

Residential Smart Inverter

ES LD 5.0-10kW

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

Solutions Manual

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NOTICE

The information in this user manual is subject to change due to product updates or other reasons.

This manual cannot replace the product safety labels unless otherwise specified. All descriptions in the manual are for guidance only.

About This Manual

Overview

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

Applicable Model

The energy storage system includes the following products:

Product Type	Product Information	Description
Inverter	ES LD Series	Nominal output power: 5kW-10kW
Battery system	LX A5.0-30	Rated capacity 5.12kWh, maximum support for 30 parallel clusters
	LX U5.0-30	Rated capacity 5.12kWh, maximum support for 30 parallel clusters
	GW14.3-BAT-LV-G10	Rated capacity 14.3kWh, maximum support for 30 parallel clusters
	GW16.1-BAT-LV-G10	Rated capacity 16.1kWh, maximum support for 30 parallel clusters
Smart Meter	GM330	Monitoring module in the energy storage system, capable of detecting operating voltage, current, and other information

Product Type	Product Information	Description
Smart dongle	WiFi/LAN Kit-20	Can upload system operating information to the monitoring platform via WiFi or LAN signals

Symbol Definition

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

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1 Safety Precautions

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

WARNING

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

1.1 General Safety

NOTICE

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

1.2 personnel requirements

NOTICE

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

1. Professionals or qualified personnel include:
 - Personnel who have mastered the equipment's working principles, system structure, and knowledge of relevant risks and hazards, and have received professional operation training or possess rich practical experience.
 - Personnel who have received relevant technical and safety training, have certain operational experience, can be aware of potential dangers that specific operations may pose to themselves, and are able to 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.
 - Personnel who hold a degree in electrical engineering/an advanced diploma in an electrical discipline or equivalent qualification/a professional qualification in the electrical field, and have at least 2/3/4 years of experience in testing and supervising in accordance with electrical equipment safety standards.
2. Personnel engaged in special tasks such as electrical operations, working at heights, and operation of special equipment must hold valid qualification certificates as required by the location of the equipment.
3. Operation of medium-voltage equipment must be performed by certified high-voltage electricians.
4. Replacement of the equipment and its components is only permitted to be carried out by authorized personnel.

1.3 System Safety



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

WARNING

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

1.3.1 PV String Safety

WARNING

- Ensure the module frame and mounting system are properly grounded.
- After the connection is completed, ensure that the cables are securely fastened and free from looseness. Improper wiring may result in poor contact or high impedance, and damage the Inverter.
- Use a multimeter to measure the positive and negative poles of the DC cable, ensuring correct polarity without reverse connection; and confirm the voltage is within the allowable range.
- Use a multimeter to measure the DC cable, ensuring correct polarity and no reverse connection. The voltage should be lower than the maximum DC input voltage. Damage caused by reverse connection or over-voltage is not covered by the manufacturer's warranty.
- The PV string output does not support grounding. Before connecting the PV string to Inverter, ensure that the the minimum insulation resistance of the PV string meets the minimum insulation resistance requirement ($R = \text{Max.Input Voltage (V)} / 30\text{mA}$).
- Do not connect the same PV string to multiple Inverter, as this may cause damage to the Inverter.
- The PV modules used in conjunction with Inverter must comply with IEC 61730 Class A standards.
- When the input PV String value is high or the input current value is high, it may cause Inverter output derating.

1.3.2 Inverter Safety

 WARNING

- Ensure the voltage and Frequency at the on-grid access point comply with Inverter on-grid requirements.
- It is recommended to add breaker or fuses as Protection devices on the AC side. The specifications of the Protection device should be greater than 1.25 times the maximum current of the AC output of Inverter.
- If the arc alarm is triggered less than 5 times within 24 hours, it can be automatically cleared. After the 5th arc alarm, the Inverter will shut down Protection, and the Inverter can only resume normal operation after the fault is cleared.
- In photovoltaic systems, if a Battery is not configured, it is not recommended to use the BACK-UP function, as it may lead to system POWER OFF risks.
- When Utility grid, voltage, and Frequency change, it may lead to Inverter output derating.

1.3.3 Battery Safety

DANGER

- Keep Power Off before any operations to avoid danger of electric shock. Strictly follow all safety precautions outlined in this manual and safety labels on the equipment during the operation.
- Do not disassemble, modify, or replace any part of the battery or the power control unit without official authorization from the manufacturer. Otherwise, it will cause electrical shock or damages to the equipment, which shall not be borne by the manufacturer.
- Do not hit, pull, drag, squeeze or step on the equipment or put the battery into fire. Otherwise, the battery may explode.
- Do not place the battery in a high temperature environment. Make sure that there is no direct sunlight and no heat source near the battery. When the ambient temperature exceeds 60 °C, it will cause fire.
- Do not use the battery or the power control unit if it is defective, broken, or damaged. Damaged battery may leak electrolyte.
- Do not move the battery system while it is working. Contact after-sales service if the battery shall be replaced or added.
- A short circuit in the battery may cause personal injury. The instantaneous high current caused by a short circuit can release a large amount of energy and may cause a fire.
- The DC breaker for battery shall meet the requirements according to AS/NZS 5139.

WARNING

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

Emergency Measures

- **Battery Electrolyte Leakage**

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

- Breath in the leaked substance: Evacuate from the polluted area, and seek immediate medical assistance.
- Eye contact: Rinse your eyes for at least 15 minutes with clean water and seek immediate medical assistance.
- Skin contact: Thoroughly wash the touch area with soap and clean water, and seek immediate medical assistance.
- Ingestion: Induce vomiting, and seek immediate medical assistance.

- **Fire**

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

- **Battery triggers fire protection**

For batteries with fire protection functions, perform the following operations after the fire protection function is triggered:

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

1.3.4 Smart Meter Safety

WARNING

If the Utility grid voltage fluctuation exceeds 265V, prolonged overvoltage operation may damage the meter. It is recommended to install a fuse with a rated current of 0.5A on the voltage input side of the meter to protect it.

1.4 Safety Symbols and Certification Marks

DANGER

- After the equipment installation, the labels and warning signs on the enclosure must remain clearly visible. Blocking, altering, or damaging them is prohibited.
- The following warning labels on the enclosure are for reference only. Please refer to the actual labels on the equipment.

No.	Symbol	Meaning
1		Potential DANGER exists during equipment operation. Please take protective measures when operating the equipment.
2		High voltage DANGER. High voltage is present during equipment operation. Ensure the equipment is POWER OFF before performing any operations.
3		The surface of Inverter is at high temperature. Do not touch during operation to avoid burns.
4		Please use the equipment properly. In extreme conditions, there is a risk of explosion.
5		Battery contains flammable materials, beware of fire.
6		The equipment contains corrosive electrolyte. Avoid contact with leaked electrolyte or vaporized gases.

No.	Symbol	Meaning
7		After the equipment is power off, please wait for 5 minutes until it is fully Discharge.
8		The equipment should be kept away from open flames or ignition sources.
9		The equipment shall be Keep away from children accessible areas.
10		Do not extinguish with water.
11		Before operating the equipment, please read the product manual carefully.
12		Wear personal protective equipment during Installation, operation, and maintenance.
13		The equipment must not be disposed of as household waste. Please handle it in accordance with local laws and regulations or return it to the equipment manufacturer.
14		grounding point
15		Recycling symbol.
16		CE marking

No.	Symbol	Meaning
17		TUV Mark.
18		RCM mark.

1.5 EU Declaration of Conformity

1.5.2 Equipment without Wireless Communication Modules (Except Battery)

The equipment without wireless communication modules sold in the European market meets the requirements of the following directives:

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

1.5.3 Battery

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

- Electromagnetic compatibility Directive 2014/30/EU (EMC)
- Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)*¹
- Regulation (EU) 2023/1542 Article 12 - Safety of stationary battery energy storage systems
- Regulation (EU) 2023/1542 Article 10 - Performance and durability requirements for rechargeable industrial batteries, LMT batteries and electric vehicle batteries

- Regulation (EU) 2023/1542 Article 14 - Information on the state of health and expected lifetime of batteries
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)
*1: Our company's battery products meet the hazardous substance limit requirements specified in this regulation.

More EU conformity declarations can be obtained from the [official website](#).

2 System Introduction

2.1 System Overview

The residential Smart Inverter solution integrates devices such as the inverter, Battery, Smart Meter, and smart communication stick. It converts solar energy into electrical power within the photovoltaic system to meet household electricity demands. The energy IoT devices in the system manage the electrical loads by identifying the overall power situation in the system, thereby intelligently managing the power supply for use by loads, storage into the Battery, or export to the grid.

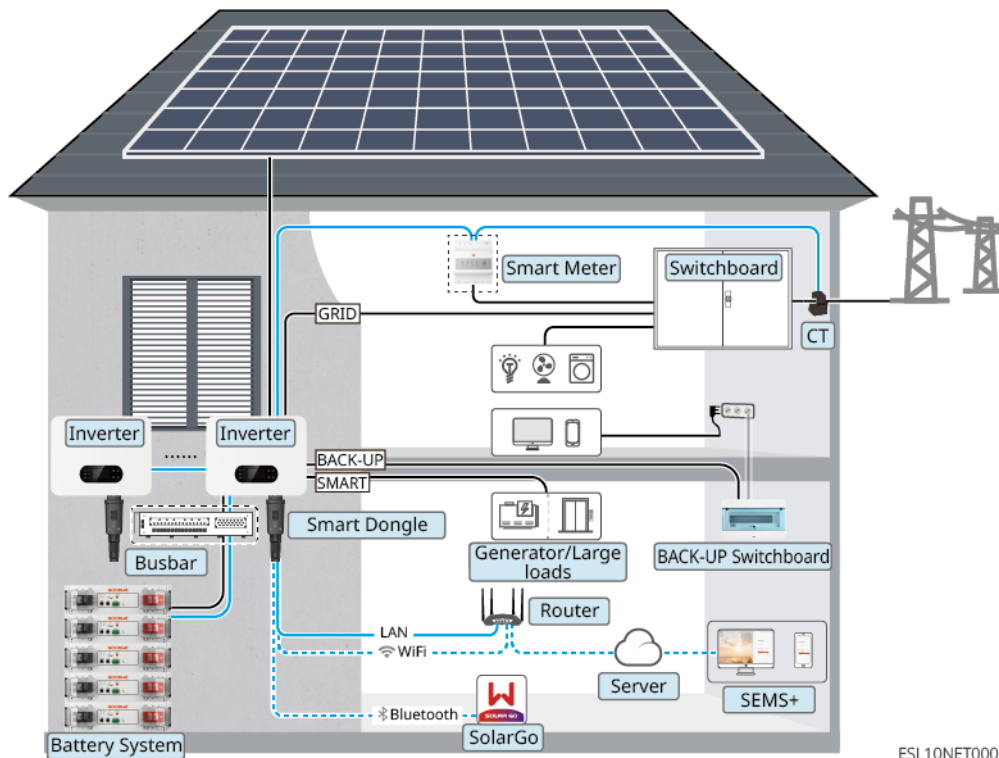


- Select the battery model according to the inverter and battery compatibility list. For requirements regarding batteries used in the same system, such as whether models can be mixed or if capacities must be consistent, please refer to the user manual of the corresponding battery model or contact the battery manufacturer for relevant requirements. [Inverter and Battery Compatibility List:
https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_Battery%20Compatibility%20Overview-EN.pdf](https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_Battery%20Compatibility%20Overview-EN.pdf)
- Due to product version upgrades or other reasons, document content is updated periodically. For the compatibility between inverters and IoT products, please refer to: https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_Compatibility-list-of-GoodWe-inverters-and-IoT-products-EN.pdf
- For detailed networking and wiring schemes for various scenarios, please refer to: [5.2.Detailed System Wiring Diagram\(Page 92\)](#)
- The energy storage system is not suitable for connecting to devices that rely on a stable power supply, such as life-supporting medical equipment. Ensure that a system power failure does not lead to personal injury.
- In a system where the inverter operates completely off-grid, if the battery remains in low sunlight or rainy weather for an extended period and cannot be replenished in time, it may lead to over-discharge, causing battery performance degradation or damage. To ensure long-term stable system operation, avoid completely draining the battery. 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, promptly replenish the battery using an external energy source (such as a generator or grid-assisted charging).
 4. Regularly check the battery status to ensure it operates within a safe working range.
 5. It is recommended to perform a full charge and discharge cycle on the battery every six months to calibrate SOC accuracy.

When the energy storage system is in off-grid mode, it can normally supply the following loads:

Off-grid Load Capacity Specification						
Load Type	GW5K-ES-LD-G10		GW7.5K-ES-LD-G10		GW10K-ES-LD-G10	
	Single-phase (L-N)	Two-phase/Split-phase (L1-L2)	Single-phase (L-N)	Two-phase/Split-phase (L1-L2)	Single-phase (L-N)	Two-phase/Split-phase (L1-L2)
Rated Power per Single Motor Load (kVA)	1.1	2.2	1.1	2.2	1.1	2.2
Total Motor Load Rated Power (kVA)	$0.44 \cdot P_n / 2$	$0.44 \cdot P_n$	$0.5 \cdot P_n / 2$	$0.5 \cdot P_n$	$0.5 \cdot P_n / 2$	$0.5 \cdot P_n$
Capacitive Load (kVA)	$0.33 \cdot P_n / 2$	$0.33 \cdot P_n$	$0.33 \cdot P_n / 2$	$0.33 \cdot P_n$	$0.33 \cdot P_n / 2$	$0.33 \cdot P_n$
Half-wave Load (kW)	1.5	NA	2	NA	2.5	NA
Note: • P_n: Inverter rated output power. • For 2 or more units in parallel, the allowed total motor load rated power = Rated Power per Single Motor Load * Number of parallel units * 80%. • Half-wave load: Some older or non-EMC compliant household appliances (e.g., hair dryers, small heaters using half-wave rectification).						

General Scenario



ESL10NET0001

Device Type	model	Description
Inverter	GW5K-ES-LD-G10 GW7.5K-ES-LD-G10 GW10K-ES-LD-G10	- When only one inverter is used in the system, it supports connection to a generator, large load, or grid-tie unit. - The system supports a maximum of 10 inverters to form a parallel system; microgrid functionality is not supported during parallel operation. - When forming a parallel system network, the following version requirements must be met: - All inverters in the parallel system must have the same software version. - All inverters in the parallel system must be of the same model. - The inverter ARM software version must be 03.133 or higher. - The inverter DSP software version must be xxx 01.1074 or higher.

Device Type	model	Description
Battery system	LX A5.0-30	• Battery systems of different models cannot be used together. Parallel cluster expansion between different models is currently not supported. Parallel cluster expansion is allowed within one year of purchase for the same model, but not allowed after one year. • A maximum of 30 parallel clusters is supported in a single system. • After battery parallel clustering or expansion, the charge/discharge SOC of the batteries may be unbalanced in the short term. This does not affect battery safety or basic functions, and the system will automatically perform balance correction.
	LX U5.0-30	• A maximum of 30 parallel clusters is supported in a single system. • Parallel cluster expansion between different models is currently not supported. Parallel cluster expansion is allowed within one year of purchase for the same model, but not allowed after one year. • After battery parallel clustering or expansion, the charge/discharge SOC of the batteries may be unbalanced in the short term. This does not affect battery safety or basic functions, and the system will automatically perform balance correction.

Device Type	model	Description
	GW14.3-BAT-LV-G10	- Parallel cluster expansion between different models is currently not supported. Parallel cluster expansion is allowed within one year of purchase for the same model, but not allowed after one year. - After battery parallel clustering or expansion, the charge/discharge SOC of the batteries may be unbalanced in the short term. This does not affect battery safety or basic functions, and the system will automatically perform balance correction. - A maximum of 30 parallel clusters is supported in a single system: - Products with SN code 25C and later support 30 parallel clusters by default. - For products before 25C to support 30 parallel clusters, please contact GoodWe After-Sales Service Center to upgrade the firmware version. - Refer to 11.3.SN Code Meaning(Page 288) for viewing product SN codes.

Device Type	model	Description
	GW16.1-BAT-LV-G10	• A maximum of 30 parallel clusters is supported in a single system. • Parallel cluster expansion between different models is currently not supported. Parallel cluster expansion is allowed within one year of purchase for the same model, but not allowed after one year. • After battery parallel clustering or expansion, the charge/discharge SOC of the batteries may be unbalanced in the short term. This does not affect battery safety or basic functions, and the system will automatically perform balance correction.
	Lead-acid battery	• Supports connection of AGM, GEL, and Flooded type lead-acid batteries. • Calculate the number of batteries that can be connected in series based on the lead-acid battery voltage. The total voltage of series-connected batteries must not exceed 60V.
Busbar	BCB-22-WW-0 BCB-32-WW-0 BCB-33-WW-0 (Purchased from GoodWe)	Please select the busbar according to the inverter charge/discharge capability, load size, and battery charge/discharge capability in the system. • BCB-22-WW-0: ◦ When used with LX A5.0-30, the battery system supports a maximum of 720A operating current, 36kW operating power, and can connect up to 6 inverters and 6 battery units. ◦ When used with LX U5.0-30, the battery system supports a maximum of 720A operating current, 36kW operating power, and can connect up to 6 inverters and 6 battery units.

Device Type	model	Description
		• BCB-32-WW-0: ◦ When used with LX A5.0-30, the battery system supports a maximum of 720A operating current, 36kW operating power, and can connect up to 6 inverters and 15 battery units. ◦ When used with LX U5.0-30, the battery system supports a maximum of 720A operating current, 36kW operating power, and can connect up to 6 inverters and 8 battery units. ◦ When used with GW14.3-BAT-LV-G10, the battery system supports a maximum of 720A operating current, 36kW operating power, and can connect up to 6 inverters and 15 battery units. ◦ When used with GW16.1-BAT-LV-G10, the battery system supports a maximum of 720A operating current, 36kW operating power, and can connect up to 6 inverters and 15 battery units. • BCB-33-WW-0: ◦ When used with LX U5.0-30, the battery system supports a maximum of 720A operating current, 36kW operating power, and can connect up to 6 inverters and 15 battery units. When the number of battery units exceeds 8, two fuses rated at 600A need to be connected in parallel. • Others: Please configure according to system power and current requirements.

Device Type	model	Description
Smart Meter	- Built-in meter (standard-equipped) - GM330 (Purchased from GoodWe)	- Please use the CT shipped with the package to connect to the inverter. The CT ratio is 120A:40mA. - GM330: The CT can be purchased from GoodWe or 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.
Communication stick	WiFi/LAN Kit-20 (standard-equipped)	- Please use the WiFi/LAN Kit-20 smart communication stick for local device debugging and remote monitoring of system operation information. - In a parallel system, each inverter needs to be installed with a WiFi/LAN Kit-20, and the software version must be V2.5 or higher.
Large load	-	Supports SG Ready. Large load specifications: - Total power of large load < Maximum output power of GEN port. - Large load power + BACK-UP power < Maximum AC input power (Utility grid).
Generator	-	- Generator power must be greater than the total power of all loads on the BACKUP port. - The generator type must match the utility grid type.

Microgrid Scenario

When a grid-tied inverter is connected to the GEN port of the hybrid inverter, it constitutes a Microgrid Scenario.

- In microgrid scenarios, the open-circuit voltage of PV strings connected to the hybrid solar-storage inverter is not recommended to be $\geq 490\text{V}$, to avoid triggering overvoltage protection due to high system voltage under harsh conditions.
- In microgrid systems, the inverter does not support parallel operation; only one hybrid inverter is supported in the system.
- If the system is in high temperature or BMS current limiting conditions, it may cause battery charging power to be limited, leading to high system voltage triggering overvoltage protection.



Device Type	model	Description
Inverter	GW5K-ES-LD-G10 GW7.5K-ES-LD-G10 GW10K-ES-LD-G10	• In a microgrid system, the inverter does not support parallel operation; only one inverter is supported in the system. • The inverter ARM software version must be 03.133 or higher • The inverter DSP software version must be xxx 01.1074 or higher
Battery system	LX A5.0-30	• Battery systems of different models cannot be mixed. Expansion by paralleling clusters between different models is currently not supported. For the same model, cluster parallel expansion is allowed within one year of customer purchase and use; it is not allowed after one year. • A maximum of 30 units in parallel clusters is supported in a single system. • After battery cluster paralleling or expansion, the charge/discharge SOC of the batteries may be unbalanced in the short term. This does not affect battery safety or basic functions; the system will automatically perform balance correction.

Device Type	model	Description
	LX U5.0-30	• A maximum of 30 units in parallel clusters is supported in a single system. • Expansion by paralleling clusters between different models is currently not supported. For the same model, cluster parallel expansion is allowed within one year of customer purchase and use; it is not allowed after one year. • After battery cluster paralleling or expansion, the charge/discharge SOC of the batteries may be unbalanced in the short term. This does not affect battery safety or basic functions; the system will automatically perform balance correction.
	GW14.3-BAT-LV-G10	• Expansion by paralleling clusters between different models is currently not supported. For the same model, cluster parallel expansion is allowed within one year of customer purchase and use; it is not allowed after one year. • After battery cluster paralleling or expansion, the charge/discharge SOC of the batteries may be unbalanced in the short term. This does not affect battery safety or basic functions; the system will automatically perform balance correction. • A maximum of 30 units in parallel clusters is supported in a single system: ◦ Products with SN codes 25C and later support 30-unit cluster paralleling by default. ◦ For products before 25C to meet the 30-unit cluster requirement, please contact GoodWe After-Sales Service Center to upgrade the firmware version. ◦ Refer to 11.3.SN Code Meanings(Page 288) for viewing product SN codes.

Device Type	model	Description
	GW16.1-BAT-LV-G10	• A maximum of 30 units in parallel clusters is supported in a single system. • Expansion by paralleling clusters between different models is currently not supported. For the same model, cluster parallel expansion is allowed within one year of customer purchase and use; it is not allowed after one year. • After battery cluster paralleling or expansion, the charge/discharge SOC of the batteries may be unbalanced in the short term. This does not affect battery safety or basic functions; the system will automatically perform balance correction.
	Lead-acid Battery	• Supports connection of AGM, GEL, and Flooded type lead-acid batteries. • Calculate the number of batteries that can be connected in series based on the lead-acid battery voltage. The total voltage of the series-connected batteries must not exceed 60V.
Busbar	BCB-22-WW-0 BCB-32-WW-0 BCB-33-WW-0 (Purchased from GoodWe)	Select the busbar according to the inverter's charge/discharge capability, load size, and battery charge/discharge capability in the system. • BCB-22-WW-0: ◦ When used with LX A5.0-30, the battery system supports a maximum working current of 720A, working power of 36kW, maximum connection of 6 inverters, and 6 battery units. ◦ When used with LX U5.0-30, the battery system supports a maximum working current of 720A, working power of 36kW, maximum connection of 6 inverters, and 6 battery units.

Device Type	model	Description
		• BCB-32-WW-0: ◦ When used with LX A5.0-30, the battery system supports a maximum working current of 720A, working power of 36kW, maximum connection of 6 inverters, and 15 battery units. ◦ When used with LX U5.0-30, the battery system supports a maximum working current of 720A, working power of 36kW, maximum connection of 6 inverters, and 8 battery units. ◦ When used with GW14.3-BAT-LV-G10, the battery system supports a maximum working current of 720A, working power of 36kW, maximum connection of 6 inverters, and 15 battery units. ◦ When used with GW16.1-BAT-LV-G10, the battery system supports a maximum working current of 720A, working power of 36kW, maximum connection of 6 inverters, and 15 battery units. • BCB-33-WW-0: ◦ When used with LX U5.0-30, the battery system supports a maximum working current of 720A, working power of 36kW, maximum connection of 6 inverters, and 15 battery units. When the number of battery units exceeds 8, two fuses with a specification of 600A need to be connected in parallel. • Others: Please configure according to the system power and current.

Device Type	model	Description
Smart Meter	- Built-in meter (standard-equipped) - GM330 (Purchased from GoodWe)	- Please use the CT shipped with the box to connect to the inverter. The CT ratio is 120A:40mA. - GM330: CT can be purchased from GoodWe or 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.
Communication Stick	WiFi/LAN Kit-20 (standard-equipped)	- Please use the WiFi/LAN Kit-20 Smart Communication Stick for local device commissioning and remote monitoring of system operation information. - In a parallel inverter system, each inverter needs to be installed with a WiFi/LAN Kit-20. The software version must be V2.5 or higher.
grid-tied PV inverter	-	- GoodWe brand grid-tied inverters are recommended. Third-party grid-tied inverters are supported for use. - In a microgrid system, please ensure: - The safety parameter settings of the grid-tied inverter are consistent with the hybrid inverter, such as: Type of Electrical Supply System, over-frequency power reduction function, etc. - The rated output power of the grid-tied inverter $\leq$ the rated output power of the hybrid inverter. - When the microgrid system is in grid-tied state, if power limitation is required, please ensure: - For the PV-storage hybrid inverter, set it in the Set Power Limitation Parameters interface via the SEMS+ APP. For the grid-tied inverter,

Device Type	model	Description
		please set it according to the actual tool used. ◦ To ensure the grid-tied inverter can continue generating power and operating, adjust the output power of the hybrid inverter in the Microgrid Control Parameters interface via the SEMS+ APP. • Note: The output power control accuracy varies among different grid-tied inverters. Please set the grid-tied power limitation parameter value according to the actual situation. • In a microgrid system, when the grid type of the PV-storage hybrid inverter is configured as a two-phase grid, and when matched with a single-phase grid-tied inverter, the output power of the grid-tied inverter may be affected by the output voltage, potentially leading to power reduction. • In a microgrid system, if the battery SOC is below 5%, or the load power exceeds 5% of the inverter's rated power, the grid-tied inverter cannot be awakened via the automatic wake-up function.

2.2 Product Overview

2.2.1 Inverter

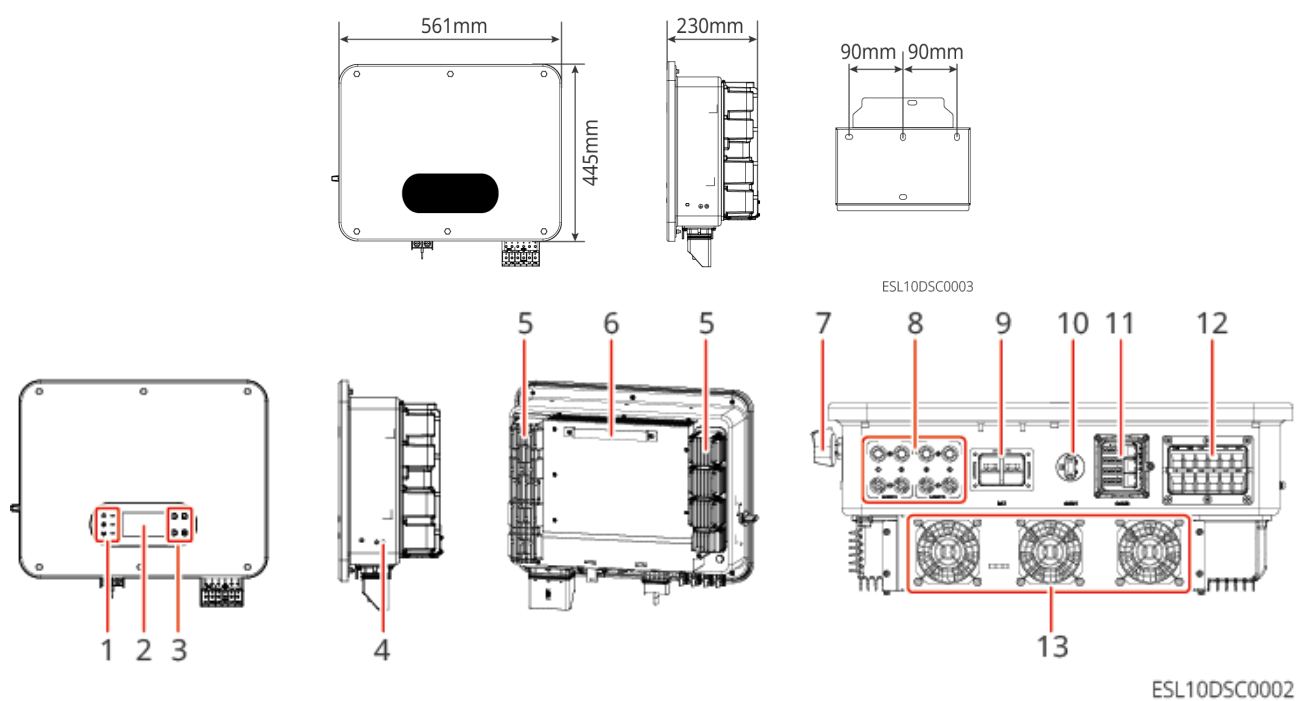
The inverter in photovoltaic systems controls and optimizes energy flow through an integrated energy management system. It can use the electricity generated in the photovoltaic system for loads, store it in batteries, or output it to the grid, etc.

No.	model	Nominal output power	Nominal output voltage
1	GW5K-ES-LD-G10	5kW	
2	GW7.5K-ES-LD-G10	7.5kW	

No.	model	Nominal output power	Nominal output voltage
3	GW10K-ES-LD-G10	10kW	120/208, 2L/N/PE 127/220, 2L/N/PE 120/240, 2L/N/PE 127/254, 2L/N/PE

NOTICE

The appearance of inverters with different power ratings may vary. Please refer to the actual product.



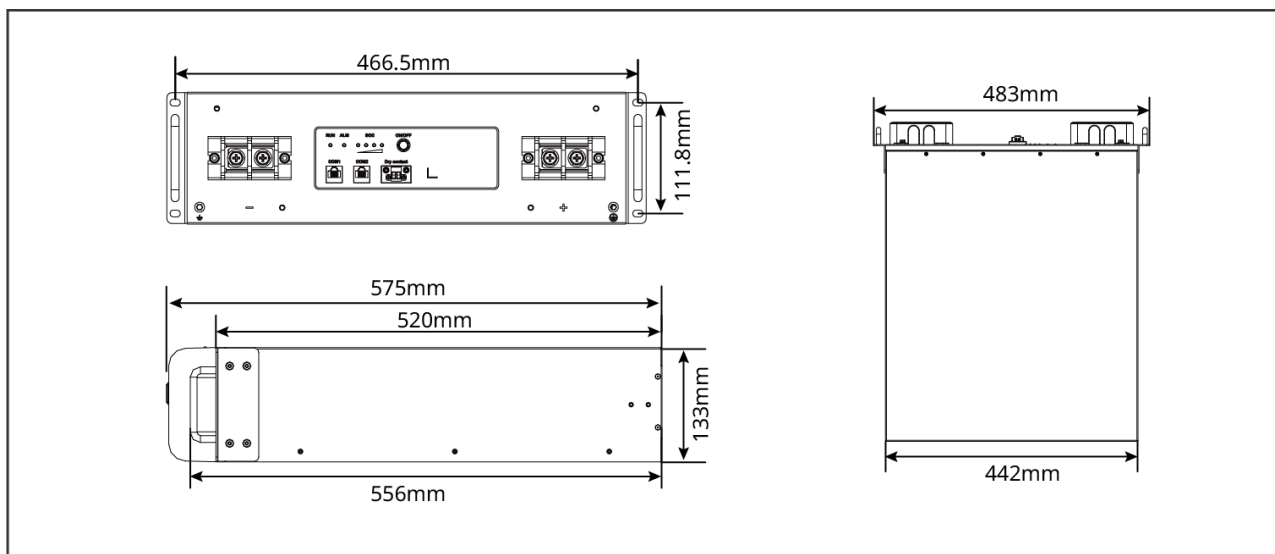
No.	Component/Silkscreen	Description
1	indicator	Indicates the working status of the inverter.
2	Display Screen	View relevant data of the inverter.
3	Buttons	Operate the inverter in conjunction with the display screen.
4	Grounding terminal	Connecting the PE cable.
5	heat sink	Provides heat dissipation for the inverter.

6	Mounting Bracket	Mount the inverter.
7	DC Switch	Controls the connection or disconnection of the DC input.
8	PV Input Ports	Connect the DC input cables from the PV modules. • GW5K-ES-LD-G10: PV+/PV- x 2 • GW7.5K-ES-LD-G10: PV+/PV- x 3 • GW10K-ES-LD-G10: PV+/PV- x 4
9	Battery Port	Connect the DC cables from the battery.
10	Smart Communication Stick Port	Connect the smart communication stick. Please select the type of smart communication stick according to actual requirements.
11	Communication Port	Connect load control, CT, RS485, Remote Shutdown/Rapid Shutdown
12	AC Port	Connect the AC cables to link the inverter to the grid.
13	Fan	The inverter is equipped with external fans to cool it down when the temperature is too high. • GW5K-ES-LD-G10: No external fan. • GW7.5K-ES-LD-G10: External fan x 2. • GW10K-ES-LD-G10: External fan x 3.

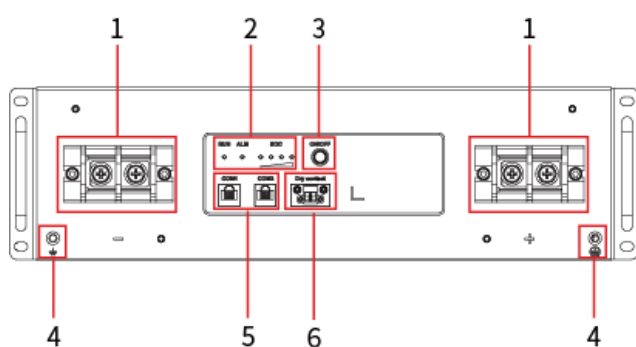
2.2.2 Battery

The Battery system can store and release electrical energy according to the requirements of the photovoltaic energy storage system. The input and output ports of this energy storage system are both high-voltage direct current. The inverter supports use with lead-acid batteries. Please obtain relevant product documentation for lead-acid batteries from the lead-acid battery manufacturer.

2.2.2.1 LX A5.0-30



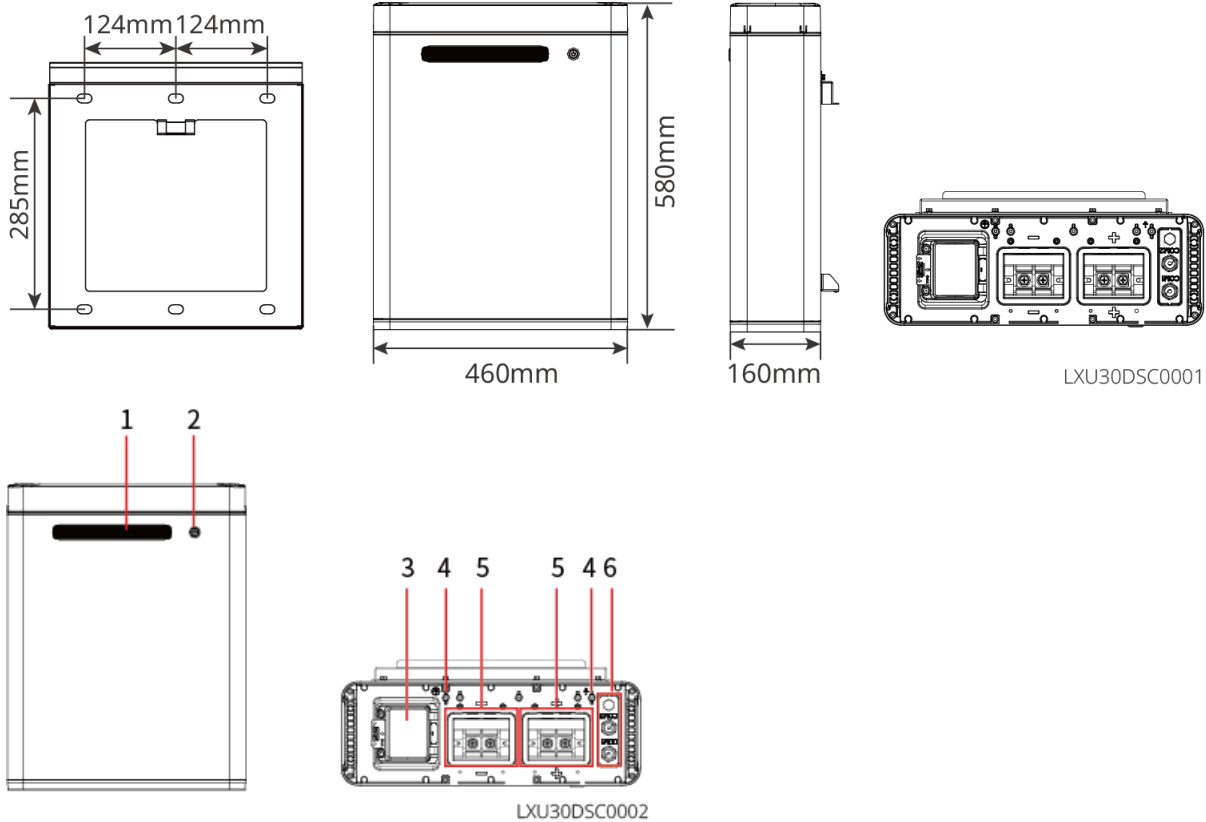
LXA30DSC0001



LXA30DSC0002

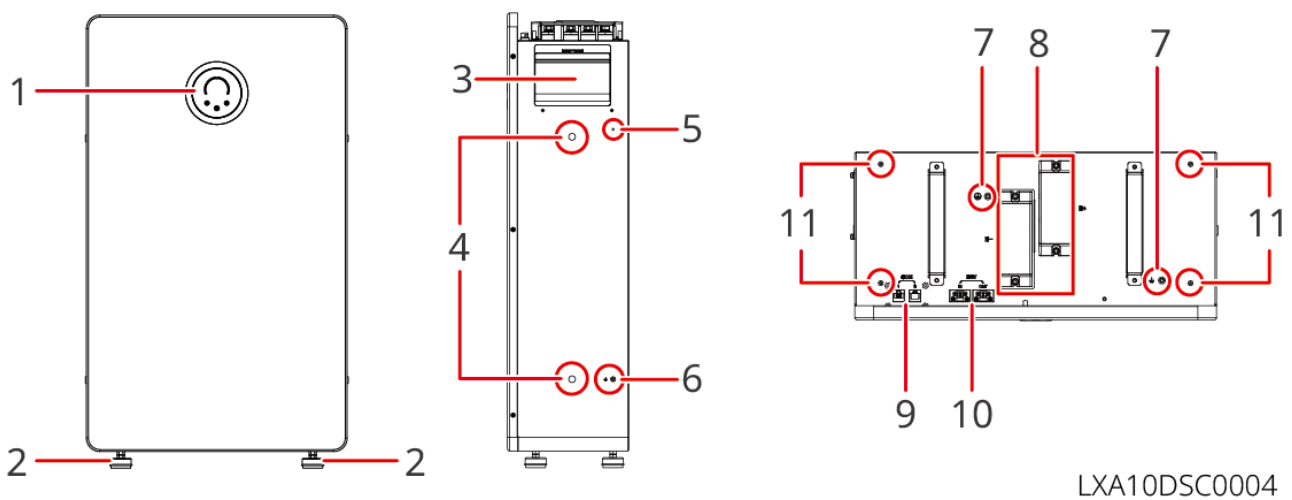
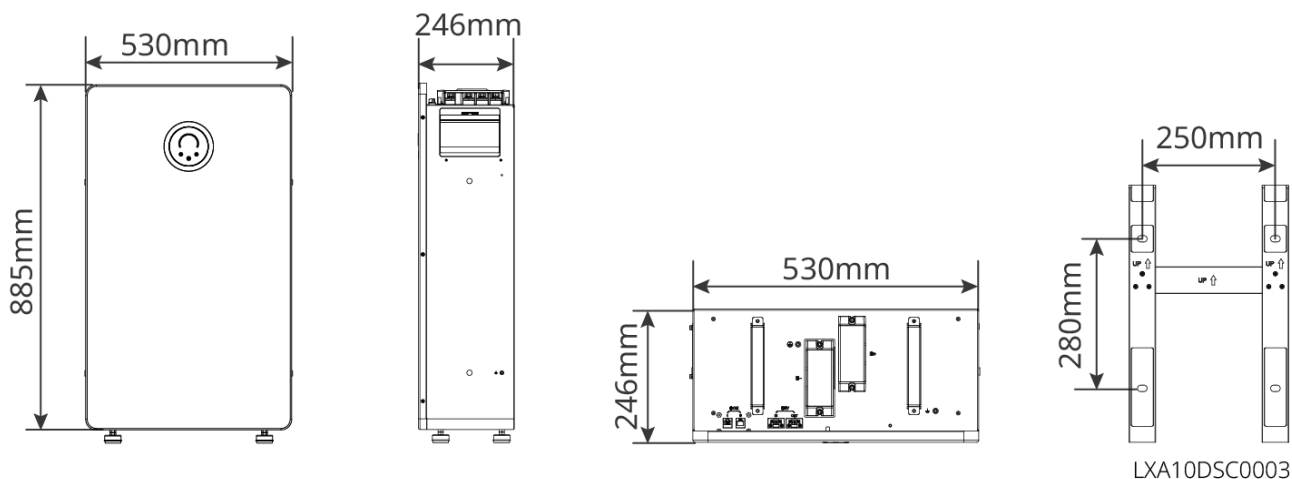
No.	Part/Marking	Description
1	Battery DC port	Connect the battery DC input cable.
2	indicator	Indicates the operating status of the battery.
3	Battery system button	Used for battery power on/off and black start.
4	Grounding terminal	Connect the chassis protective ground wire.
5	Communication Port	Connect the battery communication cable.
6	Dry contact	Reserved.

2.2.2.2 LX U5.0-30



No.	Component/Silk Screen	Description
1	indicator	Indicates the battery's operating status.
2	Battery System Button	Used for battery power on/off and black start.
3	Battery Circuit Breaker	Used for battery power on/off.
4	Grounding terminal	Connects to the enclosure protective ground wire.
5	Battery DC Port	Connects the battery DC input cable.
6	Communication Port	Connects the battery communication cable.

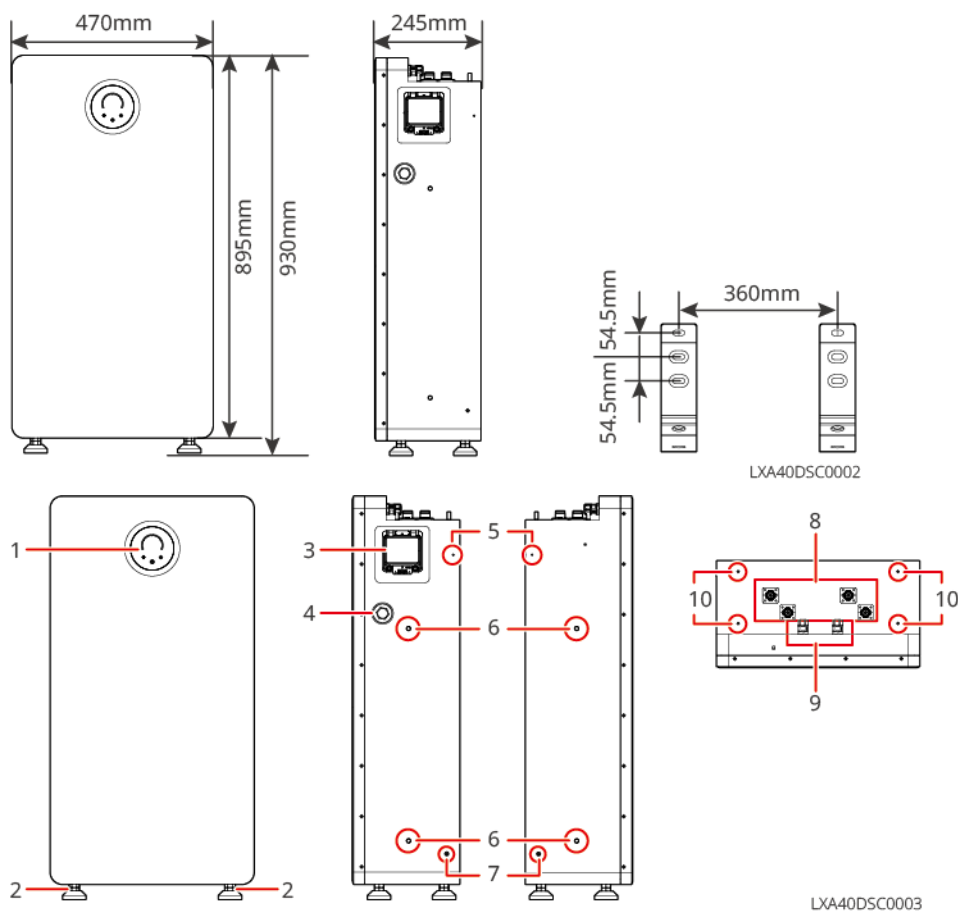
2.2.2.3 GW14.3-BAT-LV-G10



No.	Component/Silk screen	Description
1	indicator	Indicates the operating status of the battery.
2	Foot	Supports the battery.
3	Battery Circuit Breaker	Used for powering the battery on and off.
4	Lifting Handle Installation Hole	Used for installing the lifting handle. Used when manually transporting the battery.
5	L-Shaped Bracket Mounting Hole	Used for securing the battery to the wall.
6	Grounding terminal	Connects to the chassis protective ground wire, reserved.

No.	Component/Silk screen	Description
7	Grounding terminal	Connects to the battery system protective ground wire.
8	Battery DC Port	Connects the battery DC input cable.
9	Communication Port	Connects the battery communication cable.
10	Dry Contact	Reserved.
11	Decorative Cover Mounting Hole	Used for securing the battery decorative cover.

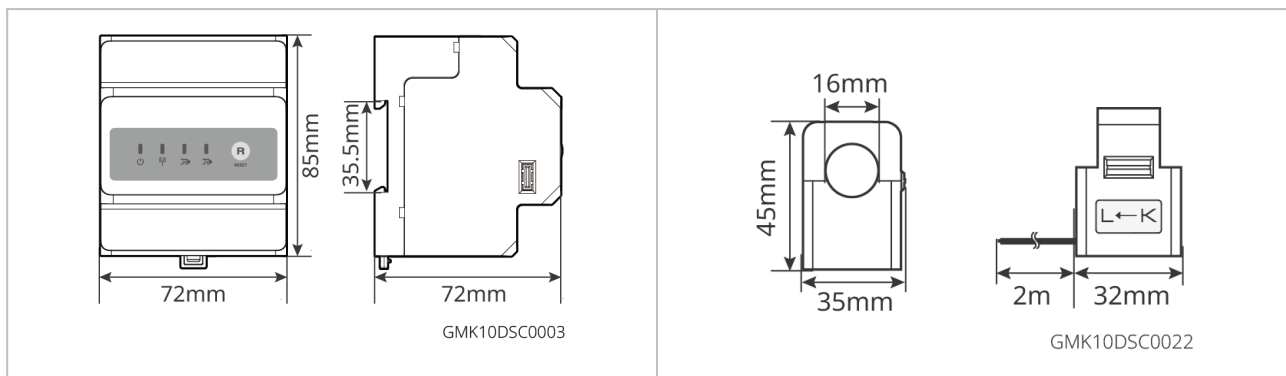
2.2.2.4 GW16.1-BAT-LV-G10



No.	Component/Silk Screen	Description
1	indicator	Indicates the operating status of the battery.
2	Foot	Supports the battery.
3	Battery circuit breaker	Used for powering the battery on and off.
4	Explosion-proof vent valve	The explosion-proof vent valve balances internal and external air pressure and provides explosion protection.
5	Anti-tip bracket mounting hole	Used for securing the battery to the wall.
6	Carrying handle mounting hole	Used for installing the carrying handle. Used during manual battery handling.
7	Grounding terminal	Connects the protective ground wire of the enclosure.
8	Battery DC port	Connects the battery DC input cable.
9	Communication Port	Connects the battery communication cable.
10	Decorative cover mounting hole	Used for securing the battery decorative cover.

2.2.3 Smart Meter

Smart Meter can measure and monitor power data in photovoltaic energy storage systems, such as: voltage, current, Frequency, Power Factor, power, etc.

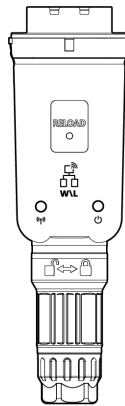


No.	model	Applicable Scenarios
1	GM330	CT can be purchased from Goodwe or on your own. CT ratio requirement: nA: 5A • nA: CT primary side input current, where n ranges from 200 to 5000 • 5A: CT secondary side output current

2.2.4 smart dongle

The smart dongle is primarily used for real-time transmission of various inverter power generation data to remote monitoring platforms, and for connecting to the smart dongle via an APP for local device debugging.

WiFi/LAN Kit-20

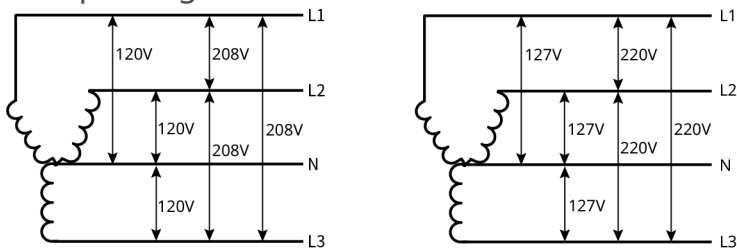


Smart dongle 0006

The WiFi/LAN Kit-20 supports Bluetooth, WiFi, and LAN signals, suitable for local device debugging and transmitting device operation information to remote monitoring systems.

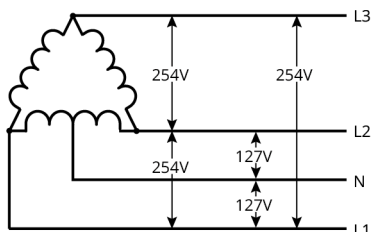
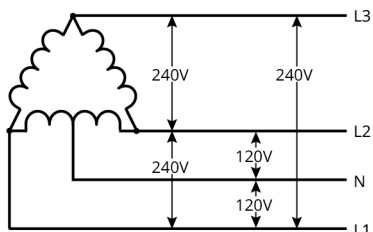
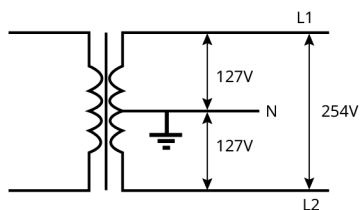
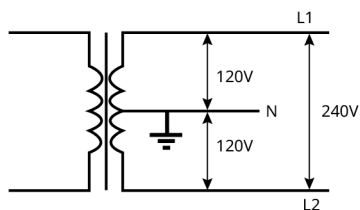
2.3 Supported Grid Types

Two-phase grid



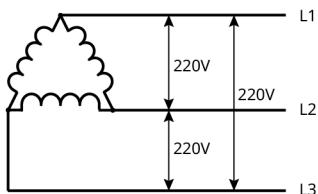
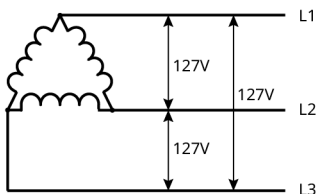
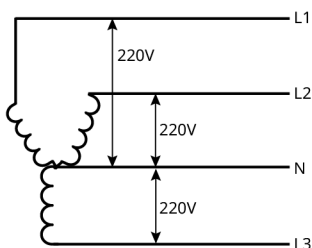
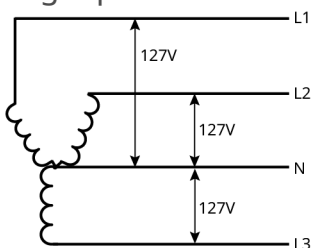
TNNET0010

Split-phase grid



TNNET0011

Single-phase



TNNET0012

2.4 System Working Mode

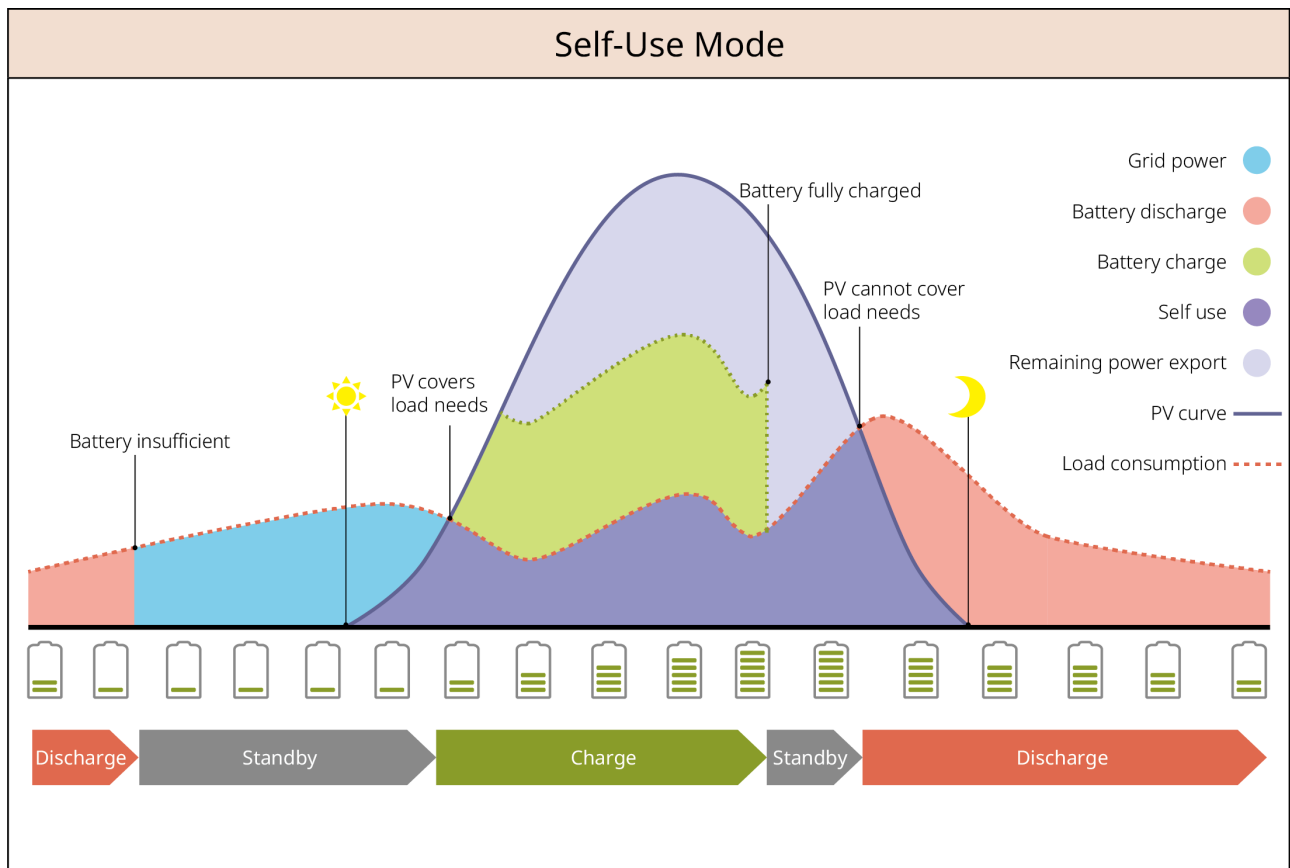
NOTICE

After the initial installation of the GW14.3-BAT-LV-G10 and GW16.1-BAT-LV-G10 battery systems, an automatic full battery charge will be performed. Upon completion, the system will switch to operate in the set working mode.

Self-Use Mode

- The basic mode of system operation.

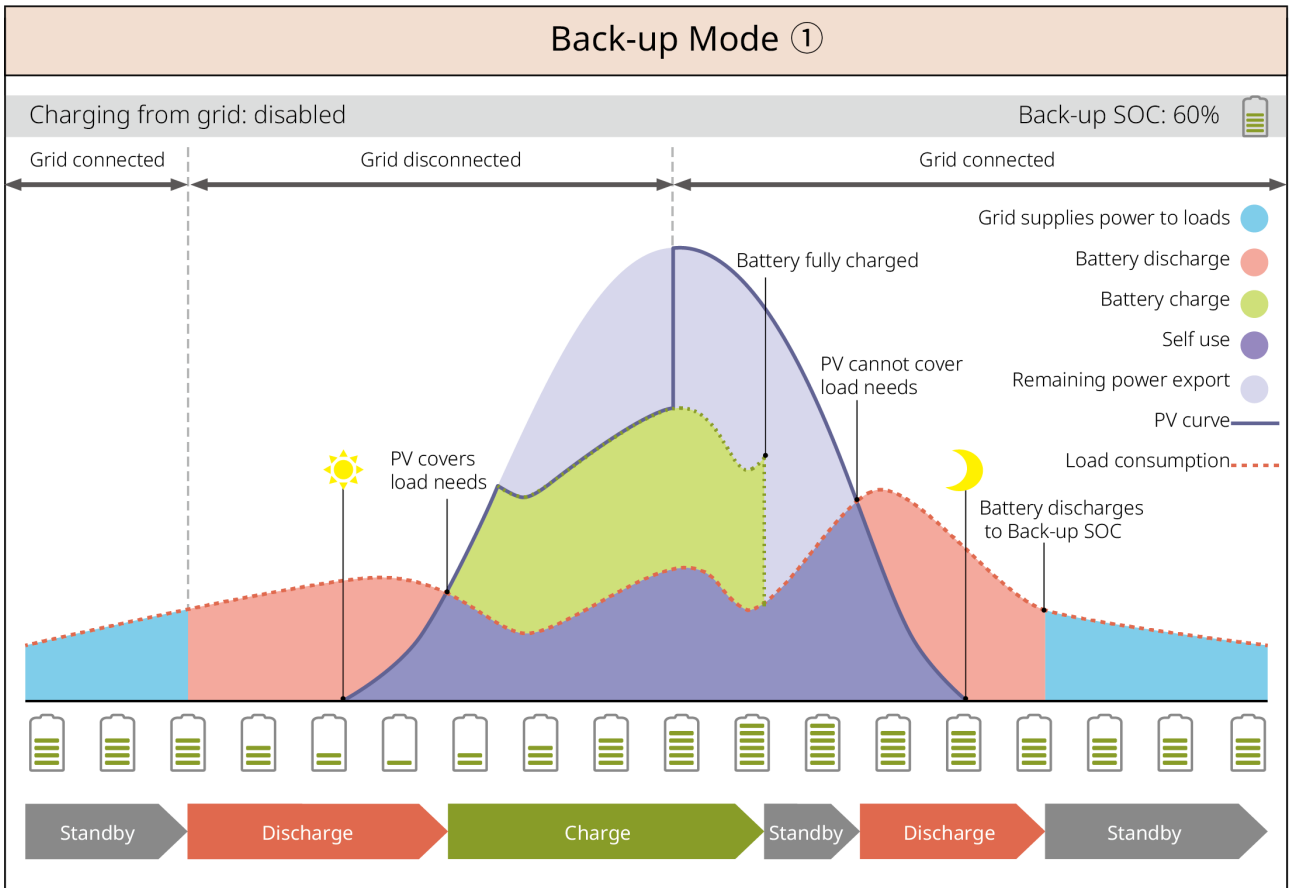
- PV generation prioritizes supplying power to loads, excess electricity charges the battery, and any remaining electricity is sold to the grid. When PV generation does not meet the load demand, the battery supplies power to the loads; when the battery power is also insufficient, the grid supplies power to the loads.



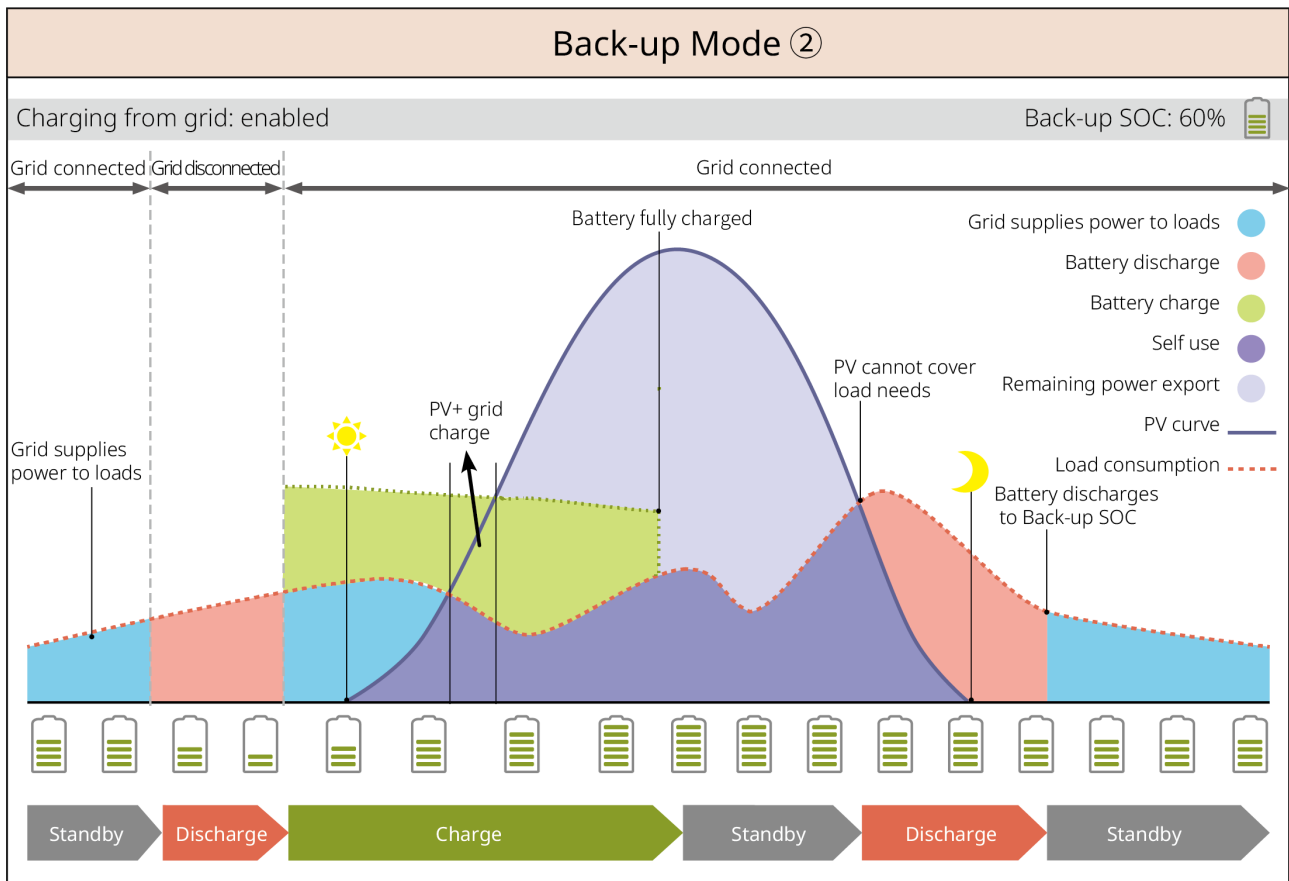
SLG00NET0009

Backup Mode

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



SLG00NET0002

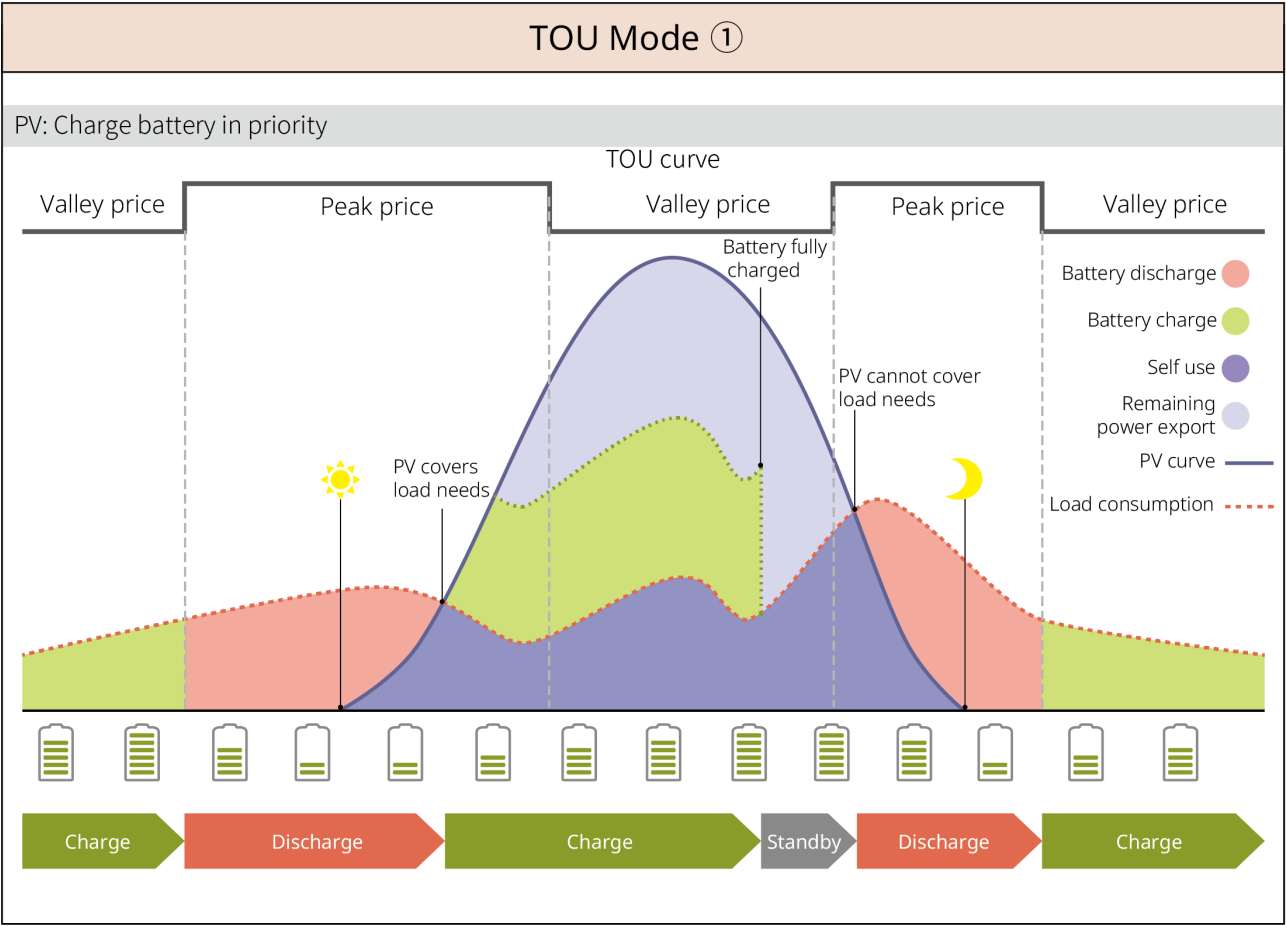


SLG00NET0003

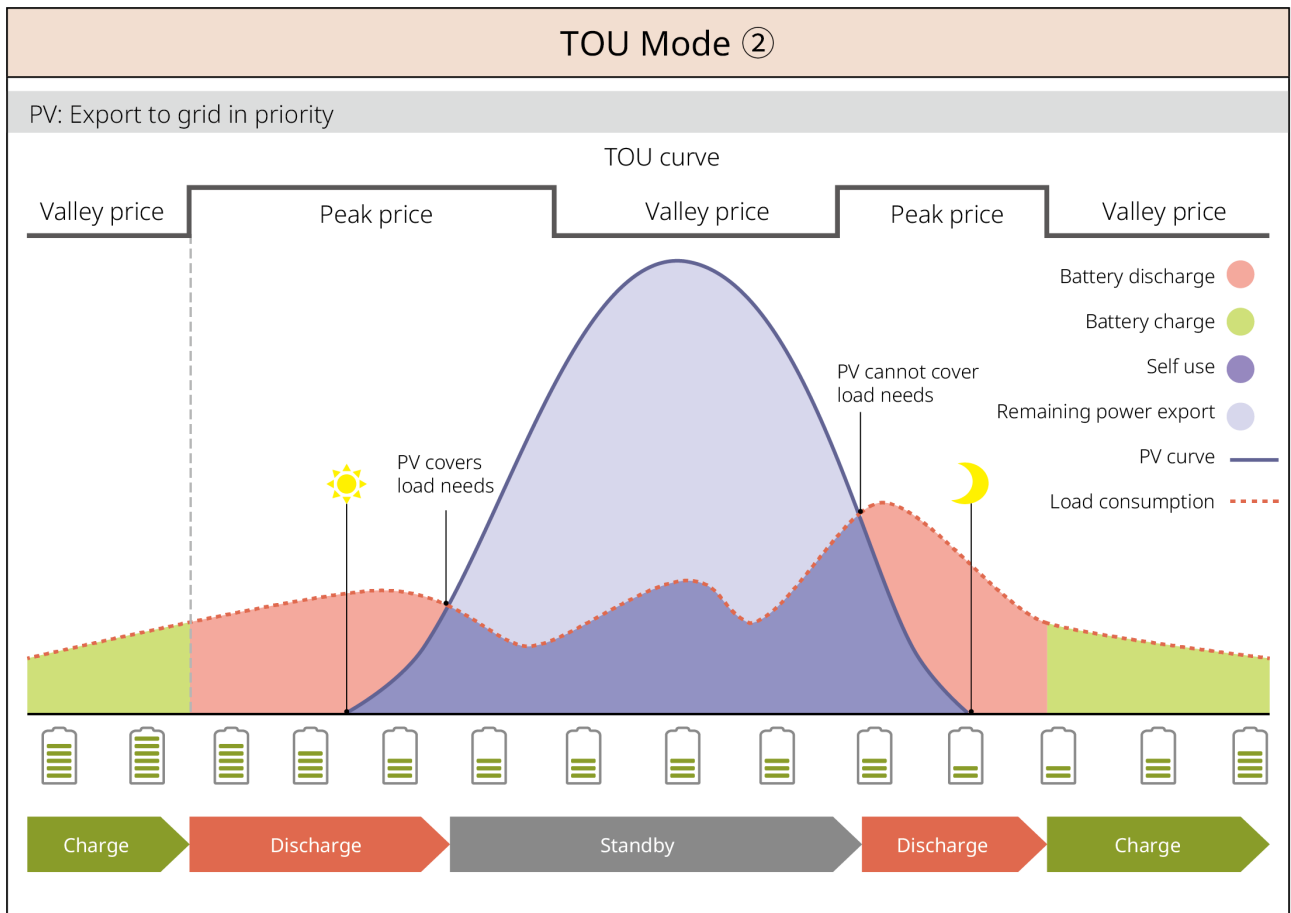
TOU Mode

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

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



SLG00NET0004



SLG00NET0005

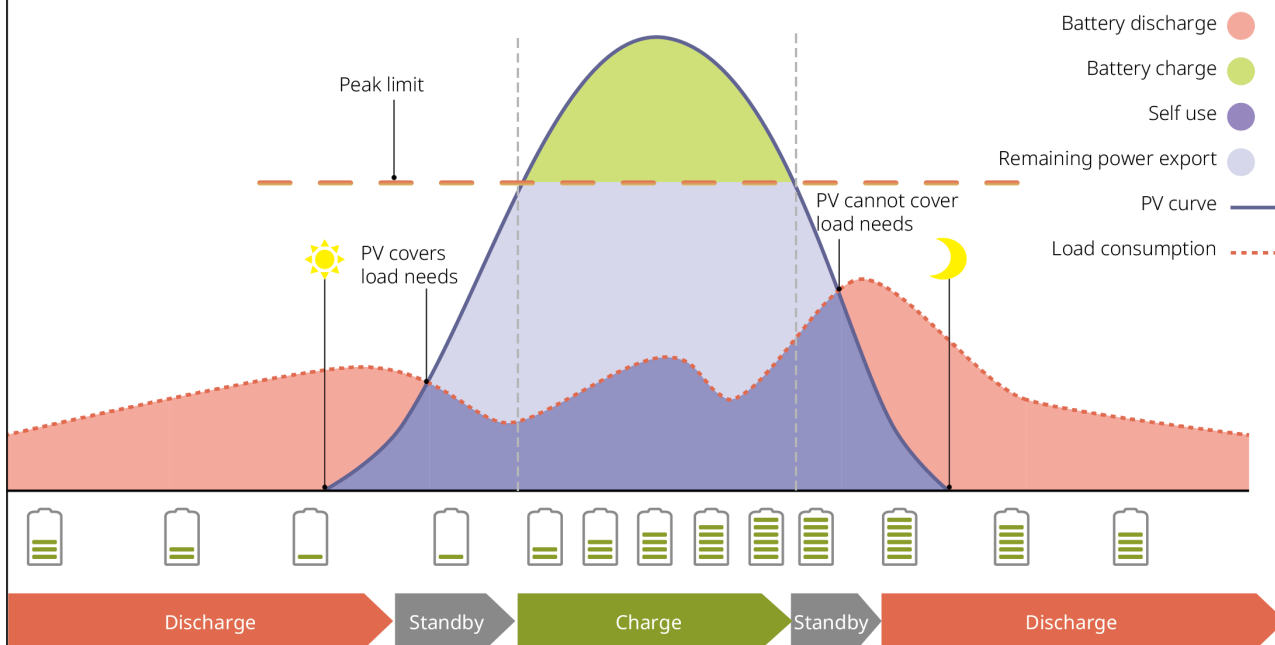
Delayed Charging Mode

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

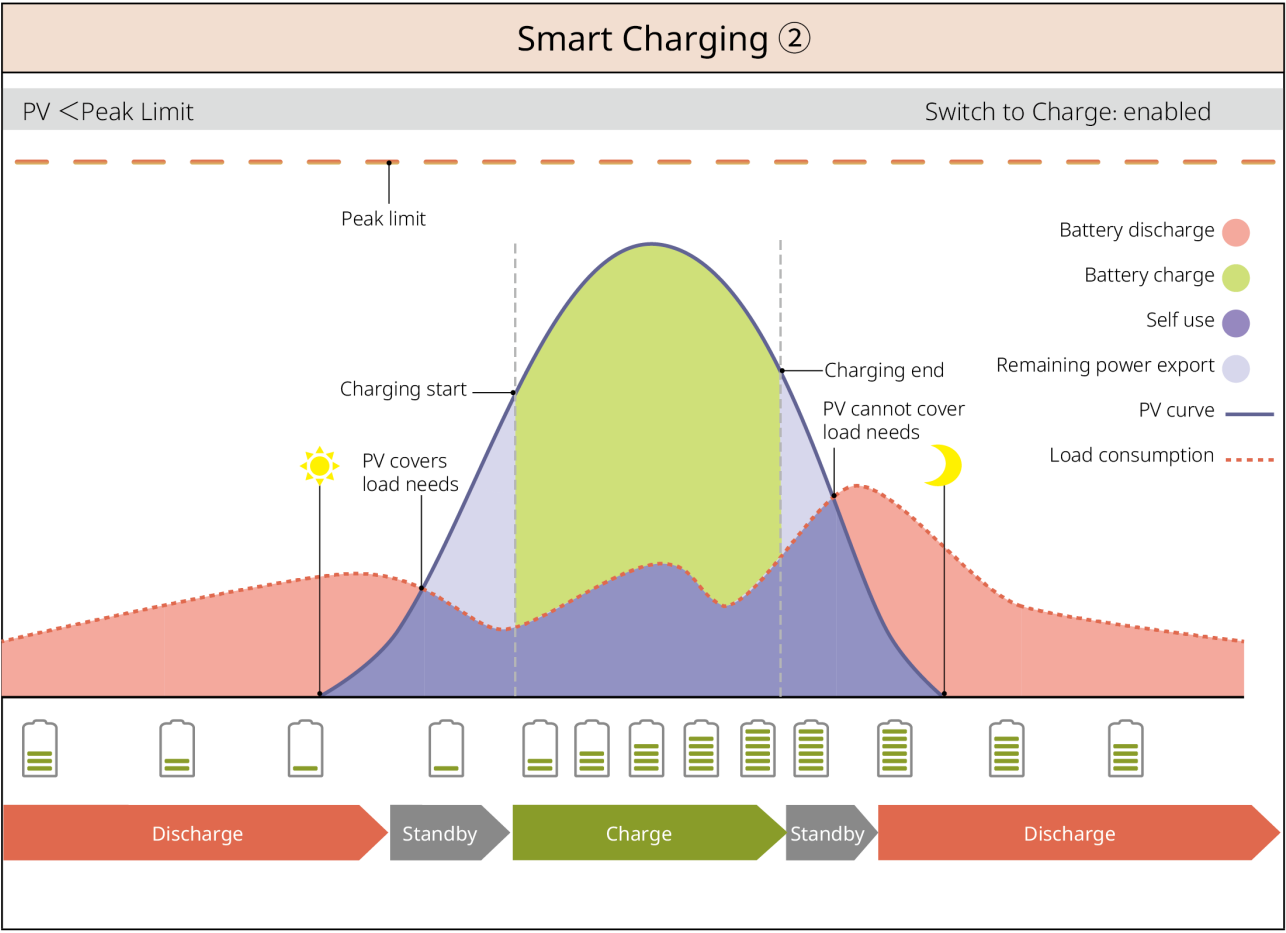
Smart Charging ①

PV > Peak Limit

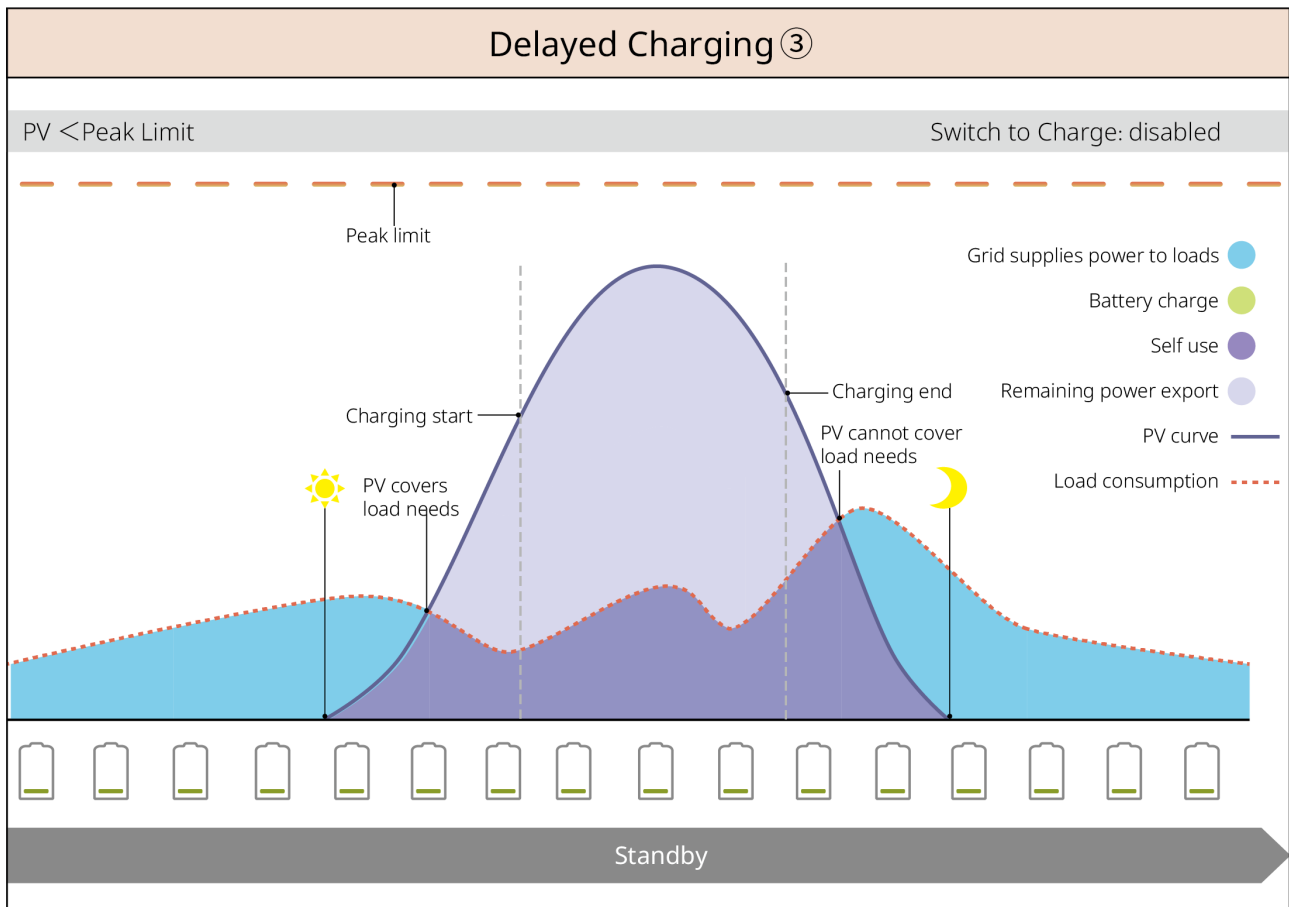
Switch to Charge: enabled/disabled



SLG00NET0006

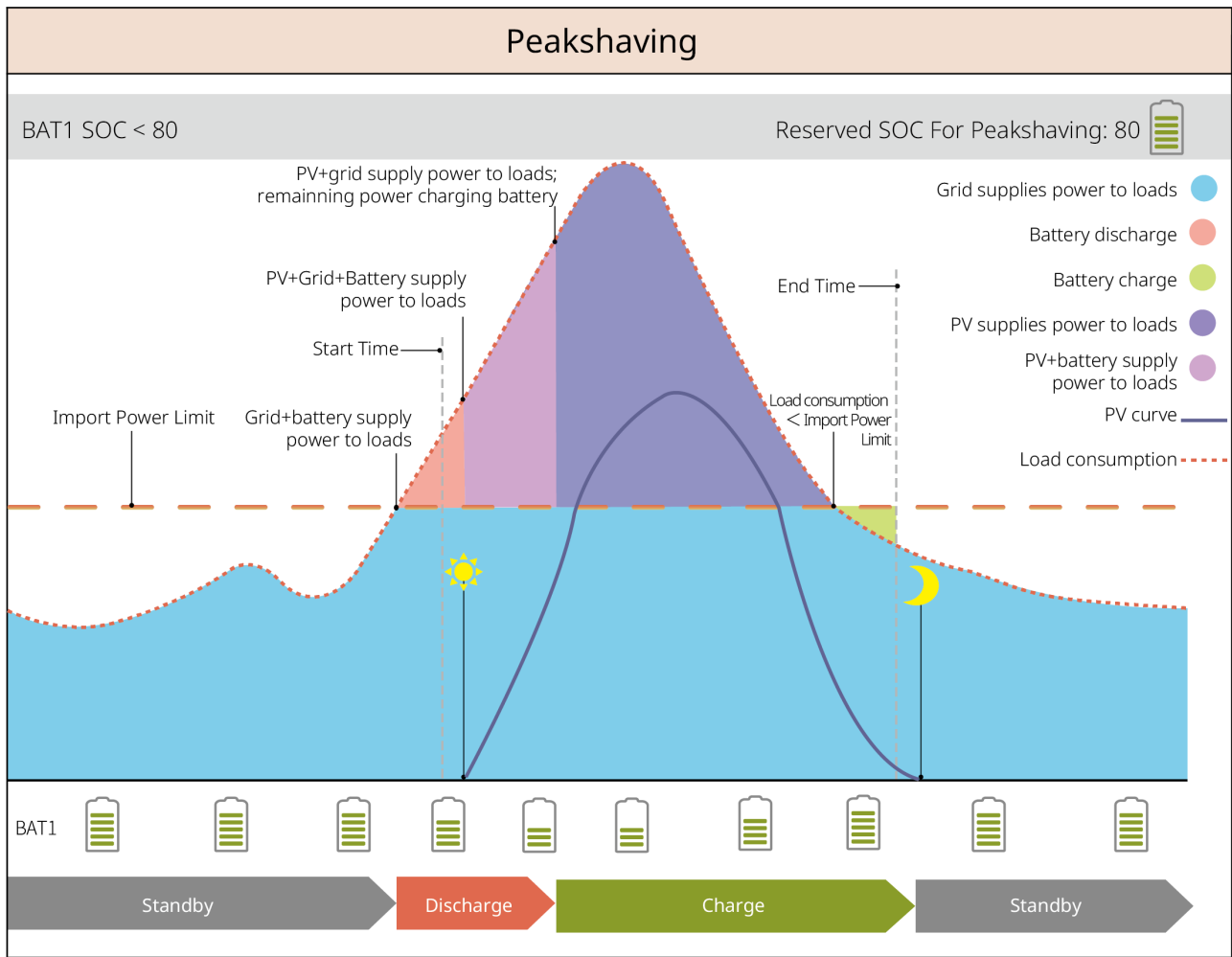


SLG00NET0007



Demand Control Mode

- Mainly applicable to industrial and commercial scenarios.
- When the total power consumption of loads exceeds the electricity quota in a short time, battery discharge can be used to reduce the electricity consumption beyond the quota.
- When the battery SOC is lower than the reserved SOC for demand control, the system purchases electricity from the grid based on time periods, load electricity consumption, and the peak purchase limit.



SLG00NET0001

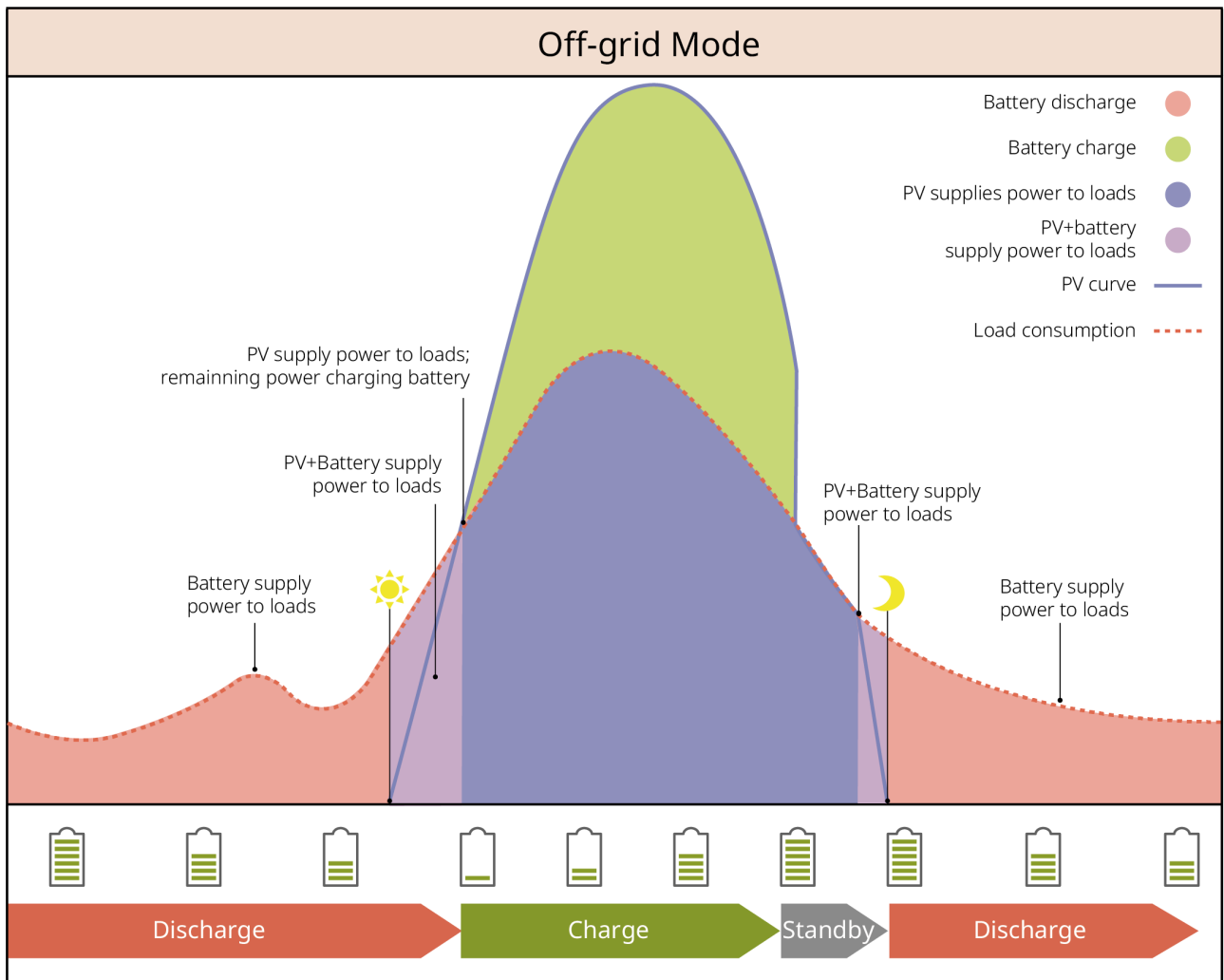
Off-Grid Mode

NOTICE

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

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

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



2.5 Features

AFCI

The inverter integrates an AFCI circuit protection device, which detects arc faults (arc fault) and quickly cuts off the circuit when detected, thereby preventing electrical fires.

Causes of arc generation:

- Connector connections in the photovoltaic system are damaged.
- Cable connections are incorrect or damaged.
- Connectors and cables are aged.

Fault handling methods:

1. When the inverter detects an arc occurrence, the fault type can be viewed through the inverter display or App.
2. If the inverter triggers a fault <5 times within 24 hours, after waiting for 5 minutes, the machine will automatically restore grid connection and protection. After the 5th arc fault, the inverter can only work normally after clearing the fault. For specific operations, please refer to the 'SolarGo APP User Manual' or 'Xiaogu Yun Chuang+ APP User Manual'.

load control

The inverter dry contact control port supports connecting additional contactors to control the load on or off. Supports household loads, heat pumps, etc.

Load control methods are as follows:

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

Two-phase unbalanced output

The inverter grid connection terminal and BACK-UP terminal both support two-phase unbalanced output, each phase can connect loads of different power. The maximum output power per phase for different models is shown in the table below:

No.	model	Single-phase Maximum Output Power
1	GW5K-ES-LD-G10	2.5kW
2	GW7.5K-ES-LD-G10	3.7kW
3	GW10K-ES-LD-G10	5kW

Rapid Shutdown (RSD)

In the rapid shutdown system, the rapid shutdown transmitter and receiver are used together to achieve system rapid shutdown. The receiver maintains component output by receiving signals from the transmitter. The transmitter can be external or

built into the inverter. In case of an emergency, by enabling the external trigger device, the transmitter can be stopped, thereby shutting down the components.

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

3 Check and Storage

3.1 Check Before Receiving

Before signing for the product, please carefully check the following items:

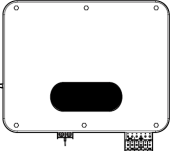
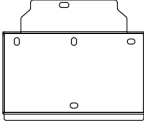
1. Check the outer packaging for any damage, such as deformation, holes, cracks, or any other signs that may indicate damage to the equipment inside the box. If damage is found, do not open the packaging and contact your dealer.
2. When removing the GW14.3-BAT-LV-G10 and GW16.1-BAT-LV-G10 batteries, please ensure the cardboard carton remains intact. If the packaging is accidentally damaged and you need to process a return or exchange due to product quality issues, contact GoodWe after-sales service or your dealer to obtain a dedicated packaging box.
3. Check if the device model is correct. If it does not match, do not open the packaging and contact your dealer.

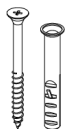
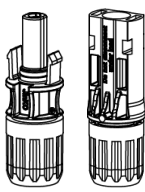
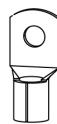
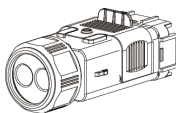
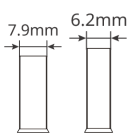
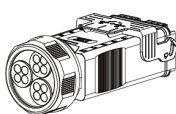
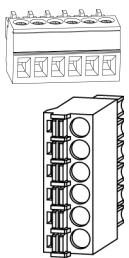
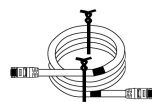
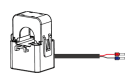
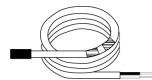
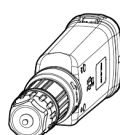
3.2 deliverables

WARNING

Check whether the deliverables type and quantity are correct and whether there is any damage to the appearance. If damaged, please contact your distributor.
After removing deliverables from the packaging, do not place it on rough, uneven, or sharp surfaces to avoid paint chipping.

3.2.1 Inverter Deliverables

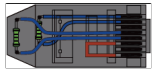
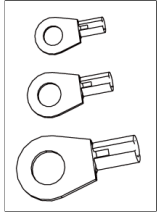
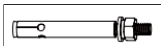
Part	Description	Part	Description
	Inverter x1		mounting plate x1

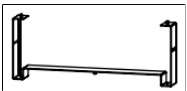
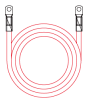
Part	Description	Part	Description
	Expansion screw x4		Grounding terminal x 1
	PV DC terminal • GW5K-ES-LD-G10: PV+/PV- x 2 • GW7.5K-ES-LD-G10: PV+/PV- x 3 • GW10K-ES-LD-G10: PV+/PV- x 4		Battery OT terminal x 2
	Battery connector x1		AC tubular terminal x 24 (7.9mm x 15; 6.2mm x 15)
	AC cover x 1		Communication tubular terminal x 18
 or	6PIN communication terminal x 3		BMS communication cable x 1
	CT x 2		Lead-acid battery temperature sensor cable x 1
	Lead-acid battery temperature sensor cable fixing adhesive tape x 2		Smart dongle x1

Part	Description	Part	Description
	Product documentation x 1		PV terminal unlocking tool x 1

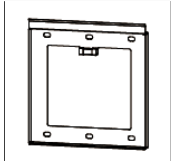
3.2.2 Batteries Deliverables

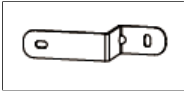
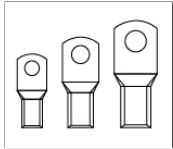
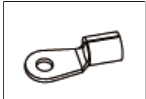
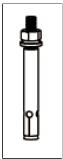
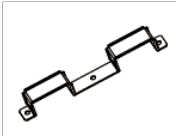
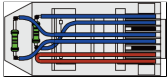
3.2.2.1 LX A5.0-30

Component	Description	Component	Description
	Battery module x 1		Terminal resistor x 1 When connecting to a third-party busbar, Battery must Install this Terminal resistor.
	- M5 OT terminal x 2: Recommended connection 10mm² cable - M8 OT terminal x 4: Recommended connection 50mm² cable - M10 OT terminal x 2: Recommended connection 70mm² cable		M5*12PE screw x 2
	Bracket x 2 Wall-mounted selection Mounting method with accessories		M6*70Expansion bolt x 4 Wall-mounted selection Mounting method with accessories

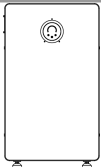
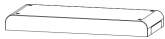
Component	Description	Component	Description
	M5*12PE screw x 2 Wall-mounted selection Mounting method with accessories		Marking Template x 1 Wall-mounted selection Mounting method with accessories
	Battery Bracket x 2 (Optional) Select stack Mounting method for distribution		M4*8 screw x 8 Select stack Mounting method for allocation
	Product Documentation x 1		Negative power cable (optional) x 1
	Positive terminal (optional) x 1		Grounding wire (optional) x 1
	Communication cable (optional) x 1		Decorative Cover (Optional) x 1

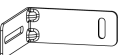
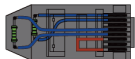
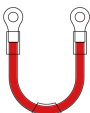
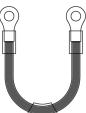
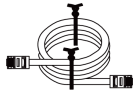
3.2.2.2 Batteries Deliverables(LX U5.0-30)

Component	Description	Component	Description
	Battery x 1		Plastic cover x 1
	Wall-mounted x 1		Expansion screwx 2

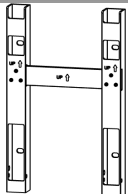
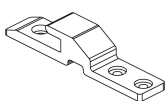
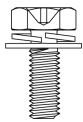
Component	Description	Component	Description
	locking bracket x 2		• 35-8 OT terminal x 4: Recommended to connect 25mm² or 35mm² cables • 50-8 OT terminal x 4: Recommended to connect 50mm² cable • 70-10 OT terminal x 2: Recommended connection with 70mm² cable
	14-5Grounding terminal x 2		M5 x 7
	M10 x 6		Wire harness fixing plate x 1
	Terminal resistor x 1		Product Documentation x 1

3.2.2.3 Batteries Deliverables (GW14.3-BAT-LV-G10)

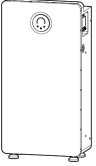
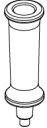
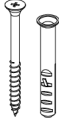
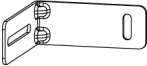
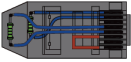
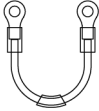
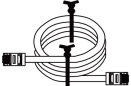
Component	Description	Component	Description
	Battery x 1		Wire cover x 1

	Lifting rod x 2 (Shipped with the box after October 2025)		Expansion screw x 2
	M5*16 internal cross external hexagon screw x 7		Wall-mounted anti-tipping bracket x 2
	Terminal resistor x 1		Grounding OT terminal x 1 (Shipped with the box before October 2025)
	DC OT terminal x 6 (Shipped with the box before October 2025)		Grounding 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

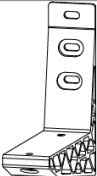
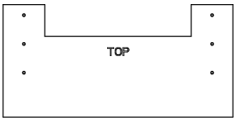
Optional accessories

Component	Description	Component	Description
	Wall Mount Bracket x 1		Hook x 4
	M5*16 Internal Cross External Hex x 12		M10 Expansion Bolt x 4

3.2.2.4 Batteries Deliverables (GW16.1-BAT-LV-G10)

Component	Description	Component	Description
	Battery x 1		Decorative cover x 1
	Lifting rod x 2		Expansion screw x 2
	M5*12 hex socket screw x 7		Wall-mounted anti-tipping bracket x 2
	Terminal resistor x 1		Ground wire x 1
 	Positive power cable x 1 Negative power cable x 1		Decorative cover plug x 4
	Communication cable x 1		Product documentation x 1
	Quick-connect terminal unlocking tool x 1		

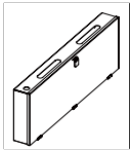
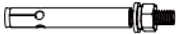
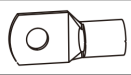
Optional accessories

Component	Description	Component	Description
	Wall mount bracket x 2		Positioning cardboard x 1
	M10 expansion screw x 6		M10*60 bolt x 2

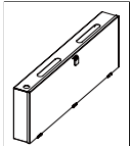
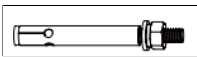
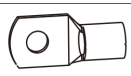
Component	Description	Component	Description
 	Inter-battery parallel cluster positive power cable x 1 Inter-battery parallel cluster negative power cable x 1		

3.2.3 Combiner Box Deliverables

3.2.3.1 BCB-22-WW-0

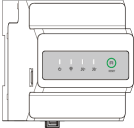
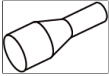
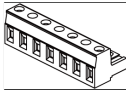
Part	Description	Part	Description
	BCB-22-WW-0 Junction Box x 1		M6 Expansion Bolt x 4
	(25-8) OT terminal x 36 (70-10) OT terminal x 6	-	-

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

Part	Description	Part	Description
	BCB-32-WW-0, BCB-33-WW-0 junction box x 1		M6 expansion bolt x 4
	(50-8) OT terminal x 30 (70-10) OT terminal x 6	-	-

3.2.4 Smart Meter Deliverables

3.2.4.1 GM330

Component	Description	Component	Description
	Smart Meterx1		2PIN connector x1
	PIN terminal x 6		7PIN connector x1
	screwdriver x1		Product Documentation x 1

3.3 Storage

If the device is not put into use immediately, please store it according to the following requirements. After long-term storage, the device must be inspected and confirmed by professionals before it can be used again.

1. If the inverter is stored for more than two years or not operated for more than six months after installation, it is recommended to have it inspected and tested by professionals before putting it into use.
2. To ensure the good electrical performance of the internal electronic components of the inverter, it is recommended to power it on every six months during storage. If it has not been powered on for more than six months, it is recommended to have it inspected and tested by professionals before use.
3. To ensure battery performance and service life, it is recommended to avoid long-term idle storage. Prolonged storage may cause deep discharge of the battery, leading to irreversible chemical damage, resulting in capacity degradation or even complete failure. It is recommended to use it promptly. If the battery needs to be stored for a long time, please maintain it according to the following requirements:

Battery Model	Initial SOC Range for Battery Storage	Recommended Storage Temperature	Charge/Discharge Maintenance Cycle ^[1]	Battery Maintenance Method ^[2]
LX A5.0-30	30%~40%	0~35°C	-20~45°C, ≤6 months	Please consult your dealer or after-sales service center for maintenance methods.
LX U5.0-30	30%~40%	0~35°C	-20~35°C, ≤12 months 35~45°C, ≤6 months	
GW14.3-BAT-LV-G10	30%~40%	0~35°C	-20~35°C, ≤12 months	
GW16.1-BAT-LV-G10			35~45°C, ≤6 months	

NOTICE

[1] The storage time is calculated from the SN date on the battery outer packaging. Charge/discharge maintenance is required after exceeding the storage period. (Battery maintenance time = SN date + charge/discharge maintenance cycle). For the method to view the SN date, refer to: [11.3.SN Code Meaning\(Page 288\)](#).

[2] After passing the charge/discharge maintenance, if the outer box has a Maintaining Label, please update the maintenance information on the Maintaining Label. If there is no Maintaining Label, please record the maintenance time and battery SOC yourself and keep the data properly for maintaining maintenance records.

Packaging Requirements:

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

Environmental Requirements:

1. Ensure that the device is stored in a cool place, avoiding direct sunlight.
2. Ensure that the storage environment is clean, with appropriate temperature and humidity ranges, and no condensation. If there is condensation on the device

ports, do not install the device.

3. Ensure that the device is stored away from flammable, explosive, corrosive, and other hazardous materials.

Stacking Requirements:

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

4 Installation



Please use the deliverables included in the shipment for equipment Installation and electrical connections. Otherwise, any resulting equipment damage will not be covered under warranty.

4.1 System Installation and Commissioning Procedure

Steps	1 Installation	2 PE	3 PV	4 Battery	5 AC	6 COM	7 Communication module
Inverter							
Tools							
Steps	1 Installation	2 PE	3 Battery	4 COM	5 AC	6 COM	7 Communication module
Battery							
Tools							
Steps	1 Installation	2 PE	3 Battery	4 COM	5 AC	6 COM	7 Communication module
Battery							
Tools							
Steps	1 Installation	2 PE	3 Battery	4 COM	5 AC	6 COM	7 Communication module
Battery							
Tools							
Steps	1 Installation	2 Cable Connections	3 Power	4 Commissioning	5 AC	6 COM	7 Communication module
Smart meter							

ESL10INT0007

4.2 Installation Requirements

4.2.1 Installation Environment Requirements

NOTICE

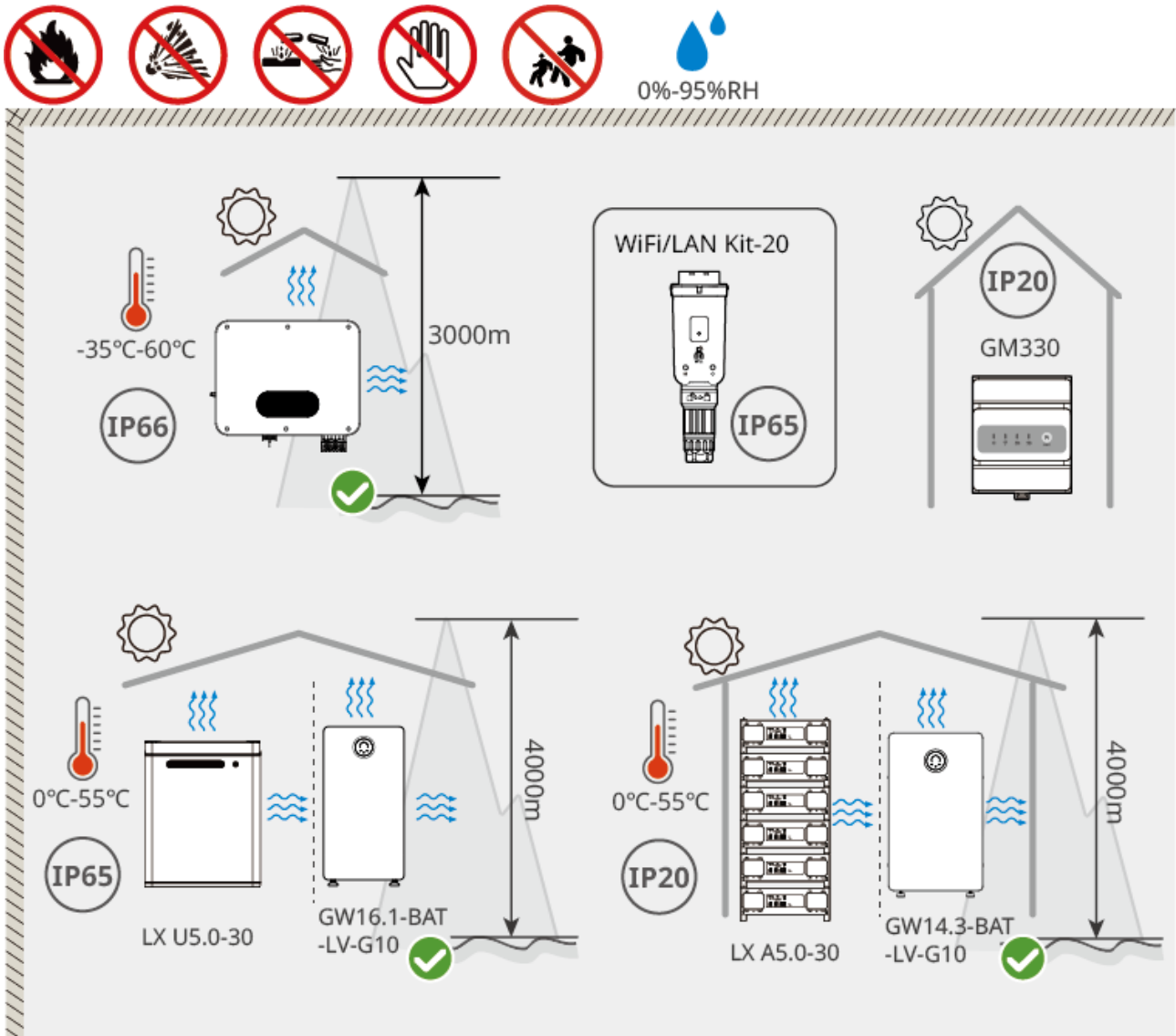
If installed in an environment below 0°C, the battery will be unable to recharge and restore energy after being depleted, resulting in battery undervoltage protection.

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

1. The equipment must not be installed in flammable, explosive, corrosive, or similar environments.
2. The temperature and humidity of the installation environment must be within a suitable range.
3. The installation location must be out of reach of children and avoid being placed in easily accessible positions.
4. The enclosure temperature of the Inverter may exceed 60°C during operation. Do not touch the enclosure before it has cooled down to prevent burns.
5. The equipment should be installed away from direct sunlight, rain, snow accumulation, and similar conditions. It is recommended to install it in a sheltered location. If necessary, a sunshade canopy can be constructed.
6. The installation space must meet the equipment's ventilation, heat dissipation, and operational space requirements.
7. The installation environment must satisfy the equipment's protection rating. The Inverter, battery, and smart communication stick are suitable for both indoor and outdoor installation; the meter is suitable for indoor installation only.
8. The installation height of the equipment should facilitate operation and maintenance, ensuring the equipment indicator lights, all labels are easily visible, and the wiring terminals are easy to operate.
9. The installation altitude of the equipment should be lower than the maximum operating altitude.
10. For outdoor installation of equipment in salt damage areas, please consult the equipment manufacturer. Salt damage areas mainly refer to regions within 500m of the coastline. The affected area is related to factors such as sea breeze,

precipitation, and terrain.

11. Keep away from strong magnetic field environments to avoid electromagnetic interference. If there are radio stations or wireless communication equipment below 30MHz near the installation location, please install the equipment according to the following requirements:
 - a. Inverter: Add ferrite cores with multiple turns on the DC input lines or AC output lines of the Inverter, or add low-pass EMI filters; or maintain a distance of over 30m between the Inverter and the wireless electromagnetic interference source.
 - b. Other equipment: Maintain a distance of over 30m between the equipment and the wireless electromagnetic interference source.
12. The length of the DC cable and communication cable between the battery and the Inverter must be less than 3m. Please ensure the installation distance between the Inverter and the battery meets the cable length requirement.



ESL10INT0004

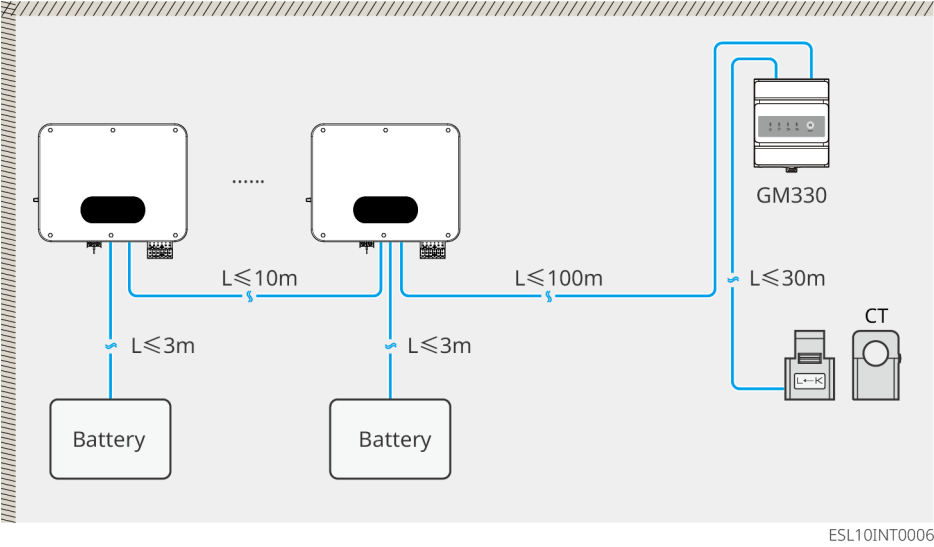
4.2.2 Installation Space Requirements

When installing the device in the system, sufficient space should be reserved around the device to ensure adequate installation and heat dissipation space.

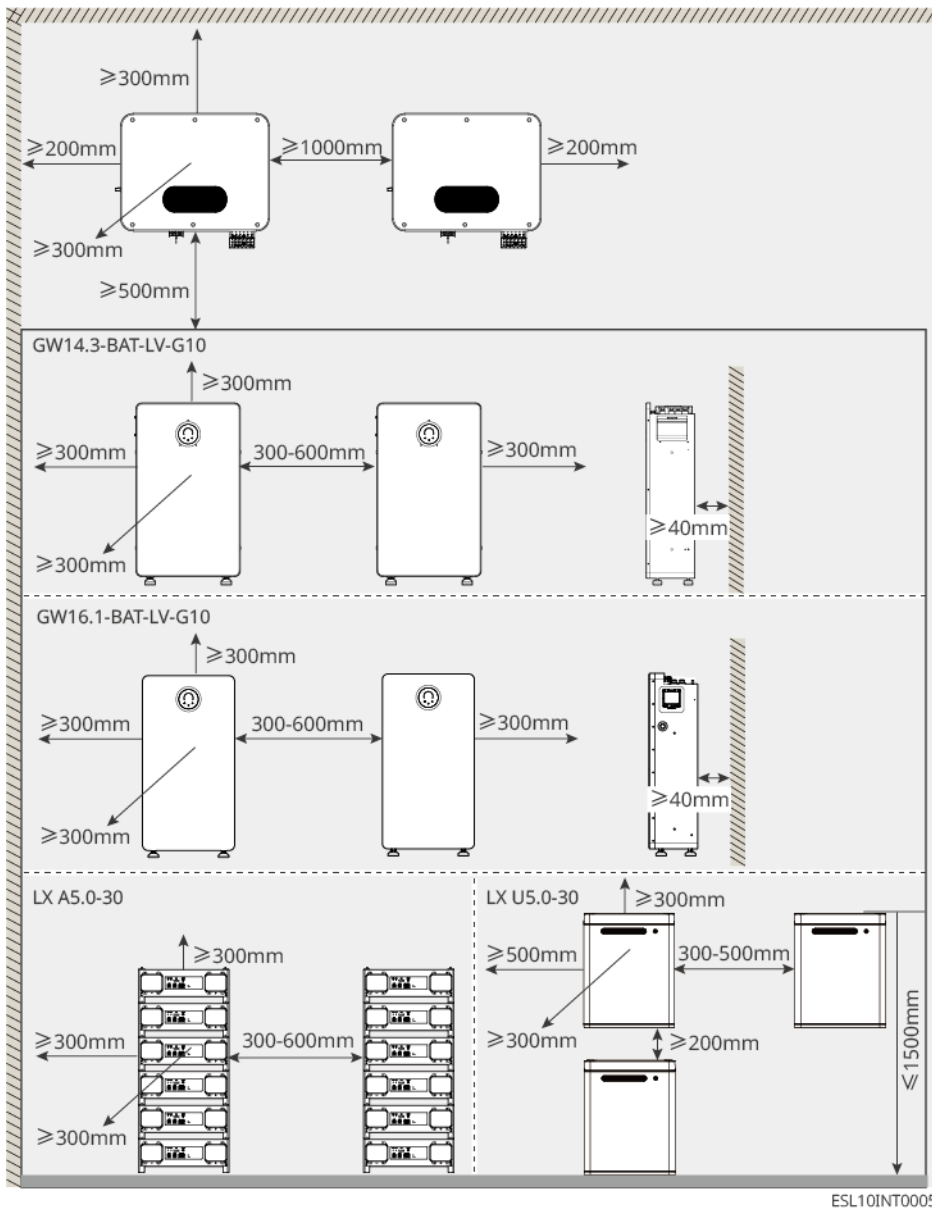
- When using CAT7E communication cables between inverters, the cable distance should not exceed 10 meters; when using CAT5E or CAT6E communication cables, the cable distance should not exceed 5 meters. Do not exceed 10m for communication cables, otherwise communication abnormalities may occur.
- For CT installation, use shielded twisted-pair cables of CAT5E or above, with a cable distance not exceeding 30 meters.
- The RS485 twisted-pair shielded cable for communication between the inverter and

the meter should have a cable distance not exceeding 100 meters.

Communication Cable Length



Installation Space

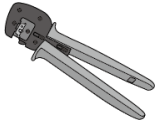
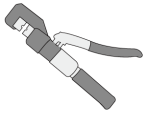
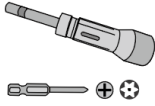
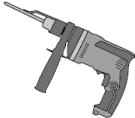
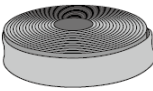


4.2.3 Tool Requirements

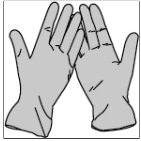
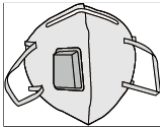
NOTICE

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

Installation Tools

Tool Type	Description	Tool Type	Description
	diagonal plier		RJ45 Crimping Tool
	wire stripper		Level bar
	open-end wrench		PV Terminal Crimping Tool A-2546B
	AC Terminal Crimping Tool YQK-70		torque wrench M2、M4、M5、M8
	hammer drill (Bit Φ8mm)		cable tie
	rubber hammer		socket wrench
	Marker Pen		multimeter Range ≤600V
	Heat Shrink Tubing		Heat Gun
	Vacuum Cleaner		

personal protective equipment

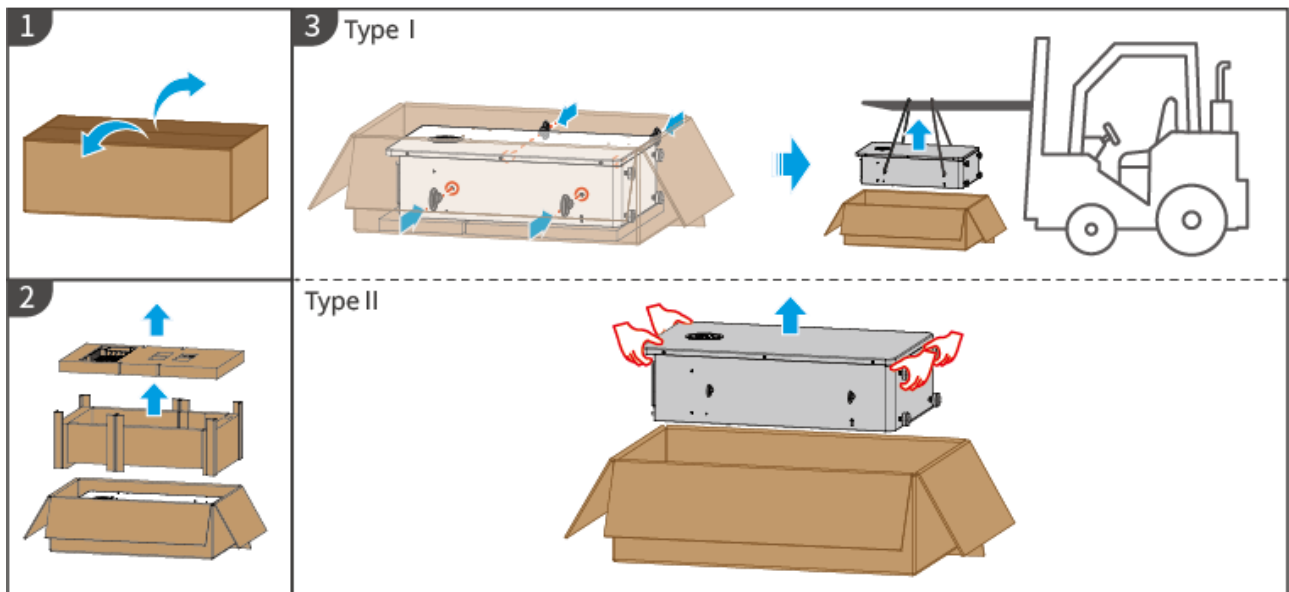
Tool Type	Description	Tool Type	Description
	Insulating gloves, Protective gloves		Dust mask
	goggle		Safety shoes

4.3 Equipment Handling

CAUTION

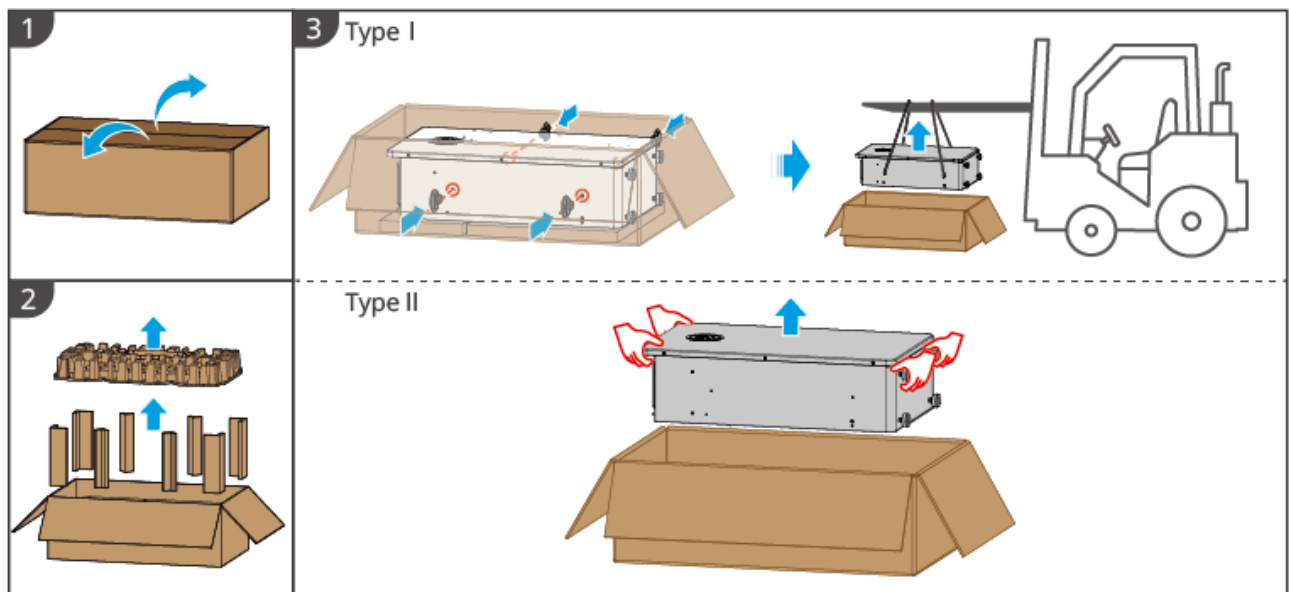
1. During operations such as transportation, handling, and installation, the laws, regulations, and relevant standards of the country or region must be complied with.
2. Before installation, the equipment needs to be moved to the installation site. To avoid personal injury or equipment damage during handling, please note the following:
3. Assign personnel according to the weight of the equipment to prevent it from exceeding the human body's lifting capacity and causing injury from dropping.
4. Please wear safety gloves to avoid injury.
5. Ensure the equipment remains balanced during handling to prevent it from falling.
6. The battery system can be removed from the packaging using a crane or hoisting method and transported to the installation location.
 - Crane requirements (GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10): Load capacity $\geq 180\text{kg}$
7. When using hoisting to move the equipment, please use flexible slings or straps. The requirements for lifting rings and slings for GW14.3-BAT-LV-G10 and GW16.1-BAT-LV-G10 are:
 - Lifting rings: 4 M10 lifting rings, each with a load capacity $\geq 260\text{ kg}$
 - Hoisting rope: 1 piece, rope length $\geq 2.5\text{m}$, load capacity $\geq 600\text{kg}$

GW14.3-BAT-LV-G10:



LXA10INT0010

GW16.1-BAT-LV-G10:



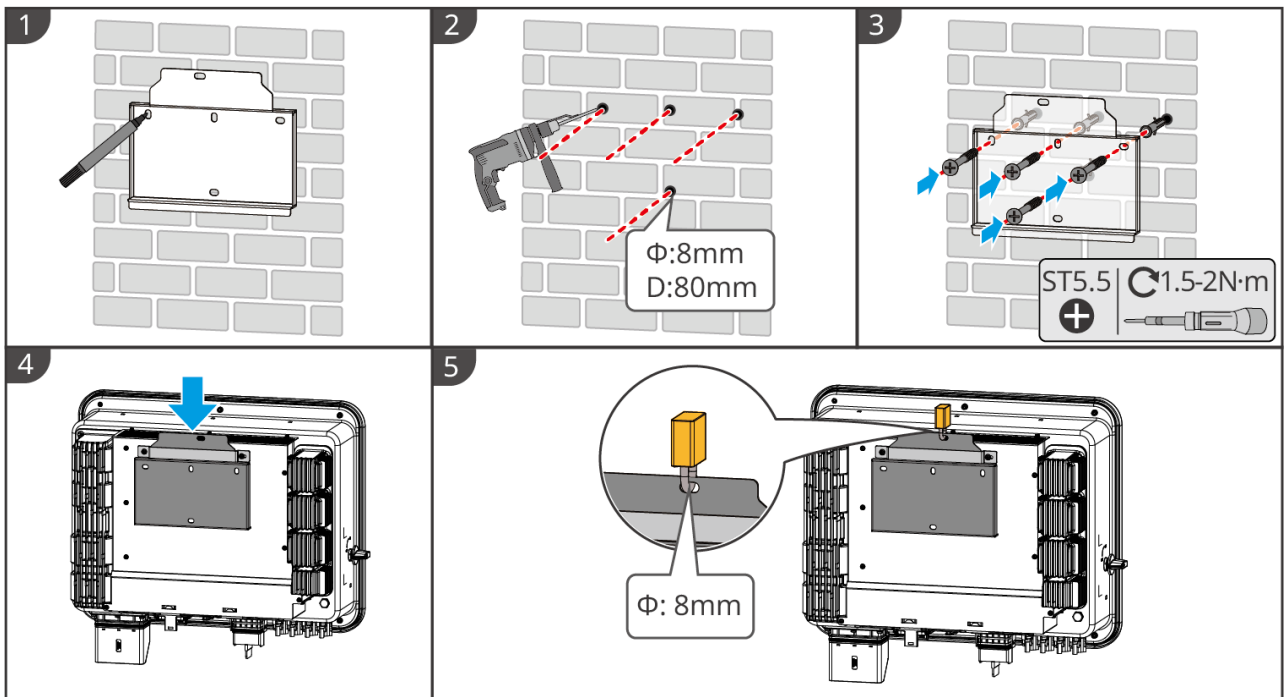
LXA40INT0005

4.4 Installing the Inverter

 CAUTION

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

1. Place the back mounting plate horizontally on the wall, and use a marker pen to mark the drilling positions.
2. Use an impact drill to drill the holes.
3. Use expansion screws to fix the inverter back mounting plate bracket to the wall.
4. Hang the inverter on the back plate. After hanging, use screws to secure the back plate and the inverter, ensuring the inverter is installed firmly.



ESL10INT0002

4.5 Installing the Battery System



- When installing the battery system, ensure that it is level and secure. When using an anti-tipping bracket, the bracket should be vertically close to the wall and the surface of the battery system.
- When using an impact drill to make holes, use cardboard or other coverings to shield the battery system to prevent foreign objects from entering the device and causing damage.
- After marking the drilling positions with a marker pen, move the battery system away to prevent the impact drill from being too close to the battery system during drilling, which could cause damage.

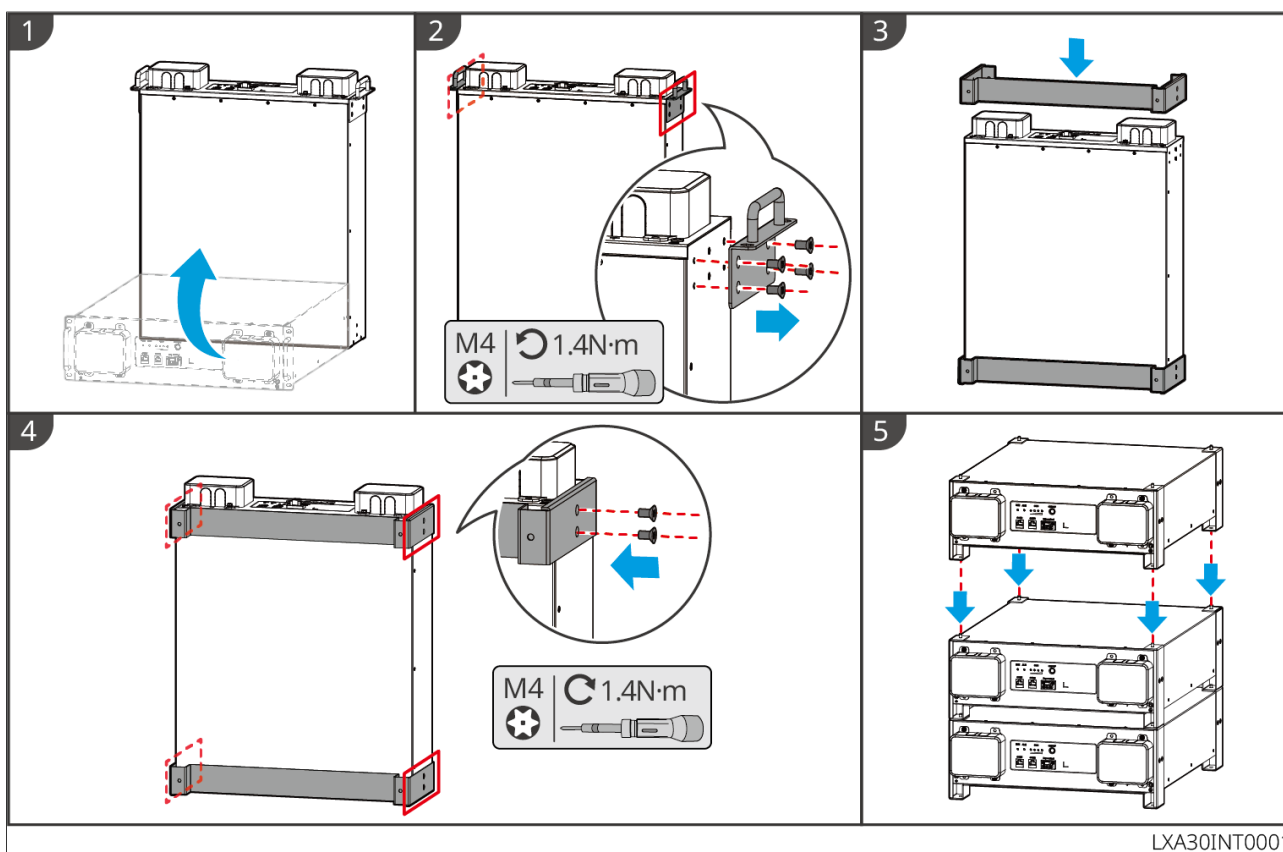
4.5.1 LX A5.0-30

LX A5.0-30: Ground Stacking

NOTICE

The maximum stacking height for floor stacking is 6 Battery units.

1. Place the Battery vertically and remove the Battery Handle.
2. Mount the bracket Installation onto the Battery and secure it with screw.
3. Lay flat Battery, stack multiple Battery Installation. Ensure to insert locating pin into the positioning hole.

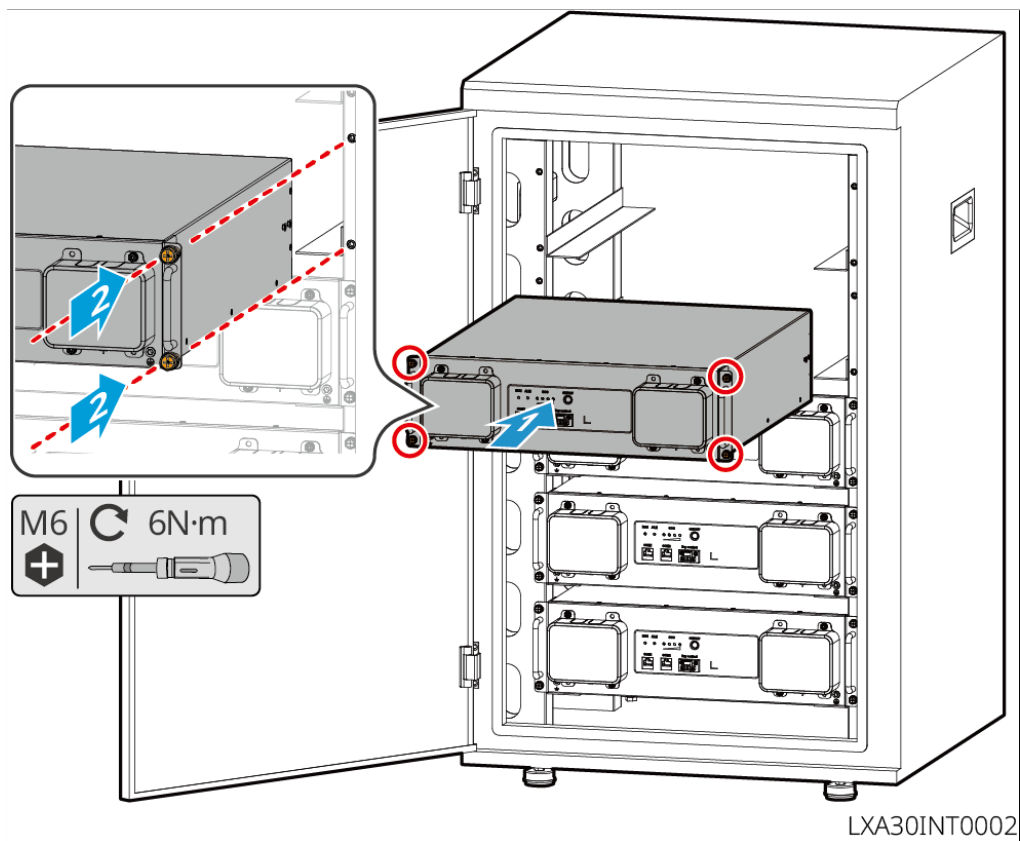


LX A5.0-30: Cabinet Installation

NOTICE

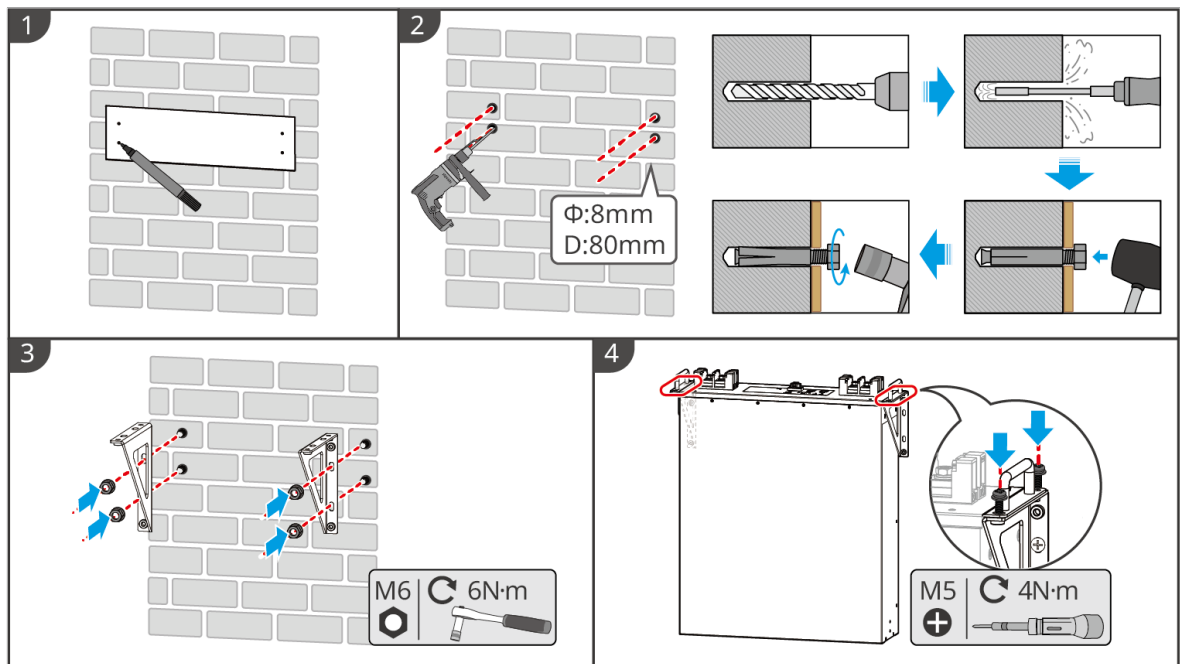
- It is recommended to install Installation in a 19-inch standard cabinet with dimensions of length*width: 600*800mm or larger, and height: selected based on the thickness of Battery (133mm) or greater.
- For cabinet installation, it is necessary to affix electrical labels and warning labels on the front panel of any Battery (these labels are additionally shipped as accessories).

1. Place the Battery onto the guide rails of the cabinet, and use the screw to fasten the Battery to the cabinet from the Handle.



LX A5.0-30: Wall-mounted Installation

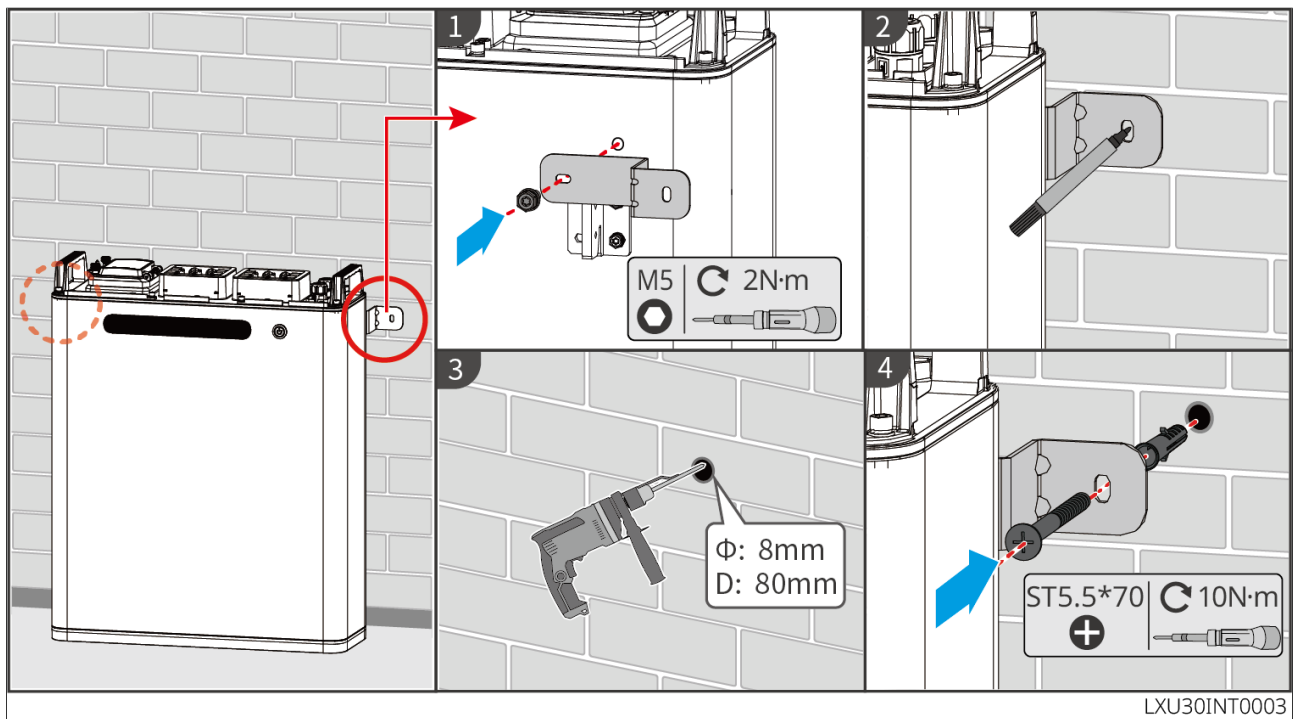
1. Determine the punching position according to the marked template, and mark the punching position with a marker pen.
2. Use hammer drill for punching.
3. Installing the Battery System mounting bracket
4. Mount the Battery Installation on the bracket, and secure the Battery to the bracket using screw.



LXA30INT0003

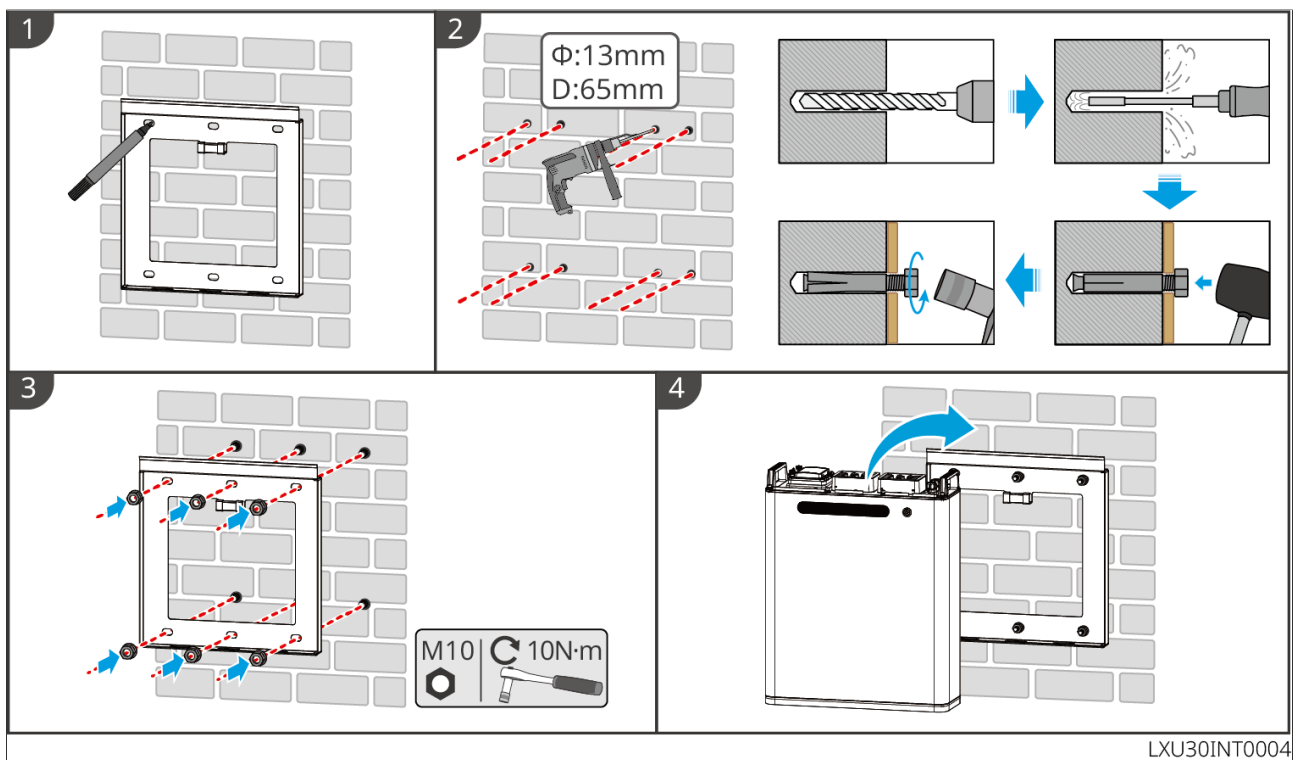
4.5.2 LX U5.0-30

LX U5.0-30: Floor-mounted Installation



LXU30INT0003

LX U5.0-30: Wall-mounted Installation

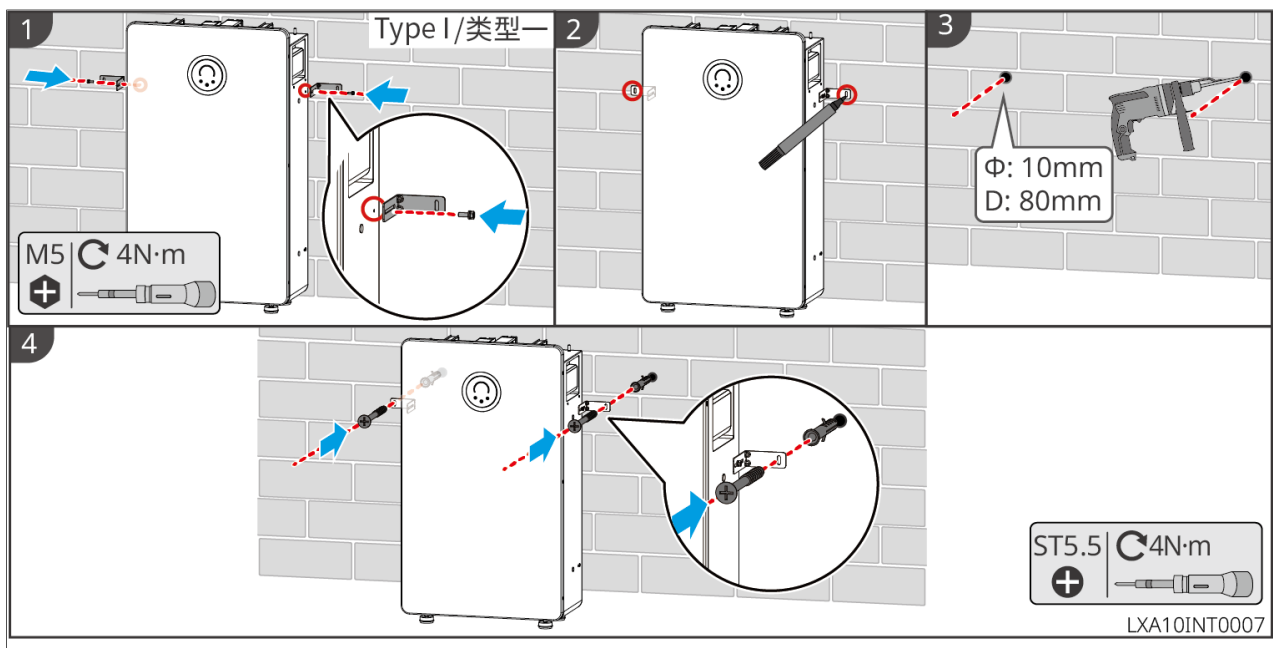


4.5.3 GW14.3-BAT-LV-G10

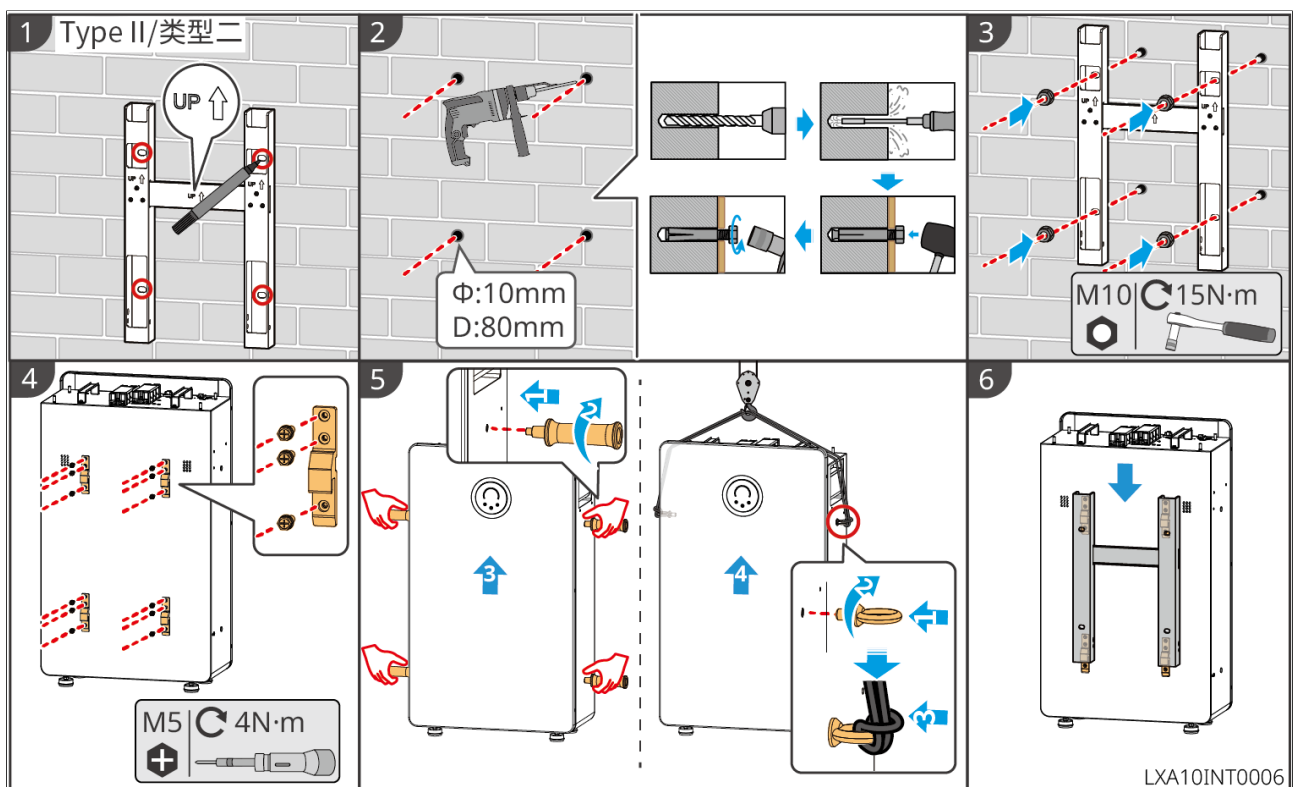
NOTICE

- Wall mounting requires two people.

GW14.3-BAT-LV-G10: Floor-mounted Installation



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

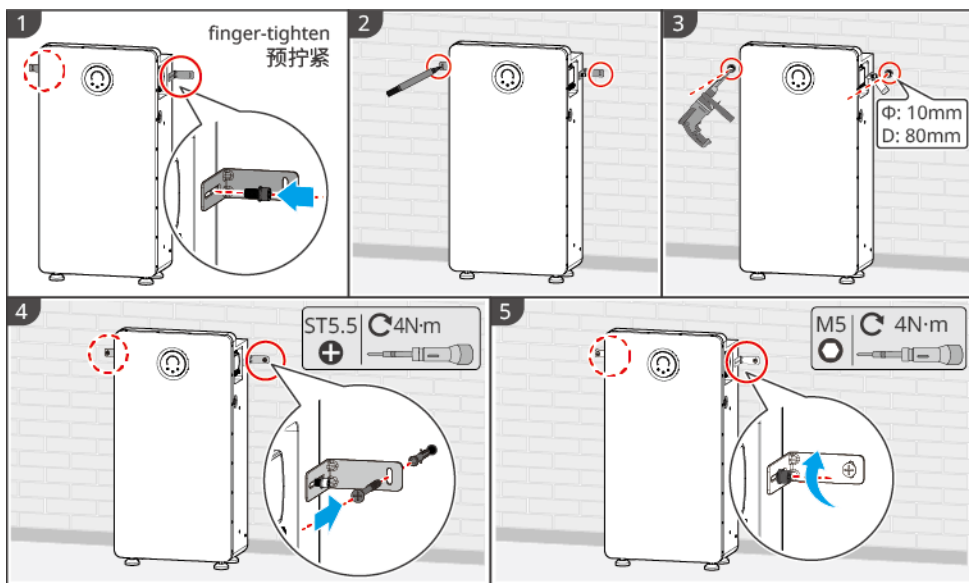


4.5.4 GW16.1-BAT-LV-G10

NOTICE

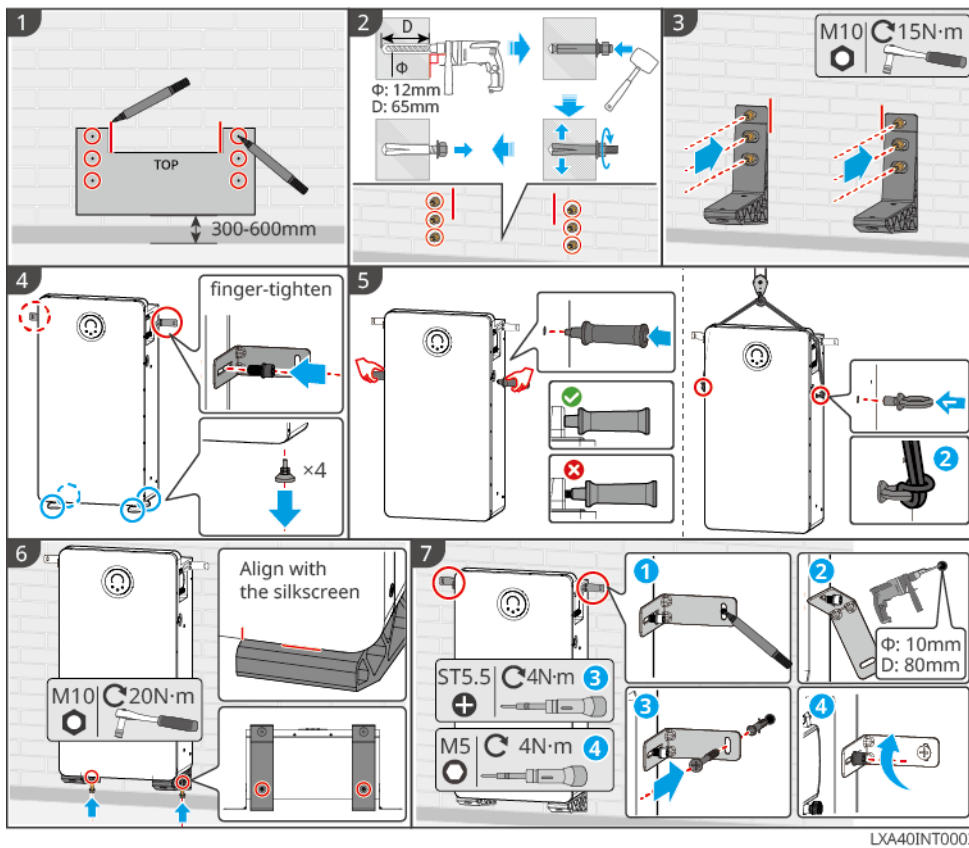
- Wall mounting requires two-person installation.

Floor-mounted installation



LXA40INT0002

Wall-mounted installation

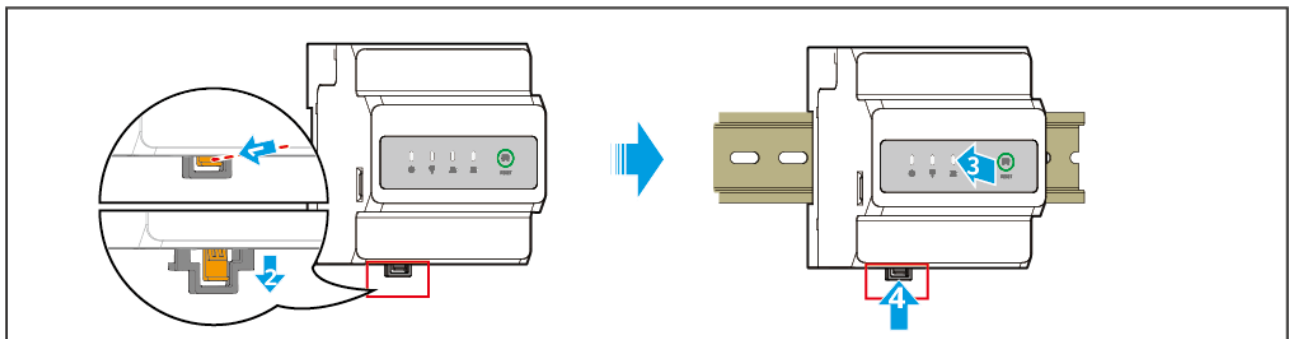


4.6 Installing the Smart Meter

⚠ WARNING

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

GM330



GMK10INT0003

5 System Wirings

DANGER

- The installation, routing, and connection of cables must comply with local laws, regulations, and standard requirements.
- All operations during the electrical connection process, as well as the specifications of cables and components used, must comply with local laws and regulations.
- Before performing electrical connections, disconnect the DC switch and AC output switch of the equipment to ensure it is POWER OFF. Live operation is strictly prohibited, as it may lead to electric shock or other DANGER.
- Cables of the same type should be bundled together and routed separately from different types of cables. Intertwining or cross-routing is strictly prohibited.
- If the cable is subjected to excessive tension, it may result in poor connections. When wiring, ensure to leave a certain length of slack in the cable before connecting it to the Inverter terminal port.
- When crimp wiring terminal, ensure that the conductor part of the cable is in full contact with the terminal terminal. Do not crimp the cable insulation together with the terminal terminal, as this may cause the equipment to malfunction or lead to unreliable connections, resulting in overheating and subsequent damage to the Inverter terminal busbar.

NOTICE

- When performing electrical connections, wear safety shoes, protective gloves, insulating gloves, etc. as required.
- Only qualified personnel are permitted to perform electrical connection operations.
- The cable colors in the diagrams of this document are for reference only. The actual cable specifications must comply with local regulatory requirements.
- For parallel systems, please NOTICE comply with the user manuals corresponding to the relevant products in the system Safety Precautions.

5.1 System Wiring Electrical Block Diagram

NOTICE

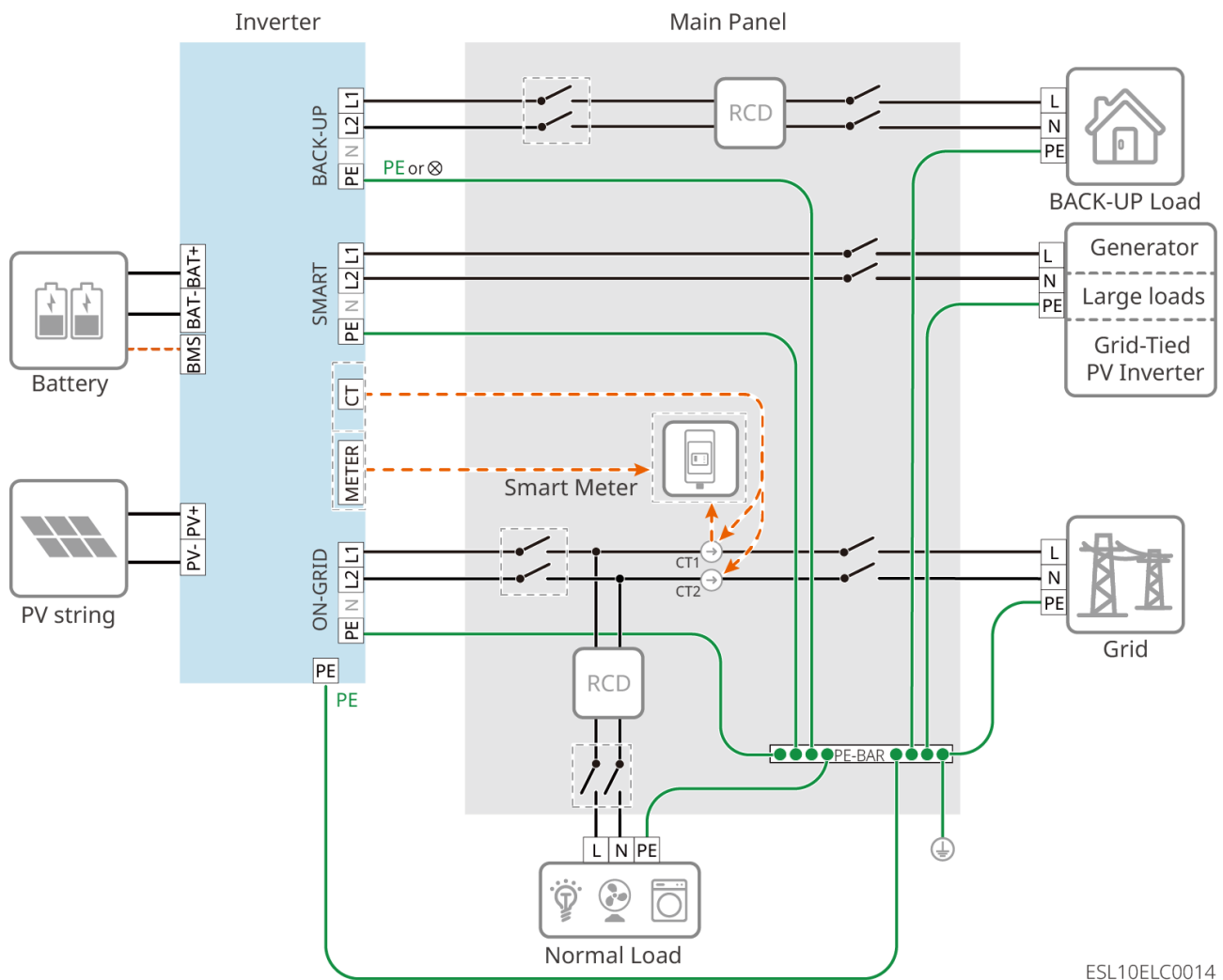
- Depending on regional regulatory requirements, the wiring methods for the N and PE lines on the inverter's ON-GRID and BACK-UP ports differ. Please follow local regulations.
- The inverter has a built-in energy meter and can be directly connected to a CT for use. The CT cable included in the shipment is 10 meters. For longer distances, shielded cables compliant with local regulations can be used to extend the length up to 30 meters.
- CT accuracy will decrease when the connection length to the inverter exceeds 30m. For higher accuracy requirements, an external smart meter can be installed.
- The inverter's ON-GRID AC port has a built-in relay. When the inverter is in off-grid mode, the built-in ON-GRID relay is open; when the inverter is in grid-tied operation mode, the built-in ON-GRID relay is closed.
- The BACK-UP AC port is live when the inverter is powered on. If maintenance is required on the BACK-UP Loads, please power down the inverter to avoid the risk of electric shock.

N and PE wires are separately connected in the distribution box

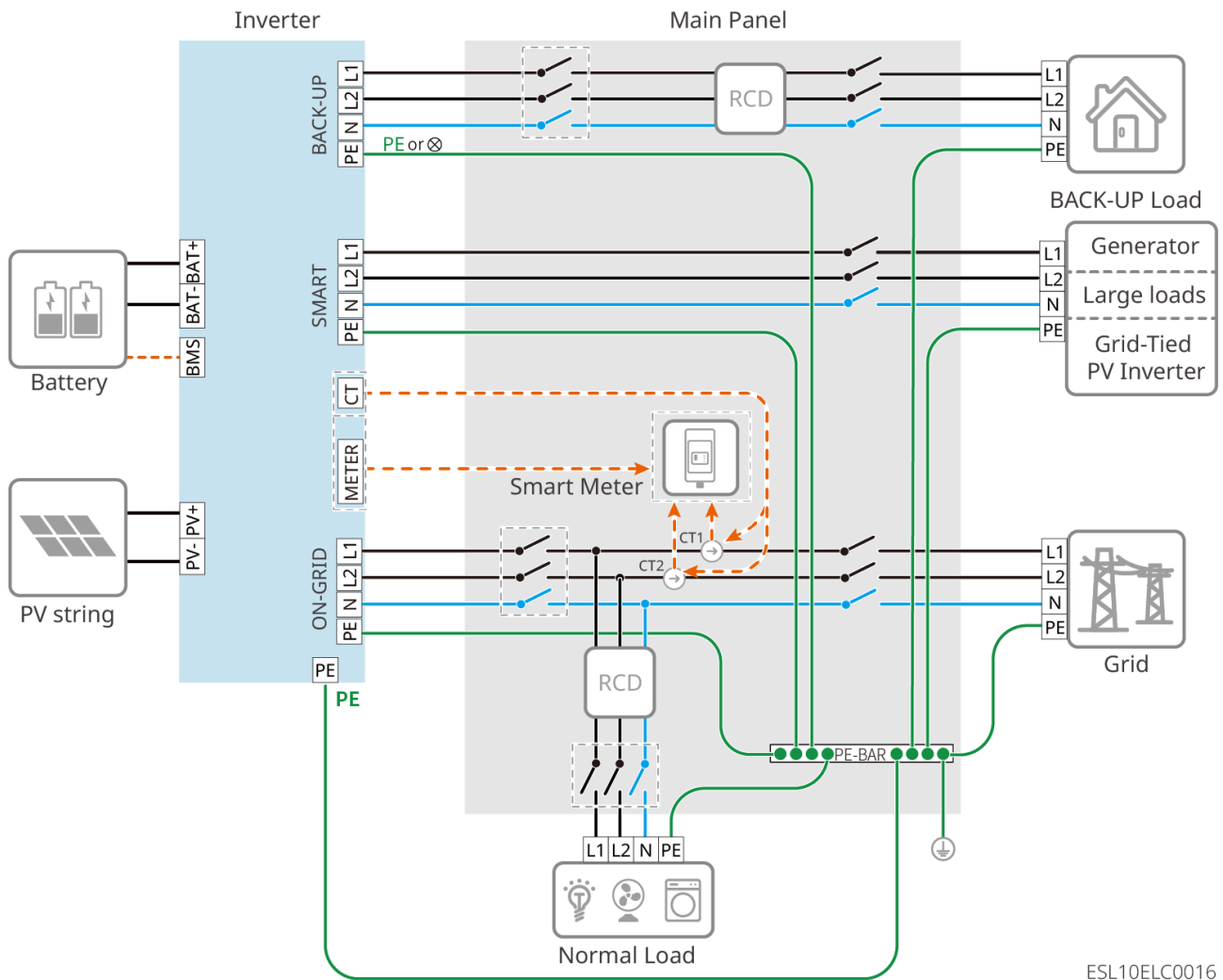
NOTICE

- Ensure the protective ground wire for the BACK-UP is correctly and securely connected; otherwise, the BACK-UP function may operate abnormally in the event of a grid fault.
- The following wiring method applies to regions other than Australia, New Zealand, etc.:

Single-phase



Two-phase/Split-phase



ESL10ELC0016

5.2 Detailed System Wiring Diagram

When the loads within the photovoltaic system cannot consume all the electricity generated by the system, the surplus power will be fed into the grid. In this case, a smart meter or CT can be used to monitor the system's power generation and control the amount of electricity fed into the grid.

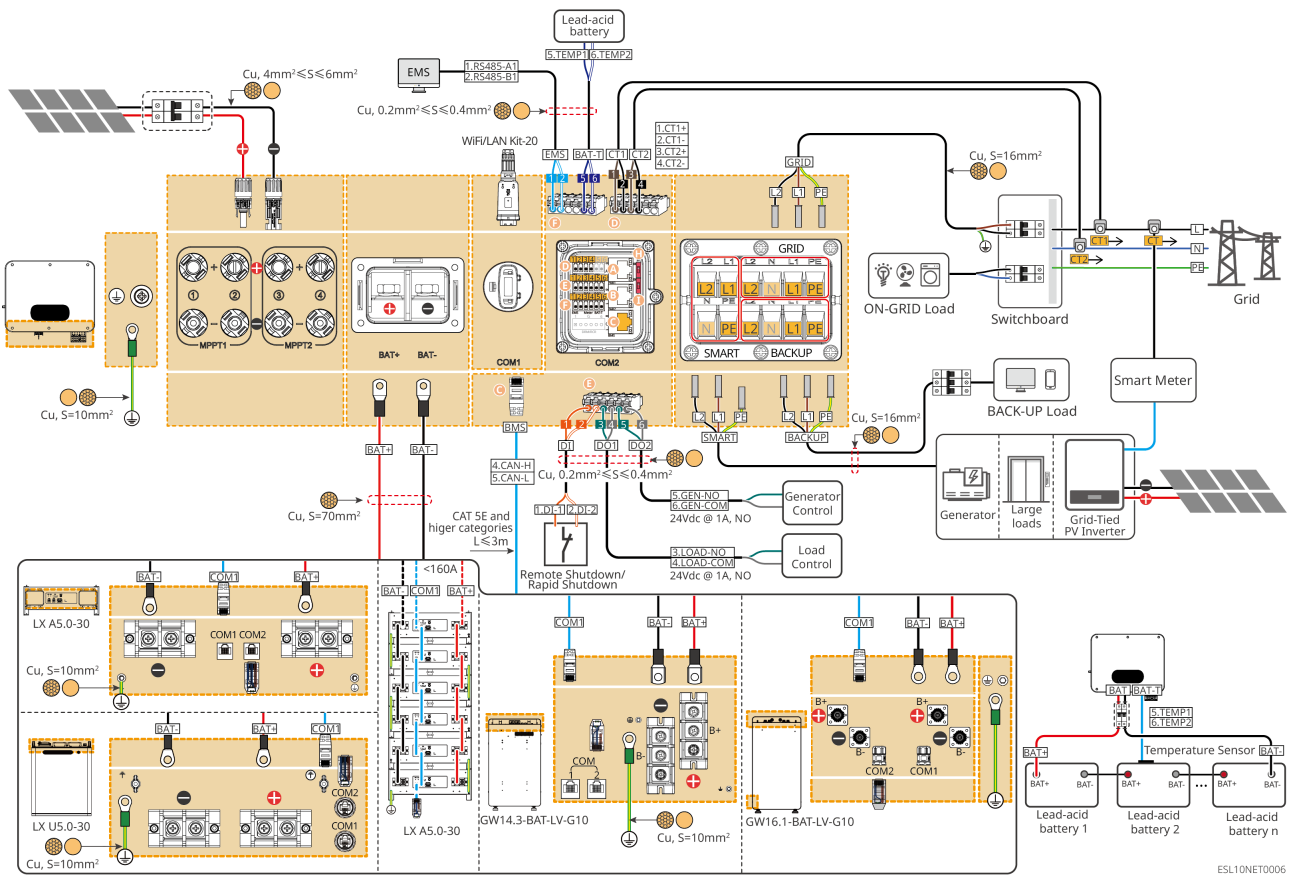
- Connecting a smart meter enables the **Export power limit** and load monitoring functions.
- After connecting the smart meter, please enable the **Export power limit** function via the App.

NOTICE

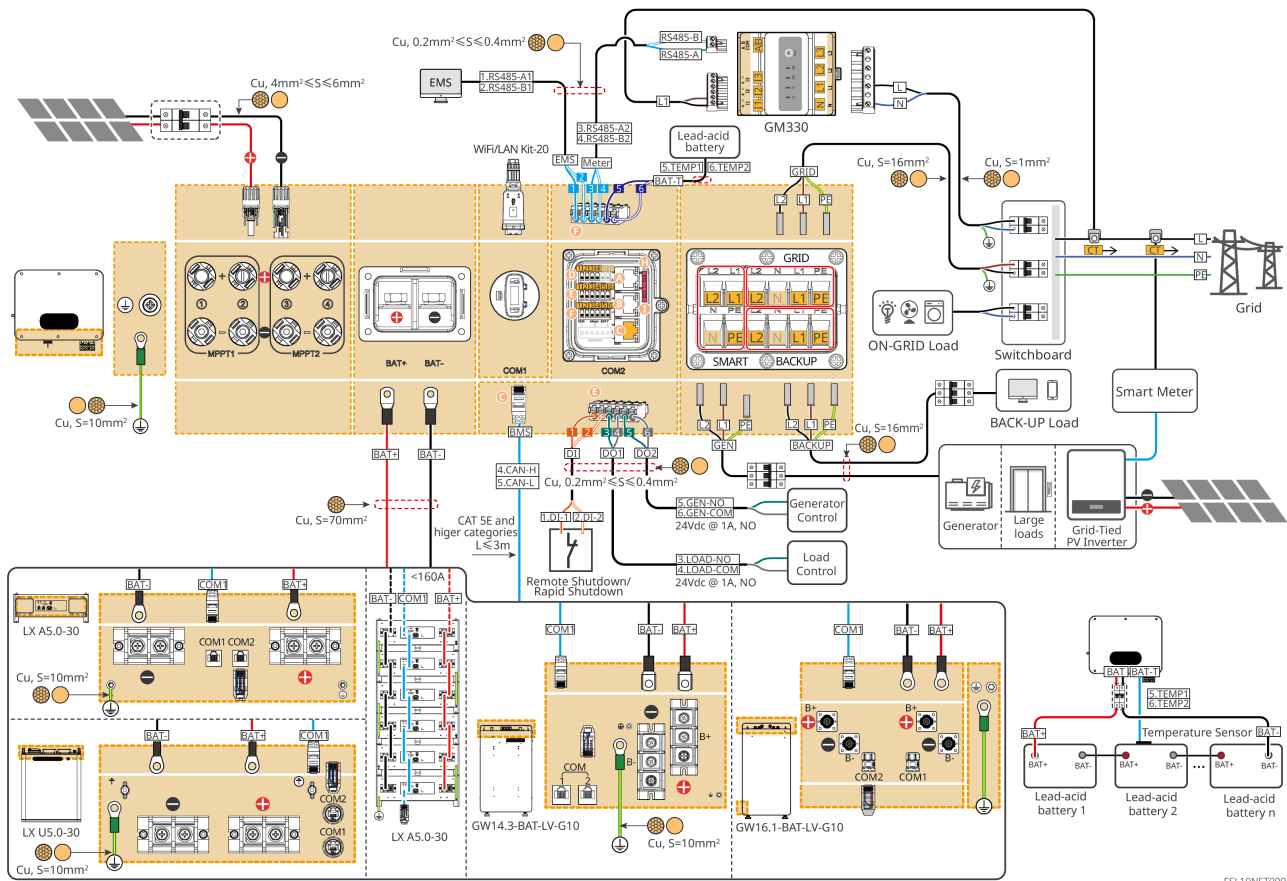
- The GM330 meter is optional. If needed, please contact GoodWe to purchase.
 - If the inverter's built-in meter is not used in the system, do not connect the inverter's CT port.
 - For grid-connected inverters that require grid power limitation, please connect a meter or CT device separately.
 - The system wiring diagram only shows the relevant wiring methods. For the specific wiring of the grid-connected inverter, please refer to the grid-connected inverter manual.
-
- The single-unit system wiring diagram only shows wiring examples for some device models. Please refer to the corresponding wiring guide chapters for the actual devices used during installation.
 - The parallel system wiring diagram focuses on the wiring related to parallel operation. For wiring requirements of other ports, please refer to the single-unit system.

5.2.1 Detailed System Wiring Diagram for Single Inverter - Single Phase

With built-in meter scenario



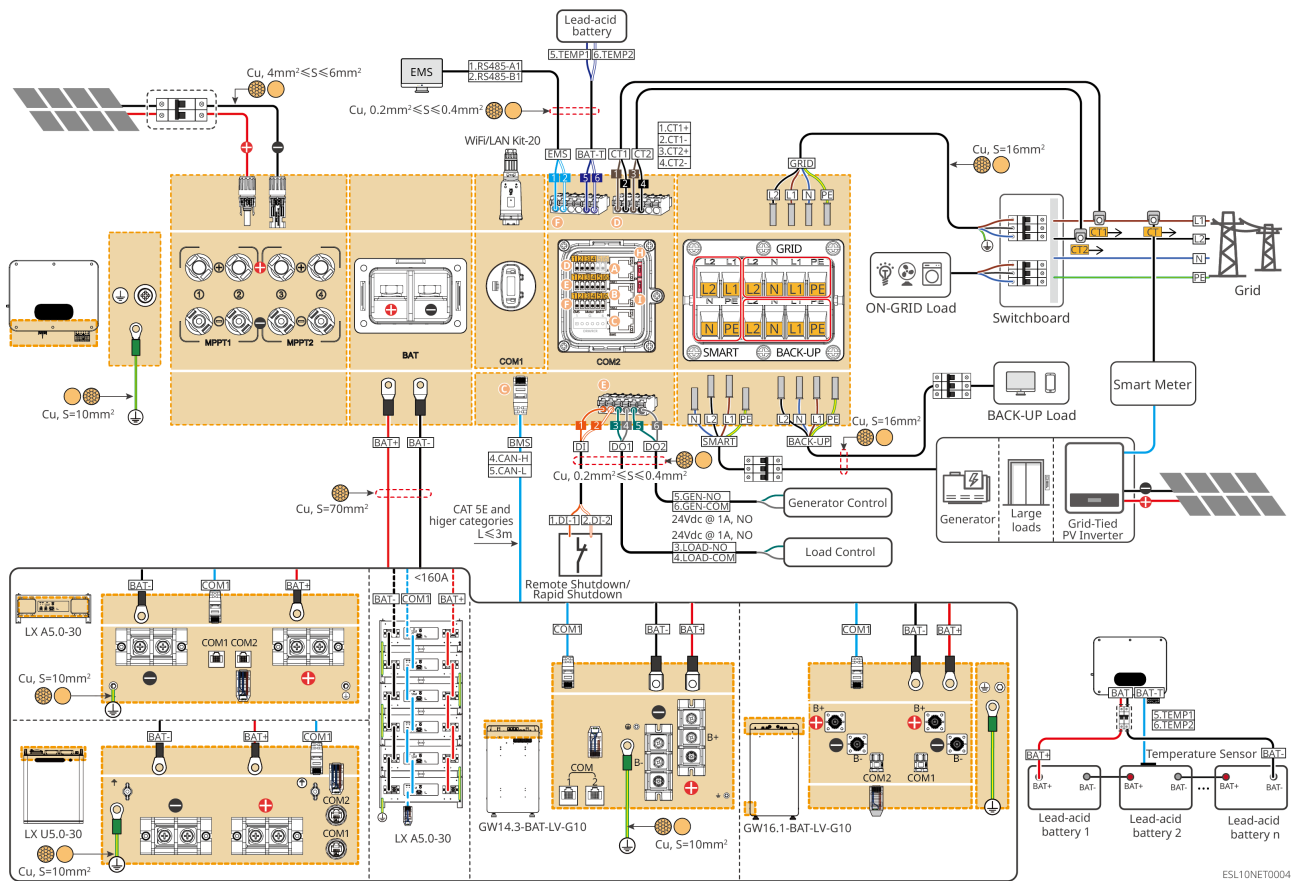
With GM330 scenario



ESL10NET0005

5.2.2 Detailed System Wiring Diagram for Single Inverter - Two-Phase/Split-Phase

With built-in meter scenario



ESL10NET0004

With GMK330 scenario

NOTICE

- The inverter connected to the meter is the master inverter, while the others are slave inverters.
- For parallel operation scenarios, please use the GM330 smart meter.
- To achieve functions such as remote shutdown, load control, and generator control, please connect the communication cable to the master inverter.
- The following diagrams focus on wiring related to parallel operation. For wiring requirements of other ports, please refer to the single-unit system.
- In a parallel system, if you need to disconnect any port circuit breaker of a slave inverter, please simultaneously disconnect the other port circuit breakers of that inverter; otherwise, it may cause abnormal system operation.
- The built-in meter of the inverter supports networking for a maximum of 2 units in parallel. If the number of parallel units in the system exceeds 2, an external GM330 smart meter must be installed.

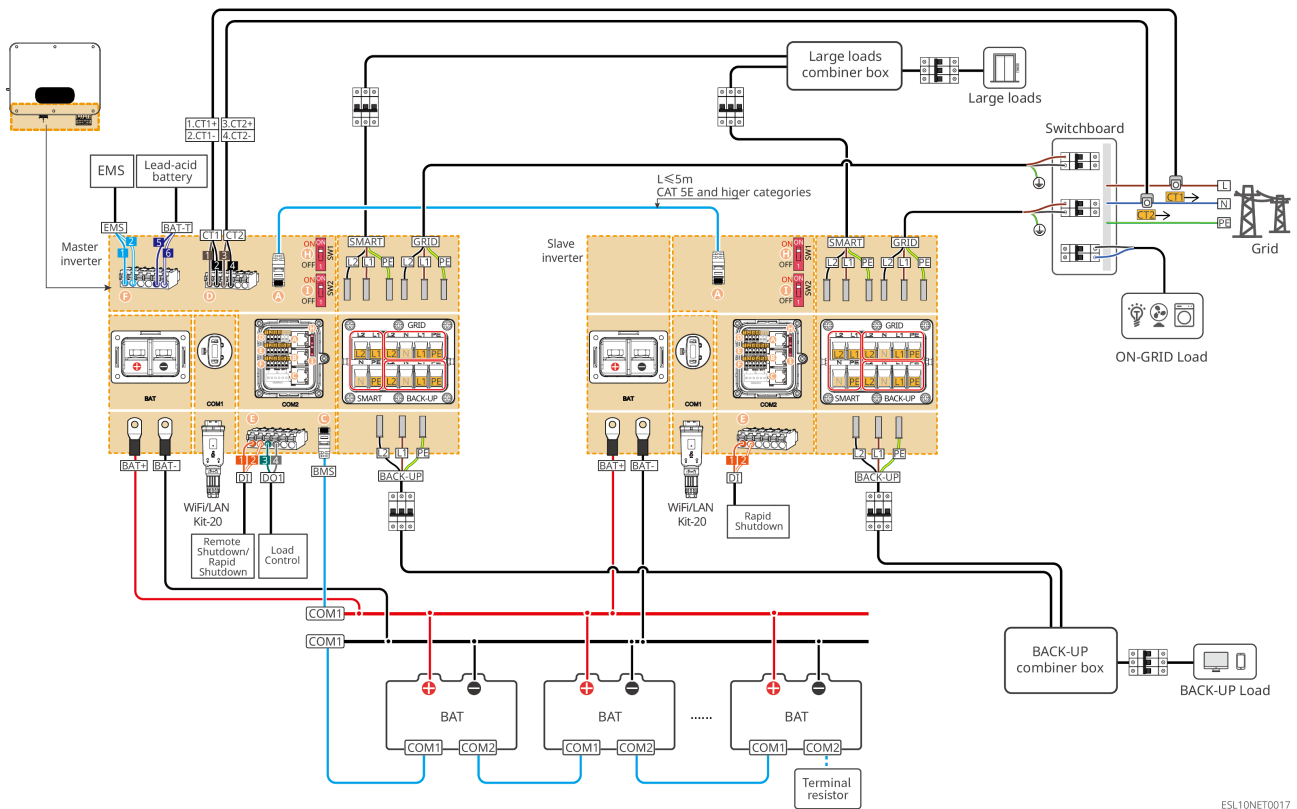
Multiple Inverters, Off-grid Parallel Operation

- In a parallel system, the inverter connected to the meter is the Master inverter, and the others are slave inverters. The Master inverter must be set as the host via the App by configuring **RS485 Parallel Operation**.
- Parallel systems do not support connection to generators or grid-tied inverters.
- If a remote shutdown device needs to be connected in the system, please connect it to the Master inverter.

Scenario with Built-in Meter

DIP Switches

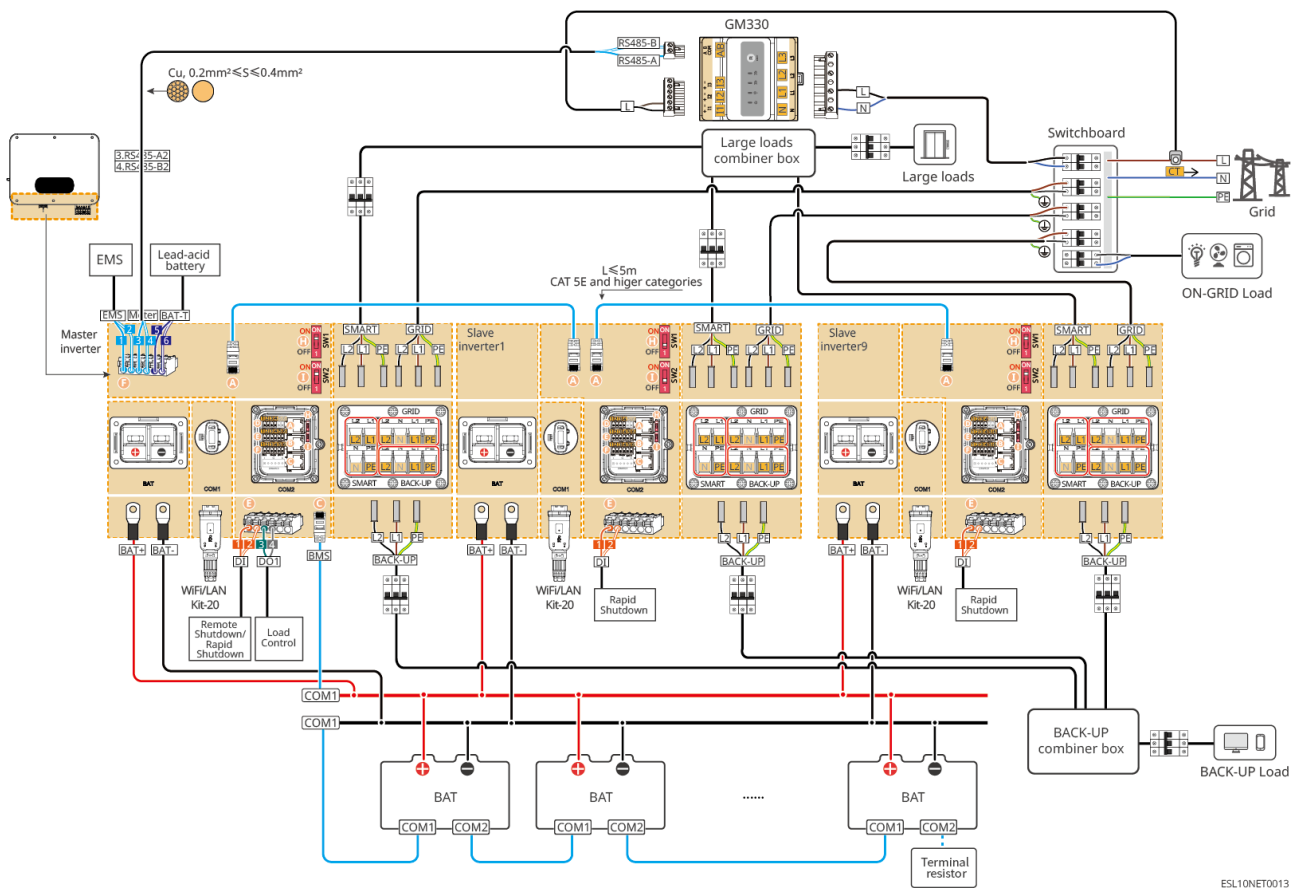
- Master inverter: SW1: ON, SW2: ON.
- Slave inverter 1: SW1: ON, SW2: ON.



Scenario with GM330

DIP Switches

- Master inverter: SW1: ON, SW2: ON.
- Slave inverter 1 and Slave inverter n-1: SW1: OFF, SW2: OFF.
- Slave inverter n: SW1: ON, SW2: ON.



5.2.4 Detailed System Wiring Diagram for Parallel System-Two-Phase/Split-Phase

NOTICE

- The inverter connected to the meter is the master inverter, while the others are slave inverters.
- For parallel operation scenarios, please use the GM330 smart meter.
- To implement functions such as remote shutdown, load control, and generator control, connect the communication cable to the master inverter.
- The following diagrams focus on wiring related to parallel operation. For wiring requirements of other ports, please refer to the single-unit system.
- In a parallel system, if you need to disconnect the circuit breaker for any port of a slave inverter, please simultaneously disconnect the circuit breakers for the other ports of this inverter; otherwise, it may cause abnormal system operation.
- The built-in meter of the inverter supports networking for a maximum of 2 devices in parallel. If the number of parallel units in the system exceeds 2, an external GM330 smart meter must be used.

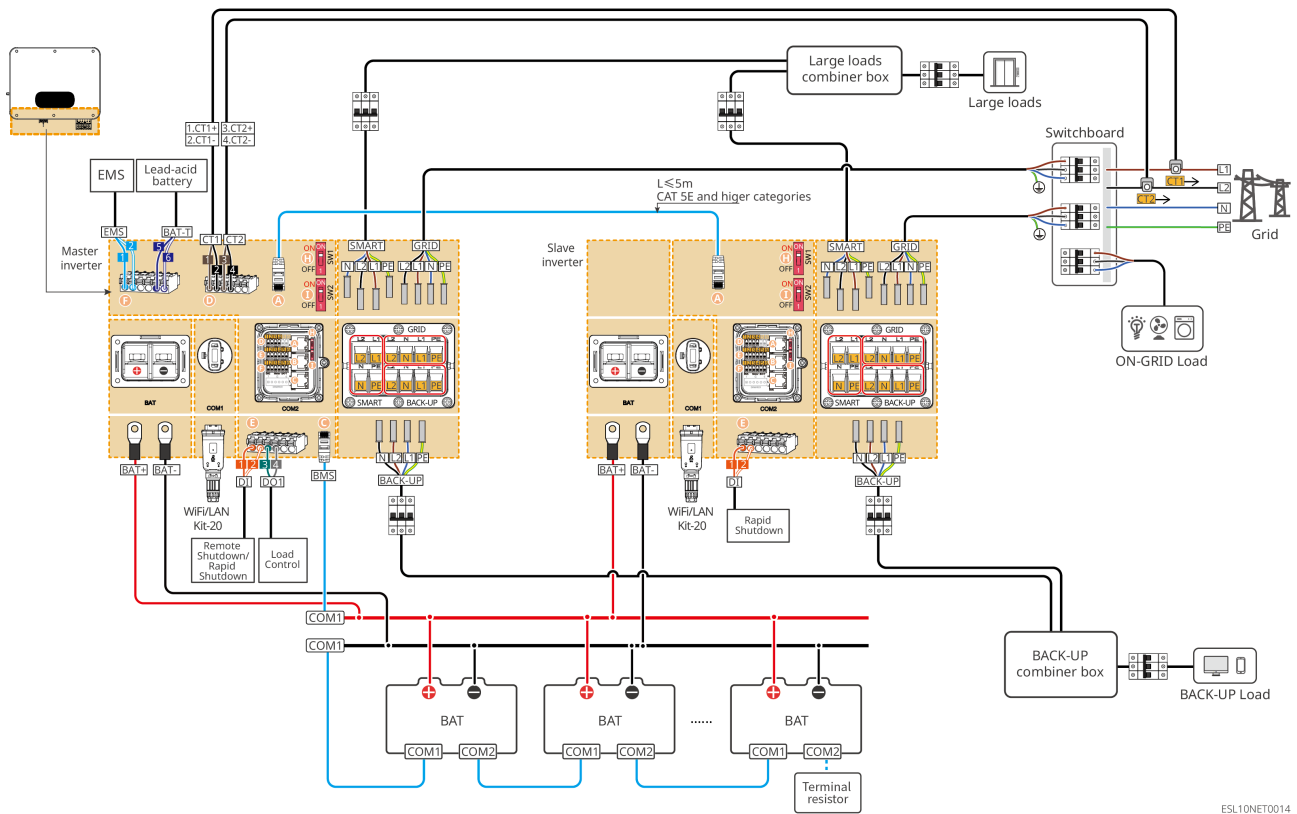
Multiple Inverters, Off-Grid Parallel Operation

- In a parallel system, the inverter connected to the meter is the Master inverter, while the others are slave inverters. The Master inverter must be configured as the host via the App by setting **RS485 Parallel Operation**.
- Parallel systems do not support the connection of generators or grid-tied inverters.
- If a remote shutdown device needs to be connected in the system, please connect it to the Master inverter.

Scenario with Built-in Meter

DIP Switch Settings

- Master inverter: SW1: ON, SW2: ON.
- Slave Inverter 1: SW1: ON, SW2: ON.

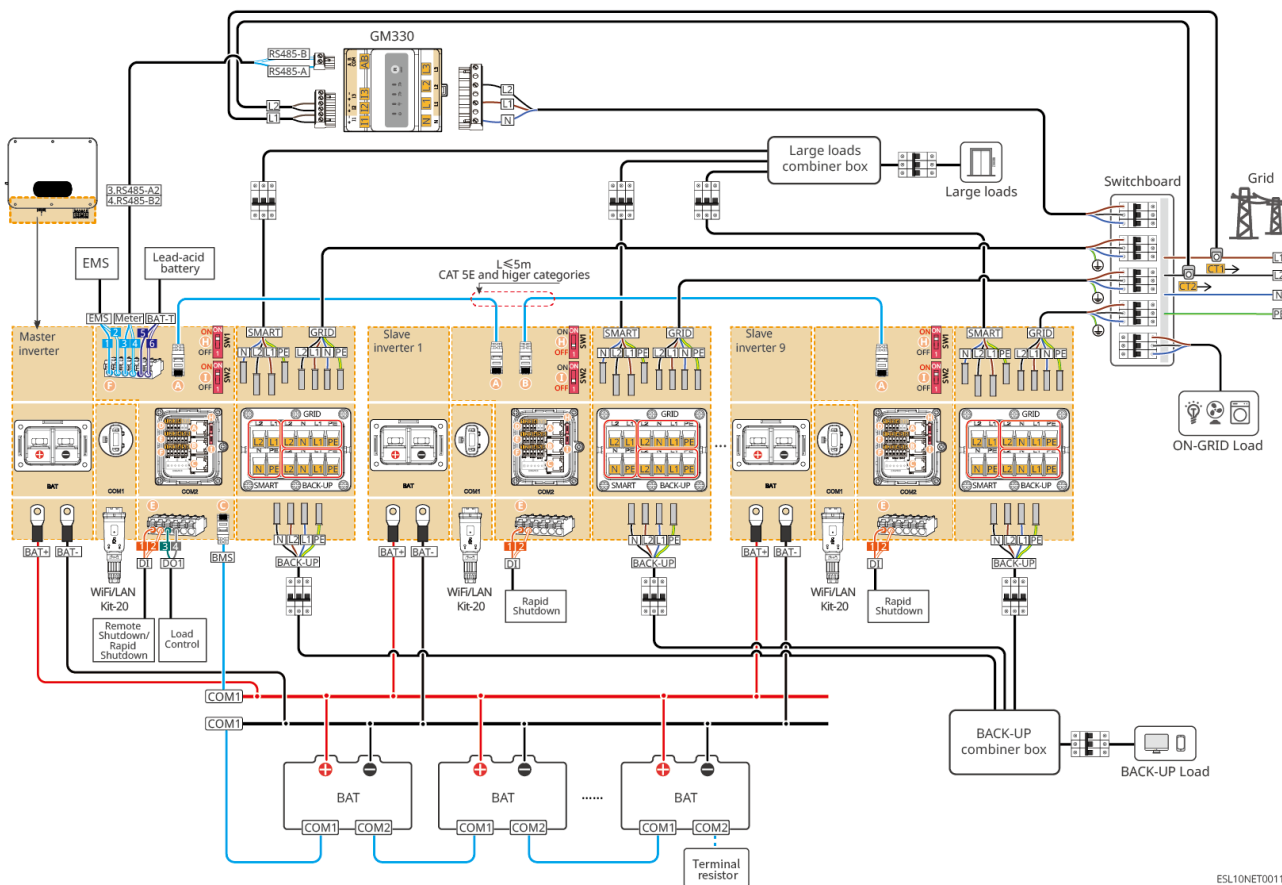


ESL10NET0014

Scenario with GM330

DIP Switch Settings

- Master inverter: SW1: ON, SW2: ON.
- Slave Inverter 1 and Slave Inverter n-1: SW1: OFF, SW2: OFF.
- Slave Inverter n: SW1: ON, SW2: ON.



5.3 Preparing Materials



- It is prohibited to connect any load between the Inverter and the AC Switch directly connected to the Inverter.
- Each Inverter must be equipped with an AC output breaker. Multiple Inverter units cannot be connected to the same AC breaker simultaneously.
- To ensure the Inverter can safely disconnect from the Utility grid in case of an abnormal situation, connect a AC breaker to the AC side of the Inverter. Select an appropriate AC breaker according to local regulations.
- When the Inverter power on, the BACK-UP AC port is live. If maintenance is required on the BACK-UP Loads, please Inverter the power off to avoid electric shock.
- For cables used in the same system, it is recommended that the conductor material, cross-sectional area, length, etc., be consistent.
 - The BACK-UP AC line of each Inverter
 - The ON-GRID AC line of each Inverter
 - power cable cable between Inverter and Battery
 - power cable cable between Battery and Battery
 - Inverter to busbar power cable cable
 - Battery to busbar power cable cable

5.3.1 Preparing Breakers

No.	breaker	Recommended Specifications	Remarks
1	ON-GRID breaker		

No.	breaker	Recommended Specifications	Remarks
2	BACK-UP Loads breaker	For whole-house backup scenarios, the following is recommended: • Rated Current: $\geq 80A$ • Nominal Voltage: ◦ Two-phase/Split-phase: $\geq 127V_{ac}$ ◦ Single-phase 127V: $\geq 127V_{ac}$ ◦ Single-phase 220V: $\geq 220V_{ac}$ For partial backup scenarios, the following is recommended: • Rated Current: ◦ GW5K-ES-LD-G10: $\geq 32A$ ◦ GW7.5K-ES-LD-G10: $\geq 40A$ ◦ GW10K-ES-LD-G10: $\geq 63A$ • Nominal Voltage: ◦ Two-phase/Split-phase: $\geq 127V_{ac}$ ◦ Single-phase 127V: $\geq 127V_{ac}$ ◦ Single-phase 220V: $\geq 220V_{ac}$ Note: If the inverter's BACK-UP port is not used, the ON-GRID breaker can be selected based on the maximum grid-tied current.	During actual selection, you can also choose a breaker that meets local installation regulations based on the actual working current.
3	Battery Switch	Select according to local laws and regulations • GW5K-ES-LD-G10: Rated Current $\geq 125A$, Nominal Voltage $\geq 60V_{dc}$ • GW7.5K-ES-LD-G10: Rated Current $\geq 200A$, Nominal Voltage $\geq 60V_{dc}$ • GW10K-ES-LD-G10: Rated Current $\geq 250A$, Nominal Voltage $\geq 60V_{dc}$	

No.	breaker	Recommended Specifications	Remarks
4	SMART breaker	- Rated Current: - GW5K-ES-LD-G10: $\geq 25\text{A}$ - GW7.5K-ES-LD-G10: $\geq 38\text{A}$ - GW10K-ES-LD-G10: $\geq 50\text{A}$ - Nominal Voltage: - Two-phase/Split-phase: $\geq 127\text{Vac}$ - Single-phase 127V: $\geq 127\text{Vac}$ - Single-phase 220V: $\geq 220\text{Vac}$	
5	RCD	Select according to local laws and regulations - Type A - ON-GRID side: 300mA - BACK-UP side: 30mA	Customer-supplied
6	Load breaker	The specification requirements must be determined based on the actual load used.	Customer-supplied

5.3.2 Preparing Cables

No.	Cable	Recommended Specifications	Acquisition Method
1	Inverter Enclosure Protective Ground Cable	- Single-core outdoor copper cable - Conductor cross-sectional area: $S=10\text{mm}^2$	User-provided

No.	Cable	Recommended Specifications	Acquisition Method
2	Battery Protective Ground Cable	• Single-core outdoor copper cable • Conductor cross-sectional area: ◦ LX A5.0-30: 10mm² ◦ LX U5.0-30: 10mm² ◦ GW14.3-BAT-LV-G10: 10mm² ◦ GW16.1-BAT-LV-G10: 10mm²	• User-provided • LX A5.0-30: Obtained from accessories (optional) • GW14.3-BAT-LV-G10: For some units, the ground cable is shipped with the battery accessory • GW16.1-BAT-LV-G10: Standard-equipped
3	PV DC Cable	• Industry-standard outdoor PV cable • Conductor cross-sectional area: 4mm²-6mm² • Cable outer diameter: 4.8mm-6.3mm	User-provided

No.	Cable	Recommended Specifications	Acquisition Method
4	Battery DC Cable	• Single-core outdoor copper cable • Inverter battery terminal connection requirements: ◦ Conductor cross-sectional area: 70mm² ◦ Cable outer diameter: 15.7mm-16.7mm • Cable requirements between battery and busbar: ◦ LX A5.0-30, Conductor cross-sectional area: 50mm² ◦ LX U5.0-30, Conductor cross-sectional area: 25mm² ◦ GW14.3-BAT-LV-G10, Conductor cross-sectional area: 70mm² ◦ GW16.1-BAT-LV-G10, Conductor cross-sectional area: 50mm² • Cable requirements between battery and battery: ◦ LX A5.0-30, Conductor cross-sectional area: 50mm² ◦ LX U5.0-30, Conductor cross-sectional area: 25mm² ◦ GW14.3-BAT-LV-G10, Conductor cross-sectional area: 70mm² ◦ GW16.1-BAT-LV-G10, Conductor cross-sectional area: 50mm²	• LX U5.0-30: Available for purchase from GoodWe • LX A5.0-30: Obtained from accessories (optional) • GW14.3-BAT-LV-G10: For some units, the battery DC cable is shipped with the battery accessory • GW16.1-BAT-LV-G10: ◦ DC cable between inverter and battery: Standard-equipped ◦ DC cable between batteries: Available for purchase from GoodWe

No.	Cable	Recommended Specifications	Acquisition Method
5	AC Cable	• Inverter AC input/output cables (BACKUP/GRID): ◦ Conductor cross-sectional area: 16mm² ◦ Multi-core outdoor copper cable outer diameter: less than 10.5mm ◦ Single-core outdoor copper cable outer diameter: less than 30mm • Generator power cable (GEN): ◦ Conductor cross-sectional area: 16mm² ◦ Multi-core outdoor copper cable outer diameter: less than 10.5mm ◦ Single-core outdoor copper cable outer diameter: less than 30mm	User-provided
6	Smart Meter Power Cable	• Outdoor copper cable • Conductor cross-sectional area: 1mm²	User-provided

No.	Cable	Recommended Specifications	Acquisition Method
7	Battery Communication Cable	Communication between the combiner box and batteries, and between batteries requires the use of CAT 5E or higher standard shielded Ethernet cable and shielded RJ45 connectors.	• User-provided • LX A5.0-30: Obtained from accessories (optional) • GW14.3-BAT-LV-G10: ◦ Communication cable between inverter and battery: Partially standard-equipped ◦ Communication cable between batteries: User-provided, cable length $\leq 2\text{m}$ • GW16.1-BAT-LV-G10: ◦ Communication cable between inverter and battery: Standard-equipped ◦ Communication cable between batteries: User-provided, cable length $\leq 1\text{m}$
8	Meter RS485 Communication Cable	• Shielded twisted pair cable • Conductor cross-sectional area: 0.2mm^2-0.4mm^2	User-provided
9	Inverter Parallel Communication Cable	CAT 5E or higher standard shielded Ethernet cable and shielded RJ45 connectors	User-provided

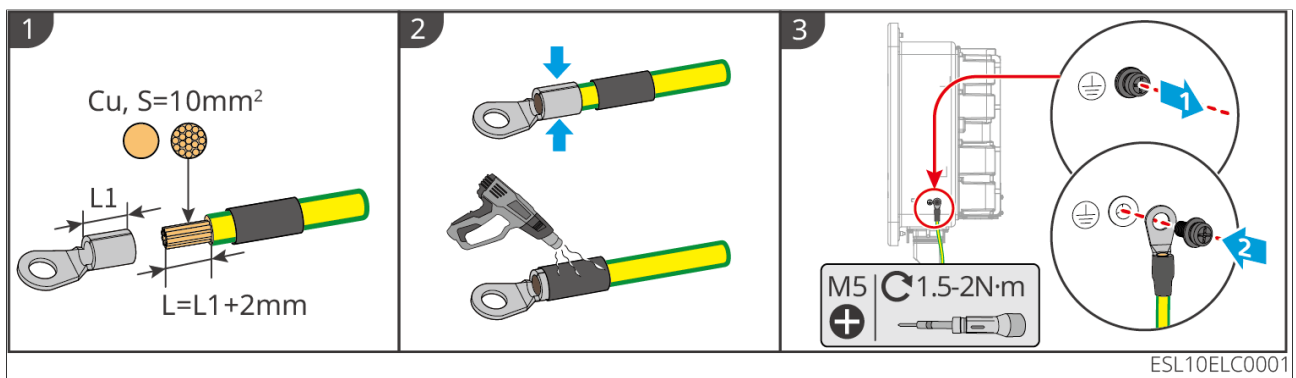
No.	Cable	Recommended Specifications	Acquisition Method
10	Remote Shutdown Communication Cable	• Copper twisted pair cable • Conductor cross-sectional area: 0.2mm²-0.4mm²	User-provided
11	Inverter-side Battery Communication Cable	-	Obtained from inverter accessories

5.4 Connecting the PE cable

WARNING

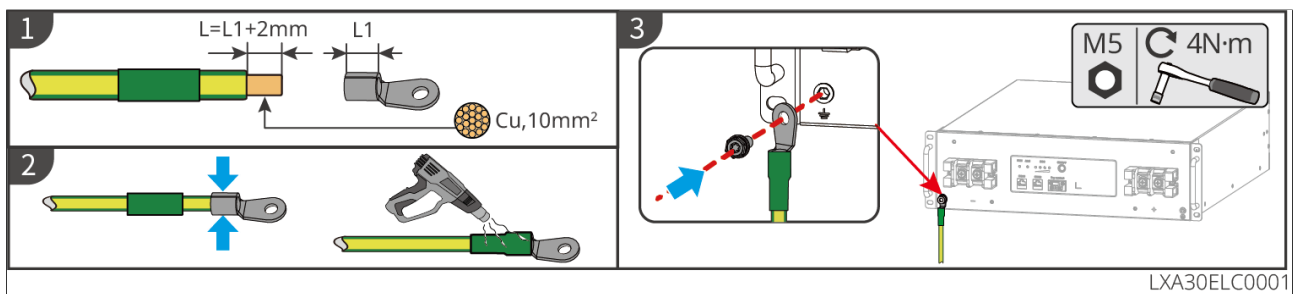
- The protective grounding of the chassis cannot replace the protective ground wire of the AC output port. When wiring, ensure the protective ground wires at both locations are reliably connected.
- When using multiple devices, ensure all device chassis protective grounding points are equipotentially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

Inverter

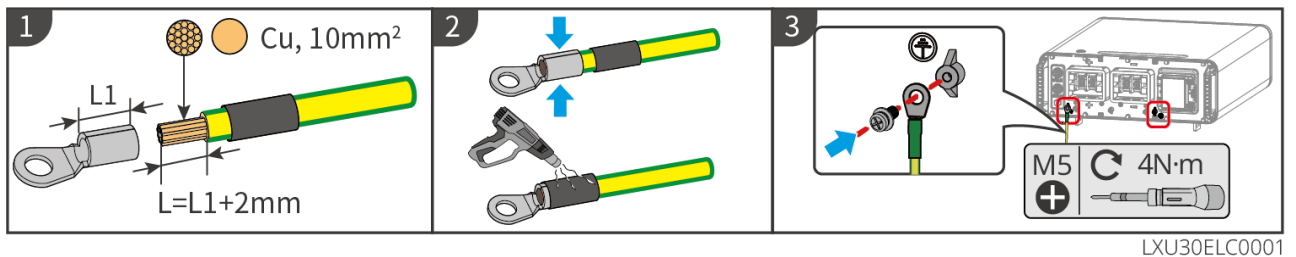


Battery

LX A5.0-30

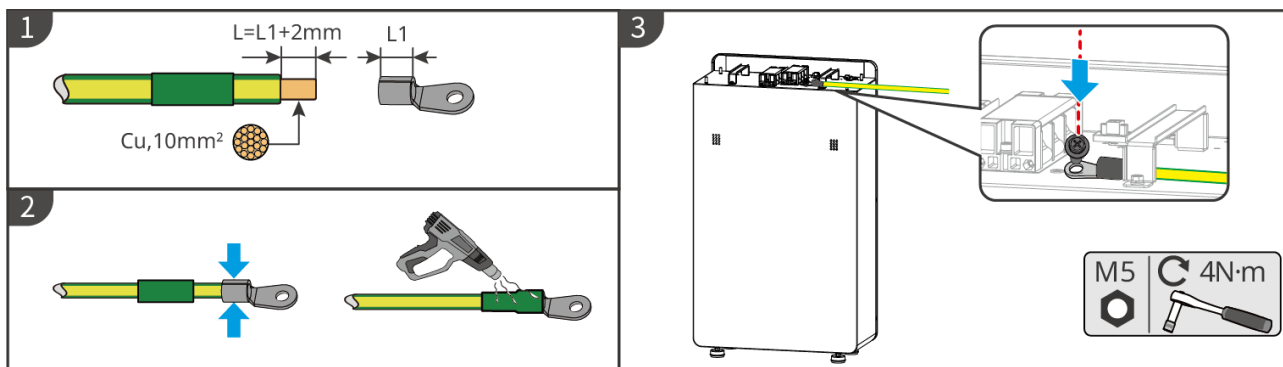


LX U5.0-30



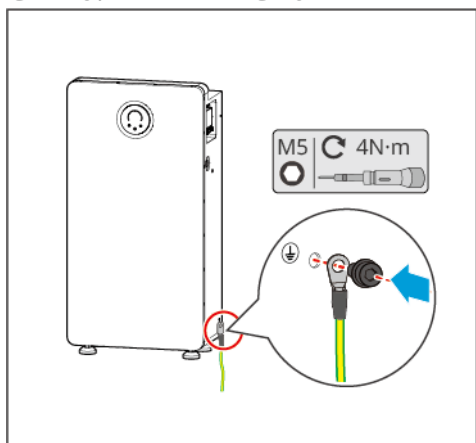
GW14.3-BAT-LV-G10

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



LXA10ELC0014

GW16.1-BAT-LV-G10



LXA40ELC0006

5.5 Connecting the PV Cable

DANGER

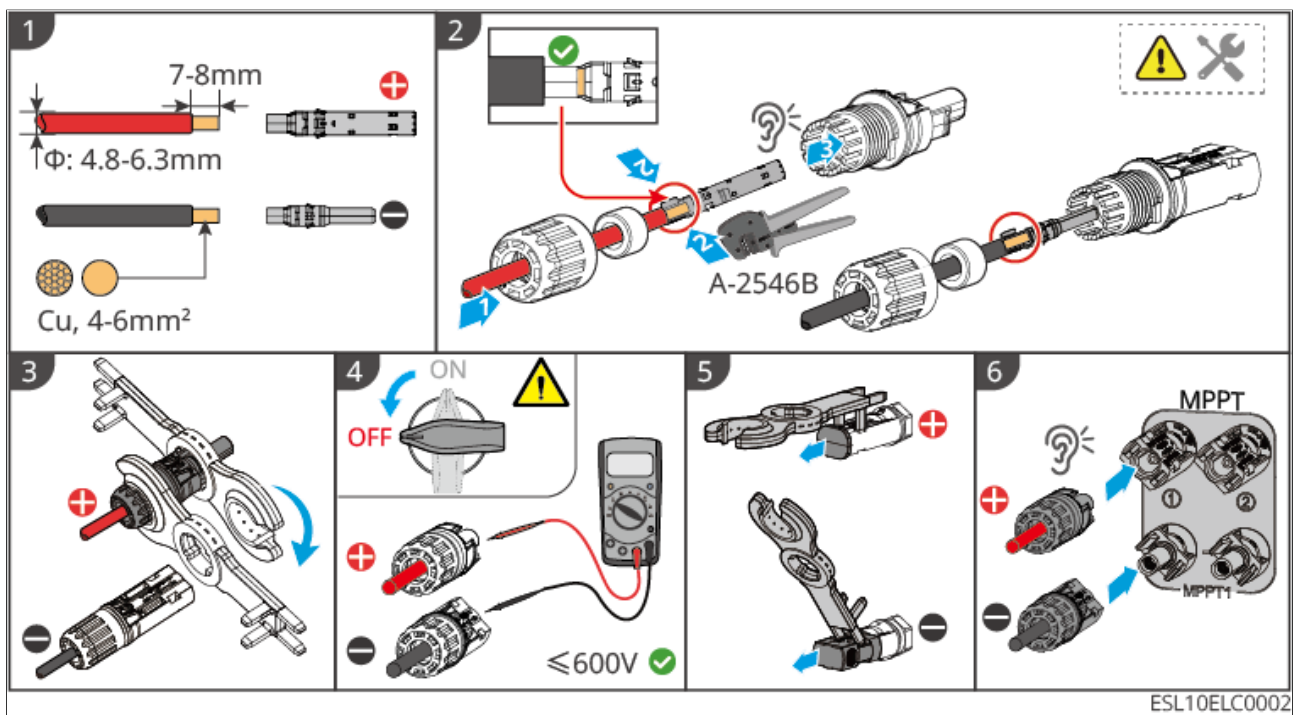
- Do not connect the same PV string to multiple inverters, as this may cause damage to the inverters.
- Before connecting the PV string to the inverter, confirm the following information; otherwise, it may cause permanent damage to the inverter, and in severe cases, lead to fire causing personal injury and property loss.
 1. Ensure that the maximum short-circuit current and Max. Input Voltage of each MPPT are within the allowable range of the inverter.
 2. Ensure that the positive pole of the PV string is connected to the PV+ of the inverter, and the negative pole of the PV string is connected to the PV- of the inverter.

 WARNING

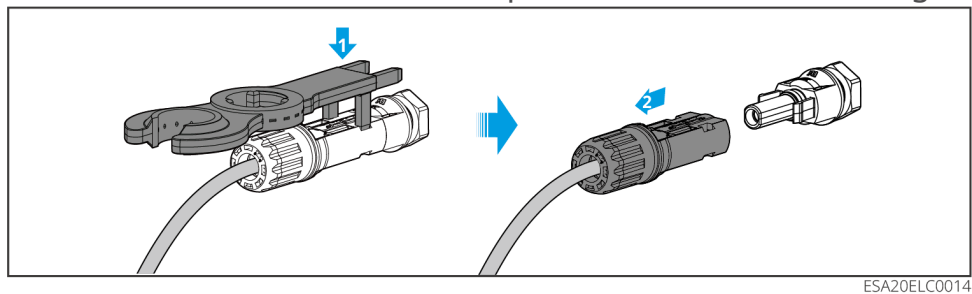
- The PV string output does not support grounding. Before connecting the PV string to the inverter, ensure that the minimum ground insulation resistance of the PV string meets the minimum insulation impedance requirement ($R = \text{Max. Input Voltage} / 30\text{mA}$).
- After completing the DC cable connection, ensure that the cable connections are tight and not loose.
- Use a multimeter to measure the positive and negative poles of the DC cable to ensure correct polarity, no reverse connection, and that the voltage is within the allowable range.

NOTICE

- The two PV strings in each MPPT should use the same model, the same number of panels, the same tilt angle, and the same azimuth angle to ensure maximum efficiency.
- In scenarios where photovoltaic panels are connected in parallel, to avoid circulating currents between parallel branches, which affect system efficiency and safety, the length of the connection cable between the convergence point and the DC input terminal of the inverter should be less than 2m.



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

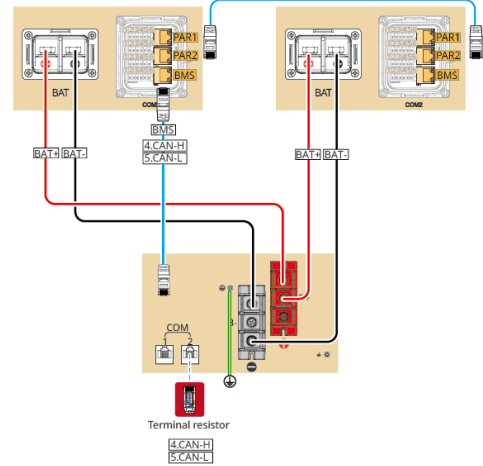
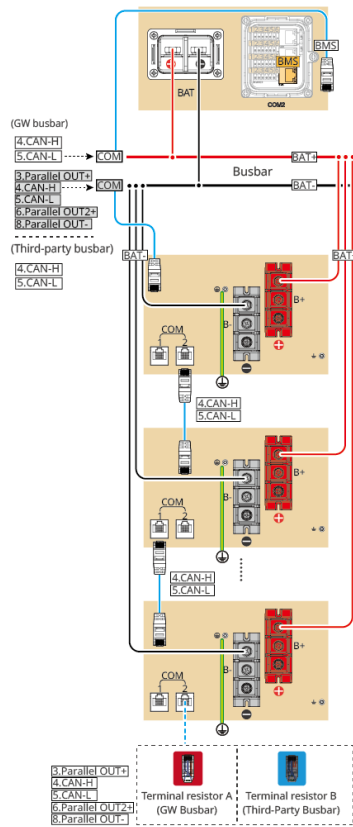
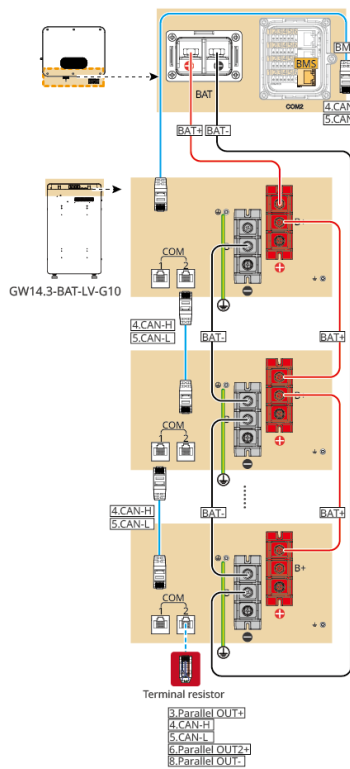


5.6 Connecting the Battery Cable

⚠ DANGER

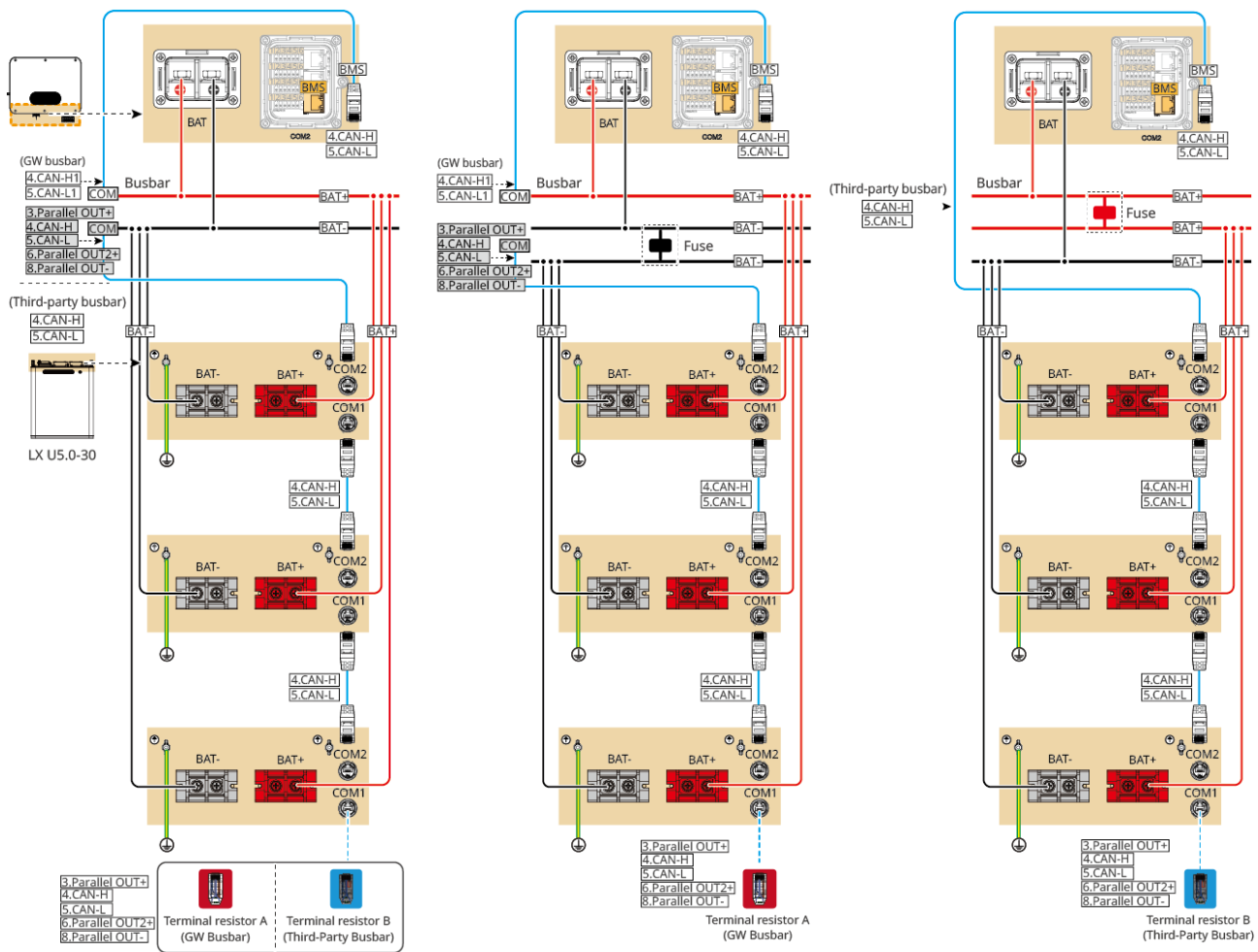
- ## Battery System Wiring Diagram





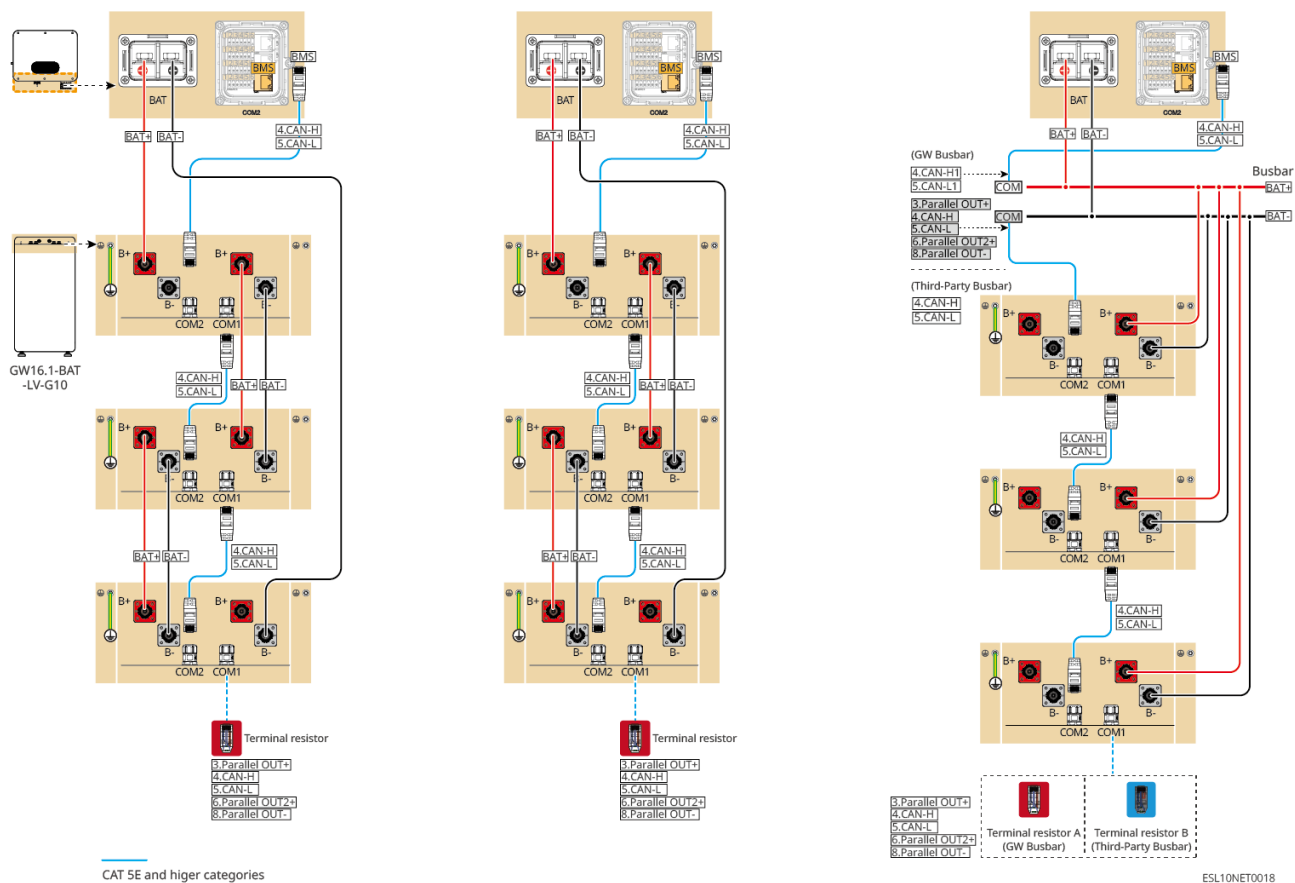
— CAT 5E and higher categories

ESL10NET0015



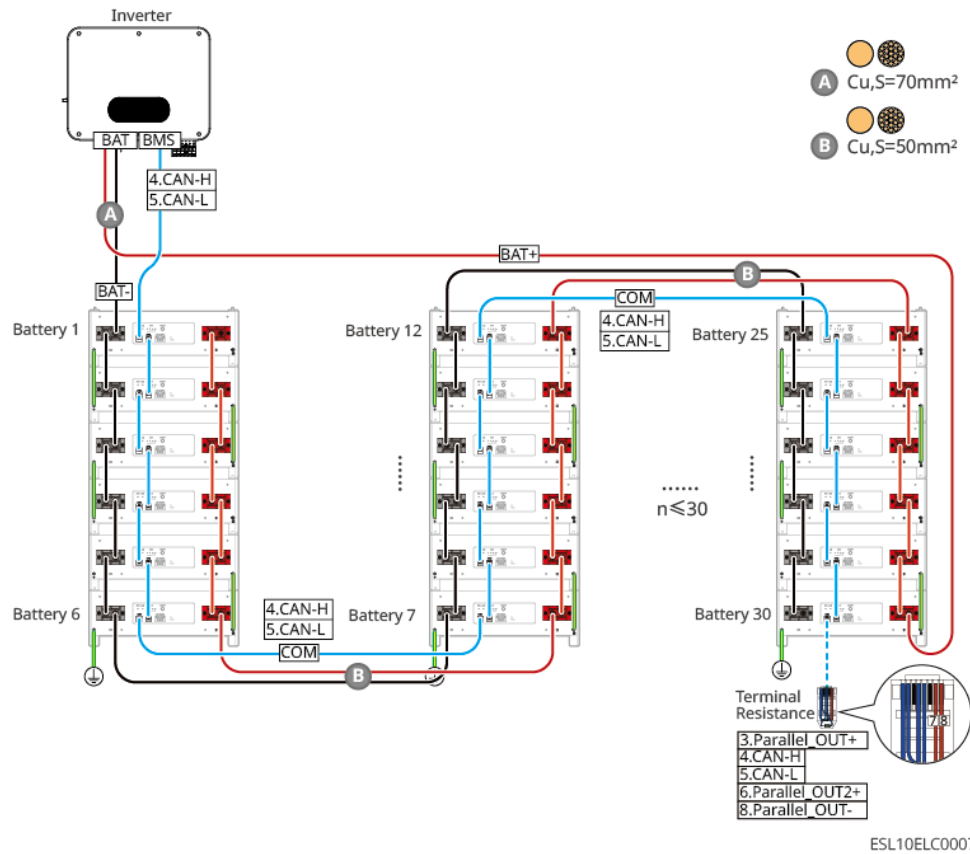
— CAT 5E and higher categories

ESL10NET0016



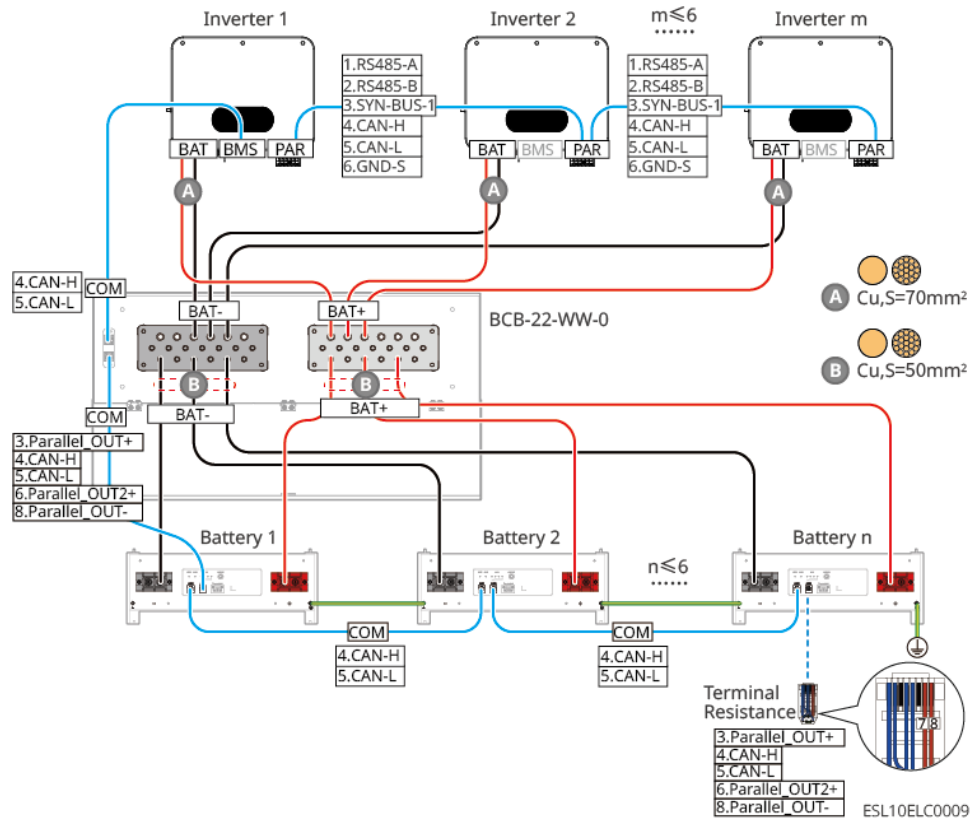
LX A5.0-30: Daisy-chain connection method

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



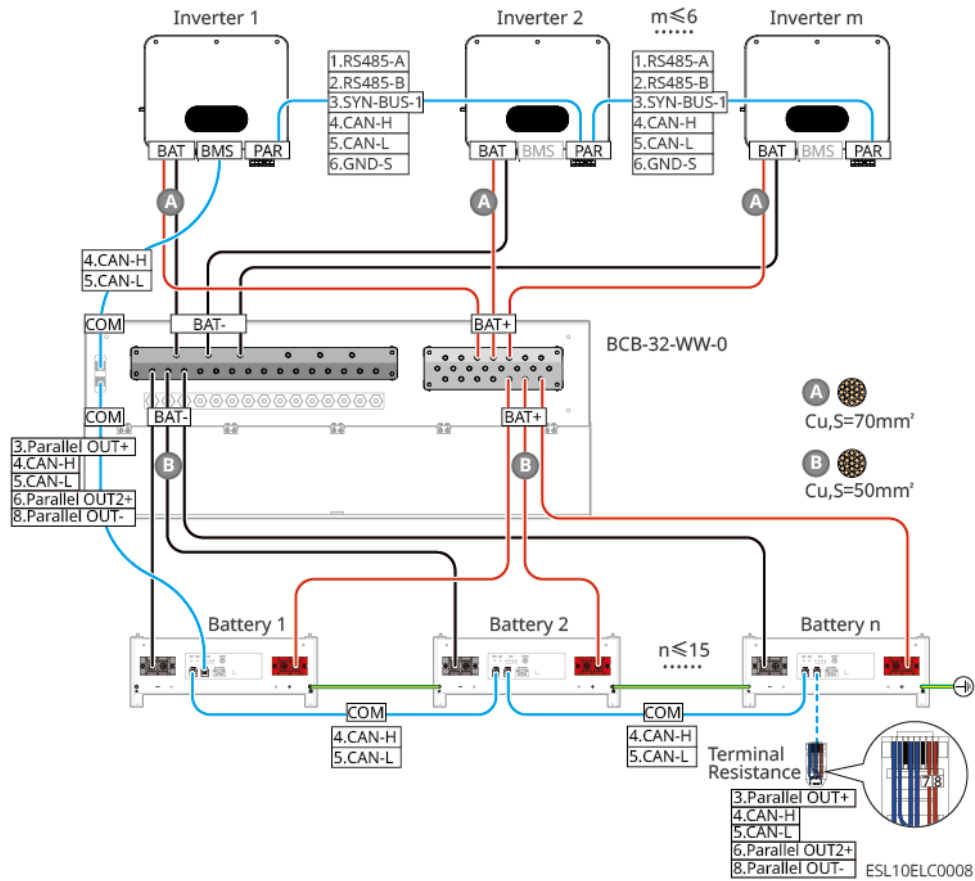
LX A5.0-30: Connection method using busbar BCB-22-WW-0

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



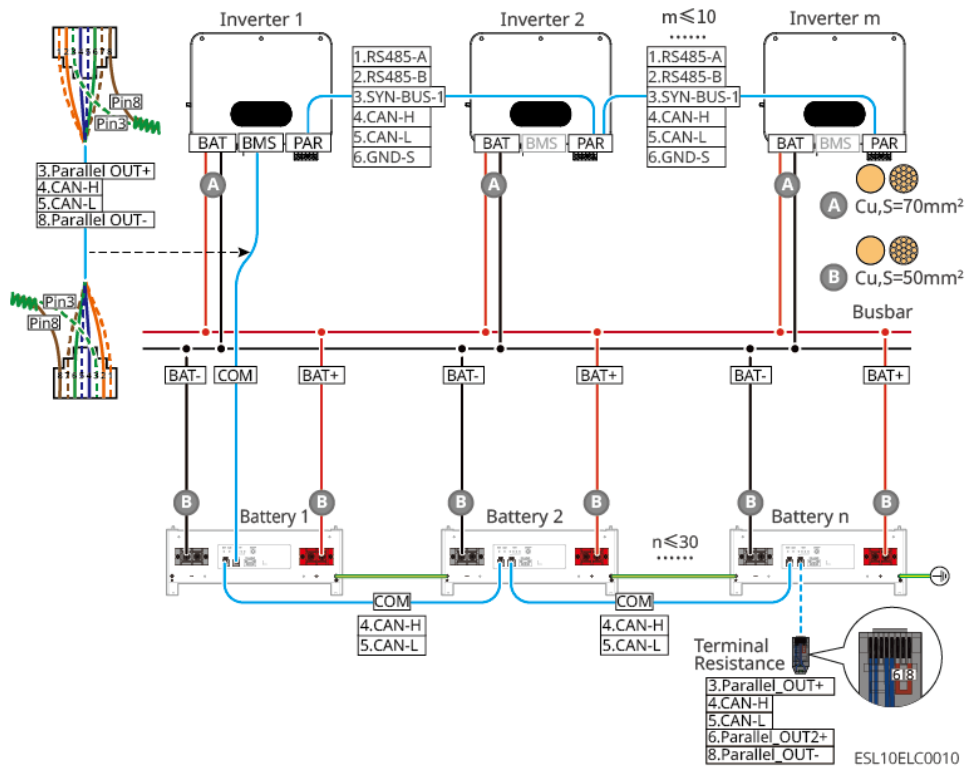
LX A5.0-30: Connection method using busbar BCB-32-WW-0

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

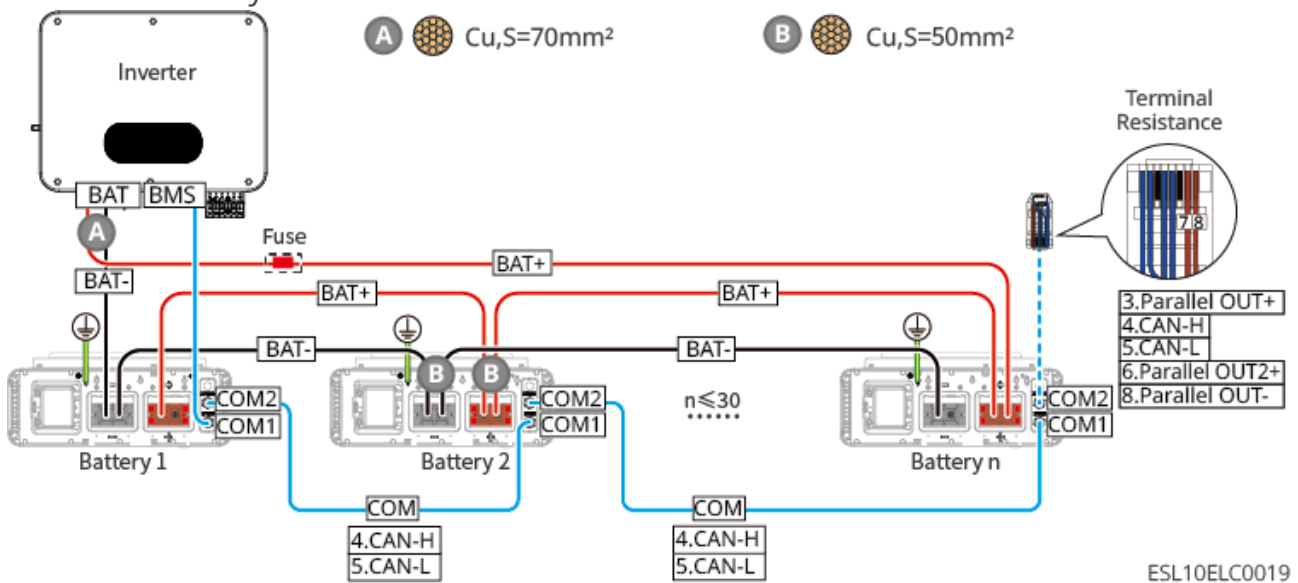


LX A5.0-30: Connection method using third-party busbar

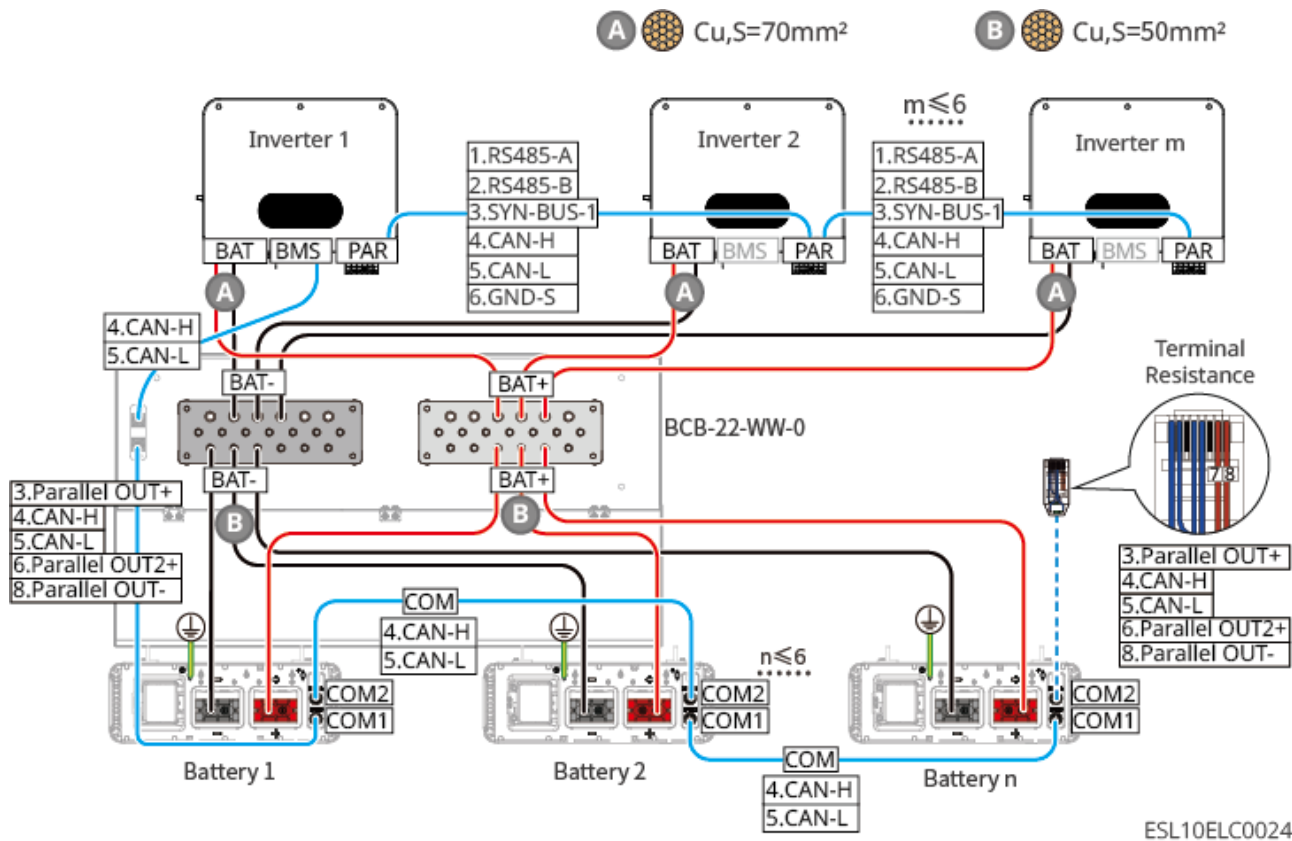
- The rated charging current per battery is 60A; rated discharging current is 100A; maximum charging current is 90A; maximum discharging current is 150A. The system supports a maximum of 30 batteries in parallel clusters.



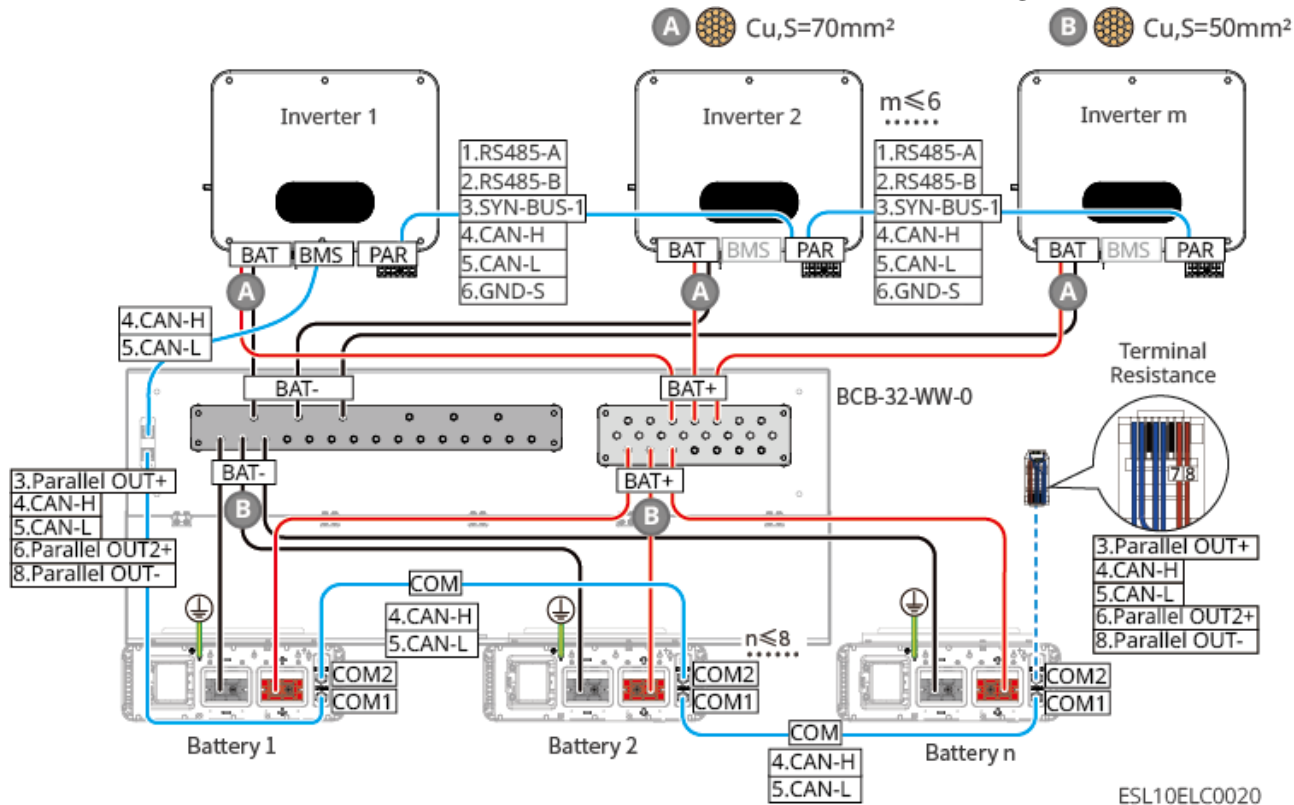
LX U5.0-30: Daisy-chain connection method



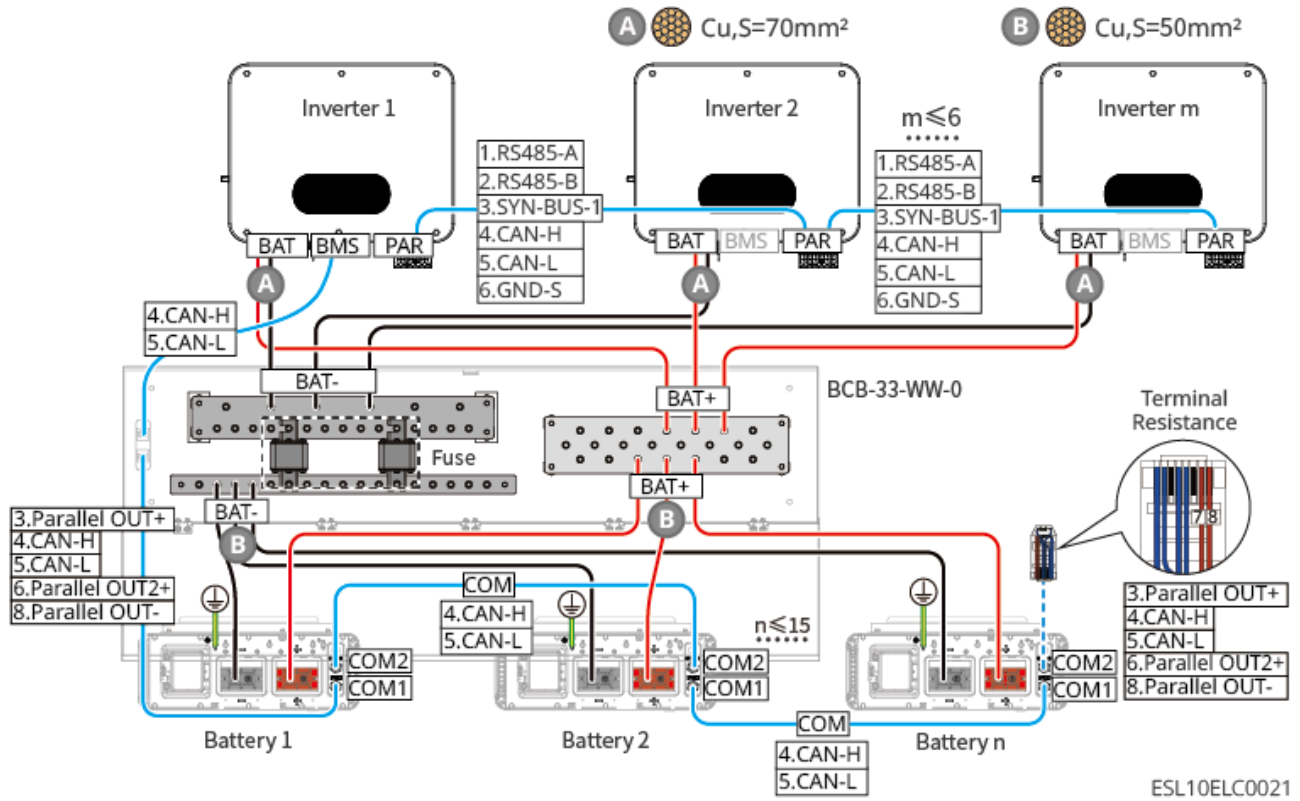
LX U5.0-30: When the number of batteries is ≤ 6 , connection method using BCB-22-WW-0



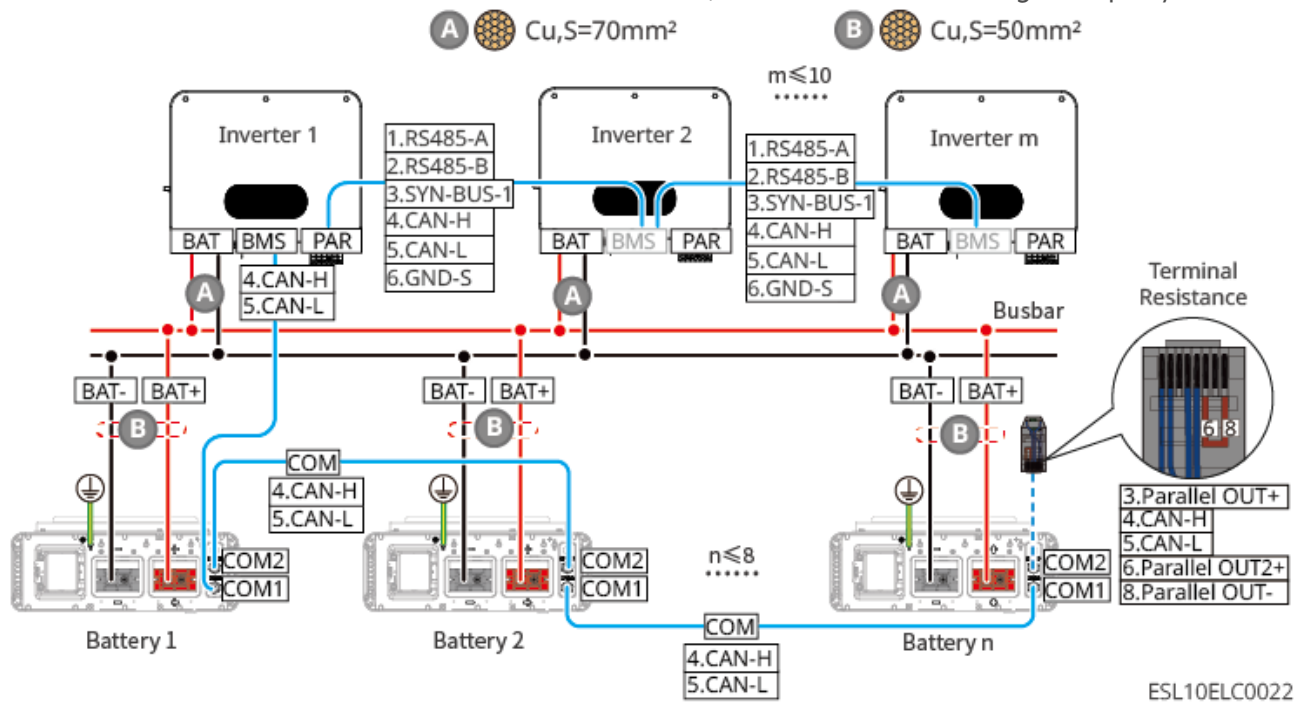
LX U5.0-30: When the number of batteries is ≤ 8 , connection method using BCB-32-WW-0



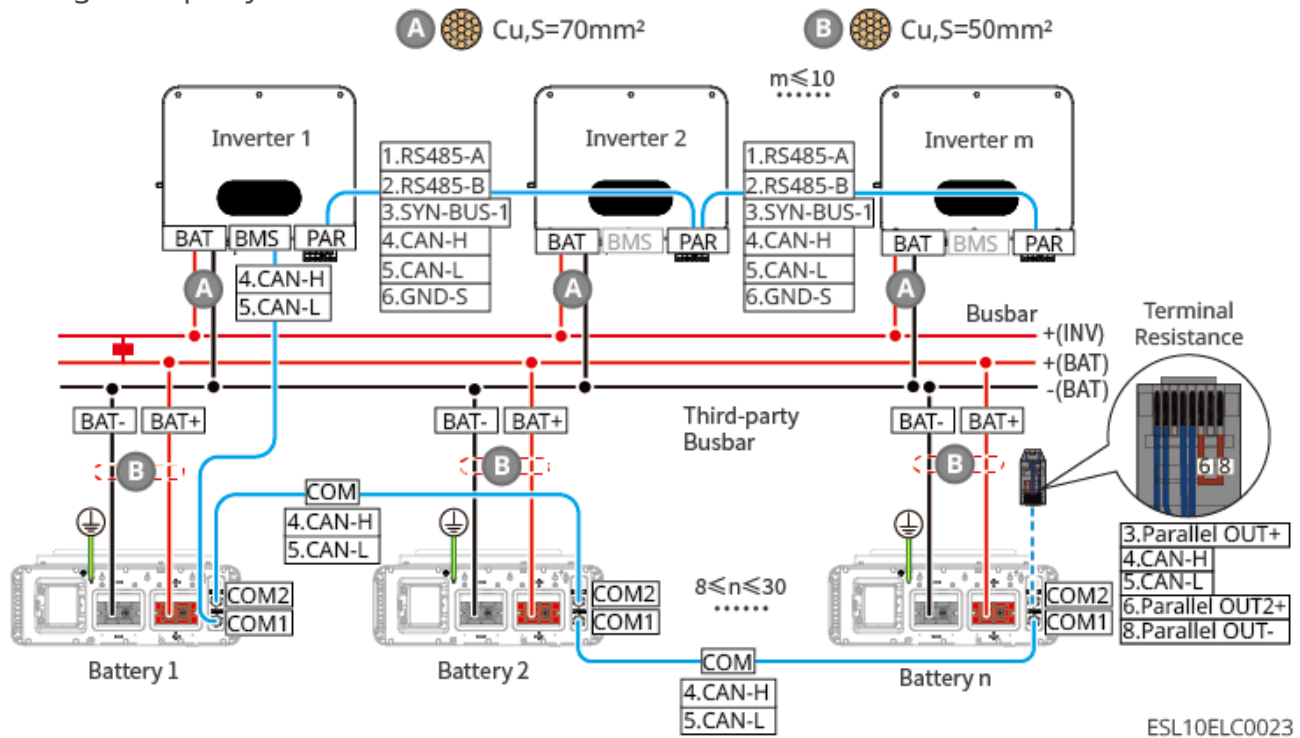
LX U5.0-30: When the number of batteries is ≤ 15 , connection method using busbar BCB-33-WW-0



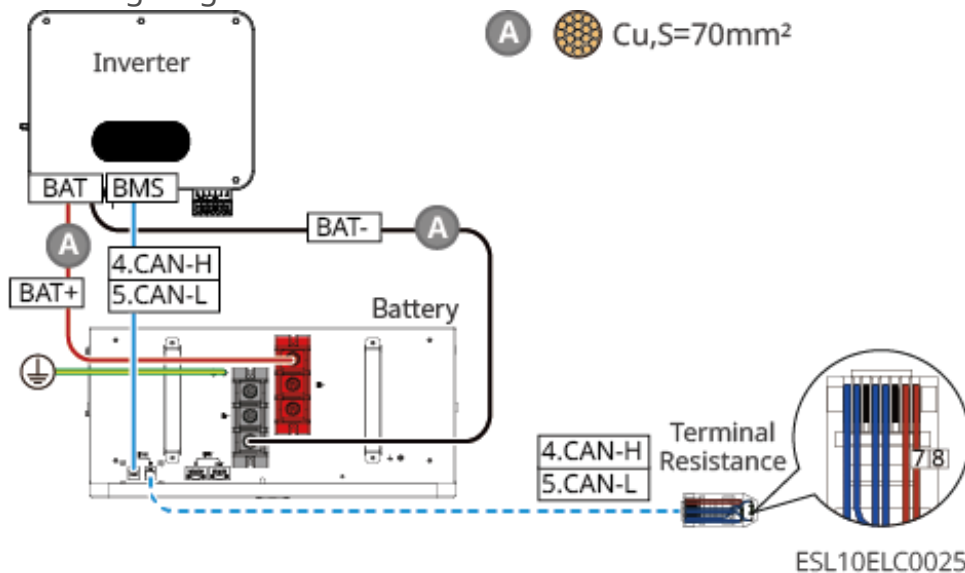
LX U5.0-30: When the number of batteries is ≤ 8 , connection method using third-party busbar



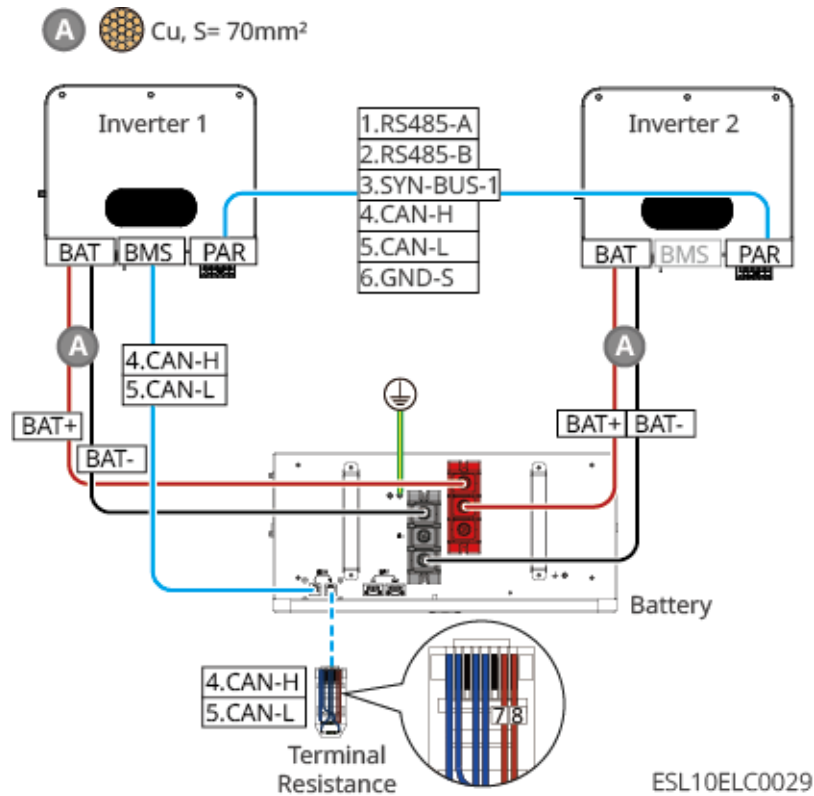
LX U5.0-30: When the number of batteries is greater than 8, connection method using third-party busbar



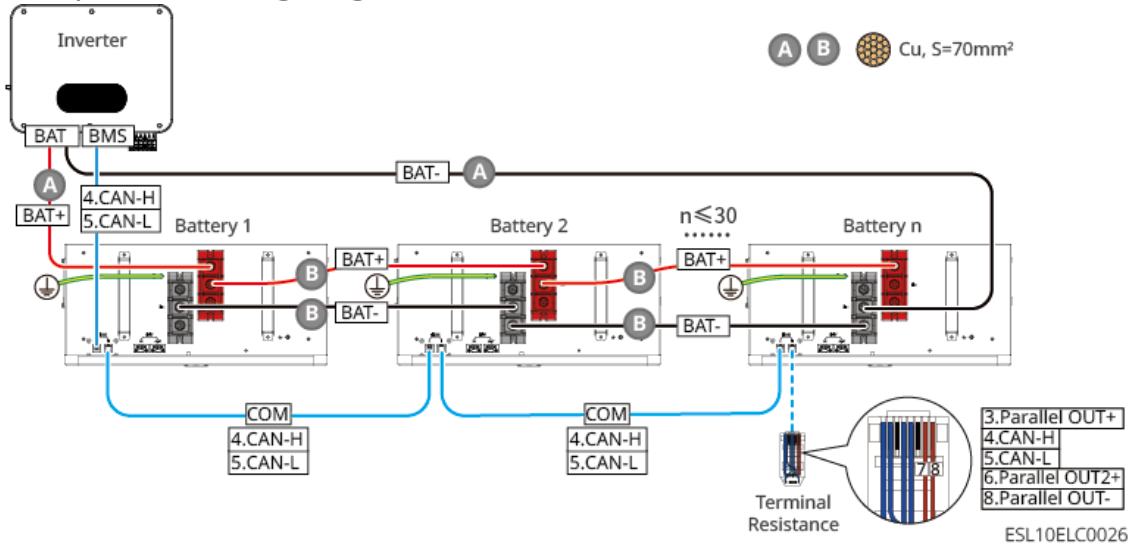
GW14.3-BAT-LV-G10: When the battery is directly connected to a single inverter with 1 output, the wiring diagram is as follows:



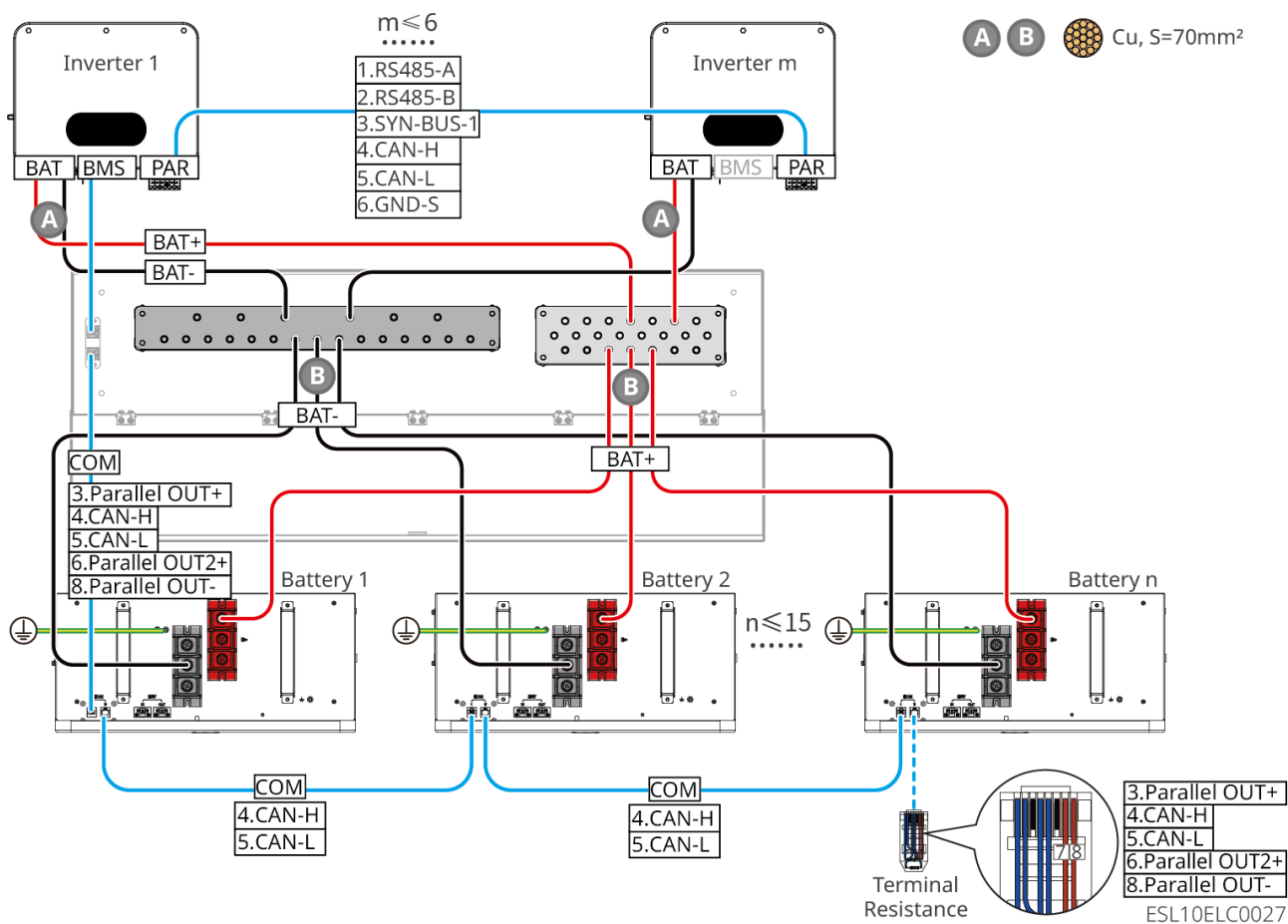
GW14.3-BAT-LV-G10: When the battery is directly connected to 2 inverters with 1 output each, the wiring diagram is as follows:



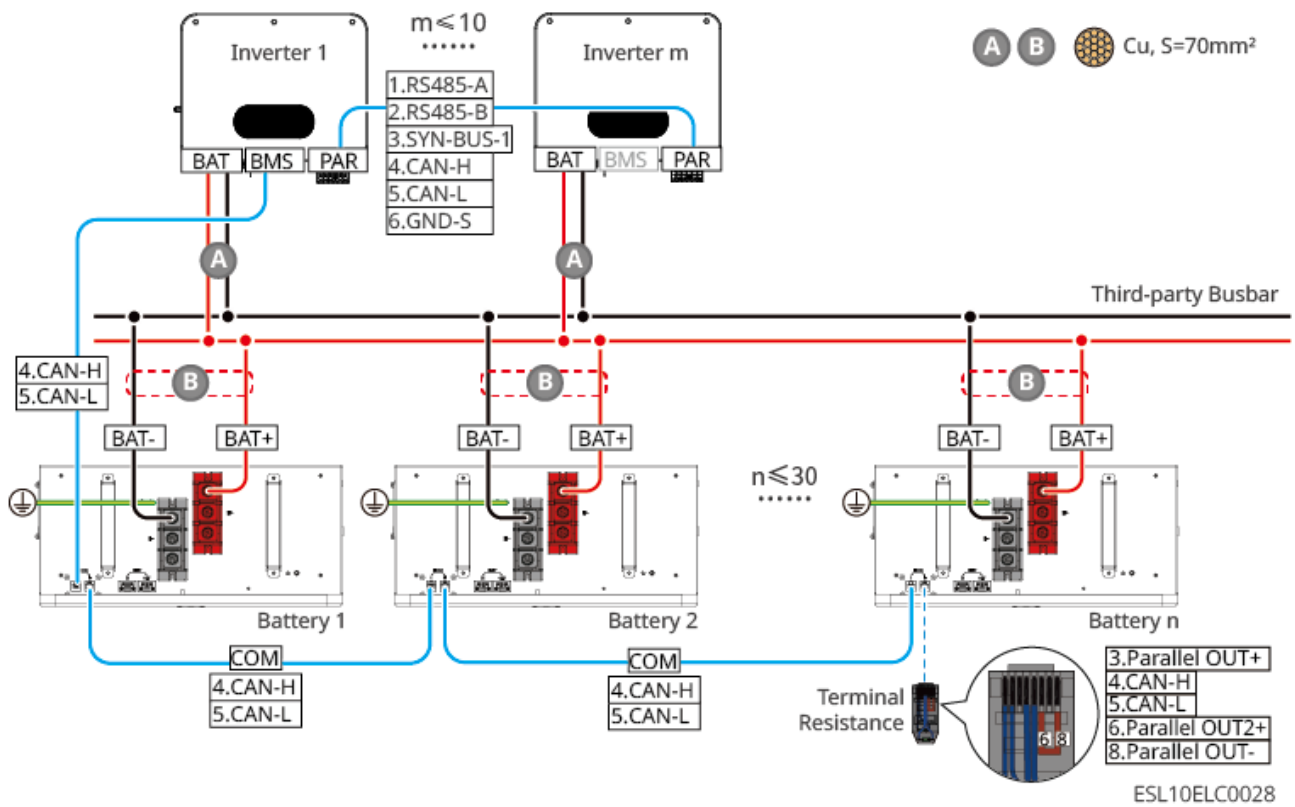
GW14.3-BAT-LV-G10: When the battery is daisy-chain connected to a single inverter with 1 output, the wiring diagram is as follows:



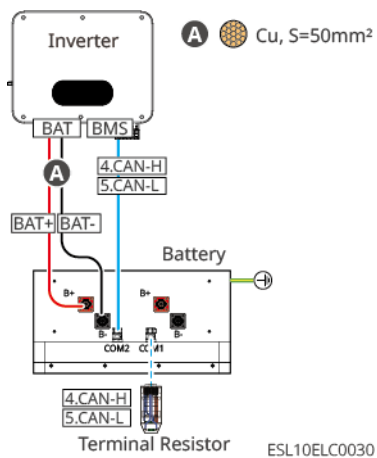
GW14.3-BAT-LV-G10: When the number of batteries is less than or equal to 15, using a busbar (BCB-32-WW-0, current $\leq 720\text{A}$) to connect to an inverter with 1 output, the wiring diagram is as follows:



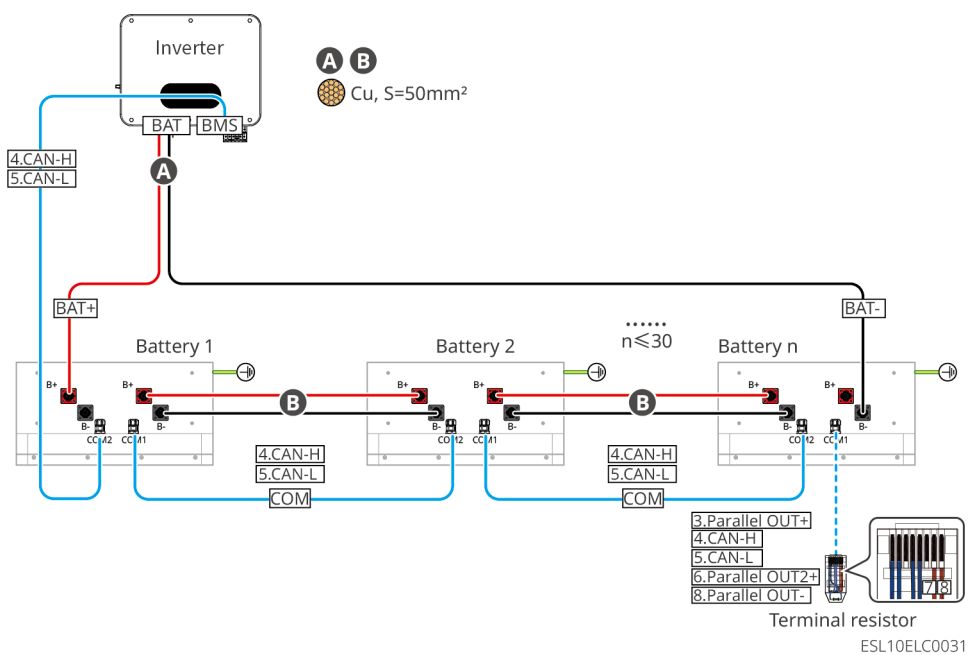
GW14.3-BAT-LV-G10: When the number of batteries is less than or equal to 30, using a third-party busbar to connect to an inverter with 1 output, the wiring diagram is as follows:



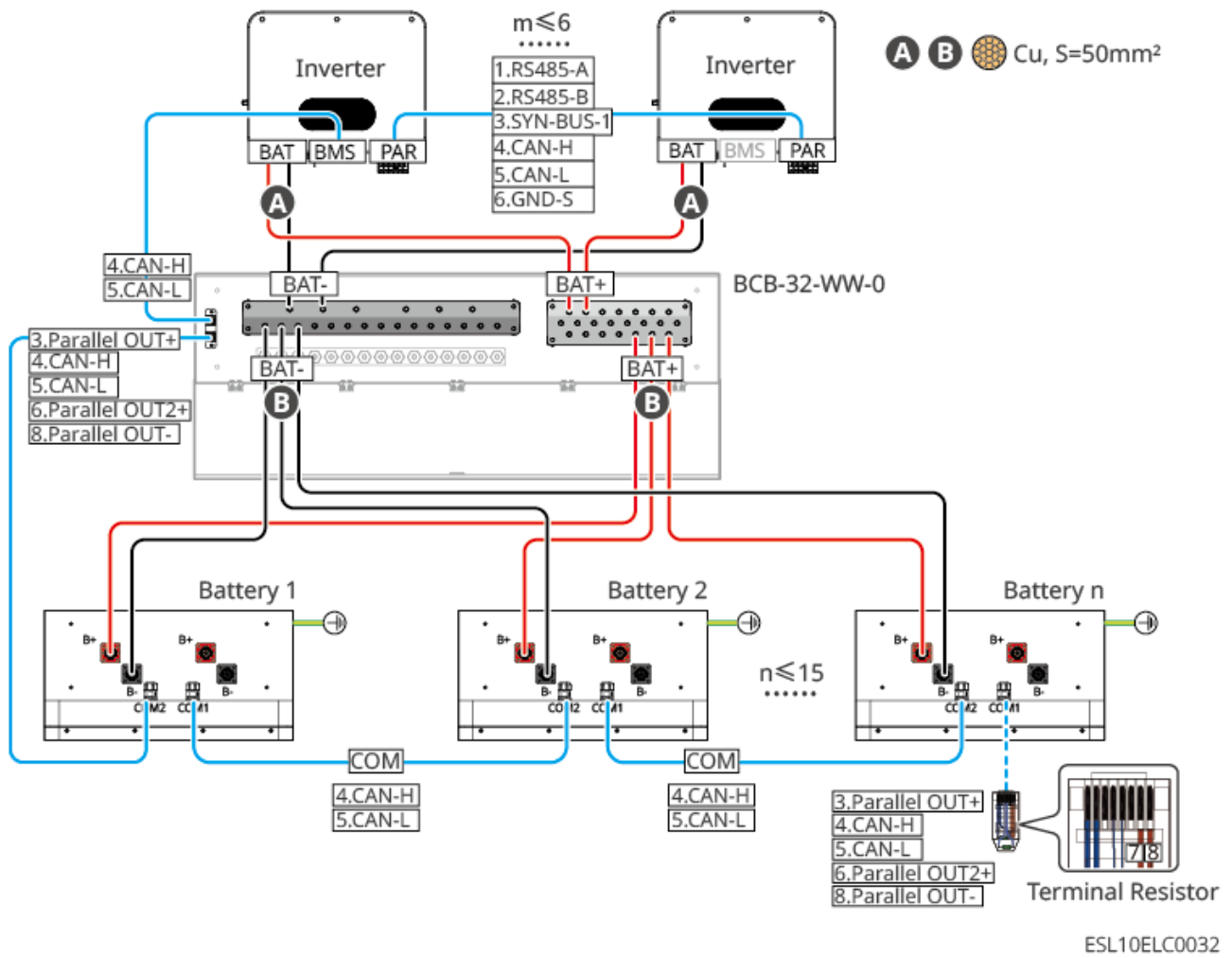
GW16.1-BAT-LV-G10: Battery connected to a single inverter:



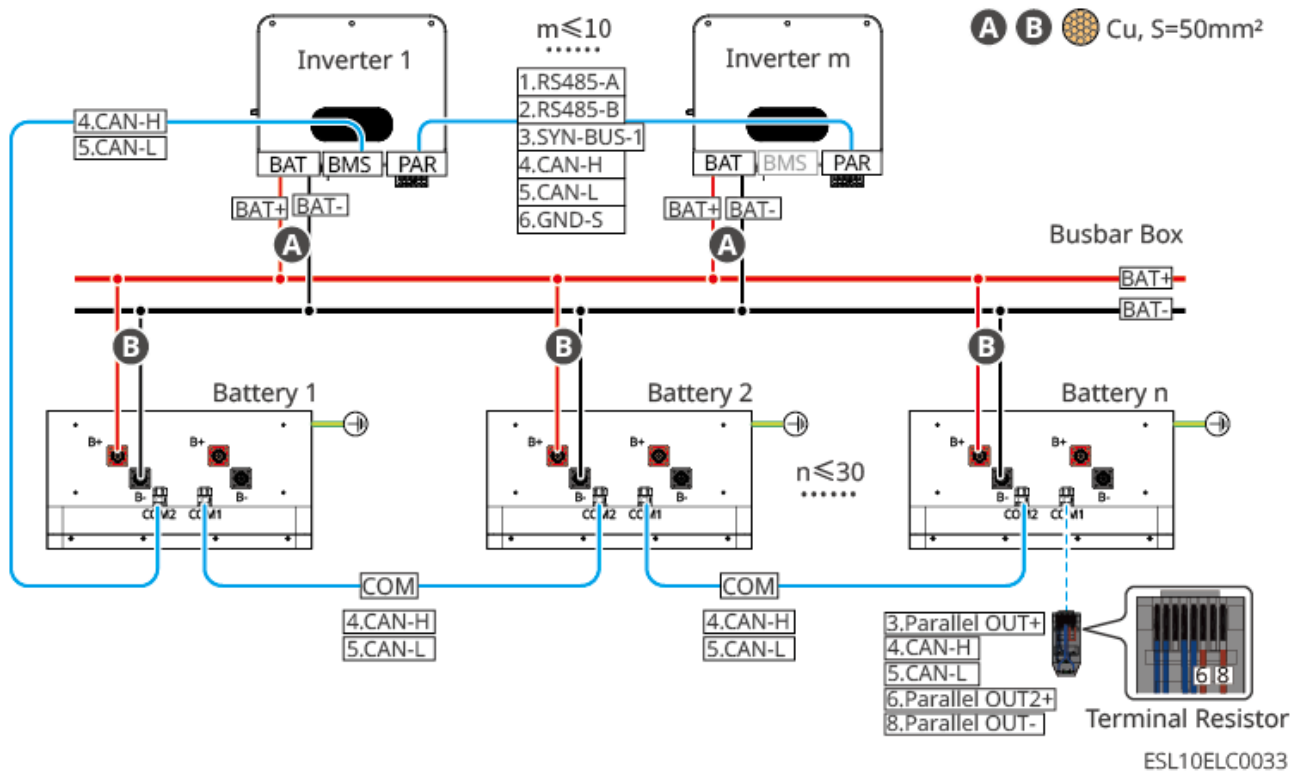
GW16.1-BAT-LV-G10: Battery daisy-chain connected to inverters:



GW16.1-BAT-LV-G10: When the number of batteries is less than or equal to 15, using a busbar box (BCB-32-WW-0, current $\leq 720A$) to connect to inverters:



GW16.1-BAT-LV-G10: When the number of batteries is less than or equal to 30, using a third-party busbar to connect to inverters:



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 Cluster Parallel Communication Port
5	CAN_1L	CAN_1L	
6	Parallel OUT2+	Parallel OUT2+	Parallel Interlock Communication Port
7	-	-	Reserved
8	Parallel OUT-	Parallel OUT-	Parallel Communication Port

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-	

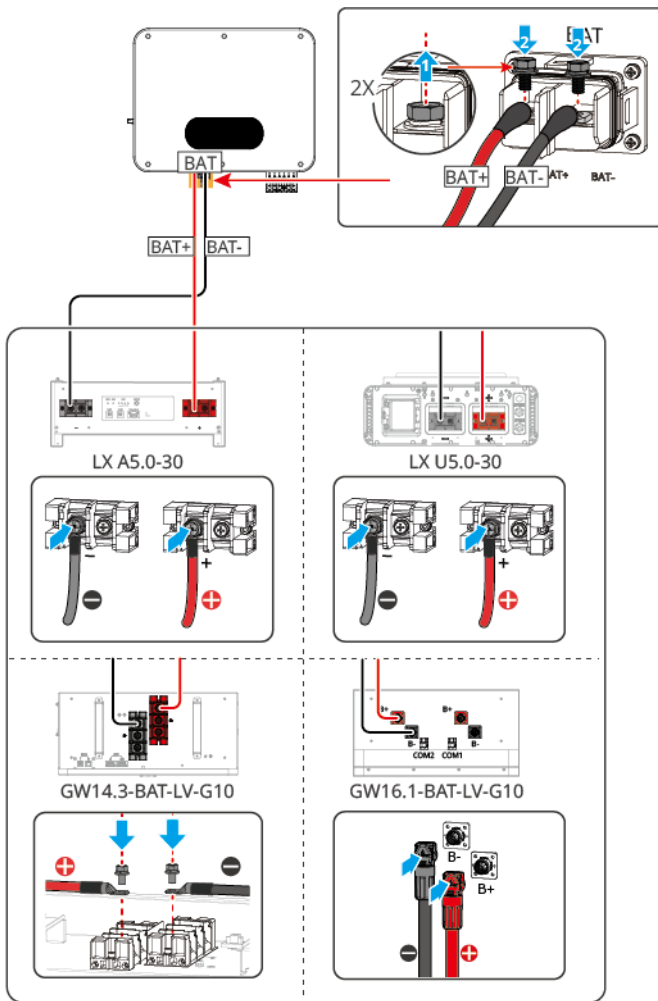
3	Parallel OUT+	Parallel OUT+	Parallel Communication Port
4	CAN_H	CAN_H	Connects to inverter communication or battery cluster parallel communication port
5	CAN_L	CAN_L	
6	Parallel OUT2+	Parallel OUT2+	Parallel Communication Port
7	-	-	Reserved
8	Parallel OUT-	Parallel OUT-	Parallel Communication Port

5.6.1 Connecting the Power Cable between the Inverter and Battery

WARNING

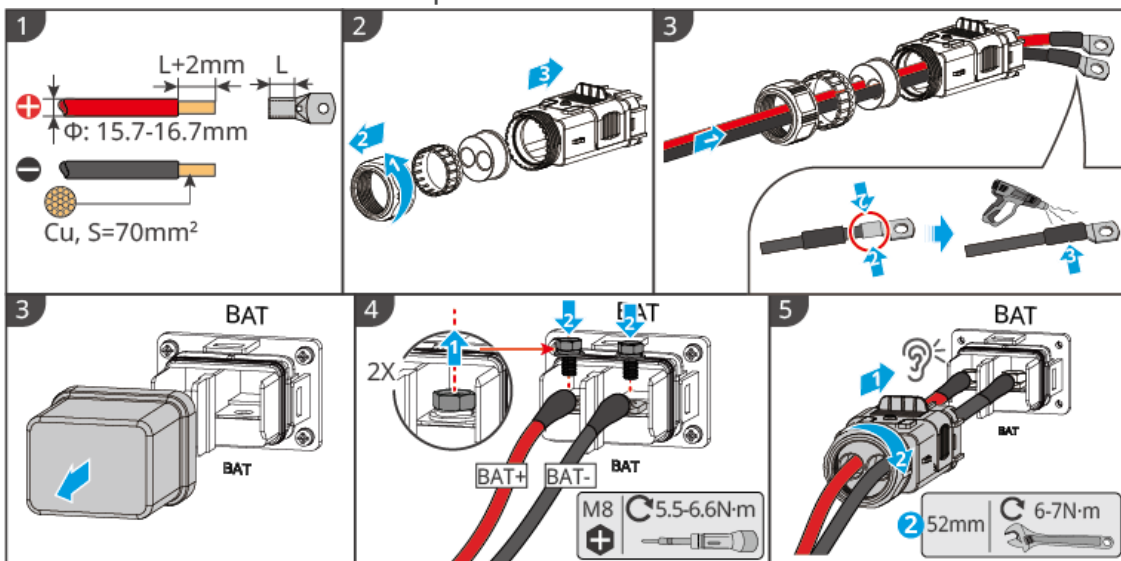
- Use a multimeter to measure the positive and negative terminals of the DC cable to ensure correct polarity and no reverse connection; and that the voltage is within the allowable range.
- During wiring, ensure the battery cables fully match the "BAT+", "BAT-", and grounding ports on the battery terminals. Incorrect cable connection will cause equipment damage.
- Ensure the wire core is fully inserted into the terminal connection hole with no exposed part.
- Ensure the cable connections are tight. Otherwise, during equipment operation, loose terminal connections may overheat and cause equipment damage.
- Do not connect the same battery bank to multiple inverters, as this may cause inverter damage.

Overview of Inverter and Battery Power Cable Connection



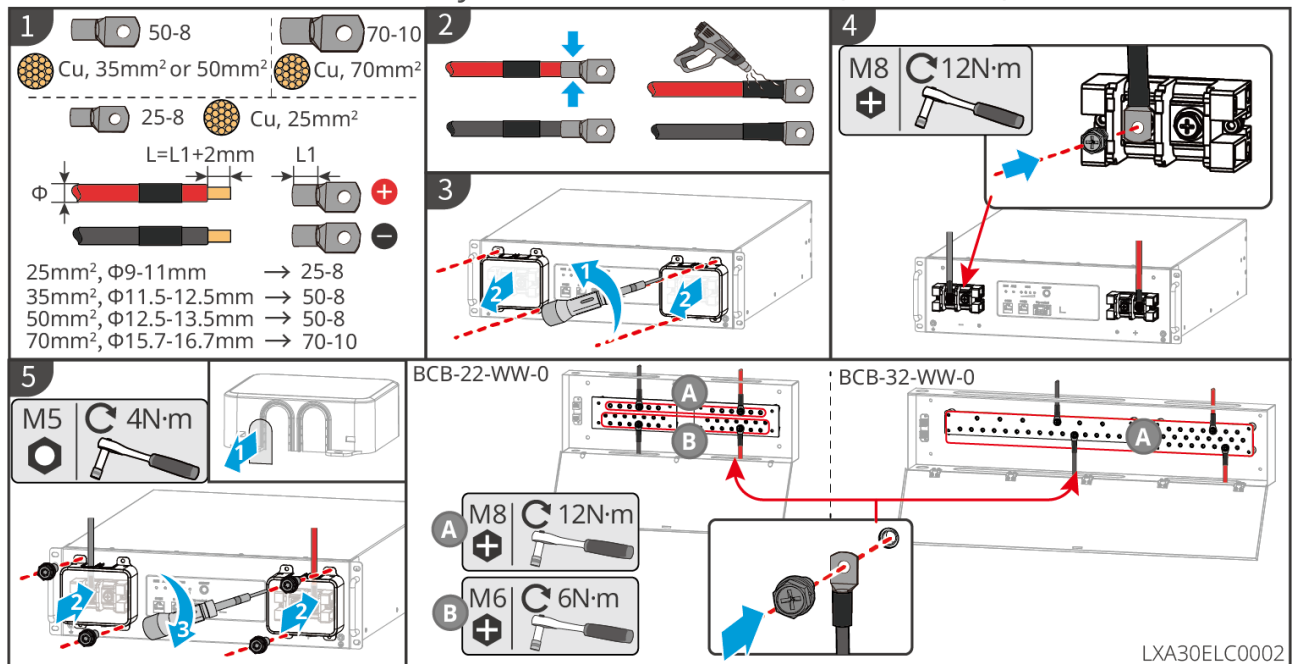
ESL10ELC0011

Inverter-side Connection Steps

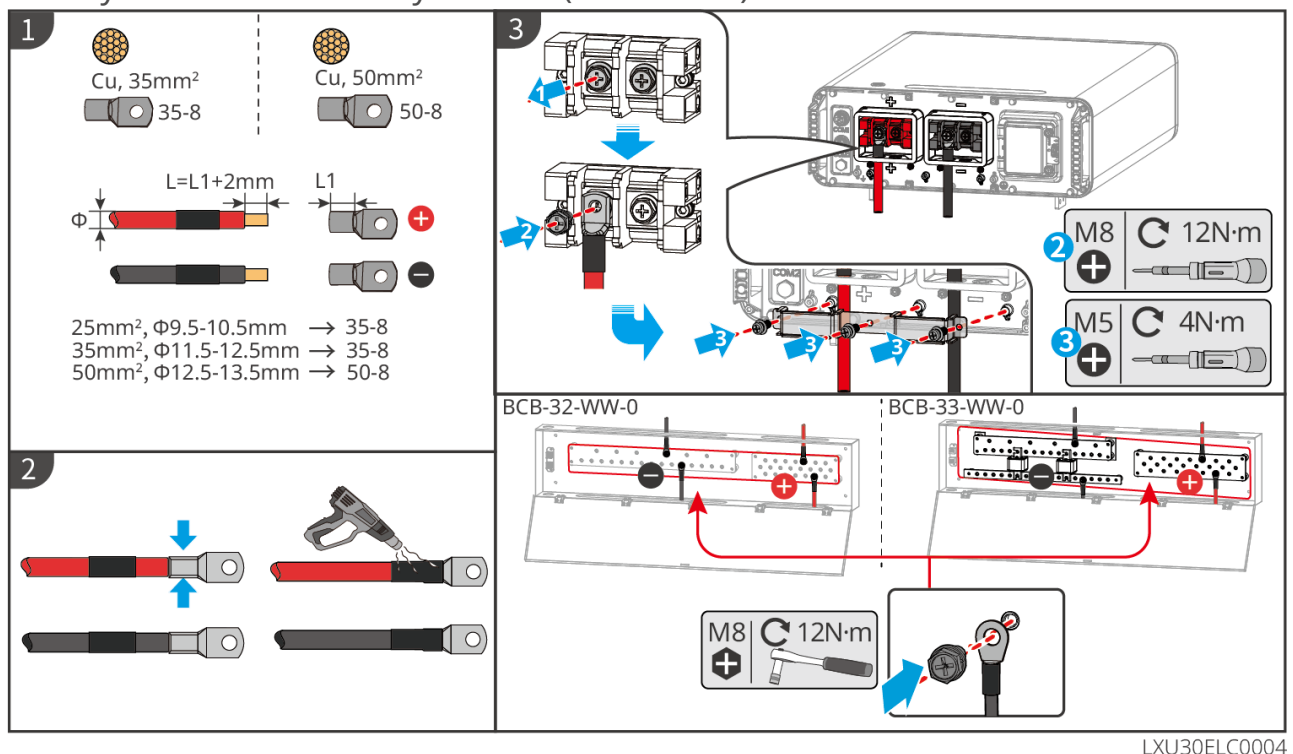


ESL10ELC0003

Connection Method for Battery and Combiner Box End (LX A5.0-30)

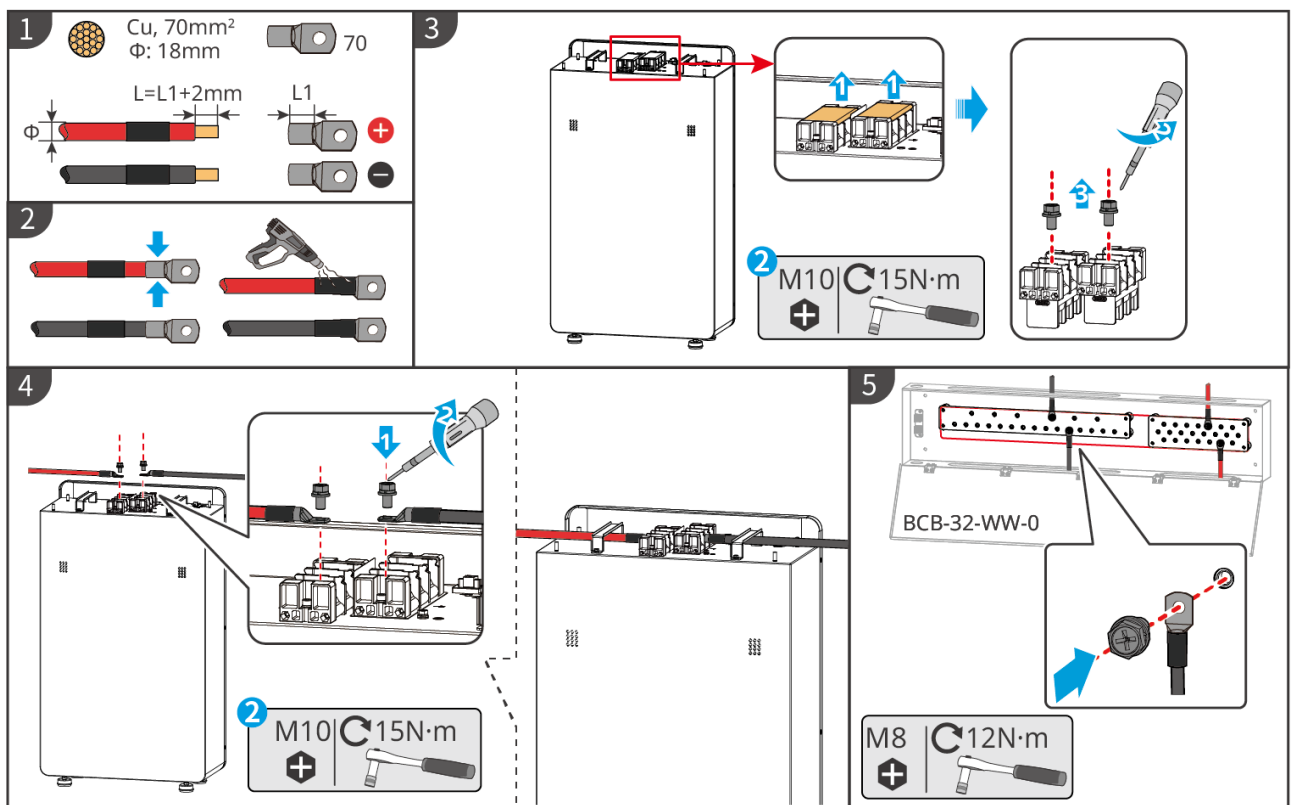


Battery-end Cable Assembly Method (LX U 5.0-30)



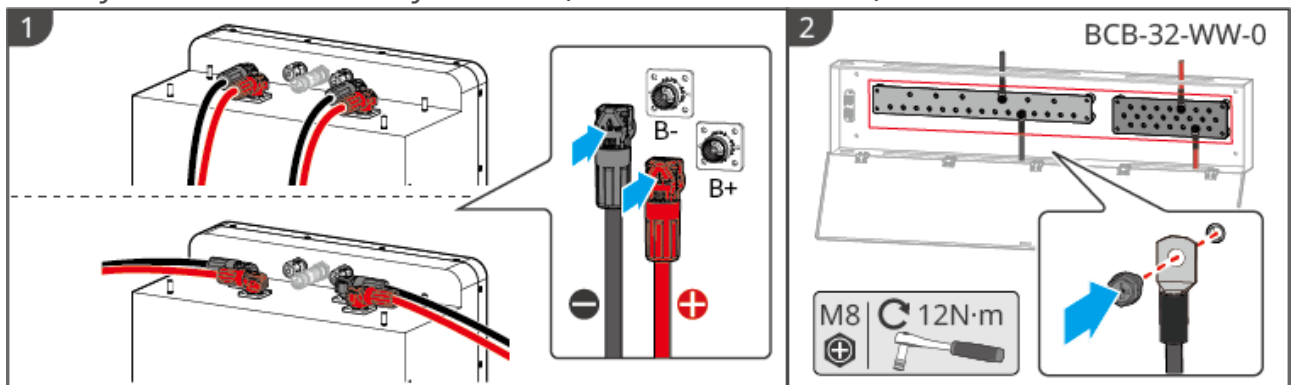
Battery-end Cable Assembly Method (GW14.3-BAT-LV-G10)

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



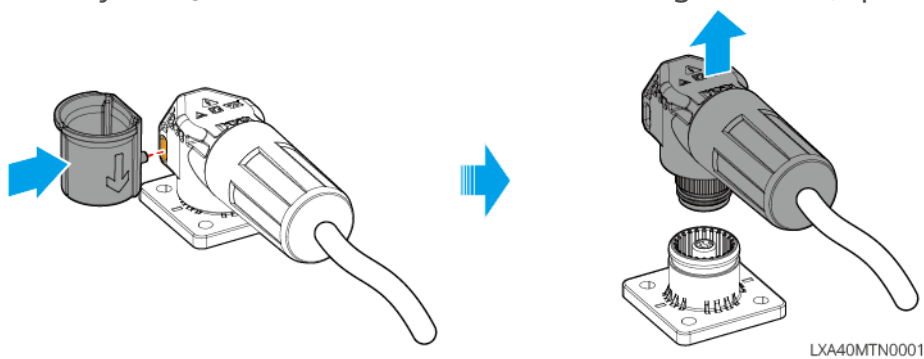
LXA10ELC0015

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



LXA40ELC0007

Battery DC Quick-connect Terminal Unlocking Method (Optional)



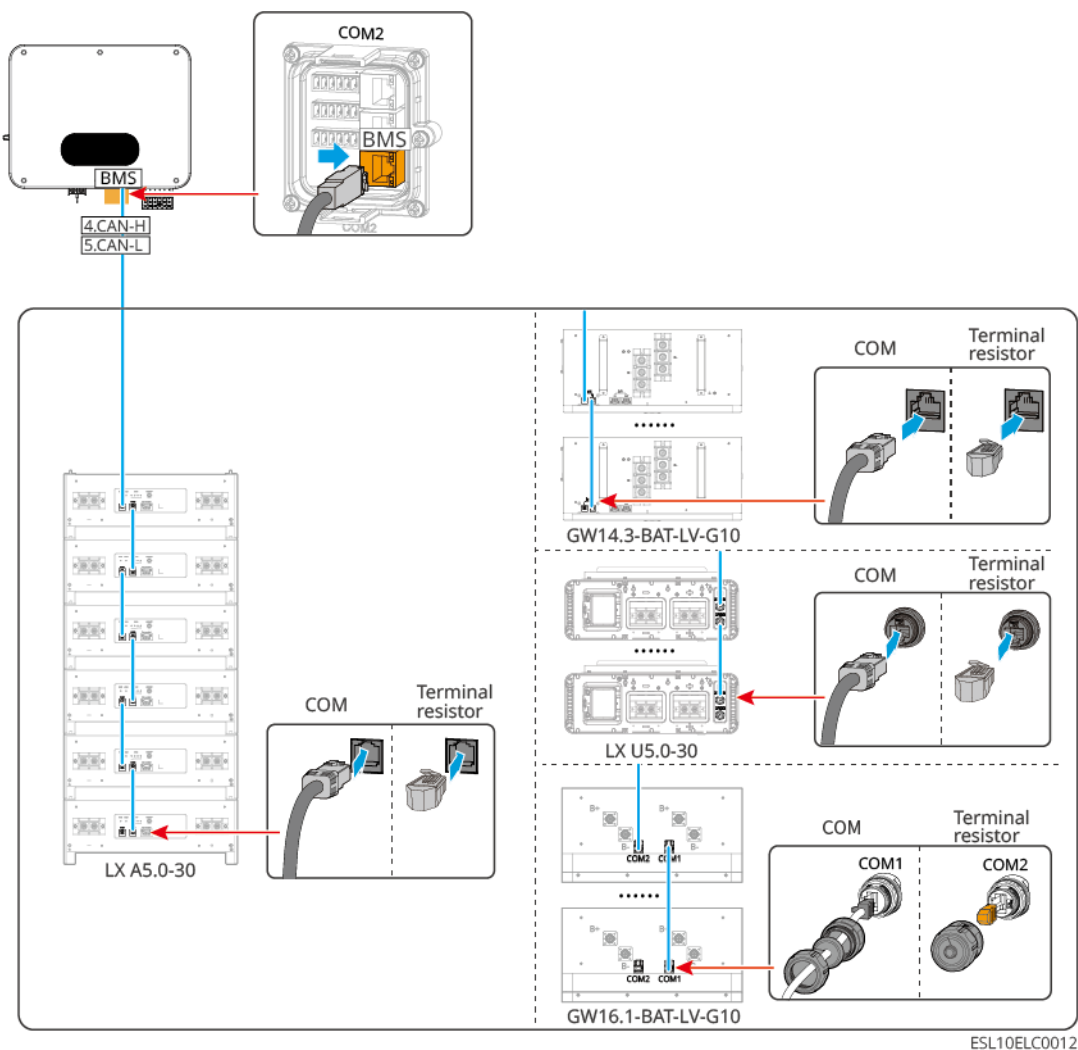
5.6.2 Connecting the Communication Cable between the Inverter and Battery

NOTICE

The inverter comes with a BMS battery communication cable in the box. It is recommended to use the BMS battery communication cable provided in the box. If the communication cable provided in the box cannot meet the requirements, please prepare your own shielded network cable and shielded RJ45 connector. When crimping, only crimp PIN4 and PIN5 of the connector, otherwise it may cause communication failure.

Explanation of BMS communication connection between the inverter and battery:

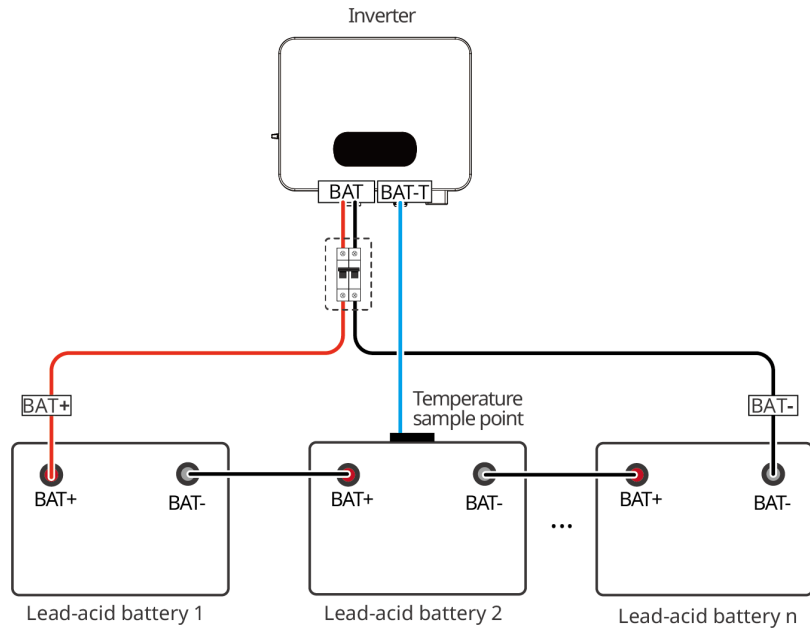
Inverter Port	Connect to Battery Port	Port Definition	Description
BMS(CAN)	COM1	4: CAN_H 5: CAN_L	• CAN communication is used between the inverter and the battery. • Connect the inverter BMS port to the battery COM1 port.



ESL10ELC0012

NOTICE

- When connecting the lead-acid battery temperature sensor cable, it is recommended to connect the temperature sensor cable to a location with poor heat dissipation. For example: when lead-acid batteries are placed side by side, fix the sensor on the lead-acid battery in the middle.
- To better protect the battery cells, the temperature sampling line must be installed, and it is recommended to place the battery in an environment with good heat dissipation.

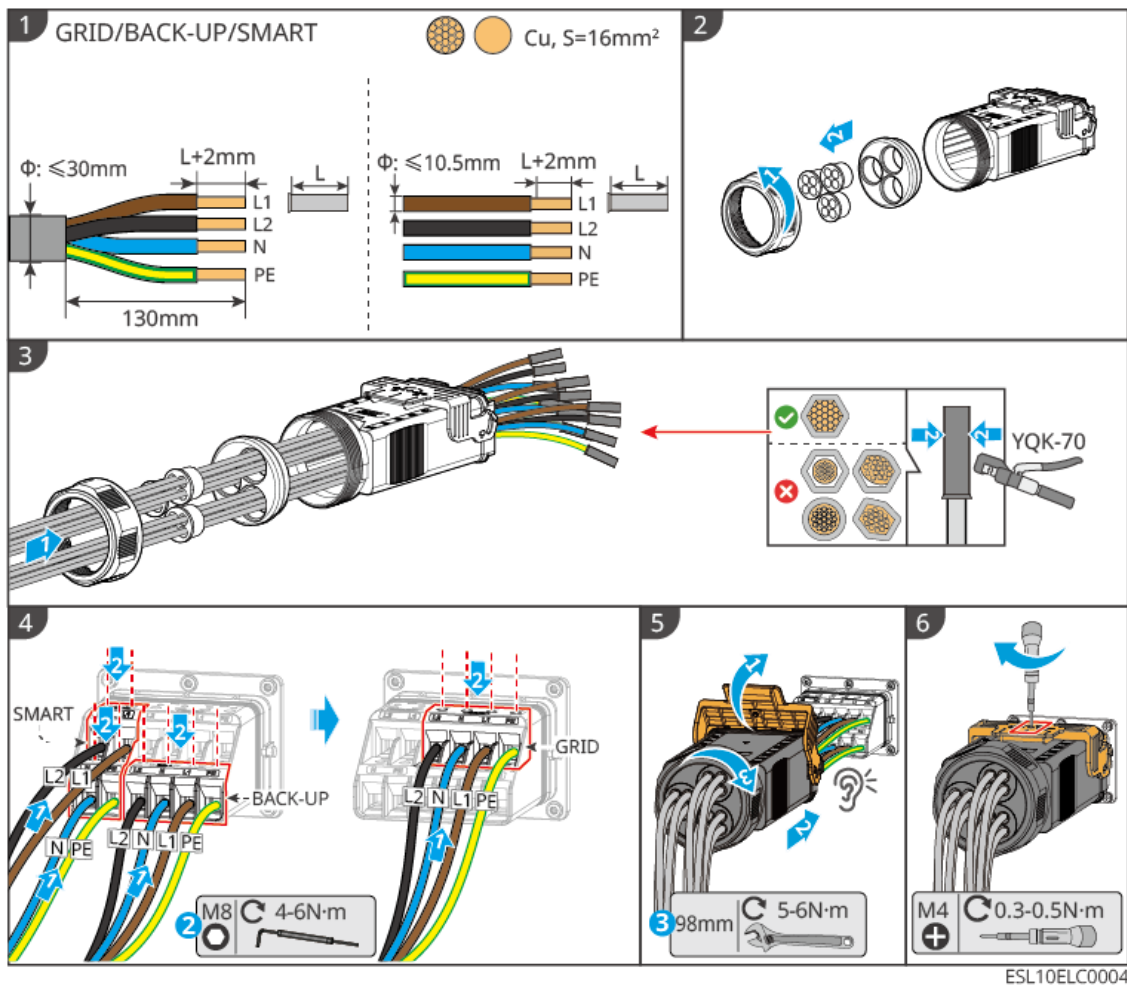


ESU10ELC0094

5.7 Connecting the AC Cable

WARNING

- The inverter integrates a Residual Current Monitoring Unit (RCMU) internally 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.
- During wiring, ensure the AC cables match perfectly with the "BACK-UP", "ON-GRID", "GEN", and ground terminals. Incorrect cable connection will cause equipment damage.
- Ensure the wire cores are fully inserted into the terminal connection holes with no exposed parts.
- Ensure the insulation board at the AC terminal is securely fastened and not loose.
- Ensure the cable connections are tight. Otherwise, during operation, loose connections may cause terminal overheating and equipment damage.

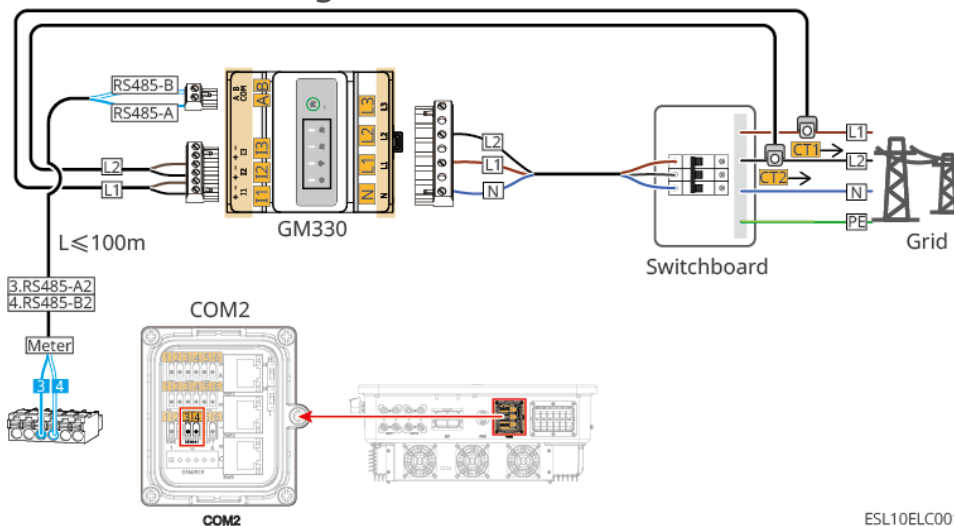


5.8 Connecting the Meter Cable

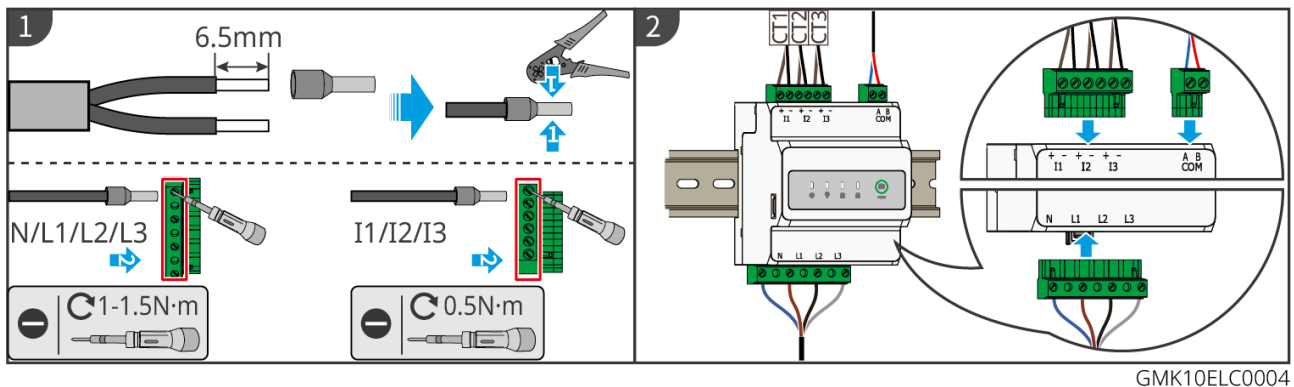
NOTICE

- Ensure the CT connection direction and phase sequence are correct; otherwise, monitoring data may be inaccurate.
- Ensure all cables are connected correctly, securely fastened, and free from looseness. Improper wiring may lead to poor contact or damage to the electricity meter.
- In areas with lightning risk, if the meter cable length exceeds 10m and the cable is not routed using a grounded metal conduit, it is recommended to install an external lightning protection device.
- The outer diameter of the AC power line must be smaller than the CT's aperture to ensure the AC power line can pass through the CT.
- To ensure the current detection accuracy of the CT, the recommended CT cable length should not exceed 30m.
- Do not use network cable as the CT cable, as excessive current may damage the electricity meter.
- The CTs provided by the equipment manufacturer may vary slightly in size and appearance depending on the model, but the installation and wiring methods are consistent.

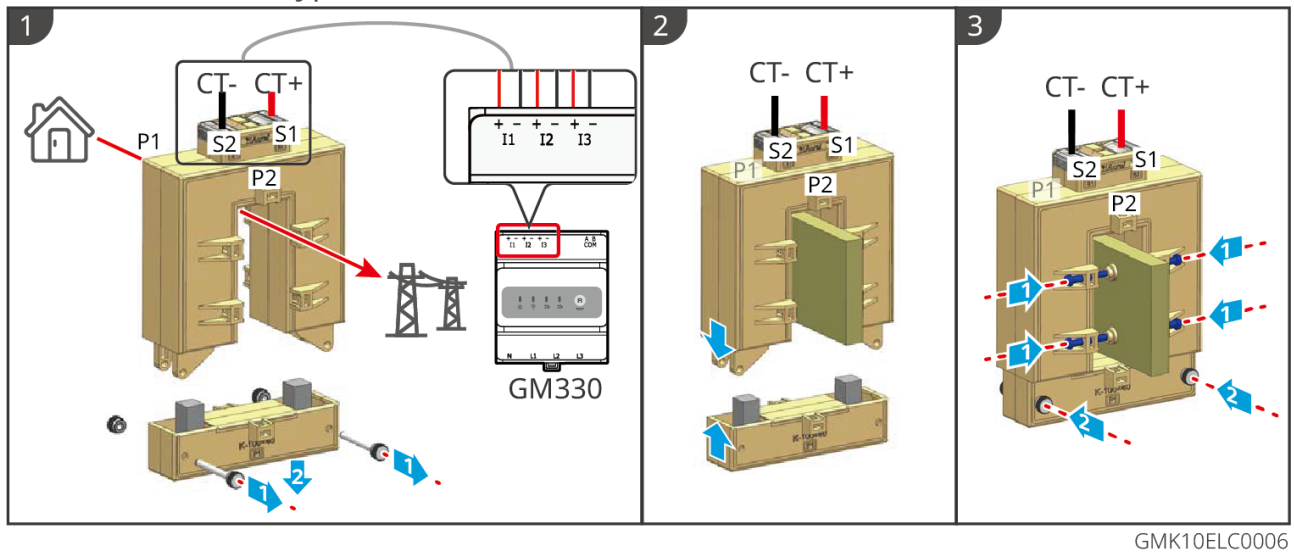
GM330 Meter Wiring



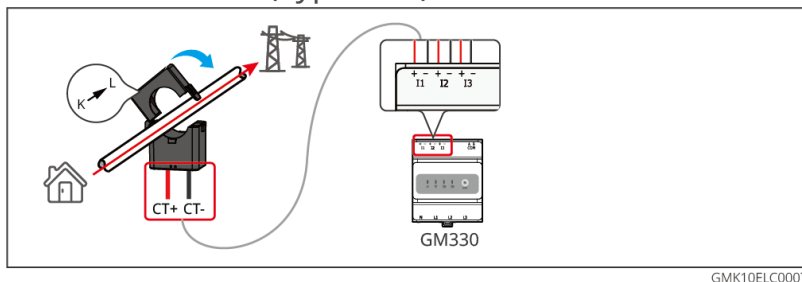
Wiring Steps



Installation of CT (Type One)



Installation of CT (Type Two)

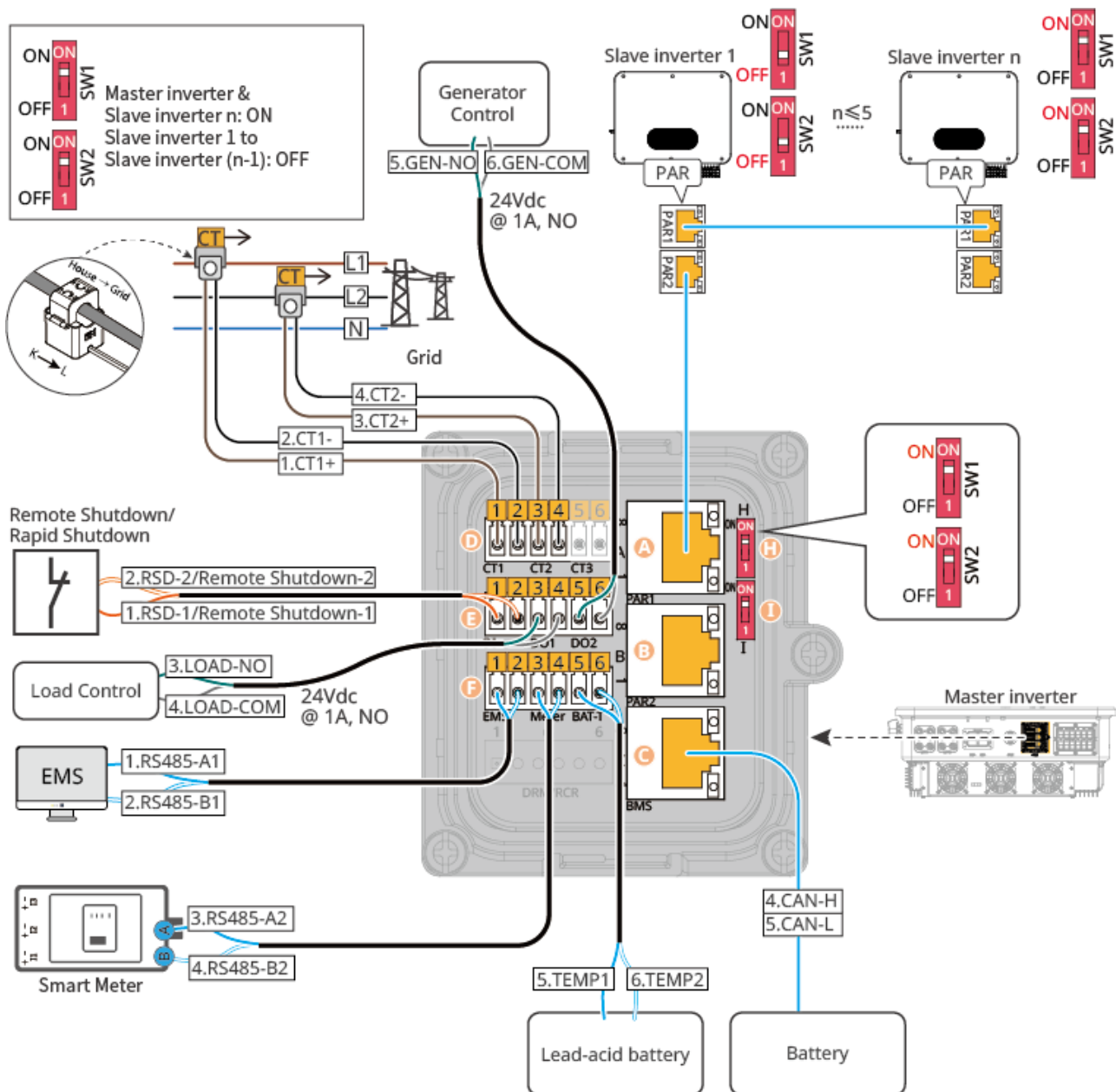


5.9 Connecting the Inverter Communication Cable

NOTICE

- The inverter communication function is optional. Please select according to the actual usage scenario.
- The inverter supports connecting to a mobile phone or WEB interface via Bluetooth, WiFi, or LAN communication methods to set device parameters, view device operation information and error messages, and stay informed about the system status.
- In a single-unit system, the WiFi/LAN Kit-20 smart communication stick can be installed.
- In a parallel system, both the master and slave inverters require the installation of the WiFi/LAN Kit-20 smart communication stick for networking.
- If the remote shutdown function is required, please enable this function in the App after wiring is completed.
- Do not enable this function in the App if the inverter is not connected to a remote shutdown device, otherwise the inverter will not be able to operate in grid-connected mode.
- Remote shutdown function: Please connect the communication cable to the master inverter. Rapid shutdown function: Please connect the communication cable to each inverter separately. If you need to use both rapid shutdown and remote shutdown functions simultaneously, please contact the after-sales service center.

Communication Function Description



ESL10ELC0006

Port (Silkscreen)		Function	Description
A	PAR1	Parallel Communication Port 1	Parallel communication port. Please use CAT5E or above standard network cable and RJ45 connector
B	PAR2	Parallel Communication Port 2	

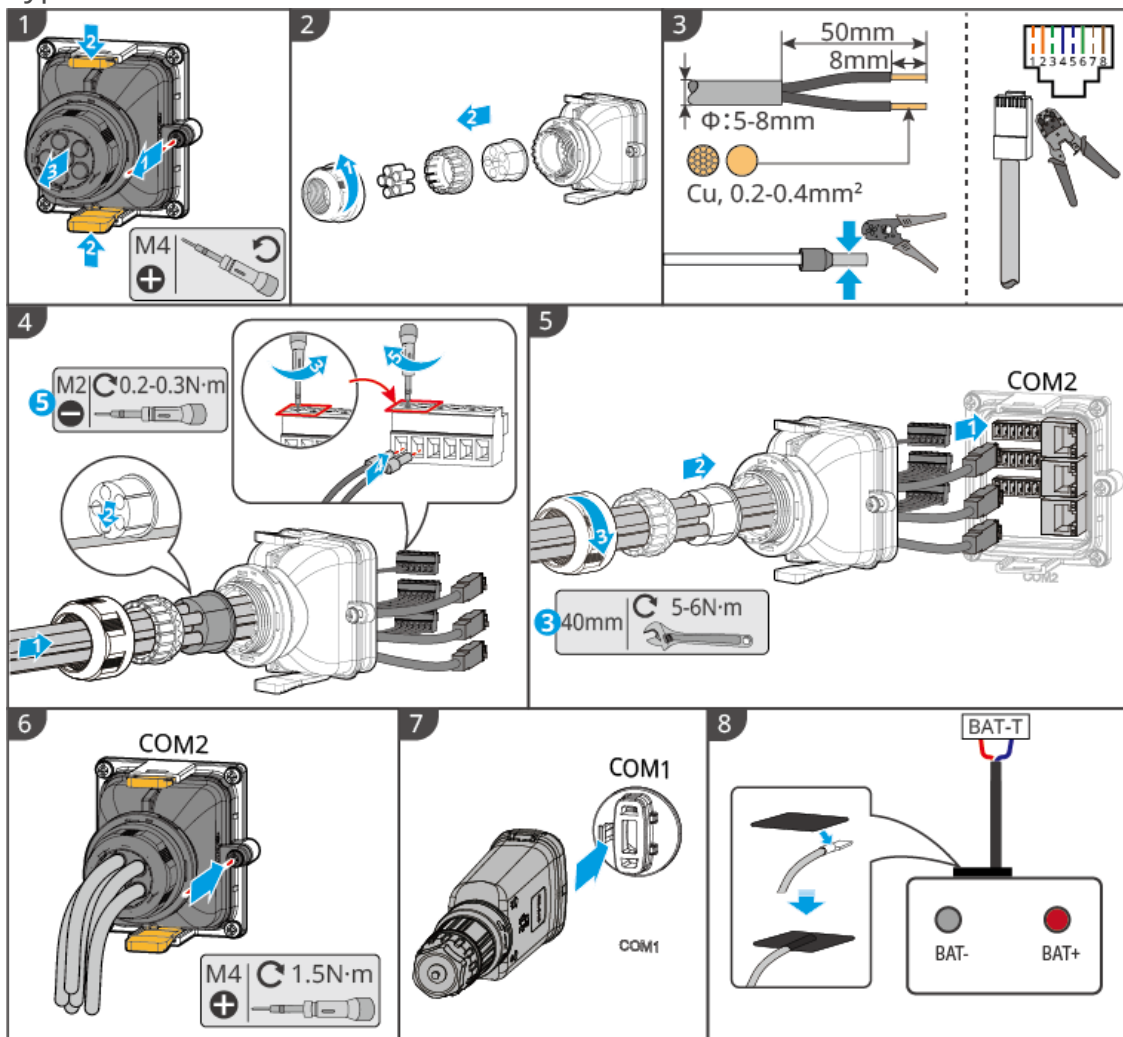
Port (Silkscreen)		Function	Description
C	BMS	Battery BMS Communication	When connecting lithium-ion batteries, used to connect the battery system BMS communication cable, supports using CAN signal communication
D	CT1, CT2	CT Connection Port	Connect CT communication cable
	CT3	Reserved	-
E	DI	Remote Shutdown/Rapid Shutdown	- Remote Shutdown function: - When an accident occurs, it can control the device to stop working - The remote shutdown device needs to be a normally closed switch - Rapid Shutdown: In a rapid shutdown system, the rapid shutdown transmitter and receiver are used together to achieve system rapid shutdown. The receiver maintains component output by receiving signals from the transmitter. The transmitter can be external or built into the inverter. In an emergency, by enabling an external trigger device, the transmitter can be stopped, thereby shutting down the components - The rapid shutdown device needs to be a normally closed switch

Port (Silkscreen)		Function	Description
	DO1	load control	• Supports connecting dry contact signals to achieve load control and other functions. DO contact capacity is 24Vdc @1A, NO/COM normally open contacts • Supports SG Ready heat pump connection, controlling the heat pump via dry contact signals • Supported working modes: ◦ Working mode 2 (signal: 0:0): Energy-saving Mode, in this mode, the heat pump runs in energy-saving mode ◦ Working mode 3 (signal: 0:1): Startup suggestion, in this mode, the heat pump increases hot water reserve while maintaining current operation, to store heat
	DO2	Generator Start/Stop Control Port	Supports connecting generator control signals DO contact capacity is 24Vdc @1A, NO/COM normally open contacts
F	EMS	EMS Communication Port	Connect third-party EMS devices for energy control. Parallel connection scenarios do not support connecting third-party EMS devices.
	Meter	Meter Communication	Supports using RS485 communication to connect external smart meters
	BAT-T	Lead-acid Temperature Measurement Port	Used to connect temperature sensing lines for lead-acid temperature measurement
D	CT1, CT2	CT Connection Port	CT communication cable needs to be connected only when using the inverter's built-in meter
H	SW1	Parallel DIP Switch	

Port (Silkscreen)		Function	Description
I	SW2		In multi-machine parallel scenarios, the parallel DIP switches of the first and last inverters need to be set to ON position, and other inverters to OFF position

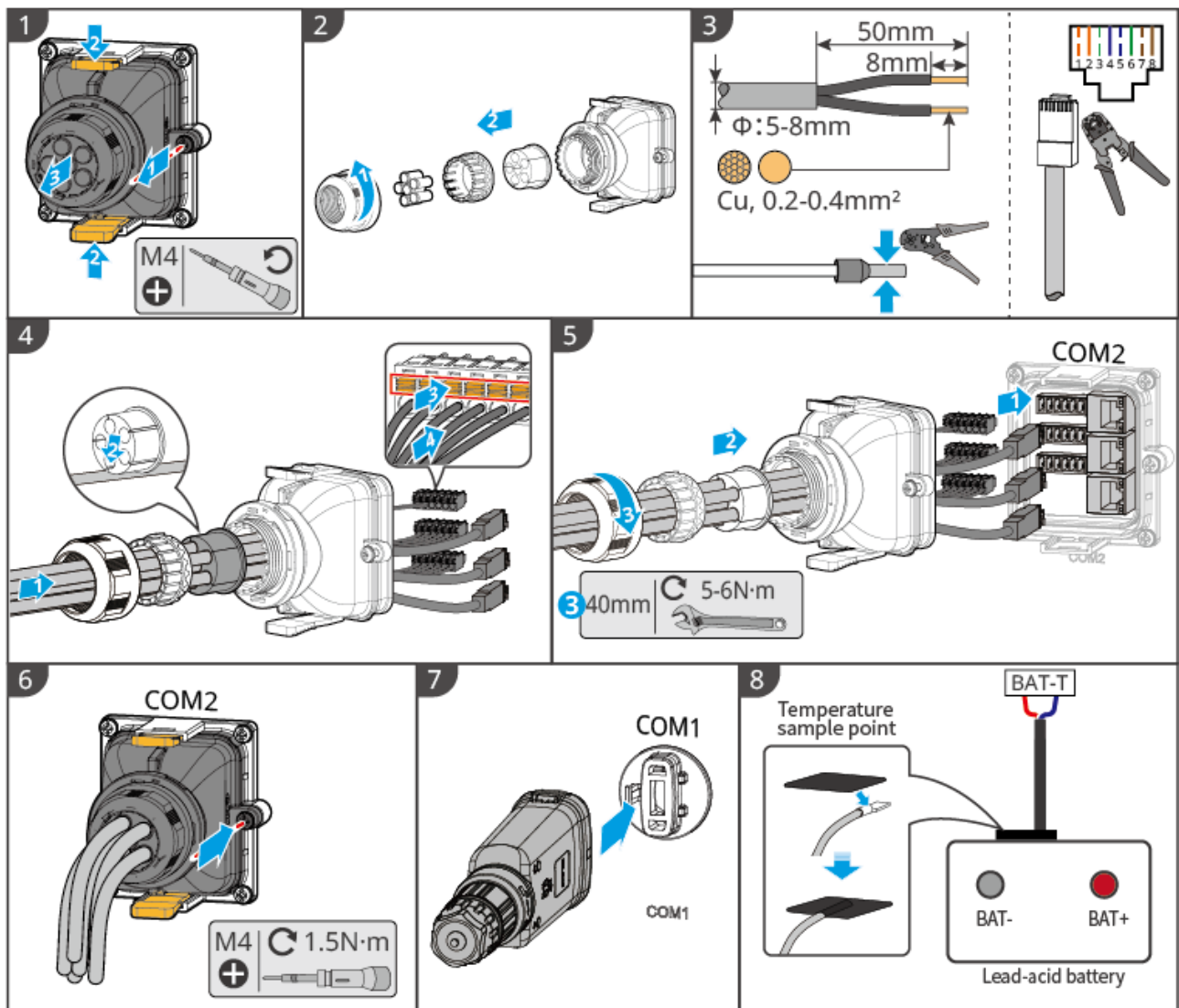
Method for Connecting the Communication Cable

Type One



ESL10ELC0005

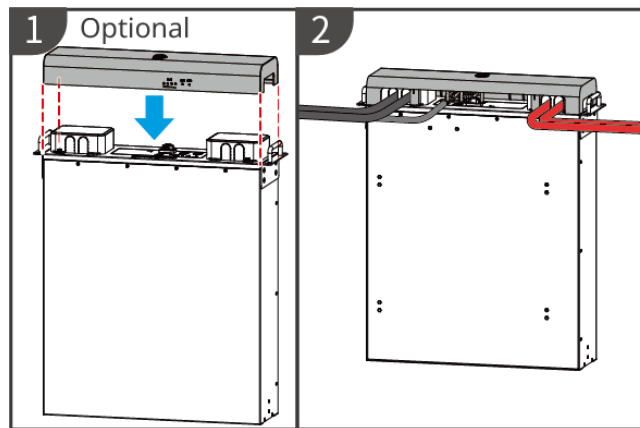
Type Two



ESL10ELC0034

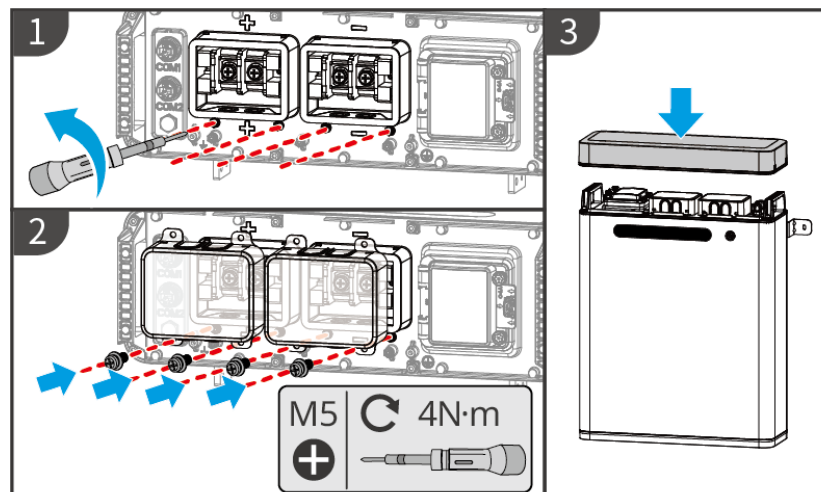
5.10 Installing the Battery System Protection Cover

5.10.1 LX A5.0-30



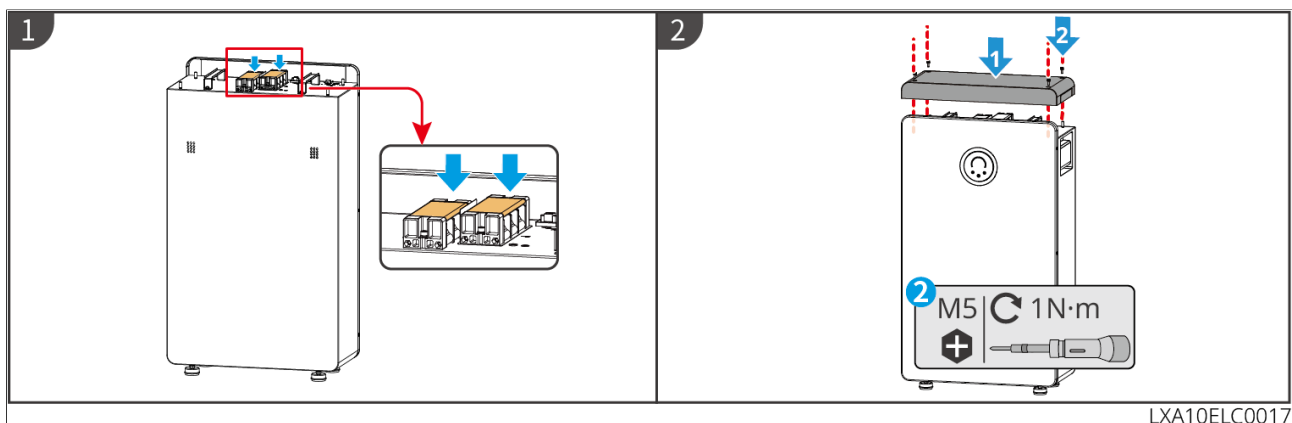
LXA30INT0006

5.10.2 LX U5.0-30



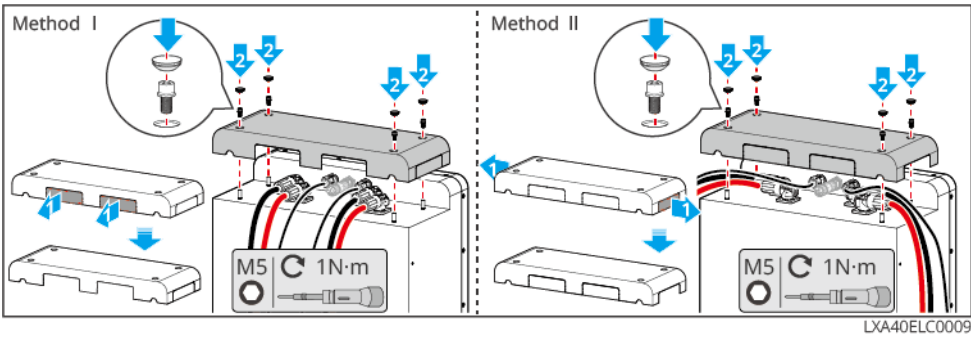
LXU30INT0006

5.10.3 GW14.3-BAT-LV-G10



LXA10ELC0017

5.10.4 GW16.1-BAT-LV-G10



6 System Commissioning

6.1 Check Before Power ON

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

6.2 Power ON



- Battery black start: When there is no PV power generation in the photovoltaic system and the grid is abnormal, if the inverter cannot work normally, the battery black start function can be used to force the battery to discharge and start the inverter. The inverter can then enter off-grid mode and supply power to the load from the battery.
- After the battery system is started, please ensure that the communication between the inverter and the battery system is normal within 15 minutes. If the inverter and the battery system cannot communicate normally, the battery system switch will automatically disconnect, cutting off power to the battery system.
- When there are multiple batteries in the system, starting any one battery can start all batteries.
 - GW14.3-BAT-LV-G10: After the battery is powered off and then powered on again, it is necessary to restart each battery one by one or wait for 15 minutes before starting 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 A5.0-30: Press the battery system switch for ≤ 2 s.
 - b. LX U5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10: Close the battery system integrated circuit breaker, then briefly press the battery system button.
3. Close the DC switch of the inverter.
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 SMART circuit breaker.

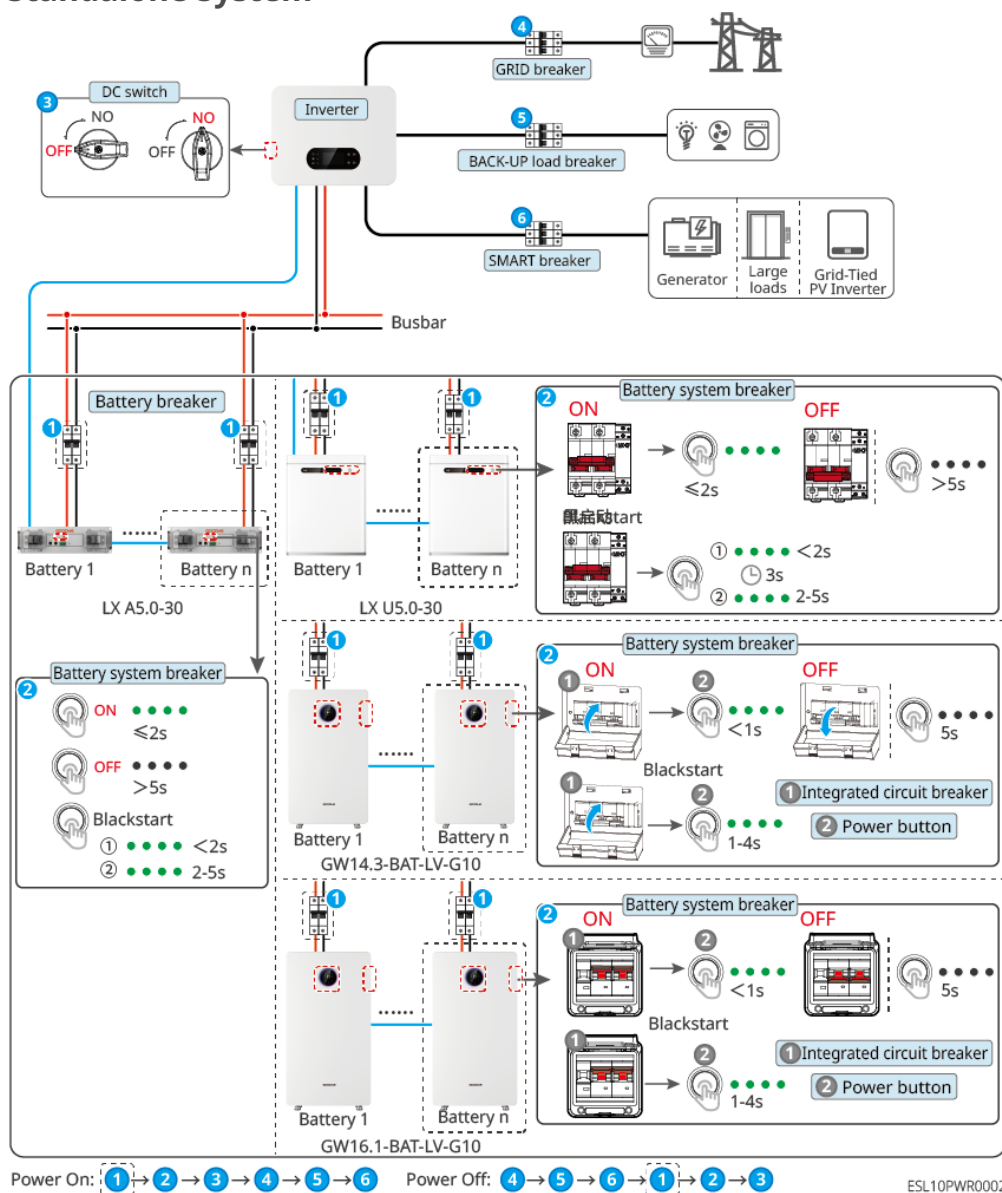
Battery Black Start

1. Close the battery system switch.
2. Start the battery:
 - a. LX A5.0-30, LX U5.0-30: Briefly press the battery multi-function button for < 2 seconds, then press and hold for 2-5 seconds to start the battery system. The

battery forces discharge to activate the inverter.

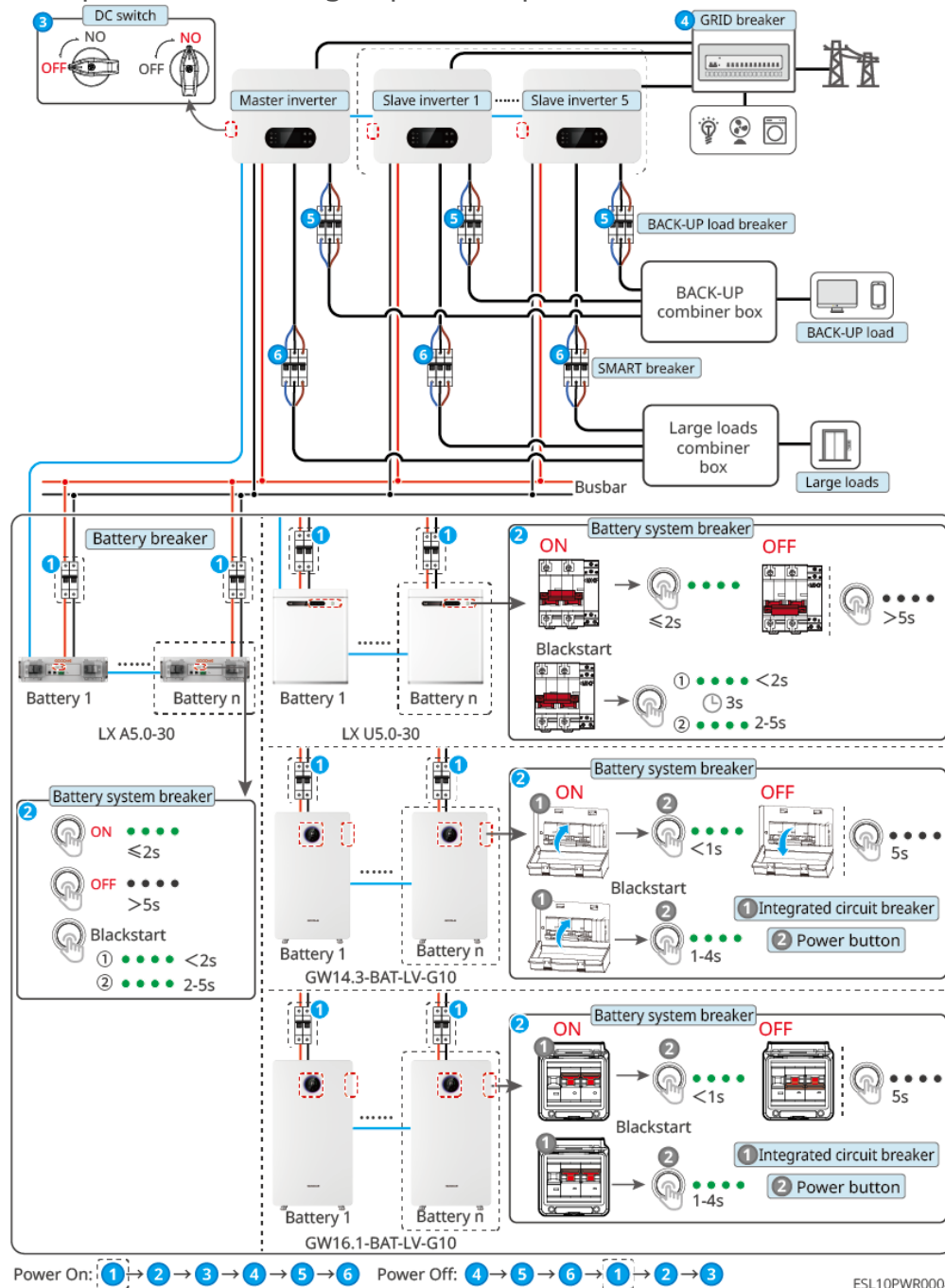
- b. GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10: Press and hold the battery multi-function button for 1-4 seconds to start the battery system. The battery forces discharge to activate the inverter.
3. Close the DC switch of the inverter.
4. (Select according to local regulations) Close the circuit breaker between the PV modules and the inverter.
5. Close the GRID circuit breaker.
6. Close the BACK-UP circuit breaker.
7. (Optional) Close the SMART circuit breaker.

Standalone System



Parallel System

Multiple inverters, off-grid parallel operation



6.3 Indicators

6.3.1 Inverter Indicators

Indicator	Status	Description
		Inverter is starting up and in self-check mode
		Inverter is operating normally in grid-tied generation or off-grid mode
		BACK-UP output overload
		System fault
		LCD ON: Inverter is powered on and in standby mode LCD OFF: Inverter is powered off
		Grid abnormal, inverter BACK-UP port power supply normal
		Grid normal, inverter BACK-UP port power supply normal
		BACK-UP port has no power supply
		Inverter monitoring module resetting
		No connection established between inverter and communication terminal
		Communication failure between communication terminal and cloud server
		Inverter monitoring normal
		Inverter monitoring module not started

6.3.2 Battery Indicators

6.3.2.1 LX A5.0-30、LX U5.0-30

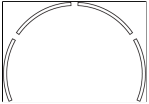
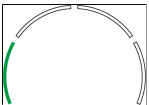
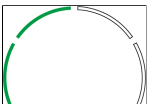
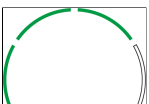
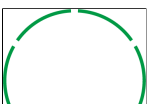
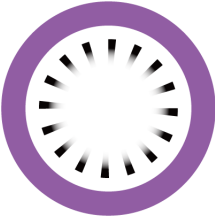
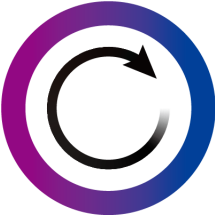
indicator		System Status
	SOC indicator no green display	SOC=0%

indicator		System Status
	The first SOC indicator is displayed in green.	$0\% < \text{SOC} \leq 25\%$
	The second SOC indicator is displayed in green.	$25\% < \text{SOC} \leq 50\%$
	The third SOC indicator displays green.	$50\% < \text{SOC} \leq 75\%$
	The fourth SOC indicator is displayed in green.	$75\% < \text{SOC} \leq 100\%$
 RUN light	Green steady on	Battery system operating normally
	Green flashing once per second	Battery system is in the Standby state
	Green flashes 3 times/s	PCS communication loss
	slow blinking	When Battery system triggers an alarm, it will perform a self-check. After the self-check is completed, it will transition to either normal operation or fault status.
 ALM light	Red steady on	Determine the type of fault that occurred based on the SOC indicator display format, and handle it according to the recommended methods in the Troubleshooting section.

6.3.2.2 GW14.3-BAT-LV-G10

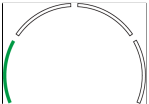
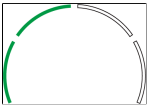
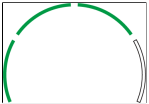
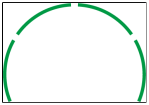
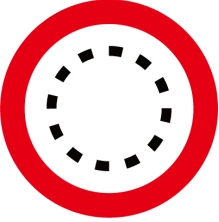


Normal state

indicator or name	indicator status		Corresponding to other light status	System Status
State of Charge (SOC)		SOC indicator Green steady on	/	SOC=0% 0% < SOC ≤ 25% 25% < SOC ≤ 50% 50% < SOC ≤ 75% 75% < SOC ≤ 100%
				
				
		SOC indicator Green Flashing		Battery system is in Discharge state
				
Operation indicator + Touch Button		White constant light	 Blue-purple breathing light	The system is operating normally.
		white flicker	 Blue-purple running light	System preparing

indicator or name	indicator status		Corresponding to other light status	System Status
Communication light		White steady light	/	PCS communication normal

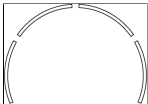
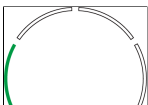
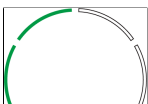
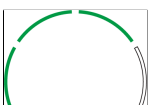
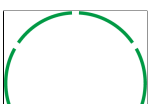
abnormal state

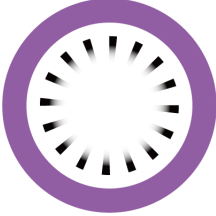
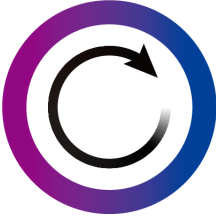
indicator or name	indicator status		Corresponding to other light status	System Status
State of Charge (SOC)	   	SOC indicator Green steady on	 Red flashing  extinguish  Red steady on	Determine the type of fault that occurred based on the SOC indicator display format, and handle it according to the recommended methods in the Troubleshooting section.
communication light		extinguish	/	PCS communication loss
System Alarm Light		White constant light	/	System Alarm and under-voltage fault levels 2, 3, 4

6.3.2.3 GW16.1-BAT-LV-G10

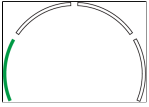
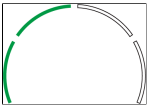
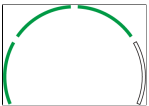
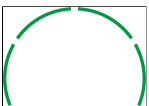
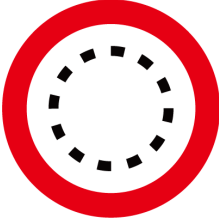


Normal Status

Indicat or Name	Indicator Status		Corresponding Other Light Status	System Status	
SOC Indicat or		SOC indicator solid green	/	SOC=0%	
				0% < SOC ≤ 25%	
		SOC indicator blinking green		25% < SOC ≤ 50%	
				50% < SOC ≤ 75%	
				75% < SOC ≤ 100%	
				Battery system is discharging	

Indicator or Name	Indicator Status		Corresponding Other Light Status	System Status
Operation Indicator + Touch Button		Solid white	 Blue-purple breathing light	System operating normally
		Blinking white	 Blue-purple chasing light	System preparing
Communi- cation Light		Solid white	/	PCS communication normal

Abnormal Status

Indicat or Name	Indicator State		Corresponding Other Light States	System Status
SOC Indicat or	   	SOC indicator green steady on	 red flashing  off  red steady on	Determine the fault type based on the SOC indicator display pattern, and handle it using the methods recommended in the Fault Handling section.
Commu nication Light		Off	/	PCS Comm Loss
System Alarm Light		White steady on	/	System alarm and undervoltage fault levels 2, 3, 4

6.3.3 Smart Meter Indicator

6.3.3.1 GM330

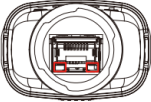
Type	Status	Description
Power LED 	Always On	The meter has been power on, with no RS485 communication.
	flicker	The meter has been power on, and RS485 communication is functioning normally.
	Extinguish	The electricity meter has been power off
Communication light 	Extinguish	Reserved
	flicker	Press and hold the Reset button for $\geq 5s$, the power light and buy/sell light flash: the meter resets.
Buying and selling electric lights 	Always On	buy power from the grid
	flicker	Sell electricity to Utility grid
	Extinguish	No purchase, no sale of electricity
	Reserved	

6.3.4 Smart Dongle Indicator

6.3.4.1 WiFi/LAN Kit-20

Indicator	Status	Description
Power Light 		Constantly lit: The smart communication stick is powered on.
		Off: The smart communication stick is not powered on.
Communi cation Light 		Constantly lit: Communication is normal in WiFi mode or LAN mode.
		Single blink: The smart communication stick's Bluetooth signal is enabled, waiting to connect to the App.
		Two blinks: The smart communication stick is not connected to the router.
		Four blinks: The smart communication stick communicates normally with the router but is not connected to the server.

Indicator	Status	Description
		Six blinks: The smart communication stick is identifying connected devices.
		Off: The smart communication stick is undergoing a software reset or is not powered on.

Indicator	Color	Status	Description
LAN port communication indicator 	Green	Steady on	100Mbps wired network connection is normal.
		Off	• Network cable is not connected. • 100Mbps wired network connection is abnormal. • 10Mbps wired network connection is normal.
	Yellow	Steady on	10/100Mbps wired network connection is normal, with no communication data being transmitted or received.
		Flashing	Communication data is being transmitted or received.
		Off	Network cable is not connected.

Button	Description
Reload	Hold for 0.5~3 seconds, the smart communication stick will reset.
	Hold for 6~20 seconds, the smart communication stick will restore factory settings.

7 System Commissioning

7.1 Commissioning Method Overview

For inverters with a screen, users can configure parameters via the APP or set parameters directly through the LCD screen.

7.2 Configuration via LCD

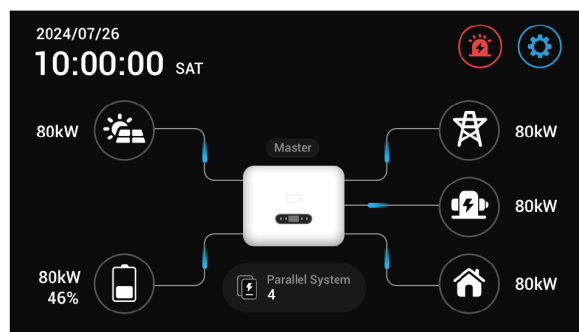
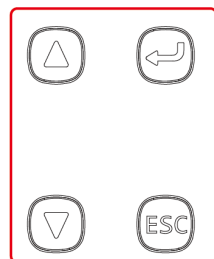
7.2.1 LCD Overview

Through the LCD screen, users can:

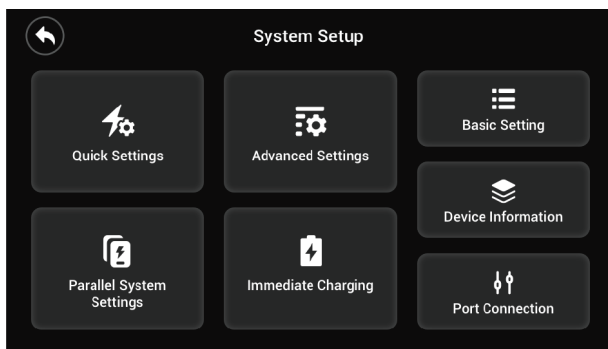
1. View device operation data, software version, alarm information, etc.
2. Set parameters, safety regulation regions, anti-reverse flow, etc.

LCD Interface Introduction

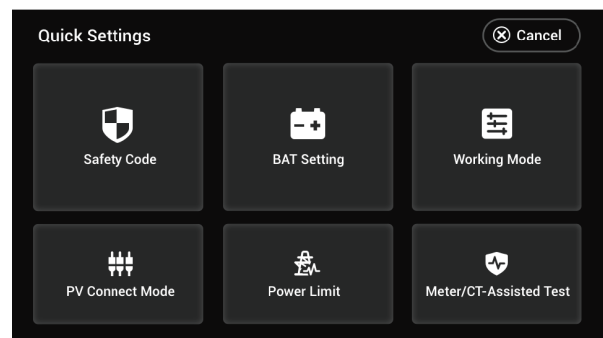
LCD supports both touch and button operation methods.



ESL10CON0004



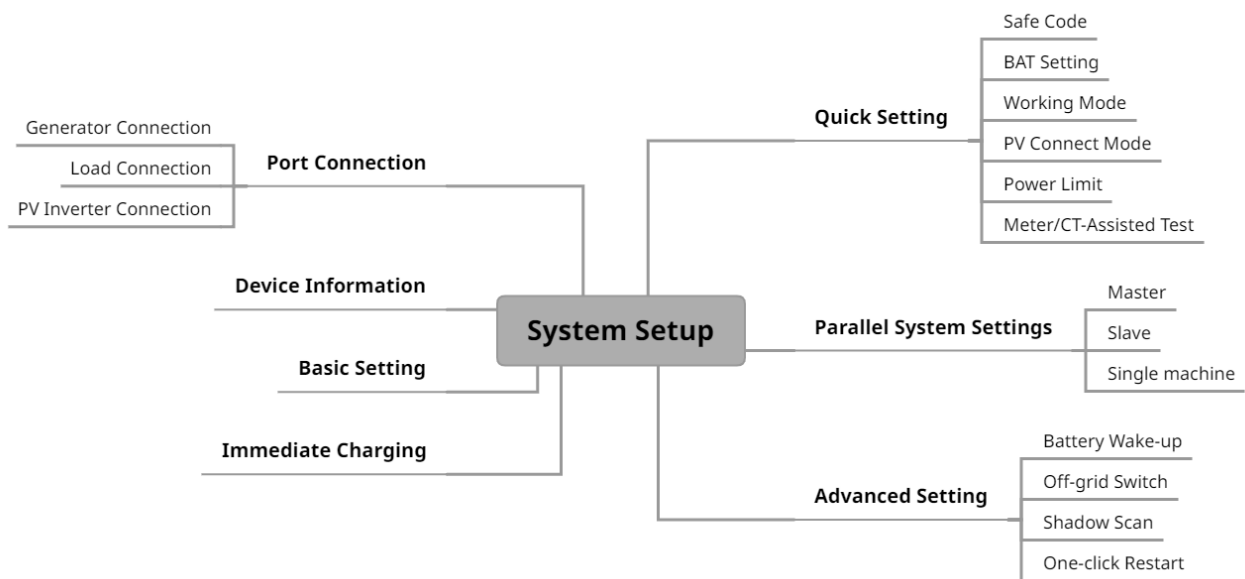
ESL10CON0005



ESU10CON0008

Name/Icon	Description
	Up
	Down
	Confirm
	• Short press: Exit page • Press and hold  and  simultaneously for 5s: Restart the device
	Used to view PV current, voltage, power generation, and other information
	Used to view battery model, status, and other information
	Used to view inverter alarm and fault information
	Used to enter the inverter's 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 Parallel System Settings

1. On the main interface, click > Parallel System Settings to enter the parameter setting interface.
2. Based on the actual wiring of the inverter, set it as Master, Slave, or Standalone.
3. After completing the settings, click Confirm. A "Confirm OK" prompt indicates successful parameter setting.

NOTICE

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

Set Master Inverter Parameters

Parallel System Settings [Cancel]

1. ☒ Master ☐ Slave ☐ Single machine

Tips:
1. If you choose the master, please set the number of inverters.
2. If you choose the slave, please set the slave address.

3. Next 2. Confirm

Parallel Grid Connection [Cancel]

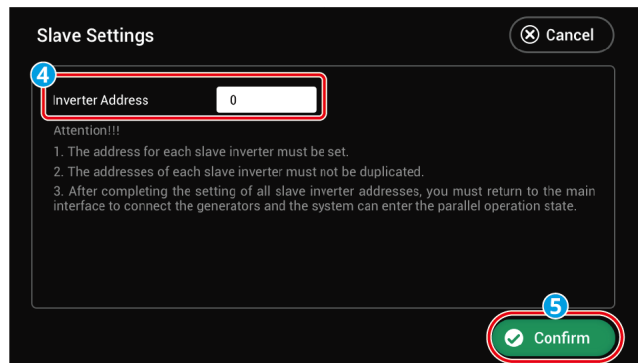
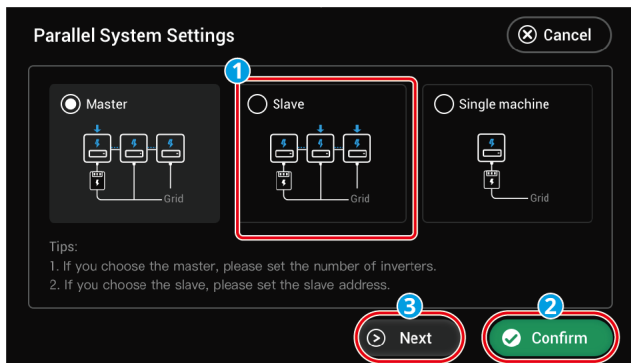
4. Number of Inverters [2,10] 0

Attention!!!
1. In the well drilling system, all the addresses of the slave inverters must be set first, and then return to the main machine interface to connect the generators.
2. After completing the address settings of all the slave inverters, one must return to complete the generator networking. Only then can the system enter the parallel operation state.

5. Confirm

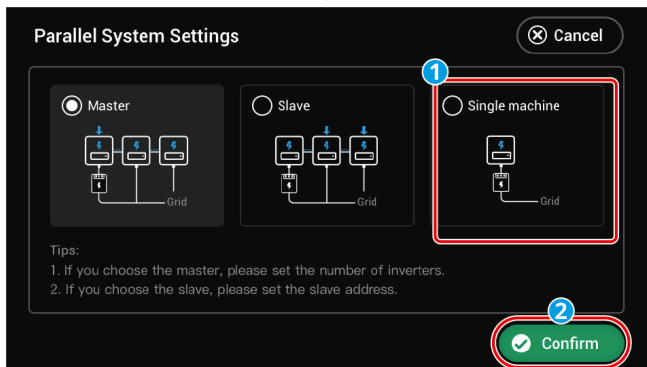
ESL10CON0006

Set Slave Inverter Parameters



ESL10CON0007

Set Standalone

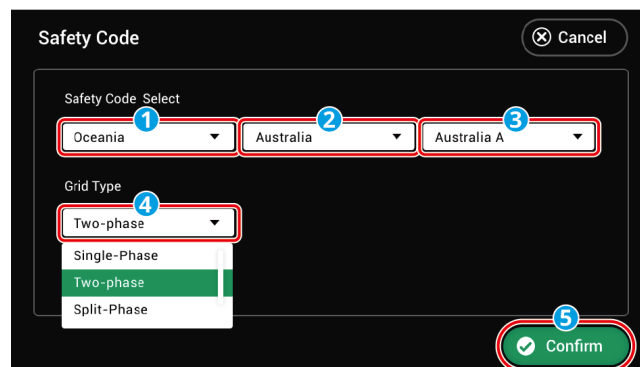


ESL10CON0008

7.2.3 Quick Settings

Set Safety Standard

1. From the main interface, click > Quick Settings > Safe Code to enter the parameter setting interface.
2. Please select the corresponding safety standard code according to the country or region where the device is located.
3. After completing the settings, click Confirm. The parameter setting is successful when the interface prompts 'Confirm OK'.



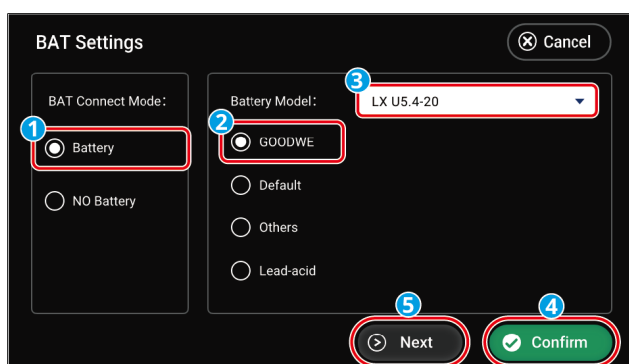
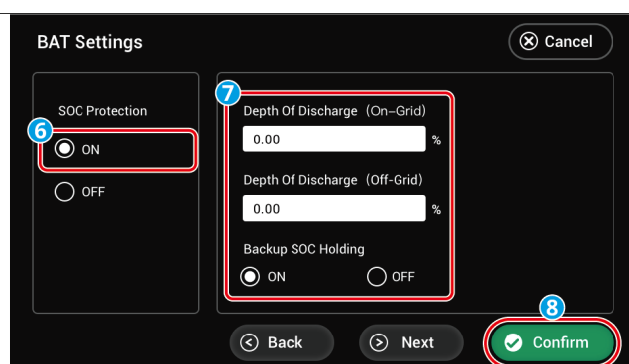
ESL10CON0003

Set Battery Parameters

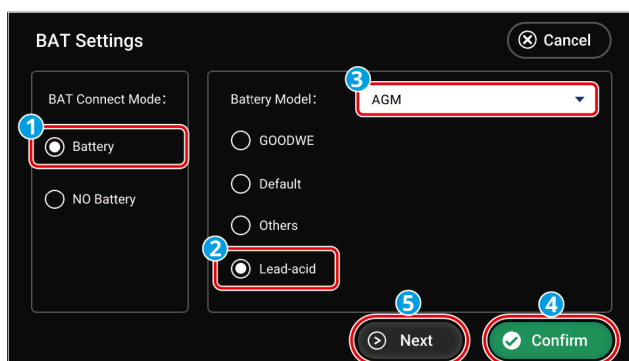
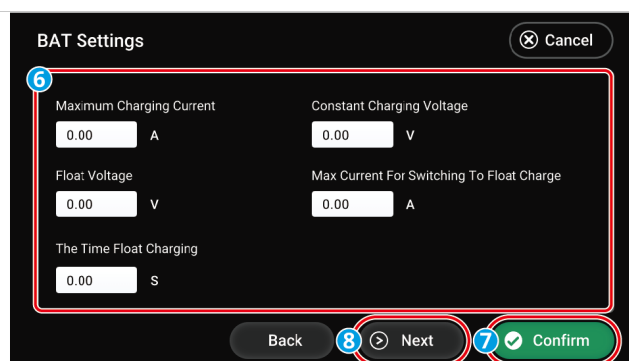
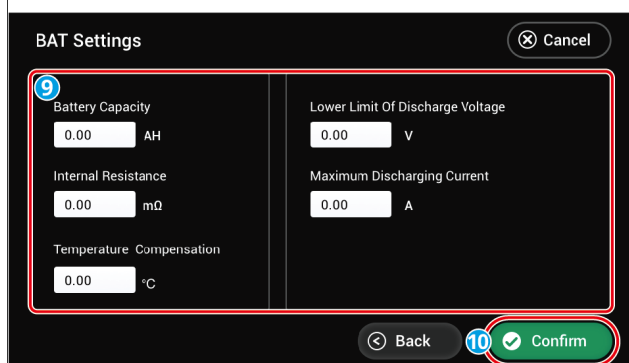
1. From the main interface, click  > Quick Settings > BAT Setting to enter the parameter setting interface.
2. Please set the parameters according to the actual situation.
3. After completing the settings, click Confirm. The parameter setting is successful when the interface prompts 'Confirm OK'.

NOTICE

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

ESU10CON0010

ESU10CON0011

Basic Parameter Settings

BAT Connection Mode	Type	Description
Battery	GOODWE	If the system is connected to a GOODWE brand lithium battery, select GOODWE and choose the correct model. If the actual GOODWE battery model used is not in the options, please use the App settings.
	Default	If the third-party lithium battery model connected to 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 to 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 choose the correct lead-acid type. Currently supported types are GEL, AGM, Flooded.
NO Battery	No battery is connected to the system.	
BAT Setting	Configure according to the actual battery 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 depth of discharge protection point for the battery when the inverter operates in grid-connected mode.
Depth Of Discharge (Off-Grid)	The maximum depth of discharge protection point for the battery when the inverter operates in off-grid mode.
Backup SOC Holding	To ensure the battery SOC is sufficient to maintain normal system operation during off-grid periods, the battery will be charged via the grid or PV to the set SOC protection value when the system operates in grid-connected mode.

Lead-Acid Battery Parameter Settings

Parameter Name	Description
Maximum Charging Current	Battery charging defaults to constant current charging mode;
Constant Charging Voltage	The maximum charging voltage and maximum charging current in this mode need to be set; please configure according to the battery technical specifications.
Float Voltage	When the battery charging current is less than the Maximum Current For Switch To Float Charge and this condition persists for the duration of The Time Float Charging, the battery charging state switches from constant current charging mode to float charging mode. Float Voltage is the maximum charging voltage for the battery in float charging mode. Please set it according to the battery technical specifications.
The Time Float Charging	
Maximum Current For Switch To Float Charge	
Battery Capacity	Set the battery capacity according to the parameters of the actually connected battery.
Internal Resistance	The internal resistance present within the battery. Please set it according to the battery technical specifications.
Temperature Compensation	By default, when the temperature exceeds 25°C, for every 1°C increase, the upper limit of the charging voltage decreases by 3mV. Please configure the actual settings according to the battery technical specifications.
Lower Limit Of Discharge Voltage	Please set according to the battery technical specifications.
Maximum Discharging Current	Please set according to the battery technical specifications. The higher 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 according to the actual situation.

3. After completing the settings, click Confirm. The parameter setting is successful when the interface prompts 'Confirm OK'.

NOTICE

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

Working Mode

Working Mode:

1

☒ Self-use Mode

☐ Backup Mode

☐ Off-Grid Mode

☒ 2 TOU Mode

3

Next

4

Confirm

Working Mode

Backup Mode

4

Charging From Grid

☒ ON ☐ OFF

5

Rated Power

0.00 %

6

Confirm

Back

Next

TOU Mode

Add up to 4 battery working groups

7

☒ Battery Working Group 1

Time

00 : 00 - 00 : 00

Charge

☒

Discharge

☐

Power(%)

0.00

Bat(%)

0.00

Month

☒ Jan ☐ Feb ☐ Mar ☒ Apr ☐ May ☐ Jun

☒ Jul ☐ Aug ☐ Sep ☒ Oct ☐ Nov ☐ Dec

Week

☒ Sun ☐ Mon ☐ Tues ☒ Wed ☐ Thur ☐ Fri ☐ Sat

8

Confirm

Back

Next

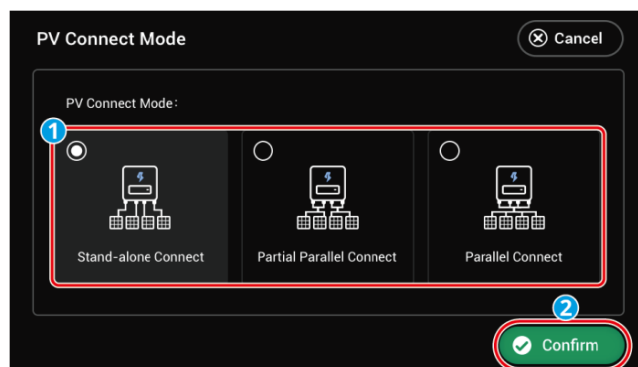
ETL10CON0008

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

TOU Mode	Time	Within the start and end time, the battery charges or discharges according to the set charge/discharge mode and rated power.
	Charge/Discharge	Set to charge or discharge based on actual requirements.
	Power (%)	The percentage of the power during charging or discharging relative to the inverter's rated power.
	Bat (%)	Charging stops when the battery reaches the set SOC. To set the stop SOC for battery discharge, please refer to the Setting Battery Parameters section and configure the Depth of Discharge (On-Grid) and Depth of Discharge (Off-Grid) via the LCD screen.
Off-Grid Mode		In Off-Grid Mode, the inverter disconnects from the grid, and the output only supplies power to BACK-UP Loads, with any excess energy used to charge the battery.

Set PV Connection Mode

1. From the main interface, click  > Quick Settings > PV Connect Mode to enter the parameter setting interface.
2. Please set the parameters according to the actual situation.
3. After completing the settings, click Confirm. The parameter setting is successful when the interface prompts 'Confirm OK'.

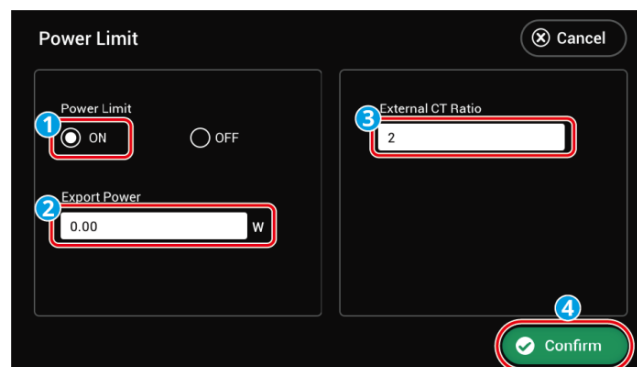


ESU10CON0015

Parameter Name	Description
Stand-alone Connect	A one-to-one correspondence connection between a PV string and an MPPT port on the inverter side.
Partial Parallel Connect	When one PV string is connected to multiple MPPT ports on the inverter side, other PV components are simultaneously connected to other MPPT ports on the inverter side.
Parallel Connect	When an external PV string is connected to the PV input ports on the inverter side, one PV string is connected to multiple PV input ports.

Set Grid Power Limit

1. From the main interface, click  > Quick Settings > Power Limit to enter the parameter setting interface.
2. Please set the parameters according to the actual situation.
3. After completing the settings, click Confirm. The parameter setting is successful when the interface prompts 'Confirm OK'.



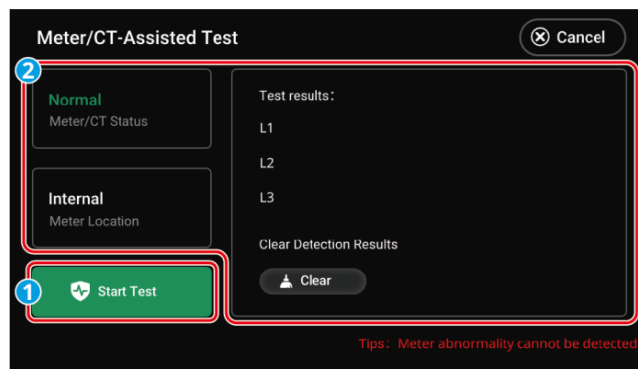
ESU10CON0016

Parameter Name	Description
Power Limit	Enable this function when output power limitation is required according to grid standards in certain countries or regions.
Export Power	Set based on the maximum power that can actually be fed into the grid.

External CT Ratio	Set as the ratio of primary to secondary current of the external CT. - Built-in meter: No need to set CT ratio. Default CT ratio is 120A/40mA. - GM330: CT can be purchased from GoodWe or separately. CT ratio requirement: nA/5A - nA: CT primary input current, where n ranges from 200-5000. 5A: CT secondary output current.
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Meter/CT Auxiliary Detection

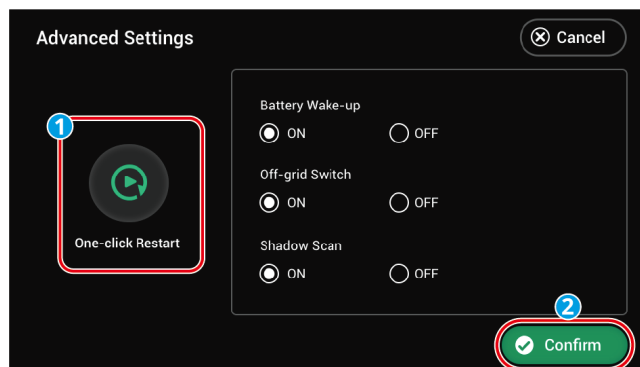
1. From the main interface, click  > Quick Settings > Meter/CT Assisted Test to enter the parameter setting interface.
2. Click Start Test to begin detection. After detection is complete, determine the result based on the interface prompts.



ESU10CON0026

7.2.4 Setting Advanced Parameters

1. From the main interface, click  > Advanced Settings to enter the parameter settings interface. Enter the initial password: 1111.
2. Please set the parameters according to actual needs.
3. After setting is complete, click Confirm. The interface will prompt Confirm OK, indicating the parameters have been set successfully.



ESU10CON0020

Parameter Name	Description
One-click restart	Using this function, the inverter can be quickly restarted.
Battery Wake-up	When enabled, it can wake up the battery after it shuts down due to under-voltage protection. If there is a circuit breaker between the lithium battery and the inverter, ensure the circuit breaker is closed. 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. This function is not effective in grid-tied mode. The switch is initially in the ON state, enabling the off-grid function. After the inverter is powered on, it activates the off-grid output function. In the off-grid state, turning the off-grid switch OFF and then ON can clear the off-grid overload timer and restart off-grid output.
Shadow Scan	When photovoltaic panels are severely shaded, enabling the shadow scan function can optimize the inverter's power generation efficiency.

7.2.5 Setting Immediate Charging

1. Through the main interface, click  Immediate Charging, enter the parameter setting interface.
2. Please set the parameters according to the actual situation.
3. After completing the settings, click "Confirm." The interface will display "Confirm OK," indicating that the parameter configuration is successful.

ESU10CON0021

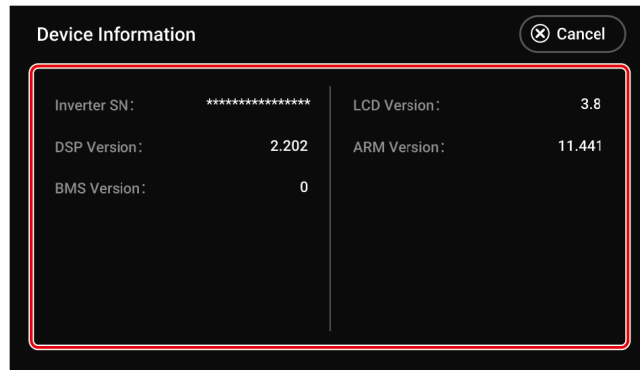
Parameter Name	Description
Immediate Charging	After activation, Utility grid will immediately supply power to Battery charge. This effect is only triggered once. Please enable or disable it as needed.
SOC For Stopping Charging	When Battery (immediate charging) is enabled, charging to Battery charge will stop once the Battery SOC reaches the Charge cutoff SOC.
Immediate Charging Power	When Battery is enabled for charging, the percentage of Charge Power to Inverter Nominal power. For example, for a Nominal power with a capacity of 10kW, when set to 60, the Charge Power is 6kW.

7.2.7 Viewing Device Information

1. Through the main interface, click > Device Information, enter the parameter query interface.

NOTICE

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



ESU10CON0028

7.2.8 Setting Port Connection

NOTICE

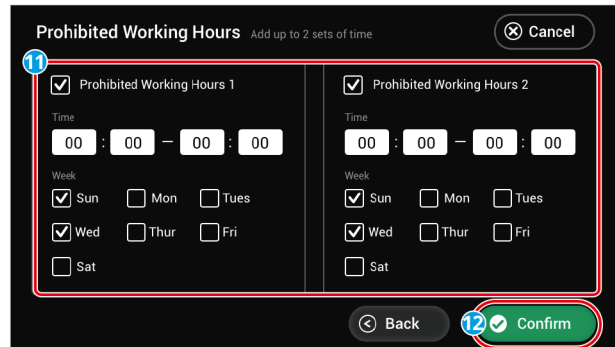
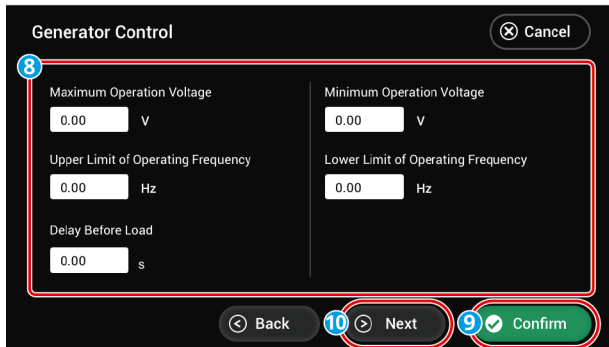
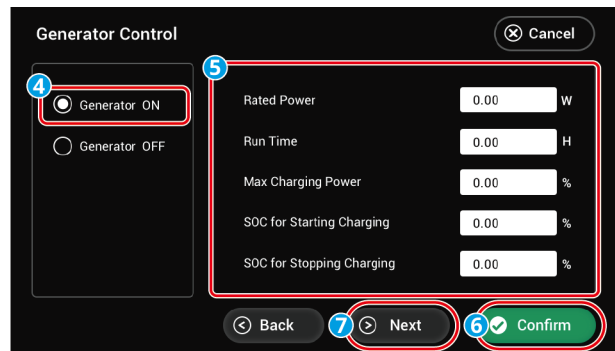
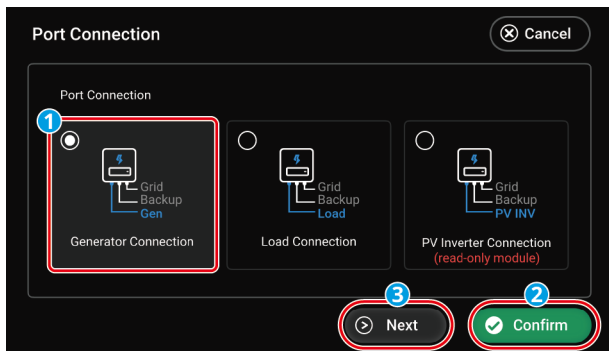
To set the relevant parameters of grid-tied PV inverter in microgrid mode, please connect SolarGo APP for configuration.

Setting Port Connection generator

1. Through the main interface, click  > Port Connection, enter the parameter setting interface.
2. Please set the parameters according to the actual situation.
3. After completing the settings, click "Confirm". The interface will display "Confirm OK" to indicate successful parameter configuration.

NOTICE

Please ensure to click "Confirm" on each page to validate the parameters; otherwise, the system will operate with default settings.



ETL10CON0004

No.	Parameter Name	Description
1	Generator ON/OFF	Control the start and stop of the generator. Only applicable to generators supporting dry contacts.
2	Rated Power	Generator's Nominal power.
3	Run Time	The continuous operation time of the generator. After exceeding the set operation time, the generator will automatically shut down. This function is only effective for generators that support dry contact connections.
4	Max Charging Power	Set as Max charge power with generator as Battery charge.
5	SOC for Starting Charging	Set the generator to start at Battery charge SOC. When the SOC of Battery falls below the set value, the generator will charge Battery charge.
6	SOC for Stopping Charging	Set the generator to stop charging Battery charge at the specified SOC. When the SOC of Battery reaches the set value, the generator will cease charging Battery charge.
7	Maximum Operation Voltage	Set the operational voltage upper limit for the generator.

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

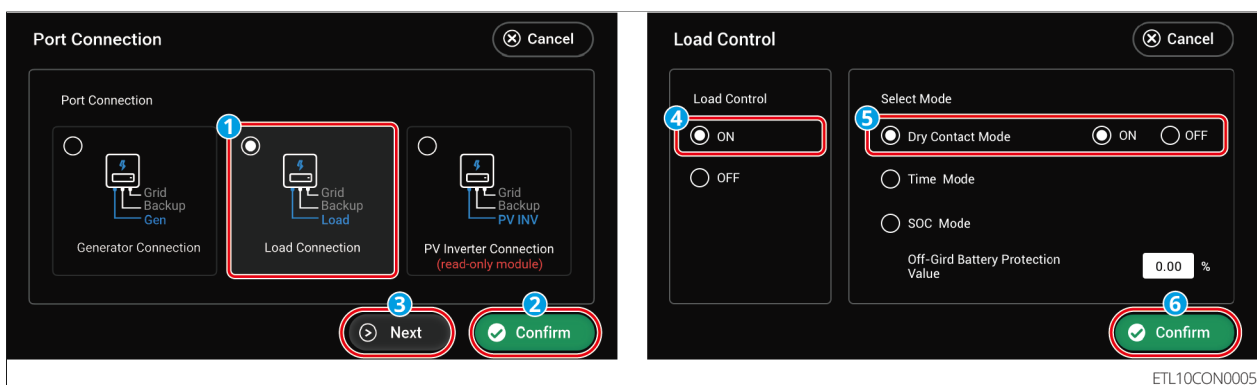
Setting Port Connection load control

1. Through the main interface, click  > Port Connection, enter the parameter setting interface.
2. Please set the parameters according to the actual situation.
3. After completing the settings, click "Confirm". The interface will display "Confirm OK" to indicate successful parameter configuration.

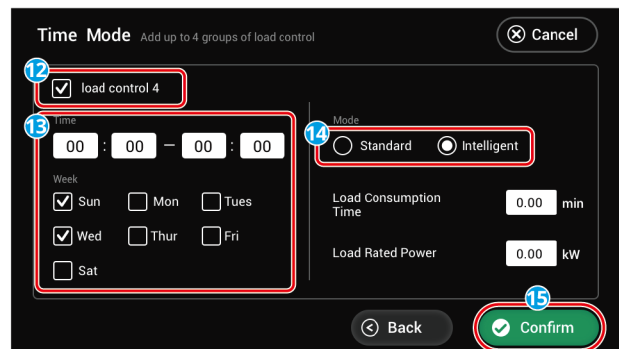
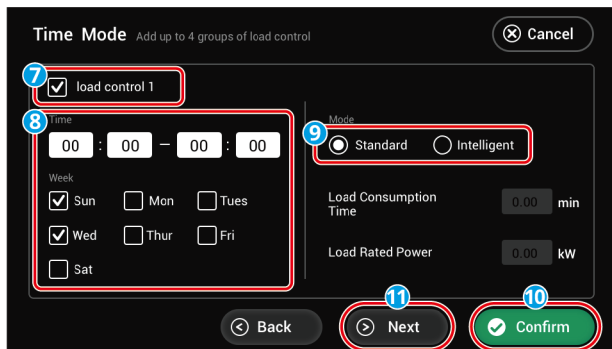
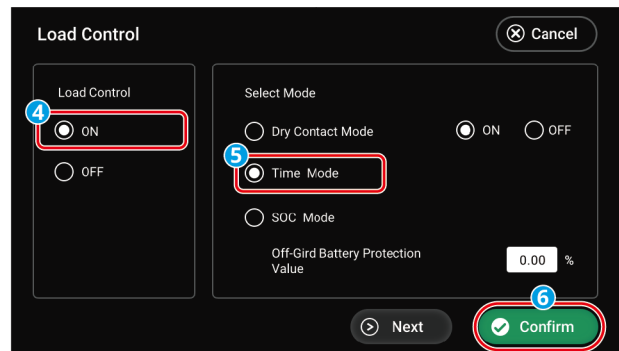
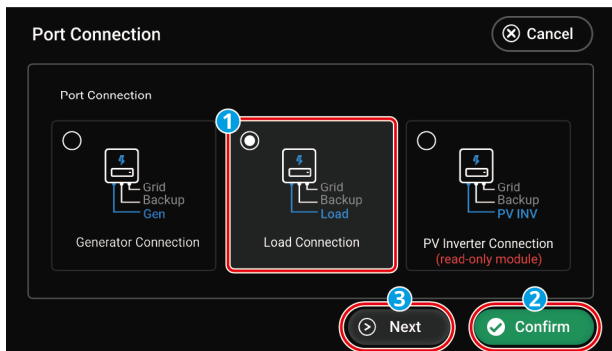
NOTICE

Please ensure to click "Confirm" on each page to validate the parameters; otherwise, the system will operate with default settings.

Dry contact mode

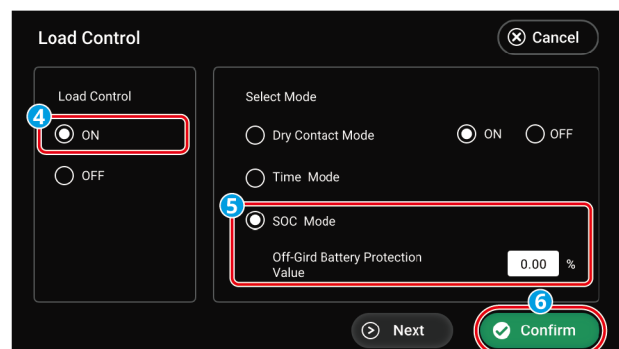
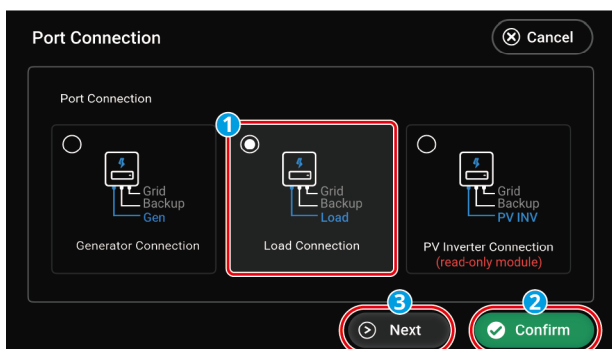


Time mode



ETL10CON0007

SOC mode



ETL10CON0006

No.	Parameter Name	Description
1	Load Control ON/OFF	Enable/disable load control function
2	Dry Contact Mode	ON: When the switch status is set to ON, power supply to the load begins. OFF: When the switch status is set to OFF, power supply to the load is terminated.
3	Time Mode	Within the set time period, the load will automatically supply power to the load or POWER OFF. Standard mode or smart mode can be selected.

4	Load Control 1	Set the 1st group load control time, up to 4 groups can be set.
5	Mode: Standard/Intelligent	Standard mode: Power will be supplied to the load during the set time period. Smart Mode: During the set time period, when the remaining energy generated by photovoltaics exceeds the preset load Nominal power, it starts supplying power to the load.
6	Load Consumption Time	Minimum operating time after load is turned on to prevent frequent switching due to energy fluctuations. Only applicable in smart mode.
7	Load Rated Power	When the surplus energy generated by the PV exceeds this load Nominal power, it starts supplying power to the load. This applies only to smart mode.
8	SOC Mode	Inverter has built-in relay dry contact control port, which can control whether to supply power to the load through the relay.
9	Off-Grid Battery Protection Value	In off-grid mode, if an overload is detected at the BACK-UP terminal or the BatterySOC value falls below the off-grid BatteryProtection setpoint, power supply to the load connected to the relay port can be terminated. Please configure the off-grid BatteryProtection value according to actual requirements.

7.3 Setting Inverter Parameters via SolarGo APP

SolarGo APP is a mobile application software that can communicate with inverters via Bluetooth and WiFi. The following are common functions:

1. View the inverter's operating data, software version, alarm information, etc.
2. Set the inverter's grid parameters, communication parameters, etc.
3. Maintain the device.

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



SolarGo APP



SolarGo APP User Manual

8 System Commissioning and Power Plant Monitoring

8.1 Setting Inverter Parameters via App

SEMS+ App is a software used for remote power station monitoring or local device debugging. It supports installers or owners:

- Remotely monitor the operation of the power station and set parameters for the station and equipment.
- Locally connect to devices, view device operation status, and set device parameters.

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



SEMS+ App User Manual

8.1.1 Download and Install SEMS+ App

Phone Requirements:

- Operating System: Android 7.0 or above, iOS 15.1 or above.
- Phone must have a web browser and be connected to the Internet.
- Phone must support WLAN/Bluetooth functionality.

Download Methods:

Method 1:

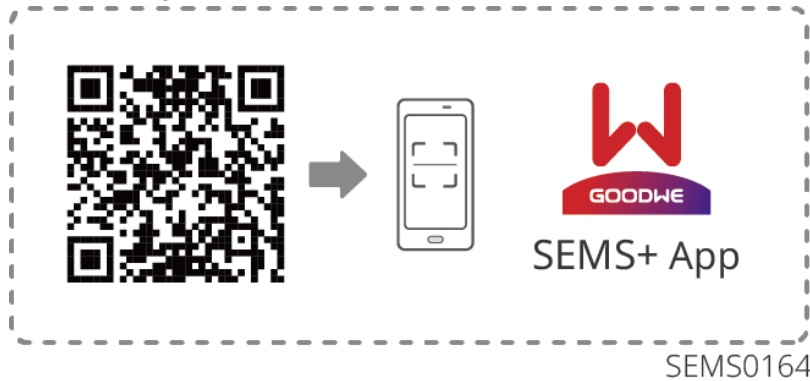
Search for "SEMS+" in Google Play, App Store, Huawei, Honor, Xiaomi, OPPO, or vivo

app stores to download and install.



Method 2:

Scan the QR code below to download and install.



8.2 Power Plant Monitoring via SEMS+ WEB

SEMS+ WEB is a monitoring platform that communicates via WiFi or LAN. The following are the 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, please refer to the ["SEMS+ WEB User Manual"](#).



"SEMS+ WEB User Manual"

9 Maintenance

9.1 Power OFF the System

DANGER

- When performing operation and maintenance on equipment within the system, please power down the system. Operating equipment while energized may cause equipment damage or risk of electric shock.
- After power is cut off from the equipment, internal components require a certain amount of time to discharge. Please wait according to the time specified on the label until the equipment is completely discharged.
- Restarting the battery should be performed using the air switch power-on method.
- When shutting down the battery system, please strictly adhere to the battery system power-down requirements to prevent damage to the battery system.
- When there are multiple batteries in the system, powering down any one battery will power down all batteries.

NOTICE

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

Power OFF Procedure

1. Turn OFF the ON-GRID circuit breaker.
2. Turn OFF the BACK-UP circuit breaker.
3. (Optional) Turn OFF the SMART circuit breaker.
4. (Select according to local regulations) Turn OFF the switch between the inverter

and the battery.

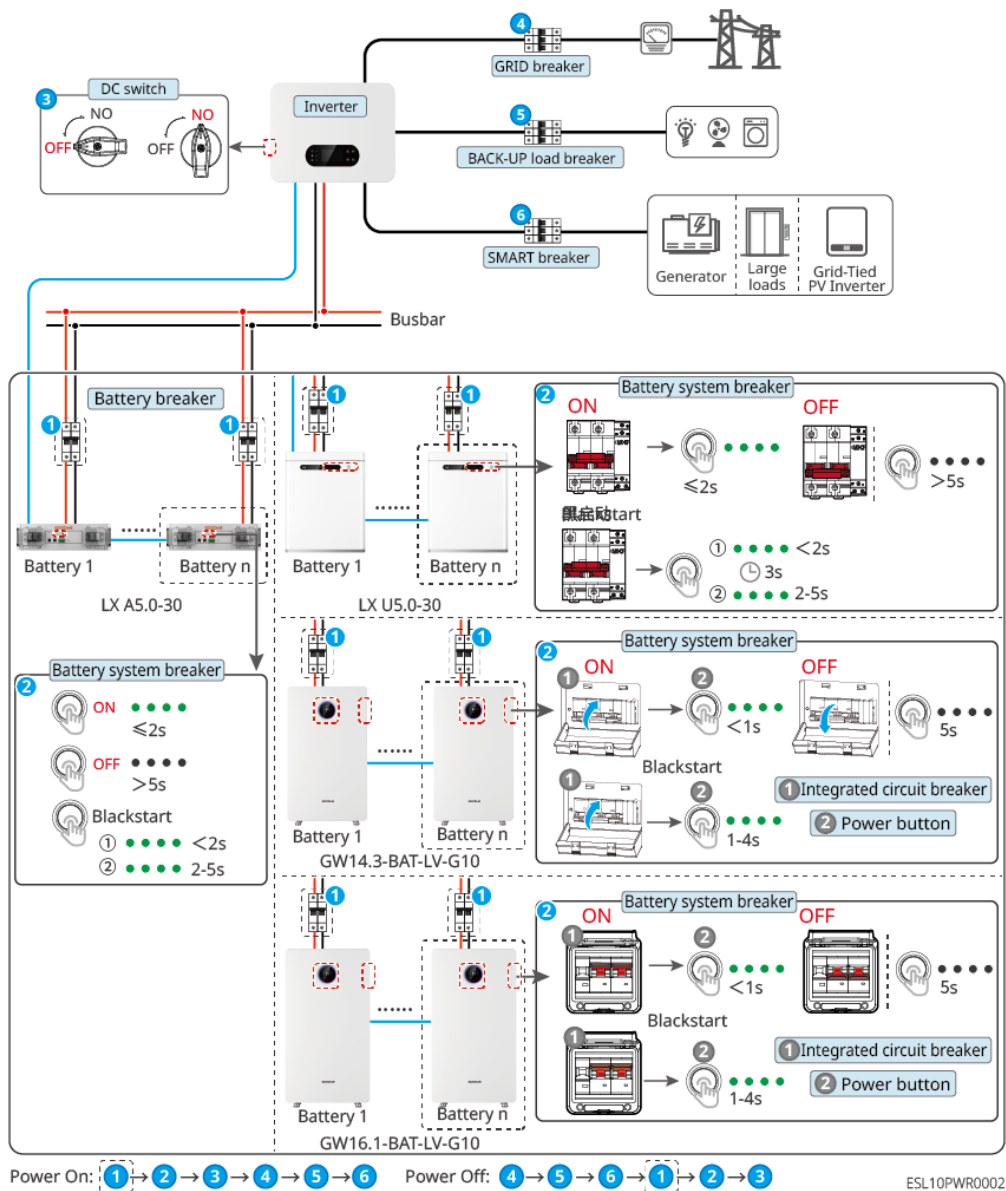
5. Power OFF the battery system:

- a. LX A5.0-30: Press and hold the battery multifunction button for more than 5 seconds.
- b. LX U5.0-30, GW14.3-BAT-LV-G10, GW16.1-BAT-LV-G10: Close the battery system integrated circuit breaker or press and hold the battery system button for more than 5 seconds, and the battery system integrated circuit breaker will automatically turn OFF.

6. (Select according to local regulations) Turn OFF the circuit breaker between the PV modules and the inverter.

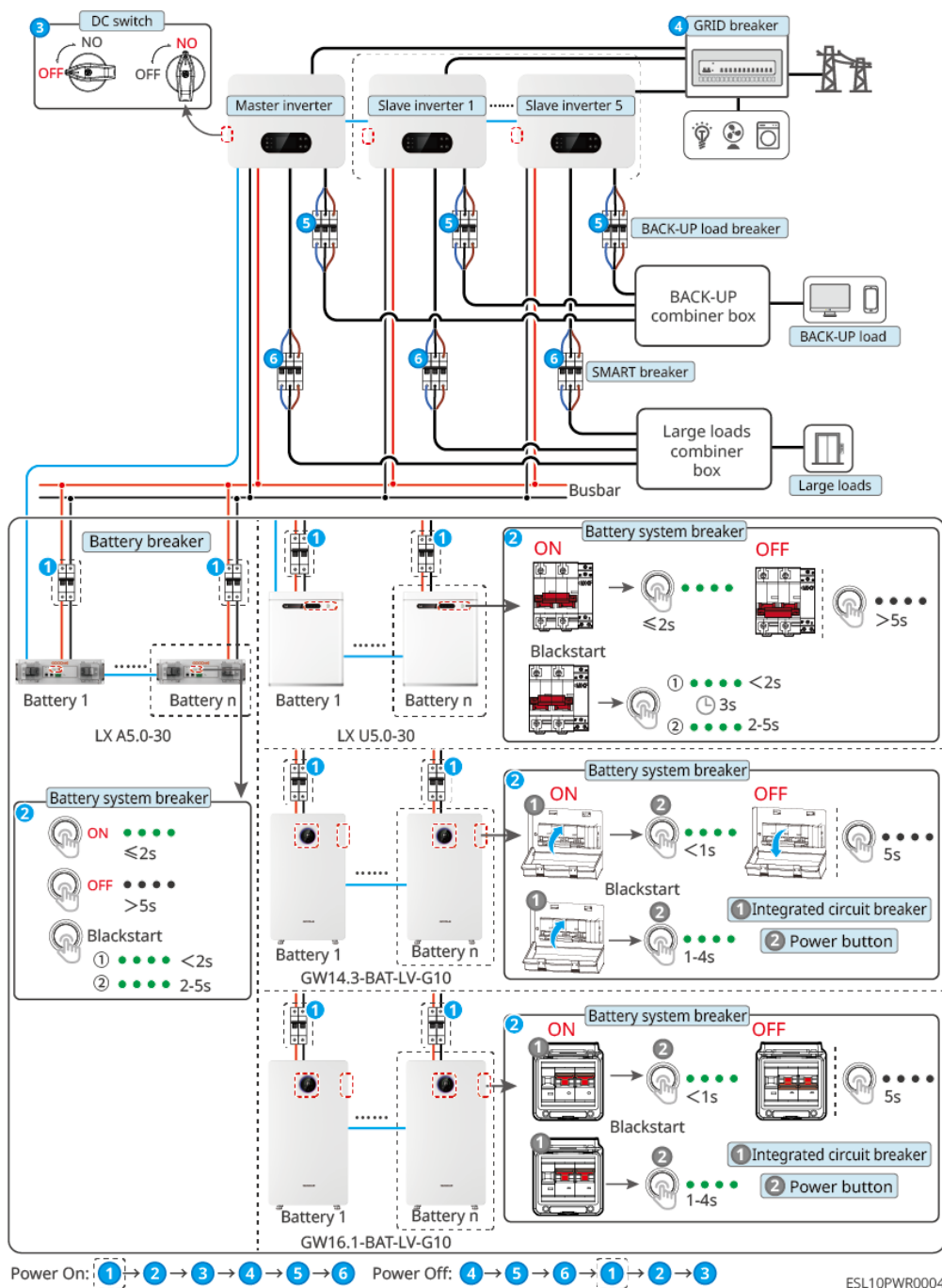
7. Turn OFF the DC switch of the inverter.

Single-unit System



Parallel System

Multiple inverters, off-grid parallel



9.2 Removing the Equipment



- Ensure the equipment is POWER OFF.
- When operating the equipment, please wear personal protective equipment.
- When connecting dismantle, use standard disassembly tools to avoid damaging terminal or equipment.
- Unless otherwise specified, the disassembly method of the equipment is the reverse sequence of the Installation method, and this document will not elaborate further.

1. Perform power off on the system.
2. Label the connected cables in the system to indicate their types.
3. Disconnect the cables in the system, such as DC cables, AC cables, Communication cable, and PE cable, from Inverter, Battery, and Smart Meter.
4. dismantle, smart dongle, Inverter, Battery, Smart Meter, and other equipment.
5. Store the equipment properly. If it is to be put into use later, ensure that the storage conditions meet the requirements.

9.3 Disposing of the Equipment

When the equipment can no longer be used and requires scrapping, it must be disposed of in accordance with the electrical waste disposal regulations of the country/region where the equipment is located. The equipment must not be treated as general household waste.

9.4 Routine Maintenance



- If any issues that may affect the Battery or hybrid inverter system are detected, please contact after-sales personnel. Unauthorized disassembly is prohibited.
- If exposed copper wires are found inside the conductive line, do not touch them. High voltage DANGER, please contact after-sales personnel. Disassembly by unauthorized personnel is prohibited.
- In case of any other emergencies, please contact the after-sales personnel immediately and follow their instructions, or wait for on-site assistance from the after-sales team.

Maintenance Content	Maintenance method	Maintenance cycle	Maintenance purpose
System cleaning	Check for any foreign objects or dust on the heat sink, fan, and air inlet/outlet. Check if the Installation space meets the requirements, and inspect whether there is any debris accumulation around the equipment.	Once every six months	Prevent heat dissipation.
System Installation	Check if the equipment Installation is secure and whether the fastenings screw are loose. Inspect the equipment for any damage or deformation to the exterior.	Once every six months to once a year	Verify the stability of the Installation equipment.
Electrical connection	Check for loose electrical connections, damaged cable insulation, and exposed copper conductors.	Once every six months to once a year	Verify the reliability of electrical connections.
Sealing	Check whether the cable entry hole Sealing of the equipment meets the requirements. If the gap is too large or unsealed, resealing is required.	Once per year	Verify that the machine's sealing and waterproof performance are intact.

Maintenance Content	Maintenance method	Maintenance cycle	Maintenance purpose
Battery maintenance	If the Battery has not been used or fully charged for a long time, it is recommended to perform regular Charge on the Battery.	Once/15 days	Protection Battery service life.

9.5 fault

9.5.1 Viewing Fault/Alarms Information

All detailed fault and alarm information for the energy storage system is displayed in the **SolarGo App**, 小固云窗+ **App**, 小固云窗+ **WEB**, and the LCD screen. If your product experiences an abnormality and you do not see relevant fault information in the **SolarGo App**, 小固云窗+ **App**, 小固云窗+ **WEB**, or on the LCD screen, please contact the after-sales service center.

- LCD Screen

Click or select the fault information icon  on the screen to view the energy storage system's alarm or fault information.

- SolarGo App

View the energy storage system's alarm information via [Home] > [Parameters] > [Alarms].

- 小固云窗+ App

1. Open the 小固云窗+ App and log in with any account.
2. On the home page, click "Alarms" to view alarm information for all power plants under the account.

- 小固云窗+ WEB

1. Open 小固云窗+ WEB and log in with any account.
2. On the power plant details interface, click "Alarms" to view all alarm information for the current power plant.

9.5.2 Fault Information and Troubleshooting

Please troubleshoot according to the following method for fault. If the troubleshooting method does not help, please contact the after-sales service center. When contacting the after-sales service center, please collect the following information to facilitate a quick resolution.

1. Product information, such as: serial number, software version, device Installation time, fault occurrence time, fault occurrence Frequency, etc.
2. Equipment Installation environment, such as weather conditions, whether the modules are shaded, have shadows, etc. Installation environment recommendations can provide photos, videos, and other documents to assist in problem analysis.
3. Utility grid situation.

9.5.2.1 System Malfunction

If the system experiences a problem not listed, or if following the instructions does not stop the problem or abnormality, immediately cease system operation and contact your dealer at once.

No.	fault	Solution
1	Unable to search for the Smart Communication Stick's wireless signal	1. Ensure no other devices are connected to the Smart Communication Stick's wireless signal. 2. Ensure the App has been upgraded to the latest version. 3. Ensure the Smart Communication Stick is powered normally, with the blue signal light blinking or steadily on. 4. Ensure the smart device is within the communication range of the Smart Communication Stick. 5. Refresh the device list in the App again. 6. Restart the inverter.

No.	fault	Solution
2	Unable to connect to the Smart Communication Stick's wireless signal	1. Ensure no other devices are connected to the Smart Communication Stick's wireless signal. 2. Restart the inverter or the Communication Stick, then try connecting to the Smart Communication Stick's wireless signal again. 3. Ensure Bluetooth encrypted pairing is successful.
3	Unable to find the router SSID	1. Place the router closer to the Smart Communication Stick, or add a WiFi repeater device to enhance the WiFi signal. 2. Reduce the number of devices connected to the router.
4	After all configuration is complete, the Smart Communication Stick fails to connect to the router	1. Restart the inverter. 2. Check if 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 device to enhance the WiFi signal.
5	After all configuration is complete, the Smart Communication Stick fails to connect to the server	Restart the router and the inverter.

9.5.2.2 Inverterfault

fault code	fault name	fault cause	Troubleshooting recommendation
F01	Grid Power Outage	1. Power outage. 2. AC line or AC Switch disconnected.	1. The alarm automatically disappears after Grid connected recovery. 2. Check whether the AC line or AC Switch is disconnected.
F02	Grid Overvoltage Protection	Utility gridvoltage exceeds the allowable range, or the high voltage Duration surpasses the high voltage ride-through setting value.	1. If it occurs occasionally, it may be due to a temporary abnormality in Utility grid. Inverter will resume normal operation after detecting that Utility grid is normal, without requiring manual intervention. 2. If it occurs frequently, check whether Utility grid and voltage are within the allowable range. • If Utility gridvoltage exceeds the permissible range, please contact the local power operator. • If the Utility gridvoltage is within the allowable range, it is necessary to modify the InverterGrid Overvoltage Protection point after obtaining consent from the local power operator.HVRTEnable or

fault code	fault name	fault cause	Troubleshooting recommendation
			disable the Grid Overvoltage Protection function. 3. If the issue persists for an extended period, please check whether the breaker on the AC side and the output cables are properly connected.
F03	Grid Undervoltage Protection	Utility gridvoltage is below the allowable range, or the low-voltage Duration exceeds the Low Voltage ride-through setting.	1. If it occurs occasionally, it may be due to a temporary abnormality in Utility grid. Inverter will resume normal operation after detecting that Utility grid is functioning properly, without requiring manual intervention. 2. If it occurs frequently, check whether the Utility grid voltage is within the allowable range. • If the Utility gridvoltage exceeds the permissible range, please contact the local power operator. • If the Utility gridvoltage is within the allowable range, it is necessary to modify the InverterGrid Undervoltage Protection

fault code	fault name	fault cause	Troubleshooting recommendation
			point after obtaining consent from the local power operator.LVRTEnable or disable the Grid Undervoltage Protection function. 3. If the issue persists for an extended period, please check whether the AC-side breaker and output cables are properly connected.
F04	Grid Rapid Overvoltage Protection	Utility gridvoltage detection shows abnormality or ultra-high voltage triggers fault.	1. If it occurs occasionally, it may be due to a temporary abnormality in the Utility grid. The Inverter will resume normal operation after detecting that the Utility grid is functioning properly, without requiring manual intervention. 2. If it occurs frequently, check whether Utility grid and voltage are within the allowable range. • If the Utility gridvoltage exceeds the permissible range, please contact the local power operator.

fault code	fault name	fault cause	Troubleshooting recommendation
			• If the Utility gridvoltage is within the allowable range, it is necessary to modify the InverterGrid Undervoltage Protection point after obtaining consent from the local power operator.LVRTEnable or disable the Grid Undervoltage Protection function. 3. If the issue persists for an extended period, please check whether the AC-side breaker and output cables are properly connected.

fault code	fault name	fault cause	Troubleshooting recommendation
F05	10minOvervoltage Protection	In10minThe sliding average of Utility gridvoltage exceeds the safety regulation limits.	1. If it occurs occasionally, it may be due to a temporary anomaly in Utility grid. Inverter will resume normal operation after detecting that Utility grid is functioning properly, without requiring manual intervention. 2. Check if Utility grid voltage is operating at a consistently high voltage. If this occurs frequently, verify whether Utility grid voltage is within the permissible range. • If Utility gridvoltage exceeds the permissible range, please contact the local power operator. • If Utility gridvoltage is within the allowable range, it is necessary to obtain the consent of the local power operator before modifying Utility grid.10minOvervoltage Protection point.

fault code	fault name	fault cause	Troubleshooting recommendation
F06	Grid Overfrequency	Utility grid anomaly: Utility grid actual Frequency exceeds local Utility grid standard requirements.	1. If it occurs occasionally, it may be due to a temporary anomaly in Utility grid. Inverter will resume normal operation upon detecting that Utility grid is functioning properly, without requiring manual intervention. 2. If it occurs frequently, please check whether Utility grid Frequency is within the allowable range. • If the Utility gridFrequency exceeds the permissible range, please contact the local power operator. • If the Utility gridFrequency is within the allowable range, the Grid Overfrequency point needs to be modified after obtaining consent from the local power operator.

fault code	fault name	fault cause	Troubleshooting recommendation
F07	Grid Underfrequency	Utility grid anomaly: Utility grid actual Frequency is lower than the local Utility grid standard requirement.	1. If it occurs occasionally, it may be due to a temporary abnormality in Utility grid. Inverter will resume normal operation after detecting that Utility grid is functioning properly, without requiring manual intervention. 2. If it occurs frequently, check whether Utility gridFrequency is within the allowable range. • If Utility gridFrequency exceeds the permissible range, please contact the local power operator. • If the Utility gridFrequency is within the allowable range, the Grid Overfrequency point needs to be modified after obtaining consent from the local power operator.

fault code	fault name	fault cause	Troubleshooting recommendation
F08	Grid Frequency Instability	Utility grid anomaly: Utility grid actual Frequency variation rate does not comply with local Utility grid standard.	1. If it occurs occasionally, it may be due to a temporary abnormality in Utility grid. Inverter will resume normal operation after detecting that Utility grid is normal, without requiring manual intervention. 2. If it occurs frequently, check whether Utility grid and Frequency are within the allowable range. • If Utility gridFrequency exceeds the permissible range, please contact the local power operator. • If Utility gridFrequency is within the allowable range, please contact your dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F163	Grid Phase Instability	Utility grid anomaly: Utility grid voltage phase variation rate does not comply with local Utility grid standard.	1. If it occurs occasionally, it may be due to a temporary anomaly in Utility grid. Inverter will resume normal operation after detecting that Utility grid is functioning properly, without requiring manual intervention. 2. If it occurs frequently, check whether Utility grid and Frequency are within the allowable range. • If Utility gridFrequency exceeds the permissible range, please contact the local power operator. • If the Utility gridFrequency is within the allowable range, please contact your dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F09	Anti-islanding Protection	Utility grid has been disconnected. Due to the presence of load, Utility grid voltage is maintained. According to safety regulation Protection, on-grid is stopped.	1. If it occurs occasionally, it may be due to a temporary anomaly in Utility grid. Inverter will resume normal operation after detecting that Utility grid is functioning properly, without requiring manual intervention. 2. If it occurs frequently, check whether Utility grid and Frequency are within the allowable range. • If Utility gridFrequency exceeds the permissible range, please contact the local power operator. • If the Utility gridFrequency is within the allowable range, please contact your dealer or after-sales service center.
F10	undervoltage ride-through	Utility grid anomaly: Grid Voltage Abnormal duration exceeds the specified high-low transition time.	

fault code	fault name	fault cause	Troubleshooting recommendation
F11	HVRT Overvoltage	Utility grid anomaly: Grid Voltage Abnormal duration exceeds the specified high-low crossing time.	1. If it occurs occasionally, it may be due to a temporary abnormality in Utility grid. Inverter will resume normal operation after detecting that Utility grid is normal, without requiring manual intervention. 2. If this occurs frequently, please check whether the Utility grid, voltage, and Frequency are within the allowable range and stable. If not, contact the local power operator; if yes, contact your dealer or after-sales service center.
F43	Grid Waveform Abnormal	Utility grid anomaly: Utility gridvoltage detection triggered fault due to abnormality.	
F44	Grid Phase Loss	Utility grid anomaly: Utility gridvoltage has a single-phase voltage dip.	

fault code	fault name	fault cause	Troubleshooting recommendation
F45	Grid Voltage Imbalance	Utility grid phase voltage difference is too large.	1. If it occurs occasionally, it may be due to a temporary abnormality in Utility grid. Inverter will resume normal operation after detecting that Utility grid is normal, without requiring manual intervention. 2. If this occurs frequently, please check whether the Utility grid, voltage, and Frequency are within the allowable range and stable. If not, contact the local power operator; if yes, contact your dealer or after-sales service center.
F46	Grid Phase Sequence Failure	Inverter and Utility grid wiring abnormality: wiring is not in positive sequence	1. Check whether the wiring of Inverter and Utility grid is in positive sequence. After the wiring is corrected (e.g., by swapping any two live wires), fault will automatically disappear. 2. If the fault persists despite correct wiring, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F47	Grid Rapid Shutdown Protection	Quickly shut down the output upon detecting the Grid Power Outage operating condition.	1. Grid connected automatically disappears after fault is restored
F48	Grid Neutral Wire Loss	Phase Separation Grid Neutral Wire Loss	1. The alarm automatically disappears after Grid connected recovery. 2. Check whether the AC line or AC Switch is disconnected.
F160	EMS/Forced off-grid	EMS Issue forced off-grid command, but the off-grid function is not enabled.	Enable off-grid function
F161	Passive Anti-islanding Protection	-	-
F162	Grid Type Fault	Actual Type of Electrical Supply System (two-phase or split-phase) does not match the set safety regulations.	Switch the corresponding safety regulations according to the actual Type of Electrical Supply System.

fault code	fault name	fault cause	Troubleshooting recommendation
F12	30mAGfciProtection	During operation, the input-to-ground insulation resistance becomes low.	1. If it occurs occasionally, it may be caused by temporary external line abnormalities. It will resume normal operation after the fault is cleared, without requiring manual intervention. 2. If the issue occurs frequently or persists for an extended period, check whether the PV String ground impedance is too low.
F13	60mAGfciProtection	During operation, the input-to-ground insulation resistance becomes low.	1. If it occurs occasionally, it may be caused by temporary external line abnormalities. The system will resume normal operation after fault is cleared, without requiring manual intervention. 2. If the issue occurs frequently or cannot be resolved for an extended period, please check whether the PV String ground impedance is too low.

fault code	fault name	fault cause	Troubleshooting recommendation
F14	150mAGfciProtection	During operation, the input-to-ground insulation resistance becomes low.	1. If it occurs occasionally, it may be caused by temporary abnormalities in the external circuit. It will return to normal operation after fault is cleared, without requiring manual intervention. 2. If the issue occurs frequently or cannot be resolved for an extended period, please check whether the PV String ground impedance is too low.
F15	Gfcigradual change Protection	During operation, the input-to-ground insulation resistance becomes low.	1. If it occurs occasionally, it may be caused by temporary abnormalities in the external circuit. The system will resume normal operation after fault is cleared, without requiring manual intervention. 2. If the issue occurs frequently or persists for an extended period, please check whether the PV String ground impedance is too low.

fault code	fault name	fault cause	Troubleshooting recommendation
F16	DCIPrimary Protection	The current of the inverter output is outside the safety regulations or the default permissible range of the machine.	1. If the abnormality is caused by an external fault, the Inverter will automatically resume normal operation after the fault disappears, without requiring 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.
F17	DCISecondary Protection	The High DC Component of the inverter output current exceeds the safety regulations or the default permissible range of the machine.	1. If the abnormality is caused by an external fault, the Inverter will automatically resume normal operation after the fault disappears, without requiring 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	Troubleshooting recommendation
F18	Low Insulation Resistance	1. PV String is short-circuited to ground for Protection. 2. The environment of PV String Installation is consistently humid, and the line-to-ground insulation is poor. 3. Batteryport line-to-ground Low Insulation Resistance.	1. Check the impedance between PV String/Batteryport and ground Protection. A resistance greater than 80kΩ is normal. If the measured resistance is less than 80kΩ, locate and rectify the short-circuit point. 2. Check whether the PE cable of the Inverter is properly connected. 3. If it is confirmed that the impedance is indeed lower than the default value in rainy weather, please reset the "Inverter insulation resistance Protection point" via the App. Australia and New Zealand markets Inverter, when insulation resistance fault occurs, can also issue alarms through the following methods: 1. Inverter is equipped with a buzzer, which will sound continuously for 1 minute when a fault occurs; if the fault is not resolved, the buzzer will sound again every 30

fault code	fault name	fault cause	Troubleshooting recommendation
			minutes. 2. If Inverter is added to the monitoring platform and the alarm notification method is configured, alarm information can be sent to customers via email.
F19	Grounding Abnormal	1. Inverter's PE cable Not Connected. 2. When the output of PV String is grounded, the output side of Inverter is not connected to an isolation transformer.	1. Please confirm whether the Inverter of PE cable is Not Connected normal. 2. In the scenario where the output of PV String is grounded, please confirm whether an isolation transformer is connected on the output side of Inverter.
F49	L-PE Short Circuit	Output phase line toPELow impedance or short circuit	Detect output phase line toPEImpedance, identify Locations with low impedance and repair them.

fault code	fault name	fault cause	Troubleshooting recommendation
F50	DCVPrimary 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 requiring 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.
F51	DCVsecondary 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 requiring 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	Troubleshooting recommendation
F20	Hardware Export 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 requiring 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.
F21	Internal Comm Loss	Reference specific subcode reason	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault still persists, please contact the dealer or after-sales service center.
F52	Leakage currentGFCIMultiple fault shutdowns	North American safety regulations require that after multiple fault, the system must not recover automatically and requires manual intervention or waiting.24hPost-recovery	1. Please check if the PV String ground impedance is too low.

fault code	fault name	fault cause	Troubleshooting recommendation
F53	DC Arc Failure AFCI Multiple fault shutdowns	North American safety regulations require that after multiple fault, the system must not automatically recover and requires manual intervention or waiting. 24h post-recovery	1. After the machine is re-on-grid, check whether the voltage current of each circuit is abnormally reduced to zero. 2. Check if the DC-side terminal is securely connected.
F54	External communication link failure	Inverter external device communication lost, possibly due to peripheral power supply issue, Communication Protocols mismatch, or unconfigured corresponding peripheral.	Judgment is made based on the actual model and detection enable bits. Peripherals not supported by certain models will not be detected.
F55	Back-upport Overload fault	1. Prevent Inverter from continuous Overload output.	1. Disconnect some off-grid loads to reduce the off-grid output Power of the Inverter.

fault code	fault name	fault cause	Troubleshooting recommendation
F56	Back-upport overvoltage fault	2. Prevent damage to the load caused by overvoltage in the Inverter output.	1. If it occurs occasionally, it may be caused by load switching and does not require manual intervention. 2. If this occurs frequently, please contact the dealer or after-sales service center.
F107	On-grid PWM Sync Failure	Abnormal occurrence in carrier synchronization on-grid	1Check if the synchronization line connection is normal. 2Check if the master-slave setting is normal. 3Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F57	External connectionBoxfault	Waiting during Switch On-Grid to Off-GridBoxExcessive relay switching time	1. InspectionBoxIs it functioning properly; 2. InspectionBoxIs the communication wiring correct?
-	Generator Failure		

fault code	fault name	fault cause	Troubleshooting recommendation
F22	Generator waveform detection fault	1. In the case of a Not Connected generator, this fault will always be displayed. 2. During generator operation, failure to meet generator safety regulations will trigger this fault.	1. When the generator is not connected, ignore this fault; 2. This fault is normal when the generator experiences fault. After the generator recovers, wait for a period of time, and the fault will clear automatically. 3. The fault will not affect the normal operation of the off-grid mode. 4. The generator and Utility grid are connected simultaneously and meet safety requirements. Utility grid takes priority for on-grid and will operate in the Utility grid on-grid state.
F23	Abnormal generator connection		
F24	Generator voltage low		
F25	Generator voltage high		
F26	Generator Frequency low		
F27	Generator Frequency high		
F109	External connectionSTSfault	andSTSA abnormal connection cable	Check Inverter andSTSI the wiring sequence of the harness connections one-to-one and sequentially corresponding?
F58	CTMissing fault	CTConnection line disconnected (Japanese safety standard requirement)	InspectionCTIs the wiring correct.

fault code	fault name	fault cause	Troubleshooting recommendation
F110	Export Limit Protection	1. Inverter fault trip-off 2. meterUnstable communication 3. Reverse power flow condition	1. Check if there are any other error messages in Inverter. If present, perform targeted troubleshooting. 2. InspectionmeterIs the connection 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	BypassOverload	-	-
F112	Black Start Failure	-	-
F28	Parallel operationIOSelf-test anomaly	Parallel communication line is not securely connected or parallel operation is not functioning.IOChip damage	Check if the parallel communication cable is securely connected, and then recheck.IOCheck if the chip is damaged, and if so, replace it.IOChip.
F59	Parallel operationCANComm unication anomaly	Parallel communication cable is not securely connected or some units are offline.	Check whether all machines are power on and ensure the parallel communication cables are securely connected.

fault code	fault name	fault cause	Troubleshooting recommendation
F29	Paralell Grid Line Reversed	Some machines have the Utility grid line reversed with other connections.	Reconnect the Utility grid wire.
F60	Parallel operationBack-upreverse connection	Partial machinesbackupLine reversed with other connections	reconnectionbackupLine.
F61	Inverter Soft Start Failure	Off-grid cold start Inverter Soft Start Failure	Check whether the inverter module of the machine is damaged.
F113	Offgrid AC Ins Volt High	-	-
F30	AC HCT check Abnormal	AC sensor sampling anomaly detected	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F62	AC HCT Failure	HCTSensor anomaly detected	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F31	GFCI HCT Check Abnormal	Leakage current sensor sampling anomaly detected	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F63	GFCI HCT Failure	Leakage current sensor abnormality detected	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F32	Relay Check Abnormal	Relay abnormality, cause: 1Relay abnormality (relay short circuit) 2Relay sampling circuit abnormal. 3Abnormal AC side wiring (possible loose connection or short circuit phenomenon)	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F64	Relay Failure	1Relay abnormality (relay short circuit) 2Relay sampling circuit abnormality. 3Abnormal AC side wiring (possible loose connection or short circuit phenomenon)	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F164	String (array)17~32)	1DC side connection terminal loose; 2DC side connection terminal poor contact; 3Core damage and poor contact	1After the machine is re-on-grid, check whether the voltage current of each circuit is abnormally reduced to zero. 2Check if the DC-side terminal is securely connected.
F165	DC Arcing Failure (string)33~48)	1DC side connection terminal loose; 2DC side connection terminal loose contact; 3Core damage and poor contact	1After the machine is re-on-grid, check whether the voltage current of each circuit is abnormally reduced to zero. 2Check if the DC side terminal is securely connected.
F33	FlashRead/Write Error	Possible causes: flashContent has been changed;flashEnd of life	1. Upgrade to the latest version of the program 2. Contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F42	String (array)1~16)	1DC side connection terminal loose; 2DC side connection terminal loose contact; 3Core damage and poor contact	1After the machine is re-on-grid, check whether the voltage current of each circuit is abnormally reduced to zero. 2Check if the DC-side terminal is securely connected.
F34	AFCI Check Failure	During the Arc Failure self-check process, the Arc Failure module failed to detect the Arc Failure.	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F65	AC Terminal Overtemperature	AC Terminal Overtemperature, Possible causes: 1InverterInstallation Location non-ventilated. 2Ambient Overtemperature 3Internal fan operation abnormal.	

fault code	fault name	fault cause	Troubleshooting recommendation
F35	Cabinet Overtemperature	Cabinet Overtemperature, Possible causes: 1InverterInstallation Location is not ventilated. 2Ambient Overtemperature 3Internal fan operation abnormal.	1Check whether the ventilation of InverterInstallation Location is adequate and whether the ambient temperature exceeds the maximum allowable range. 2If there is no ventilation or Ambient Overtemperature, please improve its ventilation and heat dissipation conditions.
F66	INVModule temperature too high	Inverter module temperature too high, possible causes: 1InverterInstallation Location not ventilated. 2Ambient Overtemperature 3Internal fan operation abnormal.	3If ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F67	BoostModule temperature too high	BoostModule temperature too high, possible causes: 1Inverter Installation Location not ventilated. 2Ambient Overtemperature 3Internal fan operation abnormal.	
F68	AC Capacitor Overtemperature	Output filter capacitor temperature is too high, possible causes: 1InverterInstallatio n Location not ventilated. 2Ambient Overtemperature 3Internal fan operation abnormal.	

fault code	fault name	fault cause	Troubleshooting recommendation
F114	Relay Failure2	Relay abnormality, cause: 1 Relay abnormality (relay short circuit) 2 Relay sampling circuit abnormality. 3 Abnormal AC side wiring (possible loose connection or short circuit phenomenon)	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F69	PV IGBT short circuit	Possible causes: 1. IGBT short circuit 2 Inverter sampling circuit abnormality	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F70	PV IGBT open circuit	1. Software issue causing no wave transmission 2. Drive circuit abnormality: 3. IGBT Open Circuit	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F71	NTCAbnormal	NTCTemperature sensor abnormality detected	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F72	PWM Abnormal	PWMAbnormal waveform detected	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F73	CPUInterruption anomaly	CPUInterruption anomaly occurred	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F74	Microelectronics fault	Function Safety detected an anomaly	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F75	PV HCTfault	boostcurrent sensor anomaly	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F76	1. 5VBaseline anomaly	Reference Circuit fault	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F77	0. 3VBaseline anomaly	Reference circuit	
F78	CPLDVersion identification error	CPLDVersion identification error	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F79	CPLDCommunication fault	CPLDandDSPCommunication content error or timeout	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F80	Model Identification fault	fault of Model Recognition Error	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F115	SVGPrecharge Disabled	SVGPrecharge hardware failure	Contact the dealer or after-sales service center.
F116	NightSVG PIDPrevention of fault	PIDPrevent hardware anomalies	Contact the dealer or after-sales service center.
F117	DSPVersion identification error	DSPSoftware version identification error	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F36	Bus Overvoltage		Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F81	P-Bus Overvoltage		
F82	N-Bus Overvoltage		
F83	DeputyCPU1)		
F84	DeputyCPU1)		

fault code	fault name	fault cause	Troubleshooting recommendation
F85	DeputyCPU1)	BUSOvervoltage, possible causes: 1. PVvoltage too high 2InverterBUSSampling anomaly 3The rear-end double splitting has poor isolation effect, causing mutual interference between the two Inverter on-grid. One of them reports DC overvoltage when Inverter on-grid.	
F86	DeputyCPU2)		
F87	DeputyCPU2)		
F88	DeputyCPU2)		
F89	P-Bus Overvoltage(CPLD)		
F90	Complex Programmable Logic Device (CPLD)		
F118	MOSContinuous overvoltage	1. Software issue causes the inverter drive to shut down earlier than the flyback drive. 2. Inverter drive circuit abnormality prevents turn-on. 3. PVvoltage too high 4. MosSampling anomaly	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F119	Busbar short circuit	1. Hardware damage	In case of occurrenceBUSAfter a fault short circuit, the Inverter remains in an off-grid state. Please contact the dealer or after-sales service center.
F120	Busbar sampling abnormality	1. BusSampling hardware	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F121	DCLateral sampling abnormality	1. Bus sampling hardware 2. Battery Voltage Sampling Hardware fault 3. DcrlyRelay Failure	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F37	PVInput overvoltage	PVvoltage input is too high, possible causes: PV array configuration error, the number of PV Battery panels connected in series is excessive, causing the open-circuit voltage of the string to exceed the maximum operating voltage of the Inverter.	Check the series configuration of the corresponding PV array string to ensure that the open-circuit voltage of the string does not exceed the maximum working voltage of Inverter. Once the PV array is correctly configured, the Inverter alarm will automatically disappear.
F38	PVContinuous Hardware Overcurrent	1. Unreasonable module configuration 2. Hardware damage	Disconnect the AC output side switch and DC input side switch,5After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F39	PVContinuous software overcurrent	1. Unreasonable module configuration 2. Hardware damage	
F91	FlyCap Software Overvoltage	Flying capacitor overvoltage, possible causes: 1. PVvoltage too high 2Flying capacitor sampling anomaly	

fault code	fault name	fault cause	Troubleshooting recommendation
F92	FlyCap Hardware Overvoltage	Flying capacitor overvoltage, possible causes: 1. PVvoltage too high 2Inverter flying capacitor voltage sampling anomaly;	Disconnect the AC output side switch and DC input side switch,5After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F93	FlyCap Undervoltage	FlyCap Undervoltage, Possible causes: 1. PVEnergy deficit; 2Inverter flying capacitor voltage sampling anomaly;	
F94	FlyCap Precharge Failure	FlyCap Precharge Failure, Possible causes: 1. PVEnergy deficiency; 2Inverter flying capacitor voltage sampling anomaly;	
F95	FlyCap Precharge Abnormal	1. Unreasonable control loop parameters 2. Hardware damage	
F96	String overcurrent(String1~16)		

fault code	fault name	fault cause	Troubleshooting recommendation
F97	String overcurrent(String1 7~32)	Possible causes: 1. String Overcurrent 2. String current sensor anomaly	
F40	String reverse connection(String1~16)	PVString reverse connection	Check if the string is reverse connected.
F98	String reverse connection(String17~32)	PVString reverse connection	Check if the string is reverse connected.
F99	String loss(String1~16)	String fuse disconnected (if applicable)	Check if the fuse is blown.
F100	String loss(String17~32)	String fuse disconnected (if applicable)	Check if the fuse is blown.

fault code	fault name	fault cause	Troubleshooting recommendation
F122	PVAccess Mode setting error	PVAccess Mode has three modes, with four channels.MPPTFor example: 1. Parallel mode: that isAAAAMode(homologous mode),PV1-PV4homologous,4RoadPVConnect the same photovoltaic panel 2. Partial Parallel Mode: That isAACCMode,PV1and PV2homologous connection,PV3and PV4homologous connection 3. Stand-alone mode: i.e.ABCDMode(non-homologous),PV1、PV2、PV3、PV4Independent connection,4RoadPVEach connected to a photovoltaic panel IfPVActual Access Mode versus equipment	InspectionPVIs Access Mode correctly set (ABCD、AACC、AAAA), reset in the correct mannerPVAccess Mode 1. Confirm the actual connection of each circuitPVIs the connection correct. 2. IfPVCorrectly connected, passedAppOr check the current settings on the screenPVAccess Mode" corresponds to the actual Access Mode. 3. If the currently setPVAccess Mode" does not match the actual Access Mode, and needs to be adjusted throughAppor the screen willPVAccess Mode" is set to a mode consistent with the actual situation. After the setup is completed,PVandACPower supply disconnection and restart. 4. After the setup is completed, if the currentPVAccess Mode matches the actual Access Mode, but this fault is still reported. Please contact

fault code	fault name	fault cause	Troubleshooting recommendation
		settingsPVAccess Mode does not match, this fault will be reported.	the dealer or after-sales service center.
-	String reverse connection(String33~48)	PVString reverse connection	Check if the string is reverse connected.
-	String loss(String33~48)	String fuse disconnected (if applicable)	Check if the fuse is blown.
-	String overcurrent(String33~48)	Possible causes: 1. String Overcurrent 2. String current sensor anomaly	

fault code	fault name	fault cause	Troubleshooting recommendation
F123	Multi-channel PV phase error	Incorrect PV input mode setting	Check if the PVAccess Mode is correctly set (ABCD, AACC, AAAA) and reset the PVAccess Mode in the correct manner. 1. Verify that each connected PV string is correctly wired. 2. If the PV is correctly connected, check via the App or screen whether the currently set "PVAccess Mode" corresponds to the actual Access Mode. 3. If the currently set "PV Access Mode" does not match the actual Access Mode, it is necessary to use the App or screen to set the "PV Access Mode" to the mode consistent with the actual situation. After completing the settings, disconnect the PV and AC power supply and restart. 4. After the setup is completed, if the current "PV string" matches the actual string but this alarm still occurs, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F101	Battery1Precharge resistor	Battery1Pre-circuit fault (e.g., pre-resistance burnout, etc.)	Check whether the pre-Charge circuit is in good condition, and verify that the Battery power on after Battery Voltage matches the busbar voltage. If they do not match, please contact the distributor or after-sales service center.
F102	Battery1Relay Failure	Battery1The relay fails to operate properly.	After Battery power on, check if the Battery relay operates and if a closing sound is heard. If it does not function, please contact the distributor or after-sales service center.
F103	Battery1overvoltage at connection point	Battery1The voltage input exceeds the rated range of the machine.	Verify whether Battery Voltage is within the machine's rated range.
F104	Battery2Precharge fault	Battery2Pre-Charge circuit fault (such as pre-Charge resistor burnout, etc.)	Check whether the pre-Charge circuit is in good condition, and verify that the Battery power on after Battery Voltage matches the busbar voltage. If they do not match, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F105	Battery2Relay Failure	Battery2The relay fails to operate normally.	After Battery power on, check whether the Battery relay operates and if the closing sound is heard. If it does not function, please contact the dealer or after-sales service center.
F106	Battery2overvoltage at connection point	Battery2The input voltage exceeds the rated range of the machine.	Verify if Battery Voltage is within the machine's rated range.
F124	Battery1Reverse polarity fault	Battery1Reverse polarity of positive and negative terminals	Check whether the polarity of Battery and the machine terminals is consistent.
F125	Battery2Reverse connection	Battery2Reverse polarity of positive and negative terminals	Check whether the polarity of Battery and the machine terminal is consistent.
F126	Abnormal connection of Battery	Abnormal Access of Battery	Check if the Battery is functioning properly.
-	BMS Status Bit Error	BMS Module fault	Disconnect the AC output side switch and DC input side switch, then close the AC output side switch and DC input side switch after 5 minutes. If fault persists, please contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F127	BAT Overtemperature	Battery temperature is too high, possible causes: 1 Inverter Installation Location not ventilated. 2 Ambient Overtemperature 3 Internal fan operation abnormal.	
F128	Ref Voltage Abnormal	Reference Circuit fault	Disconnect the AC output side switch and DC input side switch, 5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F129	Cabinet Under Temperature	Cabinet Under Temperature, Possible causes: 1. The ambient temperature is too low.	
F130	AC side SPD fault	AC Failure of lateral lightning protection device	Replacement AC Side lightning protection device.
F131	DC side SPD fault	DC Failure of lateral lightning protection device	Replacement DC Side lightning protection device.

fault code	fault name	fault cause	Troubleshooting recommendation
F132	Internal Fan Abnormal	Internal Fan Abnormal, possible causes: 1Abnormal fan power supply; 2Mechanical fault(Locked rotor); 3Fan aging and damage.	Disconnect the AC output side switch and DC input side switch,5 After a few minutes, close the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or after-sales service center.
F133	External Fan Abnormal	External Fan Abnormal, Possible causes: 1Abnormal fan power supply; 2Mechanical fault(Locked rotor); 3Fan aging and damage.	
F134	PIDDiagnosis anomaly	PIDHardware fault orPVvoltage too highPIDSuspend	PVOvervoltage caused by voltagePIDPause WARNING No processing required,PIDHardware fault can be turned off.PIDSwitch Reclose ClearPIDfault, replacementPIDinstallatio n

fault code	fault name	fault cause	Troubleshooting recommendation
F135	Trip-Switch Trip Warning	Possible causes: Overcurrent orPVReverse connection causes the trip switch to trip.	Please contact the dealer or after-sales service center. The reason for disconnection is due to occurrence.PVShort circuit or reverse connection, need to check for any historical issues.PVShort circuit WARNING or historyPVReverse connection WARNING. If present, maintenance personnel should inspect the corresponding issue.PVSituation. After confirming there is no fault, the trip switch can be manually closed, and then pass through.AppInterface clear history fault operation clears this WARNING.

fault code	fault name	fault cause	Troubleshooting recommendation
F136	HistoryPV IGBT short circuit	Possible causes: Overcurrent caused the trip switch to open.	Please contact the dealer or after-sales service center. Maintenance personnel must follow the historicalPVShort-circuit WARNING subcode, check for short-circuit occurrenceBoostCheck if there is any fault in the hardware and external string; After confirming there is no fault, it can proceed.AppInterface clear history operation clears the WARNING.
F137	HistoryPVReverse connection WARNING(String1~16)	Possible causes: OccurrencePVReverse connection causes the trip switch to trip.	Contact the dealer or after-sales service center. Maintenance personnel should follow the historicalPVReverse connection WARNING subcode, check whether the corresponding string has a reverse connection, inspectPVIIs there a voltage difference in the panel configuration? After checking, it can be passed if there is no fault.AppInterface Clear History fault Operation Clears This WARNING.

fault code	fault name	fault cause	Troubleshooting recommendation
F138	historyPVReverse connection WARNING(String17~32)	Possible causes: OccurrencePVReverse connection causes the trip switch to trip.	Contact the dealer or after-sales service center. Maintenance personnel should follow the historicalPVReverse connection WARNING subcode, check whether the corresponding string has a reverse connection, inspectPVIIs there a voltage difference in the panel configuration? After checking and confirming no fault, it can be passed.AppInterface Clear History fault Operation Clears This WARNING.
F139	FlashRead/Write Error	Possible causes: flashContent has been changed;flashEnd of life	1. Upgrade to the latest version of the program. 2. Contact the dealer or after-sales service center.

fault code	fault name	fault cause	Troubleshooting recommendation
F140	Meter Comm Loss	This WARNING may only be reported after enabling the Power Limit function. Possible causes: 1. Meter not connected; 2. The communication line connection between the meter and Inverter is incorrect.	Check the meter wiring and ensure the meter is correctly connected. If fault persists after inspection, please contact the dealer or after-sales service center.
F141	PVPanel type identification failed	PVPanel identification hardware anomaly	Contact the dealer or after-sales service center.
F142	PV String Mismatch	PVPV String Mismatch, same circuitMPPTThe configurations of the next two strings are different.	Check the two strings open-circuit voltage, and configure the strings with the same open-circuit voltage to the same circuit.MPPTProlonged PV String Mismatch poses safety hazards.
F143	CTNot connected	CTNot connected	InspectionCTWiring.
F144	CTReverse connection	CTReverse connection	InspectionCTWiring.
F145	PE Loss/PE Loss	Ground wire not connected	Check the ground wire.

fault code	fault name	fault cause	Troubleshooting recommendation
F146	String terminal temperature high(String1~8)	37176RegisterPVterminal temperature alarm subcode1Set position	-
F147	String terminal temperature high(String9~16)	37177RegisterPVterminal temperature alarm subcode2Set	-
F148	String terminal temperature high(String17~20)	37178RegisterPVterminal temperature alarm subcode3Set position	-
F149	HistoryPVReverse connection WARNING(String33~48)	Possible causes: OccurrencePVReverse connection causes the trip switch to trip.	Please contact the dealer or after-sales service center; maintenance personnel should follow the historicalPVReverse polarity WARNING subcode, check if the corresponding string has reversed polarity, inspectPVIIs there a voltage difference in the panel configuration? After the inspection is completed and no fault is found, it can be passed.AppInterface clear history operation clears the WARNING.
F150	Battery1voltage low	Battery Voltage is below the set value	-
F151	Battery2voltage low	Battery Voltage is below the set value	-

fault code	fault name	fault cause	Troubleshooting recommendation
F152	Low Voltage of Battery Power	Non-Charge mode, voltage below shutdown voltage	-
F153	BAT1 Voltage High	-	-
F154	2voltage high	-	-
F155	Online Low Insulation Resistance	PV String is short-circuited to Protection ground. 2. The environment of PV String Installation is consistently humid, and the line-to-ground insulation is poor.	1. Check the impedance of PV String to Protection ground. If a short circuit is found, rectify the short circuit point. 2. Check whether the PE cable of the Inverter is properly connected. 3. If it is confirmed that the impedance is indeed lower than the default value under rainy conditions, please reconfigure the "insulation resistance Protection point".
F156	Micro-grid Overload Warning	Backup terminal input current exceeds limit	Occasional occurrences require no action; if this alarm appears frequently, please contact the dealer or after-sales service center.
F157	Manual Reset	-	-

fault code	fault name	fault cause	Troubleshooting recommendation
F158	Generator Phase Sequence Abnormal	-	-
F159	Multiplexed Port Configuration Abnormal	Reuse (Generator) port configured as a microgrid or large load, but actually connected to a generator.	Use the App to change the reuse (generator) port configuration.
F41	Generator Port Overload	1. Off-grid side output exceeds the requirements specified in the specification. 2. Off-grid side short circuit 3. Off-grid terminal voltage too low 4. When acting as a large load port, the large load exceeds the requirements specified in the specification.	By verifying the data, confirm the output parameters such as voltage, current, and Power on the off-grid side to identify the cause of the issue.
F108	DSP Communication Failure	-	-

fault name	fault cause	Troubleshooting recommendation
Parallel Comm Timeout Shutdown	In parallel operation, if the slave exceeds 400ms No communication from the host within seconds	Check whether the parallel communication harness is securely connected and verify that there are no duplicate slave addresses.
One-touch shutdown and stop	Check if the one-touch shutdown function is enabled via the App.	Deactivate one-touch shutdown.
Offline shutdown	-	-
Remote shutdown	-	-
Child Node Communication Failure	Internal Comm Abnormal	Restart the machine and observe whether fault is eliminated.
DG Communication Failure	Abnormal communication link between the control board and the diesel generator	1. Check the link communication harness to observe whether fault is eliminated; 2. Attempt to restart the machine and observe whether the fault is eliminated; 3. If the fault persists after restarting, please contact the after-sales service center.
Battery Over Voltage	1. The voltage of a single cell is too high. 2. Abnormal voltage collection line	

fault name	fault cause	Troubleshooting recommendation
	1. Battery total pressure too high 2. Abnormal voltage collection line	Record the fault phenomenon, restart the Battery, wait for a few minutes, and confirm whether the fault disappears. If the problem persists after restarting, please contact the after-sales service center.
Battery Undervoltage	1. Single cell voltage too low 2. Abnormal voltage collection line	
	1. Battery Total pressure too low 2. Abnormal voltage collection line	
Battery Overcurrent	1. Charging Current is too large, Battery current limiting is abnormal: temperature and voltage value suddenly change 2. Inverter response anomaly	
	Battery discharge current too large	
Battery Overtemperature	1. Ambient Overtemperature 2. Temperature sensor abnormality	
	1. Ambient Overtemperature 2. Temperature sensor abnormality	
Battery Undertemperature	1. Ambient temperature is too low 2. Temperature sensor abnormality	
	1. Ambient temperature is too low 2. Temperature sensor abnormality	
Battery Terminal Overtemperature	Pole temperature too high	

fault name	fault cause	Troubleshooting recommendation
Battery Imbalance	1. Excessive temperature difference at different stages. The Battery will impose restrictions on the BatteryPower, specifically limiting the charging Dischargecurrent. Therefore, this issue is generally unlikely to occur. 2. The capacity of the battery cell degrades, leading to excessive internal resistance, resulting in significant temperature rise and large temperature differences during Overcurrent. 3. Poor welding of battery cell tabs, leading to excessive temperature rise in the Overcurrent cell. 4. Temperature sampling issue; 5. power cable connection loose	
	1. Inconsistent aging levels of battery cells 2. Issues with the board chips can also lead to excessive voltage differences in the battery cells. 3. Imbalanced board issues can also lead to excessive voltage differences between cells. 4. Harness issue causing	
	1. Inconsistent aging levels of battery cells 2. Issues with the cell chips can also lead to excessive voltage differences between cells. 3. Imbalance issues in the battery pack can also lead to excessive voltage differences between cells. 4. Harness issue causing	

fault name	fault cause	Troubleshooting recommendation
Insulation Resistance	Insulation resistance failure	Check if the ground wire is properly connected, restart the Battery. If the issue persists after restarting, please contact the after-sales service center.
Pre-charging Failure fault	Pre-charging Failure	It indicates that during the precharge process, the voltage across the precharge MOS consistently exceeds the specified threshold. After restarting the system, observe whether this fault persists, and check whether the wiring is correct and whether the precharge MOS is damaged.
Harvesting line fault	Collection line Battery is disconnected or broken	Check the wiring and restart the Battery. If the issue persists after restarting, please contact the after-sales service center.
	Single voltage collection line poor contact or disconnected	
	Single temperature acquisition line poor contact or disconnected	

fault name	fault cause	Troubleshooting recommendation
	Dual-channel current comparison error is too large, or current acquisition line circuit is abnormal.	Check the wiring and restart the Battery. If the issue persists after restarting, please contact the after-sales service center.
	Dual-channel voltage comparison error is too large, or the comparison error between MCU and AFE voltage is too large, or the voltage acquisition line loop is abnormal.	
	Temperature acquisition line circuit abnormal or poor contact, disconnected	
	Overvoltage level 5 or overtemperature level 5, fuse the three-terminal fuse	To replace the three-section fuse, please contact the after-sales service center to replace the main control board.
Relay or MOSFET overtemperature	Relay or MOSFET overtemperature	The fault indicates that the MOSFET temperature has exceeded the specified threshold. Power off and let it stand for 2 hours to allow temperature recovery.
Shunt Over-temperature	Shunt Over-temperature	The fault indicates that the shunt tube temperature has exceeded the specified threshold. Power off and let it stand for 2 hours to allow the temperature to recover.

fault name	fault cause	Troubleshooting recommendation
BMS1 Other fault1 (Residential Storage Category)	Relay or MOSFET open circuit	1. Upgrade the software, power off and let it sit for 5 minutes, then check if fault persists after restarting. 2. If the problem persists, replace the Battery package.
	Relay or MOSFET short circuit	1. Upgrade the software, power off and let it sit for 5 minutes, then check if fault persists after restarting. 2. If the issue persists, replace the Battery package.
	Communication abnormality between the master cluster and slave cluster, or inconsistency of battery cells among clusters.	1. Check the Battery information and software version of the slave unit, as well as whether the communication line connection with the master unit is normal. 2. Upgrade the software
	Abnormal circuit harness in Battery system, resulting in no loop formation in interlocking signal	Check if Terminal resistorInstallation is correct

fault name	fault cause	Troubleshooting recommendation
	Abnormal communication between BMS and PCS	1. Verify that the communication line interface definition between Inverter and Battery is correct. 2. Please contact the after-sales service center to check the background data and verify whether the Inverter and Battery software are correctly matched.
	Abnormal communication harness between BMS master and slave control	Check the wiring and restart the Battery.
	Communication loss between main and auxiliary chips	2. Upgrade the Battery. If the issue persists after restarting, please contact the after-sales service center.
	Circuit breaker, shunt trip abnormality	Let the system stand powered off for 5 minutes, then restart to check if fault persists. 2. Check whether the blind mating at the bottom of the PACK and PCU, as well as the communication pins, are loose or misaligned.

fault name	fault cause	Troubleshooting recommendation
	MCU self-test failed	Upgrade the software and restart the Battery. If the issue persists after restarting, please contact the after-sales service center.
	1. The software version is too low or the BMS board is damaged. 2. A large number of Inverter parallel units, Battery experiences excessive impact during pre-charging.	1. Upgrade the software and observe whether fault persists. 2. In the case of parallel operation, perform a black start on Battery first, then start Inverter.
	Internal fault of MCU	Upgrade the software and restart the Battery. Typically, this issue is caused by a damaged MCU or external component. If the problem persists after restarting, please contact the after-sales service center.
	Total control current exceeds the specified threshold	1. Let the system stand and shut down for 5 minutes, then restart to check if fault persists. 2. Check if the Inverter is set with an excessively large Power, causing the bus load to be exceeded.

fault name	fault cause	Troubleshooting recommendation
	Cell inconsistency in parallel clusters	Confirm whether the cells in the cluster Battery are consistent.
	Reverse polarity connection of PV string positive and negative terminals	Check whether the positive and negative poles of the string combiner box are reversed.
	Severe overheating or overvoltage triggering the fire protection system	Contact the after-sales service center.
Air Conditioner Failure	Air conditioning abnormal failure	Try restarting the system. If fault persists, please contact the after-sales service center.
	Cabinet door not closed	Check whether the cabinet door is properly closed.
	Power supply voltage too high	Verify that the power supply voltage value meets the air conditioning input voltage requirements, and proceed with re-power on only after confirmation.
	Insufficient power supply	
	No voltage input	
	Unstable power supply	
	Compressor voltage instability	Try restarting the system. If fault persists, please contact the after-sales service center.
	Sensor poor contact or damaged	
	Abnormal air conditioning fan	
	There is an abnormality in the voltage or current inside the DCDC.	Please refer to the specific DC Failure content for details.

fault name	fault cause	Troubleshooting recommendation
BMS1 Other fault2 (Residential Storage Category)	DCDCOverload or heat sink temperature too high	
	Abnormal cell acquisition or inconsistent aging levels	Please contact the after-sales service center.
	Fan operation not executed properly	Please contact the after-sales service center.
	Output port screw loose or poor contact	1. Battery Shut down, check wiring and output port screw status 2. After confirmation, restart the Battery and observe whether the fault persists. If it does, please contact the after-sales service center.
	Battery has been used for too long or the battery cell is 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 Inverter parallel units is large, and the impact during pre-charging of Battery is excessive.	1. Upgrade the software and observe whether fault persists. 2. In the case of parallel operation, perform a black start on Battery before starting Inverter.
	Heating film damaged	Please contact the after-sales service center.
	The heating film's three-terminal fuse is blown, rendering the heating function unusable.	Please contact the after-sales service center.

fault name	fault cause	Troubleshooting recommendation
	Software model, Cell Type, and hardware model mismatch.	Check whether the software model, serial number (SN), Cell Type, and hardware model are consistent. If they are inconsistent, please contact the after-sales service center.
	Thermal management board communication disconnection	Let the system stand powered off for 5 minutes, then restart to check if fault persists. 2. If the fault is not restored, contact after-sales service to replace the pack.
	Thermal management board communication disconnection	Let the system stand powered off for 5 minutes, then restart to check if fault persists. 2. If the fault is not restored, contact after-sales service to replace the pack.
	Thermal management board communication disconnection	Let the system stand powered off for 5 minutes, then restart to check if fault persists. 2. If the fault is not restored, contact after-sales service to replace the pack.

fault name	fault cause	Troubleshooting recommendation
	Pack fan fault signal trigger	Let the system stand powered off for 5 minutes, then restart to check if fault persists. 2. If the fault is not restored, contact after-sales service to replace the pack.
DC combiner box	Output portvoltage too high	Check the output portvoltage. If the output portvoltage is normal and the fault still cannot be resolved after restarting Battery, please contact the after-sales service center.
	The DCDC module detected that Battery Voltage exceeded the maximum Charge voltage.	Stop Charge and Discharge when SOC drops below 90% or remains idle for 2 hours. If the issue persists and restarting fault does not resolve it, please contact the after-sales service center.
	Radiator temperature too high	Let the Battery stand for 1 hour until the radiator temperature drops. If the issue persists and restarting the fault does not resolve it, please contact the after-sales service center.

fault name	fault cause	Troubleshooting recommendation
	Battery discharge current too large	Check if the load exceeds the Battery's Discharge capability. Turn off the load or stop the PCS for 60 seconds. If the issue persists after restarting the fault, please contact the after-sales service center.
	Output port power harness positive and negative poles are reversed with the combiner box Battery or PCS.	Turn off the Battery manual switch, check if the output port wiring is correct, and restart the Battery.
	The output Power relay cannot close.	Check whether the output port wiring is correct and if there is a short circuit. If the issue persists after restarting fault, please contact the after-sales service center.
	Power device temperature too high	Let the Battery stand for 1 hour to allow the temperature of internal Power components to decrease. If the issue persists and restarting the fault does not resolve it, please contact the after-sales service center.

fault name	fault cause	Troubleshooting recommendation
	Relay sticking	Restart fault still exists. Please contact the after-sales service center.
Battery Rack Circulating Current Failure	1. Cell imbalance 2. First power on incomplete charge correction	-
BMS1 Other fault3 (Large Storage Category)	Communication exception with Linux module	1. Check if the communication link is functioning properly. 2. Upgrade the software, restart the Battery, and observe whether the fault persists. If it does, please contact the after-sales service center.
	Excessive temperature rise in battery cells	Cell abnormality, contact after-sales service to replace the pack.
	SOC below 10%	Perform Charge on Battery.
	SN writing does not comply with the rules	Check if the SN digits are normal. If abnormal, please contact the after-sales service center.

fault name	fault cause	Troubleshooting recommendation
	1. Battery Intra-cluster daisy chain communication anomaly 2. Inconsistent aging levels of battery cells between Battery clusters	1. Check the contact condition of the single cluster Battery pack. 2. Verify the usage of each cluster, such as cumulative charge/discharge capacity and cycle count. 3. Please contact the after-sales service center.
	High Humidity within the pack	-
	Fuse tripped	Contact after-sales service to replace the pack.
	Low battery level	Perform Charge on Battery.
BMS1 Other fault4 (Large Storage Category)	Circuit Breaker Abnormality	Contact after-sales service to replace the pack.
	External device abnormality	Contact after-sales service to replace the pack.
Contactor Failure 1	-	-
Contactor Failure 2	-	-
Jinggui (Jinggui)	Continuous Overload (exceeding 690kVA) for 10s	Please contact the after-sales service center.

fault name	fault cause	Troubleshooting recommendation
OverloadProtection(Smart port)	Continuous Overload (exceeding 690kVA) for 10s	Please contact the after-sales service center.
Master AC On Meter Comm Error	1. The meter may not be connected to the host. 2. The meter communication cable may be loose.	1. Check if the meter is connected to the main unit. 2. Check if the meter communication cable is loose.
Parallel Slave Meter Error	The meter is connected to the slave unit.	Set the meter connection machine as the master.
Slave AC On Timeout with Master	1. Incorrect slave address setting 2. Slave communication line is loose	1. Check whether the slave address is duplicated. 2. Check if the parallel communication cable is loose.

9.5.2.3 Battery Fault (LX A5.0-30, LX U5.0-30)

Alarm Status

 When the battery ALM indicator is red, combine it with the SOC indicator display status to locate and troubleshoot the fault.

No.	SOC Indicator	Fault Name	Resolution
1		Battery Over Voltage Battery Undervoltage	1. Check via the APP whether the inverter's charging current limit is 0. If it is 0, confirm that the communication cable connection between the battery and the inverter is secure and communication is normal. 2. Power off and let it stand for 5 minutes. After restarting, confirm if 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 if the battery model is correct. Confirm if the real-time battery current exceeds the charging current limit or discharge current limit. If it does, please contact the after-sales service center. 2. If it is less than the limit, power off the battery or upgrade the firmware. Restart and confirm if the fault continues to occur. 3. If the fault is not resolved, please contact after-sales service.
3		Battery Overtemperature Battery Undertemperature Battery Terminal Overtemperature	Power off and let it stand for 60 minutes to allow the temperature to recover. If the problem persists after restarting, please contact the after-sales service center.

No.	SOC Indicator	Fault Name	Resolution
4	○●○○○	Battery Imbalance	Power off and let it stand for 30 minutes. If the problem persists after restarting, please contact the after-sales service center.
		SOH Too Low Fault	
5	●○○●●	Pre-charge Failure Fault	1. Confirm whether the battery output terminals and the inverter are connected in reverse. 2. Power off and let it stand for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
6	○●○○●	Harness 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 Overtemperature Shunt Overtemperature	Power off and let it stand for 30 minutes. If the problem persists after restarting, please contact the after-sales service center.
		Other BMS Faults: Output Port Overtemperature Fault	1. Check if the battery power cables are tightened. Power off and let it stand for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
8	○●●○○	Other Protections: MOS Cannot Close	Power off and let it stand for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
9	○●●●●	Other Protections: MOS Adhesion	

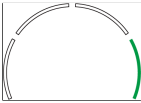
No.	SOC Indicator	Fault Name	Resolution
10	●○○○	Other Protections: Parallel Cluster Fault	1. Confirm that the type of terminal resistor used and its installation location are correct. 2. Confirm that the communication cable connections between batteries, and between the battery and the inverter, are secure and communication is normal. 3. If the fault is not resolved, please contact the after-sales service center.
11	○○○○	Other Protections: Communication Loss with Inverter	1. Confirm that the communication cable connections between batteries, and between the battery and the inverter, are secure and communication is normal. 2. If the fault is not resolved, please contact the after-sales service center.
12	●○○●	Other Protections: BMU Communication Fault	1. Confirm that the type of terminal resistor used and its installation location are correct. 2. Confirm that the communication cable connections between batteries, and between the battery and the inverter, are secure and communication is normal. 3. Power off and let it stand for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
13	●○●○	Other Protections: Breaker Adhesion Fault	Power off and let it stand for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.

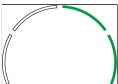
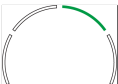
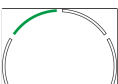
No.	SOC Indicator	Fault Name	Resolution
14		Other Protections: Software Failure	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
15		Other Protections: Hardware Overcurrent Fault	
16		Other Protections: Microelectronics Fault	
		Heating Pad Three-Terminal Abnormality	1. Upgrade the software. 2. Power off and let it stand for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.

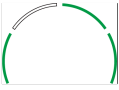
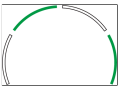
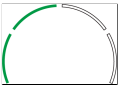
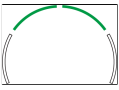
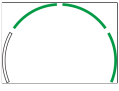
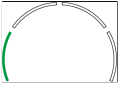
9.5.2.4 Battery Fault (GW14.3-BAT-LV-G10)

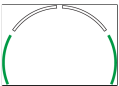
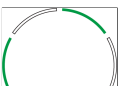
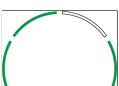
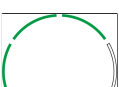
When the battery alarm indicator shows red , the outer marquee lights show

red flashing , and the operation light is off, troubleshoot the fault by referring to the status indicated by the SOC light.

No.	SOC Indicator	Fault Name	Resolution
1		Battery Over Voltage	

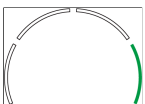
		Battery Undervoltage	1. Check via the App whether the inverter's charging current limit is 0. If it is 0, verify that the communication cable connection between the battery and the inverter is reliable and communication is normal. 2. Power off and let it sit for 5 minutes. After restarting, confirm if 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. Confirm if the battery's real-time current is greater than the charging current limit or the discharging current limit. If so, please contact the after-sales service center. 2. If it's lower, power off the battery or upgrade the software, then restart to confirm if the fault continues to occur. 3. If the fault is not resolved, please contact after-sales.
3		Battery Overtemperature	Power off and let it sit for 60 minutes to allow the temperature to recover. If the problem persists after restarting, please contact the after-sales service center.
		Battery Undertemperature	
		Battery Terminal Overtemperature	
4		Battery Imbalance SOH Too Low Fault	Power off and let it sit for 30 minutes. If the problem persists after restarting, please contact the after-sales service center.

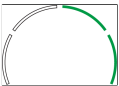
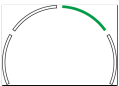
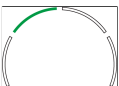
5		Precharge Failure Fault	1. Confirm whether the battery output terminals and the inverter are connected in reverse. 2. Power off and let it sit for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
6		Harness Fault	Confirm whether the battery circuit breaker is closed. If the battery circuit breaker is closed and the problem persists, please contact the after-sales service center.
7		Relay or MOS Overtemperature	Power off and let it sit for 30 minutes. If the problem persists after restarting, please contact the after-sales service center.
		Output Port Overtemperature	1. Check if the battery power cables are securely tightened. 2. Power off and let it sit for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
8		MOS Cannot Close	Power off and let it sit for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
9		MOS Sticking	
10		Parallel Cluster Fault	1. Confirm the type and installation position of the terminal resistor used is correct. 2. Verify that the communication cable connections between batteries, and between the battery and the inverter, are reliable and communication is normal. 3. If the fault is not resolved, please contact the after-sales service center.
11		Software/Hardware Version Mismatch	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.

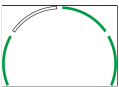
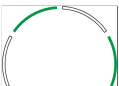
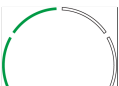
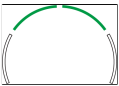
12		BMU Communication Fault	
13		Circuit Breaker Sticking Fault	Power off and let it sit for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.
14		Software Failure	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
15		Hardware Overcurrent Fault	
16		Microelectronics Fault	
		Heating Film Three-Terminal Anomaly	1. Upgrade the software. 2. Power off and let it sit for 5 minutes. If the problem persists after restarting, please contact the after-sales service center.

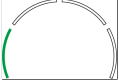
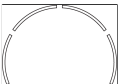
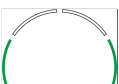
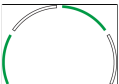
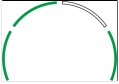
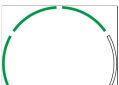
9.5.2.5 Battery Fault (GW16.1-BAT-LV-G10)

When the battery alarm indicator shows red , the outer ring marquee lights show red flashing , and the operation light is off, locate and troubleshoot the fault based on the status indicated by the SOC indicator.

No.	SOC Indicator Light	Fault Name	Resolution
1		Battery Over Voltage	

		Battery Undervoltage	1. Check via the App if the inverter's charging current limit is 0. If it is 0, verify that the communication cable connection between the battery and the inverter is reliable and communication is normal. 2. Power off and let the system rest for 5 minutes. After restarting, confirm if 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 if the battery model is correct. Confirm if the real-time battery current exceeds the charging current limit or the discharging current limit value. Please contact the after-sales service center. 2. If it is lower, power off the battery or upgrade the software. After restarting, confirm if the fault continues to occur. 3. If the fault is not resolved, please contact after-sales.
3		Battery Overtemperature	Power off and let the system rest for 60 minutes to allow the temperature to recover. After restarting, if the problem persists, please contact the after-sales service center.
		Battery Undertemperature	
		Battery Terminal Overtemperature	
4		Battery Imbalance	Power off and let the system rest for 30 minutes. After restarting, if the problem persists, please contact the after-sales service center.
		SOH Too Low Fault	

5		Precharge Failure Fault	1. Confirm if the battery output terminals and the inverter are connected in reverse. 2. Power off and let the system rest for 5 minutes. After restarting, if the problem persists, please contact the after-sales service center.
6		Acquisition Line Fault	Confirm if the battery circuit breaker is closed. If the battery circuit breaker is closed and the problem persists, please contact the after-sales service center.
7		Relay or MOS Overtemperature	Power off and let the system rest for 30 minutes. After restarting, if the problem persists, please contact the after-sales service center.
		Output Port Overtemperature	1. Check if the battery power cables are securely fastened. 2. Power off and let the system rest for 5 minutes. After restarting, if the problem persists, please contact the after-sales service center.
8		MOS Cannot Close	Power off and let the system rest for 5 minutes. After restarting, if the problem persists, please contact the after-sales service center.
9		MOS Sticking	

10		Parallel Cluster Fault	1. Confirm the type and installation position of the terminal resistor used are correct. 2. Confirm that the communication cable connections between batteries, and between the battery and the inverter, are reliable and communication is normal. 3. Use the battery SN code to confirm if the cells in the parallel cluster batteries are consistent. 4. If the fault is not resolved, please contact the after-sales service center.
11		Software/Hardware Version Mismatch	Restart the battery. After restarting, if the problem persists, please contact the after-sales service center.
12		BMU Communication Fault	
13		Circuit Breaker Sticking Fault	Power off and let the system rest for 5 minutes. After restarting, if the problem persists, please contact the after-sales service center.
14		Software Failure	Restart the battery. After restarting, if the problem persists, please contact the after-sales service center.
15		Hardware Overcurrent Fault	
16		Microelectronics Fault	1. Upgrade the software. 2. Power off and let the system rest for 5 minutes. After restarting, if the problem persists, please contact the after-sales service center.
		Heating Pad Three-Terminal Abnormality	

10 technical parameter

10.1 Inverter Parameters

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
Battery Side			
Battery Type*1	LFP (LiFePO ₄) /Lead-acid	LFP (LiFePO ₄) /Lead-acid	LFP (LiFePO ₄) /Lead-acid
Nominal Voltage (V)	48	48	48
Voltage Range (V)	40~60	40~60	40~60
Start-up Voltage (V)	44.2	44.2	44.2
Number of Battery Inputs	1	1	1
Max. Continuous Charging Current (A)	120	165	220
Max. Continuous Discharging Current (A)	120	165	220
Max. Charging Power (kW)	5.0	7.5	10.0
Max. Discharging Power (kW)	5.5	8.2	11.0
PV Side			
Max. Input Power (kW)	10.0	15.0	20.0

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
Max. Input Voltage (V) ^{*1}	600	600	600
MPPT Operating Voltage Range (V) ^{*2}	50~550	50~550	50~550
MPPT Operating Voltage Range at Nominal Power (V)	150-500	150-500	150-500
Start-up Voltage (V)	60	60	60
Nominal Input Voltage (V)	360	360	360
Max. MPPT Current (A)	20/20	40/20	40/40
Max. MPPT Short Circuit Current (A)	26/26	52/26	52/52
Max. Backfeed Current to the Array (A)	0	0	0
Number of MPPTs	2	2	2
Number of Strings per MPPT	1/1	2/1	2/2
AC Side (Grid Port)			
Rated Power (kW)	5.0	7.5	10.0
Max. Power (kW)	5.0	7.5	10.0
Rated Power at 40°C (kW)	5.0	7.5	10.0
Max. Power at 40°C (kW)	5.0	7.5	10.0

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
Rated Apparent Power from Grid (kVA)	5.0	7.5	10.0
Rated Apparent Power to Grid (kVA)	5.0	7.5	10.0
Max. Apparent Power to Grid (kVA)	5.0	7.5	10.0
Max. Apparent Power from Grid (kVA)	16.0	16.0	16.0
Nominal Voltage (V)	120/208, 2L/N/PE 127/220, 2L/N/PE 120/240, 2L/N/PE 127/254, 2L/N/PE	120/208, 2L/N/PE 127/220, 2L/N/PE 120/240, 2L/N/PE 127/254, 2L/N/PE	120/208, 2L/N/PE 127/220, 2L/N/PE 120/240, 2L/N/PE 127/254, 2L/N/PE
Voltage Range (V)	170~290 170~290 170~290 170~290	170~290 170~290 170~290 170~290	170~290 170~290 170~290 170~290
Nominal Frequency (Hz)	50/60	50/60	50/60
Frequency Range (Hz)	45~55/55~65	45~55/55~65	45~55/55~65

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
Rated Current from Grid (A)	24.0 @120/208V, 2L/N/PE 22.7 @127/220V, 2L/N/PE 20.8 @120/240V, 2L/N/PE 19.7 @127/254V, 2L/N/PE	36.1 @120/208V, 2L/N/PE 34.1 @127/220V, 2L/N/PE 31.3 @120/240V, 2L/N/PE 29.5 @127/254V, 2L/N/PE	48.1 @120/208V, 2L/N/PE 45.5 @127/220V, 2L/N/PE 41.7 @120/240V, 2L/N/PE 39.4 @127/254V, 2L/N/PE
Rated Current to Grid (A)	24.0 @120/208V, 2L/N/PE 22.7 @127/220V, 2L/N/PE 20.8 @120/240V, 2L/N/PE 19.7 @127/254V, 2L/N/PE	36.1 @120/208V, 2L/N/PE 34.1 @127/220V, 2L/N/PE 31.3 @120/240V, 2L/N/PE 29.5 @127/254V, 2L/N/PE	48.1 @120/208V, 2L/N/PE 45.5 @127/220V, 2L/N/PE 41.7 @120/240V, 2L/N/PE 39.4 @127/254V, 2L/N/PE
Max. Current from Grid (A)	63.0	63.0	63.0
Max. Current to Grid (A)	24.0 @120/208V, 2L/N/PE 22.7 @127/220V, 2L/N/PE 20.8 @120/240V, 2L/N/PE 19.7 @127/254V, 2L/N/PE	36.1 @120/208V, 2L/N/PE 34.1 @127/220V, 2L/N/PE 31.3 @120/240V, 2L/N/PE 29.5 @127/254V, 2L/N/PE	48.1 @120/208V, 2L/N/PE 45.5 @127/220V, 2L/N/PE 41.7 @120/240V, 2L/N/PE 39.4 @127/254V, 2L/N/PE
Max. Output Fault Current (Peak and Duration) (A)	105A, 3us	105A, 3us	130A, 3us

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
Inrush Current (Peak and Duration) (A)	105A, 3 μ s	105A, 3 μ s	130A, 3 μ s
Power Factor	0.8 leading ... 0.8 lagging	0.8 leading ... 0.8 lagging	0.8 leading ... 0.8 lagging
THDi	<3%	<3%	<3%
Maximum Output Overcurrent Protection (A)	105	105	130
Type of Voltage	a.c.	a.c.	a.c.
AC Side (Back-up Port)			
Rated Output Apparent Power (kVA)	5.0	7.5	10.0
Max. Output Apparent Power (kVA)	Off-grid: 5.5(10.0, 10s) Bypass: 16.0	Off-grid: 8.2(15.0, 10s) Bypass: 16.0	Off-grid: 11.0(20.0, 10s) Bypass: 16.0
Nominal Output Voltage (V)	120/208, 2L/N/PE 127/220, 2L/N/PE 120/240V, 2L/N/PE 127/254V, 2L/N/PE	120/208, 2L/N/PE 127/220, 2L/N/PE 120/240V, 2L/N/PE 127/254V, 2L/N/PE	120/208, 2L/N/PE 127/220, 2L/N/PE 120/240V, 2L/N/PE 127/254V, 2L/N/PE

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
Nominal Output Frequency (Hz)	50/60	50/60	50/60
Frequency Range (Hz)	45~55/55~65	45~55/55~65	45~55/55~65
Rated Output Current (A)	24.0 @120/208V, 2L/N/PE 22.7 @127/220V, 2L/N/PE 20.8 @120/240V, 2L/N/PE 19.7 @127/254V, 2L/N/PE	36.1 @120/208V, 2L/N/PE 34.1 @127/220V, 2L/N/PE 31.3 @120/240V, 2L/N/PE 29.5 @127/254V, 2L/N/PE	48.1 @120/208V, 2L/N/PE 45.5 @127/220V, 2L/N/PE 41.7 @120/240V, 2L/N/PE 39.4 @127/254V, 2L/N/PE
Max. Output Current (A) ^{*3}	Off-grid: 24.0, Bypass: 63.0	Off-grid: 36.1, Bypass: 63.0	Off-grid: 48.1, Bypass: 63.0
Max. Fault Current (Peak and Duration) (A)	105A, 3us	105A, 3us	130A, 3us
Inrush Current (Peak and Duration) (A)	105A, 3us	105A, 3us	130A, 3us
Maximum Overcurrent Protection (A)	105	105	130
THDv (@Linear Load)	<3%	<3%	<3%
On/Off-grid Switching Time (ms)	≤4	≤4	≤4
AC Side (Smart Port)			

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
Rated Apparent Power (kVA)	5.0	7.5	10.0
Max. Apparent Power (kVA)	12.7	12.7	12.7
Nominal Voltage (V)	120/208, 2L/N/PE 127/220, 2L/N/PE 120/240, 2L/N/PE 127/254, 2L/N/PE	120/208, 2L/N/PE 127/220, 2L/N/PE 120/240, 2L/N/PE 127/254, 2L/N/PE	120/208, 2L/N/PE 127/220, 2L/N/PE 120/240, 2L/N/PE 127/254, 2L/N/PE
Voltage Range (V)	170~290	170~290	170~290
Nominal Frequency (Hz)	50/60	50/60	50/60
Frequency Range (Hz)	45~55/55~65	45~55/55~65	45~55/55~65
Max. Current (A)	50	50	50
Efficiency			
Max. Efficiency	97.6%	97.6%	97.6%
Max. Battery to AC Efficiency	95.5%	95.5%	95.5%
MPPT Efficiency	99.9%	99.9%	99.9%
Protection			
PV String Current Monitoring	Integrated	Integrated	Integrated

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
PV Insulation Resistance Detection	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated
DC Surge Protection	Type II	Type II	Type II
AC Surge Protection	Type II	Type II	Type II
AFCI	Integrated	Integrated	Integrated
Rapid Shutdown	Optional	Optional	Optional
Remote Shutdown	Integrated	Integrated	Integrated
General Data			

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
Operating Temperature Range (°C)	-35~+60	-35~+60	-35~+60
Operating Environment	Indoor/Outdoor	Indoor/Outdoor	Indoor/Outdoor
Storage Temperature (°C)	-40~+85	-40~+85	-40~+85
Relative Humidity	0 ~ 95%	0 ~ 95%	0 ~ 95%
Max. Operating Altitude (m)	3000	3000	3000
Cooling Method	Natural Cooling	Smart Fan Cooling	Smart Fan Cooling
User Interface	LCD, WLAN+APP	LCD WLAN+APP	LCD WLAN+APP
Communication with BMS	CAN	CAN	CAN
Communication	RS485, WiFi+LAN+Bluetooth	RS485, WiFi+LAN+Bluetooth	RS485, WiFi+LAN+Bluetooth
Communication Protocols	Modbus-RTU, Modbus-TCP	Modbus-RTU, Modbus-TCP	Modbus-RTU, Modbus-TCP
Weight (kg)	26.4	27.3	28.9
Dimension (W×H×D mm)	561*445*230	561*445*230	561*445*230
Noise Emission (dB)	<35	<45	<45
Topology	Non-isolated	Non-isolated	Non-isolated

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
Power Self-consumption at Night (W)	<15	<15	<15
Ingress Protection Rating	IP66	IP66	IP66
Anti-corrosion Class	C4	C4	C4
DC Connector	JK01M	JK01M	JK01M
AC Connector	TG	TG	TG
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
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	AFDPF + AQDPF*4	AFDPF + AQDPF*4	AFDPF + AQDPF*4
Type of Electrical Supply System	Two Phase/Split Phase	Two Phase/Split Phase	Two Phase/Split Phase

Technical Data	GW5K-ES-LD-G10	GW7.5K-ES-LD-G10	GW10K-ES-LD-G10
Country of Manufacture	China	China	China
Certification			
Grid Standard	Please refer to the official website		
Safety Regulation			
EMC			

*1: When the input voltage ranges from 560V to 600V, the inverter will enter the standby mode, and the voltage returns to 560V to enter the normal operation state.

*2: Please refer to the user manual for the MPPT Voltage Range at nominal Power.

*3: The Max. Output Current in off-grid operation accounts for a three-phase maximum 150% unbalanced capability.

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

10.2 Battery Technical Data

10.3 Smart Meter Technical Data

10.3.1 GM330

technical parameter		GM330
Measurement Range	Supported Grid Type	Three-phase, Split-phase, Single-phase
	Voltage Range L-L (Vac)	172~817
	Voltage Range L-N (Vac)	100~472
	Nominal Frequency (Hz)	50/60
	CT ratio	nA:5A

technical parameter		GM330
Communication Parameter	Communication Method	RS485
	Communication Distance (m/ft)	1000/3280
Accuracy Parameter	voltage/current	Class 0.5
	Active Energy	Class 0.5
	Reactive Energy	Class 1
General Parameter	Dimensions(WxHxDmm/in)	72x85x72/2.83x3.35x2.83
	Housing	4 Module
	Weight (g/lb)	240/0.53
	Mounting Method	DIN Rail
	User Interface	4 LEDs, Reset Button
	Power Consumption (W)	≤5
Environmental Parameter	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 Parameter	Certification	UL1741/ANSI

10.4 Smart Dongle Technical Data

10.4.1 WiFi/LAN Kit-20

technical parameter		WiFi/LAN Kit-20
Output voltage (V)		5
Power Consumption (W)		≤2
Communication interface		USB
	Ethernet	10M/100Mbps auto-negotiation

technical parameter		WiFi/LAN Kit-20
Communication parameters	wireless	IEEE 802.11 b/g/n @2.4 GHz
	Bluetooth	Bluetooth V4.2 BR/EDR and Bluetooth LE standards
Mechanical Parameters	Dimensions (W × H × D mm)	48.3*159.5*32.1
	Weight (g)	82
	Ingress Protection Rating	IP65
	Mounting method	plug and pull
Operating Temperature Range (°C)		-30~+60
Storage Temperature range (°C)		-40~+70
Relative Humidity		0-95%
Max. Operating Altitude (m)		4000

11 Appendix

11.1 FAQ

11.1.1 How to perform meter/CT auxiliary testing?

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

- Option 1:

1. Through **[Home]** > **[Settings]** > **[Electric meter/CT auxiliary detection]** Enter the detection page.
2. Click to start detection, wait for the detection to complete, and then view the detection results.

- Option 2:

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

11.1.2 How to Upgrade the 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 via the App; please refer to the actual situation.

- **Prompted Upgrade:**

The user opens the APP, and a upgrade prompt pops up on the home page. The user can choose whether to upgrade. If upgrade is selected, follow the on-screen instructions to complete the upgrade.

- **Regular Upgrade:**

Go to **[Home]** > **[Settings]** > **[Firmware Information]** to access the firmware

information view.

Click "Check for Updates". If a new version is available, follow the on-screen instructions to complete the upgrade.

- **Forced Upgrade:**

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

11.2 Explanation of Terms

- **Over voltage category definition**

- **Overvoltage Category I** Equipment connected to circuits with measures to limit transient overvoltages to a relatively low level.
- **Overvoltage Category II** Energy-consuming equipment powered by a fixed electrical installation. Such equipment includes appliances, portable tools, and other household and similar loads. If there are special requirements for the reliability and suitability of such equipment, then voltage Category III is adopted.
- **Category III overvoltage** The equipment in fixed electrical installations must meet special requirements for reliability and suitability. This includes switchgear in fixed electrical installations and industrial equipment permanently connected to fixed electrical installations.
- **Overvoltage category IV** The upper equipment used in the power supply of distribution devices includes measuring instruments and prefixed overcurrent protection devices, among others.

- **Definition of Wet Location Categories**

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

- **Explanation of Environmental Categories:**

- **Outdoor Inverter** The ambient air temperature range is -25 to +60°C, suitable for Pollution Degree 3 environments.
- **Indoor Type II Inverter** The ambient air temperature range is -25 to +40°C,

suitable for Pollution Degree3 environments;

- **Indoor Type I Inverter**The ambient air temperature range is 0 to +40°C, suitable for Pollution Degree2 environments;

- **Pollution Degree category definition**

- **Pollution Degree1**No pollution or only dry non-conductive pollution;
- **Pollution Degree2**Generally, there is only non-conductive pollution, but occasional temporary conductive pollution due to condensation must be considered.
- **Pollution Degree3**Conductive contamination exists, or non-conductive contamination becomes conductive due to condensation;
- **Pollution Degree4**Persistent conductive contamination, such as that caused by conductive dust or rain/snow.

11.3 Battery SN code meaning

*****2388*****
T

The 11th-14th digits

LXD10DSC0002

The 11th to 14th digits of the product SN code represent the production time code.
The production date shown in the above image is 2023-08-08.

- The 11th and 12th digits represent the last two digits of the production year, e.g., 2023 is denoted as 23;
- The 13th digit represents the production month, for example, August is represented by 8;

The details are as follows:

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

- The 14th digit represents the production date, e.g., the 8th is denoted as 8;

Use numbers for priority representation, such as 1~9 for the 1st~9th day, and A for 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

Contact Details

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