault that occurred based on the display pattern of the SOC indicator, and handle it according to the methods recommended in the fault handling chapter.
Communication light		Off	/	PCS Comm Loss
System alarm light		Solid white	/	System Alarm and undervoltage fault levels 2, 3, and 4

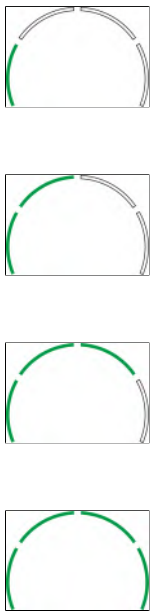
6.3.2.6 GW16.1-BAT-LV-G10

Normal state

Indicator Light Name	Indicator Light Status		Corresponding Status of Other Lights	System status
SOC indicator	  	SOC indicator light solid 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 the discharging state.

Indicator Light Name	Indicator Light Status		Corresponding Status of Other Lights	System status
Operation indicator light + touch button		Solid white	Blue-purple Breathing Light	System operating normally
		Flashing white	Blue-purple chasing light	System initializing
Communication light		Solid white	/	PCS communication normal

Abnormal state

Indicator Light Name	Indicator Light Status		Corresponding Status of Other Lights	System status
SOC indicator		SOC indicator light solid green	Flashing red Off Solid red	Determine the type of fault that occurred based on the display pattern of the SOC indicator, and handle it according to the methods recommended in the fault handling chapter.
Communication light		Off	/	PCS Comm Loss
System alarm light		Solid white	/	System alarm and undervoltage fault levels 2, 3, 4

6.3.3 Mix Parallel Unit Indicator Light

Indicator light	Status	Description
	Steady green	System operating normally
	Green flashing	System initializing
	Green off	System Fault
	Steady green	Communication normal

Indicator light	Status	Description
	Green off	Communication lost
	Solid red	System Fault
	Red off	System normal

6.3.4 Smart Meter Indicator Light

6.3.4.1 GMK110

Type	Status	Description
Power LED	Steady on	Meter is powered on
	Off	Meter is powered off
Communication LED	Flashing	Meter communication is normal
	Off	Meter communication is abnormal or not communicating

6.3.4.2 GM330

Type	Status	Description
Power LED	Steady on	Meter is powered on, no RS485 communication
	Flashing	Meter is powered on, RS485 communication is normal
	Off	Meter is powered off
Communication LED	Off	Reserved
	Flashing	Press and hold the Reset button for ≥5s, the power LED and buy/export energy LED flash: meter reset
	Steady on	Buying electricity from the grid

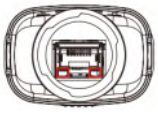
Type	Status	Description
Buy/export energy LED	Flashing	Export energy to the grid
	Off	Neither buying electricity nor exporting energy
	Reserved	

6.3.5 Smart Communication Stick Indicator Light

6.3.5.1 WiFi/LAN Kit-20

Indicator light	Status	Description
Power LED		Steady on: Smart communication stick is powered on.
		Off: Smart communication stick is not powered on
Communication LED		Steady on: Communication is normal in WiFi mode or LAN mode.
		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 in software reset or not powered on.

Indicator light	Color	Status	Description
	Green	Steady on	100Mbps wired network connection is normal.

Indicator light	Color	Status	Description
LAN port communication LED 		Off	• Network cable Not Connected. • 100Mbps wired network connection abnormal. • 10Mbps wired network connection normal.
	Yellow	Steady on	10/100Mbps wired network connection normal, no communication data transmission/reception.
		Flashing	Communication data transmission/reception in progress.
		Off	Network cable Not Connected.

Button	Description
Reload	Press and hold for 0.5-3 seconds, the Smart Communication Stick will reset.
	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 light	Status	Description
Power LED		Steady on: Smart communication stick is powered on.
		Off: The Smart Communication Stick is not powered on.
Communication LED		Steady on: The Smart Communication Stick is connected to the server, 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.

Indicator light	Status	Description
		Six flashes: The communication between the Smart Communication Stick and the inverter is disconnected.
		Off: Smart communication stick is in software reset or 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
Power LED	Blue		Blinking = communication stick is working normally.
			Off = communication stick is powered off.
Communication LED	Green		Steady on = communication stick is connected to the server.
			Double flash = communication stick is Not Connected to the router.
			Four flashes = 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 restore factory settings. Quick double-click to enable the Bluetooth signal (only lasts for 5 minutes).

7 System Commissioning

7.1 Overview of Commissioning Methods

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

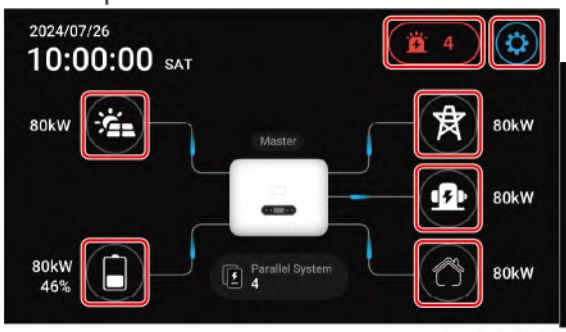
7.2 Configuration via the LCD

7.2.1 Introduction to LCD

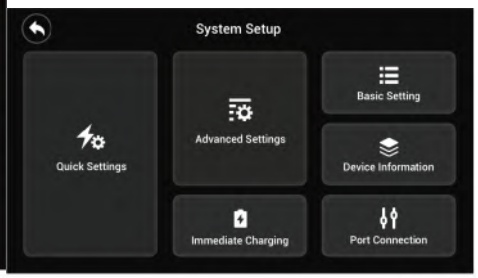
Through the LCD screen, users can:

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

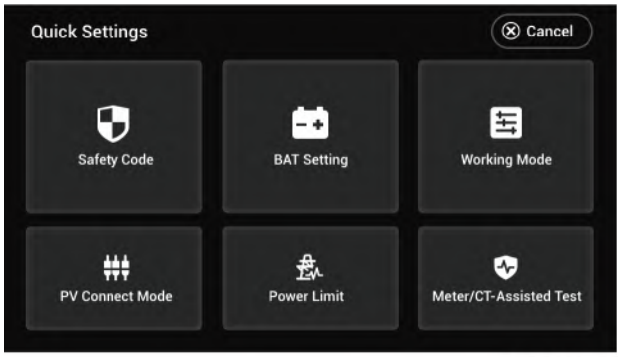
LCD Interface Introduction
The LCD supports two operation modes: touch and buttons.



ESU10DSC0006



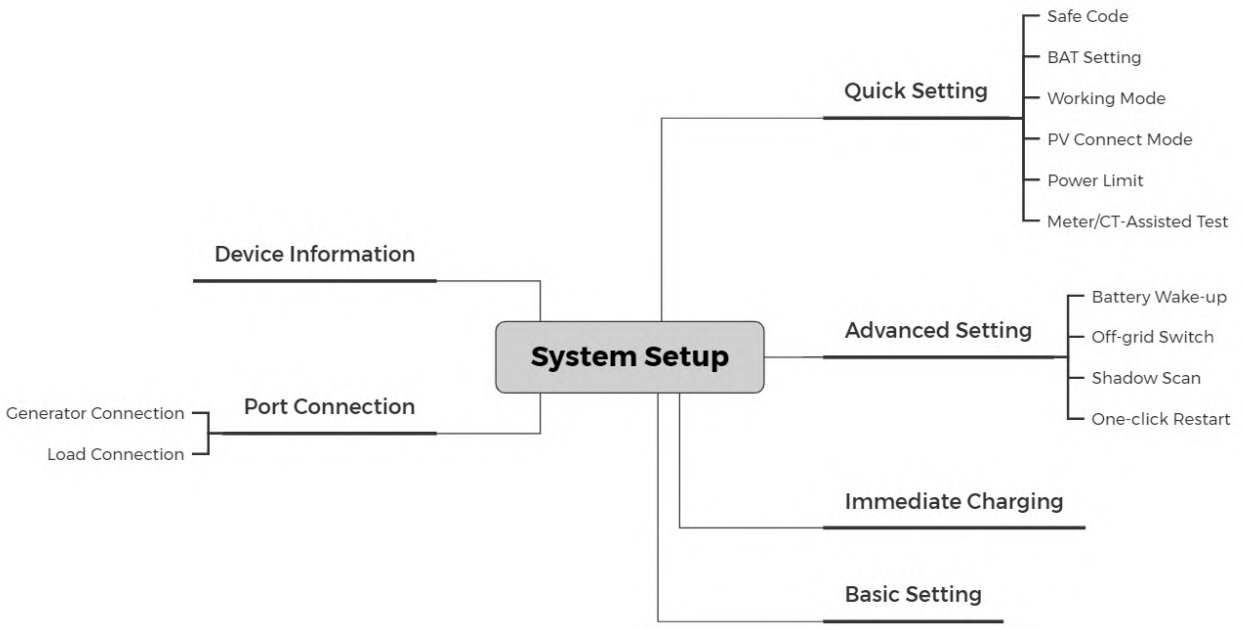
ESU10CON0007



ESU10CON0008

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

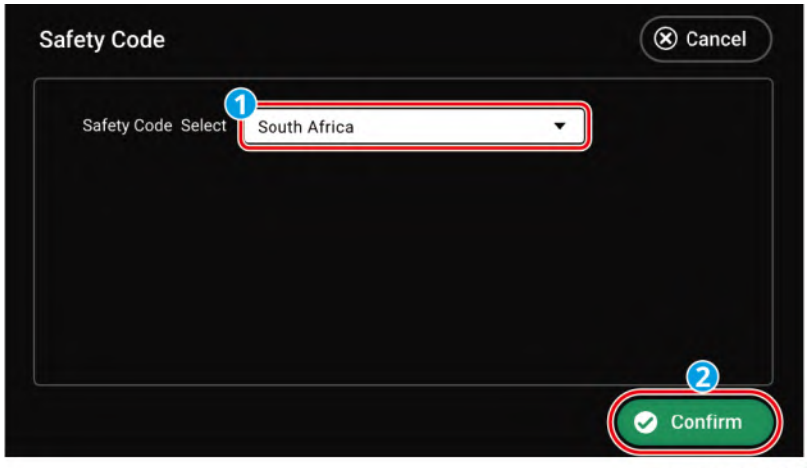
LCD Settings Interface Structure



7.2.2 Quick Settings

Set Safety Code

1. From the main interface, click ⚙ > Quick Settings > Safe Code to enter the parameter settings interface.
2. Please set the parameters based on the actual situation.
3. After the settings are completed, please click Confirm. Once the interface prompts Confirm OK, the parameter settings are successful.



ESU10CON0009

Parameter Name	Safety Code	Description

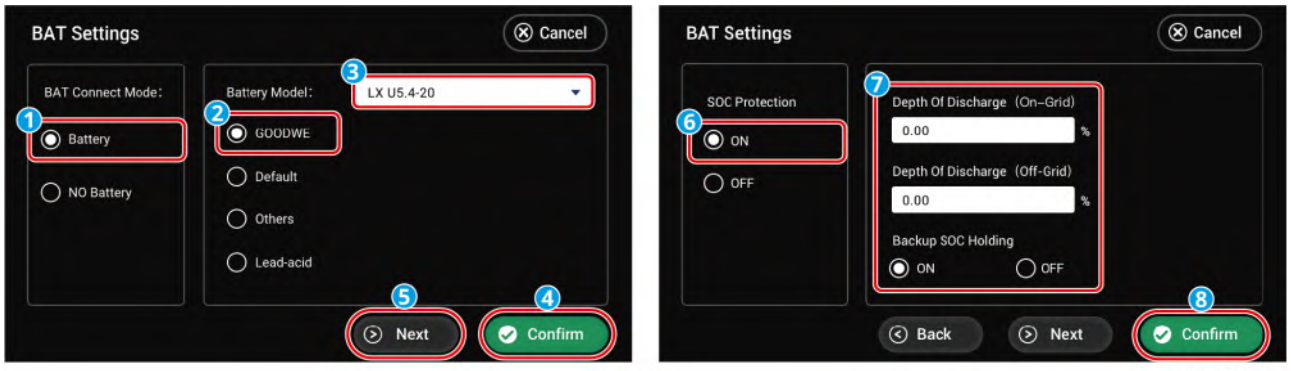
Safety Code select	South Africa	Select the corresponding safety code based on the country or region where the device is located.
	Pakistan	
	Argentina	
	Philippines	
	60Hz Default	
	50Hz Default	
	IEC61727 60Hz	

Set battery parameters.

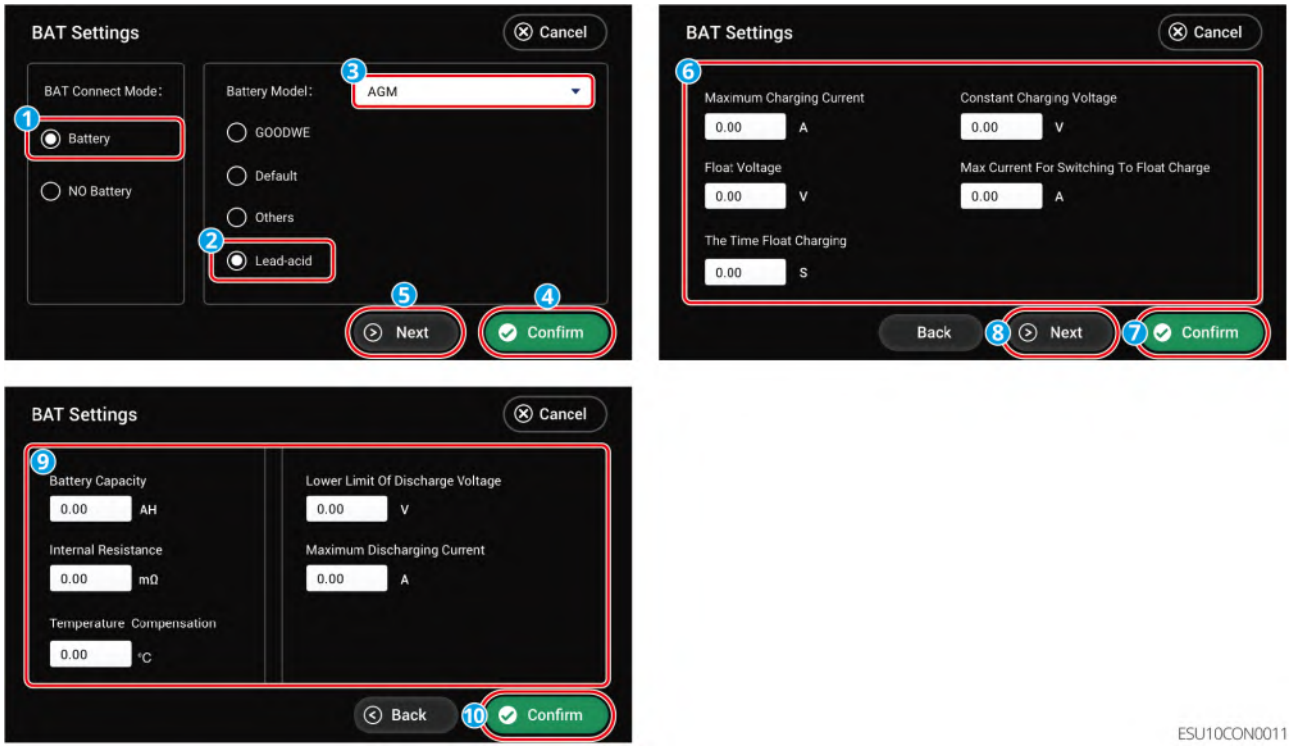
1. From the main interface, click ⚙ > Quick Settings > BAT Setting to enter the parameter setting interface.
2. Please set the parameters based on the actual situation.
3. After the settings are completed, please click Confirm. Once the interface prompts Confirm OK, the parameter settings are successful.

NOTICE

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



ESU10CON0010



General Data Settings

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

	Lead acid	If the system is connected to a lead-acid battery, select Lead acid, and then select the correct lead-acid type. Currently supported: GEL, AGM, Flooded.
NO Battery	No battery is connected in the system.	
BAT Setting	Set 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)	The maximum discharge depth Protection point of the battery when the inverter is operating in grid-connected mode.
Depth Of Discharge (Off-Grid)	The maximum discharge depth Protection point of the battery when the inverter is operating in off-grid mode.
Backup SOC Holding	To ensure that the battery SOC is sufficient to maintain normal system operation in off-grid mode, when the system operates in grid-connected mode, the battery will be charged by the grid or PV to the set SOC Protection value.

Lead-acid battery parameter settings

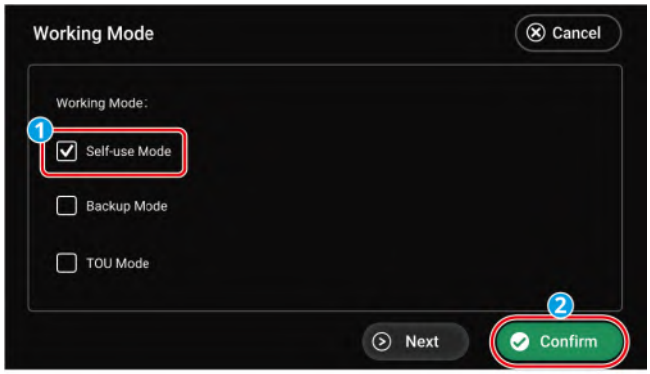
Parameter Name	Description
Maximum Charging Current	Battery charging defaults to constant charge mode; The maximum charging voltage and maximum Charging Current in this mode need to be set; please set them according to the battery technical parameters.
Constant Charging Voltage	
Float Voltage	
The Time Float Charging	

Maximum Current For Switch To Float Charge	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 changes from constant charge mode to float charge mode. Float Voltage is the maximum battery charging voltage in float charge mode. Please set it according to the battery technical parameters.
Battery Capacity	Set the battery capacity according to the parameters of the battery actually connected.
Internal Resistance	Set the internal resistance of the battery according to the battery technical parameters.
Temperature Compensation	By default, for every 1°C increase above 25°C, the charging voltage upper limit is reduced by 3mV. In practice, please set it according to the battery technical parameters.
Lower Limit Of Discharge Voltage	Please set it according to the battery technical parameters.
Maximum Discharging Current	Please set it according to the battery technical parameters. The larger the discharge current, the shorter the battery operating time.

Set working mode

1. From the main interface, click ⚙ > Quick Settings > Working Mode to enter the parameter setting interface.
2. Please set the parameters based on the actual situation.
3. After the settings are completed, please click Confirm. Once the interface prompts Confirm OK, the parameter settings are successful.

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



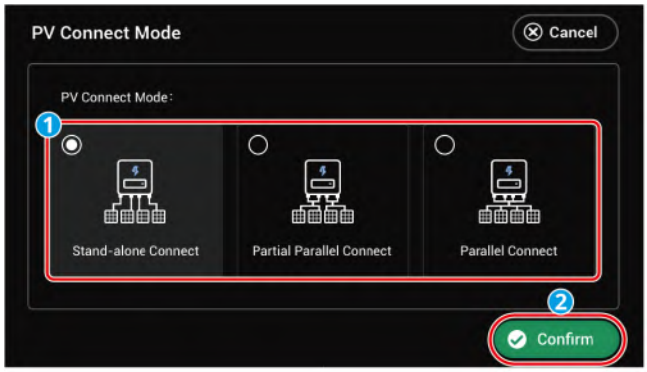
ESU10CON0012

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 at the same time. Please choose 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 electricity from the grid.
	Rated Power	The percentage of the power purchased from the grid to the inverter Rated Power.
TOU Mode	Time	Within the Start Time and End Time, the battery charges or discharges according to the set charge/discharge mode and Rated Power.
	Charge/Discharge	Set to charging or discharging according to actual requirements.
	Power (%)	The percentage of the charging or discharging power to the inverter Rated Power.
	Bat (%)	When the battery SOC reaches the set SOC, charging stops. To set the SOC at which battery discharge stops, 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. From the main interface, click ⚙ > Quick Settings > PV Connect Mode to enter the parameter setting interface.

2. Please set the parameters based on the actual situation.
3. After the settings are completed, please click Confirm. Once the interface prompts Confirm OK, the parameter settings are successful.

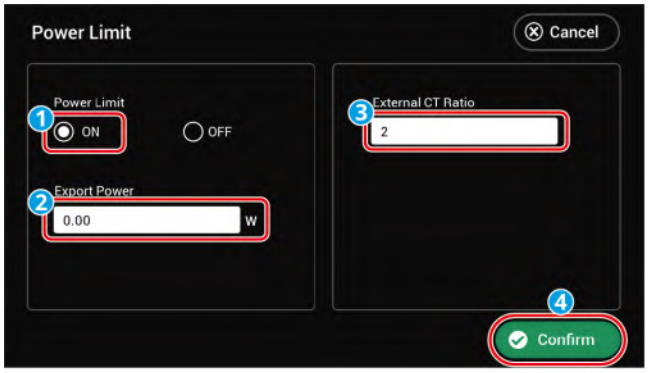


ESU10CON0015

Parameter Name	Description
Stand-alone Connect	PV strings are connected to the inverter-side MPPT ports on a one-to-one basis.
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 external PV strings are connected to the inverter-side PV input ports, one PV string is connected to multiple PV input ports.

Set On-Grid Power Limit

1. From the main interface, click ⚙ > Quick Settings > Power Limit to enter the parameter setting interface.
2. Please set the parameters based on the actual situation.
3. After the settings are completed, please click Confirm. Once the interface prompts Confirm OK, the parameter settings are successful.

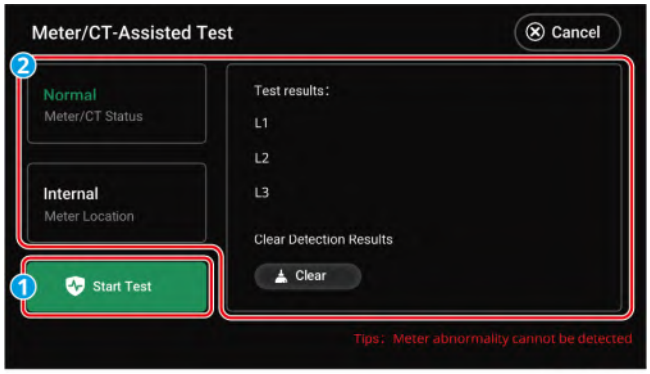


ESU10CON0016

Parameter Name	Description
Power Limit	According to the grid standard requirements of some countries or regions, enable this function when Output Power Limit is required.
Export Power	Set according to the actual Max. Power that can be fed into the grid.
External CT Ratio	Set to the ratio of the external CT primary-side current to the secondary-side current. • Built-in meter or GMK110: no need to set the CT ratio. The default CT ratio is 120A/40mA. • GM330: CT can be purchased from GoodWe or obtained separately. CT ratio requirement: nA/5A • nA: CT primary-side input current, where n ranges from 200 to 5000. • 5A: CT secondary-side output current.

Meter/CT Auxiliary Detection

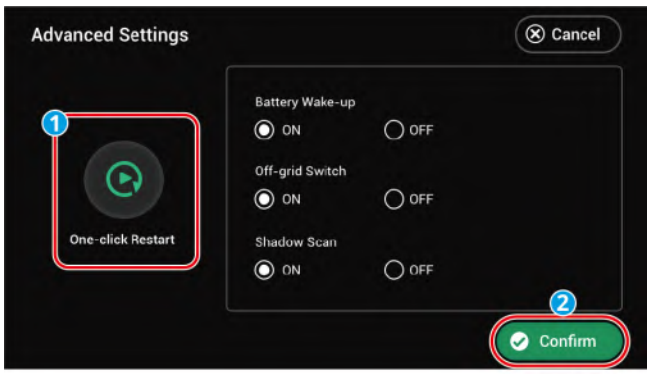
1. From the main interface, click > Quick Settings > Meter/CT Assisted Test to enter the parameter setting interface.
2. Tap Start Test to start the test. After the test is completed, determine the test result according to the interface prompts.



ESU10CON0026

7.2.3 Set Advanced Parameters

1. From the main interface, click > Advanced Settings to enter the parameter setting interface. Enter the initial password: 1111.
2. Please set the parameters based on the actual situation.
3. After the settings are completed, please click Confirm. Once the interface prompts Confirm OK, the parameter settings are successful.



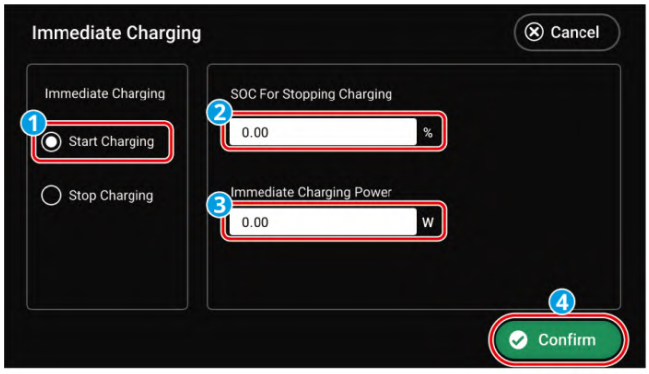
ESU10CON0020

Parameter Name	Description
One-click restart	Using this function, the inverter can be restarted quickly.
Battery Wake-up	When enabled, after the battery shuts down due to under-voltage Protection, the battery can be woken up. 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 at the battery port is approximately 60V.

Off-grid Switch	In off-grid mode, the off-grid control switch controls the enabling and disabling of the inverter's off-grid function. In on-grid mode, this function does not take effect. The switch is in the ON state by default, and the off-grid function is available at this time. 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, the off-grid Overload time can be cleared, and off-grid output can be restarted.
Shadow Scan	When photovoltaic panels are severely shaded, enabling the shadow scanning function can optimize the inverter's power generation Efficiency.

7.2.4 Set Immediate Charging

1. From the main interface, click > Immediate Charging to enter the parameter setting interface.
2. Please set the parameters based on the actual situation.
3. After the settings are completed, please click Confirm. Once the interface prompts Confirm OK, the parameter settings are successful.



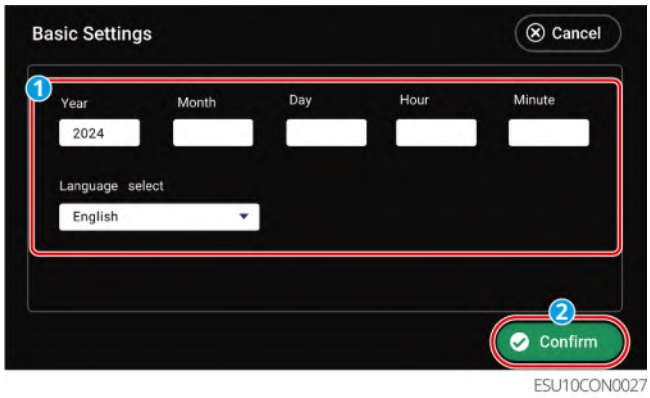
ESU10CON0021

Parameter Name	Description
Immediate Charging	After being enabled, the grid will immediately charge the battery. It takes effect only once. Please choose to enable or stop it according to actual needs.
SOC For Stopping Charging	When Immediate Charging is enabled, when the battery SOC reaches the charging cutoff SOC, charging of the battery will stop.

Immediate Charging Power	When Immediate Charging is enabled, the percentage of the charging power to the inverter's 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. From the main interface, click ⚙ > Basic Settings to enter the parameter setting interface.
2. Please set the parameters based on the actual situation.
3. After the settings are completed, please click Confirm. Once the interface prompts Confirm OK, the parameter settings are successful.

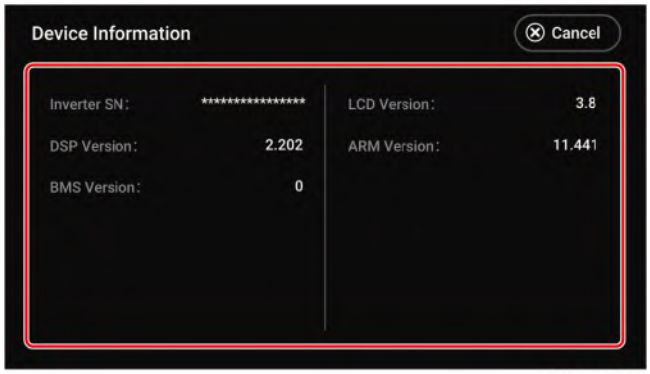


ESU10CON0027

7.2.6 View Device Information

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

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



ESU10CON0028

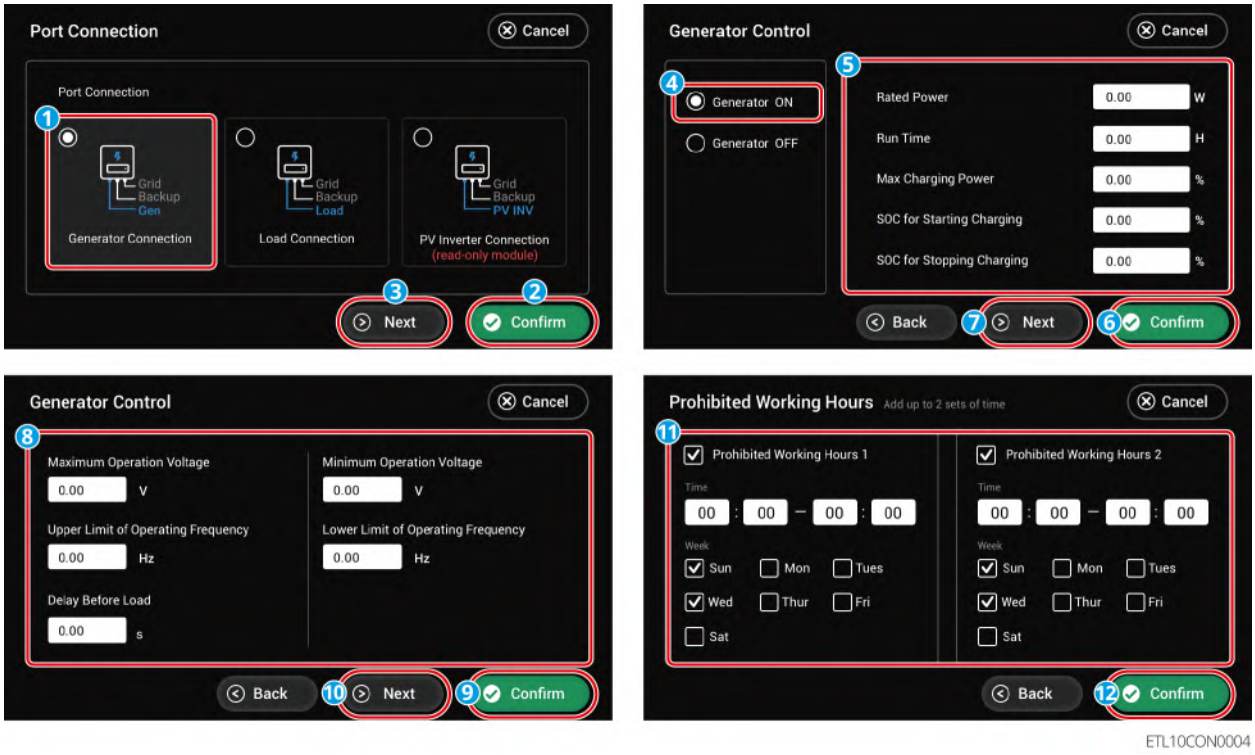
7.2.7 Set Port Connection

NOTICE
In microgrid mode, if you need to set parameters related to the grid-connected inverter, please connect to the APP to configure.

Set Port Connection to Generator

1. From the main interface, click ⚙ > Port Connection to enter the parameter setting interface.
2. Please set the parameters based on the actual situation.
3. After the settings are completed, please click Confirm. Once the interface prompts Confirm OK, the parameter settings are successful.

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



ETL10CON0004

No.	Parameter Name	Description
1	Generator ON/OFF	Controls the start/stop of the generator. Only applicable to generators that support dry contact.
2	Rated Power	The Rated Power of the generator.
3	Run Time	The continuous running time of the generator. After the set running time is exceeded, the generator will shut down automatically. This function only takes effect 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 for the generator to stop 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's operating voltage.

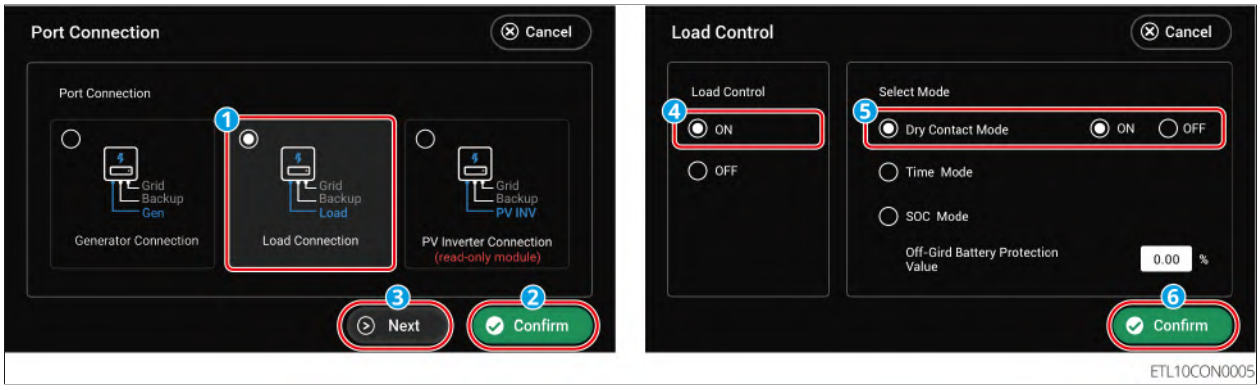
8	Minimum Operation Voltage	Set the lower limit of the generator's operating voltage.
9	Upper Limit Of Operating Frequency	Set the upper limit of the generator's operating frequency.
10	Lower Limit Of Operating Frequency	Set the lower limit of the generator's operating frequency.
11	Delay Before Load	The no-load preheating time before the generator is loaded.
12	Prohibited Working Hours	Please set the generator's prohibited operating time according to actual conditions.

Set Port Connection for Load Control

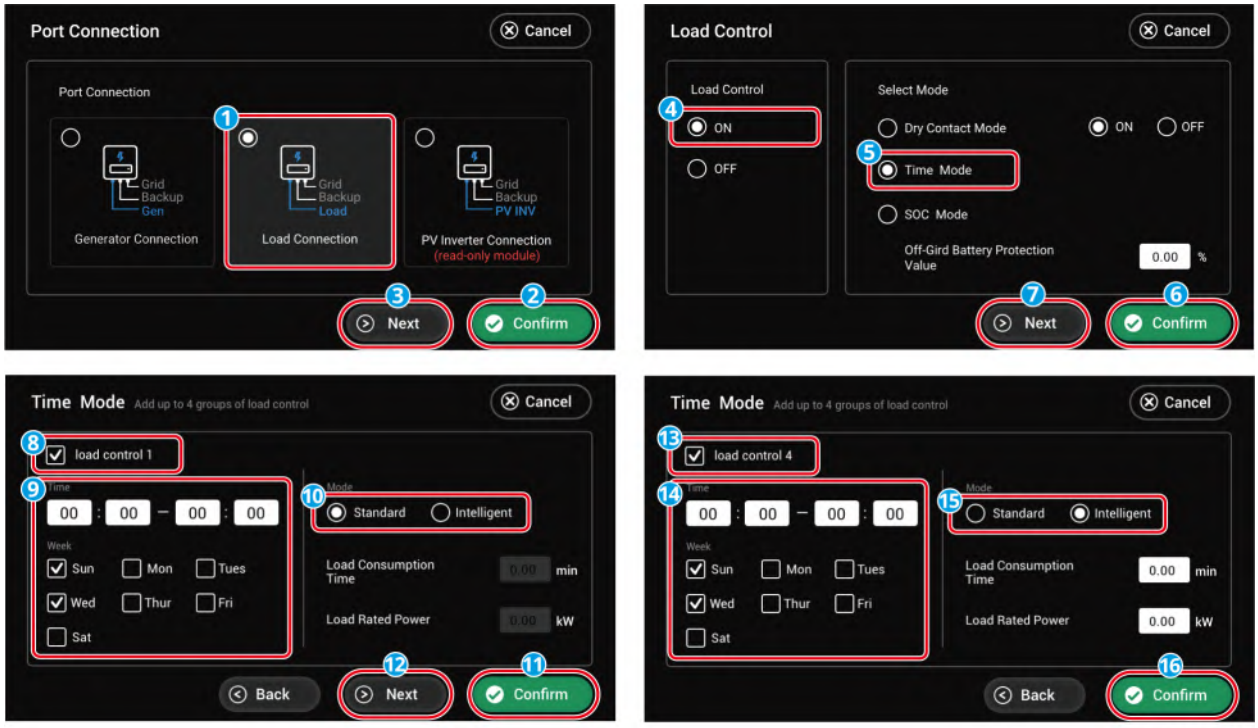
1. From the main interface, click > Port Connection to enter the parameter setting interface.
2. Please set the parameters based on the actual situation.
3. After the settings are completed, please click Confirm. Once the interface prompts Confirm OK, the parameter settings are successful.

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

Dry Contact Mode

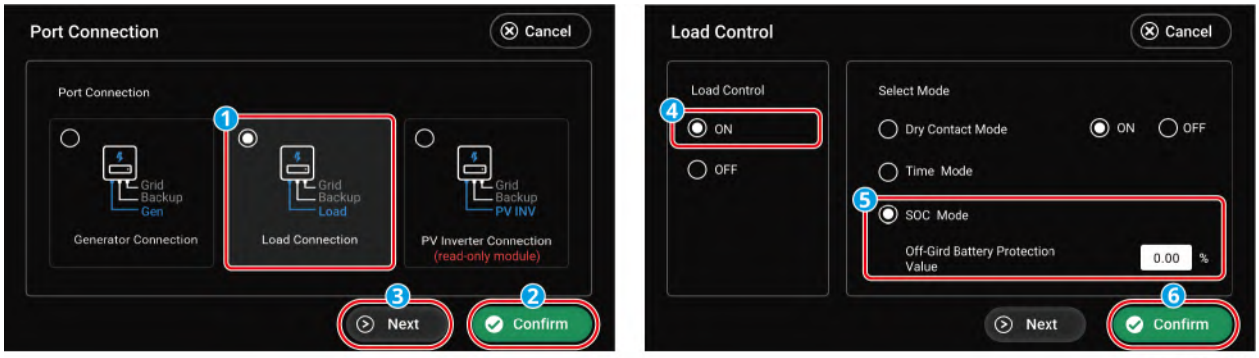


Time Mode



ETL10CON0007

SOC Mode



ETL10CON0006

No.	Parameter Name	Description
1	Load Control ON/OFF	Set load control function on/off
2	Dry Contact Mode	ON: When the switch state is set to ON, power supply to the load starts. OFF: When the switch state is set to OFF, power supply to the load stops.
3	Time Mode	Within the set time period, the load automatically powers on or off. Standard Mode or Smart Mode can be selected.
4	Load Control 1	Set the load control time for Group 1. A total of 4 groups can be set.

5	Mode: Standard/Intelligent	Standard Mode: The load will be powered 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, power supply to the load starts.
6	Load Consumption Time	The minimum operating time after the load is turned on, to prevent the load from switching frequently due to energy fluctuations. Only applicable to Smart Mode.
7	Load Rated Power	When the surplus energy generated by PV exceeds this load Rated Power, power supply to the load starts. Only applicable to Smart Mode.
8	SOC Mode	The inverter has a built-in relay dry contact control port, through which the relay controls whether to supply power to the load.
9	Off-Grid Battery Protection Value	In off-grid mode, if an Overload is detected on the BACK-UP terminal or the battery SOC value is lower than the off-grid battery Protection setpoint, power supply to loads connected to the relay port can be stopped. Set the off-grid battery Protection value according to actual needs.

7.3 Setting Inverter Parameters via the App

SolarGo App is a mobile application that communicates with inverters via Bluetooth and WiFi. The following are common functions:

1. View inverter operating data, software version, alarm information, etc.
2. Set inverter grid parameters, communication parameters, etc.
3. Maintain equipment.

For detailed functions, see the SolarGo App User Manual. The user manual can be obtained from the official website or by scanning the following QR code.

SolarGo App

SolarGo App User Manual

8 System Commissioning and Power Plant Monitoring

8.1 Setting Inverter Parameters via the App

SEMS+ App is a software application for remote power station monitoring or on-site device commissioning. It supports installers or owners:

- Remotely monitor the operating status of the power station and set operating parameters for the power station and equipment.
- Connect to devices locally to view device operating status and set device parameters.

For detailed functions, see theSEMS+ 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 the SEMS+ App

Smartphone requirements

- Smartphone operating system requirements: Android 7.0 and above, iOS 15.1 and above.
- The smartphone supports a web browser and Internet connection.
- The smartphone supports WLAN/Bluetooth functions.

Download method
Method 1:

Search for SEMS+ in Google Play, the App Store, and the Huawei, Honor, Xiaomi, OPPO, and vivo app stores, and then download and install it.

SEMS0163

Method 2:

Scan the following QR code to download and install it.

SEMS0164

Add a Desktop Widget

- When the App version is V2.5.2 or later, the SEMS+ App can be added to the phone home screen.
- Different operating systems have different steps for adding a desktop widget. Follow the actual steps.
- After the desktop widget is added, you can quickly view the operating status of the power station without opening the App.

8.2 Monitor the Power Plant via SEMS+ WEB

SEMS+ WEB is a monitoring platform that communicates via WiFi or LAN. The following are common functions of SEMS+ WEB:

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

For detailed functions, see SEMS+ WEB User Manual.

SEMS+ WEB User Manual

9 System Maintenance

9.1 System Power-Off

⚠DANGER

- When performing operation and maintenance on equipment in the system, power off the system first. Operating equipment while energized may cause equipment damage or risk of electric shock.
- After the device is powered off, it takes time for internal components to discharge. Wait until the device is fully discharged according to the time requirements on the label.
- To restart the battery, use the air switch to power it on.
- 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.

NOTICE

- The circuit breakers between the inverter and the battery, and between the 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 will close automatically 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: Press and hold the battery multi-function button for more than 5 seconds to power off all batteries.
   b. LX U5.4-L, LX U5.4-20: When the battery system integrated circuit breaker is closed or the battery system button is pressed and held for 5 seconds or less, 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: Press and hold the battery system button for 5 seconds or more; 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. (For models without a display only) Disconnect the inverter's off-grid control switch.

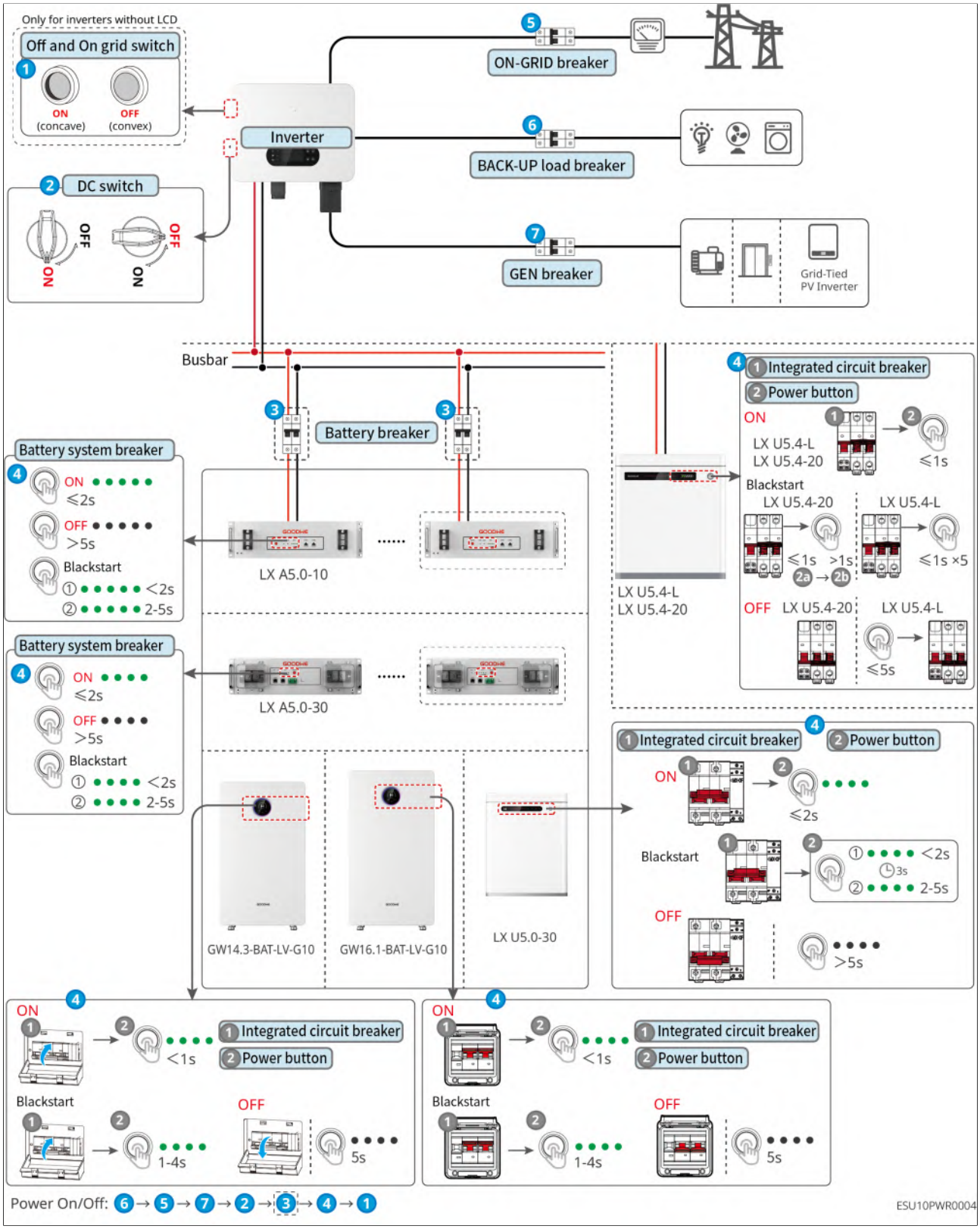


Figure48 Single-unit system

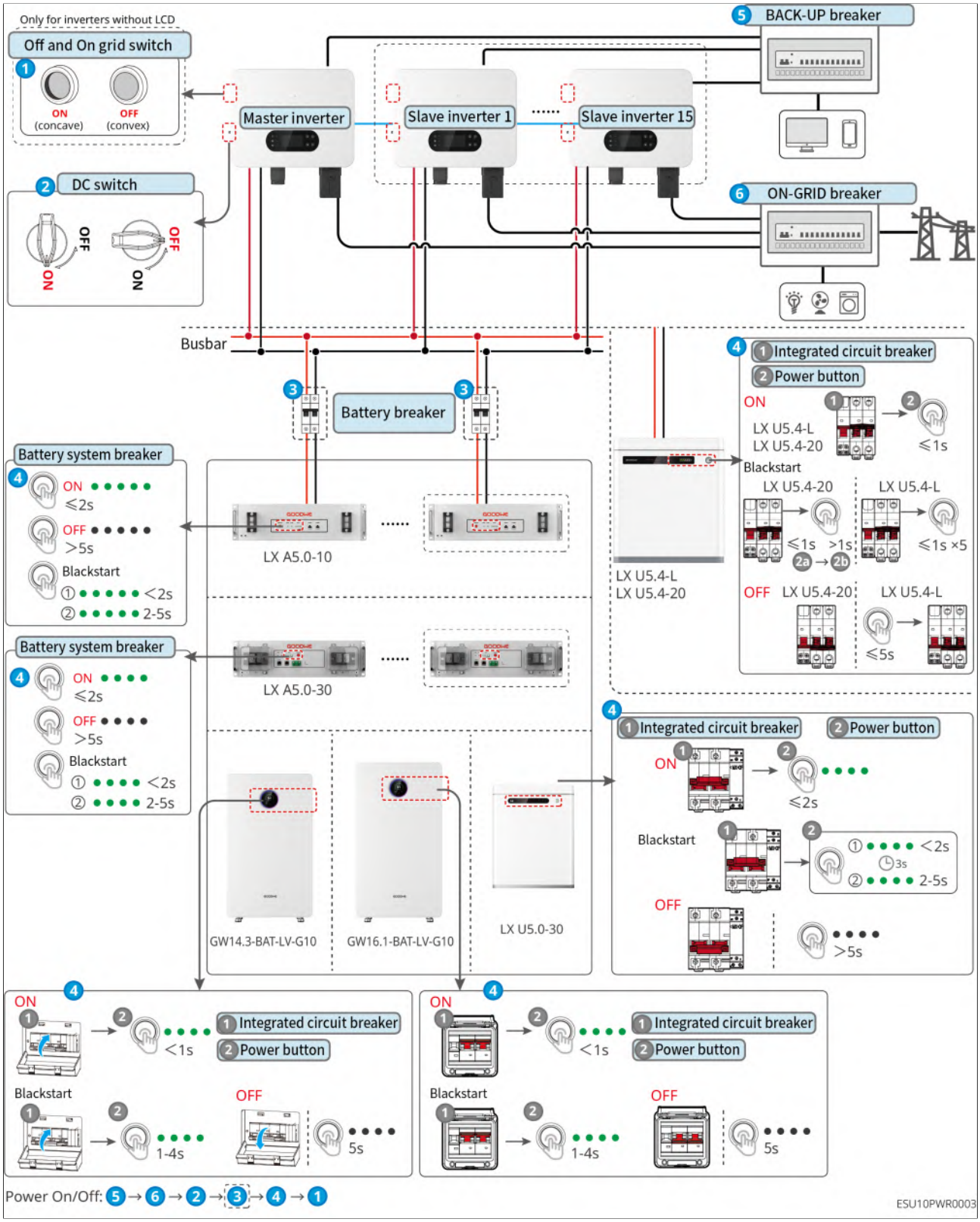


Figure49 Parallel system

9.2 Device Removal

DANGER

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

1. Power down the system.
2. Use labels to mark the cable types of the cables connected in the system.
3. Disconnect the cables connected to 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 communication stick, inverter, battery, and smart meter.
5. Store the equipment properly; if it is to be put into use later, ensure that the storage conditions meet the requirements.

9.3 Equipment Disposal

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

9.4 Routine Maintenance

WARNING

- If any issue that may affect the battery or the energy storage inverter system is found, contact after-sales personnel. Do not disassemble the device without authorization.
- If the copper wires inside the conductive cable are exposed, do not touch them. High voltage danger. Contact after-sales personnel. Do not disassemble the device without authorization.
- If any other emergency occurs, contact after-sales personnel immediately. Operate under the guidance of after-sales personnel, or wait for after-sales personnel to operate on site.

Maintenance Content	Maintenance Method	Maintenance Cycle	Maintenance Purpose
System Cleaning	Check the heat sink, fan, and air inlet/outlet for foreign objects and dust. Check that the installation space meets the requirements, and check whether debris has accumulated around the equipment.	Once every six months	Prevent heat dissipation failure.
System Installation	Check whether the equipment is installed securely and whether the fastening screws are loose. Check the equipment exterior for damage or deformation.	Once every six months to once every year	Confirm the stability of the equipment installation.
Electrical Connection	Check whether the electrical connections are loose, and whether the cable exterior is damaged or has exposed copper.	Once every six months to once every year	Confirm the reliability of the electrical connections.

Maintenance Content	Maintenance Method	Maintenance Cycle	Maintenance Purpose
Sealing	Check whether the sealing of the cable entry holes of the equipment meets the requirements. If the gaps are too large or the holes are not sealed, reseal them.	Once/year	Confirm that the unit 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 every 15 days	Protection of battery service life.

9.5 Fault

NOTICE
The fault content in the manual is updated from time to time. Faults may vary slightly by model. For details, refer to the real-time display on the device.

9.5.1 View Detailed Fault/Alarm Information

All fault and alarm details of the energy storage system are displayed in**SolarGo App**,**SEMS+ App, SEMS+ WEB**, and the LCD display. If your product malfunctions and you do not see relevant fault information in**SolarGo App**,**SEMS+ App, SEMS+ WEB**, or the LCD display, contact the after-sales service center.

- LCD screen

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

- SolarGo App

View the alarm information of the energy storage system via [Home] > [Parameters] > [Alarm].

- SEMS+ App

1. Open the SEMS+ App and log in with any account.
2. On the Home page, click "Alarm" to view the alarm information of all power stations in the account.

- SEMS+ WEB

1. Open SEMS+ WEB and log in with any account.
2. On the power station details page, click "Alarm" to view all alarm information of the current power station.

9.5.2 Fault Information and Handling Methods

Please perform troubleshooting according to the following methods. If these methods cannot help you, please contact the after-sales service center.
When contacting the after-sales service center, please gather 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 modules are shaded or blocked, etc. For the installation environment, it is recommended that you provide photos, videos and other files to assist in problem analysis.
3. Grid conditions.

9.5.2.1 System Fault

If any unlisted problem occurs in the system, or if following the instructions still cannot prevent the problem or abnormality, stop system operation immediately and contact your dealer immediately.

No.	Fault	Troubleshooting
1	Unable to find the Smart Communication Stick wireless signal	1. Please ensure that no other devices are connected to the Smart Communication Stick wireless signal. 2. Please ensure that the App has been upgraded to the latest version. 3. Ensure that the Smart Communication Stick is powered normally, and the blue signal light is flashing or steady 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 Smart Communication Stick wireless signal	1. Please ensure that no other devices are connected to the Smart Communication Stick wireless signal. 2. Restart the inverter or communication stick, and try connecting to the Smart Communication Stick wireless signal again. 3. Ensure that the Bluetooth encrypted pairing is successful.
3	 The Ezlink indicator light flashes twice.	1. Please ensure that the router is turned on. 2. When using LAN communication, ensure that the LAN cable is connected properly and the communication configuration is correct. Enable or disable the DHCP function according to the actual situation. 3. When using WiFi communication, ensure that the Wi-Fi Network connection is normal and the wireless signal strength meets requirements. Enable or disable the DHCP function according to the actual situation.

No.	Fault	Troubleshooting
4	Ezlink indicator light flashes four times.	1. 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 is not resolved, please contact the after-sales service center.
5	Ezlink indicator light is off.	Ensure that the inverter is powered on. If the problem is not resolved, please contact the after-sales service center.
6	Ezlink indicator light is off.	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 strengthen the WiFi signal. 2. Reduce the number of devices connected to the router.
8	After all configurations are completed, 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 strengthen the WiFi signal.
9	After all configurations are completed, 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 recommendations
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 yes, you also need to modify the Grid Overvoltage Protection point after obtaining permission from the local power operator. 3. If it cannot be restored 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 recommendations
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 yes, you also need to modify the Grid Undervoltage Protection point after obtaining permission from the local power operator. 3. If it cannot be restored 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 recommendations
F04	Grid Rapid Overvoltage Protection	Grid voltage detection is abnormal, or an overvoltage triggers a 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 yes, you also need to modify the Grid Undervoltage Protection point after obtaining permission from the local power operator. 3. If it cannot be restored for a long time, check whether the AC-side circuit breaker and output cable are connected properly.
F05	Grid 10minOvervoltage	WithinGrid 10minthe sliding average value of the grid voltage exceeds the range specified by safety regulations.	Check whether the grid voltage has been operating 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 the local power operator. If so, it is also necessary, after obtaining consent from the local power operator, to modify theGrid 10minOvervoltage protection point.

Fault code	Fault name	Fault cause	Fault handling recommendations
F06	Grid Overfrequency	Grid abnormal: The actual grid frequency is higher than required by 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 the local power operator. If so, it is also necessary, after obtaining consent from the local power operator, to modify the Grid Overfrequency protection point.
F07	Grid Underfrequency	Grid abnormal: The actual grid frequency is lower than required by 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 the local power operator. If so, it is also necessary, after obtaining consent from the local power operator, to modify the Grid Underfrequency protection point.

Fault code	Fault name	Fault cause	Fault handling recommendations
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 the local power operator.
F09	Anti-islanding Protection	The grid has been disconnected, and due to the presence of the load, the grid voltage is maintained. According to the safety regulation 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 the 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 the local power operator.

Fault code	Fault name	Fault cause	Fault handling recommendations
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 the local power operator.
F12	30mA GFCIProtection	During inverter operation, the input-to-ground insulation impedance becomes low.	1. If it occurs occasionally, it may be caused by an occasional abnormality in the external circuit. After the fault is cleared, it will resume normal operation without manual intervention. 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	60mA GFCIProtection	During inverter operation, the input-to-ground insulation impedance becomes low.	1. If it occurs occasionally, it may be caused by an occasional abnormality in the external circuit. After the fault is cleared, it will resume normal operation without manual intervention. 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 recommendations
F14	150mA GFCIProtection	During inverter operation, the input-to-ground insulation impedance becomes low.	1. If it occurs occasionally, it may be caused by an occasional abnormality in the external circuit. After the fault is cleared, it will resume normal operation without manual intervention. 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	During inverter operation, the input-to-ground insulation impedance becomes low.	1. If it occurs occasionally, it may be caused by an occasional abnormality in the external circuit. After the fault is cleared, it will resume normal operation without manual intervention. 2. If it occurs frequently or cannot be recovered for a long time, check whether the PV string-to-ground impedance is too low.
F16	DCIProtection Level1	The inverter output current has a High DC Component that exceeds 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, without manual intervention. 2. If this alarm occurs frequently and affects the normal power generation of the power station, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F17	DCIProtection Level2	The inverter output current has a High DC Component that exceeds 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, without manual intervention. 2. If this alarm occurs frequently and affects the normal power generation of the power station, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F18	Low Insulation Resistance	1. The PV string is short-circuited to Protection earth. 2. The installation environment of the PV string is humid for a long time, and the wiring insulation to ground is poor. 3. Low Insulation Resistance of the battery port wiring to ground.	1. Check the impedance between the PV string/battery port and the Protection earth. If a short circuit occurs, find the short-circuit point and rectify it. 2. Check whether the inverter's Protection earth wire is correctly connected. 3. If it is confirmed that in rainy/cloudy weather the impedance is indeed lower than the default value, 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, an alarm 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 and the alarm notification mode is set, the alarm information can be sent to the customer via email.

Fault code	Fault name	Fault cause	Fault handling recommendations
F19	Grounding Abnormal	1. The inverter's Protection earth wire is Not Connected. 2. When the PV string output is grounded, the output side of the inverter is not connected to an isolation transformer.	1. Please confirm whether the inverter's Protection earth wire is Not Connected properly. 2. In the scenario where the PV string output is grounded, please confirm whether the output side of the inverter is connected to an isolation transformer
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, without manual intervention. 2. If this alarm occurs frequently and affects the normal power generation of the power station, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F21	Internal Comm Loss	SlaveDSP1communication timeout-MasterDSP, SlaveDSP2communication timeout-MasterDSP, SlaveDSP2communication timeout-SlaveDSP1, MasterDSPcommunication timeout-SlaveDSP1, MasterDSPcommunication timeout-SlaveDSP2or SlaveDSP1communication timeout-SlaveDSP2: 1. The chip is not powered on 2. The chip program version is incorrect	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
		MasterDSP CANmodule error, SlaveDSP1 CANmodule error or SlaveDSP2 CANmodule error: 1. Frame format error 2. Parity check error 3. CAN busoffline 4. HardwareCRCcheck error 5. When sending (receiving), the control bit is receiving (sending) 6. Transfer to non-allowed unit	
F22	Generator Waveform Detection Fault	1. If the generator is Not Connected, this fault will always be displayed; 2. When the generator is operating, this fault is triggered if the generator safety regulations are not met.	1. If the generator is not connected, ignore this fault; 2. It is normal for this fault to appear when a generator fault occurs; after the generator recovers, wait for a period of time and the fault will clear automatically; 3. This fault will not affect the normal operation of off-grid mode. 4. When the generator and the grid are connected simultaneously and meet the safety requirements, the grid takes priority for grid connection, and the system will operate in grid-connected state.
F23	Generator Abnormal Connection		
F24	Generator Voltage Low		
F25	Generator Voltage High		
F26	Generator Frequency Low		

Fault code	Fault name	Fault cause	Fault handling recommendations
F27	Generator Frequency High		
F28	ParallelI/OSelf-Check Abnormal	Parallel communication cable is not securely connected, or the parallelIOchip is damaged.	Check whether the parallel communication cable is securely connected, and then check whether theIOchip is damaged. If so, replace theIOchip.
F29	Paralell Grid Line Reversed	Grid lines of some machines are reversed with others.	Reconnect the grid lines.
F30	AC HCT check Abnormal	AC sensor has sampling abnormality.	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F31	GFCI HCT Check Abnormal	Leakage current sensor has sampling abnormality.	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F32	Inverter Internal Failure	Inverter has a fault.	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F33	FlashR/W Abnormal	Possible causes: flashcontent has changed;flashlifetime is exhausted;	1. Upgrade to the latest program version. 2. Contact the dealer or after-sales service center.
F34	AFCI Check Failure	During the Arc Failure self-test process, the Arc Failure module did not detect the Arc Failure as required.	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F35	Cabinet Overtemperature	Cabinet Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If it is not ventilated or an Ambient Overtemperature condition occurs, improve its ventilation and heat dissipation. 3. If the ventilation and ambient temperature are both normal, contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F36	Bus Overvoltage	BUSovervoltage, possible causes: 1. PVvoltage is too high; 2. InverterBUSvoltage sampling abnormal; 3. The isolation effect of the double-split transformer at the rear end of the inverter is poor, causing the two inverters to affect each other when grid-connected; when one inverter is grid-connected, it reports DC overvoltage.	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F37	PVInput Overvoltage	PVinput voltage is too high, possible causes: PV array configuration error: too many PV modules are connected in series in a string, causing the string open-circuit voltage to be higher than the inverter's maximum operating voltage.	Check the series configuration of the corresponding PV array strings to ensure that the string open-circuit voltage is not higher than the inverter's maximum operating voltage. After the PV array is configured correctly, the inverter alarm will automatically disappear.
F38	PVContinuous Hardware Overcurrent	1. Improper module configuration 2. Hardware damage	Disconnect the AC output side switch and the DC input side switch, and5minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F39	PVContinuous Software Overcurrent	1. Improper module configuration 2. Hardware damage	Disconnect the AC output side switch and the DC input side switch, and5minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F40, F98	String Reverse Connection(String1-n) n: Determined based on the actual Number of Strings of the inverter.	PVString Reverse Connection	Check whether the string is reverse-connected.

9.5.2.2.2 Fault Handling (Fault Codes F41-F80)

Fault code	Fault name	Fault cause	Fault handling recommendations
F41	Generator Port Overload	1. Off-grid side output exceeds specification requirements 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 specification requirements	Confirm the cause of the problem by checking the off-grid side output voltage, current, power and other data.

Fault code	Fault name	Fault cause	Fault handling recommendations
F42, F164,F165	DC Arcing Failure(String1-n) n: Determined based on the actual Number of Strings of the inverter.	1. DC side connection terminal is loose; 2. DC side connection terminal has poor contact; 3. DC cable core damaged and poorly connected;	1. After the machine is reconnected to the grid, check whether the voltage and current of each circuit abnormally drop to zero; 2. Check whether the DC side terminals are securely connected.
F43	Grid Waveform Abnormal	Grid abnormal: Grid voltage detection abnormality triggers a 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 the local power operator.
F44	Grid Phase Loss	Grid abnormal: Grid voltage has a single-phase sag.	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 the local power operator.

Fault code	Fault name	Fault cause	Fault handling recommendations
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 the local power operator.
F46	Grid Phase Sequence Failure	The wiring between the inverter and the grid is abnormal: the wiring is not in positive sequence.	1. Check whether the wiring between the inverter and the grid is in positive sequence. After the wiring is correct (e.g., swap any two live wires), the fault will disappear automatically. 2. If the fault persists after the wiring is correct, contact the dealer or after-sales service center.
F47	Grid Rapid Shutdown Protection	After detecting a Grid Power Outage condition, quickly shut off the output.	After grid power supply is restored, the fault will clear automatically.
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 toPElow impedance or short circuit	Check the output phase line toPEimpedance and find the location with low impedance and repair it.
F50	DCVProtecti on Level1	Abnormal Load Fluctuation	

Fault code	Fault name	Fault cause	Fault handling recommendations
F51	DCVProtection Level2	Abnormal Load Fluctuation	1. If the abnormality is caused by an external fault, the inverter will automatically resume normal operation after the fault disappears, without manual intervention. 2. If this alarm occurs frequently and affects the normal power generation of the power station, please contact the dealer or after-sales service center.
F52	Leakage current (GFCI) Multiple Fault Shutdown	North American safety regulations require that after multiple faults, the inverter must not automatically recover; manual recovery or recovery after waiting24his required.	Please check whether the PV string impedance to ground is too low.
F53	DC Arc Failure (AFCI) Multiple Fault Shutdown	North American safety regulations require that after multiple faults, the inverter must not automatically recover; manual recovery or recovery after waiting24his required.	1. After the machine is reconnected to the grid, check whether the voltage and current of each circuit abnormally drop to zero; 2. Check whether the DC side terminals are securely connected.

Fault code	Fault name	Fault cause	Fault handling recommendations
F54	External Communication Link Lost	Inverter external device communication loss may be caused by external device power supply issues, mismatched Communication Protocols, or no corresponding external device configured.	The judgment is made based on the actual model and detection enable bits; peripherals not supported by some models will not be detected.
F55	Back-upOutput Overload	Prevent the inverter from sustained overload output.	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 requires no manual intervention. 2. If it occurs frequently, please contact the dealer or after-sales service center.
F57	ExternalBox Fault	When executing Switch On-Grid to Off-Grid, the wait time forBoxrelay switching is too long.	1. Check whether theBoxis working properly; 2. Check whether theBoxcommunication wiring is correct;
F58	CTLoss	CTconnection cable disconnected (Japanese safety regulation requirement)	Check whether theCTwiring is correct;

Fault code	Fault name	Fault cause	Fault handling recommendations
F59	ParallelCAN Comm Abnormal	The parallel communication cable is not securely connected, or some machines are not online.	Check whether all machines are powered on and the parallel communication cable is securely connected.
F60	ParallelBack-upLine Reversed	Some units have thebackupline reversed with others.	Reconnect thebackupline.
F61	Inverter Soft Start Failure	Inverter Soft Start Failure during off-grid cold startup	Check whether the machine's inverter module is damaged.
F62	AC HCT Failure	HCTSensor Abnormal	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F63	GFCI HCT Failure	Leakage Current Sensor Abnormal	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F64	Inverter Internal Failure	Inverter has a fault.	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F65	AC Terminal Overtemperature	AC Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If it is not ventilated or an Ambient Overtemperature condition occurs, improve its ventilation and heat dissipation. 3. If the ventilation and ambient temperature are both normal, contact the dealer or after-sales service center.
F66	INVModule Overtemperature	Inverter Module Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If it is not ventilated or an Ambient Overtemperature condition occurs, improve its ventilation and heat dissipation. 3. If the ventilation and ambient temperature are both normal, contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F67	BoostModule Overtemperature	BoostModule Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If it is not ventilated or an Ambient Overtemperature condition occurs, improve its ventilation and heat dissipation. 3. If the ventilation and ambient temperature are both normal, contact the dealer or after-sales service center.
F68	AC Capacitor Overtemperature	Output Filter Capacitor Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If it is not ventilated or an Ambient Overtemperature condition occurs, improve its ventilation and heat dissipation. 3. If the ventilation and ambient temperature are both normal, contact the dealer or after-sales service center.
F69	PV IGBT Short Circuit	Possible causes: 1. IGBTshort circuit 2. Inverter sampling circuit abnormal	

Fault code	Fault name	Fault cause	Fault handling recommendations
F70	PV IGBTOpen Circuit	1. Software issue causes no waveform output: 2. Drive circuit abnormal: 3. IGBTopen circuit	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F71	NTCAbnormal	NTCtemperature sensor abnormal	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F72	PWM Abnormal	PWMabnormal waveform	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F73	CPUInterrupt Abnormal	CPUInterrupt Abnormal	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F74	Microelectronic fault	Function Safety detected an anomaly	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F75	PV HCTFault	boostcurrent sensor abnormal	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F76	1.5VRef Abnormal	Reference Circuit Fault	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F77	0.3VRef Abnormal	Reference Circuit Fault	
F78	CPLDVersio n Error	CPLDVersion Error	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F79	CPLDComm Failure	CPLDandDSPComm unication Content Error or Timeout	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F80	Model Recognition Fault	Fault Related to Model Recognition Error	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

9.5.2.2.3 Fault Handling (Fault Codes F81-F121)

Fault code	Fault name	Fault cause	Fault handling recommendations
F81	P-Bus Overvoltage	BUSovervoltage, possible causes: 1. PVvoltage is too high; 2. InverterBUSvoltage sampling abnormal; 3. The isolation effect of the double-split transformer at the rear end of the inverter is poor, causing the two inverters to affect each other when grid-connected; when one inverter is grid-connected, it reports DC overvoltage.	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F82	N-Bus Overvoltage		
F83	Bus Overvoltage (SecondaryCPU1)		Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F84	P-Bus Overvoltage (SecondaryCPU1)		

Fault code	Fault name	Fault cause	Fault handling recommendations
F85	N-Bus Overvoltage (SecondaryCPU1)	BUSovervoltage, possible causes: 1. PVvoltage is too high; 2. InverterBUSvoltage sampling abnormal; 3. The isolation effect of the double-split transformer at the rear end of the inverter is poor, causing the two inverters to affect each other when grid-connected; when one inverter is grid-connected, it reports DC overvoltage.	
F86	Bus Overvoltage (SecondaryCPU2)		Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F87	P-Bus Overvoltage (SecondaryCPU2)		

Fault code	Fault name	Fault cause	Fault handling recommendations
F88	N-Bus Overvoltage (SecondaryCPU2)	BUSovervoltage, possible causes: 1. PVvoltage is too high; 2. InverterBUSvoltage sampling abnormal; 3. The isolation effect of the double-split transformer at the rear end of the inverter is poor, causing the two inverters to affect each other when grid-connected; when one inverter is grid-connected, it reports DC overvoltage.	
F89	P-Bus Overvoltage(CPLD)		Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F90	N-Bus Overvoltage(CPLD)	BUSovervoltage, possible causes: 1. PVvoltage is too high; 2. InverterBUSvoltage sampling abnormal; 3. The isolation effect of the double-split transformer at the rear end of the inverter is poor, causing the two inverters to affect each other when grid-connected; when one inverter is grid-connected, it reports DC overvoltage.	
F91	FlyCap Software Overvoltage	FlyCap Overvoltage, possible causes: 1. PVvoltage is too high; 2. Inverter FlyCap voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch, and5minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F92	FlyCap Hardware Overvoltage		

Fault code	Fault name	Fault cause	Fault handling recommendations
F93	FlyCap Undervoltage	FlyCap Undervoltage, possible causes: 1. PVenergy is insufficient; 2. Inverter FlyCap voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch, and5minutes later, close the AC output switch and DC input switch. If the fault persists, contact the dealer or after-sales service center.
F94	FlyCap Precharge Failure	FlyCap Precharge Failure, possible causes: 1. PVenergy is insufficient; 2. Inverter FlyCap voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch, and5minutes later, close the AC output switch and DC input switch. If the fault persists, contact the dealer or after-sales service center.
F95	FlyCap Precharge Abnormal	1. Improper control loop parameters 2. Hardware damage	Disconnect the AC output side switch and the DC input side switch, and5minutes later, close the AC output switch and DC input switch. If the fault persists, contact the dealer or after-sales service center.
F96, F97	String overcurrent(String1-n) n: Determined based on 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 the DC input side switch, and5minutes later, close the AC output switch and DC input switch. If the fault persists, contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F99, F100	String lost(String1-n) n: Determined based on the actual Number of Strings of the inverter.	String fuse blown (if any)	Check if the fuse is blown.
F101	Battery1Precharge Failure	Battery1Precharge circuit fault (precharge resistor burned out, etc.)	Check whether the precharge circuit is functioning properly, and whether the Battery Voltage and bus voltage are consistent after battery power-on. If they are inconsistent, contact the dealer or after-sales service center.
F102	Battery1Relay Failure	Battery1relay cannot operate normally	After battery power-on, check whether the battery relay operates, and whether a closing sound is heard. If it does not operate, contact the dealer or after-sales service center.
F103	Battery1Overvoltage	Battery1input voltage exceeds the machine rated range	Confirm whether the Battery Voltage is within the machine rated range.
F104	Battery2Precharge Failure	Battery2Precharge circuit fault (precharge resistor burned out, etc.)	Check whether the precharge circuit is functioning properly, and whether the Battery Voltage and bus voltage are consistent after battery power-on. If they are inconsistent, contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F105	Battery2Relay Failure	Battery2relay cannot operate normally	After battery power-on, check whether the battery relay operates, and whether a closing sound is heard. If it does not operate, contact the dealer or after-sales service center.
F106	Battery2Overvoltage	Battery2input voltage exceeds the machine rated range	Confirm whether the Battery Voltage is within the machine rated range.
F107	On-grid PWM Sync Failure	Carrier synchronization anomaly during grid connection	1. Check whether the synchronization cable connection is normal 2. Check whether the master/slave setting is normal; 3. Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and DC input side switch. If the fault still exists, contact the dealer or after-sales service center.
F108	DSPCommunication Failure	-	-
F109	ExternalSTSFault	Inverter andSTSconnection cable abnormal	Check whether the wiring harness connection sequence between the inverter andSTSis in one-to-one sequential correspondence.

Fault code	Fault name	Fault cause	Fault handling recommendations
F110	Export Limit Protection	1. Inverter error and grid disconnection 2. metercommunication unstable 3. Reverse power flow condition occurs	1. Check whether the inverter has any other error messages. If so, take targeted actions; 2. Check whether themeterconnection is reliable; 3. If this alarm occurs frequently and affects the normal power generation of the power station, please contact the dealer or after-sales service center.
F111	BypassOver Load	-	-
F112	Black Start Failure	-	-
F113	Offgrid AC Ins Volt High	-	-
F114	Relay Failure2	Relay abnormality, cause: 1. Relay abnormal (relay short circuit) 2. Relay sampling circuit abnormal. 3. Abnormal AC-side wiring (possible loose connection or short circuit)	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F115	SVGPrecharge Failure	SVGPrecharge Hardware Failure	Contact the dealer or after-sales service center.
F116	SVG ModePIDPrevention Failure	Anti-PIDHardware Abnormal	

Fault code	Fault name	Fault cause	Fault handling recommendations
F117	DSPVersion Error	DSPSoftware Version Identification Error	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F118	MOSContinuous Overvoltage	1. Software issue causes the inverter drive to be turned off earlier than the flyback drive: 2. Abnormal inverter drive circuit prevents turn-on: 3. PVvoltage is too high; 4. Mosvoltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F119	Bus short circuit fault	Hardware damage	If aBUSshort-circuit fault occurs and the inverter remains off-grid, please contact the dealer or after-sales service center.
F120	Bus sampling abnormal	1. BUSvoltage sampling hardware fault	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F121	DCSample Abnormal	1. BUSvoltage sampling hardware fault 2. Battery Voltage sampling hardware fault 3. DcrlyRelay Failure	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

9.5.2.2.4 Fault Handling (Fault Codes F122-F171)

Fault code	Fault name	Fault cause	Fault handling recommendations
F122	PVInput Mode Error	PVAccess Mode has three modes, taking four-channelMPPTas an example: 1. Parallel mode: i.e.,AAAAmode(same-source mode),PV1-PV4are from the same source,4strings ofPVare connected to the same PV panel 2. Partial parallel mode: i.e.,AACCmode,PV1andPV2are connected to the same source,PV3andPV4are connected to the same source 3. Independent mode: i.e.,ABCDmode(not from the same source),PV1,PV2,PV3,PV4are independently connected,4strings ofPVare each connected to a PV panel IfPV's actual Access	Check whether thePVAccess Mode is correctly set (ABCD,AACC,AAAA) and correctly reset thePVAccess Mode 1. Confirm that each actually connectedPVstring is correctly connected; 2. IfPVis correctly connected, viaAPPor the screen, check the currently set \"PVAccess Mode\" to see whether it corresponds to the actual Access Mode; 3. If the currently set \"PVAccess Mode\" does not match the actual Access Mode, you need to useAPPor the screen to set \"PVAccess Mode\" to a mode consistent with the actual situation. After the setting is completed, disconnect thePVandACpower supply and restart; 4. After the setting is completed, if the currently set \"PVAccess Mode\" is consistent with the actual Access Mode, but the fault is still reported, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
		Mode does not match the device-setPVAccess Mode, this fault will be reported.	
F123	Multi-channelPVphase error	PVinput mode setting error	Check whether thePVAccess Mode is correctly set (ABCD,AACC,AAAA) and correctly reset thePVAccess Mode 1. Confirm that each actually connectedPVstring is correctly connected; 2. IfPVis correctly connected, viaAPPor the screen, check the currently set \"PVAccess Mode\" to see whether it corresponds to the actual Access Mode; 3. If the currently set \"PVAccess Mode\" does not match the actual Access Mode, you need to useAPPor the screen to set \"PVAccess Mode\" to a mode consistent with the actual situation. After the setting is completed, disconnect thePVandACpower supply and restart; 4. After the setting is completed, if the currently set \"PVAccess Mode\" is consistent with the actual Access Mode, but the fault is still reported, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F124	Battery1Reverse connection fault	Battery1positive and negative poles reversed	Check whether the positive and negative terminals of the battery and the machine wiring are consistent.
F125	Battery2Reverse connection fault	Battery2positive and negative poles reversed	Check whether the positive and negative terminals of the battery and the machine wiring are consistent.
F126	Battery abnormal connection	Battery abnormal connection	Check whether the battery is working normally.
F127	BAT Overtemperature	Battery temperature is too high. Possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F128	Ref Voltage Abnormal	Reference Circuit Fault	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F129	Cabinet Under Temperature	Cabinet Under Temperature, possible cause: ambient temperature too low.	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F130	ACsideSPDFault	AC-side surge protection device failure	ReplaceAC-side surge protection device.
F131	DCsideSPDFault	DC-side surge protection device failure	ReplaceDC-side surge protection device.
F132	Internal Fan Abnormal	Internal Fan Abnormal, possible cause: 1. Fan power supply abnormal; 2. Mechanical fault(stall); 3. Fan aging/damage.	Disconnect the AC output side switch and the DC input side switch, and5 minutes later, close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F133	External Fan Abnormal	External Fan Abnormal, possible cause: 1. Fan power supply abnormal; 2. Mechanical fault(stall); 3. Fan aging/damage.	

Fault code	Fault name	Fault cause	Fault handling recommendations
F134	Anti-PIDAbnormal	Anti-PIDhardware fault orPVovervoltage causingAnti-PIDpause	PVovervoltage-inducedAnti-PIDpause warning requires no action;Anti-PIDhardware fault can be cleared by turning off theAnti-PIDswitch and turning it on; then clear theAnti-PIDfault and replace theAnti-PIDdevice.
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 was caused byPVshort circuit or reverse connection. Check whether there is a historicalPVshort-circuit warning or historicalPVreverse-connection warning. If present, maintenance personnel need to check the correspondingPVcondition. After inspection confirms no fault, manually close the trip switch and clear the warning through 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 should, according to the historicalPVshort-circuit warning subcode, check whether the short-circuitedBoosthardware and external strings are faulty; if no fault is found after inspection, the warning can be cleared through theAPPinterface by clearing historical faults.

Fault code	Fault name	Fault cause	Fault handling recommendations
F137, F138	HistoricalPVreverse-connection warning(String1-n) (n: determined based on the inverter's actual Number of Strings)	Possible causes: APVreverse connection caused the trip switch to trip;	Contact the dealer or after-sales service center; maintenance personnel should, according to the historicalPVreverse-connection warning subcode, check whether the corresponding string is reverse-connected and whether thePVpanel configuration has a voltage difference. After the inspection confirms no fault, the warning can be cleared through theAPPinterface by clearing historical faults.
F139	FlashR/W Error	Possible causes: 1. Flashcontent has changed; 2. Flashlifetime is exhausted;	1. Upgrade to the latest program; 2. Contact the dealer 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. The communication cable between the meter and the inverter is incorrectly wired.	Check the meter wiring and connect the meter correctly. If the fault remains after the check, contact the dealer or after-sales service center.

Fault code	Fault name	Fault cause	Fault handling recommendations
F141	PVType Identification Failure	PVpanel identification hardware fault	Contact the dealer or after-sales service center.
F142	PV String Mismatch	PVString Mismatch, two strings under the sameMPPThave different open-circuit voltage configurations	Check the open-circuit voltages of the two strings and configure strings with the same open-circuit voltage to the sameMPPTbranch. Long-term PV String Mismatch poses a safety hazard.
F143	CTnot connected	CTnot connected	Check whether theCTwiring.
F144	CTReversed	CTReversed	Check whether theCTwiring.
F145	PE Loss	PE not connected	Check the ground wire.
F146	PV String Terminal Overtemperature(String 1~8)	37176registerPVterminal temperature alarm sub-code1is set	-
F147	PV String Terminal Overtemperature(String 9~16)	37177registerPVterminal temperature alarm sub-code2is set	-
F148	PV String Terminal Overtemperature(String 17~20)	37178registerPVterminal temperature alarm sub-code3is set	-

Fault code	Fault name	Fault cause	Fault handling recommendations
F149	HistoricalPVreverse-connection warning(String33~48)	Possible causes: APVreverse connection caused the trip switch to trip;	Contact the dealer or after-sales service center; maintenance personnel should, according to the historicalPVreverse-connection warning subcode, check whether the corresponding string is reverse-connected and whether thePVpanel configuration has a voltage difference. After the inspection confirms no fault, the warning can be cleared through theAPPinterface by clearing historical faults.
F150	Battery1Voltage Low	Battery Voltage below the set value	-
F151	Battery2Voltage Low	Battery Voltage below the set value	-
F152	Low Voltage of Battery Power	The battery is in non-charging mode, and its voltage is lower than the shutdown voltage.	-
F153	Battery1Voltage High	-	-
F154	Battery2Voltage High	-	-

Fault code	Fault name	Fault cause	Fault handling recommendations
F155	Online Low Insulation Resistance	1. The PV string is short-circuited to Protection earth. 2. The installation environment of the PV string is humid for a long time, and the wiring insulation to ground is poor.	1. Check the impedance of the PV string to the protection ground. If a short circuit occurs, correct the short-circuit point. 2. Check whether the inverter's Protection earth wire is correctly connected. 3. If it is confirmed that the impedance is indeed lower than the default value in rainy or cloudy conditions, please reconfigure the 'Insulation Resistance Protection Point'.
F156	Micro-grid Overload Warning	backupside 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	The multiplexed(Generator)port is configured as a micro-grid or a large load, but a generator is actually connected	Use theAPPto change the multiplexed(Generator)port configuration.

Fault code	Fault name	Fault cause	Fault handling recommendations
F160	EMSForced Off-grid	EMSissues a forced off-grid command, but the off-grid function is not enabled	Enable the off-grid function.
F161	Passive Anti-islanding Protection	-	-
F162	Grid Type Fault	Actual Type of Electrical Supply System(two-phase or split-phase)does not match the configured safety regulation	According to the actual Type of Electrical Supply System, switch to the corresponding safety regulation.
F163	Grid Phase Instability	Grid abnormality: The grid voltage phase 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 the local power operator.

Fault code	Fault name	Fault cause	Fault handling recommendations
F166	PV Terminal Overtemperature	PV Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	1. Check whether the ventilation at the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If it is not ventilated or an Ambient Overtemperature condition occurs, improve its ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact the dealer or after-sales service center.
F167	AC Terminal Overtemperature Warning	AC Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	
F168	Bat Terminal Overtemperature	Bat Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature.	

Fault code	Fault name	Fault cause	Fault handling recommendations
F169	Bat Terminal Overtemperature Alarm	Bat Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature.	
F170	STS Overtemperature	STS Overtemperature, possible causes: 1. The STS installation location is not ventilated. 2. Ambient Overtemperature.	
F171	Abnormal wiring between inverter and battery	Abnormal power cable connection between battery and inverter	Check whether the power cable connection between the battery and inverter is normal.

9.5.2.2.5 Troubleshooting

Fault name	Fault cause	Fault handling recommendations
Generator Failure	1. This fault will be displayed continuously when the generator is Not Connected. 2. When the generator is operating, failure to meet the generator safety regulations will trigger this fault.	1. If the generator is not connected, ignore this fault; 2. When the generator fails, occurrence of this fault is normal. After the generator recovers, wait for a period of time and the fault will be cleared automatically; 3. This fault does not affect normal operation in off-grid mode 4. When both the generator and the grid are connected and meet safety regulations, the grid will be prioritized for grid connection, and the system will operate in grid-tied mode.
BMS Status Bit Error	BMS Module Fault	Disconnect the AC output-side switch and DC input-side switch. After 5 minutes, close the AC output-side switch and DC input-side switch. If the fault still persists, contact your dealer or after-sales service center.
Ambient Overtemperature	1. Poor ventilation of the machine 2. Hot air flows back 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 still 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. The internal fan is operating abnormally.	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 the ventilation is poor or Ambient Overtemperature occurs, improve the ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, contact your dealer or after-sales service center.

Fault name	Fault cause	Fault handling recommendations
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 the ventilation is poor or Ambient Overtemperature occurs, improve the ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, contact your dealer or after-sales service center.
AC Terminal Overtemperature Warning	AC Terminal Overtemperature, possible causes: 1. The inverter installation location is not ventilated. 2. Ambient Overtemperature. 3. The internal fan is operating abnormally.	
Bat Terminal Overtemperature Alarm	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 the ventilation is poor or Ambient Overtemperature occurs, improve the ventilation and heat dissipation conditions. 3. If both 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.

Fault name	Fault cause	Fault handling recommendations
External STS Failure	Inverter-to-STS connection cable abnormal	Check whether the wiring harness connection sequence between the inverter and STS corresponds one-to-one in order.

Fault name	Fault cause	Fault handling recommendations
Parallel Comm Timeout Shutdown	In parallel mode, if a slave does not communicate with the master for more than400seconds	Check whether the parallel communication wiring harness is connected reliably, and check whether the 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 hardware EPO button is triggered, or remote EPO command is triggered	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.

Fault name	Fault cause	Fault handling recommendations
High combustible gas concentration	The combustible gas equipment automatically triggers when it detects a concentration of 20% LEL or above.	1. After a fault occurs, the machine will automatically open the air damper to exhaust and reduce the concentration. When the concentration drops below 5% LEL and remains for 15 minutes, the fault will automatically clear. 2. After a fault occurs, if a cluster-level Fire Fighting Failure is triggered, the air damper will be automatically closed, and the air damper status will be confirmed within 30 s to ensure that the cluster-level fire fighting is performed in a closed space for Protection. 3. Please contact the dealer or after-sales service center.
The air damper opening of the combustible gas device is inconsistent with the feedback signal.	The control signal for opening the air damper is inconsistent with the feedback signal.	1. Check that the wiring harness signal connections are free of problems. 2. Please contact the dealer or after-sales service center.
One-button shutdown	Use the App to check whether the one-button shutdown function is enabled	Turn off the one-button shutdown.
Offline shutdown	-	-

Fault name	Fault cause	Fault handling recommendations
Remote shutdown	-	-
On-Grid SPD Fault	-	1. Try restarting the machine and observe whether the fault clears; 2. If the fault cannot be cleared after restarting, please contact the dealer or after-sales service center.
Off-Grid SPD Fault	-	1. Try restarting the machine and observe whether the fault clears; 2. If the fault cannot be cleared after restarting, please contact the dealer or after-sales service center.
Child Node Communication Failure	Internal Comm Abnormal	1. Try restarting the machine and observe whether the fault clears; 2. If the fault cannot be cleared after restarting, please contact the dealer or after-sales service center.
Dehumidifier communication failure	Abnormal communication link between the dehumidifier and the LC control box.	1. Check the communication wiring harness, and observe whether the fault is eliminated; 2. Try restarting the machine and observe whether the fault clears; 3. If the fault cannot be eliminated after restart, please contact the dealer or after-sales service center.

Fault name	Fault cause	Fault handling recommendations
Communication fault of the combustible gas detection equipment.	1. The combustible gas equipment was not correctly configured with 485 address 2 before leaving the factory. 2. Abnormal communication link between the combustible gas equipment and the LC control box.	1. Check the communication wiring harness, and observe whether the fault is eliminated; 2. Try restarting the machine and observe whether the fault clears; 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 eliminated after restart, please contact the dealer or after-sales service center.
DG Communication Failure	Abnormal communication link between the control board and the diesel generator.	1. Check the link communication wiring harness, and observe whether the fault is eliminated; 2. Try restarting the machine, and observe whether the fault is eliminated; 3. If the fault cannot be eliminated after restart, please contact the dealer or after-sales service center.
Battery Over Voltage	1. Single cell voltage too high 2. Abnormal voltage sensing harness	Record the fault phenomenon, restart the battery, wait a few minutes, and confirm whether the fault disappears. If the problem still exists after restart, contact the after-sales service center.
	1. Battery total voltage too high 2. Abnormal voltage sensing harness	

Fault name	Fault cause	Fault handling recommendations
Battery Undervoltage	1. Single cell voltage too low 2. Abnormal voltage sensing harness	
	1. Battery total voltage too low 2. Abnormal voltage sensing harness	
Battery Overcurrent	1. Charging Current too high, abnormal battery current limiting: sudden changes in temperature and voltage values 2. Abnormal inverter response	
	Excessive battery discharge current.	
Battery Overtemperature	1. Ambient Overtemperature 2. Abnormal temperature sensor	
Battery Undertemperature	1. Ambient temperature too low 2. Abnormal temperature sensor	
Battery Terminal Overtemperature	Battery terminal temperature too high.	

Fault name	Fault cause	Fault handling recommendations
Battery Imbalance	1. Excessive temperature difference. In different stages, the battery limits its power, i.e., limits the charge and discharge current. Therefore, this problem is generally unlikely to occur. 2. Cell capacity degradation leads to excessive internal resistance, causing a large temperature rise during Overcurrent, thus the temperature difference becomes large. 3. Poor welding of cell tabs causes the cell to heat up too quickly under Overcurrent. 4. Temperature sampling issue; 5. Loose power cable connection.	

Fault name	Fault cause	Fault handling recommendations
	1. Inconsistent cell aging degree. 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 fault.	Check whether the ground wire is properly connected, restart the battery. If the problem still exists after restart, contact the after-sales service center.
Pre-charging Failure Fault	Pre-charging Failure	It indicates that during the pre-charging process, the voltage across the pre-charge MOS always exceeds the specified threshold. After shutdown and restart, observe whether the fault persists, and check whether the wiring is correct and whether the pre-charge MOS is damaged.
Sampling Wire Fault	Battery sensing line has poor contact or is disconnected.	Check the wiring, restart the battery. If the problem still exists after restart, contact the after-sales service center.
	Cell voltage sampling line has poor contact or is disconnected.	Check the wiring, restart the battery. If the problem still exists after restart, contact the after-sales service center.

Fault name	Fault cause	Fault handling recommendations
	Cell temperature sampling line has poor contact or is disconnected.	
	The dual-channel current comparison error is too large, or the current sampling line loop is abnormal.	
	The dual-channel voltage comparison error is too large, or the voltage comparison error between MCU and AFE is too large, or the voltage sampling line loop is abnormal.	
	The temperature sampling line loop is abnormal, or there is poor contact or disconnection.	
	Overvoltage level 5 or overtemperature level 5, blowing the three-terminal fuse.	The three-section fuse has blown. Please contact the after-sales service center to replace the main control board.
Relay or MOS over-temperature	Relay or MOS over-temperature	This fault indicates that the MOSFET temperature exceeds the specified threshold. Power off and let it rest for 2 hours to allow the temperature to recover.

Fault name	Fault cause	Fault handling recommendations
Shunt over-temperature	Shunt over-temperature	This fault indicates that the shunt tube temperature exceeds the specified threshold. Power off and let it rest for 2 hours to allow the temperature to recover.
BMS1 Other Fault 1 (Household Energy Storage Type)	Relay or MOSFET open circuit.	1. Upgrade the software, power off and let it rest for 5 minutes. After restarting, check whether the fault persists; 2. If the fault persists, replace the battery pack.
	Relay or MOSFET short circuit.	1. Upgrade the software, power off and let it rest for 5 minutes. After restarting, check whether the fault persists; 2. If the fault persists, replace the battery pack.
	Abnormal communication between the master and slave clusters, or inconsistent cells between clusters.	1. Check the slave unit's battery information and software version, and whether the communication line connection with the master is normal. 2. Upgrade the software.
	The battery system loop wiring harness is abnormal, causing the interlock signal to fail to form a loop.	Check whether the terminal resistor is installed correctly.

Fault name	Fault cause	Fault handling recommendations
	Abnormal communication between BMS and PCS.	1. Confirm whether the communication line interface definition between the battery and the inverter is correct; 2. Please contact the after-sales service center to review the backend data and observe whether the inverter and battery software are correctly matched.
	Abnormal communication harness between the BMS master controller and slave controller.	1. Check the wiring and restart the battery; 2. Upgrade the battery. If the problem still exists after restarting, please contact the after-sales service center.
	Communication lost between master and slave chips.	
	Air switch or shunt trip abnormal.	1. Power off and let it rest for 5 minutes. After restarting, check whether the fault persists; 2. Observe the blind mating connectors at the bottom of the PACK and PCU to see whether the communication pins are loose or tilted;
	MCU self-test failed.	Upgrade the software, restart the battery. If the problem still exists after restart, please contact the after-sales service center.

Fault name	Fault cause	Fault handling recommendations
	1. The software version is too low or the BMS board is damaged 2. The number of parallel inverters is large, causing excessive inrush current to the battery during pre-charging	1. Upgrade the software and observe whether the fault persists 2. If it is a parallel connection situation, black-start the battery first before starting the inverter
	MCU internal fault	Upgrade the software and restart the battery. This is generally caused by a damaged MCU or external component. If the problem still exists after restart, please contact the after-sales service center.
	The master control current exceeds the specified threshold	1. Let the battery stand with the power off for 5 minutes, then restart and check whether the fault persists. 2. Check whether the inverter power setting is too high, causing the bus load to be exceeded.
	The cells of the parallel battery clusters are inconsistent	Confirm whether the cells of the parallel battery clusters are consistent
	The positive and negative terminals of the parallel battery clusters are reversed	Check whether the positive and negative terminals of the parallel battery clusters are reversed

Fault name	Fault cause	Fault handling recommendations
	Severe over-temperature, over-voltage, etc., trigger the fire protection system	Contact the after-sales service center.
Air Conditioner Failure	Abnormal air conditioner failure	Try restarting the system. If the fault is not cleared, please contact the after-sales service center.
	The cabinet door is not closed	Check whether the cabinet door is properly closed
	Supply voltage is too high	Confirm whether the supply voltage meets the air conditioner input voltage requirements. After confirming it meets the requirements, 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, please contact the after-sales service center.
	Poor sensor contact or damage	
	Abnormal air conditioner fan	
	There is an abnormal voltage or current inside the DCDC	For details, refer to the specific DC Failure content.

Fault name	Fault cause	Fault handling recommendations
BMS1 Other Fault 2 (Residential Energy Storage Type)	DCDC Overload or heatsink temperature too high, etc.	
	Cell sampling abnormal or inconsistent aging levels	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. Turn off the battery and check the wiring and output port screws. 2. After confirmation, restart the battery and observe whether the fault persists. If it does, contact the after-sales service center.
	Battery has been used for too long or cells are severely damaged	Please contact the after-sales service center to replace the pack.
	1. The software version is too low or the BMS board is damaged 2. The number of parallel inverters is large, causing excessive inrush current to the battery during pre-charging	1. Upgrade the software and observe whether the fault persists. 2. If it is a parallel connection case, black-start the battery first, then start the inverter.
	Heating film damaged	Please contact the after-sales service center.

Fault name	Fault cause	Fault handling recommendations
	The three-terminal fuse of the heating film is blown, and the heating function cannot be used.	Please contact the after-sales service center.
	Software model, cell type, and hardware model do not match.	Check whether the software model, SN, cell type, and hardware model are consistent. If inconsistent, contact the after-sales service center.
	Thermal management board communication disconnected	1. Power off and let it rest for 5 minutes. After restarting, check whether the fault persists; 2. If the fault is not cleared, contact after-sales service to replace the pack.
	Pack fan fault signal triggered	
DCDC Failure	Output port voltage too high	Check the output port voltage. If the output port voltage is normal and the fault still cannot be automatically cleared after restarting the battery, contact the after-sales service center.
	DCDC module detected that Battery Voltage exceeds the maximum charging voltage	Stop charging, discharge to below SOC 90% or let it sit for 2 hours. If invalid and the fault persists after restart, contact the after-sales service center.
	Heatsink temperature too high	Let the battery sit for 1 hour until the heatsink temperature drops. If invalid and the fault persists after restart, contact the after-sales service center.

Fault name	Fault cause	Fault handling recommendations
	Excessive battery discharge current.	Check whether the load exceeds the battery's discharge capability. Turn off the load or stop the PCS for 60s. If invalid and the fault persists after restart, contact the after-sales service center.
	The positive and negative poles of the output port power harness are reversely connected to the parallel cluster battery or PCS.	Turn off the battery manual switch, check whether the output port wiring is correct, and restart the battery.
	Output power relay cannot close	Check whether the output port wiring is correct and whether there is a short circuit. If invalid and the fault persists after restart, contact the after-sales service center.
	Power device temperature too high	Rest the battery for 1 h until the temperature of the internal power components drops. If this is ineffective and the fault persists after restart, contact the after-sales service center.
	Relay adhesion	If the fault persists after restart, contact the after-sales service center.
Battery Rack Circulating Current Failure	1. Cell imbalance 2. No full-charge calibration performed on first power-on	Record the fault phenomenon, restart the battery, wait a few minutes, and confirm whether the fault disappears. If the problem still exists after restart, contact the after-sales service center.

Fault name	Fault cause	Fault handling recommendations
BMS1 Other Fault 3 (Large-Scale Energy Storage)	Communication abnormality with the Linux module	1. Check whether the communication cable connection is normal 2. Upgrade the software, restart the battery, and observe whether the fault persists. If it persists, contact the after-sales service center.
	Cell temperature rise too fast	Cell abnormality. Contact after-sales service to replace the pack.
	SOC below 10%	Charge the battery.
	SN write does not comply with the rules	Check whether the SN length is normal. If abnormal, contact the after-sales service center.
	1. Daisy chain communication abnormality within the battery rack 2. Inconsistent cell aging degree between battery racks	1. Check the contact condition of the battery packs in a single battery rack 2. Confirm the usage of the batteries in each battery rack, such as cumulative charge/discharge capacity, cycle count, etc. 3. Contact the after-sales service center.
	Humidity inside the pack is too high	-
	Fuse blown	Contact after-sales service to replace the pack.
	Low battery level	Charge the battery.
BMS1 Other Fault 4 (Large-Scale Energy Storage)	Abnormal circuit breaker	Contact after-sales service to replace the pack.
	External device abnormality	Contact after-sales service to replace the pack.

Fault name	Fault cause	Fault handling recommendations
Contactor Failure 1	-	-
Contactor Failure 2	-	-
Overload Protection (Ksic)	Sustained overload (over 690 kVA) for 10s	Please contact the after-sales service center.
Overload Protection (Smart Port	Sustained overload (over 690 kVA) for 10s	Please contact the after-sales service center.
Overload 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 machine connected to the meter as the master.
Slave AC On Timeout with Master	1. Incorrect slave address setting. 2. The slave communication cable is loose.	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, locate and troubleshoot the fault based on the SOC indicator status.

No.	SOC indicator	Fault name	Troubleshooting
1	○○○○●	Battery overvoltage	Power off and rest for 2h. If the problem persists after restart, contact after-sales service center
2	○○○●○	Battery undervoltage	Please contact after-sales service center
3	○○○●●	Cell temperature high	Power off and rest for 2h. If the problem persists after restart, contact after-sales service center
4	○○●○○	Charging low temperature	Power off and wait for temperature recovery. If the problem persists after restart, contact after-sales service center
5	○○●○●	Discharging low temperature	Power off and wait for temperature recovery. If the problem persists after restart, contact after-sales service center
6	○○●●○	Charging overcurrent	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
7	○○●●●	Discharging overcurrent	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
8	○●○○○	Insulation resistance too low	Please contact after-sales service center
9	○●○○●	Excessive temperature difference	Power off and rest for 2h. If the problem persists after restart, contact after-sales service center
10	○●○●●	Excessive cell voltage difference	Restart the battery and rest for 12h. If the problem persists, contact after-sales service center
11	○●●○○	Cell inconsistency	Please contact after-sales service center
12	○●●○●	Wiring harness abnormal	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.

No.	SOC indicator	Fault name	Troubleshooting
13	○●●●○	MOS cannot close	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
14	○●●●●	MOS cannot close	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
15	●○○○○	Parallel cluster fault	Check whether the battery model matches. If not, contact after-sales service center
16	●○○○●	Interlock signal fault	Check whether the terminating resistor is installed correctly. If the problem persists after restart, contact after-sales service center
17	●○○●○	BMU communication fault	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
18	●○○●●	MCU Internal Comm Failure	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
19	●○●○○	Circuit breaker sticking fault	Please contact after-sales service center
20	●○●○●	Pre-charging Failure Fault	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
21	●○●●○	MOS overtemperature fault	Power off and rest for 2h. If the problem persists after restart, contact after-sales service center
22	●○●●●	Combiner Box Overtemperature Failure	Power off and rest for 2h. If the problem persists after restart, contact after-sales service center
23	●●○○○	Reverse connection fault	Please contact after-sales service center
24	●●●●●	Microelectronic fault	Please contact 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, locate and troubleshoot the fault based on the SOC indicator status.

No.	SOC indicator	Fault name	Troubleshooting
1	○○○●	Battery Over Voltage Battery Undervoltage	1. Check through the APP whether the inverter Charging Current limit is 0. If it is 0, confirm that 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 resolved, please contact the after-sales service center.
2	○○●●	Battery Overcurrent	1. Use the APP to check whether the battery model is correct, confirm whether the battery real-time current is greater than the Charging Current limit or the Discharge Current Limit value, and contact the after-sales service center. 2. If it is less, power off the battery or upgrade the program, then restart to confirm whether the fault persists. 3. If the fault is not resolved, please contact after-sales service.

No.	SOC indicator	Fault name	Troubleshooting
3	○○●○	Battery Overtemperature Battery Undertemperature Battery Terminal Overtemperature	Power off and let the battery stand for 60 minutes until the temperature recovers. If the problem persists after restarting, please contact the after-sales service center.
4	○●○○	Battery Imbalance SOH Too Low Fault	Power off and let the battery stand for 30 minutes. If the problem persists after restarting, please contact the after-sales service center.
5	●○●●	Pre-charging Failure Fault	1. Confirm whether the battery output terminals are connected in reverse to the inverter. 2. Power off and leave it idle for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
6	○●○●	Sampling Wire Fault	Confirm whether the battery switch is closed. If the battery switch is closed and the problem persists, please contact the after-sales service center.
7	●●○○	Relay or MOS over-temperature Shunt over-temperature	Power off and let the battery stand for 30 minutes. If the problem persists after restarting, please contact the after-sales service center.

No.	SOC indicator	Fault name	Troubleshooting
		BMS Other Faults: Output Port Overtemperature Fault	1. Check whether the battery power cables are tightened. Power off and leave it idle for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
8	○●●○	Other Protection: MOS Cannot Close	Power off and leave it idle for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
9	○●●●	Other Protection: MOS Stuck	
10	●○○○	Other Protection: Parallel Cluster Fault	1. Confirm whether the type and installation position of the terminating resistor are correct. 2. Confirm whether the communication lines between batteries and between the battery and the inverter are reliably connected and communicating normally. 3. If the fault is not resolved, please contact the after-sales service center.
11	○○○○	Other Protection: Communication Loss with Inverter	1. Confirm whether the communication lines between batteries and between the battery and the inverter are reliably connected and communicating normally. 2. If the fault is not resolved, please contact the after-sales service center.

No.	SOC indicator	Fault name	Troubleshooting
12	●○○●	Other Protection: BMU Communication Fault	1. Confirm whether the type and installation position of the terminating resistor are correct. 2. Confirm whether the communication lines between batteries and between the battery and the inverter are reliably connected and communicating normally. 3. Power off and leave it idle for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
13	●○●○	Other Protection: Air Switch Stuck Fault	Power off and leave it idle for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
14	●●○●	Other Protection: Software Failure	Restart the battery. If the problem persists after restarting, please 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. Power off and leave it idle for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.

9.5.2.5 Battery Fault (LX U5.4-L)

SOC indicator	Fault name	Troubleshooting
	Temperature difference abnormal	Shut down and wait2 hours. If the problem is not resolved, please contact the after-sales service center.
	High temperature	
	Low temperature discharge	Shut down, wait for the temperature to rise, and restart the battery. If the problem is not resolved, please contact the after-sales service center.
	Charging overcurrent	Restart the battery. If the problem is not resolved, please 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 before returning to normal.
	Low temperature charging	Shut down, wait for the temperature to rise, and restart the battery. If the problem is not resolved, please contact the after-sales service center.
	Excessive cell voltage difference	Shut down and wait2 hours, restart the battery. If the problem is not resolved, please contact the after-sales service center.

Fault status

SOC indicator	Fault name	Troubleshooting
	Temperature sensor failure	Restart the battery. If the problem is not resolved, please contact the after-sales service center.
	MOSFET fault	
	Circuit breaker disconnection error	Reclose the circuit breaker. If the problem is not resolved, please contact the after-sales service center.
	Slave communication lost	Shut down, check the communication cables, and restart the battery. If the problem is not resolved, please contact the after-sales service center.
	NoSN error	Please contact after-sales service center
	Master communication lost	Shut down, check the inverter communication cable connection, and restart the battery. If the problem is not resolved, please contact the after-sales service center.
	Software version mismatch	Please contact after-sales service center
	Multi-master error	After shutdown, within30s, turn on all batteries.
	MOSFET over-temperature error	Shut down and wait2 hours. If the problem is not resolved, please contact the after-sales service center.
	Inverter communication interrupted	Shut down, check the communication cable connection, and restart the battery. If the problem is not resolved, please contact the after-sales service center.

9.5.2.6 Battery Fault (LX U5.4-20)

Alarm status

When the battery button indicator light shows red and flashes once every 1 second, locate and troubleshoot the alarm based on the SOC indicator light status.

No.	SOC indicator	Description

1		The battery system handles it automatically. You can use theSolarGo APP to view specific alarm information.
2		
3		
4		
5		
6		

Fault status

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

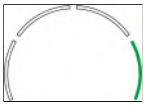
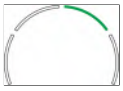
Button indicator light	SOC indicator	Fault name	Troubleshooting
Red light solid on		Battery overvoltage	Power off and let it standfor 2 hours, restart the battery. If the problem is not resolved, contact the after-sales service center.
Red light flashingonce per second		Battery undervoltage	Please contact after-sales service center
Red light solid on		Cell temperature high	Power off and let it standfor 2 hours, restart the battery. If the problem is not resolved, contact the after-sales service center.
		Charging low temperature	Power off and wait for the temperature to recover, Restart the battery. If the problem is not resolved, Please contact after-sales service center
		Discharging low temperature	
		Charging overcurrent	Restart the battery. If the problem is not resolved, please contact the after-sales service center.

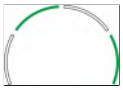
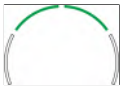
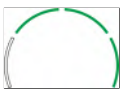
		Discharging overcurrent	
		Excessive temperature difference	Power off and let it standfor 2 hours, restart the battery. If the problem is not resolved, contact the after-sales service center.
		Excessive cell voltage difference	After restarting the battery, let it standfor 12 hours. If the problem is not resolved, contact the after-sales service center.
		Wiring harness abnormal	Restart the battery. If the problem is not resolved, please contact the after-sales service center.
		MOS cannot close	
		MOSFET short circuit	
		Parallel cluster fault	Check whether the battery model matches. If not, contact after-sales service center
		BMU communication fault	Restart the battery. If the problem is not resolved, please contact the after-sales service center.
		MCU Internal Comm Failure	
		Circuit breaker sticking fault	Please contact after-sales service center
		Pre-charging Failure Fault	Restart the battery. If the problem is not resolved, please contact the after-sales service center.
		MOSFET overtemperature fault	Power off and let it standfor 2 hours, restart the battery. If the problem is not resolved, contact the after-sales service center.
		Combiner Box Overtemperature Failure	Power off and let it standfor 2 hours, restart the battery. If the problem is not resolved, contact the after-sales service center.

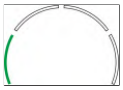
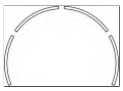
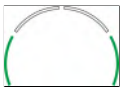
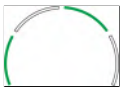
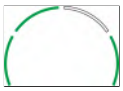
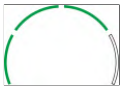
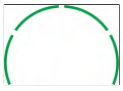
		Microelectronic fault	Please contact after-sales service center

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

When the battery alarm indicator light shows red , the outer ring marquee light flashes red , and the operation light is off, locate and troubleshoot the fault based on the SOC indicator display status.

No.	SOC indicator	Fault name	Troubleshooting
1		Battery Over Voltage	1. Check through the App whether the inverter's 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 resolved, please contact the after-sales service center.
		Battery Undervoltage	
2		Battery Overcurrent	1. Check via the App whether the battery model is correct. If the battery real-time current is greater than the Charging Current Limit or the Discharge Current Limit value, contact the after-sales service center. 2. If it is less, power off the battery or upgrade the software, then restart to confirm whether the fault persists. 3. If the fault is not resolved, contact after-sales service.
3		Battery Overtemperature	

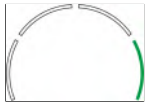
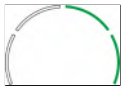
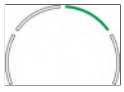
		Battery Undertemperature	Power off and let the battery stand for 60 minutes until the temperature recovers. If the problem persists after restarting, please contact the after-sales service center.
		Battery Terminal Overtemperature	
4		Battery Imbalance	Power off and let the battery stand for 30 minutes. If the problem persists after restarting, please contact the after-sales service center.
		SOH Too Low Fault	
5		Pre-charging Failure Fault	1. Confirm whether the battery output terminal and the inverter are connected in reverse. 2. Power off and leave it idle for 5 minutes; if the problem still exists after restarting, contact the after-sales service center.
6		Sampling Wire Fault	Confirm whether the battery circuit breaker is closed. If the battery circuit breaker is already closed and the problem still exists, contact the after-sales service center.
7		Relay or MOS over-temperature	Power off and let the battery stand for 30 minutes. If the problem persists after restarting, please contact the after-sales service center.
		Output Port Over-temperature	1. Check whether the battery power cable is tightened. 2. Power off and leave it idle for 5 minutes; if the problem still exists after restarting, contact the after-sales service center.
8		MOS cannot close	Power off and leave it idle for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
9		MOSFET short circuit	

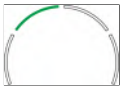
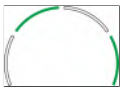
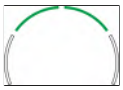
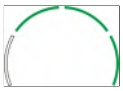
10		Parallel cluster fault	1. Confirm whether the type and installation position of the termination resistor are correct. 2. Confirm whether the communication cables between batteries and between the battery and the inverter are connected reliably and communication is normal. 3. If the fault is not resolved, please contact the after-sales service center.
11		Software and hardware versions do not match.	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
12		BMU communicatio n fault	
13		Circuit breaker sticking fault	Power off and leave it idle for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
14		Software Failure	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
15		Hardware Overcurrent Fault	
16		Microelectroni c fault	
		Heating Film Three-Terminal Abnormality	1. Upgrade the software. 2. Power off and leave it idle for 5 minutes; if the problem still exists after restarting, contact the after-sales service center.

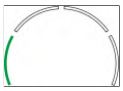
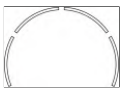
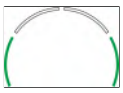
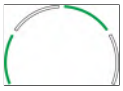
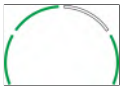
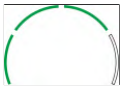
9.5.2.8 Battery Fault (GW16.1-BAT-LV-G10)

When the battery alarm indicator light shows red , the outer ring marquee light flashes red

, and the operation light is off, locate and troubleshoot the fault based on the SOC indicator display status.

No.	SOC indicator	Fault name	Troubleshooting
1		Battery Over Voltage Battery Undervoltage	1. Check through the App whether the inverter's 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 resolved, please contact the after-sales service center.
2		Battery Overcurrent	1. Check via the App whether the battery model is correct. If the battery real-time current is greater than the Charging Current Limit or the Discharge Current Limit value, contact the after-sales service center. 2. If it is less, power off the battery or upgrade the software, then restart to confirm whether the fault persists. 3. If the fault is not resolved, contact after-sales service.
3		Battery Overtemperature Battery Undertemperature Battery Terminal Overtemperature	Power off and let the battery stand for 60 minutes until the temperature recovers. If the problem persists after restarting, please contact the after-sales service center.

4		Battery Imbalance	Power off and let the battery stand for 30 minutes. If the problem persists after restarting, please contact the after-sales service center.
		SOH Too Low Fault	
5		Pre-charging Failure Fault	1. Confirm whether the battery output terminal and the inverter are connected in reverse. 2. Power off and leave it idle for 5 minutes; if the problem still exists after restarting, contact the after-sales service center.
6		Sampling Wire Fault	Confirm whether the battery circuit breaker is closed. If the battery circuit breaker is already closed and the problem still exists, contact the after-sales service center.
7		Relay or MOS over-temperature	Power off and let the battery stand for 30 minutes. If the problem persists after restarting, please contact the after-sales service center.
		Output Port Over-temperature	1. Check whether the battery power cable is tightened. 2. Power off and leave it idle for 5 minutes; if the problem still exists after restarting, contact the after-sales service center.
8		MOS cannot close	Power off and leave it idle for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
9		MOSFET short circuit	

10		Parallel cluster fault	1. Confirm whether the type and installation position of the termination resistor are correct. 2. Confirm whether the communication cables between batteries and between the battery and the inverter are connected reliably and communication is normal. 3. Confirm through the battery SN code whether the cells of the battery clusters in parallel are consistent 4. If the fault is not resolved, contact the after-sales service center
11		Software and hardware versions do not match.	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
12		BMU communication fault	
13		Circuit breaker sticking fault	Power off and leave it idle for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
14		Software Failure	Restart the battery. If the problem persists after restarting, please 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 leave it idle for 5 minutes; if the problem still exists after restarting, contact the after-sales service center.

9.5.2.9 Mix Parallel Unit Fault

No.	Fault name	Troubleshooting
1	Parallel cluster fault	Check the actual number of battery clusters connected in parallel. If >30, remove the excess batteries; if the actual number is ≤30, turn off the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
2	Shunt temperature too high	Power off and let stand for 2 hours, turn off the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
3	Software Failure	Turn off the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
4	Main control overload fault	Turn off the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
5	Parallel box hardware overcurrent fault	Turn off 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. Turn off 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. Turn off 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. Turn off the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.

No.	Fault name	Troubleshooting
9	Parallel box MOS open-circuit fault	Turn off the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
10	Parallel box MOS short-circuit fault	Turn off the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.
11	Parallel box MOS over-temperature fault	Power off and let stand for 2 hours, turn off 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 wiring sequence of the communication cables and power cables of the batteries under the parallel box matches. Turn off the parallel system and restart the parallel box. If the fault persists, contact the after-sales service center.

10 Technical Parameters

10.1 Inverter Technical Specifications

Technical Parameters	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Battery Input Parameters			
Battery Type*1	Lithium-ion Battery/Lead-acid Battery	Lithium-ion Battery/Lead-acid Battery	Lithium-ion Battery/Lead-acid Battery
Rated 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 Batteries Configured	1	1	1
Max. Continuous Charging Current (A)	160	200	240
Max. Continuous Discharging Current (A)	160	200	240
Max. Charging Power (kW)	8.0*3	10.0*3	12.0*3
Max. Discharging Power (kW)	8.8*3	11.0*3	13.2*3
PV Input Parameters			
Max. Input Power (kW)*4	16.0	20.0	24.0
Max. Input Voltage (V)*5	600	600	600

Technical Parameters	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
MPPT Operating Voltage Range (V)*6	60~550	60~550	60~550
MPPT Full-Load Voltage Range (V)	180~500	170~500	200~500
Start-up Voltage (V)	58	58	58
Nominal Input Voltage (V)	360	360	360
Max. MPPT Current per MPPT (A)	32/16	32/32	32/32
Max. MPPT Short Circuit Current per MPPT (A)	48/24	48/48	48/48
Max. Backfeed Current to the Array (A)	0	0	0
Number of MPPTs	2	2	2
Number of Strings per MPPT	2/1	2/2	2/2
Grid-Connected Output Parameters			
Rated Output Power (kW)	8.0	10.0	12.0
Rated Grid-Connected Output Apparent Power (kVA)	8.0	10.0	12.0
Max. Grid-Connected Output Apparent Power (kVA)	8.8	11.0	13.2
Rated Apparent Power for Grid Buy (kVA)	8.0	10.0	12.0
Max. Apparent Power from Grid (kVA)	16.5	16.5	16.5

Technical Parameters	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Rated Output Voltage (V)	220/230/240	220/230/240	220/230/240
Output Voltage Range (V)	170~280	170~280	170~280
Output Voltage Frequency (Hz)	50/60	50/60	50/60
Voltage Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Maximum Grid-Connected Output Current (A)	40.0	50.0	60.0
Max. Current from Grid (A)	75.0	75.0	75.0
Rated Current from Grid (A)	36.4/34.8/33.3	45.5/43.5/41.7	54.5/52.2/50.0
Maximum Output Fault Current (Peak and Duration) (A)	105A, 3us	105A, 3us	105A, 3us
Surge Current (Peak and Duration) (A)	105A, 3us	105A, 3us	105A, 3us
Rated Current to 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
Power Factor	~1 (0.8 leading...0.8 lagging adjustable)	~1 (0.8 leading...0.8 lagging adjustable)	~1 (0.8 leading...0.8 lagging adjustable)
THDi	<3%	<3%	<3%

Technical Parameters	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Maximum Output Overcurrent Protection (A)			
Type of Voltage (a.c. or d.c.)	a.c.	a.c.	a.c.
Off-Grid Output Parameters			
Off-Grid Rated Apparent Power (kVA)	8.0	10.0	12.0
Max. Apparent Power to Grid (Off-Grid) (kVA)	8.8(16.0 at 10s)	11.0(20.0 at 10s)	13.2(24.0 at 10s)
Max. Apparent Power to Grid (Grid-Connected) (kVA)	8.8	11.0	13.2
Rated Current to 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. Current to Grid (Off-Grid) (A)	40.0	50.0	60.0
Max. Current to Grid (Grid-Connected) (A)	75.0	75.0	75.0
Maximum Output Fault Current (Peak and Duration) (A)	105A, 3us	145A, 3us	145A, 3us
Surge Current (Peak and Duration) (A)	105A, 3us	145A, 3us	145A, 3us

Technical Parameters	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Maximum Output Overcurrent Protection (A)	105	145	145
Rated Output Voltage (V)	220/230/240	220/230/240	220/230/240
Rated Output Voltage Frequency (Hz)	50/60	50/60	50/60
Total Voltage Waveform Distortion Rate (@ Linear Load)	<3%	<3%	<3%
Generator Interface Parameters			
Rated Apparent Input Power (kVA)	8.0	10.0	12.0
Maximum Apparent Input Power (kVA)	11.0	12.0	12.0
Nominal Input Voltage (V)	220/230/240	220/230/240	220/230/240
Input Voltage Range (V)	170~280	170~280	170~280
Input Voltage Frequency (Hz)	50/60	50/60	50/60
Voltage Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Max. Current from Grid (A)	50	54.5	54.5
Rated Current from 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

Technical Parameters	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
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	Integration	Integration	Integration
PV Insulation Resistance Detection	Integration	Integration	Integration
Residual Current Monitoring	Integration	Integration	Integration
PV Reverse Polarity Protection	Integration	Integration	Integration
Anti-islanding Protection	Integration	Integration	Integration
AC Overcurrent Protection	Integration	Integration	Integration
AC Short Circuit Protection	Integration	Integration	Integration
AC Overvoltage Protection	Integration	Integration	Integration

Technical Parameters	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
DC Switch	Integration	Integration	Integration
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
Remote Shutdown	Integration	Integration	Integration
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 Air Cooling	Smart Air Cooling	Smart Air Cooling
User Interface	LCD, WLAN+APP	LCD, WLAN+APP	LCD, WLAN+APP
BMS Communication	CAN	CAN	CAN
Communication	RS485, WiFI+LAN+Bluetooth	RS485, WiFI+LAN+Bluetooth	RS485, WiFI+LAN+Bluetooth

Technical Parameters	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Communication Protocols	Modbus-RTU、Modbus-TCP	Modbus-RTU、Modbus-TCP	Modbus-RTU、Modbus-TCP
Weight (kg)	27kg	29kg	29kg
Dimensions (W×H×T mm)	560*445*226	560*445*226	560*445*226
Noise Emission (dB)	<45	<45	<45
Topology	Non-isolated	Non-isolated	Non-isolated
Power Self-consumption at Night (W)	<10	<10	<10
Ingress Protection Rating	IP66	IP66	IP66
Anti-corrosion Class	C4	C4	C4
DC Connector	MC4, OT terminal	MC4, OT terminal	MC4, OT terminal
AC Connector	OT terminal	OT terminal	OT terminal
Environmental Category	4K4H	4K4H	4K4H
Pollution Degree	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I
Decisive Voltage Classification (DVC)	Battery: A PV: C AC: C Com: A	Battery: A PV: C AC: C Com: A	Battery: A PV: C AC: C Com: A

Technical Parameters	GW8000-ES-C10	GW10K-ES-C10	GW12K-ES-C10
Mounting Method	Wall-mounted installation	Wall-mounted installation	Wall-mounted installation
Active Anti-islanding Method	SMS(Slip-mode frequency) +AFD	SMS(Slip-mode frequency) +AFD	SMS(Slip-mode frequency) +AFD
Type of Electrical Supply System	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT	TN-S, TN-C, TN-C-S, TT
Certification			
Grid Standard	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			
EMC	IEC 62920, IEC 61000, EN 300328,EN 301489,EN IEC 62311,EN 62479		

*1: Lithium-ion batteries typically include two mainstream types: lithium iron phosphate.
*3: When the PV input voltage exceeds 490V, the battery charging and discharging power will be gradually limited; when the input voltage drops, the power limit will be removed.
*4: For an MPPT with two strings, the Max. Current from Grid per string is 16A.
*5: When the input voltage is between 580V-600V, the inverter will enter standby mode; when the voltage recovers to 580V, it will enter normal operation.
*6: For the MPPT full-load Voltage Range, please refer to the user manual.

10.2 Battery Technical Parameters

10.2.1 LX A5.0-10

Technical Parameters		LX A5.0-10	2*LX A5.0-10	n*LX A5.0-10
Available 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 (℃)		Charge: 0 ~ +50; Discharge: -10 ~ +50		
Relative Humidity		0~95%		
Max. Operating Altitude (m)		3000		
Communication		CAN		
Weight (kg)		40	80	n×40
Dimensions (W×H×T mm)		Single LX A5.0-10 module: 442×133×420 (without handle); 483×133×452 (with handle)		
Ingress Protection Rating		IP21		
Storage Temperature (℃)		0 ~ +40 (≤1 year); -20 ~ 0 (≤1 month); -40 ~ 45 (≤1 month)		
Mounting Method		Cabinet installation / floor stacking / wall mounting		
Cycle Efficiency*4		95%		
Cycle Life*5		≥5000		
	Safety	IEC62619，IEC 63056，IEC62040-1，INmetro		
	EMC	EN IEC61000-6-1，EN IEC61000-6-2，EN IEC61000-6-3，EN IEC61000-6-4		

Technical Parameters		LX A5.0-10	2*LX A5.0-10	n*LX A5.0-10
Standards and Certification	Transportation	UN38.3，ADR		
*1: Measured with a new battery, 100% depth of discharge, 25±2℃ temperature range, under 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 state. *3: Under the condition that batteries are connected in parallel using the busbar box installation accessory. *4: New battery, within 2.5~3.65V, 25±2℃ temperature range, under 0.2C/0.2C charge/discharge conditions. Cell: 94%~95% under 0.6C/0.6C charge/discharge conditions. *5: Cell reaches 70% EOL within 2.87~3.59V, 25±2°C temperature range, under 0.6C/0.6C charge/discharge conditions. n: maximum 15.				

10.2.2 LX A5.0-30

Technical Parameters	LX A5.0-30
Battery Nominal Energy (kWh)	5.12
Usable Energy (kWh)*1	5
Cell type	LFP（LiFePO4）
Operating Voltage Range (V)	43.2 ~58.24
Nominal Charging Current (A) *2	60
Maximum Charging Current (A) *2*3	90
Nominal Discharging Current (A) *3	100
Max. Discharging Current (A)*2*3	150

Technical Parameters	LX A5.0-30
Max. Pulse Discharging Current (A)*2*3	<200 (30s)
Max. Discharging Power (W)*2*3	7200
Communication	CAN
Operating Temperature (℃)	Charge：0 < T≤55℃ Discharge：-20 < T≤55℃
Max. Operating Altitude (m)	4000
Weight (kg)	44
Dimensions (W×H×T mm)	442*133*520 (excluding mounting ears) 483*133*559 (including mounting ears)
Ingress Protection Rating	IP20
Scalability	Max. 30 parallel units (150kWh) (daisy chain / combiner box / busbar)
Mounting Method	Standard rack-mounted, floor stacking, wall-mounted
Cycle Efficiency*1	≥96%
Safety	IEC62619, IEC63056，N140
EMC	EN IEC 61000-6-1,EN IEC 61000-6-2,EN IEC 61000-6-3,EN IEC 61000-6-4
Transportation	UN38.3，ADR
Environmental	ROHS
*1: Test conditions: 100% DOD (depth of discharge), 0.2C charge and discharge, temperature 25°C±2°C, and performed at the early stage of battery life. *2: System operating current and power values depend on temperature and SOC. *3: Maximum charge/discharge current and power values may vary depending on the inverter model.	

10.2.3 LX U5.4-L

Technical Parameters	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 (℃)		Charging: 0 ~ +50 / Discharging: -10 ~ +50					
Storage Temperature (℃)		-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 Count*4		≥4000 @0.5/0.5C					
Standards and Certification	Safety	IEC62619，IEC 62040，CEC					
	EMC	CE，RCM					
	Transportation	UN38.3					
Safe Service Life (years)		≥25					

*1: Test conditions: cell voltage 2.5~3.65V, new battery charged/discharged at +25±2 ℃, 0.5C; usable energy may vary depending on the inverter.
*2: Test conditions: 0.5C charge/discharge at +25±2 ℃ with 90% DOD.
*3: Rated charging/discharging current and power are affected by temperature and SOC.
*4: Based on cell 0.5C@25±2℃ charge/discharge, EOL reaches 80%.

10.2.4 LX U5.4-20

Technical Parameters	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	16 series 5 parallel	16 series 6 parallel
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 (℃)	Charging: 0 ~ +50 / Discharging: -10 ~ +50					
Storage Temperature (℃)	-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 Count*3		≥4000 @0.5/0.5C
Standards and Certification	Safety	IEC62619，IEC 63056，IEC 62040，CEC
	EMC	CE，RCM
	Transportation	UN38.3
Safe Service Life (years)		≥25

*1: Test conditions: cell voltage 2.5~3.65V, new battery charged/discharged at +25±2 ℃, 0.5C; usable energy may vary depending on the inverter.
*3: Rated charging/discharging current and power are affected by temperature and SOC.
*3: Based on cell 0.5C@25±2℃ charge/discharge, EOL reaches 80%

10.2.5 LX U5.0-30

Technical Data	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
Nominal Charging Current (A)	60
Max. Continuous Charging Current (A) *2*3	90
Nominal Discharging Current (A)	100

Technical Data	LX U5.0-30
Max. Continuous Discharging Current (A)*2*3	100
Pulse Discharging Current (A)*2*3	＜200A（30S）
Max. Continuous Charging/Discharging Power (kW)	4.95
Communication	CAN
Charging Temperature Range (°C)	0<T≤55
Discharging Temperature Range (°C)	-20<T≤55
Ambient Temperature (°C)	0 < T ≤ 40 (Recommended 10 < T ≤ 30) Optional Heating: -20 < T ≤ 40 (Recommended 10 < T ≤ 30)
Relative Humidity	5~95%
Maximum Storage Time	12 Months (Maintenance-Free)
Max. Operating Altitude (m)	4000
Heating	Optional
Fire Protection Function	Optional, Aerosol
Unit Weight (kg)	50
Unit Dimensions (W × H × D mm)	460*580*160
Enclosure Ingress Protection Rating	IP65
Application	Grid-Connected / Grid-Connected + Backup Power / Off-Grid
Expandability	30P
Mounting Method	Floor-Mounted / Wall-Mounted
Cycle Efficiency	≥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

Technical Data	LX U5.0-30
Environmental Regulations	ROHS
Safe Service Life (years)	≥25
*1: Under the battery's factory state, the test conditions are 100% DOD, 0.2C, and charging/discharging is performed at 25°C ± 2°C ambient. *2: The system's operating current and power values are related to temperature and SOC. *3: The maximum charge/discharge current value may vary depending on the inverter model.	

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 (LiFePO4)
Nominal Voltage (V)	51.2
Max. Continuous Charging Current (A)	224
Max. Continuous Discharging Current (A)	260
Max. Input Power (System) (kW)*2	12KW
Max. Output Power (System) (kW)*2	12KW @13.2KW(10min)
Peak Output Power (System) (kW)*2	20KW (15S)
Charging Temperature Range (℃)	0~55
Discharging Temperature Range (℃)	-20~55
Relative Humidity	5%~85%
Max. Operating Altitude (m)	4000
Noise Emission Index (dB)	≤ 35
Communication	CAN、RS485

Technical Data	GW14.3-BAT-LV-G10	
Weight (kg)	125	
Dimensions (W×H×T mm)	530*885*246 (without base) 530*918.6*246 (with base)	
Optional Function Configuration	Aerosol	
Ingress Protection Rating	IP20	
Storage Temperature (℃)	-20~+45	
Ambient Temperature	0℃ < T ≤45℃ (standard configuration supports ambient temperature) 10℃ < T ≤35℃ (recommended ambient temperature) -20℃ < T ≤45℃ (optional device system supports ambient temperature)	
Maximum Storage Time	12 months (-20~35℃) 6 months (35~45°C)	
Scalability	30P	
Mounting Method	Floor-standing, wall-mounted	
Country of Manufacture	China	
Standards 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, Dangerous Goods Classification, MSDS

*1: Test conditions: At the beginning of the battery system's service life, at an ambient temperature of 25±2°C, a 100% depth of discharge is performed at a rate of 0.2P (discharge Voltage Range: 2.85V to 3.6V). Usable energy is determined by its initial design value. However, actual usable energy may vary due to charge/discharge rates, environmental conditions (such as temperature changes), and factors during transportation and storage.
*2: Max. Input Power, maximum output power, and peak output power may be reduced due to temperature changes and the state of charge (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
Usable energy (kWh)*1	≥14.9
Nominal Voltage (V)	51.2
Voltage Range (V)	45.92~57.76
Maximum continuous Charging Current (system) (A)	157
Maximum continuous discharge current (system) (A)	200
Max. Input Power (Kw)*2	8
Maximum output power (Kw)*2	10
Peak output power (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
Maximum Weight (kg)	≤122
Available extinguishing agent	CO_2, H_2O
Key materials	$LiFePO_4$, C, Cu, $LiPF_6$, Al, $(C_3H_6)_n$
Ingress Protection Rating	IP65

Technical Data		GW16.1-BAT-LV-G10
Protective Class		Ⅰ
Dimensions (W×H×T mm)		≤470*895*245 (excluding mounting feet)
Functional configuration		Roller wheels (optional), aerosol fire suppression (optional)
Storage Temperature (℃)		-20 ~45
Maximum Storage Time		-20 to 35°C ≤12 months; 35 to 45°C ≤6 months
Scalability		30P
Mounting Method		Wall-mounted, floor-standing
Cycle Life*3		≥8000（25±2℃ 0.5C 90%DOD 70% SOH）
Country of Manufacture		China
Standards and Certification	Safety	IEC62619, IEC60730，IEC63056，CE
	EMC	CE
	Transportation	UN38.3，MSDS

10.3 Mix Parallel Unit Technical Parameters

Technical Parameters	GW12/2-MPU-LVO-G10
Battery Voltage Range (V)	40~60
Max. Current from Grid per Port (A)	200
Max. Current to Grid (A)	240
Max. Input Power per Port (kW)*1	10
Max. Output Power (kW)*1	12

Technical Parameters	GW12/2-MPU-LVO-G10
Peak Output Power (kW)	18（10S）
Number of power input ports	2
Number of power output ports	1
Operating Temperature Range (°C)	-30~65
Relative Humidity	5%~95%
Maximum Operating Altitude (m)	4000
Communication	CAN
Number of communication input ports	2
Number of communication output ports	1
Weight (kg)	≤10kg
Dimensions (H×W×D mm)	332*537*132
Maximum number of parallel batteries supported*2	30P
Ingress Protection Rating	IP65
Storage Temperature (°C)	-40~85
Mounting Method	Wall-mounted
Country of Manufacture	China

*1: The Max. Input Power/Max. Output Power per port is derated depending on the temperature and state of charge (SOC) of the battery product.
*2 The maximum number of parallel batteries depends on the total capacity supported by all input ports. In addition, the maximum capacity that can be paralleled per port is limited by the maximum parallel capacity specified by the battery model.

10.4 Smart Meter Technical Specifications

10.4.1 GMK110

Technical Parameters			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 Parameters		GM330
Measurement Range	Supported Type of Electrical Supply System	Three-phase, Split-phase, Single-phase
	Voltage Range L-L (Vac)	172~817
	Voltage Range L-N (Vac)	100~472
	Nominal Frequency (Hz)	50/60
	CT Ratio	nA:5A
Communication Parameters	Communication Method	RS485
	Communication Distance (m/ft)	1000/3280
Accuracy Parameters	Voltage/Current	Class 0.5
	Active Energy	Class 0.5
	Reactive Energy	Class 1
General Parameters	Dimensions (WxHxD mm/in)	72x85x72/2.83x3.35×2.83
	Housing	4 Modules
	Weight (g/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 (°C/°F)	-30~+70/-22~+158
	Storage Temperature Range (°C/°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 Parameters		WiFi/LAN Kit-20
Output Voltage (V)		5
Power Consumption (W)		≤2
Communication Interface		USB
Communication Parameters	Ethernet	10/100Mbps auto-negotiation
	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 (°C)		-30~+60
Storage Temperature Range (°C)		-40~+70
Relative Humidity		0-95%
Max. Operating Altitude (m)		4000

10.5.2 4G Kit-CN-G20、4G Kit-CN-G21

Technical Parameters		WiFi/LAN Kit-20
Output Voltage (V)		5
Power Consumption (W)		≤2
Communication Interface		USB
Communication Parameters	Ethernet	10/100Mbps auto-negotiation
	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

Technical Parameters	WiFi/LAN Kit-20
Operating Temperature Range (°C)	-30~+60
Storage Temperature Range (°C)	-40~+70
Relative Humidity	0-95%
Max. Operating Altitude (m)	4000

10.5.3 Ezlink3000

Technical Parameters	Ezlink3000
General Parameters	
Connection Interface	USB
Ethernet interface (optional)	10/100Mbps auto-negotiation, communication distance ≤100m
Mounting Method	Plug and play
Indicator light	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 (°C)	-30 ~ +60
Storage Temperature Range (°C)	-30 ~ +70
Relative Humidity	0-100% (no condensation)
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 detect whether the meter CT is connected correctly and the current operating status of the meter and CT.

- Method 1:

1. Via**[Home]** > **[Settings]** > **[Meter/CT Auxiliary Detection]**, and enter the detection page.
2. Click Start Detection, wait for the detection to complete, and then view the detection results.

- Method 2:

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

11.1.2 How to Upgrade Device Version

Through the firmware information, 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 upgrading the software version through the SolarGo App; please refer to the actual situation.

- **Upgrade Notification:**

When the user opens the APP, an upgrade prompt pops up on the home page, and the user can choose whether to upgrade. If they choose to upgrade, follow the on-screen prompts to complete the upgrade.

- **Regular Upgrade:**

Via**[Home]** > **[Settings]** > **[Firmware Information]**, and enter the firmware

information view interface.
Click Check for Updates. If a new version is available, follow the on-screen prompts to complete the upgrade.

- **Forced Upgrade:**

The APP pushes upgrade information. The user must follow the prompts to upgrade; otherwise, the APP cannot be used. Follow the on-screen prompts to complete the upgrade.

11.2 Abbreviations

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

Abbreviation	English Description	Chinese Description
IAC,max(from grid)	Max. AC Current From Utility Grid	Max. Current from Grid
P.F.	Power Factor	Power Factor
Sr	Back-up Nominal apparent power	Off-Grid Rated Apparent Power
Smax	Max. Output Apparent Power (VA) Max. Output Apparent Power without Grid	Max. Apparent Power to Grid
IAC,max	Max. Output Current	Max. Current to Grid
UAC,r	Nominal Output Voltage	Max. Output Voltage
fAC,r	Nominal Output Freqency	Rated Output Voltage Frequency
Toperating	Operating Temperature Range	Operating Temperature Range
IDC,max	Max. Input Current	Max. Current from Grid
UDC	Input Voltage	Input Voltage
UDC,r	DC Power Supply	DC Input
UAC	Power Supply/AC Power Supply	Input Voltage Range/AC Input
UAC,r	Power Supply/Input Voltage Range	Input Voltage Range/AC Input
Toperating	Operating Temperature Range	Operating Temperature Range
Pmax	Max Output Power	Max. 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	Maximum System Voltage
Haltitude,max	Max. Operating Altitude	Max. Operating Altitude
PF	Power Factor	Power Factor

Abbreviation	English Description	Chinese Description
THDi	Total Harmonic Distortion of Current	Current Harmonics
THDv	Total Harmonic Distortion of Voltage	Voltage Harmonics
C&I	Commercial & Industrial	Commercial & Industrial
SEMS	Smart Energy Management System	Smart Energy Management System
MPPT	Maximum Power Point Tracking	Max. 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 TCP/IP
Modbus RTU	Modbus Remote Terminal Unit	Modbus over Serial Link
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

Abbreviation	English Description	Chinese Description
GFCI	Ground Fault Circuit Interrupter	Grounding Failure Interrupter
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 and Discharge Capability
SOF	State Of Function	Battery Functional State
SOS	State Of Safety	Safety Status
DOD	Depth of discharge	Depth of Discharge

11.3 Definition of Terms

- **Overvoltage Category Definition**
  - **Overvoltage category I**: Equipment connected to circuits with measures that limit transient overvoltages to a relatively low level.
  - **Overvoltage category II**: Energy-consuming equipment supplied from a fixed installation. Such equipment includes appliances, portable tools and other household and similar loads. If special requirements for reliability and suitability apply to such equipment, voltage category III is adopted.
  - **Overvoltage category III**: Equipment in a fixed installation, for which the reliability and suitability of the equipment must meet special requirements. Includes switching devices in the fixed installation and industrial equipment permanently connected to the fixed installation.
  - **Overvoltage category IV**: Equipment used at the source of the power distribution installation, including measuring instruments and primary overcurrent Protection devices, etc.
- **Definition of Damp-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 Definition:**
  - **Outdoor inverter**: ambient air temperature range -25°C to +60°C, suitable for Pollution Degree 3 environments;
  - **Indoor Type II inverter**: ambient air temperature range -25°C to +40°C, suitable for Pollution Degree 3 environments;
  - **Indoor Type I inverter**: ambient air temperature range 0°C to +40°C, suitable for Pollution Degree 2 environments;
- **Pollution Degree Category Definition**
  - **Pollution Degree 1**: no pollution or only dry, non-conductive pollution;
  - **Pollution Degree 2**: Generally, only non-conductive pollution occurs, but occasional temporary conductivity caused by condensation must be considered;
  - **Pollution Degree 3**: Conductive pollution occurs, or non-conductive pollution becomes conductive due to condensation;
  - **Pollution Degree 4**: Persistent conductive pollution, such as pollution caused by conductive dust or rain and snow.

11.4 Battery SN Code Meaning

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

- The 11th and 12th digits are the last two digits of the production year, e.g., 2023 is represented as 23;

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

Month	Months 1~9	October	November	December
Month Code	1~9	A	B	C

- The 14th digit is the production day, e.g., the 8th is represented as 8; Prefer using numeric representation, e.g., 1~9 represent the 1st to 9th days, A represents the 10th day, and so on. The letters I and O are not used to avoid confusion. Details are as follows:

Production Day	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

12 Contact Information

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