V2.1 2026-05-25

Residential Smart Inverter

ET Series 15-30kW

· Lynx Home F G2
· Lynx Home F
· Lynx Home F Plus+
· Lynx Home D

Solutions Manual

GOODWE

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Copyright Statement

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NOTICE

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

About This Manual

Overview

This document primarily introduces the product information, installation wiring, configuration and commissioning, troubleshooting, and maintenance of the energy storage system composed of inverters, the battery system, and smart meters. Please read this manual carefully before installing and using the product to understand the product safety information and familiarize yourself with the product's functions and features. The document may be updated periodically. Please obtain the latest version of the materials and more product information from the official website.

Applicable Model

The energy storage system includes the following products:

Product Type	Product Information	Description
Inverter	ET 12-30kW	Nominal output power 12kW to 30kW.
Battery system	Lynx Home F G2	Single-cluster storage capacity 6.4kWh to 28.8kWh. Maximum parallel-cluster storage capacity up to 230.4kWh.
	Lynx Home F, Lynx Home F Plus+	Single-cluster storage capacity 6.6kWh to 16.38kWh. Maximum parallel-cluster storage capacity up to 131.04kWh.
	Lynx Home D	Single-cluster storage capacity 5kWh. Maximum parallel-cluster storage capacity up to 40kWh.
Meter	GM3000	A monitoring module in the energy storage system, capable of detecting operating voltage, current, and other information within the system.
	GM330	
	GMK330	

Product Type	Product Information	Description
smart dongle	WiFi/LAN Kit-20	Can upload system operation information to the monitoring platform via WiFi or LAN signal.
	LS4G Kit-CN, 4G Kit-CN, 4G Kit-CN-G20 or 4G Kit-CN-G21 (China only)	Can upload system operation information to the monitoring platform via 4G signal.
	Wi-Fi Kit	Can upload system operation information to the monitoring platform via WiFi signal.
	Ezlink3000	Connected to the main inverter in parallel system scenarios. Can upload system operation information to the monitoring platform via WiFi or LAN signal.

Symbol Definition

⚠DANGER
Indicates a highly hazardous situation which, if not avoided, will result in death or serious injury.
⚠WARNING
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠CAUTION
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE
Emphasizes or supplements the content, may provide tips or tricks for optimal product use, and can help you solve a problem or save time.

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1 Safety Precautions

The Safety Precautions information contained in this document must always be complied with when operating the device.

⚠WARNING

The equipment has been strictly designed and tested in compliance with safety regulations. However, as electrical equipment, relevant safety instructions must be followed before performing any operations. Improper handling may result in serious injury or property damage.

1.1 General Safety

NOTICE

- Due to product version upgrades or other reasons, the document content will be updated periodically. Unless otherwise specified, the document content cannot replace the safety precautions on the product label. All descriptions in the document are for guidance only.
- Please read this document carefully before installing the equipment to understand the product and its precautions.
- All operations on the equipment must be performed by professional and qualified electrical technicians, who must be familiar with the relevant standards and safety regulations in the project location.
- When operating the equipment, use insulated tools and wear personal protective equipment to ensure personal safety. Wear anti-static gloves, anti-static wrist straps, anti-static clothing, etc., when handling electronic components to protect the equipment from electrostatic damage.
- Unauthorized disassembly or modification may cause equipment damage, which is not covered under the warranty.
- Equipment damage or personal injury caused by failure to install, use, or configure the equipment in accordance with the requirements of this document or the corresponding user manual is beyond the manufacturer's liability. For more product warranty information, please obtain it through the official website: https://en.goodwe.com/warrantyrelated.html.

1.2 personnel requirements

NOTICE

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

1. Professionals or qualified personnel include:
   - Personnel who have mastered the knowledge of equipment working principles, system structure, risks and hazards, and have received professional operation training or possess extensive practical experience.
   - Personnel who have received relevant technical and safety training, possess a certain level of operational experience, can recognize the potential dangers specific tasks may pose to themselves, and can take protective measures to minimize risks to themselves and others.
   - Qualified electrical technicians who meet the regulatory requirements of the country/region where the work is performed.
   - Personnel holding a degree in electrical engineering/an advanced diploma in electrical disciplines or equivalent/possessing professional qualifications in the electrical field, and having at least 2/3/4 years of experience in testing and supervision work using electrical equipment safety standards.
2. Personnel involved in special tasks such as electrical work, work at heights, and operation of special equipment must hold valid qualification certificates required by the location of the equipment.
3. Operation of medium-voltage equipment must be performed by certified high-voltage electricians.
4. Replacement of equipment and components is only permitted to be carried out by authorized personnel.

1.3 System Safety

⚠DANGER

- Before performing electrical connections, disconnect all upstream switches of the equipment to ensure it is powered off. Live operation is strictly prohibited, otherwise hazards such as electric shock may occur.
- For equipment supporting PV string connection, the PV input terminals have weak surge current withstand capability. It is strictly forbidden to power on the equipment directly from the PV ports using a DC voltage source. If powering on from the PV ports is necessary, please follow the steps below. Damage caused by improper operation is considered user-inflicted and is not covered by the product warranty.
  1. First, limit the output current of the DC voltage source to within the maximum allowable input current range of the PV ports.
  2. Then, close the DC switch of the inverter.
  3. Finally, slowly increase the output voltage of the DC source from zero to the target value at a rate of ≤50V/s.
- To prevent personal injury or equipment damage caused by live operation, a circuit breaker must be added to the voltage input side of the equipment.
- All operations including transportation, storage, installation, operation, use, and maintenance must comply with applicable laws, regulations, standards, and specifications.
- The specifications of cables and components used for electrical connections must comply with local laws, regulations, standards, and specifications.
- Please use the cable connectors provided with the equipment to connect the device cables. Damage caused by using other models of connectors is not the responsibility of the equipment manufacturer.
- Ensure all cable connections to the equipment are correct, secure, and not loose. Improper wiring may cause poor contact or damage the equipment.
- The equipment's protective grounding wire must be firmly connected.
- To protect the equipment and its components from damage during transportation, ensure transport personnel are professionally trained. Record the operation steps during transportation and keep the equipment balanced to avoid dropping.
- The equipment is heavy. Deploy personnel according to the equipment's weight to prevent it from exceeding the human carrying capacity, which could cause injury.
- Ensure the equipment is placed stably and not tilted. Equipment tipping over may cause equipment damage and personal injury.

⚠WARNING

- Avoid placing weight on the wiring terminals during equipment Installation, otherwise it may cause terminal damage.
- If the cable is subjected to excessive tension, poor connection may result. When wiring, leave a certain length of cable slack before connecting it to the equipment's wiring ports.
- Cables of the same type should be bundled together. Different types of cables should be routed at least 30mm apart and must not be intertwined or cross-routed.
- Using cables in high-temperature environments may cause insulation aging and damage. Maintain a distance of at least 30mm between cables and heating components or the periphery of heat source areas.

1.3.1 PV String Safety

⚠WARNING

- Ensure the component frames and mounting system are properly grounded.
- After connecting the DC cables, ensure the connections are secure and not loose. Improper wiring may cause contact failure or high impedance, and damage the inverter.
- Use a multimeter to measure the positive and negative poles of the DC cables to ensure correct polarity and no reverse connection; and that the voltage is within the allowable range.
- Use a multimeter to measure the DC cables to ensure correct polarity and no reverse connection; the voltage should be lower than the maximum DC input voltage. Damage caused by reverse connection and overvoltage is not covered by the equipment manufacturer's warranty.
- PV string output does not support grounding. Before connecting the PV string to the inverter, ensure the minimum insulation resistance to ground of the PV string meets the minimum insulation impedance requirement (R=Max. Input Voltage (V)/30mA).
- Do not connect the same PV string to multiple inverters, as this may cause inverter damage.
- The PV modules used with the inverter must comply with IEC 61730 Class A standard.
- When the PV string input voltage or input current is high, it may cause the inverter output power to derate.

1.3.2 Inverter Safety

⚠WARNING

- Ensure the voltage and frequency at the grid connection point comply with the inverter's grid-connected specifications.
- It is recommended to add protective devices such as circuit breakers or fuses on the AC side of the inverter. The rating of the protective device must be greater than 1.25 times the maximum AC output current of the inverter.
- If the inverter triggers an arc fault alarm less than 5 times within 24 hours, the alarm can be cleared automatically. After the 5th arc fault alarm, the inverter will shut down for protection. The inverter can resume normal operation only after the fault is cleared.
- If the photovoltaic system is not configured with a battery, the use of the BACK-UP function is not recommended, as it may cause a risk of system power failure.
- Changes in grid voltage and frequency may cause the inverter's output power to derate.

1.3.3 Battery Safety

⚠DANGER

- Before operating any equipment in the system, ensure the equipment is powered off to avoid the risk of electric shock. Strictly adhere to all safety precautions in this manual and the safety labels on the equipment during operation.
- Do not disassemble, modify, or repair the battery or control box without official authorization from the equipment manufacturer. Otherwise, it may cause electric shock hazards or equipment damage. Any resulting losses are beyond the manufacturer's liability.
- Do not impact, pull, drag, squeeze, or step on the equipment, and do not place the battery in fire, as the battery may explode.
- Do not place the battery in high-temperature environments. Ensure there are no heat sources near the battery and avoid direct sunlight. A fire may occur if the ambient temperature exceeds 60°C.
- Do not use the battery or control box if there are obvious defects, cracks, damage, or other issues. Battery damage may cause electrolyte leakage.
- Do not move the battery system while it is operating. If you need to replace or add batteries, please contact the after-sales service center.
- Battery short circuits may cause personal injury. The instantaneous high current from a short circuit can release a large amount of energy, potentially leading to a fire.
- The battery DC circuit breaker must comply with the requirements of AS/NZS 5139 standard.

⚠WARNING

- Battery current may be affected by factors such as temperature, Humidity, weather conditions, etc., which may lead to current limiting and affect load capacity.
- If the battery fails to start, please contact the after-sales service center as soon as possible. Otherwise, the battery may be permanently damaged.
- Please perform regular inspection and maintenance on the battery according to its maintenance requirements.

Emergency Response Measures

- Battery electrolyte leakage
  If the battery module leaks electrolyte, avoid contact with the leaked liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If accidental contact with the leaked substance occurs, take the following actions:
  - inhalation: Evacuate from the contaminated area and seek medical help immediately.
  - Eye contact: Rinse with clean water for at least 15 minutes and seek medical help immediately.
  - Skin contact: Wash the contacted area thoroughly with soap and water and seek medical help immediately.
  - Ingestion: Induce vomiting and seek medical assistance immediately.
- Fire
  - When the battery temperature exceeds 150°C, there is a risk of fire, and toxic and harmful gases may be released after a battery fire.
  - To prevent fire, ensure that carbon dioxide, Novec1230, or FM-200 fire extinguishers are available near the equipment.
  - When extinguishing a fire, do not use ABC dry powder fire extinguishers. Firefighters must wear protective clothing and self-contained breathing apparatus.
- Battery triggers fire protection
  For batteries equipped with optional fire protection function, after the fire protection function is triggered, perform the following actions:
  - Immediately cut off the main power switch to ensure no current flows through the battery system.
  - Conduct a preliminary visual inspection of the battery for any damage, deformation, leakage, or unusual odor. Inspect the battery casing, connectors, and cables.
  - Use a temperature sensor to detect the temperature of the battery and its surroundings to ensure there is no risk of overheating.
  - Isolate and mark the damaged battery, and dispose of it properly according to local regulations.

1.3.4 Smart Meter Safety

⚠WARNING

If the grid voltage fluctuation exceeds 265V, long-term overvoltage operation may cause damage to the electric meter. It is recommended to add a fuse with a rated current of 0.5A on the voltage input side of the meter to protect it.

1.4 Safety Symbols and Certification Marks

⚠DANGER

- After the equipment is installed, the labels and warning signs on the enclosure must be clearly visible. It is prohibited to cover, alter, or damage them.
- The following enclosure warning label descriptions are for reference only. Please refer to the actual labels used on the equipment.

No.	Symbol	Meaning
1		Potential hazards exist during equipment operation. Take precautions when operating the equipment.
2		High voltage hazard. High voltage is present during equipment operation. Ensure the equipment is powered off before performing any operations.
3		The inverter surface is at high temperature. Do not touch it during operation to avoid burns.
4		Use the equipment properly. There is a risk of explosion under extreme conditions.
5		Batteries contain flammable materials. Beware of fire.
6		The equipment contains corrosive electrolyte. Avoid contact with leaked electrolyte or vapor.
7		Delayed discharge. After powering off the equipment, wait for 5 minutes until it is fully discharged.
8		Keep the equipment away from open flames or ignition sources.

No.	Symbol	Meaning
9		Keep the equipment out of reach of children.
10		Use the equipment properly. There is a risk of explosion under extreme conditions.
11		Batteries contain flammable materials. Beware of fire.
12		Do not lift the equipment after the battery system wiring is completed or while the battery system is operating.
13		Do not extinguish with water.
14		Read the product manual carefully before operating the equipment.
15		Wear personal protective equipment during installation, operation, and maintenance.
16		Do not dispose of the equipment as household waste. Dispose of it according to local laws and regulations, or return it to the equipment manufacturer.
17		Do not directly disconnect or plug/unplug DC terminals while the equipment is operating.
18		Grounding point.
19		Recycling symbol.
20		CE certification mark.
21		TUV mark.
22		RCM mark.

1.5 EU Declaration of Conformity

1.5.1 Equipment with Wireless Communication Modules

Equipment with Wireless Communication Modules sold in the European market must comply with the following directives:

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

1.5.2 Equipment without Wireless Communication Modules (Except Battery)

Equipment without Wireless Communication Modules that can be sold in the European market meets the following directive requirements:

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

1.5.3 Battery

Batteries that can be sold on the European market meet the 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)*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 stipulated by this regulation.

More EU Declarations of Conformity 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 energy within the photovoltaic system to meet household electricity demands. The energy IoT devices in the system manage electrical appliances by identifying the overall power situation in the system, thereby achieving intelligent management of power for supplying loads, storing to the Battery, or exporting to the grid.

⚠WARNING

- Select the battery model according to the inverter and battery matching list. For requirements regarding batteries used in the same system, such as whether models can be mixed or capacities must be consistent, please refer to the corresponding battery user manual or contact the battery manufacturer for relevant requirements. Inverter and battery compatibility list: https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_Battery%20Compatibility%20Overview-EN.pdf.
- Due to product version upgrades or other reasons, the document content will be updated periodically. For the matching relationship 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.
- Photovoltaic systems are not suitable for connecting devices that rely on stable power supply, such as life-sustaining medical equipment, etc. Please ensure that a system power failure does not lead to personal injury.
- If a battery is not configured in the photovoltaic system, it is not recommended to use the BACK-UP function, otherwise it may cause a system power failure risk.
- The BACK-UP port does not support connection to autotransformers or isolation transformers.
- Battery current may be affected by factors such as temperature, humidity, weather conditions, etc., which may lead to battery current limiting and affect

⚠WARNING

load capacity.

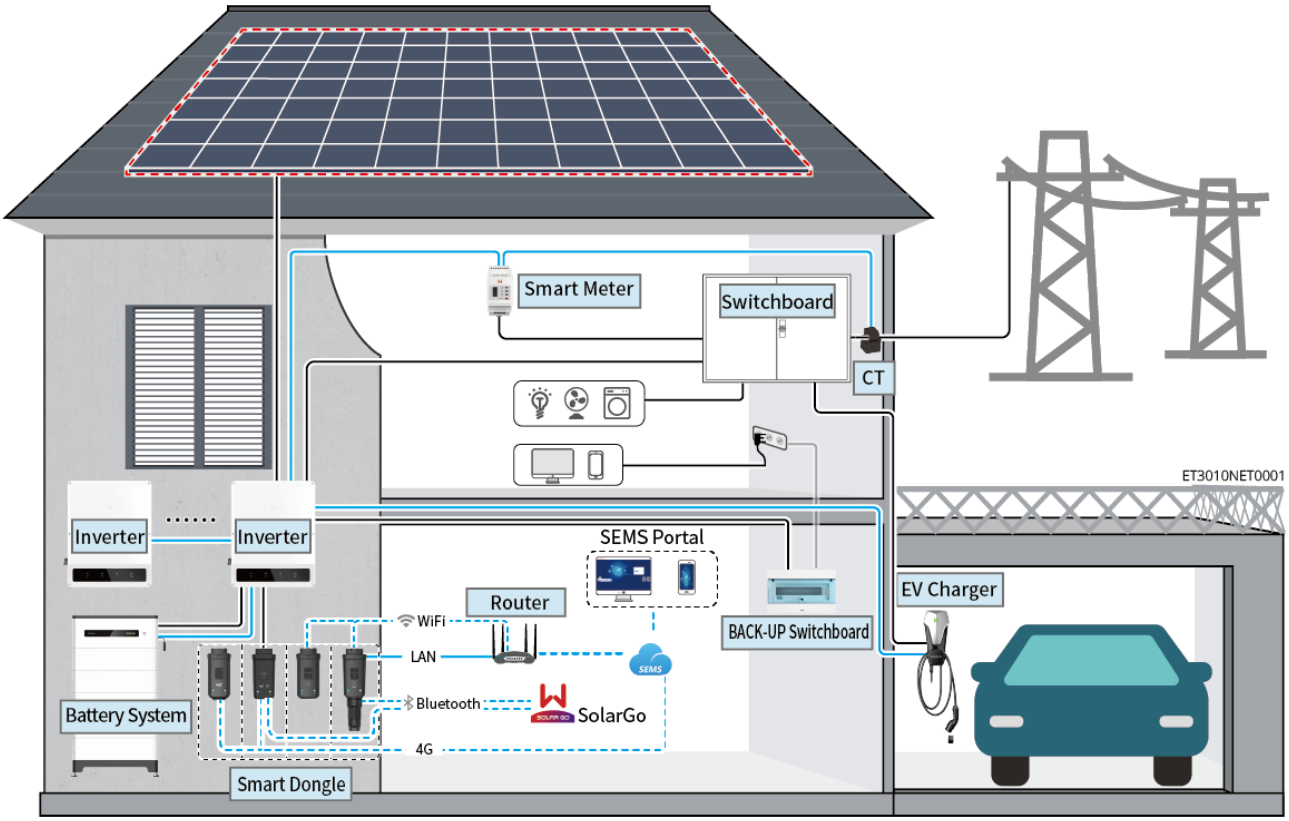
- The inverter has UPS function with a switching time of <10ms. Please ensure the BACK-UP Loads capacity is less than the inverter's rated power. Otherwise, it may cause the UPS function to fail during a grid power outage.
- If a battery is not configured in the photovoltaic system, it is not recommended to use the BACK-UP function, otherwise it may cause a system power failure risk.
- For detailed networking and wiring schemes for each scenario, please refer to: Detailed System Wiring Diagram.
- When the inverter is in off-grid state, it can be used normally for ordinary household loads. However, the following loads need to be limited, such as:
  - inductive load: inductive load power < 0.4 times the inverter's rated output power.
  - Capacitive load: total power ≤ 0.66 x inverter rated output power.
  - When connecting three-phase loads to the BACK-UP port, only three-phase loads with a neutral (N) wire are supported. Connecting loads without a neutral (N) wire is not supported, as it may cause abnormal load operation or damage the load.
  - The inverter does not support half-wave loads. Half-wave loads: Some older or EMC non-compliant appliances (such as hair dryers, small heaters using half-wave rectification) may not work properly.
- In a system where the inverter operates completely off-grid, if the battery is in low-light or rainy weather for a long time 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 depleting the battery. Recommended measures are as follows:
  - During off-grid operation, set the minimum SOC protection threshold. It is recommended to set the off-grid battery SOC lower limit to 30%.
  - When the SOC approaches the protection threshold, the system will automatically enter load limiting or protection mode.
  - If there is insufficient sunlight for several consecutive days and the battery SOC is too low, promptly replenish the battery using external energy sources (such as a generator or grid-assisted charging).
  - Regularly check the battery status to ensure it is within the safe operating range.
  - It is recommended to fully charge and discharge the battery once every six

⚠WARNING

months to calibrate the SOC accuracy.

- For detailed networking and wiring schemes for each scenario, please refer to: 5.2.Detailed System Wiring Diagram(Page 95).

General Scenarios



Device Type	model	Description
Inverter	GW12KL-ET GW18KL-ET GW15K-ET GW20K-ET GW25K-ET GW29.9K-ET GW30K-ET	• Supports up to 4 inverters to form a parallel system. • Battery-ready models do not support forming a parallel system when the battery function is not activated. • Only machines with the same AC output voltage can form a parallel system. • In a coupling scenario, using a dual meter allows simultaneous monitoring of grid-tied inverter generation and load power consumption. The following version requirements must be met: ◦ Inverter ARM software version 15.441 or above. ◦ Inverter DSP software version 11.11060 or above. ◦ SolarGo version 6.9.0 or above.
Battery system	**Lynx Home F G2** LX F6.4-H-20 LX F9.6-H-20 LX F12.8-H-20 LX F16.0-H-20 LX F19.2-H-20 LX F22.4-H-20 LX F25.6-H-20 LX F28.8-H-20	

<table>
<tr><th>Device Type</th><th>model</th><th>Description</th></tr>
<tr><td rowspan="2"></td><td>Lynx Home F,
Lynx Home Plus+
LX F6.6-H
LX F9.8-H
LX F13.1-H
LX F16.4-H</td><td rowspan="2">• The Lynx Home F battery system does not support parallel clustering.
• Up to 8 clusters of battery systems are supported for parallel clustering in a system.
• Battery systems of different versions cannot be mixed for parallel clustering.
• GW12KL-ET and GW18KL-ET inverters can only use the battery system with the Lynx Home F G2 series batteries; other battery series are not supported.
• LXF6.4-H-20 and LXF9.6-H-20 model batteries are only supported for use with GW12KL-ET and GW18KL-ET inverters; other inverters are not supported.
• Lynx Home D batteries support usable capacity expansion, with a maximum of 2 groups (each group can stack up to 4 battery modules) for a total of 8 battery modules to expand usable capacity. Contact your distributor to purchase batteries if capacity expansion is needed.</td></tr>
<tr><td>Lynx Home D
LX D5.0-10</td></tr>
<tr><td>Smart Meter</td><td>• GM3000
• GM330
• GMK330</td><td>• GM3000: Included with the inverter, CT cannot be replaced, CT ratio: 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 200-5000
◦ 5A: CT secondary side output current
• GMK330: CT is shipped with the meter, CT ratio:
◦ 120A: 40mA
◦ 200A: 50mA (Brazil only)</td></tr>
</table>

Device Type	model	Description
smart dongle	• WiFi/LAN Kit-20 • Wi-Fi Kit • LS4G Kit-CN, 4G Kit-CN, 4G Kit-CN-G20, or 4G Kit-CN-G21 (China only) • Ezlink3000	• For a single unit, use the WiFi/LAN Kit-20, Wi-Fi Kit, LS4G Kit-CN, 4G Kit-CN, 4G Kit-CN-G20, or 4G Kit-CN-G21 module. If using WiFi/LAN Kit-20 as a replacement for Wi-Fi Kit, please upgrade the inverter ARM firmware version to 08.401 or above before switching to WiFi/LAN Kit-20. • For single GW12KL-ET and GW18KL-ET model inverters, only the WiFi/LAN Kit-20 module is supported. • In a parallel system, only the master inverter needs to be connected to Ezlink3000; slave inverters do not require a communication module. • Ezlink3000 firmware version must be 05 or above.

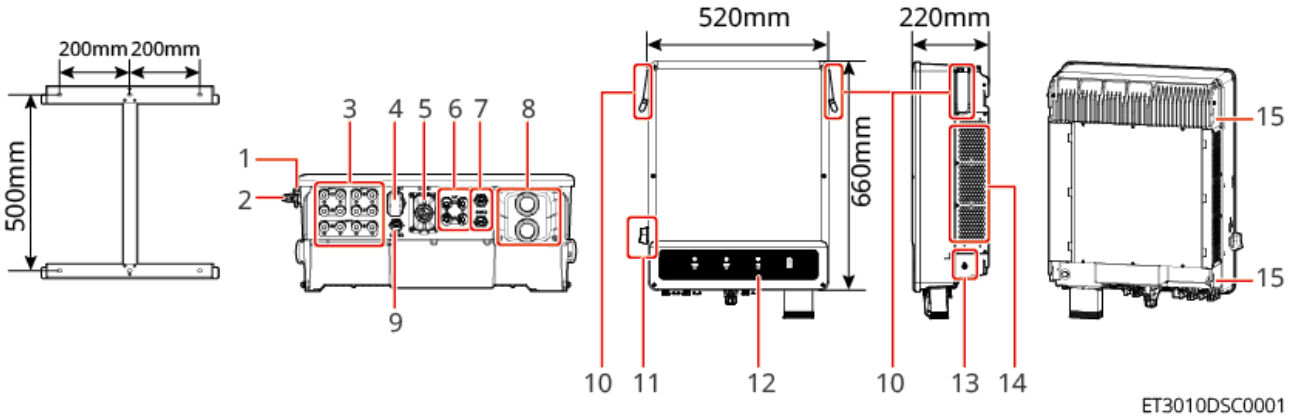
2.2 Product Overview

2.2.1 Inverter

In photovoltaic systems, the inverter controls and optimizes energy flow through an integrated energy management system. The generated electricity can be used for loads, stored in batteries, or output to the grid.

NOTICE
The appearance of inverters varies across different power ranges. Please refer to the actual product.

No.	model	Nominal output power	Nominal output voltage	Number of battery ports
1	GW12KL-ET	12kW	220V, 3L/N/PE	1
2	GW18KL-ET	18kW		2
3	GW15K-ET	15kW	380/400V, 3L/N/PE	1
4	GW20K-ET	20kW		1
5	GW25K-ET	25kW		2
6	GW29.9K-ET	29.9kW		2
7	GW30K-ET	30kW		2

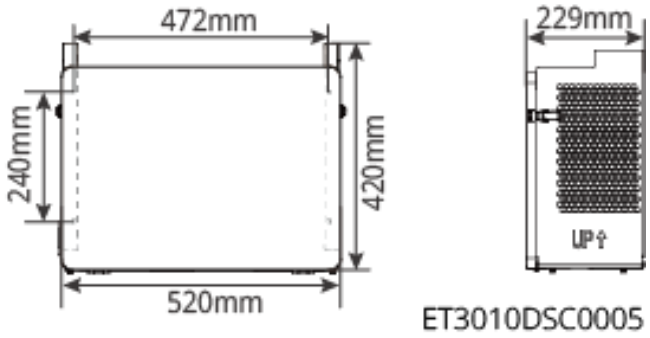


Component Introduction

No.	Component/Silkscreen	Description
1	DC Switch Lock Hole	Australia only.
2	DC Switch	Controls the connection or disconnection of the DC input.
3	PV Input Terminals	Can connect to the DC input cables from PV modules. • GW15K-ET, GW20K-ET, GW12KL-ET x 2 • GW25K-ET, GW29.9K-ET, GW30K-ET, GW18KL-ET x 3

4	Communication Module Port	Can connect to a communication module, supports connection to 4G, Wi-Fi/LAN modules.
5	Communication Port	Connects the communication cable, supports communication with DRED, Remote Shutdown, Rapid Shutdown, RCR, EMS, and generators.
6	Battery Connection Port	Connects the battery DC cables. • GW15K-ET, GW20K-ET, GW12KL-ET x 1 • GW25K-ET, GW29.9K-ET, GW30K-ET, GW18KL-ET x 2
7	BMS Communication Port	Connects the battery communication cable. • GW15K-ET, GW20K1-ET, GW12KL-ET x 1 • GW25K-ET, GW29.9K-ET, GW30K-ET, GW18KL-ET x 2
8	AC Port	Connects the AC cables, ON-GRID and BACK-UP ports.
9	METER Communication Port	Connects to the smart meter.
10	Handle	For carrying the inverter.
11	indicator	Indicates the operating status of the inverter.
12	Grounding terminal	Connects the protective ground wire for the enclosure.
13	Fan	For inverter heat dissipation.
14	Inverter Mounting Slot	For mounting and securing the inverter.

Australian Junction Box Dimensions



2.2.2 Battery

The battery system can store and release electricity according to the requirements of the photovoltaic energy storage system, and the input and output ports of this energy storage system are high-voltage direct current.

2.2.2.1 Lynx Home F、Lynx Home F Plus+

Lynx Home F series battery systems consist of a master control unit and battery modules. The system stores and releases energy according to the requirements of the photovoltaic energy storage system. Both the input and output ports of this energy storage system are high-voltage direct current.

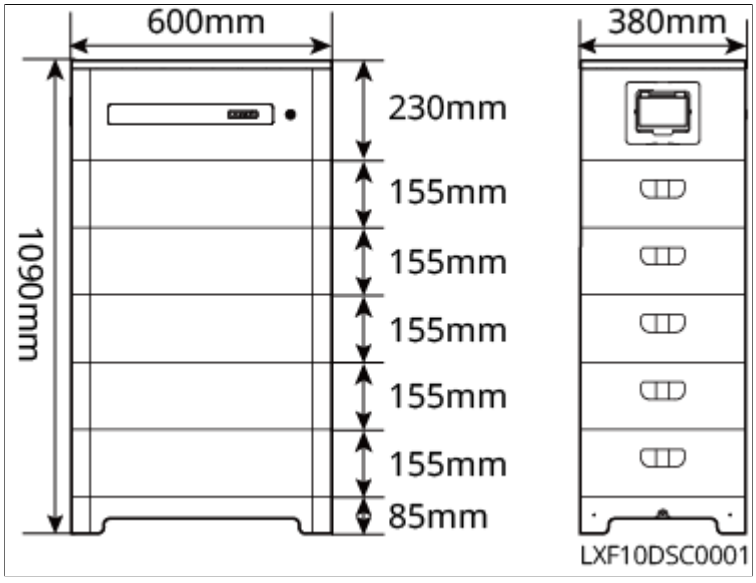


Figure1 Battery Dimensions

No.	model	Number of Battery Modules	usable energy (kWh)
1	LX F6.6-H	2	6.55kWh
2	LX F9.8-H	3	9.83kWh
3	LX F13.1-H	4	13.1kWh
4	LX F16.4-H	5	16.38kWh

2.2.2.2 Lynx Home F G2

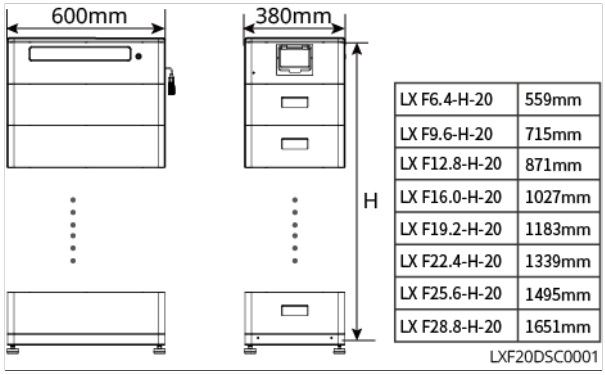


Figure2 Battery Dimensions

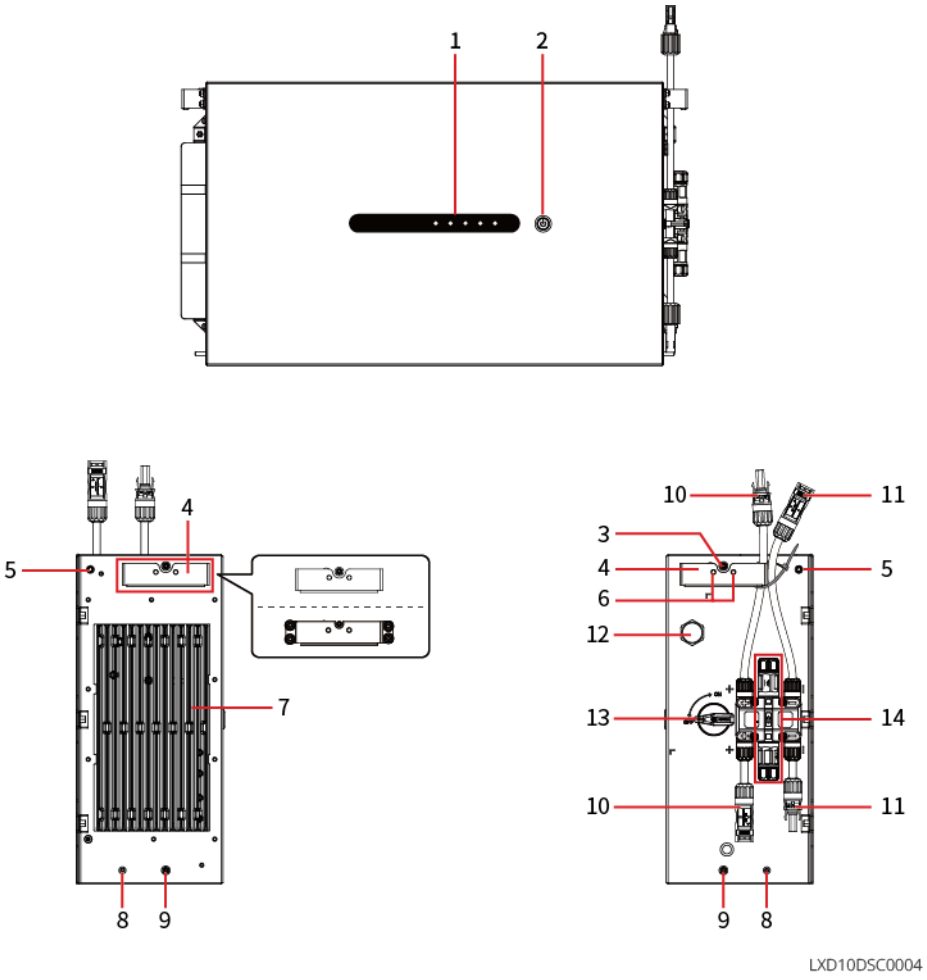
No.	model	Number of Battery Modules	usable energy（kWh）
1	LX F6.4-H-20	2	6.4kWh
2	LX F9.6-H-20	3	9.6kWh
3	LX F12.8-H-20	4	12.8kWh
4	LX F16.0-H-20	5	16.0kWh
5	LX F19.2-H-20	6	19.2kWh
6	LX F22.4-H-20	7	22.4kWh
7	LX F25.6-H-20	8	25.6kWh
8	LX F28.8-H-20	9	28.8kWh

2.2.2.3 Lynx Home D

In the Lynx Home D battery system, the BMS and battery modules are integrated into one unit.

NOTICE
Optional base or bracket installation.

Appearance Description:

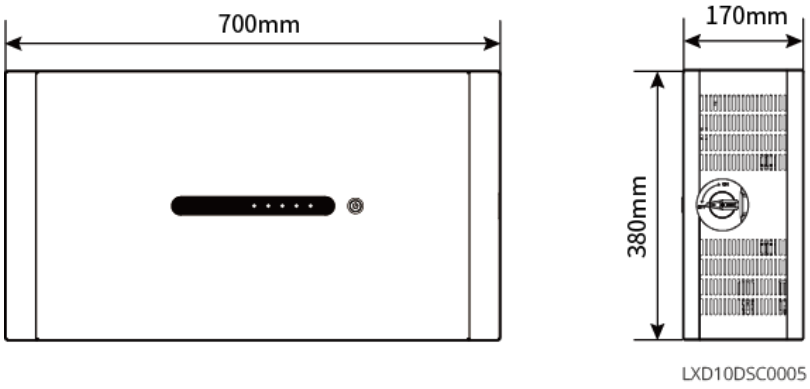


No.	Component	Description
1	Battery SOC Indicator	

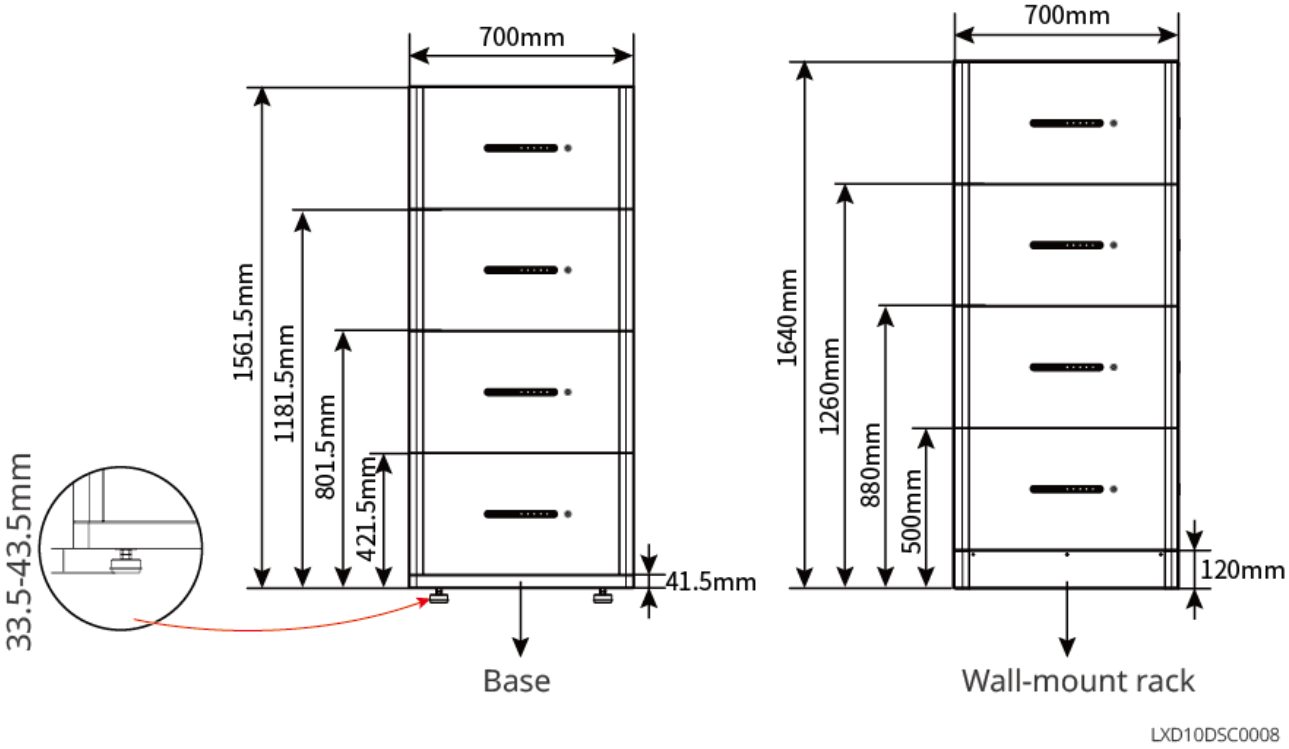
No.	Component	Description
2	Multifunction Button Indicator	• SOC Indicator: Displays battery SOC status. • Multifunction Button Indicator ◦ Battery Black Start Function: When there is no PV generation in the photovoltaic system and the grid is abnormal, if the inverter cannot operate normally, you can press and hold the multifunction button for 2 seconds to start the battery system and the inverter. The inverter can then enter off-grid mode, powered by the battery to supply the load. ◦ Press and hold the multifunction button for >5 seconds to power down the battery system. • When the SOC indicator and the multifunction button indicator display in combination, they can show the battery system's operating status, alarm status, and fault status.
3	Inter-battery Mounting Hole or Grounding Port	Used for securing between two batteries or for connecting the ground wire.
4	Handle	Used for carrying the battery.
5	Battery-to-Wall Mounting Hole	Used for securing the battery to the wall.
6	Side Cover Mounting Hole	Used for installing the side cover.
7	Heat sink	Used for battery system heat dissipation.
8	Side Cover Mounting Hole	Used for installing the side cover.
9	Inter-battery Mounting Hole	Used for securing between two batteries.

No.	Component	Description
10	Battery Positive Connection Terminal	Connects to the battery or inverter positive terminal.
11	Battery Negative Connection Terminal	Connects to the battery or inverter negative terminal.
12	Ventilation valve	Used to balance pressure inside and outside the battery.
13	Battery Power Switch	Battery power input/output switch.
14	Communication Connection Port	Connects the communication cable or termination resistor between the battery and inverter, or between batteries.

Single Battery Dimensions Introduction:

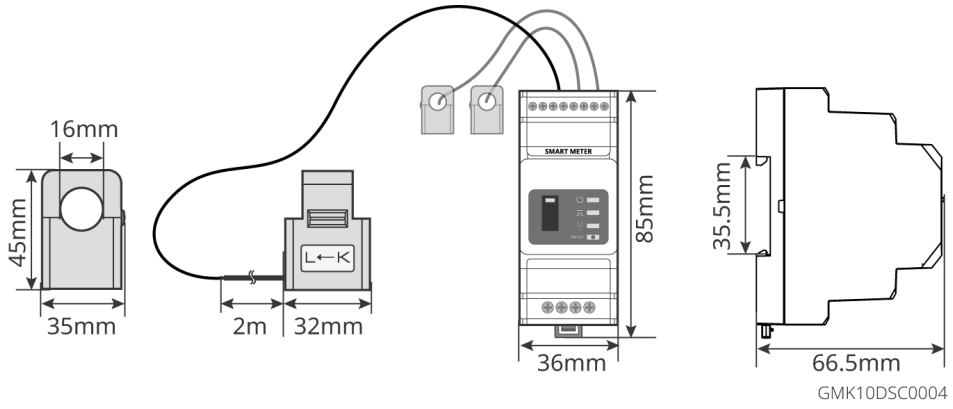


Battery Pack Dimensions Introduction:

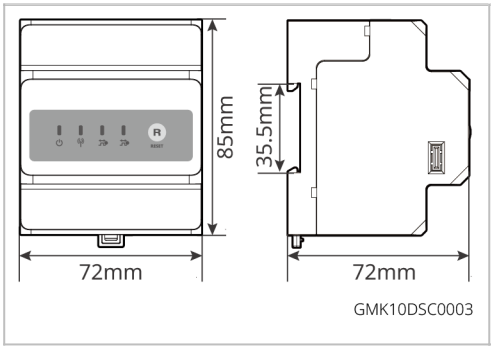


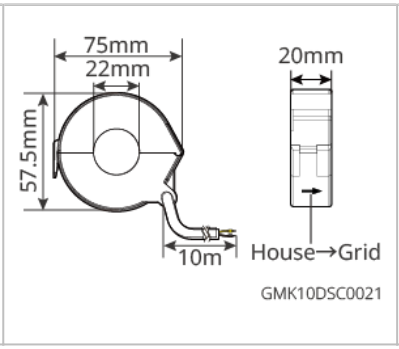
2.2.3 Smart Meter

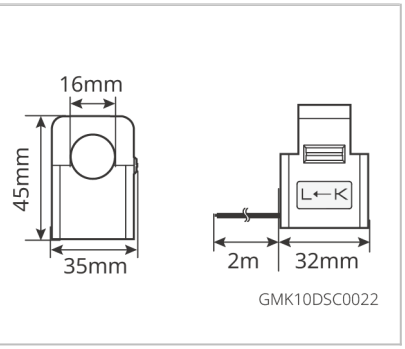
The Smart Meter can measure parameters such as grid voltage, current, Power, Frequency, and electrical energy, and transmit this information to the inverter to control the input and output Power of the energy storage system.

GM3000&CT


GM330&GMK330&CT



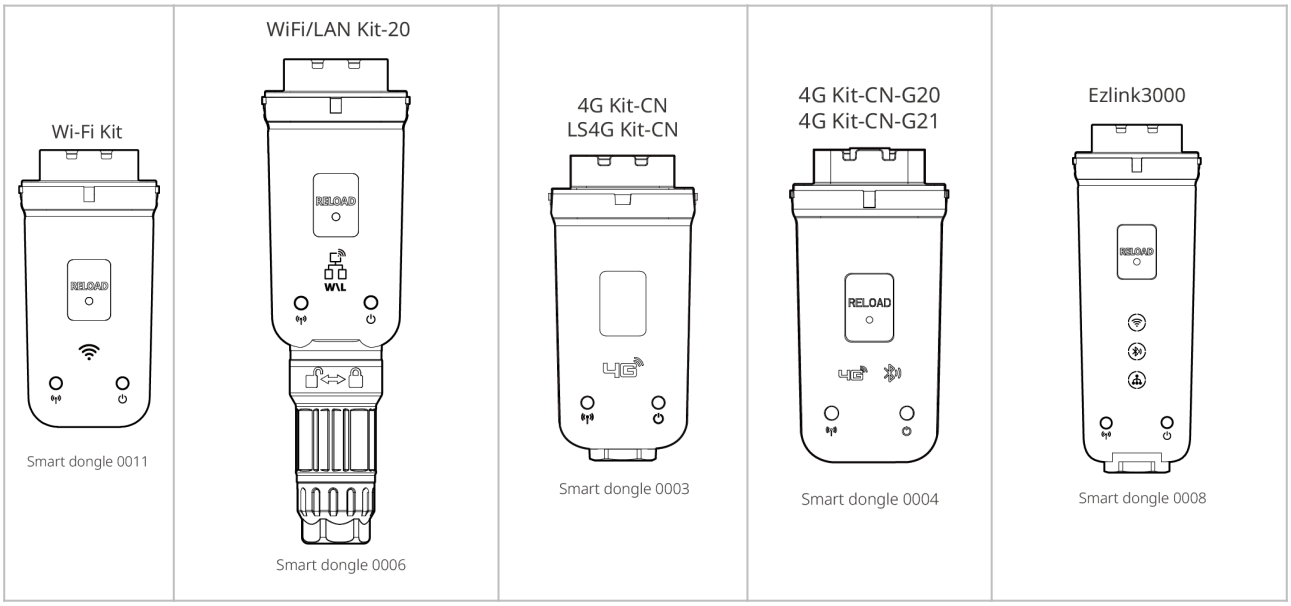




No.	model	Applicable Scenarios
1	GM3000	CT does not support replacement, CT ratio: 120A: 40mA
2	GM330	CT can be sourced from GoodWe or purchased separately, CT ratio requirement: nA: 5A • nA: CT primary side input current, the range of n is 200-5000 • 5A: CT secondary side output current
3	GMK330	CT is shipped with the meter, CT ratio: • 120A: 40mA • 200A: 50mA (Brazil only)

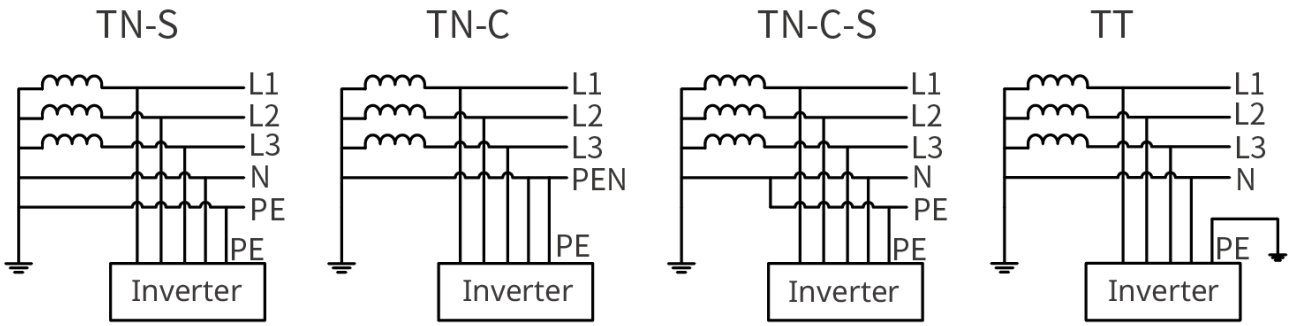
2.2.4 smart dongle

The smart dongle is primarily used for real-time transmission of various inverter power generation data to the SEMS Portal remote monitoring platform, and for local device commissioning by connecting to the smart dongle via the SolarGo APP.



No.	model	Signal Type	Applicable Scenario
1	Wi-Fi Kit	WiFi	Inverter single-unit scenario
2	WiFi/LAN Kit-20	WiFi, LAN, Bluetooth	
3	LS4G Kit-CN 4G Kit-CN	4G	
4	4G Kit-CN-G20	4G, Bluetooth	
	4G Kit-CN-G21	4G, Bluetooth, CNSS	
5	Ezlink3000	WiFi, LAN, Bluetooth	Host in inverter multi-unit scenario

2.3 Supported Grid Types



TNNET0003

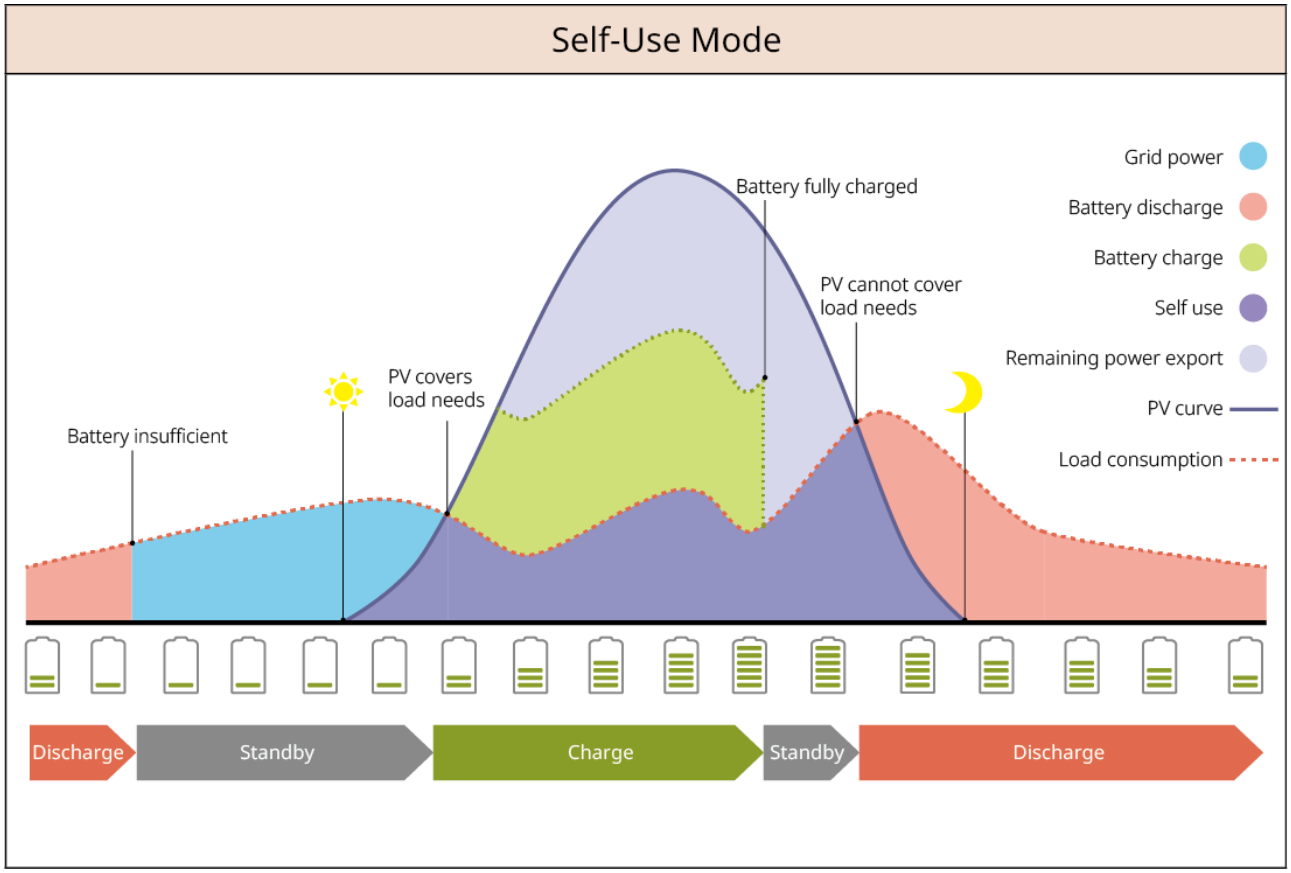
2.4 System Working Mode

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

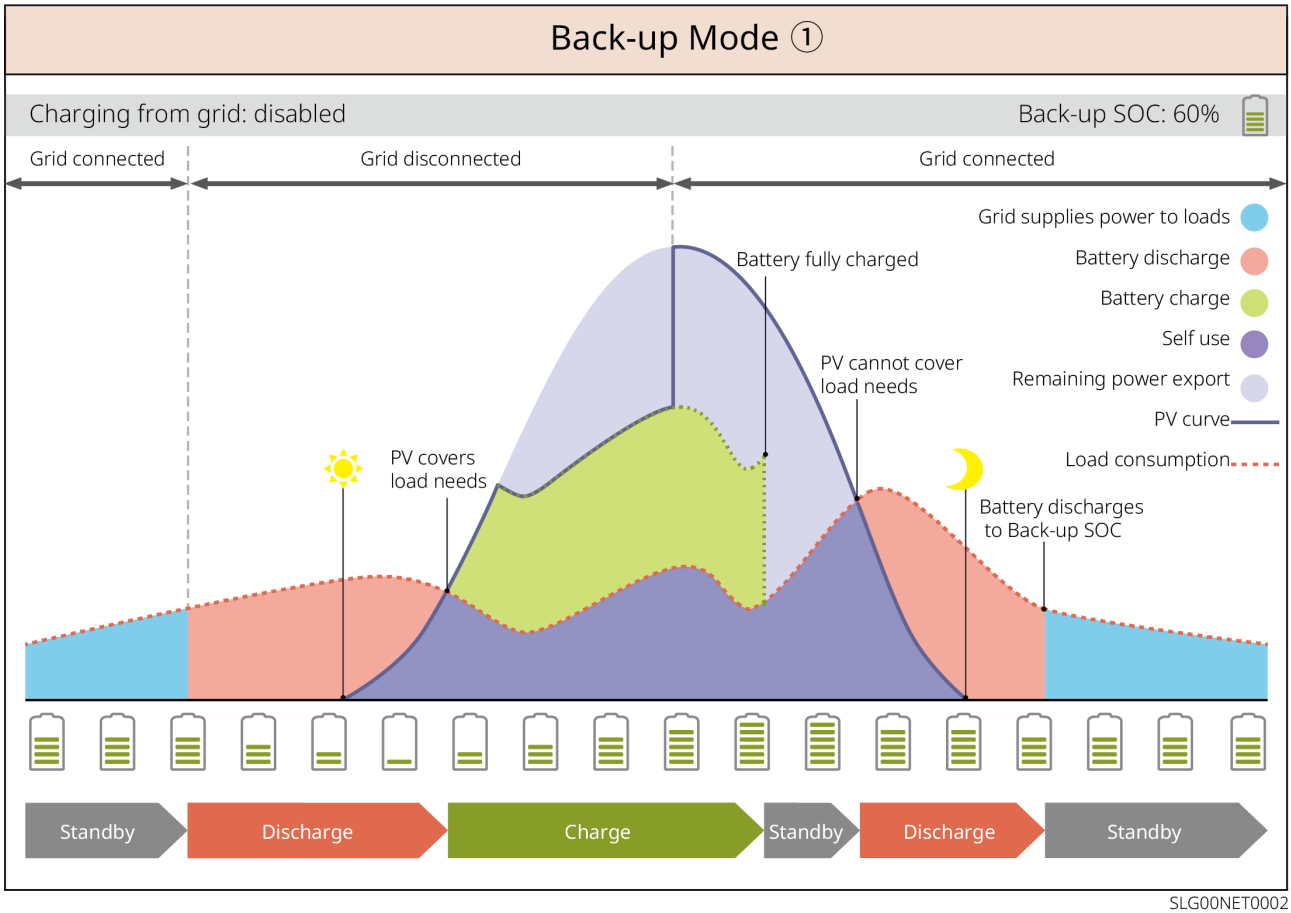
- The basic mode of system operation.
- PV power generation prioritizes supplying power to the loads. Excess power charges the battery, and any remaining power is sold to the grid. When PV power generation does not meet the load demand, the battery supplies power to the loads. If the battery power is also insufficient, the grid supplies power to the loads.



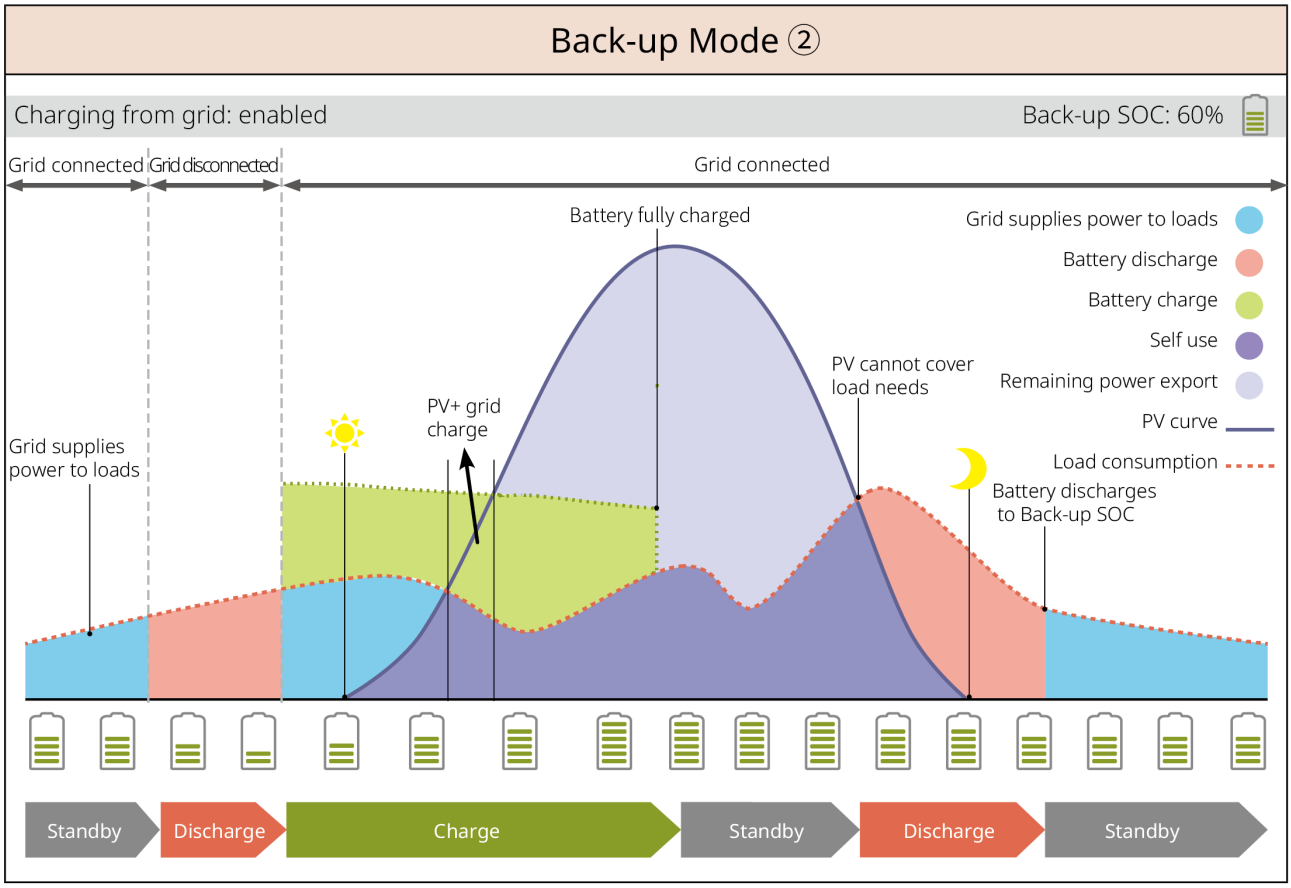
SLG00NET0009

Backup Mode

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



SLG00NET0002



SLG00NET0003

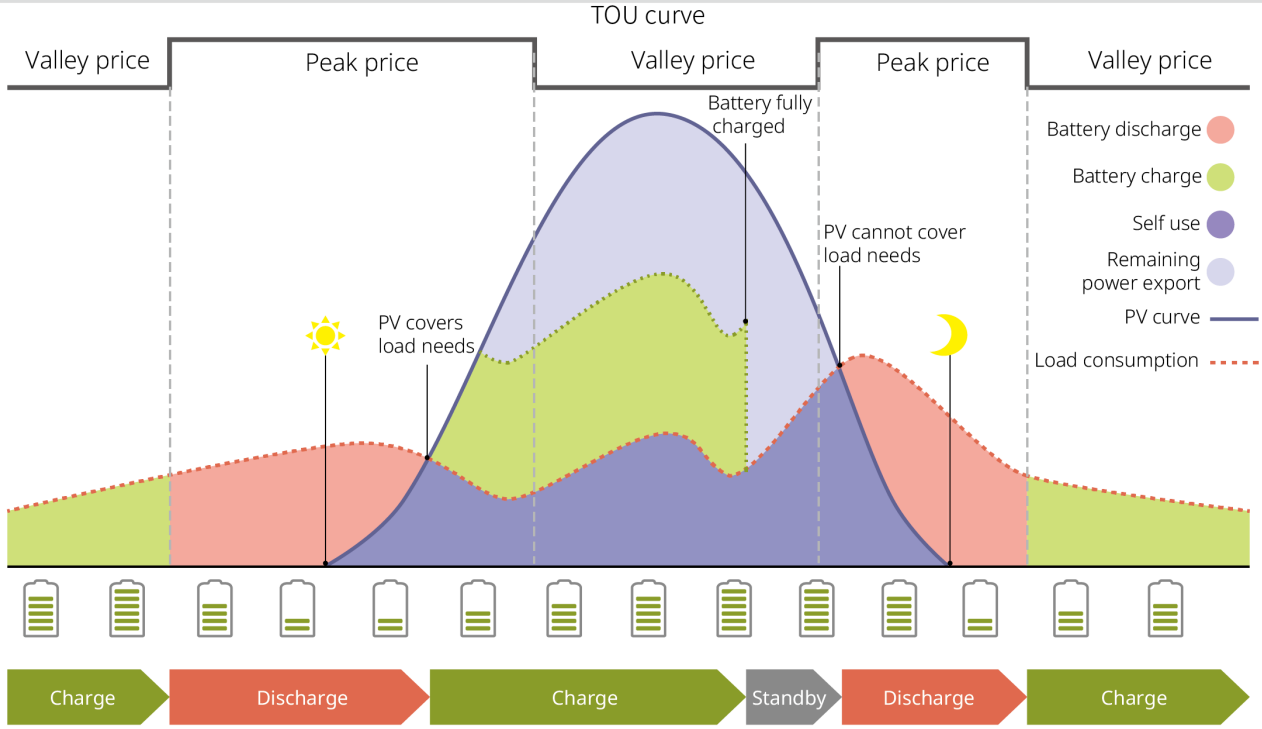
TOU Mode

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

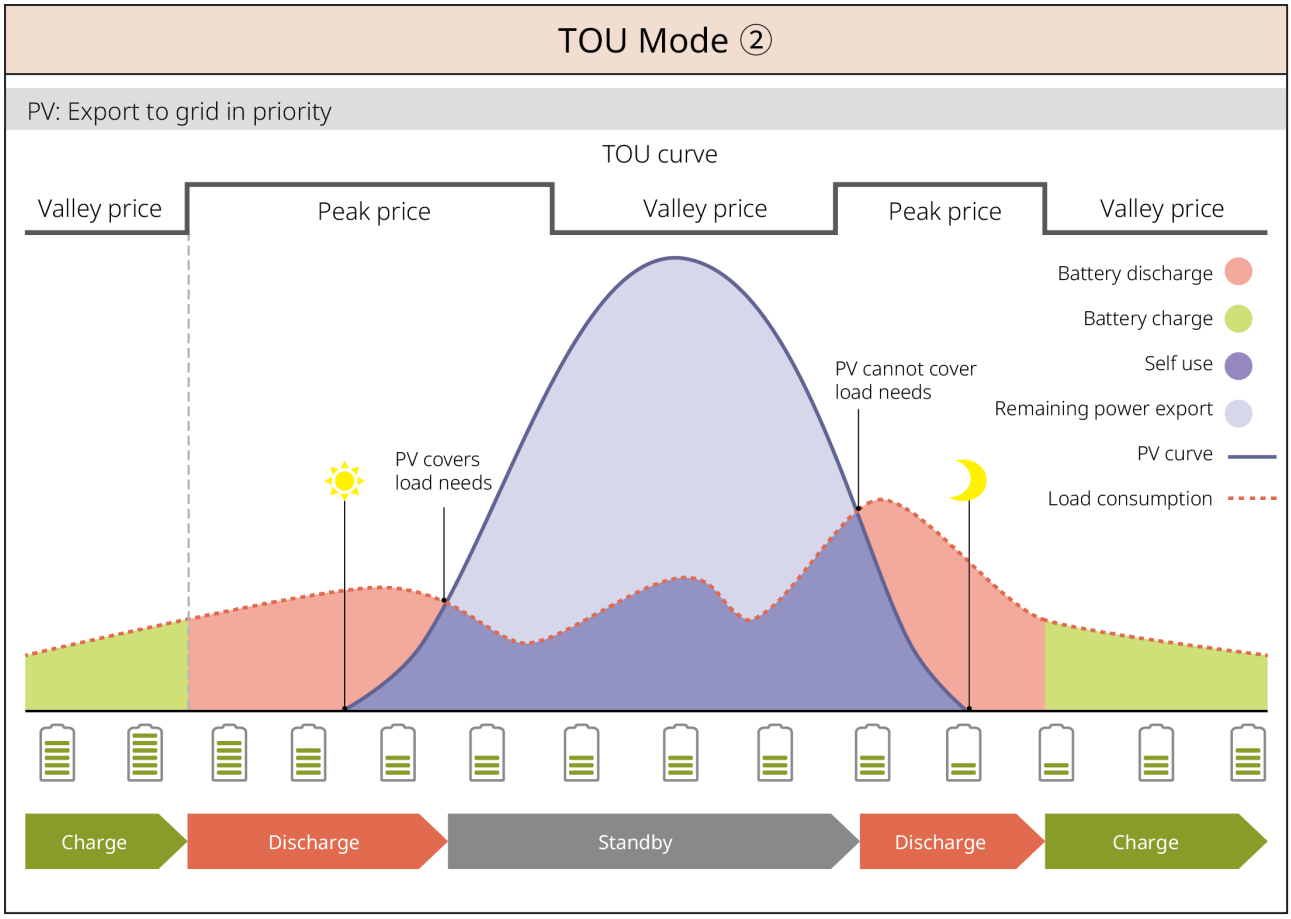
For example: during valley price periods, set the battery to charging mode to buy electricity from the grid for charging; during peak price periods, set the battery to discharging mode to supply power to the loads through the battery.

TOU Mode ①

PV: Charge battery in priority



SLG00NET0004



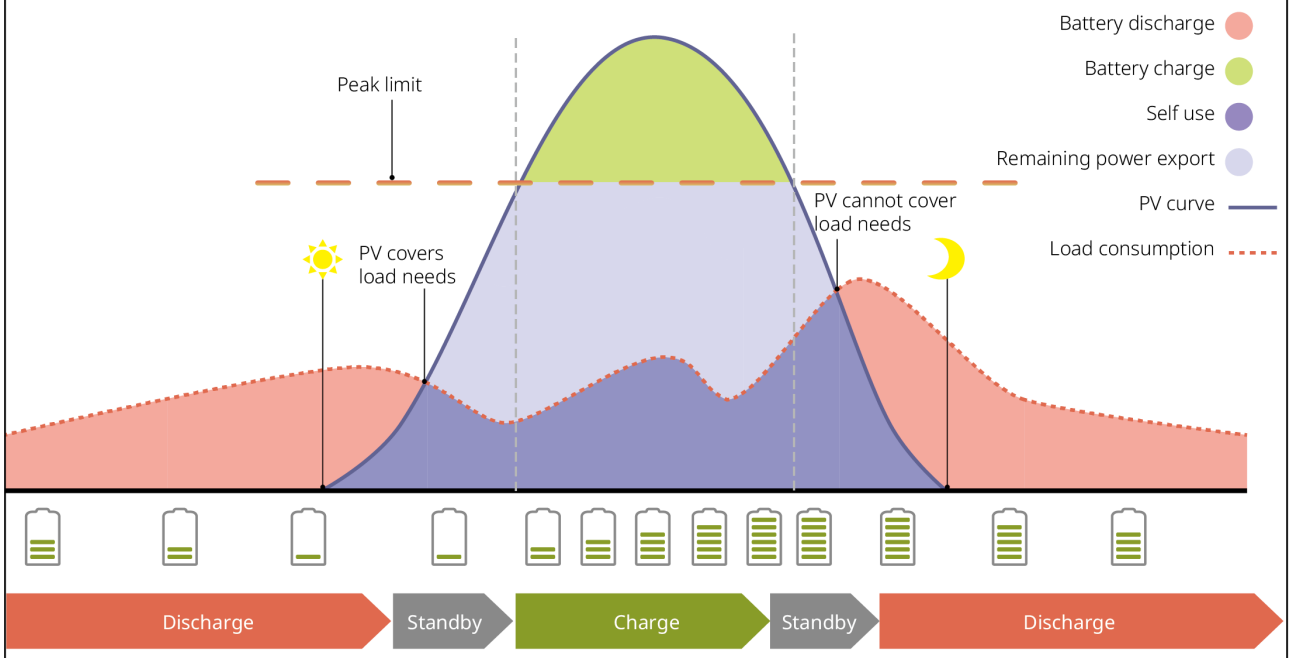
SLG00NET0005

Delayed Charging Mode

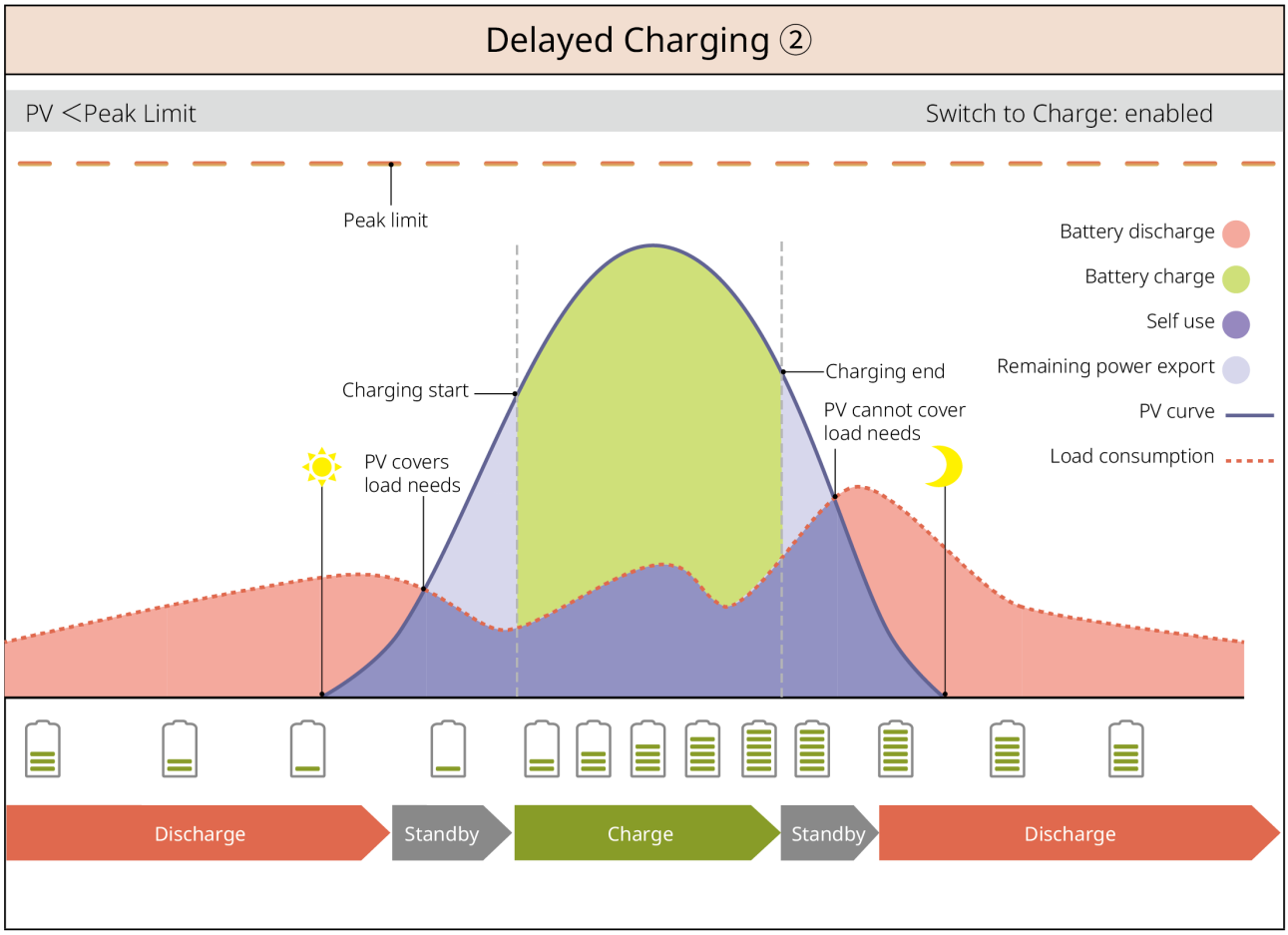
- Suitable for areas with grid-connected power output limitations.
- Setting a peak power limit can use PV power generation that exceeds the grid-connected limit to charge the battery; or set PV charging periods to use PV power generation to charge the battery during those periods.

Delayed Charging ①

PV > Peak Limit | Switch to Charge: enabled/disabled



SLG00NET0006



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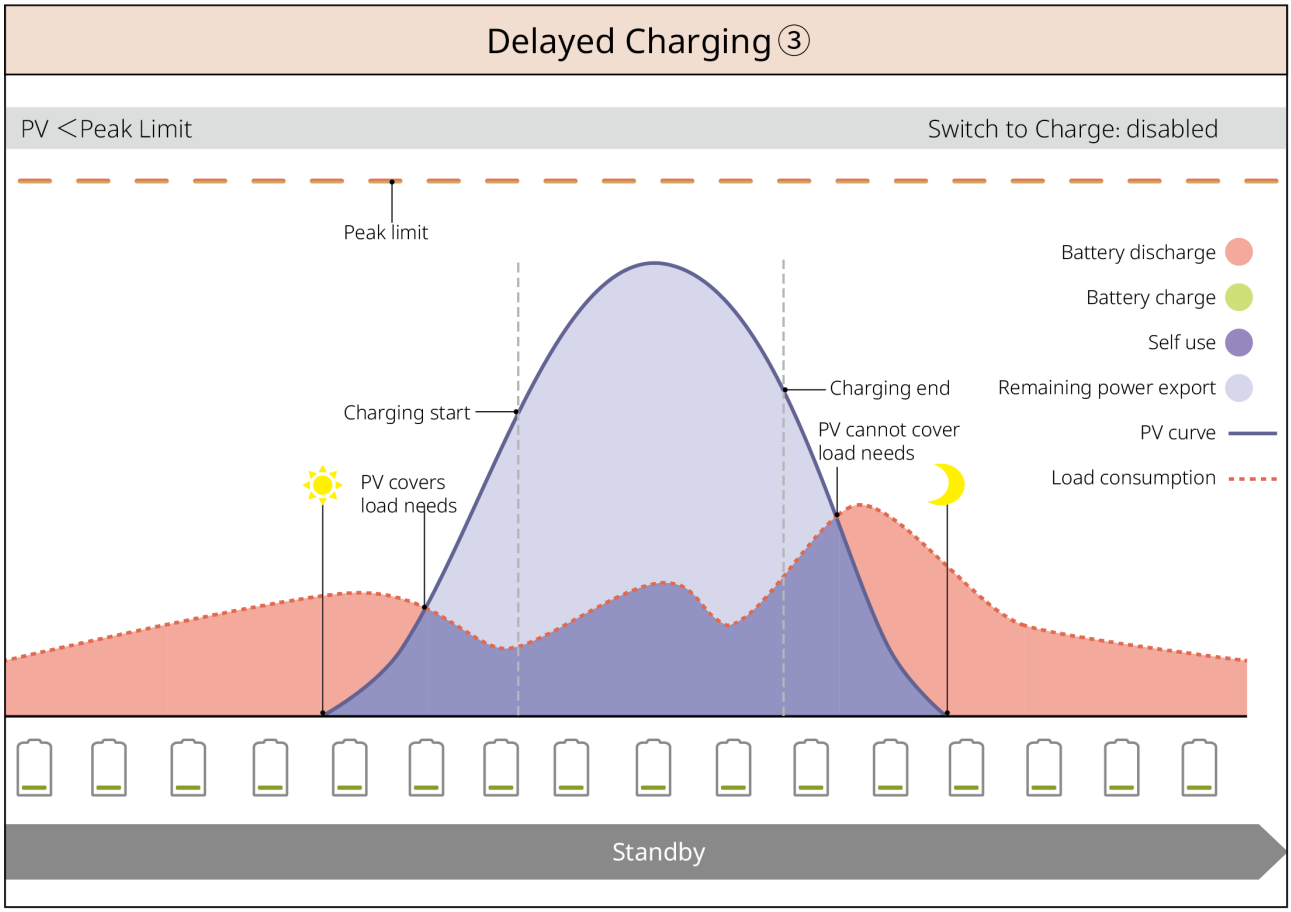
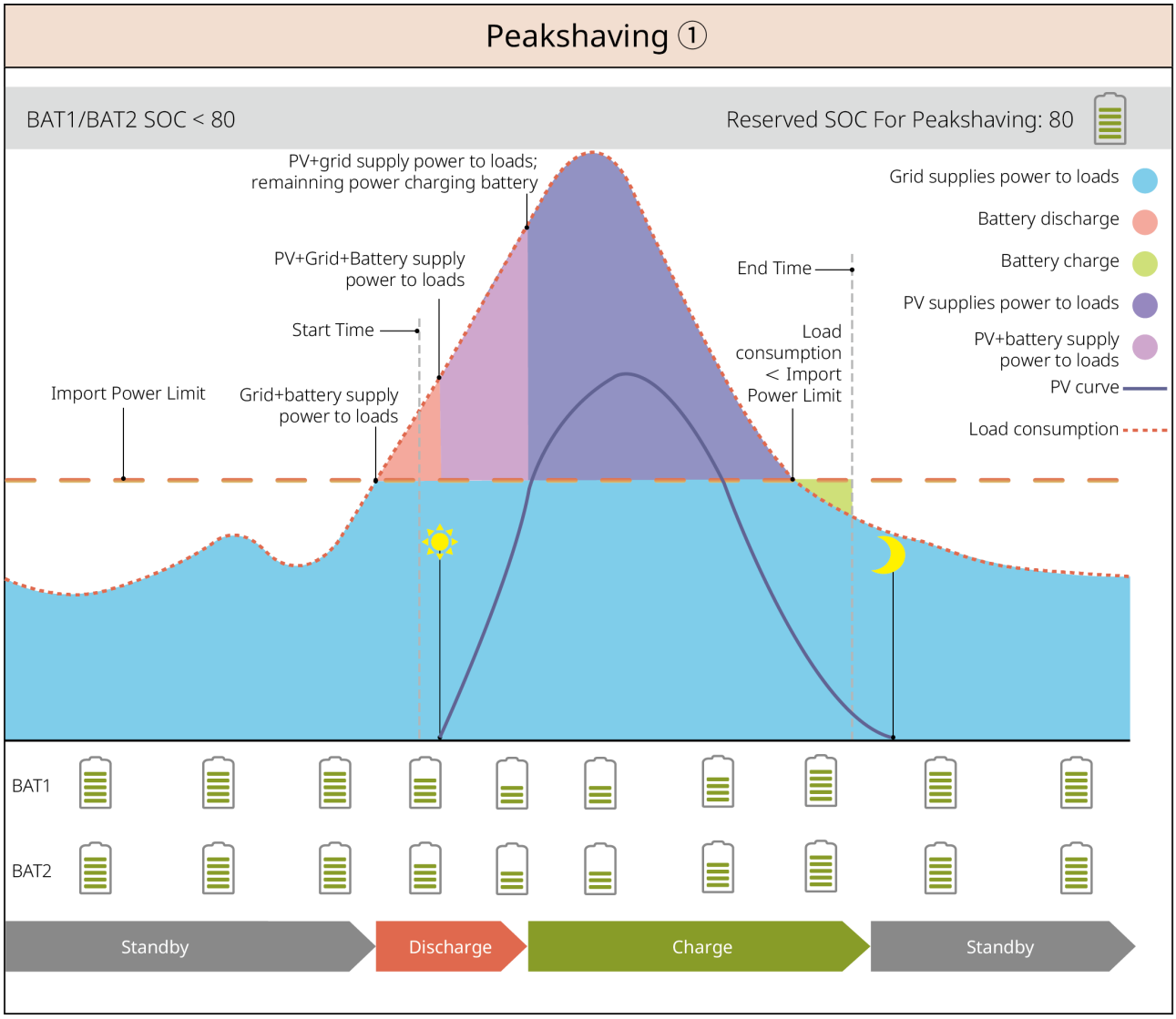


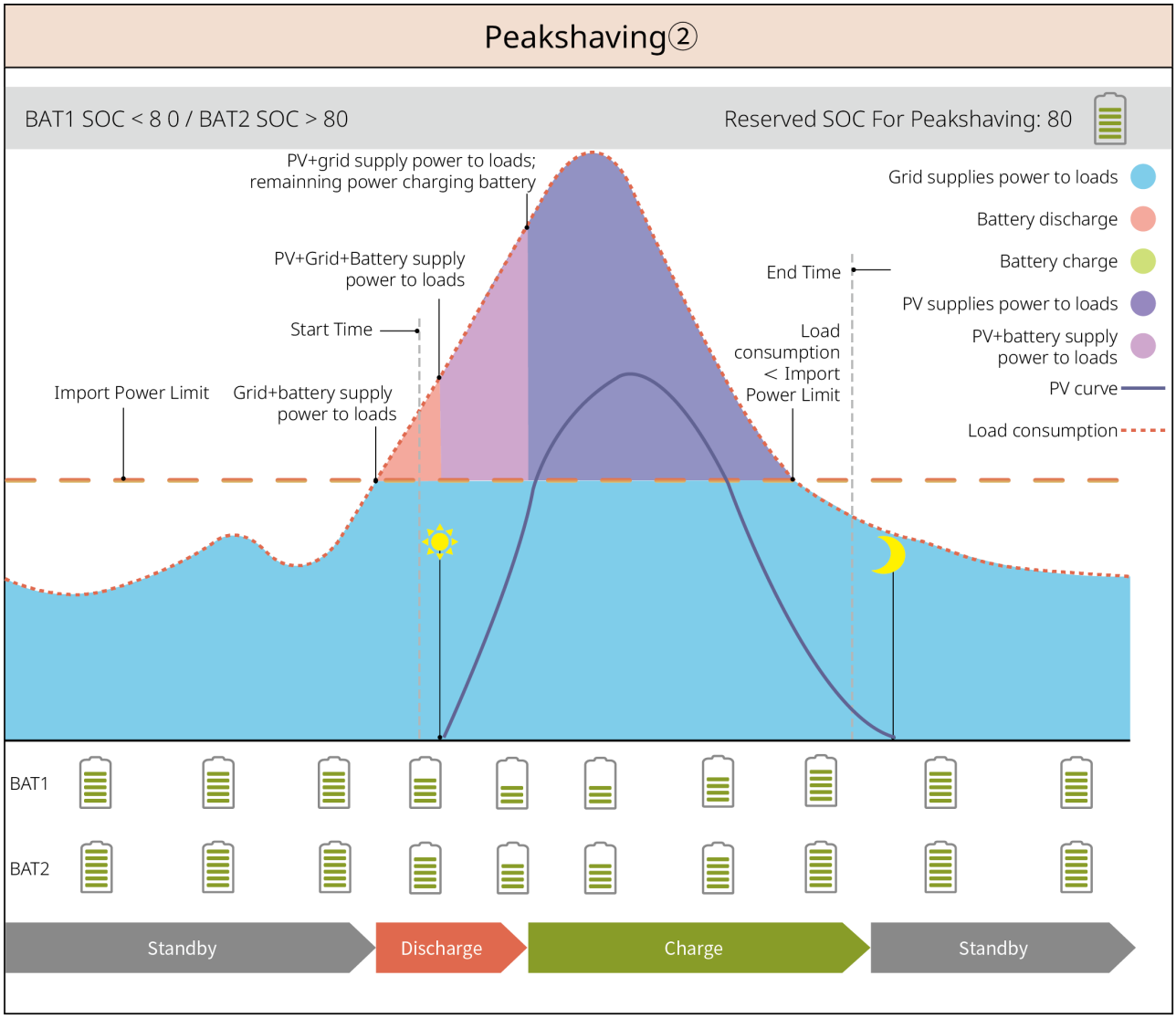
SLG00NET0008

Demand Control Mode

- Primarily suitable for industrial and commercial scenarios.
- When the total load power consumption exceeds the electricity quota in a short time, battery discharge can be used to reduce the portion of electricity consumption that exceeds the quota.
- When the SOC of both battery circuits in the inverter is below the reserved SOC for demand control, the system buys electricity from the grid based on time periods, load electricity consumption, and peak power purchase limits. When only one battery circuit in the inverter has SOC below the reserved SOC for demand control, the system buys electricity from the grid based on load electricity consumption and peak power purchase limits.



SLG00NET0010



SLG00NET0011

Off-Grid Mode

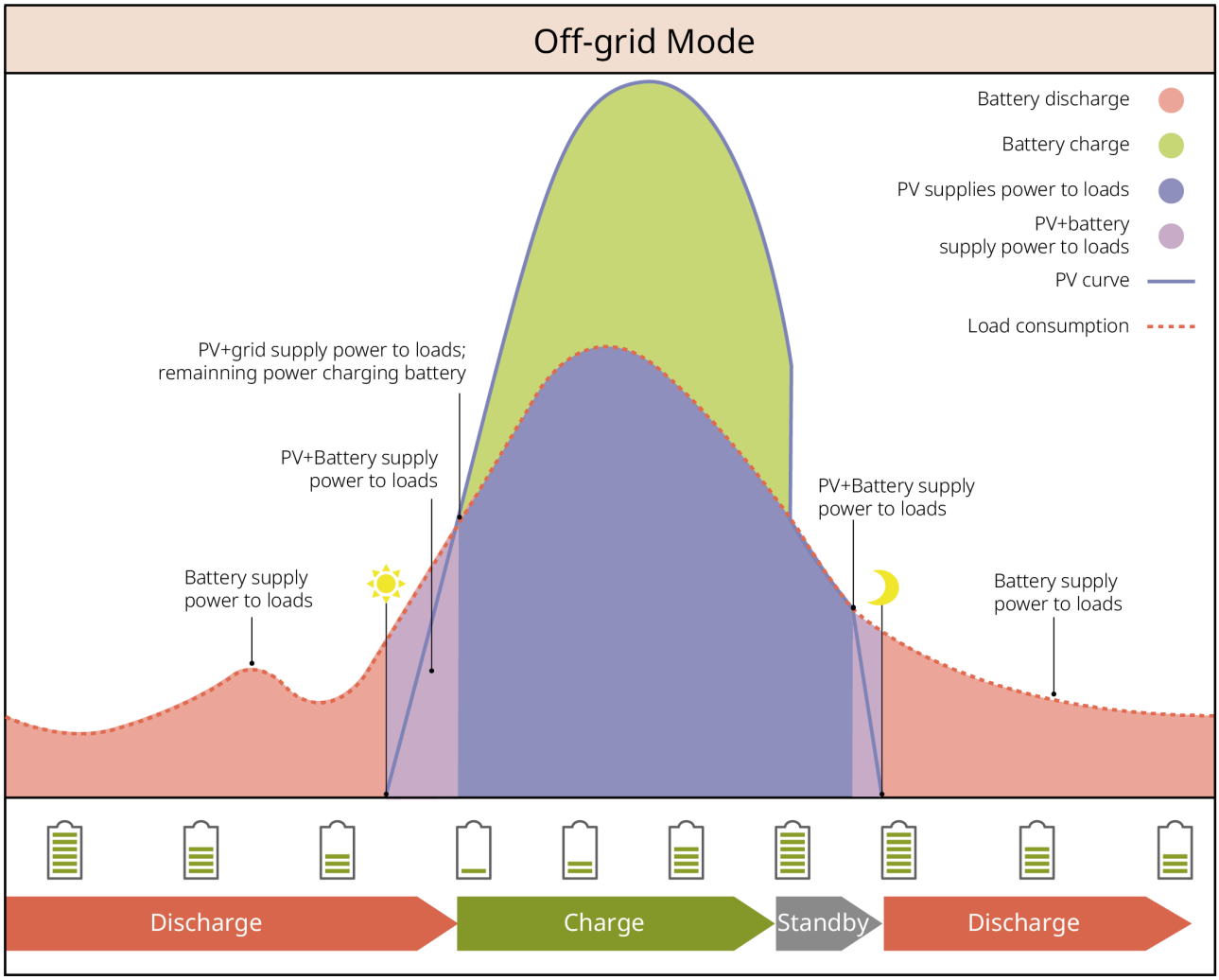
NOTICE

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

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

- During the day, PV power generation prioritizes supplying power to the loads, and excess power charges the battery.
- At night, the battery discharges to supply power to the loads, ensuring that the BACK-UP Loads do not lose power.
- Off-grid SOC recovery: After the system operates off-grid, the battery gradually

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



SLG00NET0012

2.5 Features

NOTICE
Specific features are subject to the actual product configuration.

AFCI

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

Causes of arc generation:

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

Arc Detection Method

- The inverter integrates the AFCI function, complying with the IEC 63027 standard.
- When the inverter detects an arc, the time and phenomenon of the fault can be displayed via the App.
- After the inverter triggers an AFCI alarm, it will shut down for protection. The inverter will automatically reconnect to the grid and resume operation after the alarm is cleared.
  - Automatic Reconnection: If the inverter triggers an AFCI alarm < 5 times within 24 hours, the alarm can be automatically cleared after five minutes, and the inverter will reconnect to the grid and resume operation.

Manual Reconnection: If the inverter triggers the 5 th AFCI alarm within 24 hours, the alarm must be cleared manually before the inverter can reconnect to the grid and resume operation.

model	Label	Description
GW12KL-ET	F-I-AFPE-1-2/2-2	F: Full coverage I: Integrated AFPE: Detection and interruption capability provided 1: 1 monitored string per input port 2/2: 2/2 input ports per channel 2: 2 monitored channels
GW15K-ET		
GW20K-ET		
GW18KL-ET	F-I-AFPE-1-2/4-2	F: Full coverage I: Integrated AFPE: Detection and interruption capability provided 1: 1 monitored string per input port 2/4: 2/4 input ports per channel 2: 2 monitored channels
GW20K-ET		
GW29.9K-ET		
GW30K-ET		

Three-Phase Unbalanced Output

Both the grid-tie and BACK-UP ports of the inverter support three-phase unbalanced output, allowing loads of different power ratings to be connected to each phase. The maximum output power per phase for different models is shown in the following table:

No.	model	Max Output Power per Phase
1	GW12KL-ET	4kW
2	GW18KL-ET	6kW
3	GW15K-ET	5kW
4	GW20K-ET	6.7kW
5	GW25K-ET	8.3kW
6	GW29.9K-ET	10kW
7	GW30K-ET	10kW

load control

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

- Time Control: Set the time for turning the controlled load on or off. The load will automatically turn on or off within the set time period.
- Switch Control: When the control mode is set to ON, the load will turn on; when the control mode is set to OFF, the load will turn off.
- BACK-UP Loads Control: The inverter has a built-in relay dry contact control port, which can control whether a load is turned off via the relay. In off-grid mode, if an overload on the BACK-UP port is detected and the battery SOC value falls below the set off-grid protection value, the load connected to the relay port can be turned off.

Rapid Shutdown (RSD)

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

- 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

- Internal Transmitter
  - External Trigger Device: External switch
  - Receiver Models: GR-B1F-20, GR-B2F-20
    https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_RSD-20_Quick-Installation-Guide-POLY.pdf

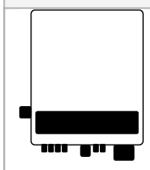
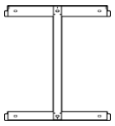
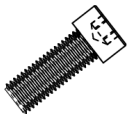
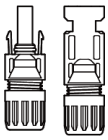
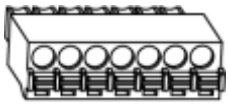
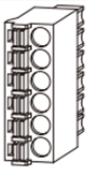
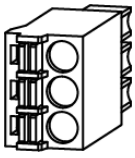
3 Check and Storage

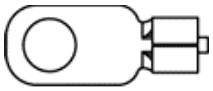
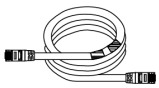
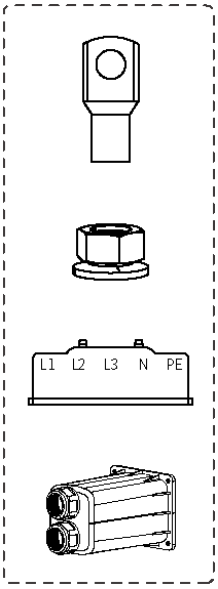
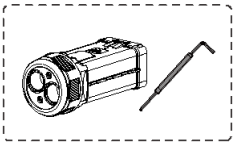
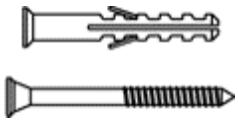
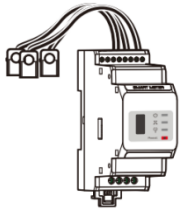
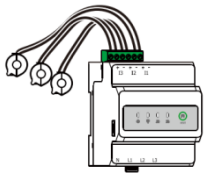
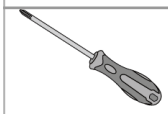
3.1 Check Before Receiving

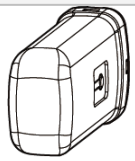
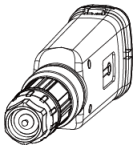
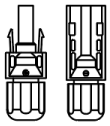
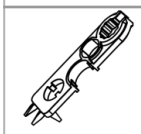
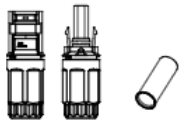
Before receiving the product, please carefully check the following:

1. Check if the outer packaging is damaged, such as deformation, holes, cracks, or other signs that might cause damage to the device inside the packaging. If damaged, do not open the packaging and contact your dealer.
2. Check if the device model is correct. If it does not match, do not open the packaging and contact your dealer.

3.2.1 Inverter Deliverables

Part	Description	Part	Description
	Inverter x 1		Backplate x 1
	Wall-mounting screws x 2		PV Connector GW12KL-ET, GW15K-ET, GW20K-ET: 4 GW18KL-ET, GW25K-ET, GW29.9K-ET, GW30K-ET: 6
	PV Wiring Tool x 1		7PIN communication terminal x 1
	6PIN communication terminal x 1		3PIN communication terminal x 1

Part	Description	Part	Description
	Protective PE screw x 1		PIN terminal x N The quantity varies depending on the inverter configuration. Please refer to the actual contents.
	Grounding terminal x 1		BMS/Meter Communication cable GW12KL-ET, GW15K-ET, GW20K-ET: 2 GW18KL-ET, GW25K-ET, GW29.9K-ET, GW30K-ET: 3
 or 	Please refer to the actual shipment • OT terminal x 12 • AC terminal flange nut x 20 • Insulation board for AC terminal x 1 • AC terminal protective cover x 1 • Hexagon screwdriverx 1		expansion bolt x 6
		 or 	Smart meter and accessories x 1 Please refer to the actual shipment
	screwdriver x 1		smart dongle x 1

Part	Description	Part	Description
	Product documentation x 1	 or 	
 Wiring tool  Battery connector	(Optional) Wiring tool x 1 Battery connector: GW12KL-ET, GW15K-ET, GW20K-ET: 1 GW18KL-ET, GW25K-ET, GW29.9K-ET, GW30K-ET: 2		
 Wiring tool  Hexagon screwdriver  Battery connector	(Optional) Wiring tool x 2 Hexagon screwdriverx 1 Battery connector: GW12KL-ET, GW15K-ET, GW20K-ET: 1 GW18KL-ET, GW25K-ET, GW29.9K-ET, GW30K-ET: 2		

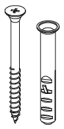
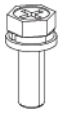
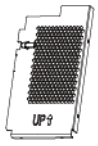
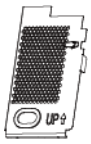
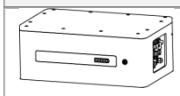
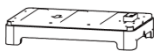
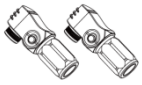
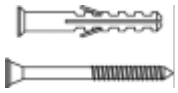
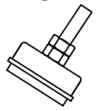
Part	Description	Part	Description
	cable tie x 10		expansion bolt x 4
	M5 Hex Screw x 10		M5 Nut x 5
	Protector Right Side Panel x 1		Protector Left Side Panel x 1
	Protector Base Plate x 1		Protector Front Cover Panel x 1

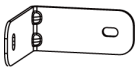
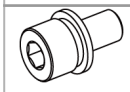
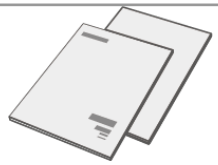
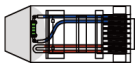
Table34 **Protective Cover Accessories (Australia only)**

3.2.2 Batteries Deliverables

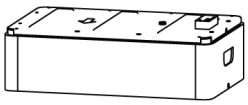
3.2.2.1 Lynx Home F 、Lynx Home F Plus+

- Control Box Package

Part	Quantity	Part	Quantity
	Power control unit x 1		Base x 1
	DC Connector • Lynx Home F x1 • Lynx Home F Plus+ x 2		Expansion bolt x 4
adjusable foot 			

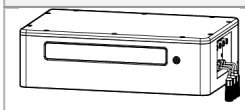
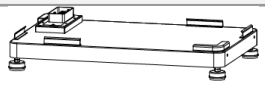
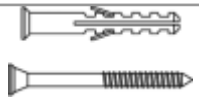
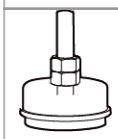
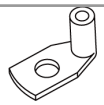
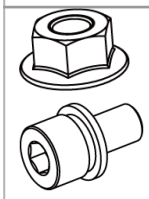
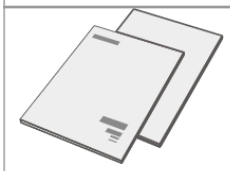
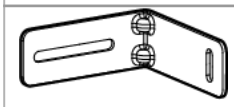
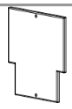
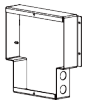
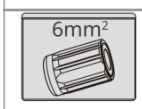
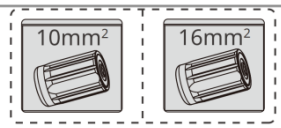
Part	Quantity	Part	Quantity
Foot anti-tip bracket 	• The adjustable foot is only available for the Lynx home F Plus+ series. • If the adjustable foot is selected, the supplied quantity is: ◦ Adjustable foot: 4pcs ◦ Foot anti-tip bracket: 2pcs ◦ Standard anti-tip bracket: 2pcs • If the adjustable foot is not selected, the supplied quantity is: ◦ Standard anti-tip bracket: 4pcs		
Standard anti-tip bracket 			
	M5*12screw x 4		M5hexalobular internal x 2
	M6nut x 2		Grounding terminal x 2
	Protective coverP x 1		Product documentation x 1
	Terminal resistor x 1	-	-

- Battery Module Package

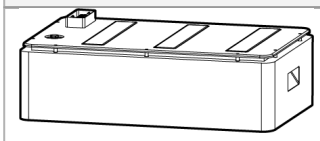
Part	Quantity
	battery module x 1

3.2.2.2 Lynx Home F G2

- Main Control Box Package

Part	Quantity	Part	Quantity
	Power control unit x 1		Base x 1
	DC Connector Positive: x 2 Negative: x 2		Expansion bolt x 8
	adjusable foot x 4		Grounding terminal x 2
	• M5*12 Screw x N • M6 Nut x N N: The quantity depends on the product configuration: • M5*12 Screw x 8, M6 Nut x 2; • M5*12 Screw x10, M6 Nut x 2; • M5*12 Screw x 11, M6 Nut x 2; • M5*12 Screw x 13, M6 Nut x 0; • M5*12 Screw x 12, M6 Nut x 0;		
	Product Documentation x 1	 Protective Cover	(Optional) Protective Cover x 1
	L-shaped Bracket x 8	 Junction Box Cover  Junction Box	(Optional) Junction Box x 1, Junction Box Cover x 1,
	DC Connector Waterproof Plug x 4		DC Connector Waterproof Plug x 4

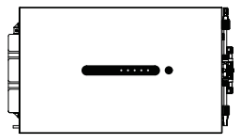
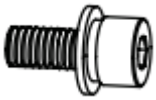
- Battery Module Package

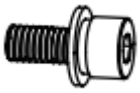
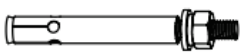
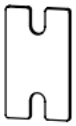
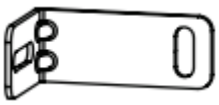
Part	Quantity
	battery module x 1

3.2.2.3 Batteries Deliverables (Lynx Home D)

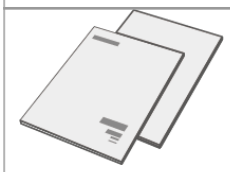
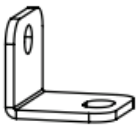
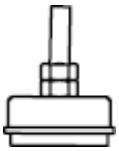
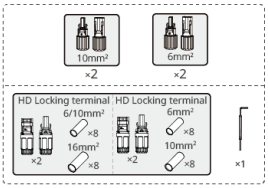
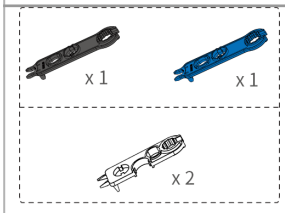
NOTICE
The battery system must be installed on a base or bracket. Please select the base or bracket according to the installation conditions. The actual delivery content is subject to the specific configuration chosen.

- Battery

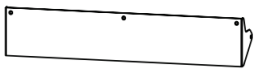
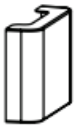
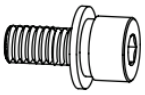
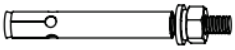
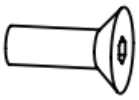
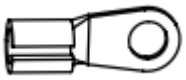
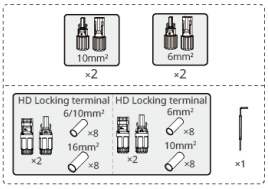
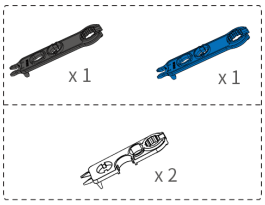
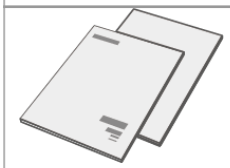
Part	Quantity	Part	Quantity
	Battery x 1		Battery left side protection cover x 1
	M6screw x 2		Battery right side protection cover x 1

Part	Quantity	Part	Quantity
	M5screw • When the battery inter-fixing bracket accessory is shipped, the quantity of M5 screws is 4. • When the battery inter-fixing bracket is installed on the machine for shipping, the quantity of M5 screws is 2.		M6Expansion bolt x 2
	Battery inter-fixing bracket • When the battery inter-fixing bracket accessory is shipped, the shipping quantity is 2. • When the battery inter-fixing bracket is installed on the machine for shipping, the shipping quantity is 0.		Battery inter-communication cable x 1
	locking bracket x 2	-	-

- (Optional) Base

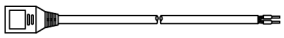
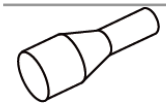
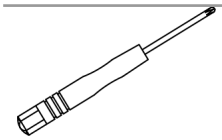
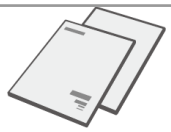
Part	Quantity	Part	Quantity
	Base x 1		M5screwx 2
	Product documentation x 1		Base and battery mounting bracket x 2
	Grounding terminalx 1		Adjustable feet x N The quantity of adjustable feet is subject to the actual shipment. If the actual delivered items do not include adjustable feet and you need them, please contact the distributor or after-sales service to obtain them.
	Power connection terminal (Optional) Hex key x 1 The hex key is shipped together with the battery DC terminal in a self-sealing bag labeled HD Locking terminal.		Terminal resistor x 1
	Power connection terminal tightening tool	-	-

Mounting Bracket (Optional)

Part	Quantity	Part	Quantity
	Mounting bracket x 1		Front protective cover x 1
	Left side protective cover x 1		Right side protective cover x 1
	Mounting bracket and battery securing bracket x 2		M5 screw x 2
	M12 expansion bolt x 4		M4 screw x 5
	Grounding terminalx 1		Terminal resistor x 1
	Power connection terminal (Optional) Hex key screwdriver x 1 The hex key screwdriver is shipped together with the battery DC terminal that has an HD Locking terminal label on the self-sealing bag.		Power connection terminal tightening tool
	Product documentation x 1	-	-

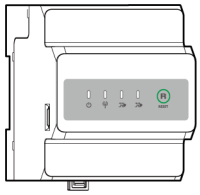
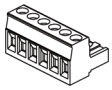
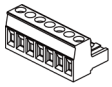
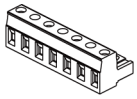
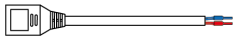
3.2.3 Smart Meter Deliverables (GM3000)

Part	Quantity	Part	Quantity

	Smart meter and CT x 1		2PIN to RJ45 adapter cable x 1
	PIN terminal x 3		USB plug x 1
	screwdriver x 1		Product documentation x 1

3.2.4 Smart Meter Delivery Package GM330&GMK330

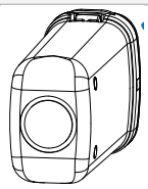
3.2.4.1 Attachment List

Part	Description	Part	Description
	Smart Meter x1 GMK330: CT×3; GMK360: CT×6; GM330: CT x 0.		2PIN Communication Terminal x1 For GM330.
	6PIN Communication Terminal x1 For GM330.		7PIN Communication Terminal x1 For GM330.
	Meter Communication Terminal For GMK330/GMK360.		RS485 Communication Terminal x 1
	2PIN to RJ45 Terminal Adapter Cable x 1		screwdriver x1

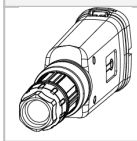
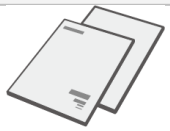
Part	Description	Part	Description
	PIN terminal GMK330/GMK360: x 5 ; GM330: x 6.		Product Documentation x 1

3.2.5 Smart Communication Stick Deliverables

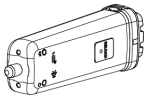
LS4G Kit-CN&4G Kit-CN

Part	Description	Part	Description
	4G smart dongle x1	-	-

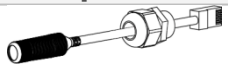
WiFi/LAN Kit-20

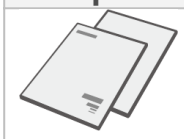
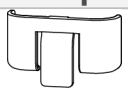
Part	Description	Part	Description
	smart dongle x1		Product Documentation x 1

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

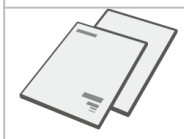
Component	Description	Component	Description
	4G Smart Communication Stick x1		Product Documentation x1

Ezlink3000

Component	Description	Component	Description
	smart dongle x1		LAN cable port x1

Component	Description	Component	Description
	Product documentation x1		Unlocking tool x1 Some modules require a tool for disassembly. If not provided, you can use the button on the module itself to unlock.

Wi-Fi Kit

Part	Description	Part	Description
	smart dongle x1		Unlocking tool x1 Some modules require a tool for disassembly. If not provided, they can be unlocked using the button on the module itself.
	Product documentation x1	-	-

3.3 Storage

NOTICE
[1] The storage time is calculated from the SN date on the battery's outer packaging. After exceeding the storage cycle, charge and discharge maintenance is required. (Battery maintenance time = SN date + charge and discharge maintenance cycle). For the method to view the SN date, refer to: 10.4.SN Code Meaning(Page 272). [2] After the charge and discharge maintenance is qualified, if there is a Maintaining Label on the outer box, 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.

If the equipment is not put into use immediately, store it according to the following

requirements. After long-term storage, the equipment must be inspected and confirmed by qualified personnel before it can be used again.

1. If the inverter is stored for more than two years or remains non-operational for more than 6 months after installation, it is recommended to have it inspected and tested by qualified personnel 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 once every 6 months during storage. If it has not been powered on for more than 6 months, it is recommended to have it inspected and tested by qualified personnel 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 degradation, capacity衰减 (fading), or even complete failure. Timely use is recommended. If the battery requires long-term storage, 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 F6.6-H	30%~50%	0~35℃	-20~0℃，≤1 month 0~35℃，≤6 months 35~45℃，≤1 month	Please consult the dealer or after-sales service center for maintenance methods.
LX F9.8-H				
LX F13.1-H				
LX F16.4-H				
LX F6.4-H-20	30%~40%	0~35℃	-20~0℃，≤1 month 0~35℃，≤6 months 35~45℃，≤1 month	
LX F9.6-H-20				
LX F12.8-H-20				
LX F16.0-H-20				
LX F19.2-H-20				
LX F22.4-H-20				
LX F25.6-H-20				
LX F28.8-H-20				
LX D5.0-10	30%~40%	0~35℃	-20~35℃，≤12 months 35~+45℃，≤6 months	

Packaging Requirements:
Ensure the outer packaging box is not removed and the desiccant inside the box is

not lost.

Environmental Requirements:

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

Stacking Requirements:

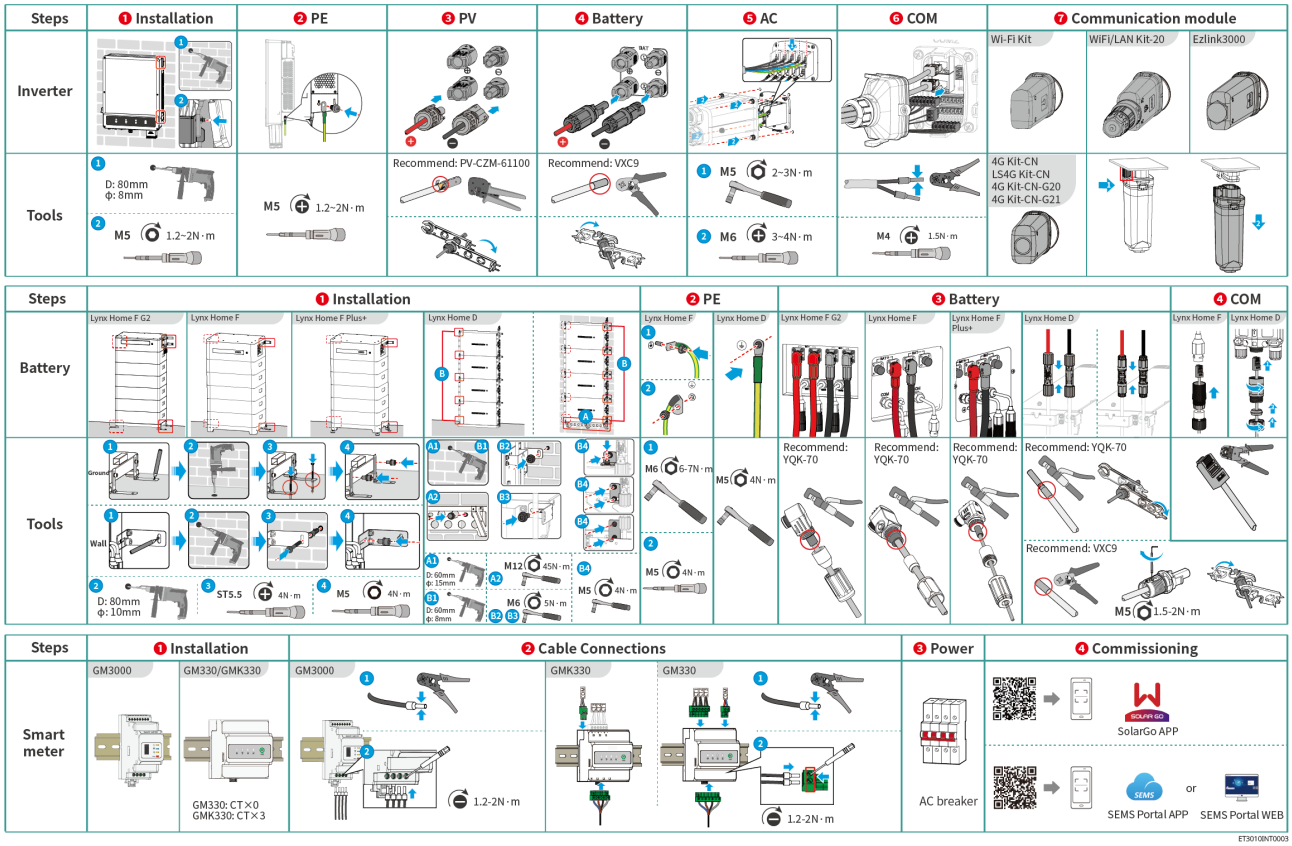
1. Ensure the stacking height and orientation of the inverters are arranged according to the instructions on the packaging box label.
2. Ensure there is no risk of the stacked inverters tipping over.

4 Installation

DANGER

When performing device installation and electrical connections, please use the delivery items included in the shipment. Otherwise, any resulting device damage will not be covered by the warranty.

4.1 System Installation and Commissioning Procedure



4.2 Installation Requirements

4.2.1 Installation Environment Requirements

NOTICE

Lynx home D:

- The sound source during battery operation mainly comes from the active cooling system, specifically the axial flow cooling fan designed with fluid dynamics optimization.
- When the battery produces a regular airflow sound of ≤35dB(A): This phenomenon indicates that the cooling system is in normal working condition, and it will not have any impact on the device's electrical performance, structural safety, or service life. If you are sensitive to noise, please choose an appropriate installation location.

1. The device must not be installed in flammable, explosive, corrosive, or other hazardous environments.
2. The ambient temperature and humidity for device installation must be within the suitable range.
3. The installation location must be out of reach of children and avoid 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 device should be installed away from direct sunlight, rain, snow accumulation, and other such conditions. It is recommended to install it in a sheltered location. If necessary, a sunshade can be constructed.
6. Unfavorable environmental conditions such as direct sunlight and high temperatures may cause the Inverter output power to derate.
7. The installation space must meet the ventilation, heat dissipation requirements, and operational space requirements of the device.
8. The installation environment must satisfy the device's ingress protection (IP) rating. The Inverter, battery, and smart communication stick are suitable for both indoor and outdoor installation; the meter is suitable for indoor installation.
9. The installation height of the device should facilitate operation and maintenance, ensuring the device indicator lights and all labels are easily visible, and the wiring terminals are easily accessible.
10. The installation altitude of the device must be lower than the maximum operating altitude.
11. Before installing devices outdoors in salt damage areas, consult the device manufacturer. Salt damage areas primarily refer to regions within 500m from the coast. The affected area is related to factors such as sea wind, precipitation, and terrain.

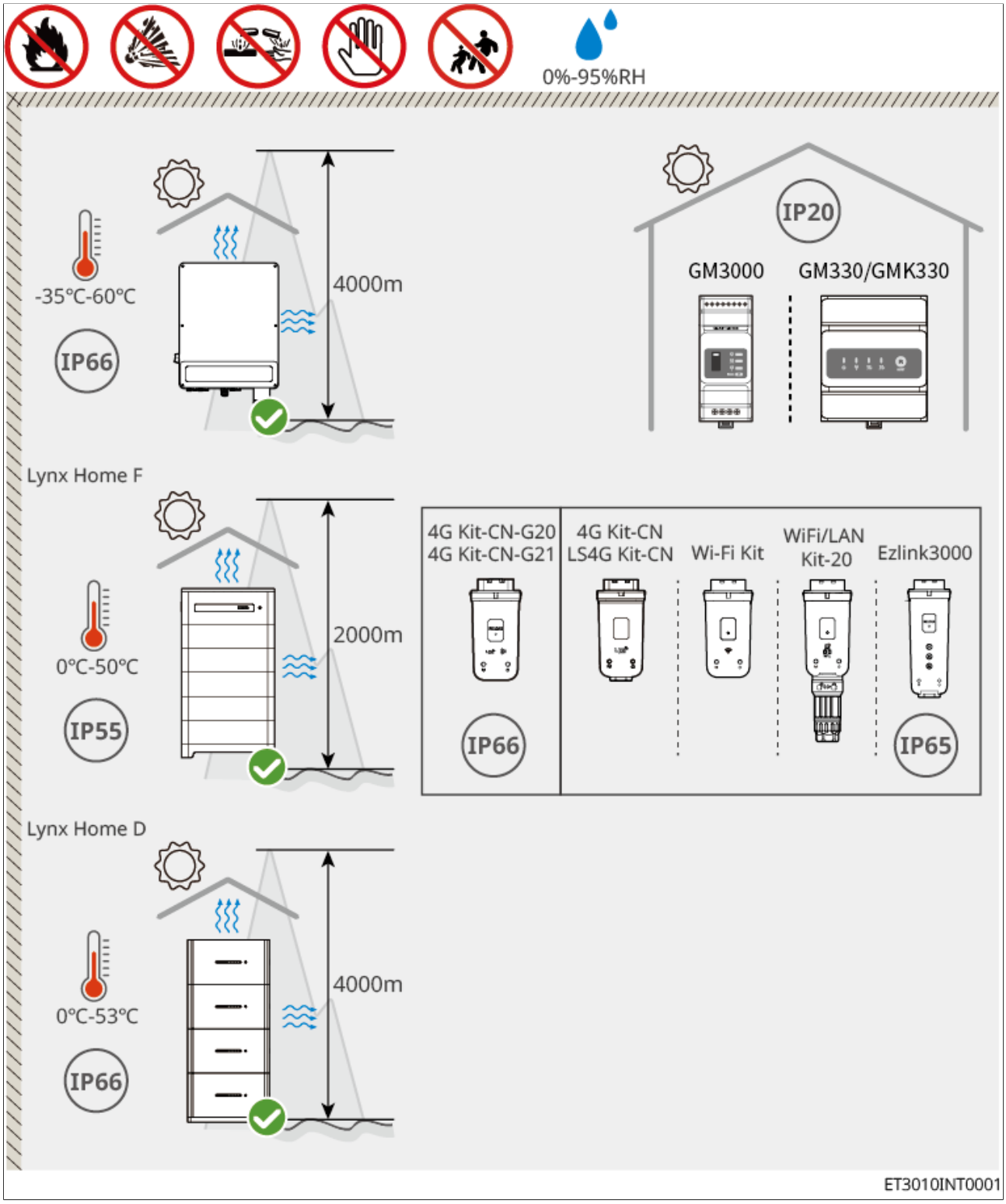
12. The length of the DC cables and communication cables between the battery and the Inverter must be less than 3m. Ensure the installation distance between the Inverter and the battery meets the cable length requirement.
13. Keep away from strong magnetic field environments to avoid electromagnetic interference. If there are radio stations or wireless communication equipment operating below 30MHz near the installation site, install the device according to the following requirements:

- Inverter: Add a ferrite core with multiple windings at the DC input or AC output lines of the Inverter, or add a low-pass EMI filter; or maintain a distance of over 30m between the Inverter and the wireless electromagnetic interference source.
- Other devices: Maintain a distance of over 30m between the device and the wireless electromagnetic interference source.

NOTICE

If installed in an environment below 0℃, the battery may become unable to recharge and recover energy after being fully discharged, resulting in battery undervoltage protection.

- Lynx home F, Lynx home F Plus+, Lynx home F G2: Charging temperature range: 0<T<50°C; Discharging temperature range: -20<T<50°C
- Lynx home D: Charging temperature range: 0<T<53°C; Discharging temperature range: -20<T<53°C

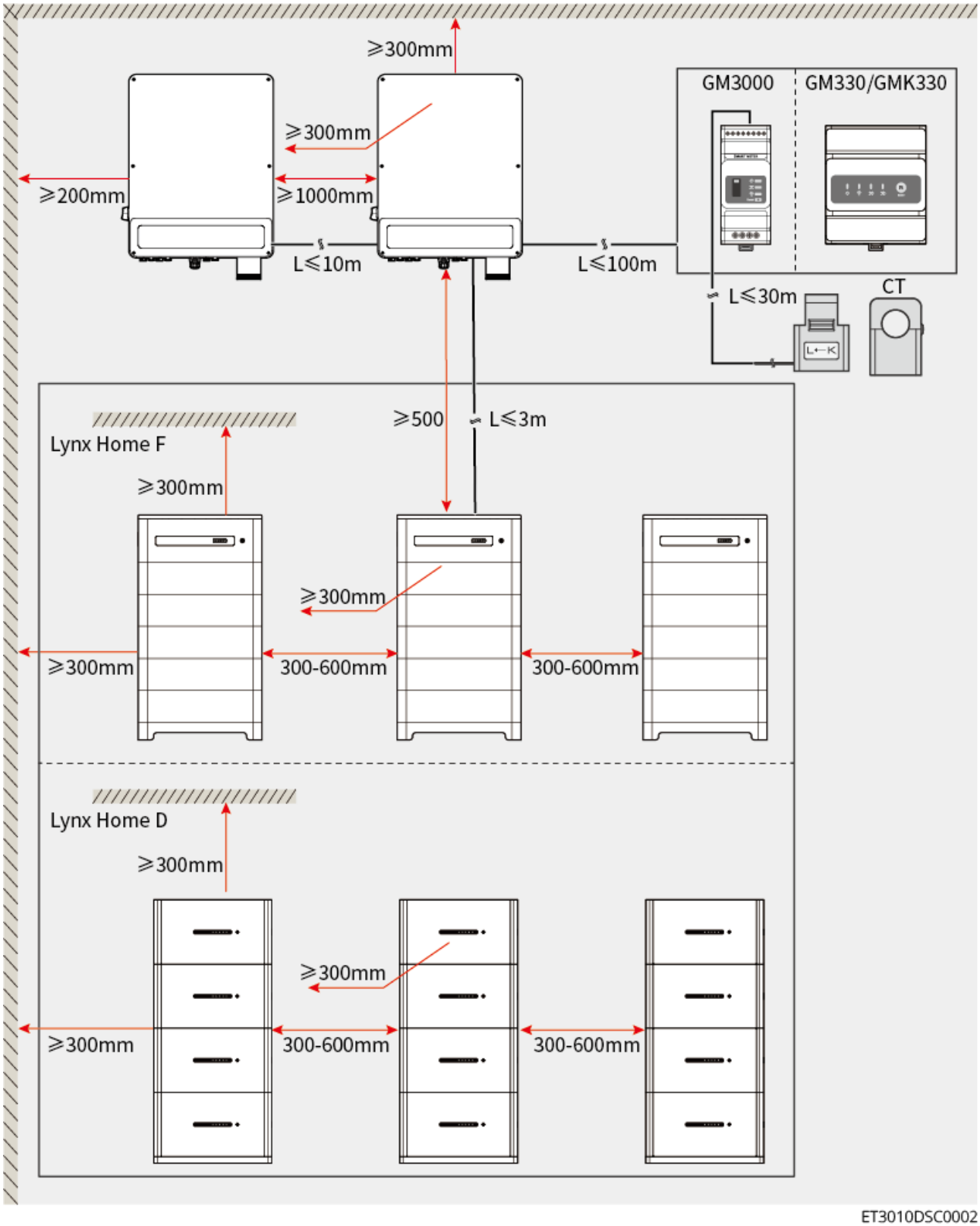


4.2.2 Installation Space Requirements

When installing equipment in the system, sufficient space should be reserved around

the equipment to ensure adequate installation and heat dissipation space.

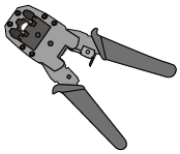
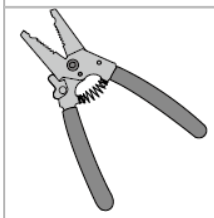
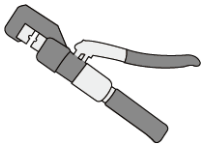
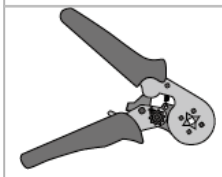
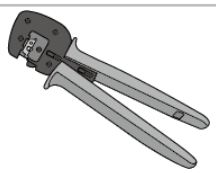
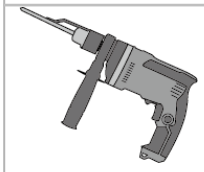
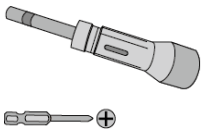
- When using CAT 7E communication cables between inverters, the cable distance should not exceed 10 meters; when using CAT 5E or CAT 6E communication cables, the cable distance should not exceed 5 meters. Do not exceed 10m for communication cables, otherwise it may cause communication abnormalities.
- For installing CTs, use CAT 5E or higher shielded twisted-pair cable, with a cable distance not exceeding 30 meters.
- For the RS485 twisted-pair shielded cable used for communication between the inverter and the meter, the cable distance should not exceed 100 meters.

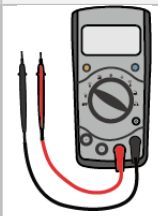
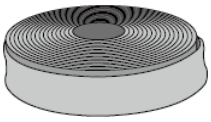
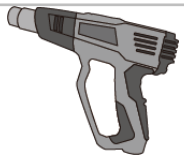

≥300mm
≥300mm
≥200mm
≥1000mm
L≤10m
L≤100m
GM3000
GM330/GMK330
L≤30m
CT
≥500
L≤3m
Lynx Home F
≥300mm
≥300mm
≥300mm
300-600mm
300-600mm
Lynx Home D
≥300mm
≥300mm
≥300mm
300-600mm
300-600mm
ET3010DSC0002

4.2.3 Tool Requirements

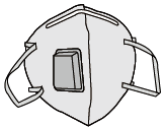
NOTICE
During installation, it is recommended to use the following installation tools. If necessary, other auxiliary tools may be used on-site.

Installation Tools

Tool Type	Description	Tool Type	Description
	diagonal plier		RJ45 crystal head crimping tool
	wire stripper		YQK-70 hydraulic pliers
	VXC9 hydraulic pliers		Level bar
	open-end wrench		PV terminal crimping tool PV-CZM-61100
	hammer drill (drill bit Φ8mm)		torque wrench M5, M6, M8
	rubber hammer		socket wrench

Tool Type	Description	Tool Type	Description
	marker pen		multimeter Range ≤1100V
	heat shrink tubing		hot air gun
	cable tie		vacuum cleaner

personal protective equipment

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

4.3 Equipment Handling

⚠CAUTION

- During operations such as transportation, handling, and installation, all applicable national/regional laws, regulations, and relevant standard requirements must be met.
- Before installation, the equipment must be moved to the installation site. To prevent personal injury or equipment damage during the moving process, please note the following:

1. Ensure an adequate number of personnel is assigned according to the equipment's weight to prevent it from exceeding the safe manual handling limit and causing injury.
2. Wear safety gloves to avoid injury.
3. Ensure the equipment remains balanced during movement to prevent dropping.

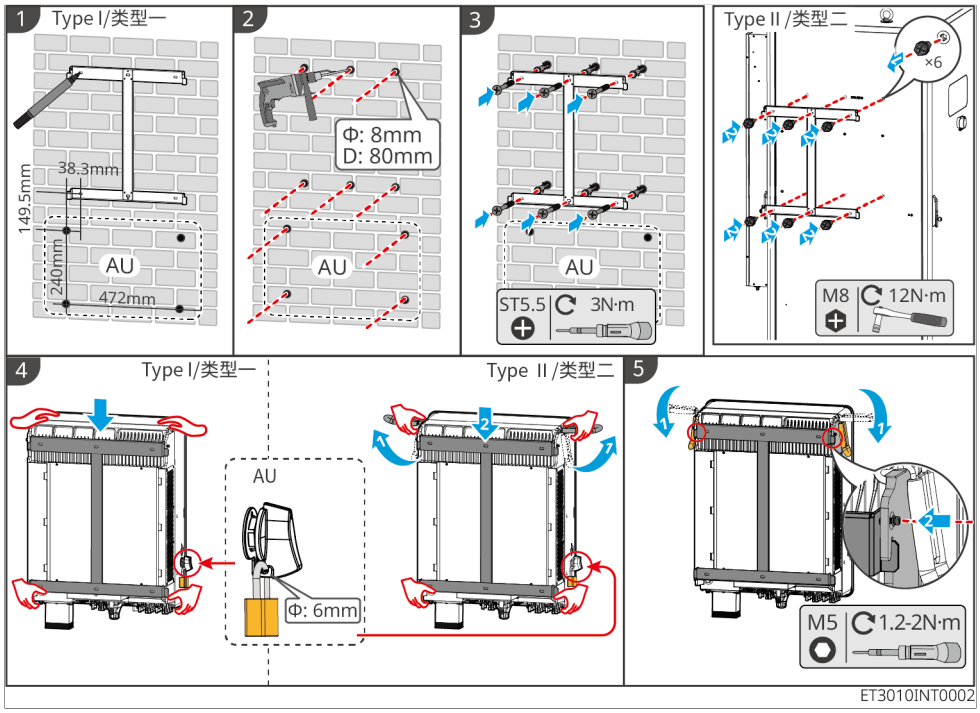
4.4 Installing the Inverter

⚠CAUTION

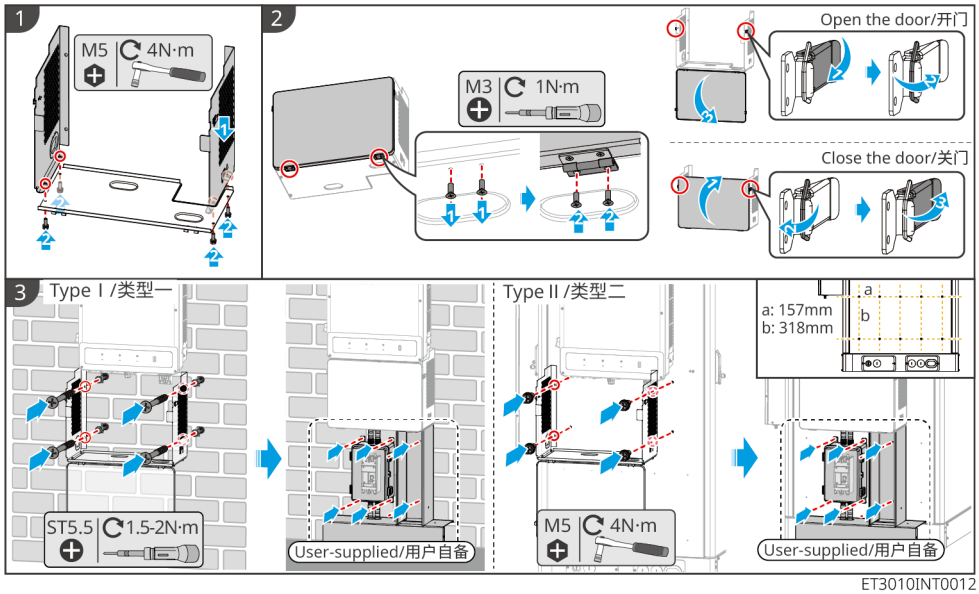
- When drilling holes, ensure the drilling location avoids water pipes, cables, etc. inside the wall to prevent hazards.
- When drilling, wear safety goggles and a dust mask to prevent dust inhalation or eye contact.
- Ensure the inverter is securely installed to prevent it from falling and causing injury.

1. Place the back mounting plate horizontally on the wall and use a marker to mark the drilling positions.
2. Use an impact drill to create the holes.
3. Secure the inverter back mounting plate bracket to the wall using expansion screws.
4. Lock the DC switch in the "OFF" state using a DC switch lock, then mount the inverter onto the backplate. (Optional) For Australia only, the DC switch lock is user-provided; please ensure the lock's aperture meets the requirements.
5. (Optional) Lower the handle.

6. Tighten the screws on both sides to secure the backplate and the inverter, ensuring the inverter is firmly installed.



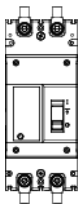
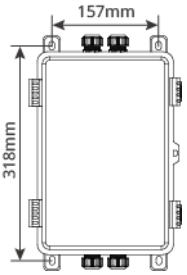
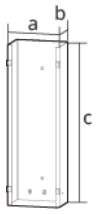
Installing the Protective Cover (Australia Only)



Step1: Assemble the protective cover.

Step2: Install the front cover plate.

Step3: Secure the protective cover to the wall/side of the battery cabinet, and install the circuit breaker, waterproof enclosure, and cable tray according to local regulations. For specific requirements, please refer to the table below.

Device		Recommended Model/Specification	Description
breaker		Select according to local laws and regulations • 2P DC switch • Rated Current ≥63A • Nominal Voltage ≥1000V	User-provided.
Waterproof Enclosure		Ingress Protection Rating > IP65 Hole Spacing Requirements: • Left-Right Hole Spacing: 157mm • Top-Bottom Hole Spacing: 318mm Style and dimensions are for reference only	User-provided. If the hole spacing of the waterproof enclosure does not meet the requirements and it cannot be fixed to the battery cabinet, please prepare an installation plate. First, drill holes in the installation plate as required and fix it to the battery cabinet, then fix the waterproof enclosure onto the installation plate.
Cable Tray		a: 250mm b: 150mm c: 510mm Style is for reference only	User-provided.

4.5 Installing the Battery System

4.5.1 Installing the Lynx Home F Series

WARNING

- Ensure the control cabinet is installed above the battery. Do not install the battery above the control cabinet.
- During battery system installation, ensure it is installed level and securely. When placing the battery base, battery, or control cabinet, confirm that the holes on the upper and lower layers are aligned; the anti-tip bracket should be vertical and flush against the ground, wall, or battery system surface.
- When using an impact drill for drilling, use cardboard or other coverings to shield the battery system to prevent foreign objects from entering the equipment and causing damage.
- Before installing the battery system, remove the protective cover from the battery module's wiring port.
- After marking the drilling position with a marker pen, lift the control cabinet down to avoid damaging the equipment due to the impact drill being too close to the control cabinet during drilling.

4.5.1.1 Installing Lynx Home F

1. Install the anti-tip bracket onto the base.
2. Place the base against the wall, use a marker to mark the drilling positions, and then remove the base.
3. Use an impact drill to create the holes.
4. Secure the base to the wall using expansion screws, ensuring the base is oriented correctly.
5. Remove the battery terminal cover.
6. Install the battery onto the base, ensuring the battery orientation matches the base orientation; and install the remaining battery modules and control box according to the actual selected battery system type.
7. Pre-install the control box anti-tip bracket onto the control box.
8. Place the control box on top of the battery, ensure it sits firmly, use a marker to mark the drilling positions, and then remove the control box.

9. Use an impact drill to create the holes.
10. Secure the control box anti-tip bracket to the wall.
11. Secure the anti-tip bracket to the control box.

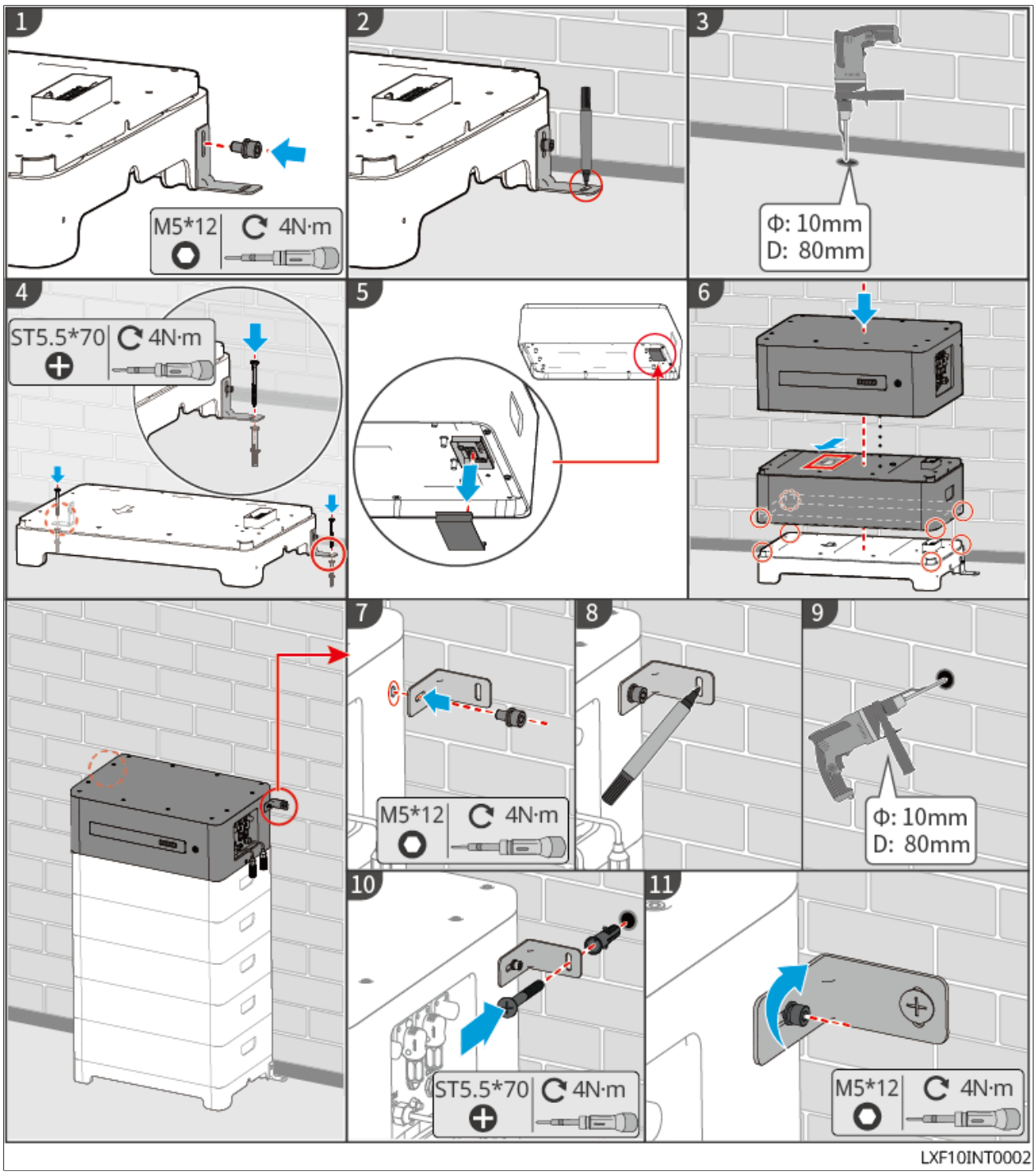


Figure3 Battery Installation

4.5.1.2 Installing Lynx Home F Plus+

1. (Optional) Attach the adjustable feet to the battery base.
2. Install the anti-tilt bracket onto the base.
3. Place the base against the wall, use a marker to mark the drilling positions, and then remove the base.
4. Use an impact drill to create the holes.
5. Secure the base to the wall using expansion screws, ensuring the base is oriented correctly.
6. Remove the protective cover from the battery connection terminals.
7. Install the battery onto the base, ensuring the battery orientation matches the base orientation; and install the remaining battery modules and the control box according to the actual selected battery system type.
8. Pre-install the control box anti-tilt bracket onto the control box.
9. Place the control box on top of the battery, ensure it sits firmly, use a marker to mark the drilling positions, and then remove the control box.
10. Use an impact drill to create the holes.
11. Fix the control box anti-tilt bracket to the wall.
12. Secure the anti-tilt bracket to the control box.
13. (Optional) After the battery system installation is complete, check if it is installed level and firm. If there is any tilting or wobbling, adjust the installation status of the battery system by rotating the adjustable feet.

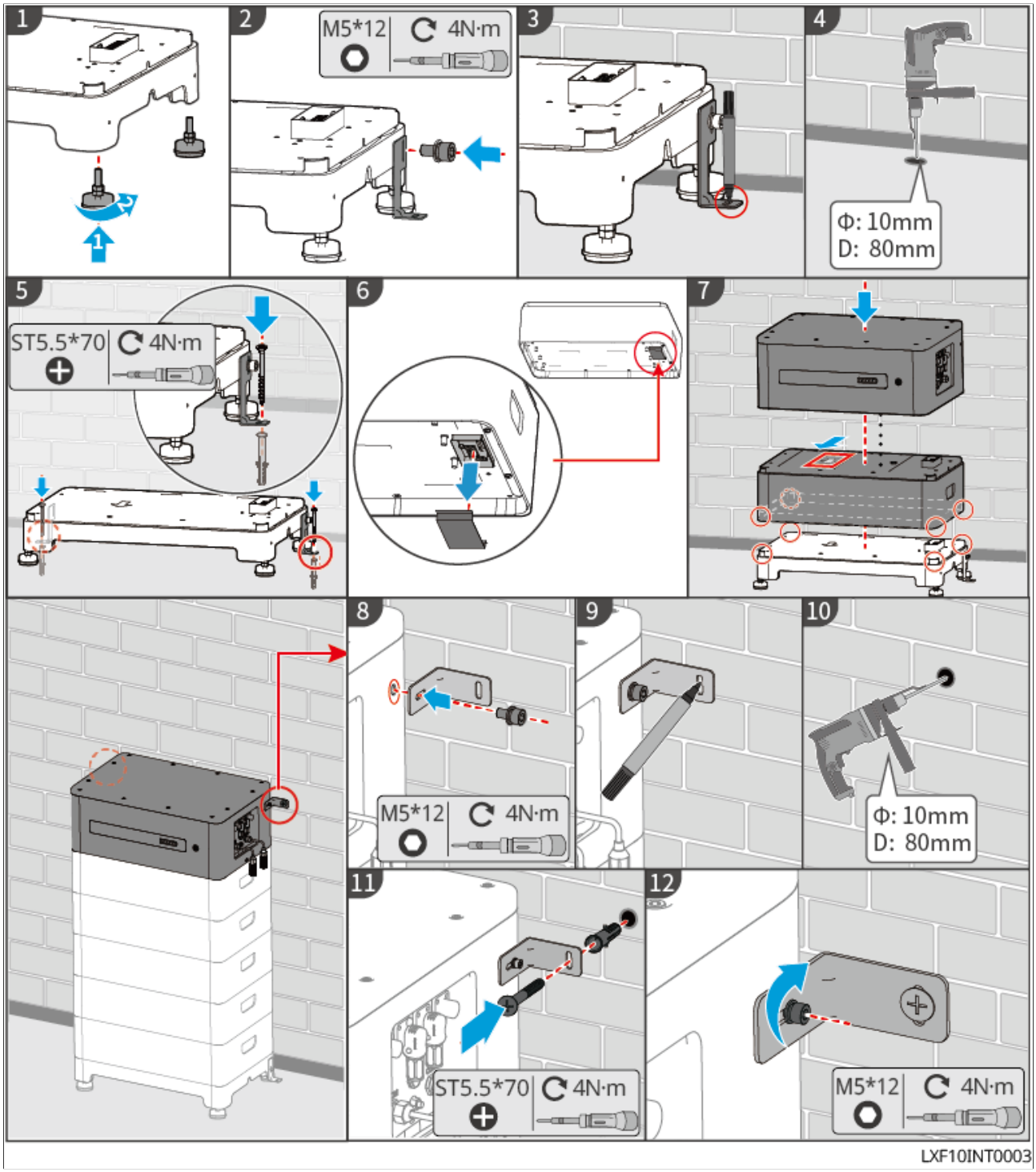


Figure4 Battery Installation

4.5.1.3 Installing Lynx Home F G2

1. (Optional) Install the adjustable feet onto the battery base.

2. Install the anti-tilt bracket onto the base.
3. Place the base against the wall, use a marker to mark the drilling positions, and then remove the base.
4. Use an impact drill to create the holes.
5. Secure the base using expansion screws, ensuring the base is oriented correctly.
6. Install the battery onto the base, ensuring the battery orientation matches the base orientation; and install the remaining battery modules and control box according to the actual selected battery system type.
7. Install the control box anti-tilt bracket.
8. Place the control box on top of the battery, ensure it is firmly positioned, use a marker to mark the drilling positions, and then remove the control box.
9. Use an impact drill to create the holes.
10. Tighten the control box anti-tilt bracket.
11. Install the anti-tilt bracket and the junction box.

    - (Optional) Secure the control box anti-tilt bracket.
    - (Optional) Install the junction box.

12. (Optional) After the battery system installation is complete, check if it is level and secure. If there is any tilting or wobbling, adjust the installation status of the battery system by rotating the adjustable feet.

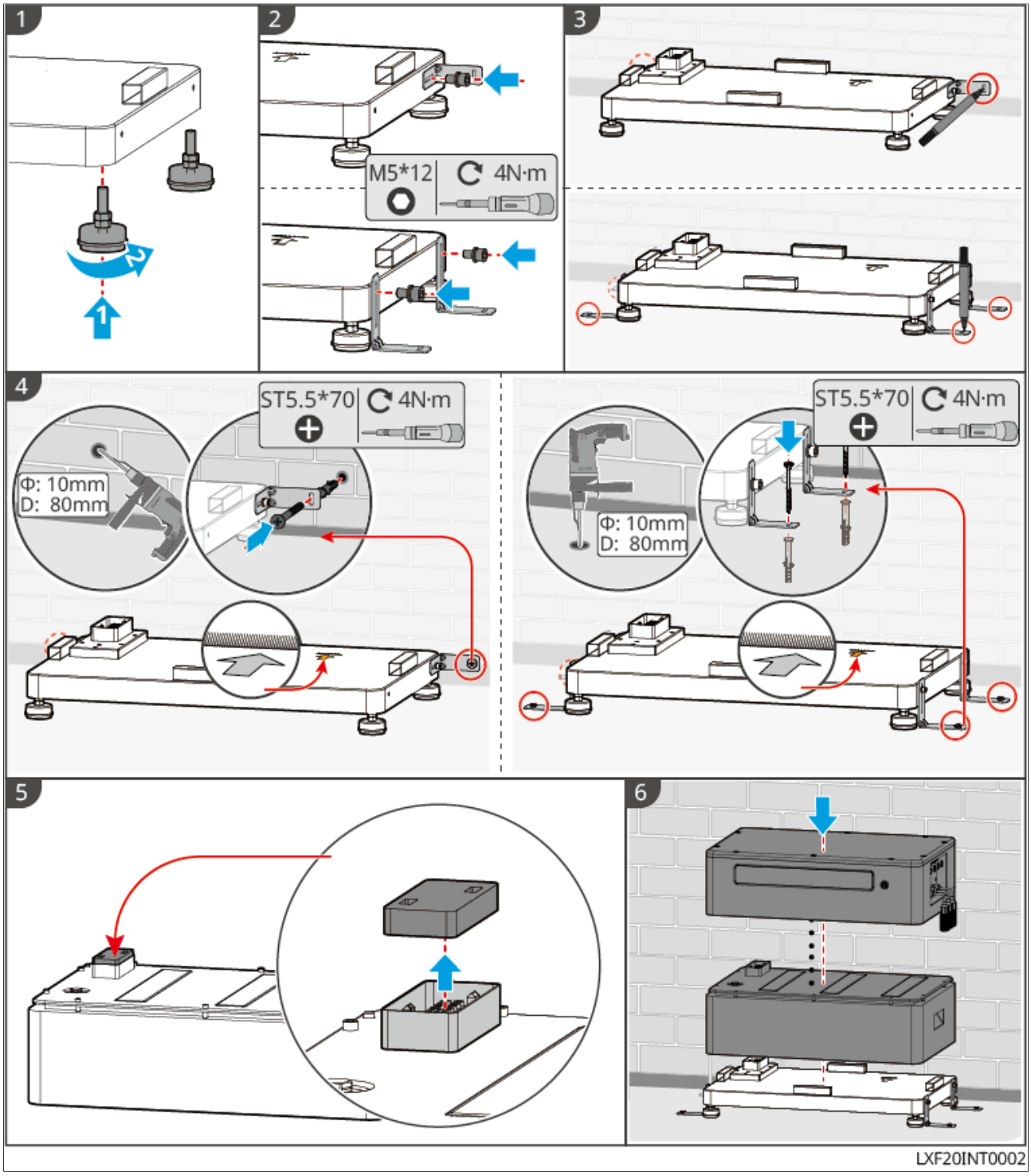


Figure5 Installing the Base and Battery

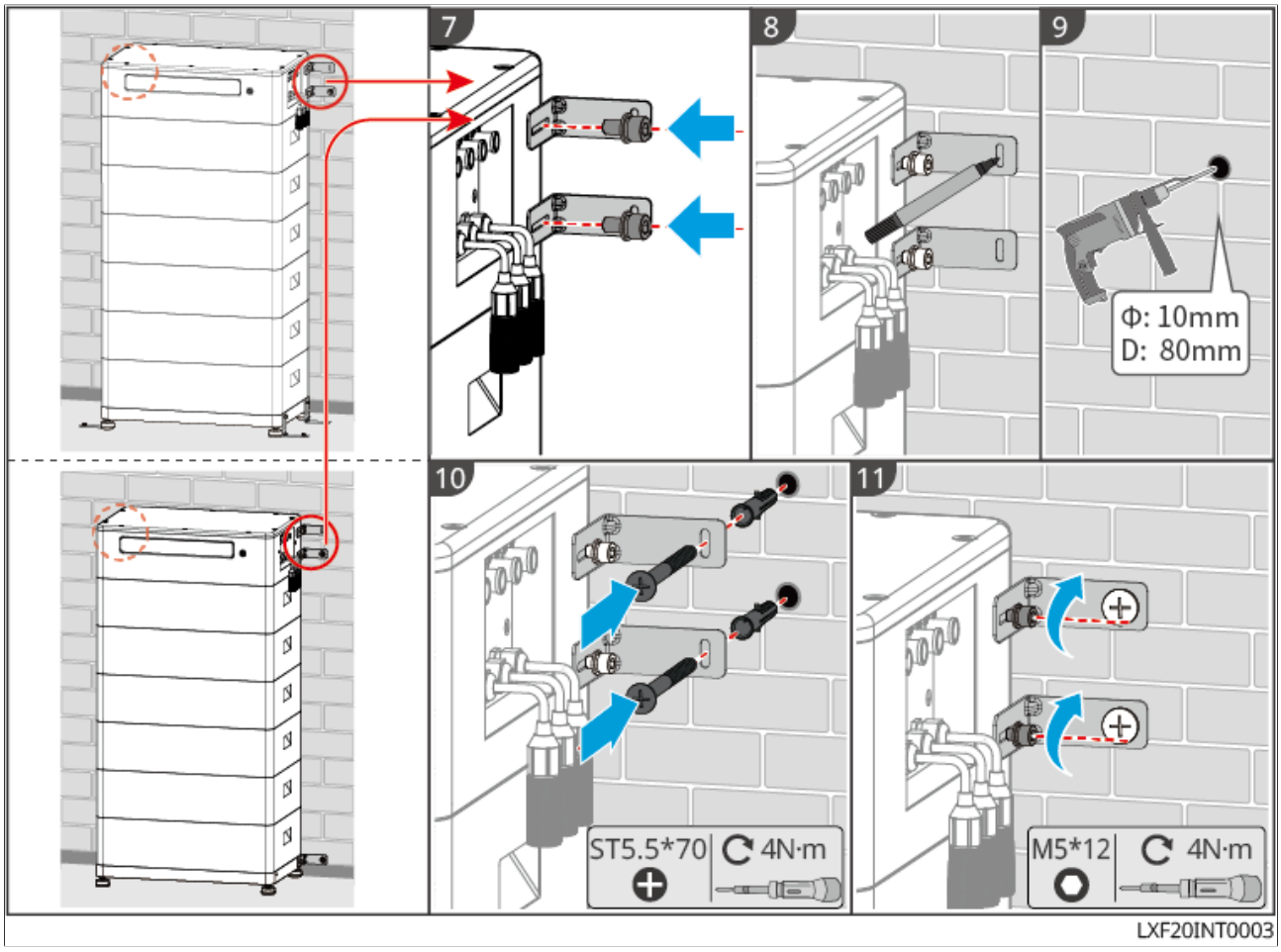


Figure6 Securing the Battery System

4.5.2 Installing the Lynx Home D

NOTICE

- The battery system must be installed on a base or bracket.
- When stacking batteries, use auxiliary tools for installation.
- When stacking more than 3 batteries in a single group, installation on a base is recommended.
- Please stack the batteries according to the recommended stacking method.

Battery Stacking Method		
Total Number of Batteries (units)	First Stack (units)	Second Stack (units)
8	4	4
7	4	3
6	3	3
5	3	2
4	2	2
3	3	-
2	2	-
1	1	-

Installing the Wall Mount (Optional)

1. Place the wall mount flush against the wall. Ensure the mount is positioned securely and use a level to check if it is horizontal.
2. After adjusting the position and level of the mount, use a marker to mark the drilling points. Once marked, remove the mount.
3. Drill holes and install the expansion bolts.
   a. Use an impact drill to drill the holes.
   b. Clean the holes.
   c. Use a rubber mallet to install the expansion bolts into the holes.
   d. Use a hex wrench to tighten the nuts clockwise to expand the bolts.
   e. Rotate the nuts counterclockwise to remove them.
4. Use a hex wrench to secure the wall mount to the wall.

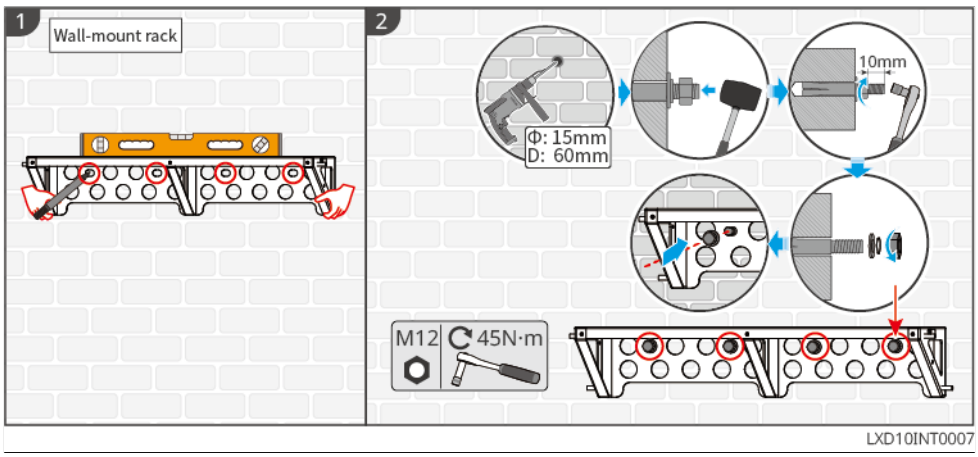


Figure7 Installing the Wall Mount

Installing the Base (Optional)

NOTICE

Check if there are adjustable feet in the accessory pack. If not and you need to use them, please contact the dealer or after-sales service to obtain them.

1. Install the adjustable feet onto the bottom of the base.
2. Place the base 15-20mm away from the wall, keep it parallel to the wall, and ensure the floor is level.
3. When installing the battery on the base, ensure the left side of the battery aligns with the base's stopper block.

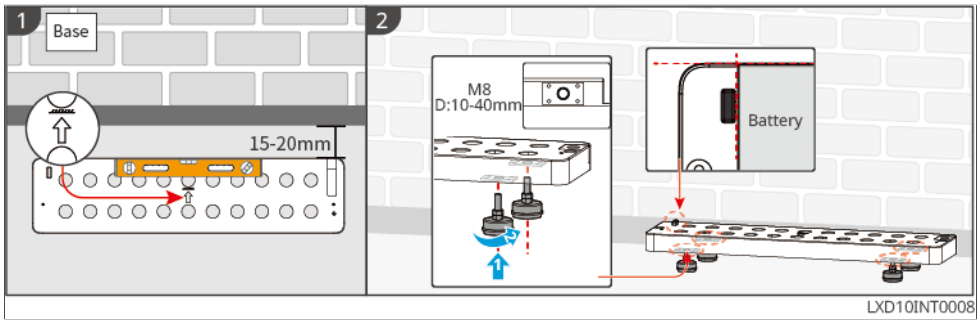


Figure8 Installing the Base

Installing the Battery System

NOTICE

- For floor-standing installation, two base and battery fixing brackets are included in the package. To prevent battery loosening or displacement, install one fixing bracket on one side of the battery positioning block, and keep the other as a spare.
- For wall-mounted installation, to prevent battery loosening or displacement, use the fixing brackets included in the package to secure the battery and both sides of the wall bracket respectively.

1. Pre-tighten the anti-tip bracket onto the battery.
2. Place the battery on the installed wall mount or base. Press the anti-tip bracket flush against the wall, mark the drilling points, then remove the battery; or use a level to mark the drilling points.
3. Install the expansion bolts and secure the battery.
   a. Use an impact drill to drill the holes.
   b. Clean the holes.
   c. Use a rubber mallet to install the expansion bolts into the holes.
   d. Use a hex wrench to tighten the nuts clockwise to expand the bolts.
   e. Rotate the nuts counterclockwise to remove them.
   f. Reinstall the battery on the base or wall mount, and adjust its position so it is 15-20mm away from the wall.
   g. Use a hex wrench to secure the battery to the wall, and use a torque screwdriver to fasten the anti-tip bracket to the battery.
4. Install and fasten the inter-battery fixing bracket.
   If installing multiple battery units, repeat steps 1 through 4 to complete the installation of all units. Do not stack more than 4 units in a single group.
5. Install and fasten the fixing bracket between the battery and the base or wall mount.

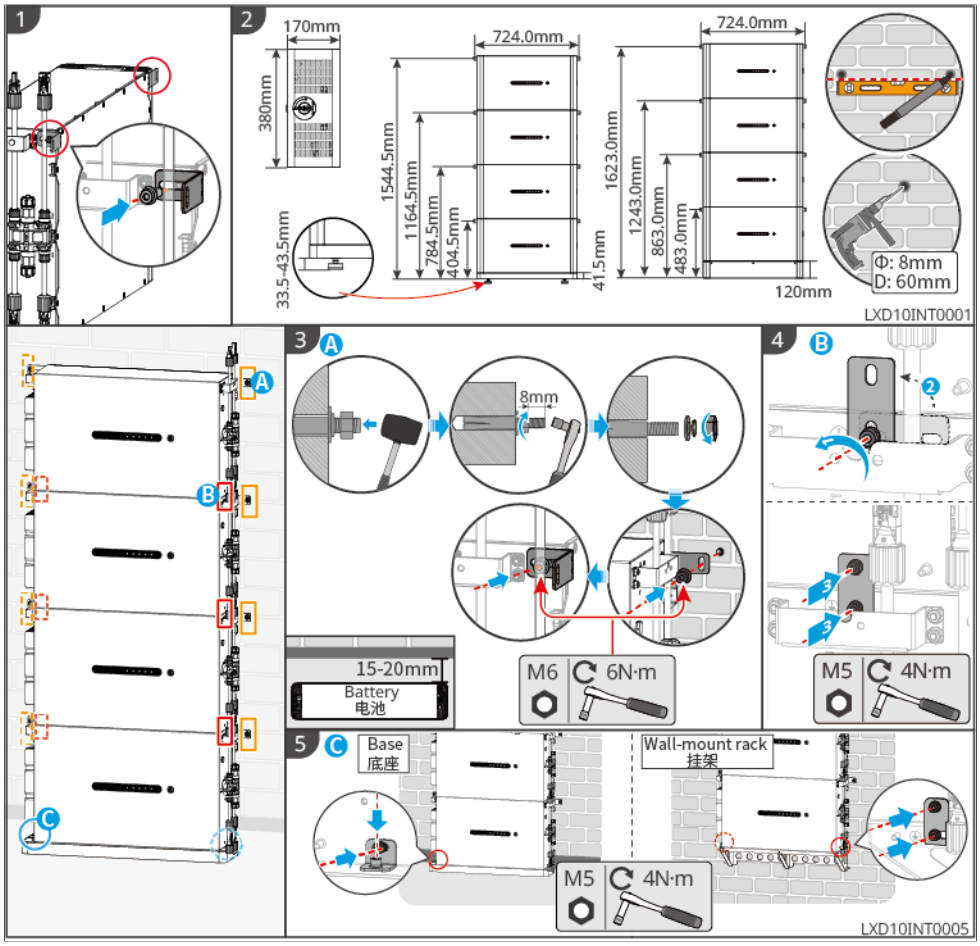


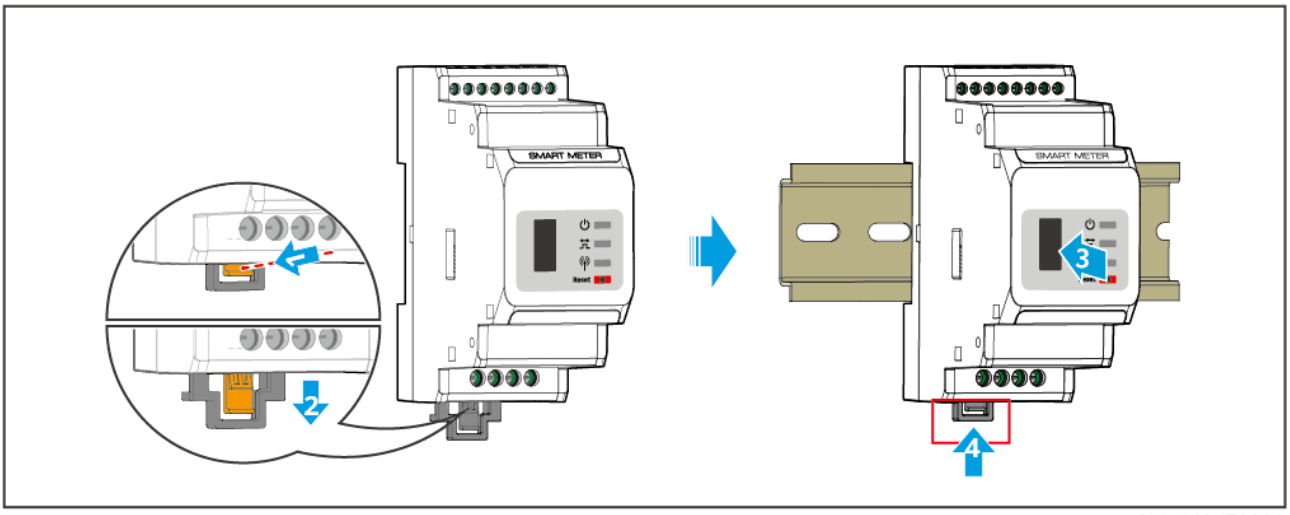
Figure9 Installing the Battery System

4.6 Installing the Smart Meter

⚠WARNING

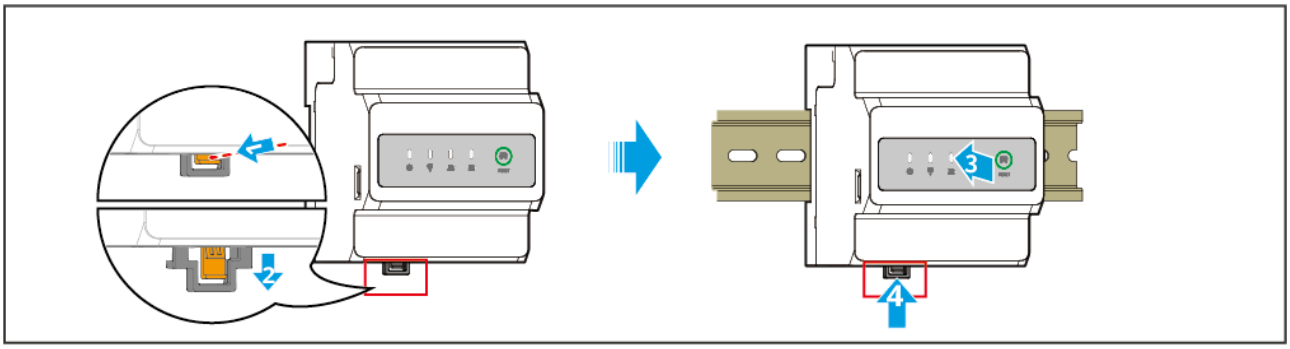
In areas with lightning risk, if the meter cable length exceeds 10m and the cable is not routed using a grounded metal conduit, it is recommended to install an external lightning protection device.

GM3000



GMK10INT0002

GM330&GMK330



GMK10INT0003

5 System Wirings

DANGER

- The installation, routing, and connection of cables must comply with local laws, regulations, and standard requirements.
- All operations during electrical connection, as well as the specifications of the cables and components used, must meet the requirements of local laws and regulations.
- Before performing electrical connections, disconnect the DC switch and AC output switch of the equipment to ensure the equipment is powered off. Live-line work is strictly prohibited, otherwise, hazards such as electric shock may occur.
- Cables of the same type should be bundled together and arranged separately from different types of cables. Intertwining or crossing arrangements are prohibited.
- If the cable is subjected to excessive tension, poor connections may result. When connecting, leave a certain length of cable slack before connecting it to the inverter terminal ports.
- When crimping terminals, ensure the cable conductor is in full contact with the terminal. Do not crimp the cable insulation together with the terminal. Otherwise, it may cause equipment malfunction, or after operation, unreliable connections leading to heating and damage to the inverter terminal block.

NOTICE

- When performing electrical connections, wear personal protective equipment such as safety shoes, protective gloves, and insulated gloves as required.
- Only qualified professionals are permitted to perform electrical connection operations.
- The cable colors shown in the diagrams in this document are for reference only. Specific cable specifications must comply with local regulatory requirements.
- For parallel systems, please adhere to the safety precautions in the user manuals corresponding to the related products within the system.

5.1 System Wiring Electrical Block Diagram

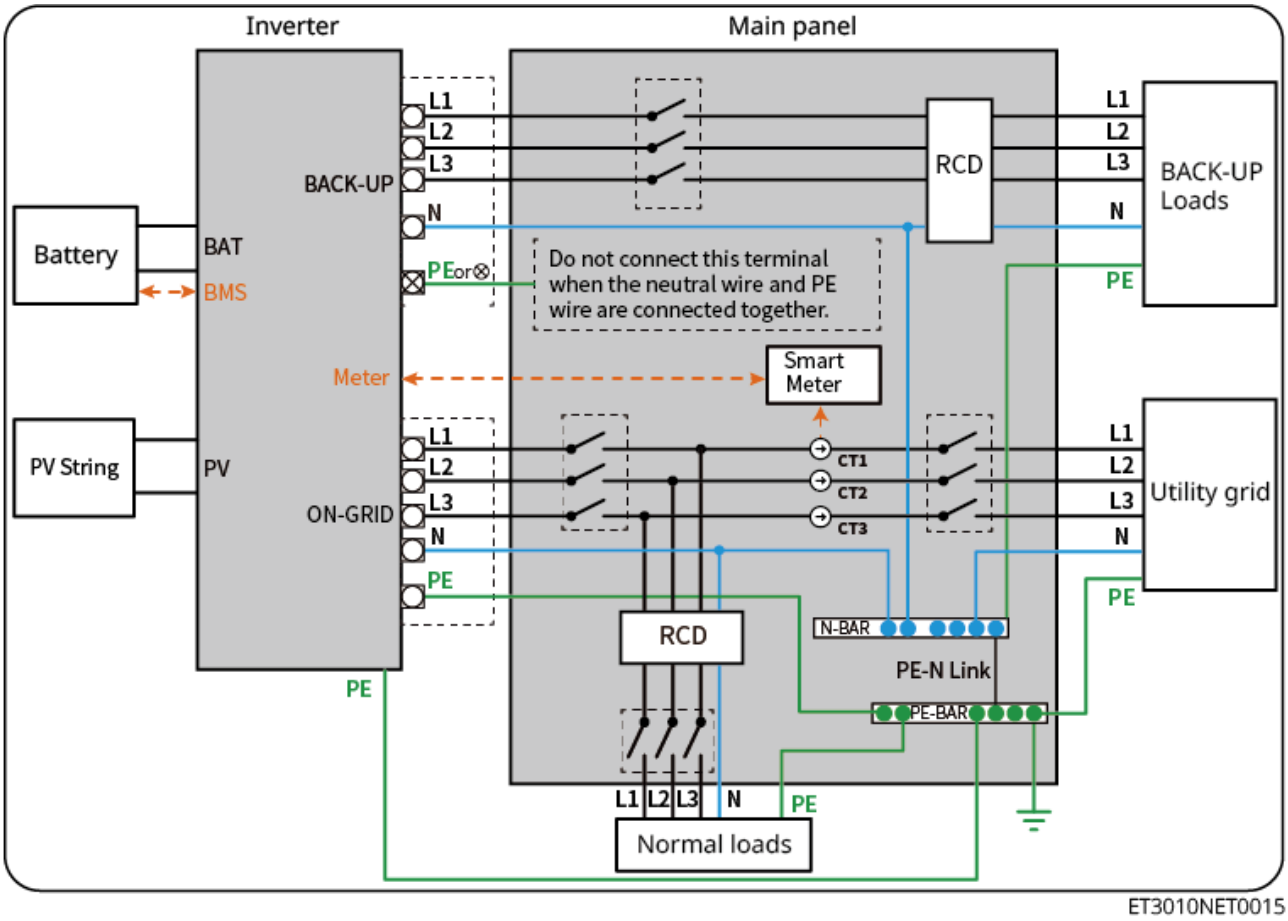
NOTICE

- Depending on regional regulatory requirements, the wiring methods for the N and PE lines of the inverter's ON-GRID and BACK-UP ports may vary. Please refer to local regulations for specifics.
- The inverter's ON-GRID AC port has a built-in relay. When the inverter is in off-grid mode, the built-in ON-GRID relay is open; when the inverter is in grid-connected operation mode, the built-in ON-GRID relay is closed.
- After the inverter is powered on, the BACK-UP AC port is live. If maintenance is required on the BACK-UP Loads, please power off the inverter to avoid electric shock.

N and PE wires are connected together in the distribution box

NOTICE

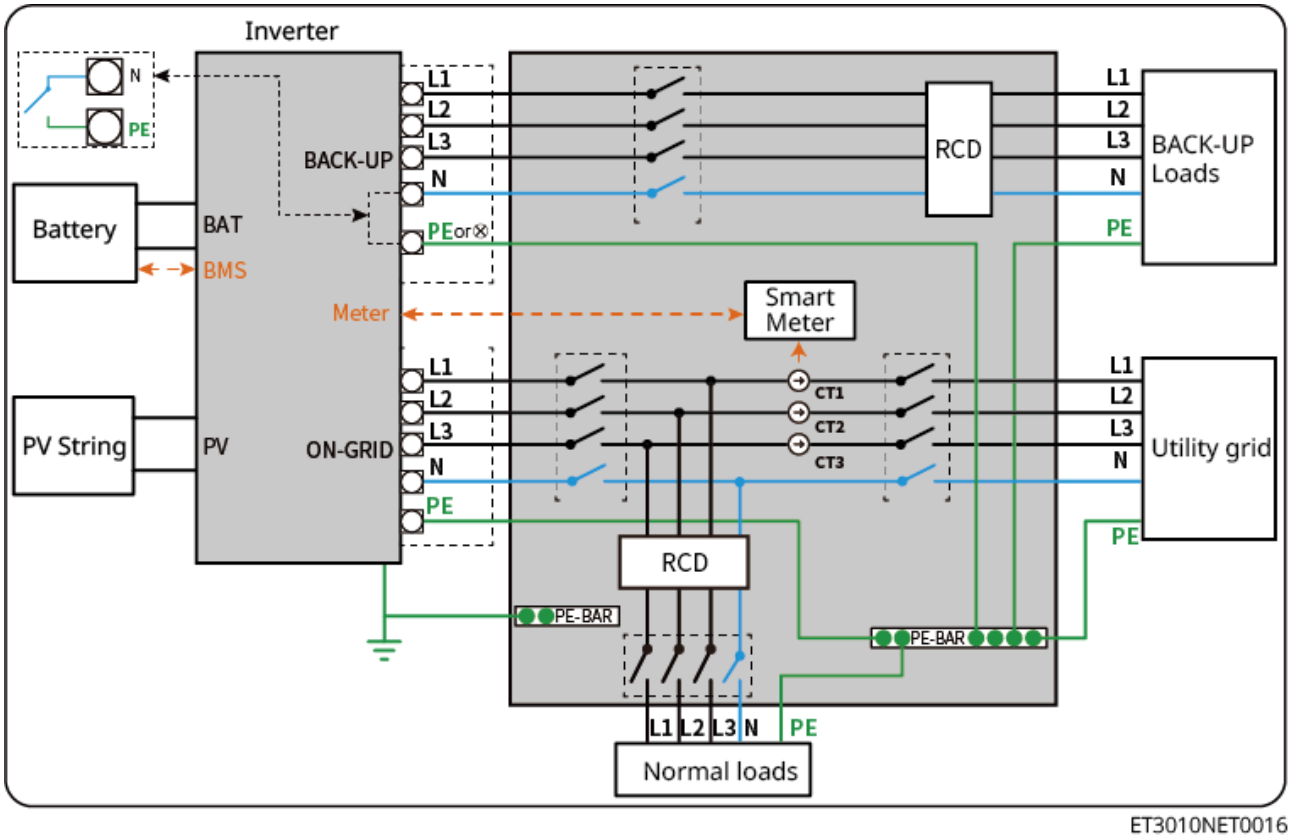
- To maintain neutral integrity, the neutral wires on the grid-connected side and off-grid side must be connected together; otherwise, the off-grid function cannot be used normally.
- The following diagram is a schematic of the grid system for regions such as Australia and New Zealand.



N and PE wires are wired separately in the distribution box

NOTICE

- Please 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.:



5.2 Detailed System Wiring Diagram

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

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

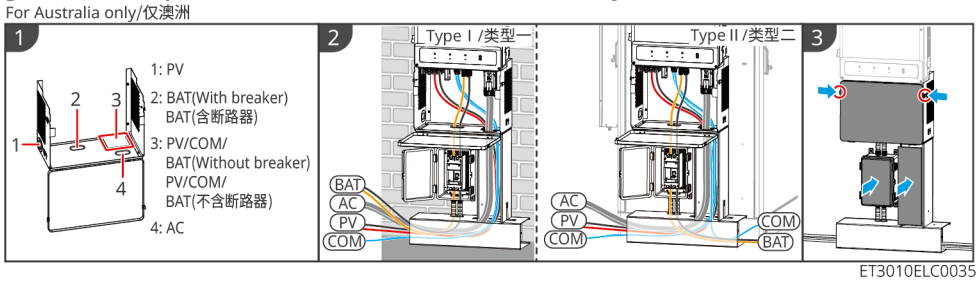
The wiring in the Detailed System Wiring Diagram is only illustrated using some model devices. Please refer to the corresponding wiring guide chapters based on the actual devices used for wiring.

NOTICE

- For coupled scenarios, if you need to implement grid-connected inverter power generation monitoring and load monitoring functions, a dual-meter networking setup is required.
  - Meter 1 is used to monitor the system's grid-connected power.
  - Meter 2 is used to monitor the grid-connected inverter's power generation.
  - By integrating data from Meter 1 and Meter 2, the monitoring platform can achieve real-time monitoring of the load's electricity consumption.
- If the grid-connected inverter requires output power limitation, please connect a separate meter or device such as a CT.

Dual Meter Configuration Scenarios	
Meter 1 (Grid Side)	Meter 2 (AC Side of Grid-Tied Inverter)
GM3000	GM3000
GM3000	GM330
GM3000	GMK330
GM330	GM330
GM330	GM3000
GM330	GMK330
GMK330	GMK330
GMK330	GM3000
GMK330	GM330

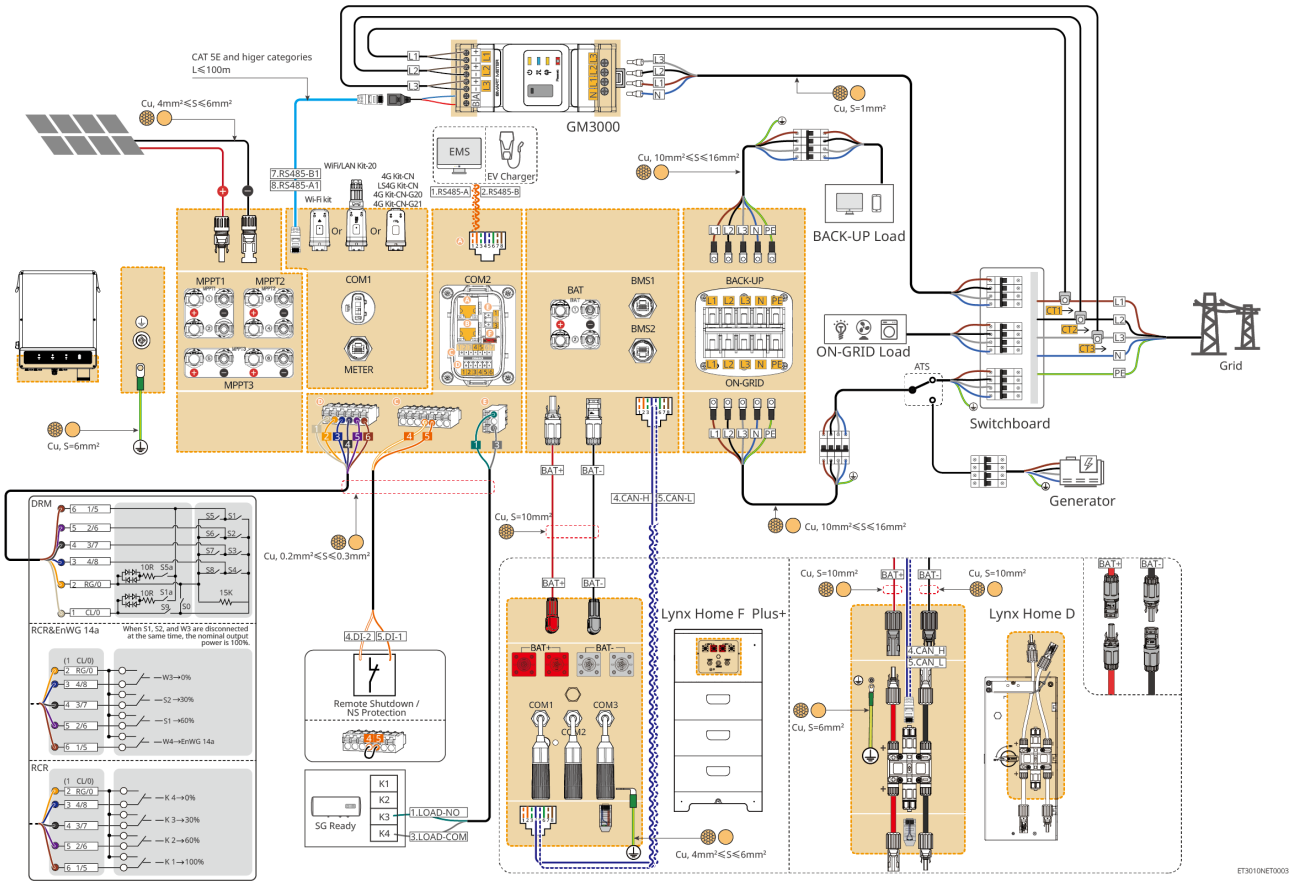
Wiring diagram with protective cover (Australia only)



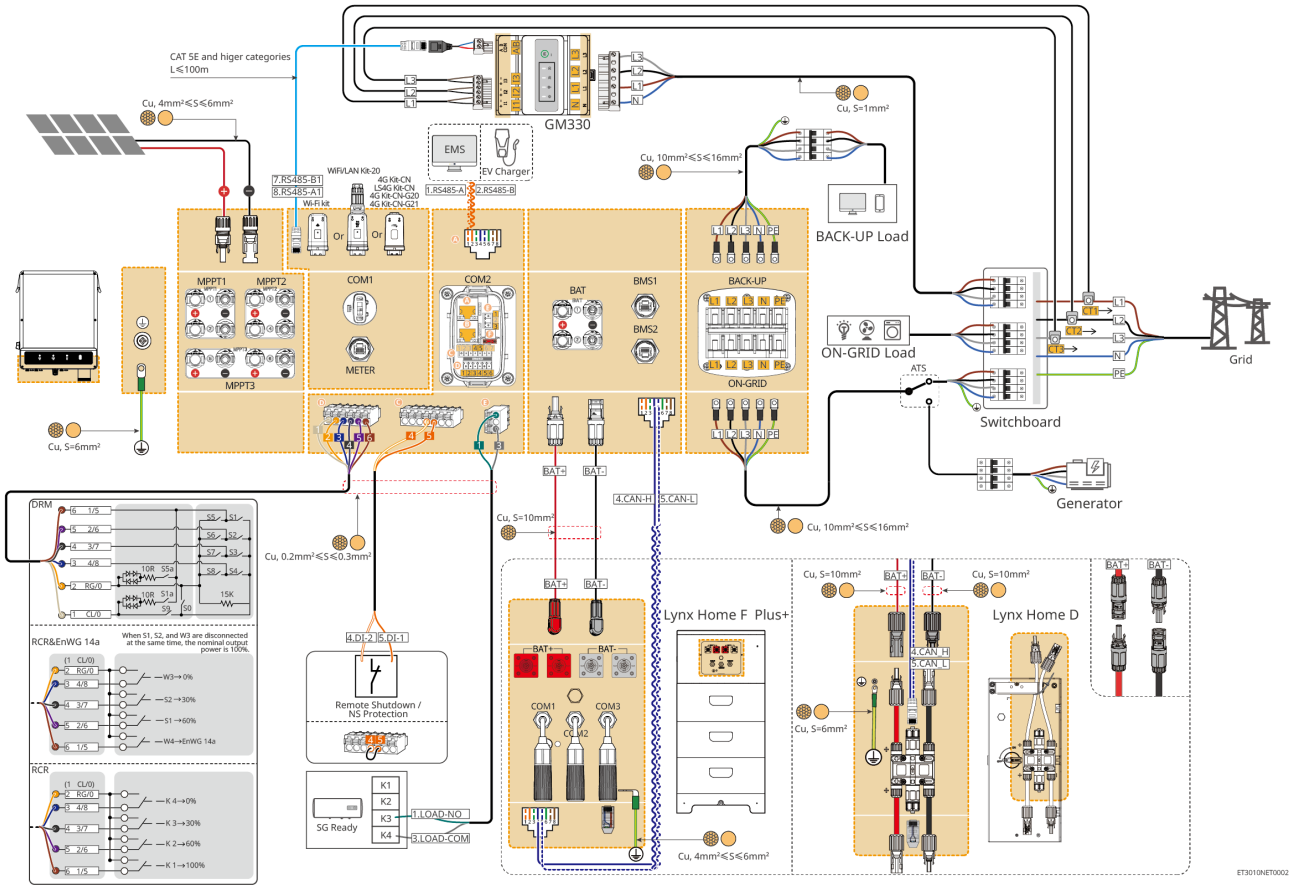
5.2.1 Detailed System Wiring Diagram for Single Inverter

General Scenarios

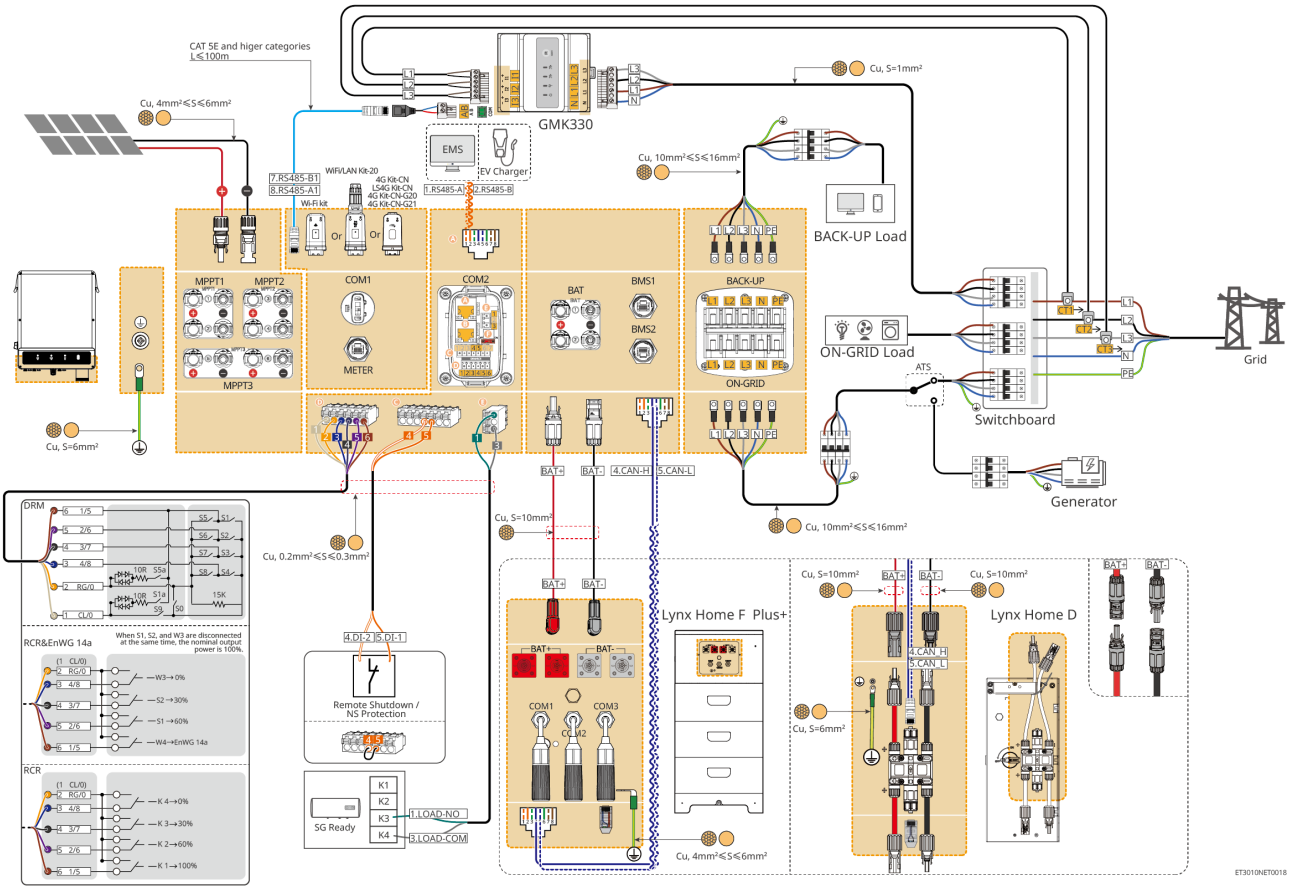
Scenario with GM3000



Scenario with GM330



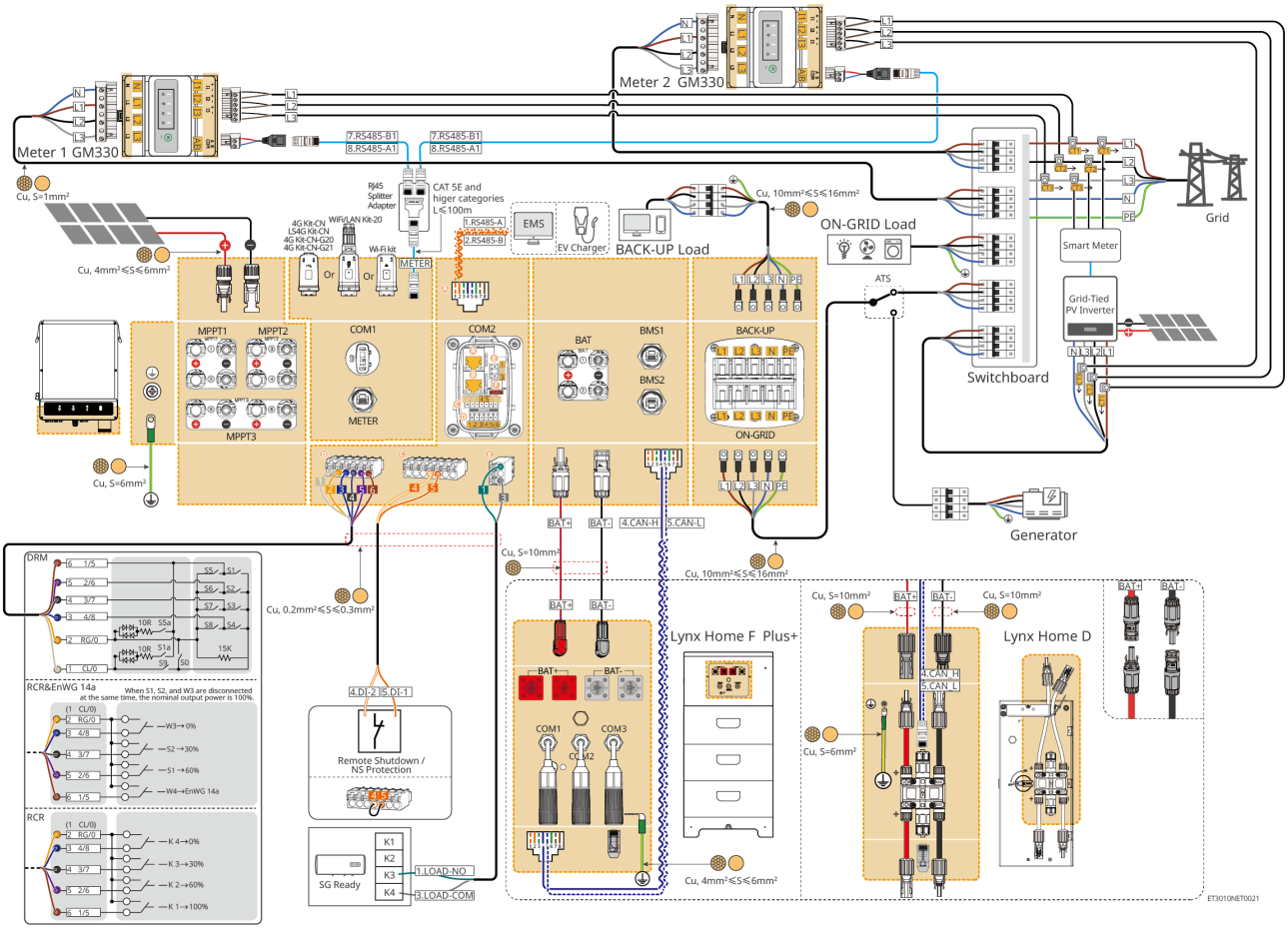
Scenario with GMK330



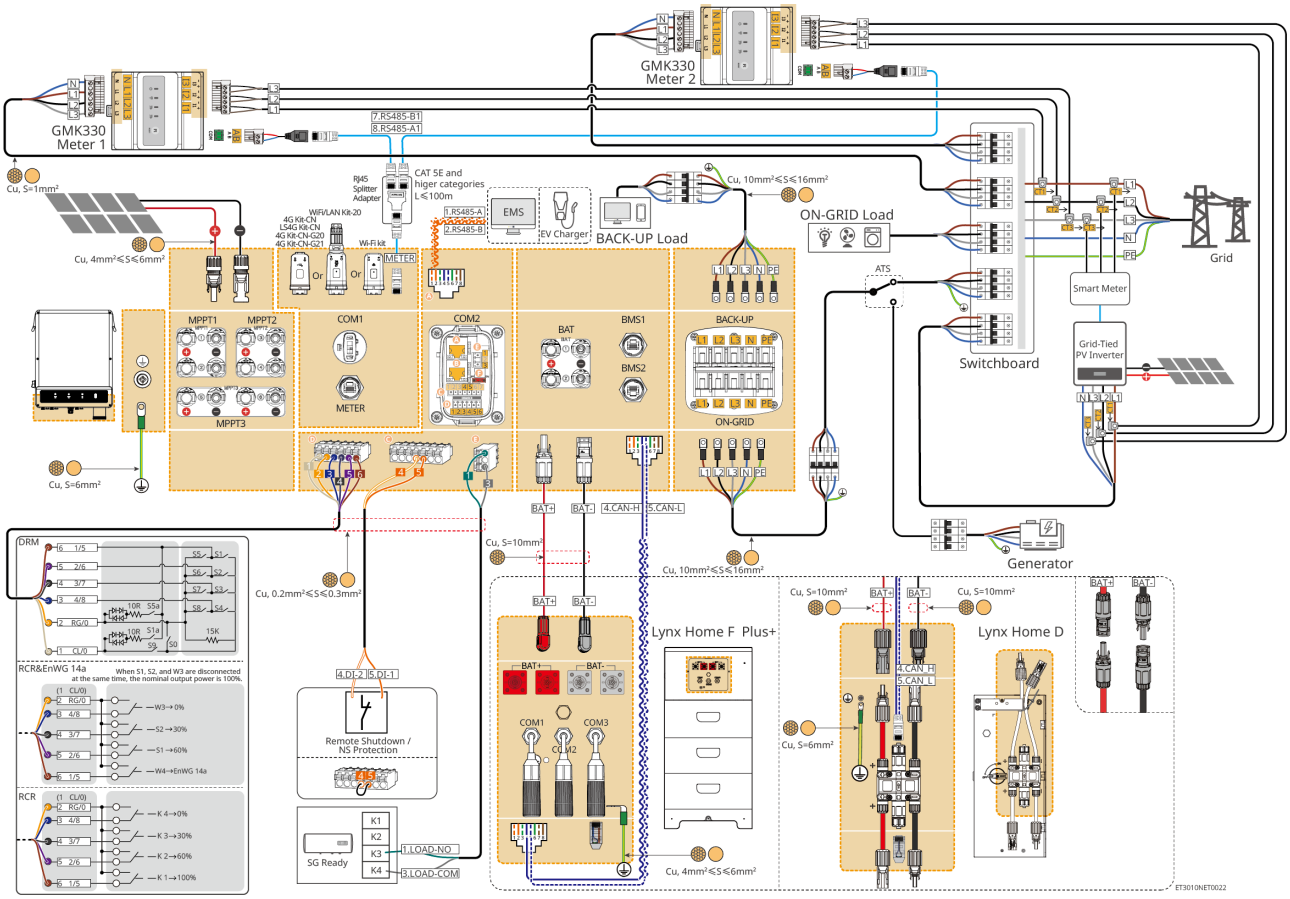
Grid-tied Inverter Power Generation Monitoring and Load Monitoring Networking Solution for Coupling Scenarios

For coupling scenarios, if output power limitation is required for the grid-tied inverter, please connect a separate meter or CT device.

GM330 Meter +GM330 Meter



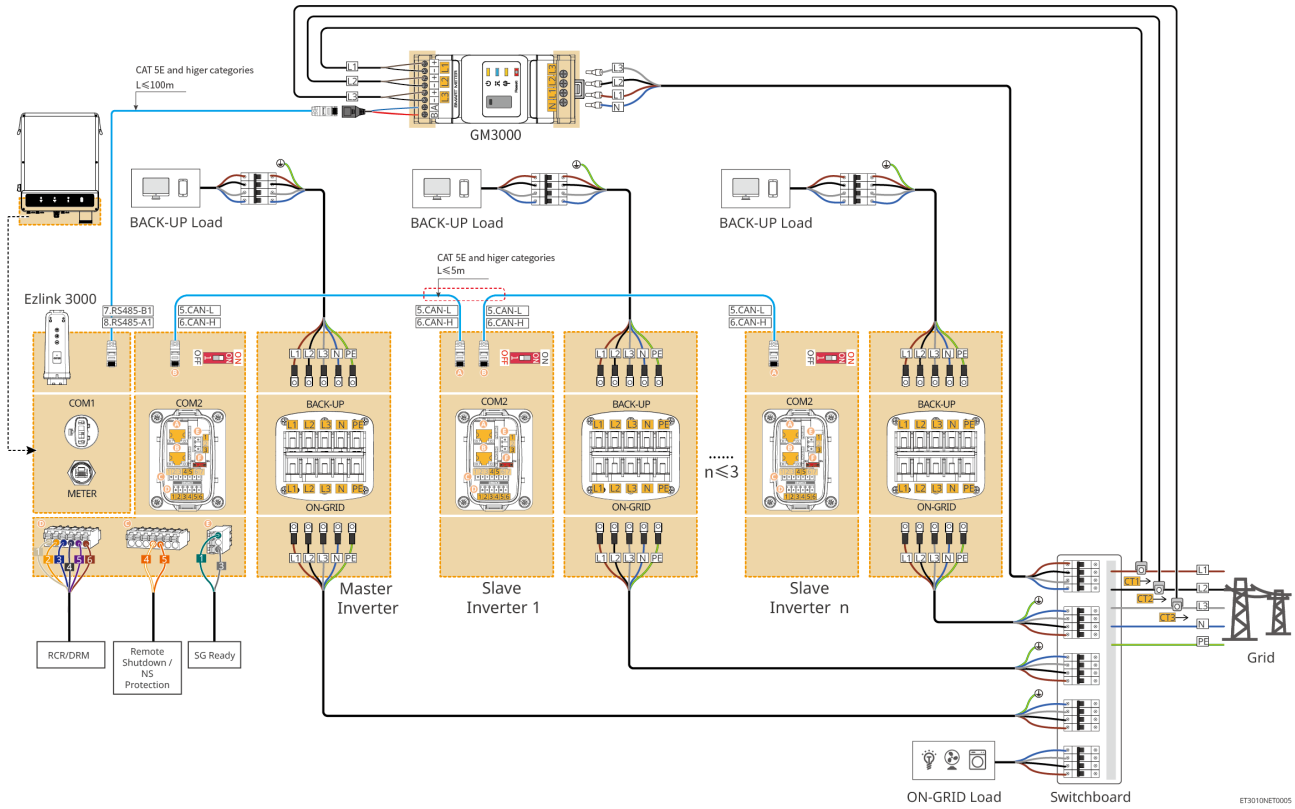
GMK330 Meter +GMK330 Meter



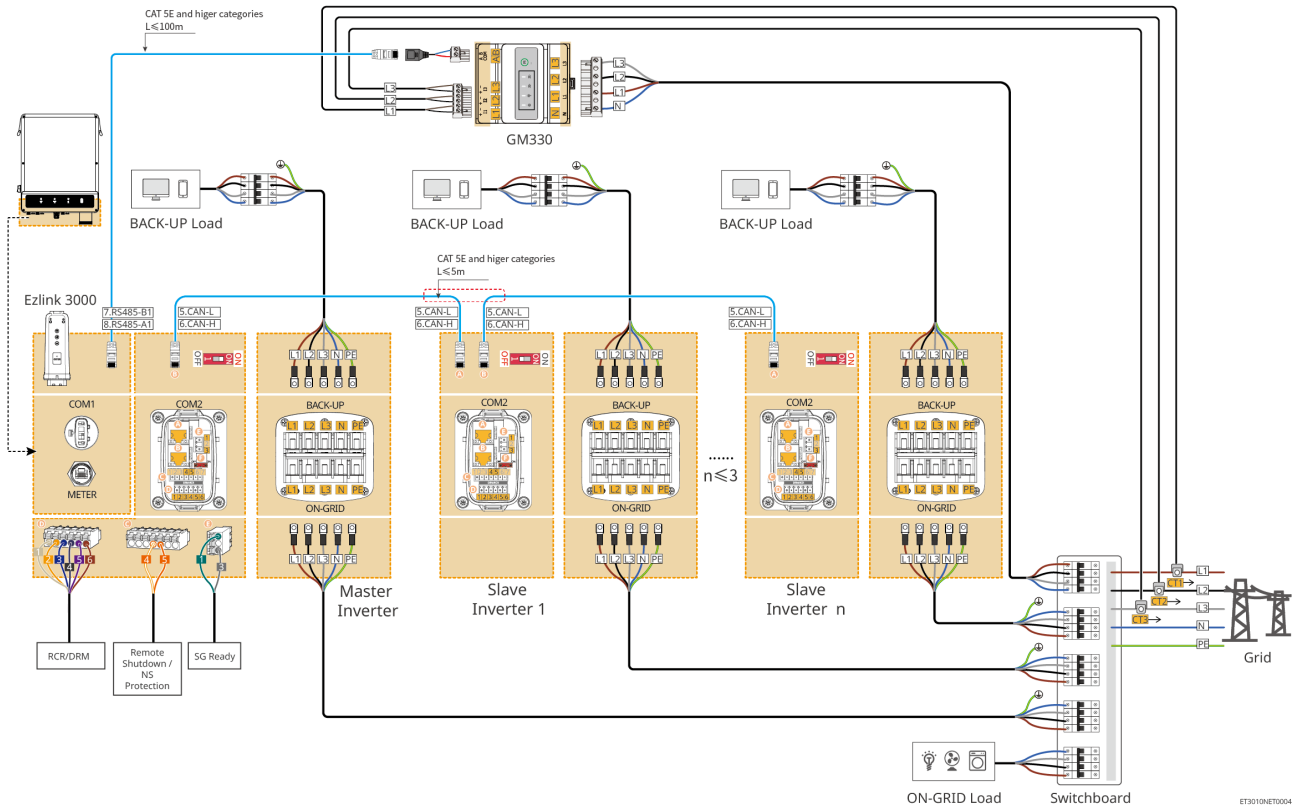
5.2.2 Detailed System Wiring Diagram for Parallel System

- In parallel system scenarios, the inverter connected to the Ezlink3000 smart communication stick and the meter is the master inverter, while others are slave inverters. In the system, slave inverters should not be connected to the smart communication stick.
- If DRED devices, RCR devices, remote shutdown devices, NS Protection, SG Ready heat pumps, etc., need to be connected in the system, please connect them to the master inverter.
- The following diagrams focus on wiring related to the parallel system. For other port wiring requirements, please refer to the single-unit system.

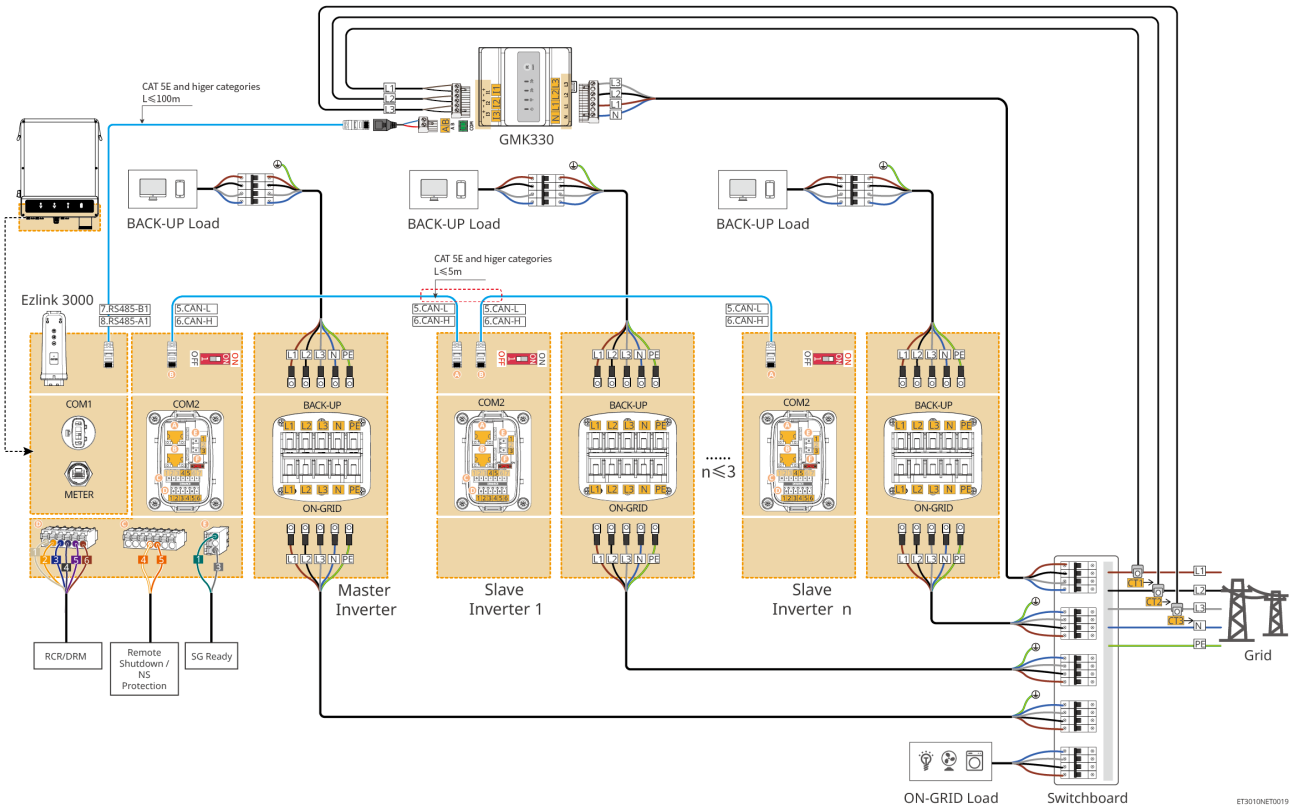
WithGM3000Scenario



WithGM330Scenario

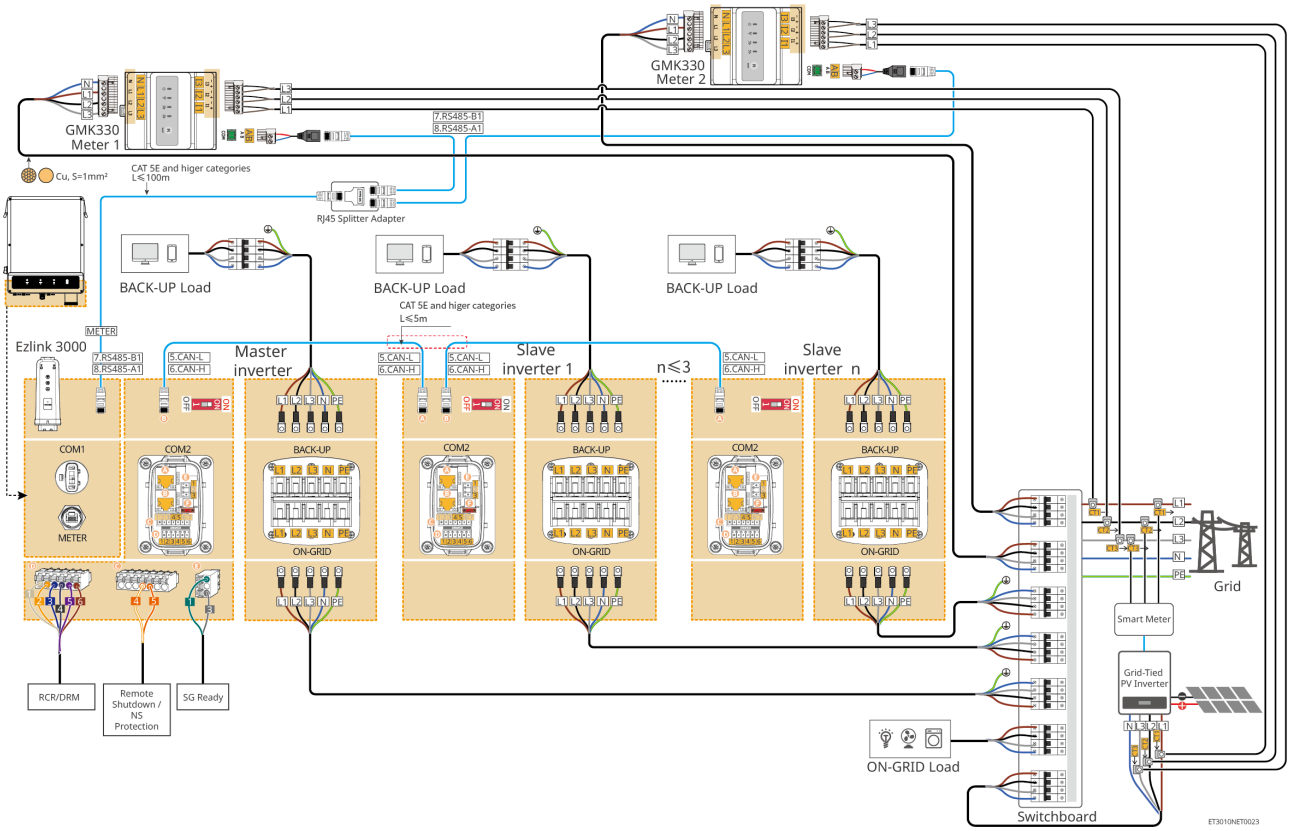


WithGMK330Scenario



Coupling Scenario Load Monitoring and Grid-tied Inverter Power Generation Monitoring Networking Solution

GMK330 meter+GMK330 meter



5.3 Preparing Materials

⚠WARNING

- Do not connect loads between the inverter and the AC switch directly connected to the inverter.
- Each inverter must be equipped with an AC output circuit breaker. Multiple inverters must not be connected to the same AC circuit breaker simultaneously.
- To ensure the inverter can be safely disconnected from the grid in case of an abnormality, connect an AC circuit breaker on the AC side of the inverter. Select a suitable AC circuit breaker according to local regulations.
- When the inverter is powered on, the BACK-UP AC port is live. If maintenance is required on the BACK-UP Loads, power down the inverter; otherwise, electric shock may occur.
- For cables used within the same system, it is recommended that the following be consistent: conductor material, cross-sectional area, length, etc.
  - BACK-UP AC cable for each inverter
  - ON-GRID AC cable for each inverter
  - Power cable between the inverter and the battery
  - Power cable between batteries
- The system only supports connecting a generator via an ATS switch in a single-unit scenario to achieve switching between grid and generator power supply. The ATS switch is connected to the grid by default.

5.3.1 Preparing Breakers

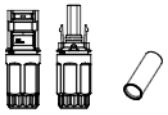
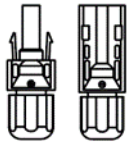
No.	breaker	Recommended Specifications	Acquisition Method	Remarks
1	ON-GRID breaker	When the BACK-UP port is not loaded, the Rated Current requirements are as follows: • GW15K-ET: Rated Current ≥32A; Nominal Voltage ≥400V • GW20K-ET: Rated Current ≥40A; Nominal Voltage ≥400V • GW25K-ET: Rated Current ≥50A; Nominal Voltage ≥400V • GW29.9K-ET, GW30K-ET: Rated Current ≥63A; Nominal Voltage ≥400V • GW12KL-ET: Rated Current ≥50A; Nominal Voltage ≥230V • GW18KL-ET: Rated Current ≥63A; Nominal Voltage ≥230V	Self-provided	If the inverter's BACK-UP port is not used, a suitable breaker can be selected based on the AC maximum output current.
		When the BACK-UP port is loaded, the Rated Current requirements are as follows: • GW15K-ET: Rated Current ≥50A; Nominal Voltage ≥400V • GW20K-ET, GW25K-ET, GW29.9K-ET, GW30K-ET: Rated Current ≥63A; Nominal Voltage ≥400V • GW12KL-ET, GW18KL-ET: Rated Current ≥63A; Nominal Voltage ≥230V		

No.	breaker	Recommended Specifications	Acquisition Method	Remarks
2	BACK-UP breaker	Nominal Voltage ≥400V, Rated Current requirements are as follows: • GW15K-ET: Rated Current ≥32A; Nominal Voltage ≥400V • GW20K-ET: Rated Current ≥40A; Nominal Voltage ≥400V • GW25K-ET: Rated Current ≥50A; Nominal Voltage ≥400V • GW29.9K-ET, GW30K-ET: Rated Current ≥63A; Nominal Voltage ≥400V • GW12KL-ET: Rated Current ≥40A; Nominal Voltage ≥230V • GW18KL-ET: Rated Current ≥63A; Nominal Voltage ≥230V	Self-provided	-
3	ATS Switch	The specifications of the ATS Switch and the ON-GRID breaker for the same model are consistent. Specification requirements (recommended): • GW15K-ET: Rated Current ≥32A; • GW20K-ET: Rated Current ≥40A; • GW25K-ET: Rated Current ≥50A; • GW29.9K-ET, GW30K-ET: Rated Current ≥63A; • GW12KL-ET: Rated Current ≥40A; • GW18KL-ET: Rated Current ≥63A;	Self-provided	During actual selection, you can also choose a breaker that meets local installation regulations based on the actual working current.

No.	breaker	Recommended Specifications	Acquisition Method	Remarks
4	Battery Switch	Select according to local laws and regulations • 2P DC Switch • Rated Current ≥63A • Nominal Voltage ≥1000V	Self-provided	-
5	RCD	Select according to local laws and regulations • Type A type • ON-GRID side: 300mA • BACK-UP side: 30mA	Self-provided	-
6	Meter Switch	• Nominal Voltage: 380V/400V • Rated Current: 0.5A	Self-provided	-

5.3.2 Preparing Cables

No.	Cable	Recommended Specifications	Acquisition Method
1	Inverter Protective Ground Cable	• Single-core Outdoor Copper Cable • Conductor Cross-sectional Area: S=6mm²	Self-provided
2	Battery Protective Ground Cable	• Single-core Outdoor Copper Cable • Conductor Cross-sectional Area: 6mm²	Self-provided

No.	Cable	Recommended Specifications	Acquisition Method
3	PV DC Cable	• Industry-standard Outdoor PV Cable • Conductor Cross-sectional Area: 4mm²-6mm² • Cable Outer Diameter: 5.9mm-8.8mm	Self-provided
4	Battery DC Cable	Terminal Type I  • Single-core Outdoor Copper Cable • Conductor Cross-sectional Area: 10mm² • Cable Outer Diameter: 6.0mm-9.5mm	Self-provided or purchase from distributor
		Terminal Type II  • Single-core Outdoor Copper Cable • Conductor Cross-sectional Area: 10mm² • Cable Outer Diameter: 5mm-8.5mm	

No.	Cable	Recommended Specifications	Acquisition Method
5	AC Cable	• Multi-core Outdoor Copper Cable • Conductor Cross-sectional Area: 10mm²-16mm² • Cable Outer Diameter: 21mm-26mm	Self-provided
6	Smart Meter Power Cable	Outdoor Copper Cable Conductor Cross-sectional Area: 1mm²	Self-provided
7	Battery BMS Communication Cable	Custom Communication cable, default length is 3m If self-provided Recommend: CAT 5E or above standard network cable and RJ45 connector	Supplied with inverter
8	Meter RS485 Communication Cable	Standard network cable: CAT 5E or above standard network cable and RJ45 connector	RJ45-2PIN terminal adapter cable and standard network cable: Supplied with the package
9	Battery Cluster Parallel Communication Cable	CAT 5E or above standard network cable and RJ45 connector	Self-provided
10	load control DO Communication Cable	• Shielded cable meeting local standards • Conductor Cross-sectional Area: 0.2mm²-0.3mm² • Cable Outer Diameter: 5mm-8mm	Self-provided
11	Remote Shutdown Communication Cable		Self-provided
12	RCR/DRED Signal Cable		Self-provided

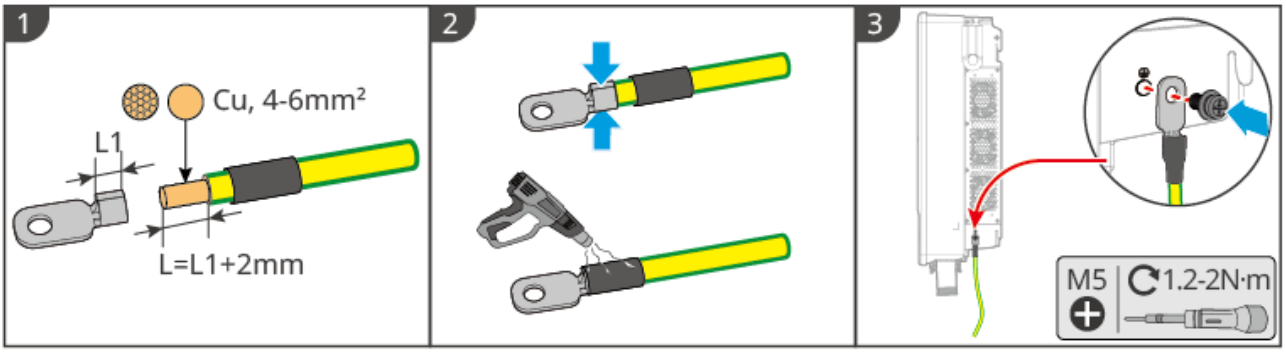
No.	Cable	Recommended Specifications	Acquisition Method
13	Inverter Parallel Communication Cable	CAT 5E or above standard network cable and RJ45 connector	Self-provided
14	EMS Communication Cable/Charging Pile Communication Cable	CAT 5E or above standard network cable and RJ45 connector	Self-provided
15	12V External Power Supply	• Outdoor Copper Cable • Conductor Cross-sectional Area: 0.2mm²-0.3mm² • Cable Outer Diameter: 5mm-8mm	Self-provided

5.4 Connecting the PE cable

⚠WARNING

- The protective grounding of the chassis enclosure cannot replace the protective ground wire of the AC output port. When wiring, ensure the protective ground wires at both locations are reliably connected.
- To improve the corrosion resistance of the terminal, it is recommended to apply silicone or paint over the external part of the grounding terminal for protection after the protective ground wire connection installation is complete.
- When installing the equipment, the protective ground wire must be installed first; when removing the equipment, the protective ground wire must be removed last.

5.4.1 Inverter Grounding



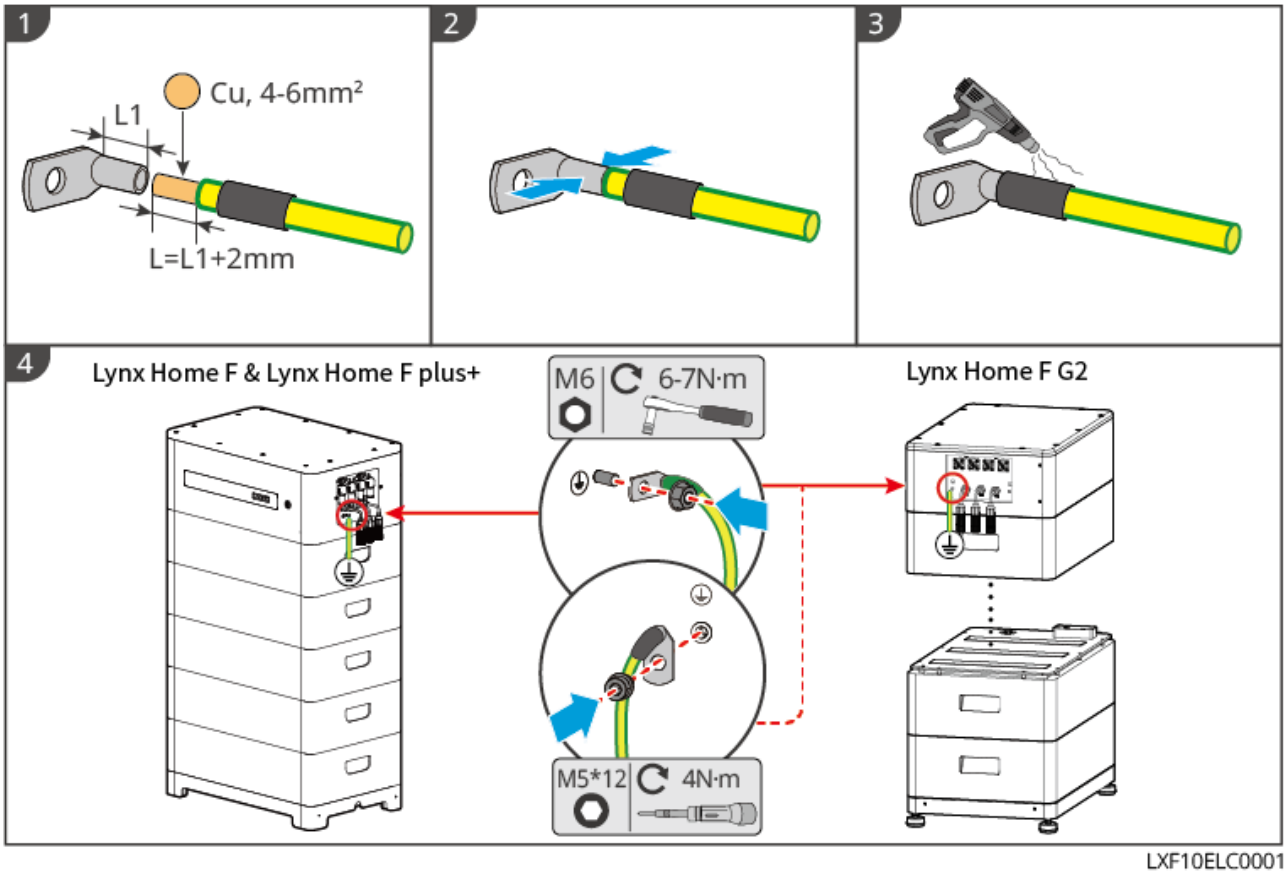
ET3010ELC0001

5.4.2 Battery System Grounding

NOTICE

The pull-out force after crimping should be greater than 400N.

Lynx Home FSeries



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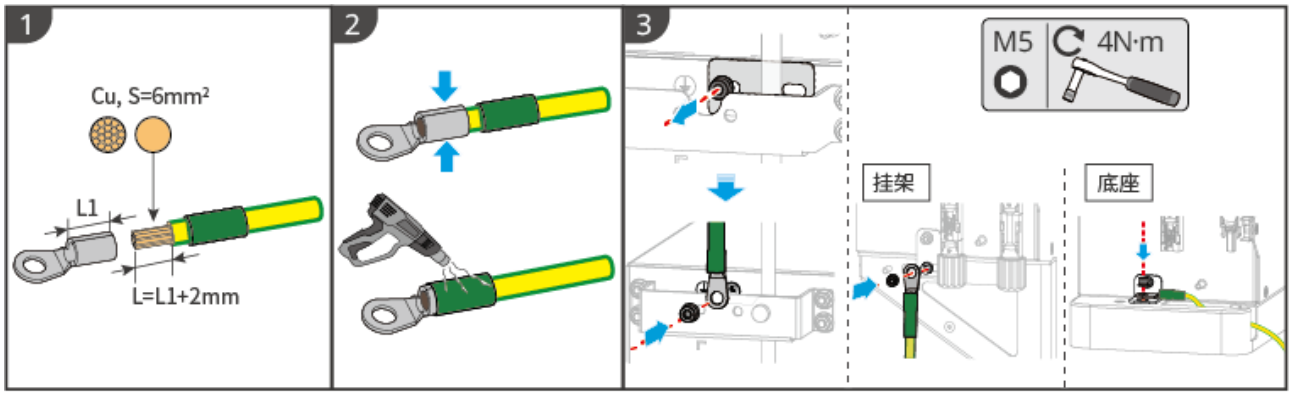
Lynx Home D

In a battery system, any grounding point can be selected for grounding.



LXD10ELC0001

5.5 Connecting the PV Cable

⚠DANGER

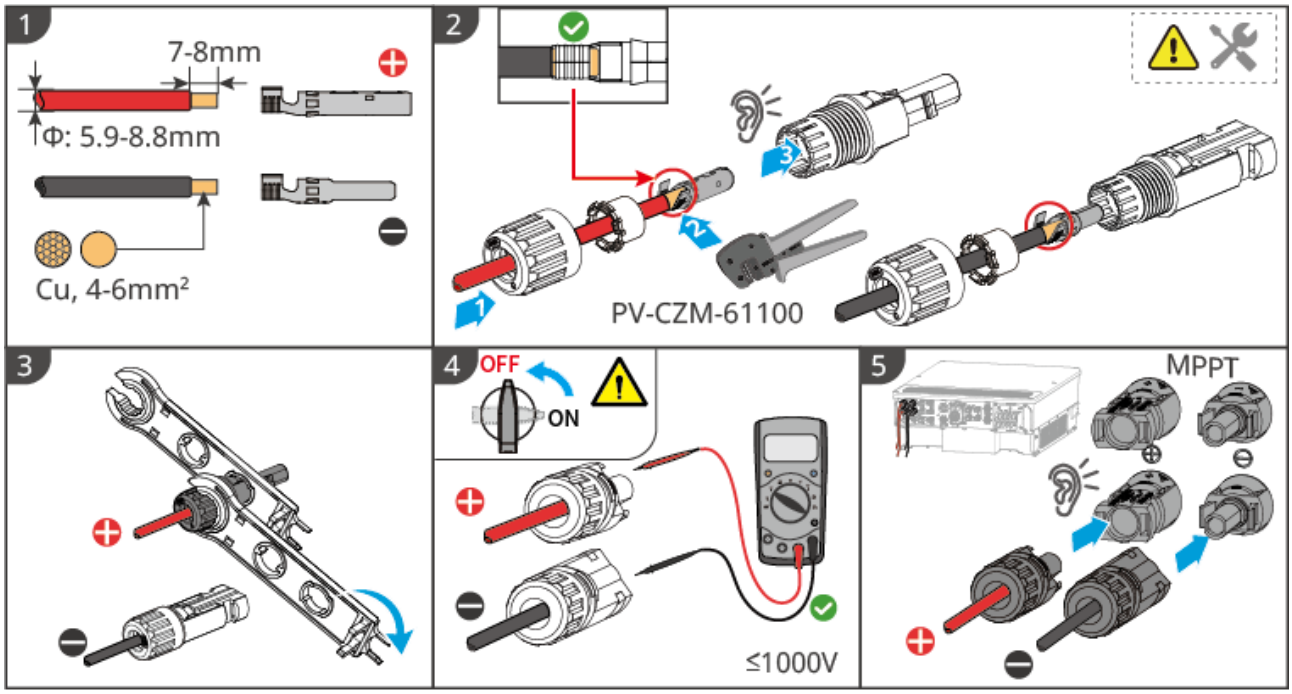
- Do not connect the same PV string to multiple inverters, as this may cause inverter damage.
- Before connecting the PV string to the inverter, confirm the following information. Failure to do so may cause permanent damage to the inverter, and in severe cases, may lead to fire, resulting in personal injury or property damage.
  1. Ensure the maximum short-circuit current and maximum input voltage for each MPPT are within the inverter's allowable range.
  2. Ensure the positive pole of the PV string is connected to the inverter's PV+ terminal, and the negative pole is connected to the inverter's PV- terminal.

⚠WARNING

- PV string output does not support grounding. Before connecting the PV string to the inverter, ensure that the minimum insulation resistance to ground of the PV string meets the minimum insulation impedance requirement (R = Max. Input Voltage / 30mA).
- 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 the voltage is within the allowable range.

NOTICE

The two sets of PV strings within each MPPT circuit must use the same model, the same number of panels, and the same tilt and azimuth angles to ensure maximum efficiency.



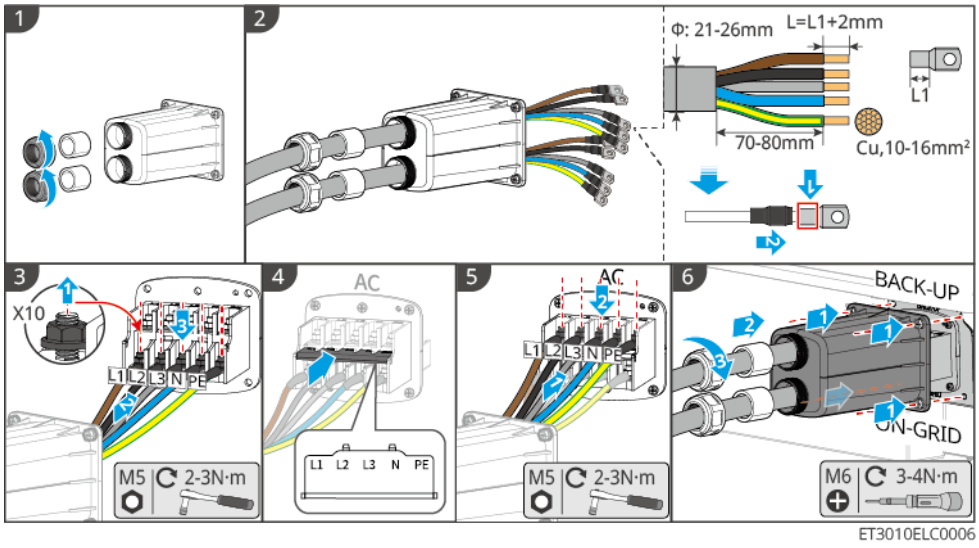
ET3010ELC0002

5.6 Connecting the AC Cable

WARNING

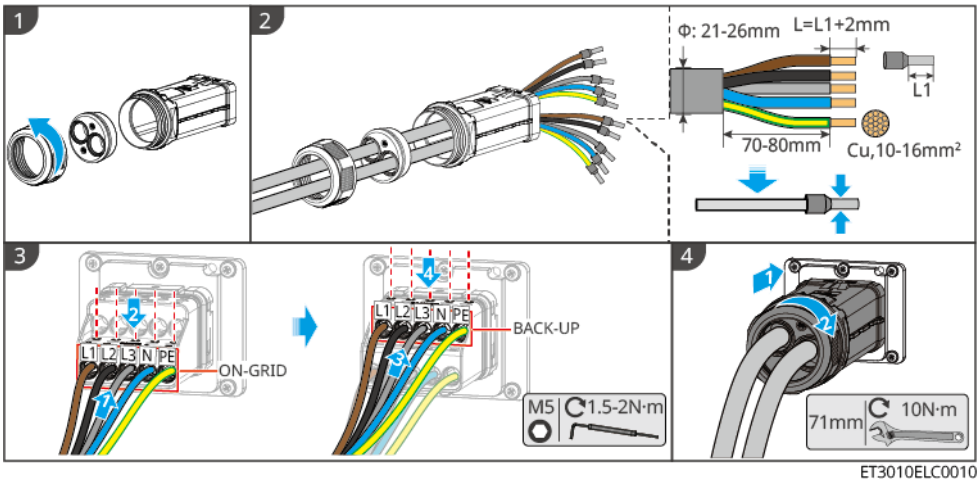
- The inverter integrates a Residual Current Monitoring Unit (RCMU) to prevent the residual current from exceeding the specified value. When the inverter detects a leakage current greater than the allowable value, it will quickly disconnect from the grid or generator.
- Each inverter must be equipped with an AC output circuit breaker. Multiple inverters cannot be connected to one AC circuit breaker simultaneously.
- To ensure the inverter can safely disconnect from the grid in case of an abnormality, please connect an AC circuit breaker on the AC side of the inverter. Select a suitable AC circuit breaker according to local regulations.
- When the inverter is powered on, the BACK-UP AC port is live. If maintenance is required on the BACK-UP load, please power down the inverter; otherwise, electric shock may occur.
- During wiring, ensure the AC wires fully match the "L1", "L2", "L3", "N", and "PE" ports of the AC 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 plate at the AC terminal is tightly fastened and not loose.
- Ensure the cable connections are tight; otherwise, loose connections may cause the terminals to overheat during operation, resulting in equipment damage.
- According to local regulations, a Type A RCD can be installed externally to the inverter. Recommended specifications: ON-GRID side: 300mA, BACK-UP side: 30mA.
- The inverter supports connection to a generator in single-unit operation scenarios. When the grid is out, power can be supplied to the energy storage system via the ON-GRID port.

Type one:



ET3010ELC0006

Type two:



ET3010ELC0010

5.7 Connecting the Battery Cable

⚠DANGER

- Do not connect the same battery bank to multiple inverters, as this may cause inverter damage.
- It is prohibited to connect loads between the inverter and the battery.
- When connecting battery cables, use insulated tools to prevent accidental electric shock or causing a battery short circuit.
- Ensure the battery open-circuit voltage is within the allowable range of the inverter.
- Whether to install a DC switch between the inverter and the battery should be selected based on local laws and regulations.

NOTICE

When using the Lynx Home D battery:

- Please select the appropriate cable crimp terminals based on the actual connected equipment.
- Please use suitable hydraulic pliers according to the DC connector model. The recommended specifications are:
  - For crimping battery DC terminals where the self-sealing bag in the delivery package does not have an HD Locking terminal label, it is recommended to use the YQK-70 hydraulic pliers.
  - For crimping battery DC terminals where the self-sealing bag in the delivery package has an HD Locking terminal label, it is recommended to use the VXC9 hydraulic pliers.
  - If hydraulic pliers cannot be purchased, please select a crimping tool based on the terminal crimping dimensions yourself, ensuring the terminal crimp meets usage requirements.
- Please use the DC connectors and terminals provided in the box to connect the power cables:
  - If the black power cable of the battery system has a label or white cable marker with the characters HD, please plug it into the connector from the delivery package whose self-sealing bag has an HD Locking terminal label.
  - If the black power cable of the battery system does not have a label or white cable marker with the characters HD, please check if the self-sealing bag containing the power connectors in the delivery package has an HD Locking terminal label. If not, plug the male and female connectors together; if it has an HD Locking terminal label, please contact the distributor or after-sales service.

GW18KL-ET, GW25K-ET, GW29.9K-ET, and GW30K-ET model inverters have two battery input ports. When the battery system is connected in parallel clusters to the inverter, the number of battery systems connected to each port is as follows:

Number of Battery Systems	BAT1 Number of Connected Battery Systems	BAT2 Number of Connected Battery Systems
1	1	0
2	1	1

Number of Battery Systems	BAT1 Number of Connected Battery Systems	BAT2 Number of Connected Battery Systems
3	2	1
4	2	2
.....	.....	.....
15	8	7
16	8	8

Inverter and Lynx Home F series battery BMS communication connection instructions:

Inverter port	Connect to battery port	Port definition	Description
BMS1 / BMS2	COM1/COM2/COM	4: CAN_H 5: CAN_L	• CAN communication is used between the Inverter and the battery. • The Inverter BMS1 port connects to the battery COM1 port. • If the battery charge/discharge current is greater than 50A, it is recommended to connect to the battery BAT1 and BAT2 ports, and the Inverter BMS1 port is connected to the battery COM1 port.

Lynx Home F communication port definition:

PIN	COM	Description
4	CAN_H	Connect to the inverter BMS Communication Port to communicate with the inverter; or terminal resistor.
5	CAN_L	
1, 2, 3, 6, 7, 8	-	-

Lynx Home F Plus+ battery parallel cluster communication connection instructions:

PIN	COM1	COM2	COM3	Description
1	CAN_H	CAN_H	CAN_H	BMS communication for battery system parallel clusters
2	CAN_L	CAN_L	CAN_L	
3	-	-	-	Reserved
4	CAN_H	-	-	• COM1: Connect to the inverter BMS Communication Port to communicate with the inverter • COM2, COM3: Reserved
5	CAN_L	-	-	
6	GND	GND	GND	Ground PIN
7	HVIL_IN	HVIL_IN	-	• COM1, COM2: Parallel cluster interlock function • COM3: Reserved
8	HVIL_OUT	HVIL_OUT	-	

Lynx Home F G2 battery parallel cluster communication connection instructions:

PIN	COM1	COM2	COM3	Description
1	RS485_A1	RS485_A1	Reserved	Connect to external RS485 communication devices
2	RS485_B1	RS485_B1		
3	-	-		Reserved
4	CAN_H	CAN_H		Connect to inverter communication or battery cluster communication port
5	CAN_L	CAN_L		
6	DI7H-	DI7H-		Battery cluster signal detection function
7	DI7H+	DI7H+		
8	-	PWM		Send cluster PWM signal

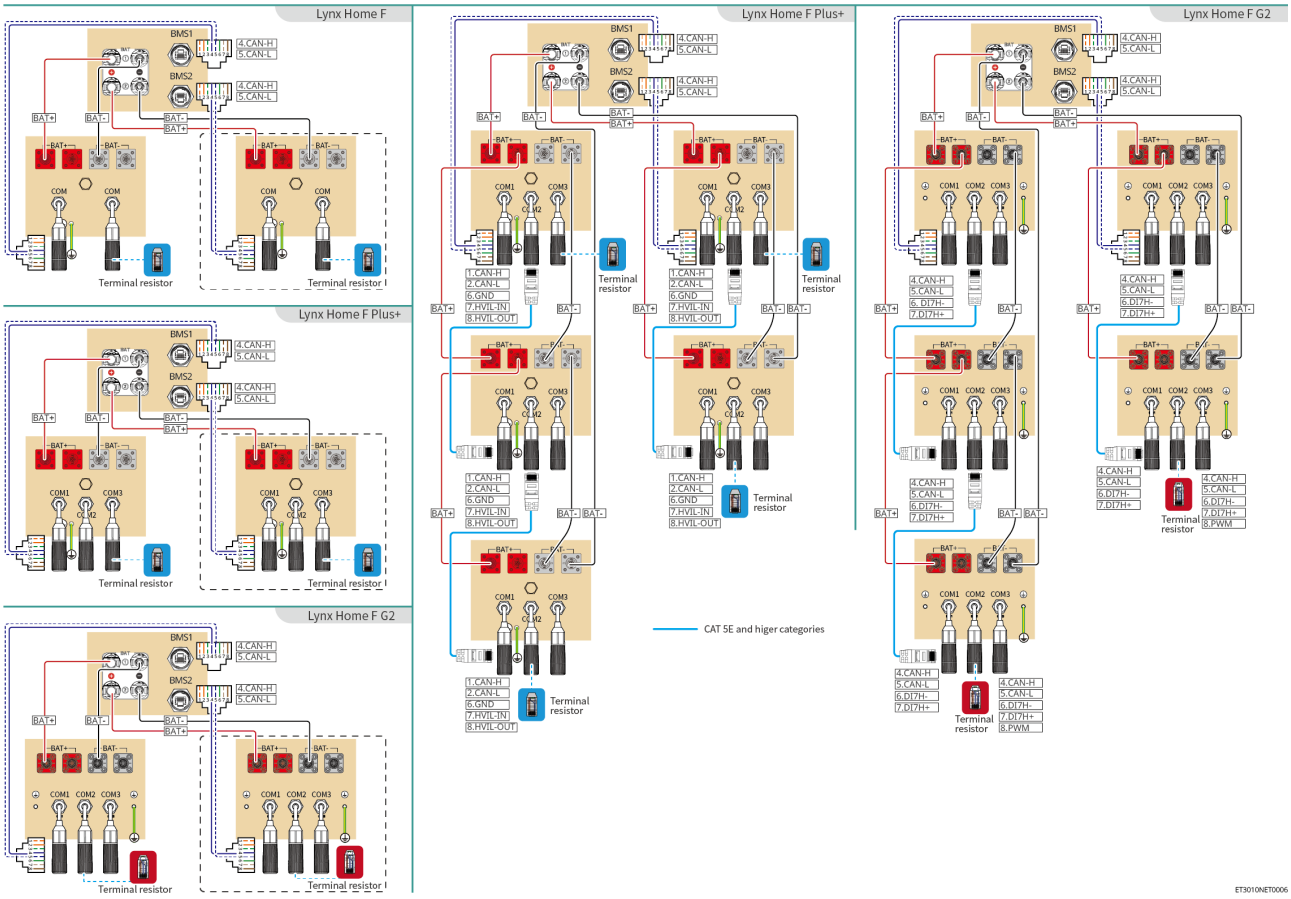
Inverter and Lynx Home D battery BMS communication connection instructions

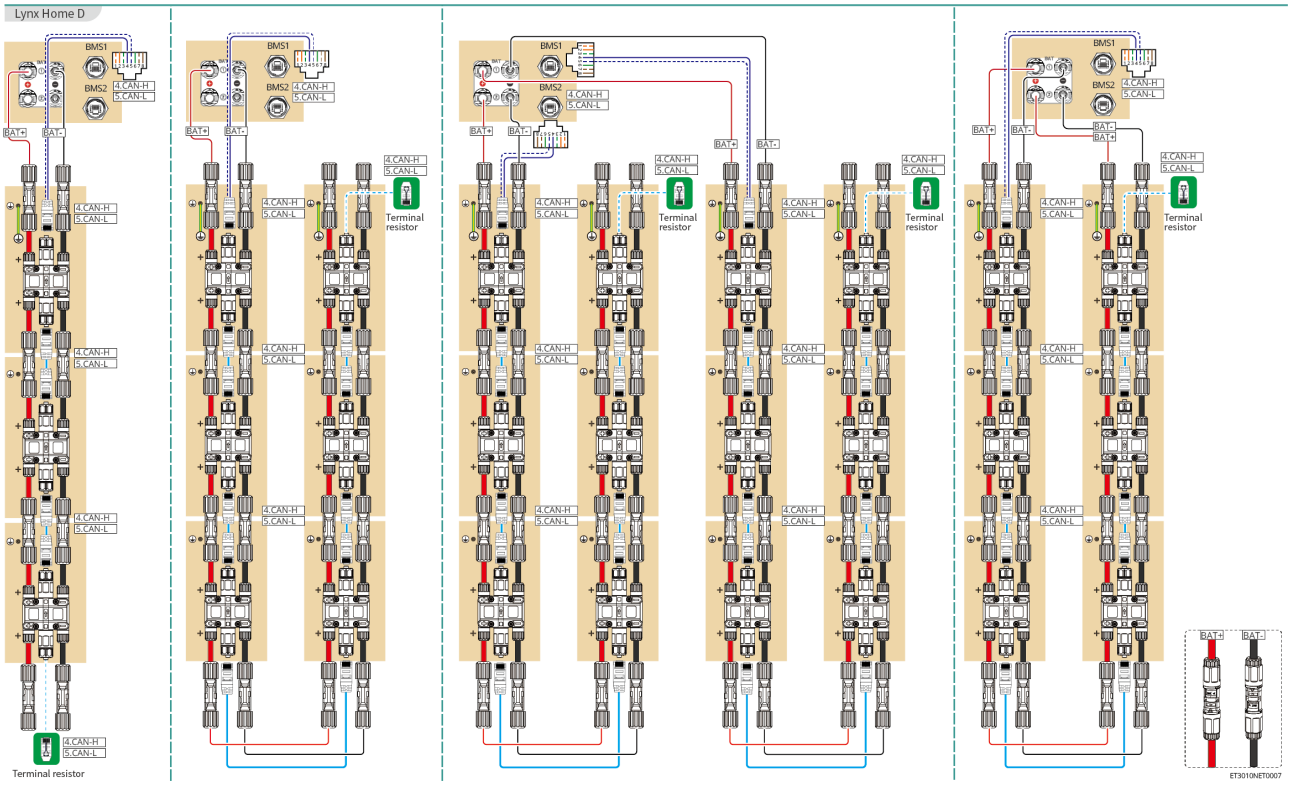
Inverter Port	Connect to Battery Port	Port Definition	Description
BMS1	COM	4: CAN_H 5: CAN_L	• The Inverter and the battery use CAN communication. • The Inverter BMS1 port is connected to the battery communication port.

Lynx Home D battery parallel cluster communication connection instructions:

PIN	Battery Port	Description
1	RS485_A1	Reserved
2	RS485_B1	
4	CAN_H	Connect to inverter communication or battery cluster communication port
5	CAN_L	
3、6、7、8	-	-

Battery system wiring diagram


Lynx Home F
Lynx Home F Plus+
Lynx Home F G2
BMS1
BMS2
4.CAN-H
5.CAN-L
BAT+
BAT-
COM
COM1
COM2
COM3
Terminal resistor
1.CAN-H
2.CAN-L
6.GND
7.HVIL-IN
8.HVIL-OUT
6.DI7H-
7.DI7H+
8.PWM
CAT 5E and higer categories
ET3010NET0006


Lynx Home D
BMS1
BMS2
4.CAN-H
5.CAN-L
BAT+
BAT-
Terminal resistor
ET3010NET0007

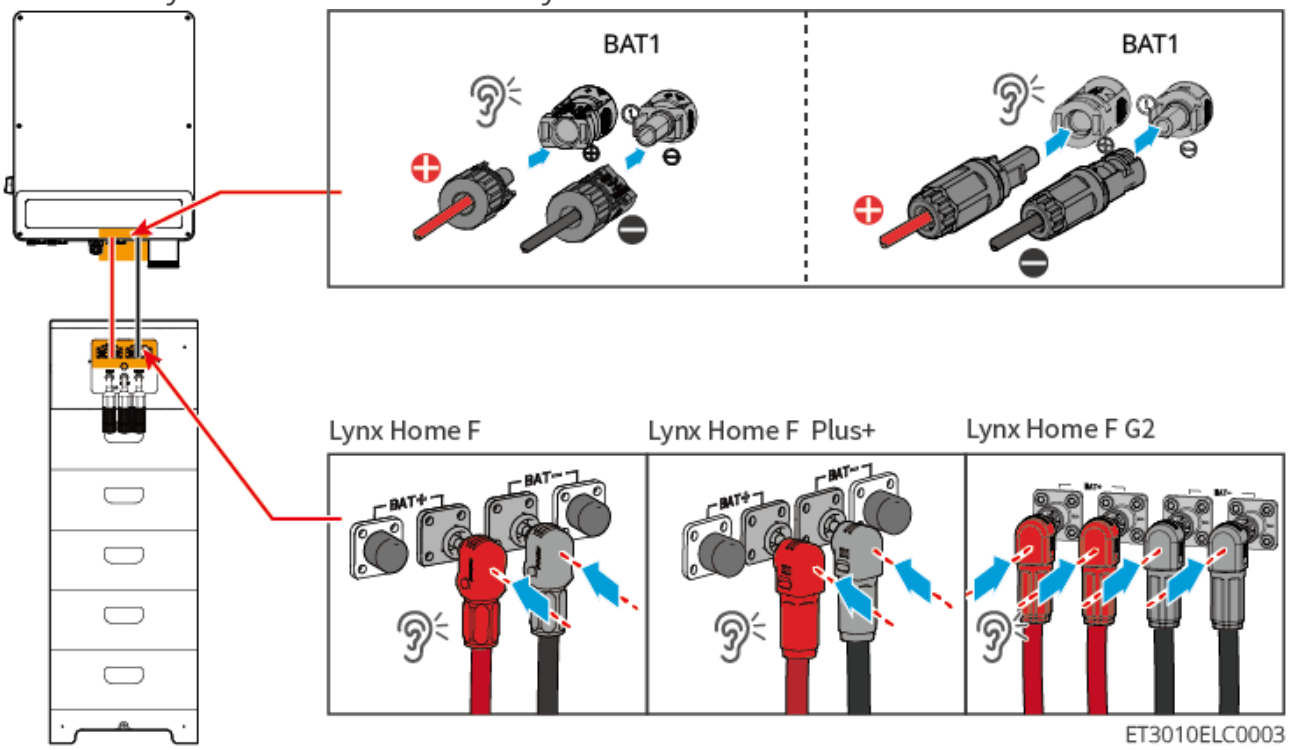
5.7.1 Connecting the Power Cable between the Inverter and Battery

⚠WARNING

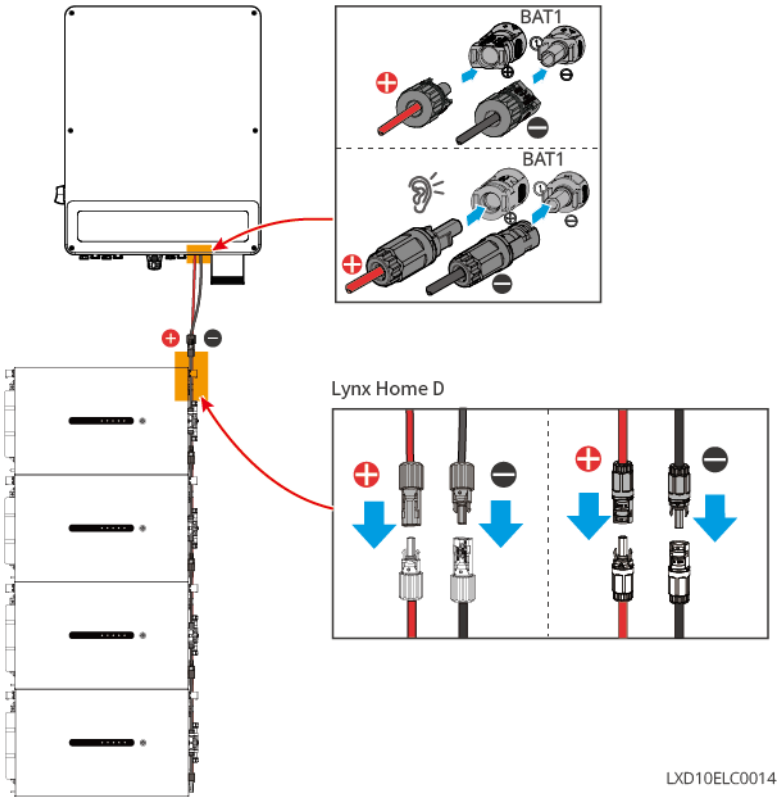
- Use a multimeter to measure the positive and negative poles of the DC cable to ensure correct polarity, with no reverse connection, and that the voltage is within the allowable range.
- When wiring, ensure the battery cables match the "BAT+", "BAT-", and ground terminals on the battery end exactly.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

Overview of Inverter and Battery Power Cable

Inverter+ Lynx Home F series Battery

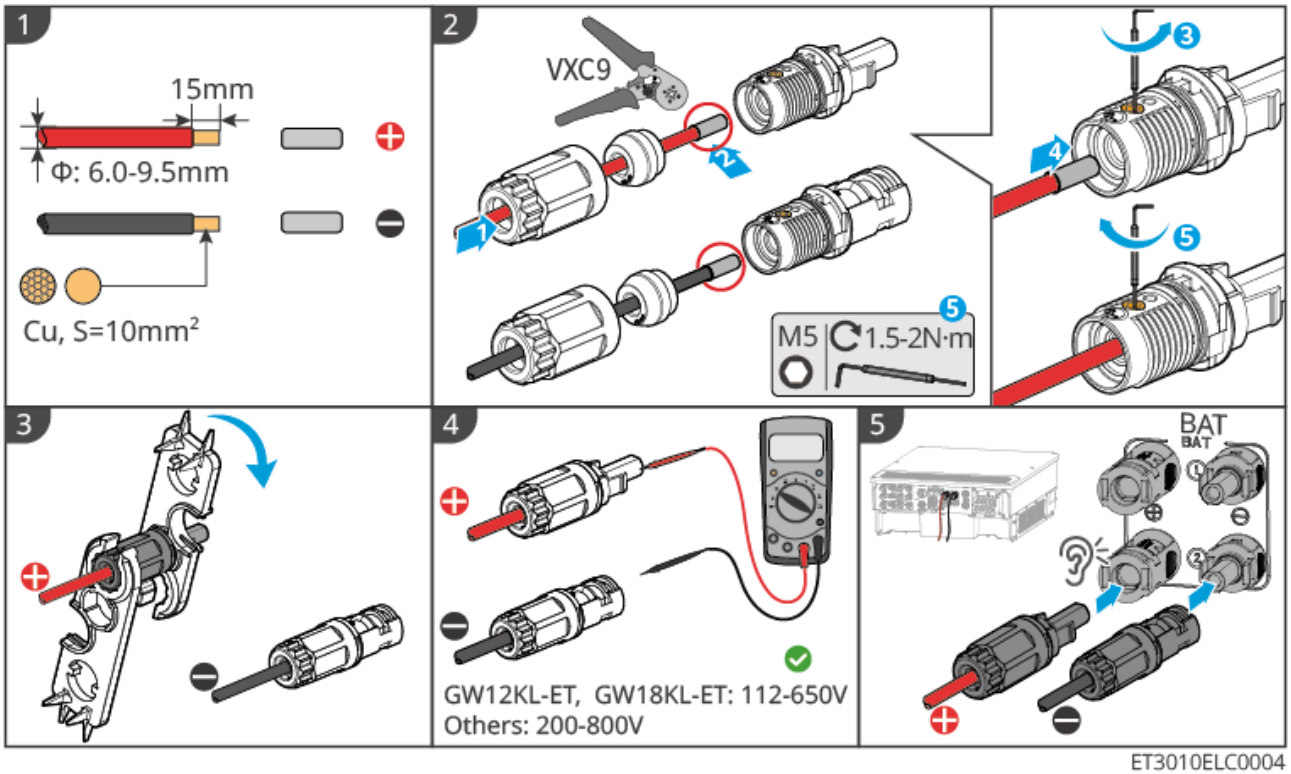


Inverter+ Lynx Home D Battery

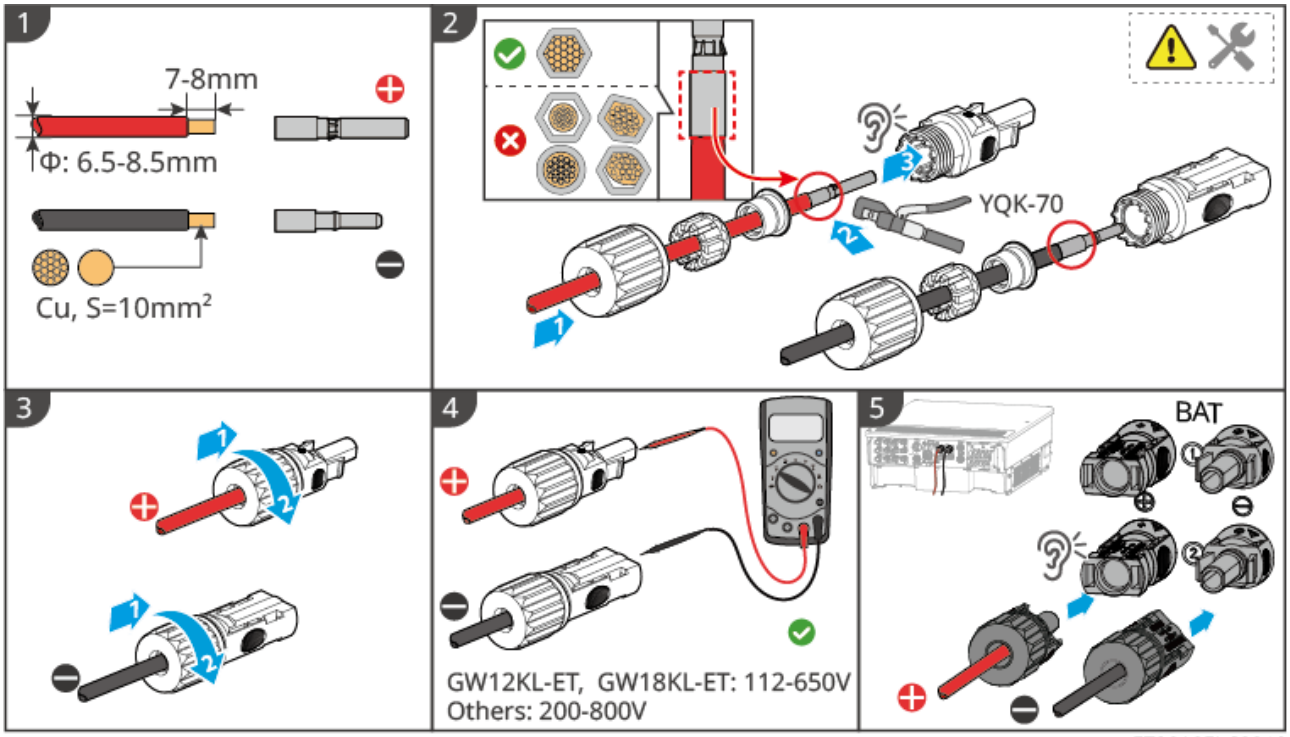


Inverter End Cable Assembly

Type One:

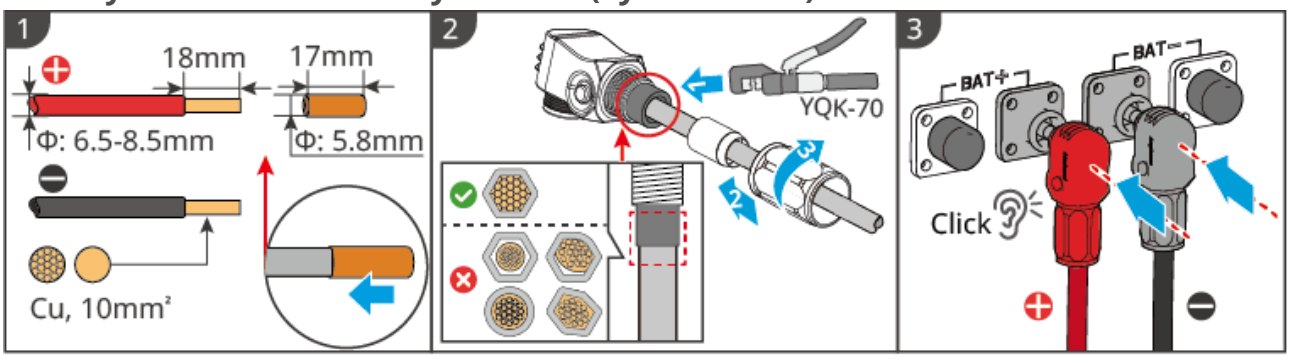


Type Two:



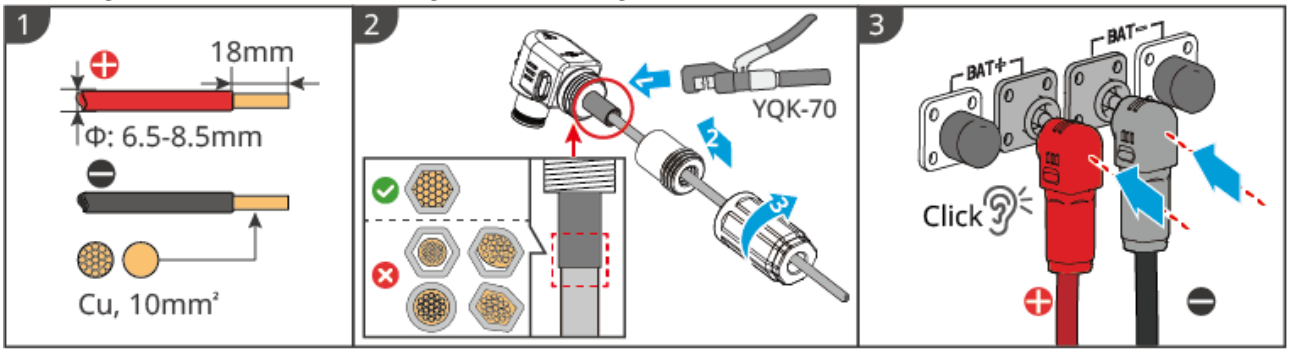
ET3010ELC0019

Battery End Cable Assembly Method (Lynx Home F)



LXF10ELC0006

Battery End Cable Assembly Method (Lynx Home F Plus+)

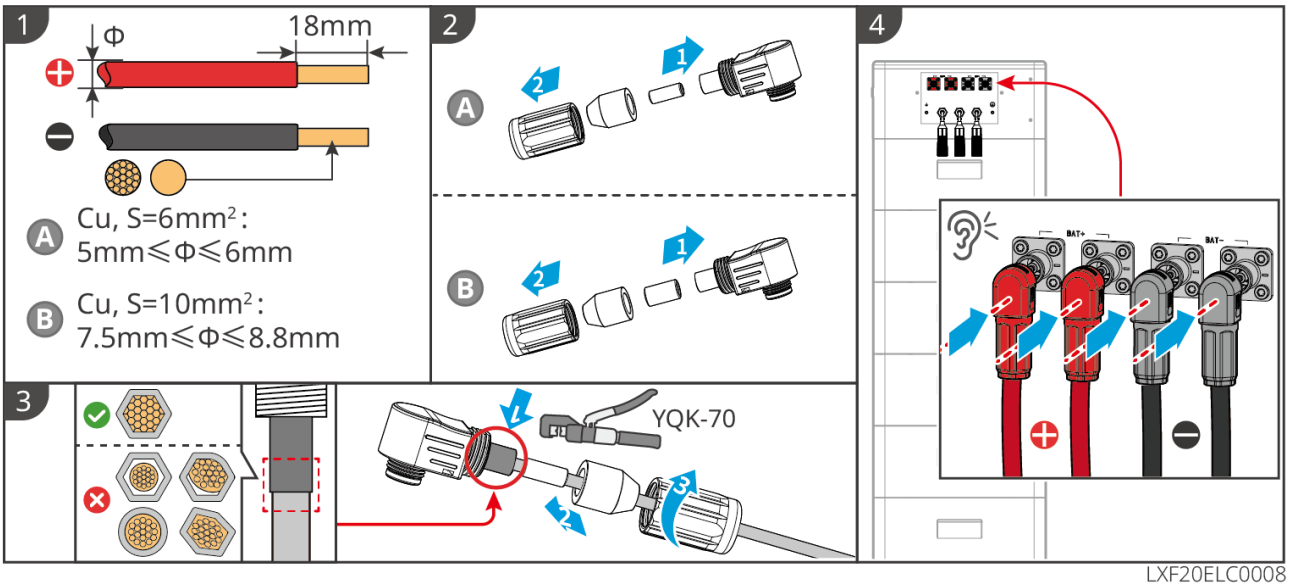


LXF10ELC0007

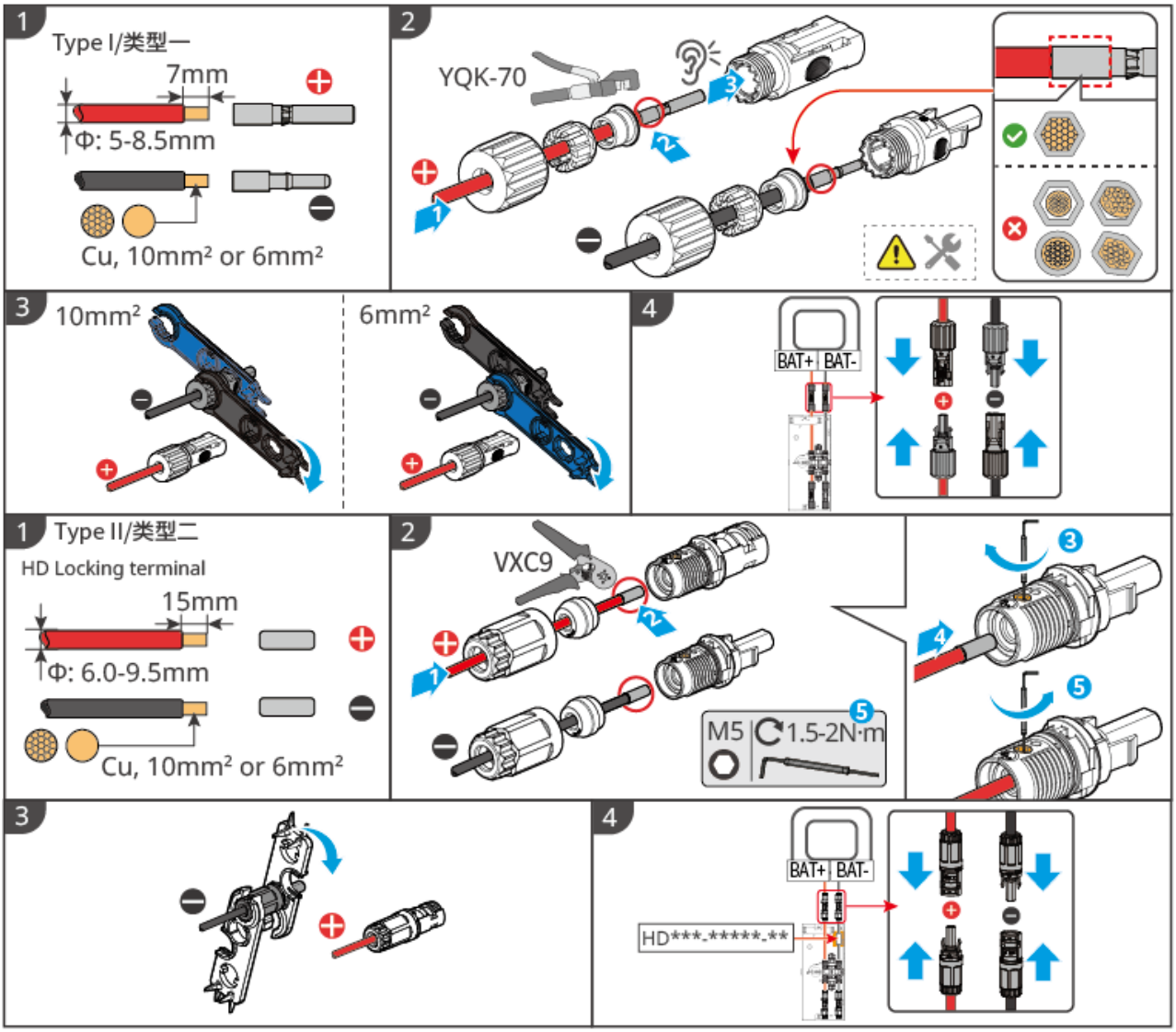
Battery End Cable Assembly Method (Lynx Home F G2)

WARNING

- Please prepare your own DC input cable. Recommended specifications:
  - Type: Outdoor single-core copper wire
  - Conductor cross-sectional area S: 6mm^2 or 10mm^2
- When the conductor cross-sectional area S is 6mm^2, please use the DC connector marked 6mm2 in the packaging bag, and ensure the cable pull-out force after crimping is > 450N. When using DC cables of this specification, only connection to a single battery system is supported. Do not parallel battery clusters, otherwise it may cause equipment damage.
- When using a cable with a cross-sectional area S of 10mm^2, please use the DC connector marked 10mm^2 in the packaging bag, and ensure the cable pull-out force after crimping is > 500N.
- It is recommended to use a YQK-70 type hydraulic crimping tool for crimping the battery DC terminals: when the conductor cross-sectional area is 6mm^2, select the crimping die marked "6"; when the conductor cross-sectional area is 10mm^2, select the crimping die marked "10".
- Please select the tool for crimping the battery DC terminals according to actual needs. The tool shown in the graphic is for illustration only.
- If the DC port does not need to be connected to a cable, do not remove the protective cover of the DC port, otherwise it may affect the equipment's ingress protection rating.



Battery End Cable Assembly Method (Lynx Home D)



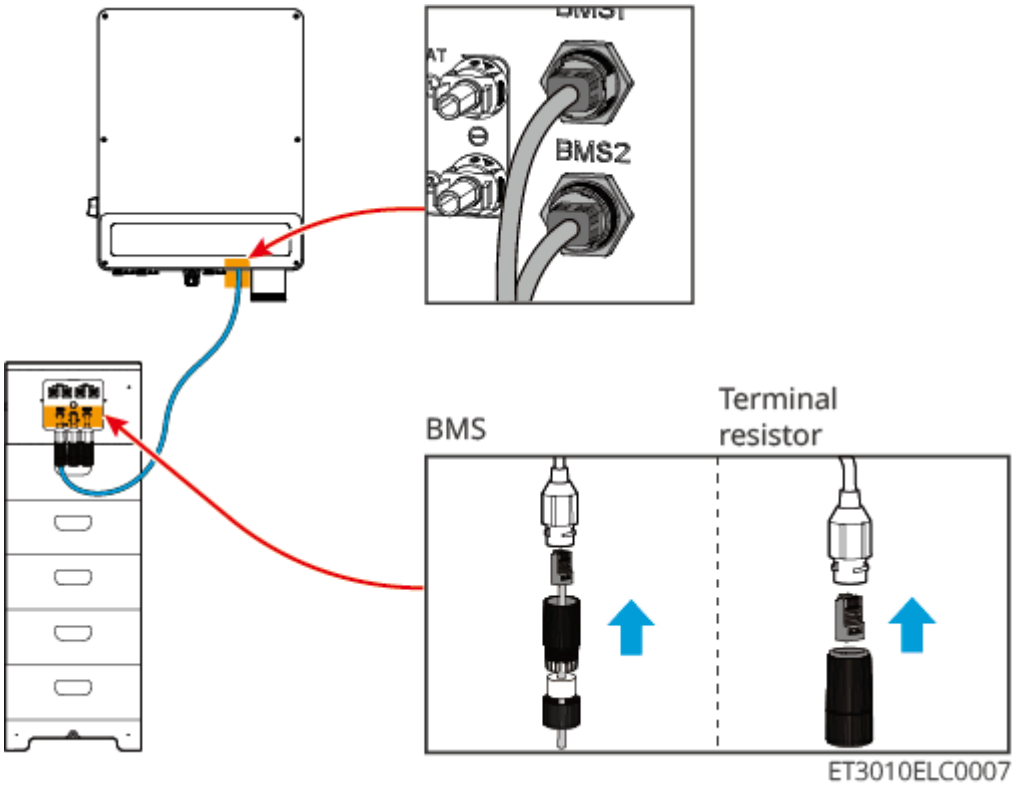
LXD10ELC0003

5.7.2 Connecting the Communication Cable between the Inverter and Battery

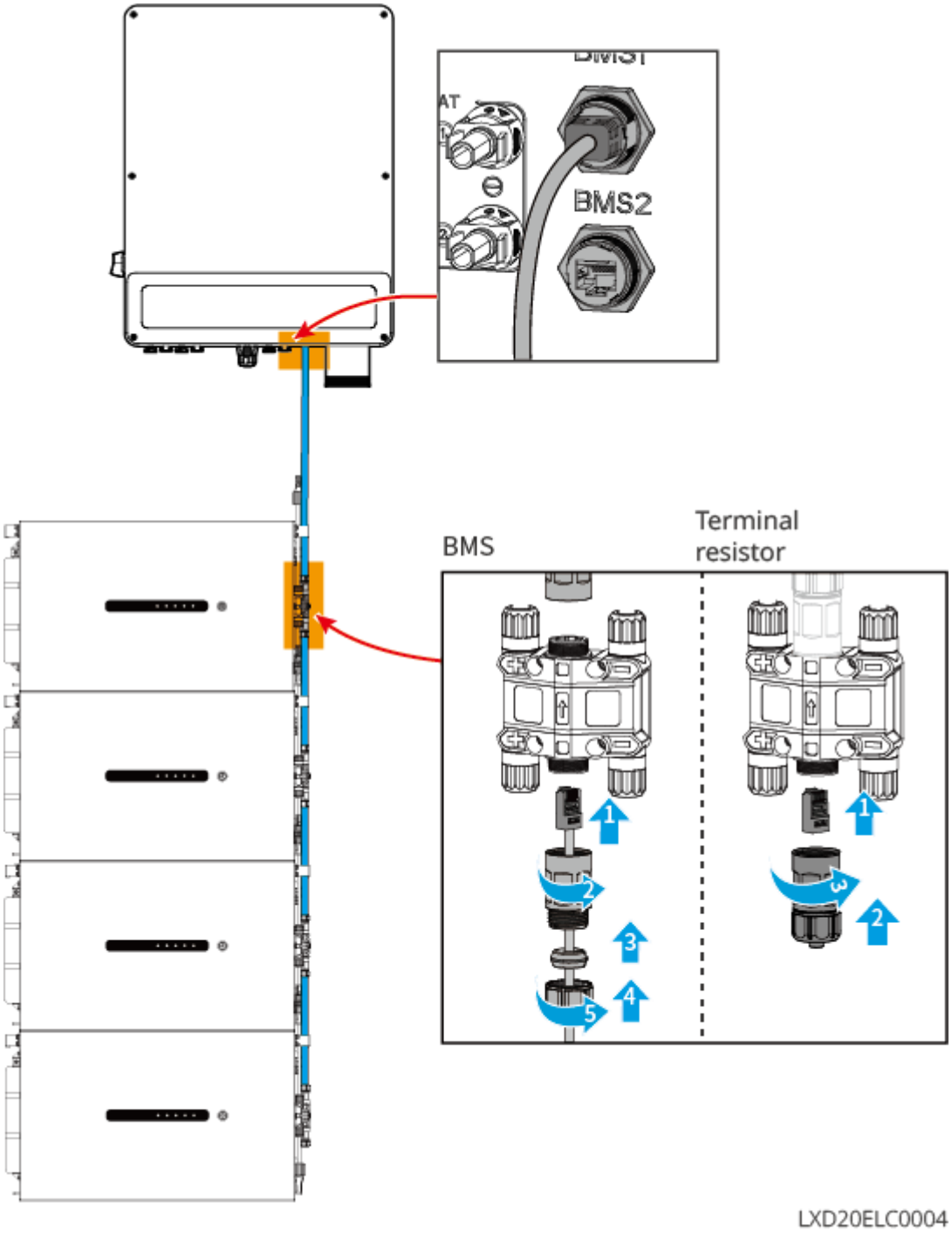
NOTICE

The inverter comes with a BMS battery communication cable in the box. It is recommended to use the BMS battery communication cable provided with the box. If the provided communication cable 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.

Inverter+ Lynx Home F Series Battery



Inverter+ Lynx Home D Battery



5.7.3 Connecting the Lynx Home D Inter-Battery Power Cables

Crimping the power cables

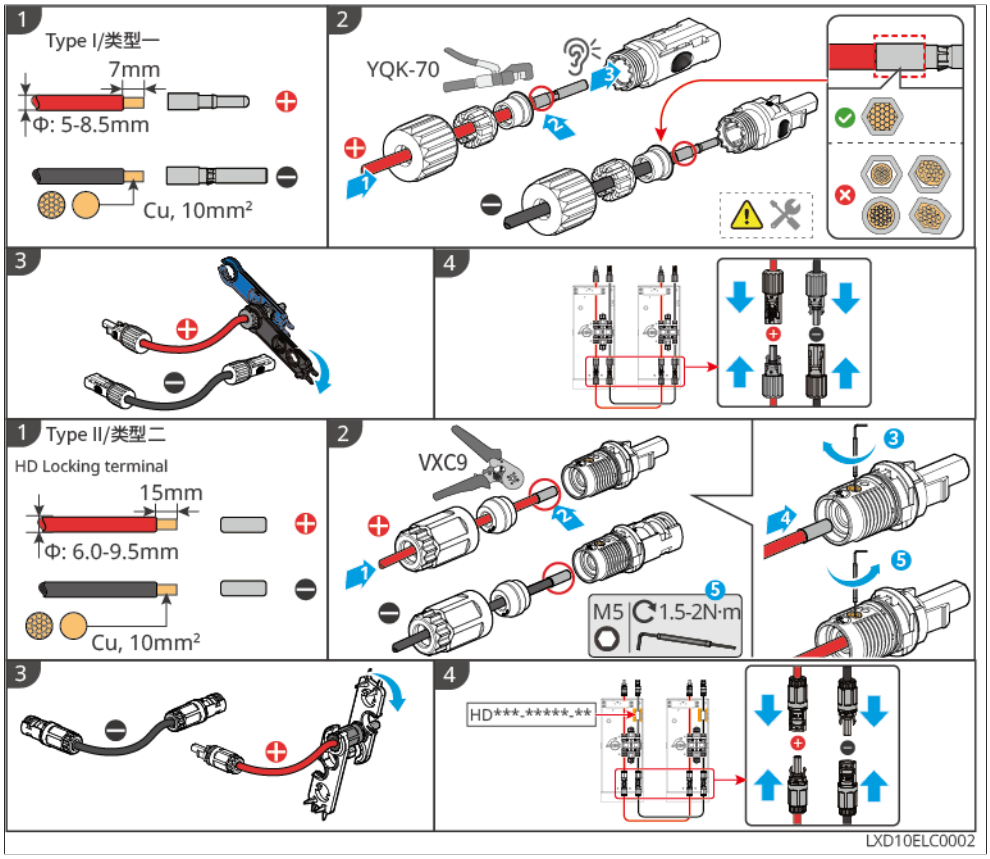


Figure10 Crimping the power cables

Connecting the power cables

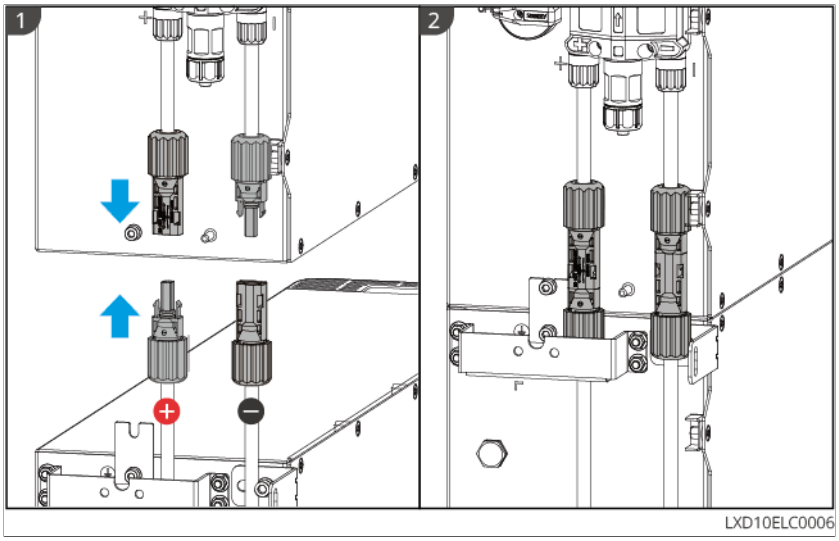


Figure11 Type 1

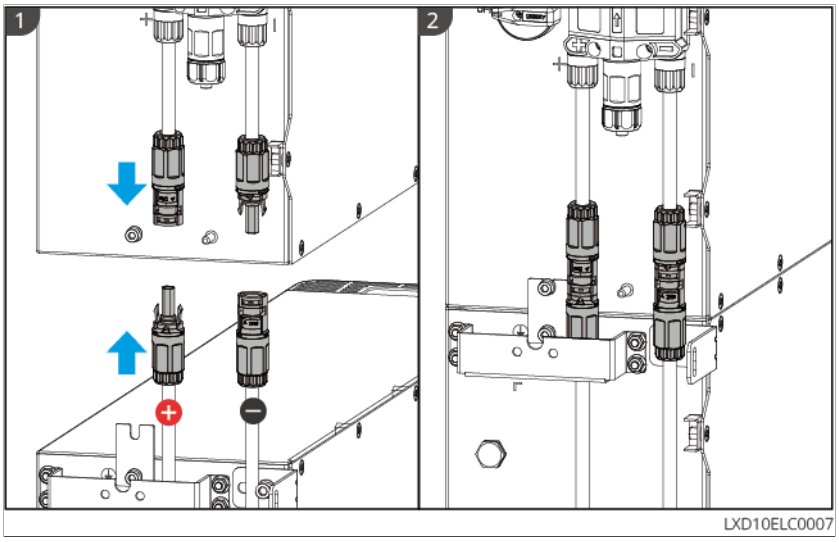


Figure12 Type 2

To remove the power connectors, please use the tool provided in the shipment and refer to the following steps.

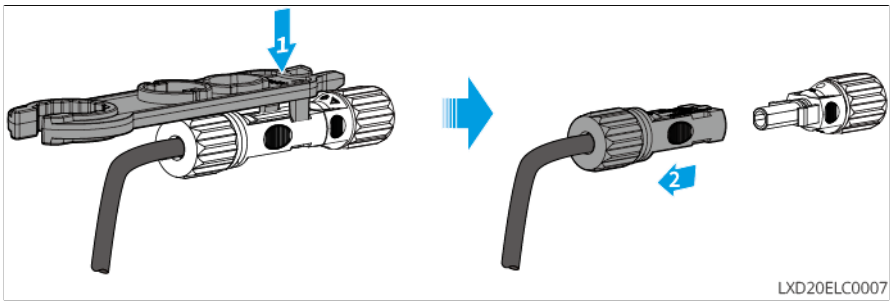


Figure13 Type 1

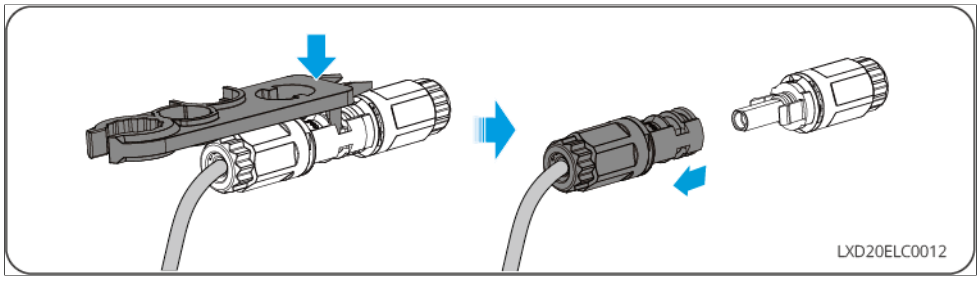


Figure14 Type 2

5.7.4 Connecting Battery Communication Cable and Terminal

Resistor

Please use the battery communication cable and terminal resistor included in the shipment.

WARNING

- Do not omit the installation of the battery system terminal resistor, otherwise it will cause the battery system to malfunction.
- Do not disassemble the waterproof plug during installation.

Lynx Home D Battery

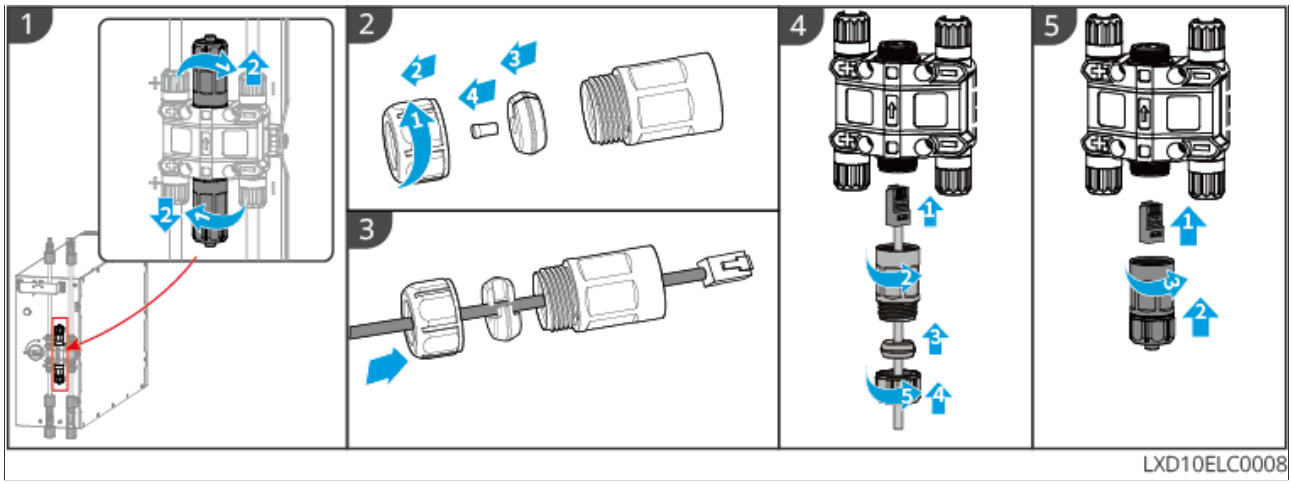


Figure15 Connecting communication cable and terminal resistor

Lynx Home F G2

1. Remove the waterproof component.
2. Pass the communication cable through the waterproof component.
3. Connect the communication cable to the battery, or install the terminal resistor. Tighten the waterproof component.

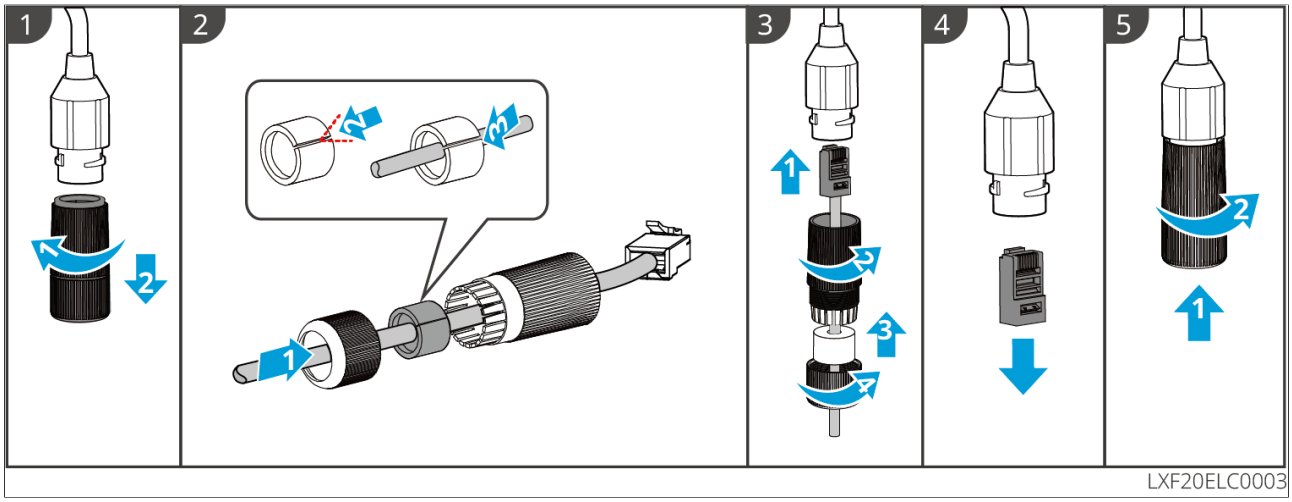


Figure16 Connecting communication cable and terminal resistor

5.7.5 Install Battery Protective Cover

NOTICE
Please remove the release paper from the back of the protective cover before installing it onto the front of the mounting bracket.

Lynx Home DBattery

Step 1: (Optional) Only for base installation scenario, when no wiring is needed at the bottom, please install the base wire hole plug.

Step 2: Install the battery side panel.

Step 3: (Optional) Only for bracket installation scenario, install the bracket panel.

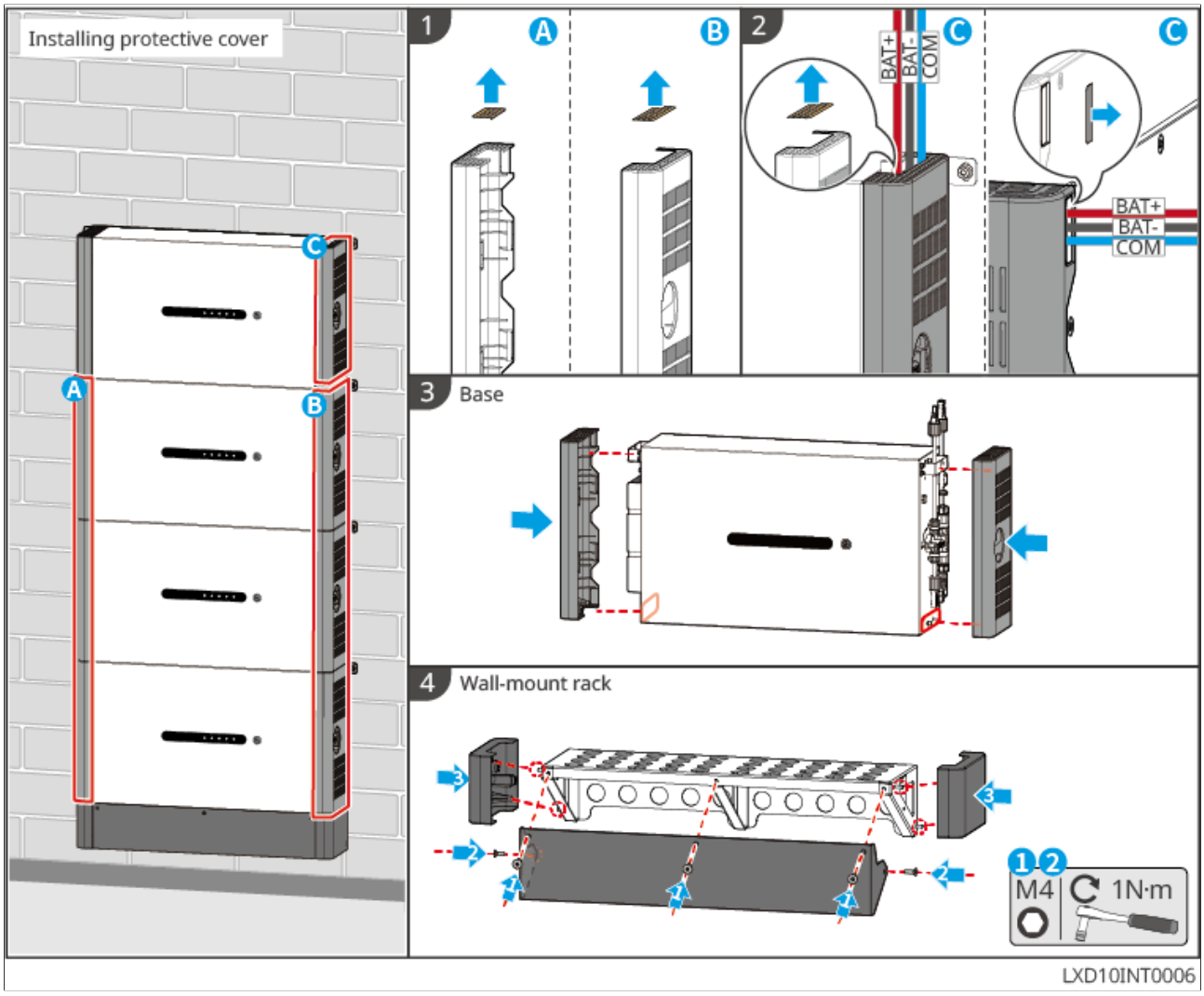


Figure17 Install Battery Protective Cover

Lynx Home F G2Battery

(Optional) This step is only for some batteries with protective cover installation holes or junction boxes. The cover plate can only be installed after wiring is completed.

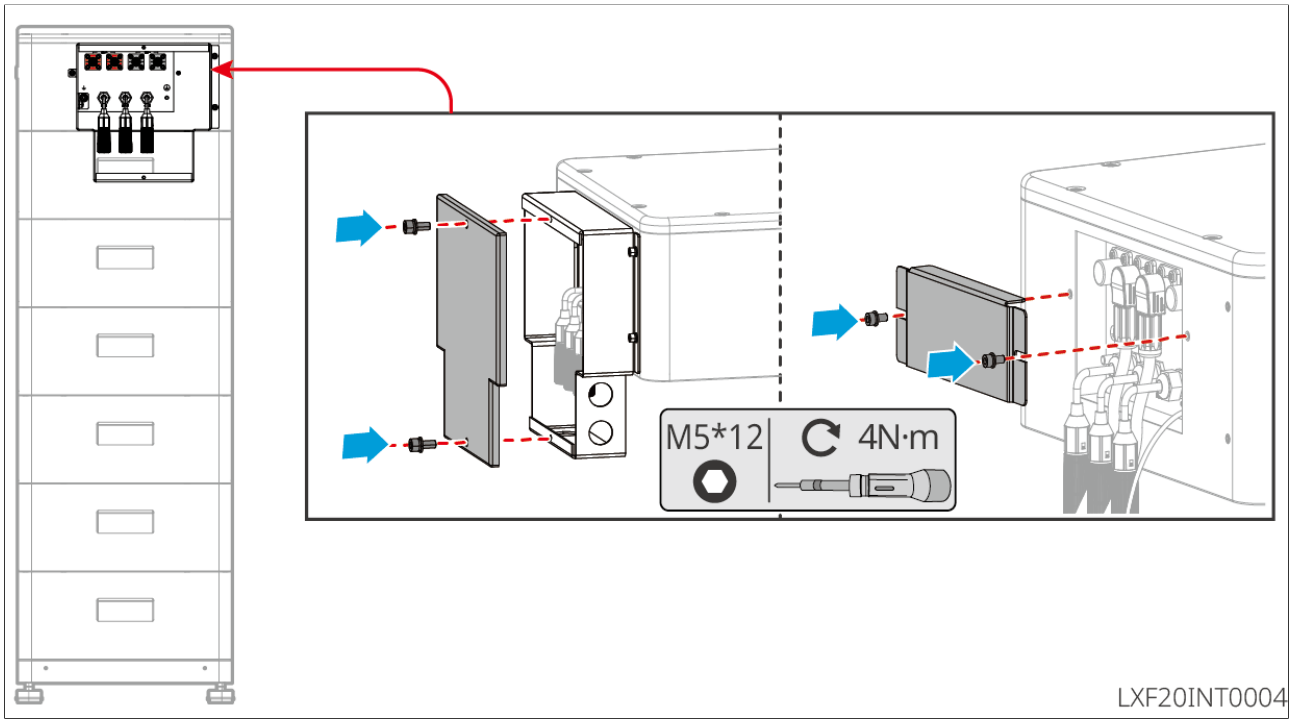


Figure18 Install Cover Plate

5.8 Connecting the Meter Cable

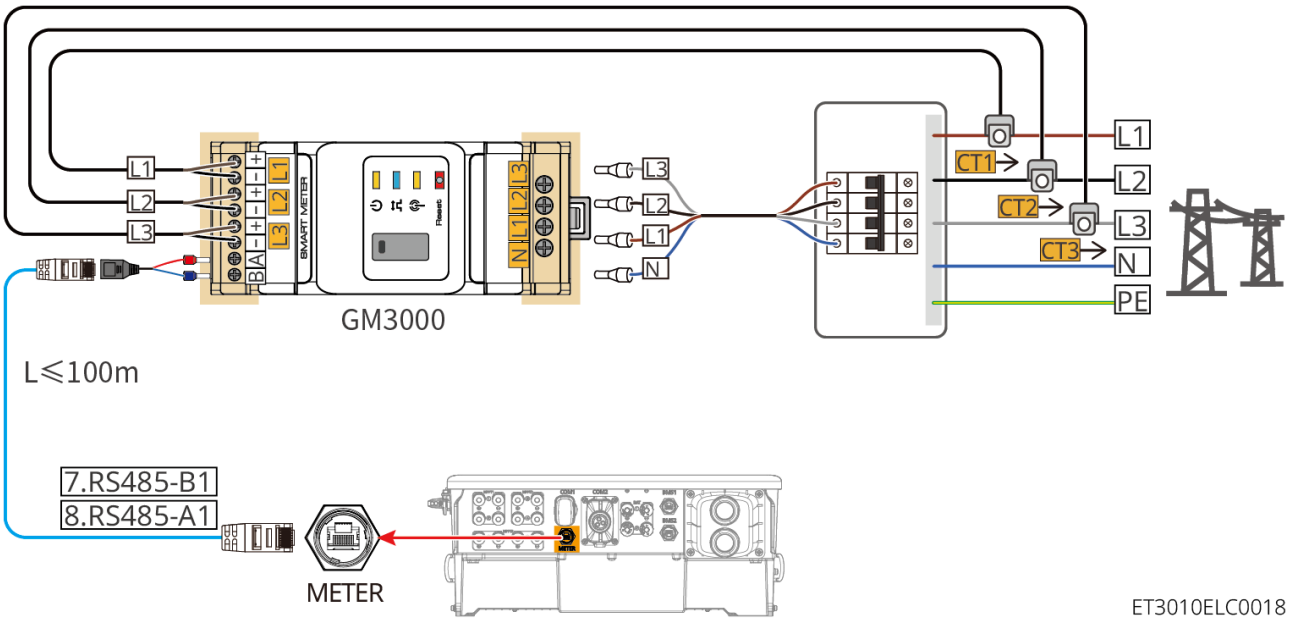
NOTICE

- The meter shipped with the box is for use with only one inverter. Do not connect one meter to multiple inverters. If you need to use multiple inverters, consult the manufacturer to purchase a meter separately.
- Ensure that the CT connection direction and phase sequence are correct; otherwise, it may lead to incorrect monitoring data.
- Ensure that all cable connections are correct, tight, and without looseness. Improper wiring may cause poor contact or damage to the meter.
- In areas with lightning risk, if the meter cable length exceeds 10m and the cables are not wired using grounded metal conduits, it is recommended to install external lightning protection devices.

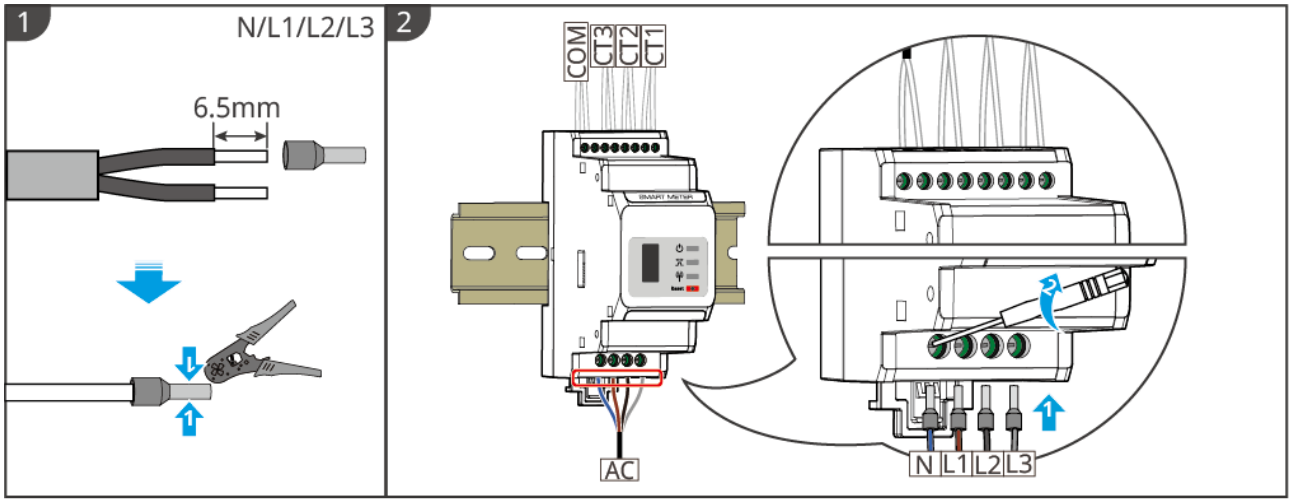
GM3000Meter Wiring

NOTICE

- The outer diameter of the AC power line must be less than the aperture of the CT to ensure the AC power line can pass through the CT.
- To ensure the current detection accuracy of the CT, the recommended length of the CT cable is no more than 30m.
- Do not use network cable as the CT cable, as excessive current may damage the meter.
- The CT provided by equipment manufacturers may vary slightly in size and appearance depending on the model, but the installation and wiring methods are the same.

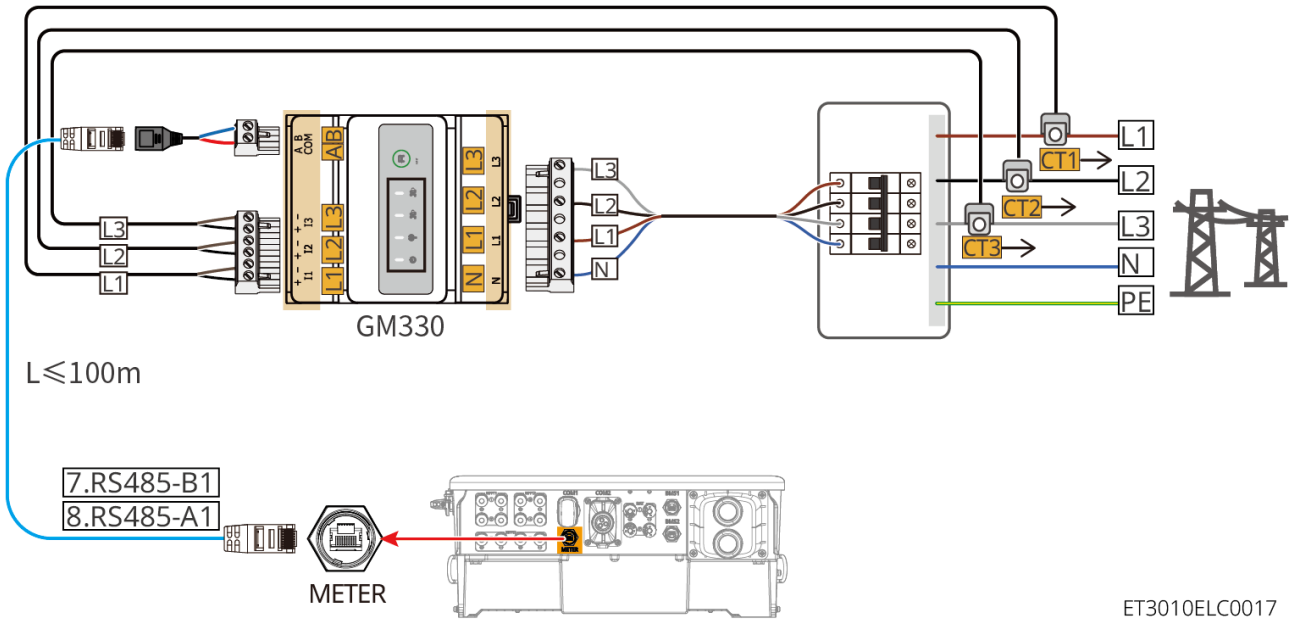


Wiring Steps

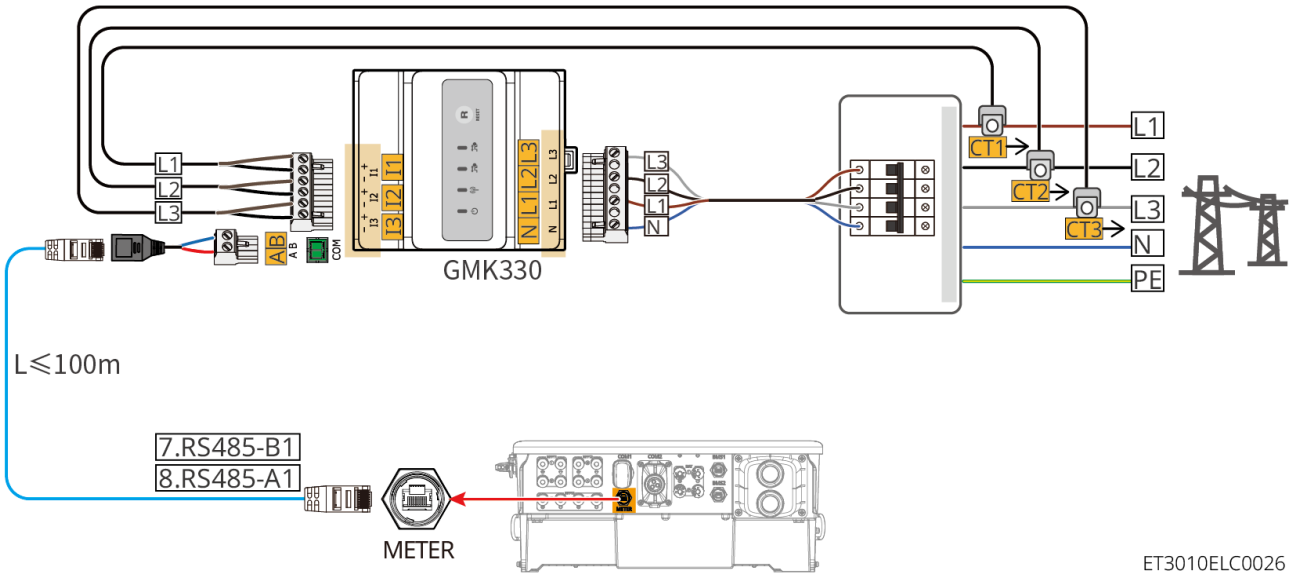


GMK10ELC0003

GM330&GMK330 Meter Wiring

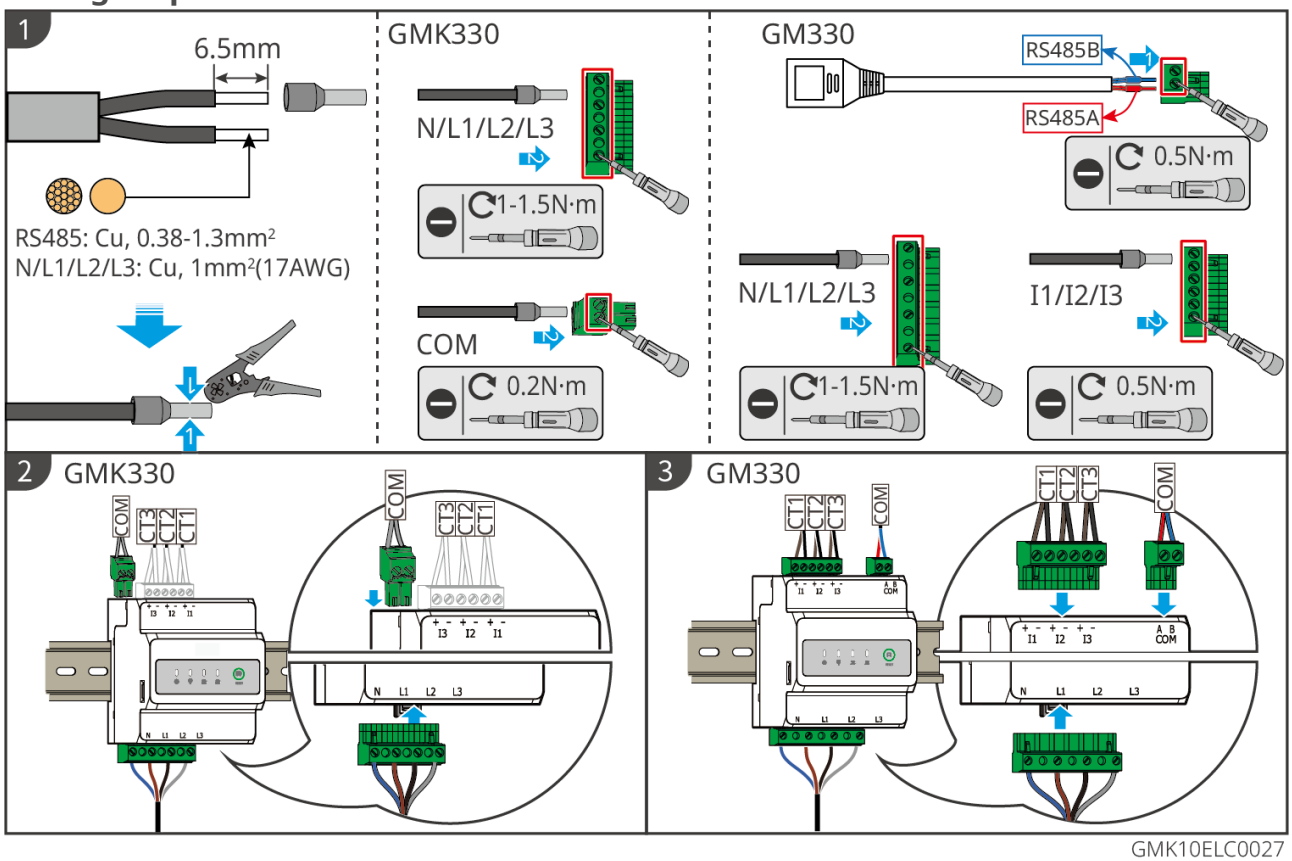


ET3010ELC0017



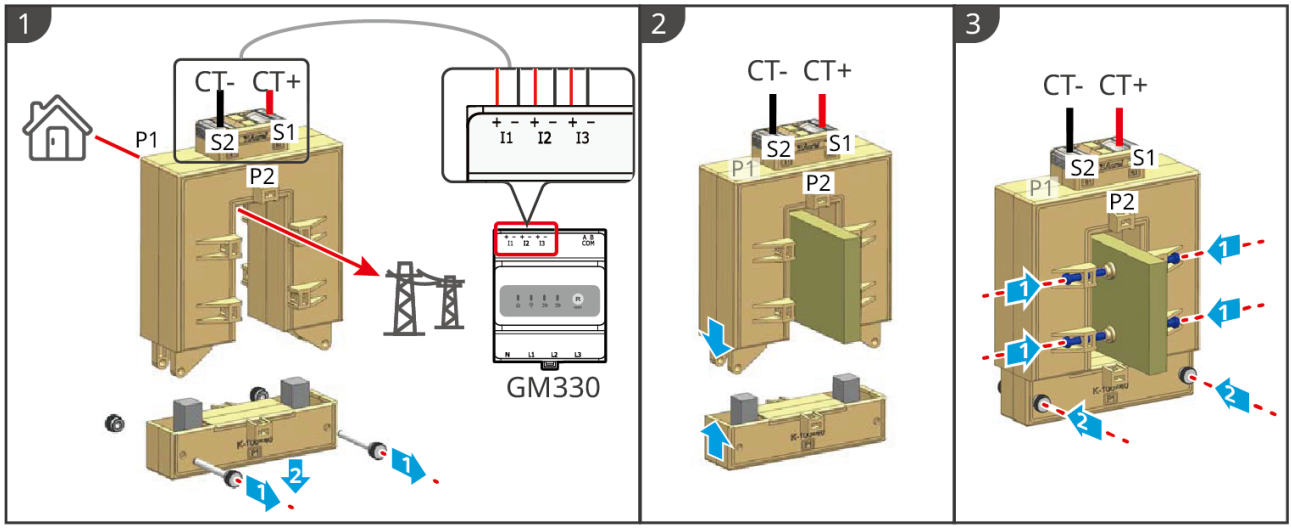
ET3010ELC0026

Wiring Steps



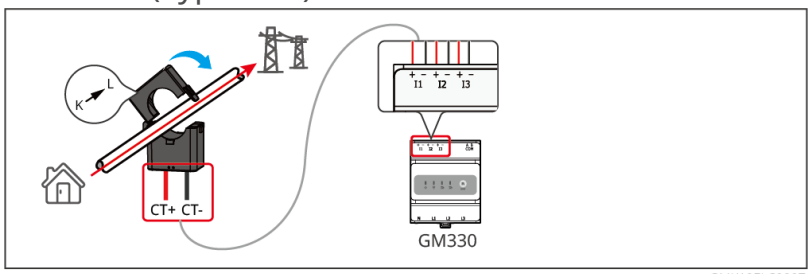
GMK10ELC0027

Install CT (Type One)



GMK10ELC0006

Install CT (Type Two)



GMK10ELC0007

5.9 Connecting the Inverter Communication Cable

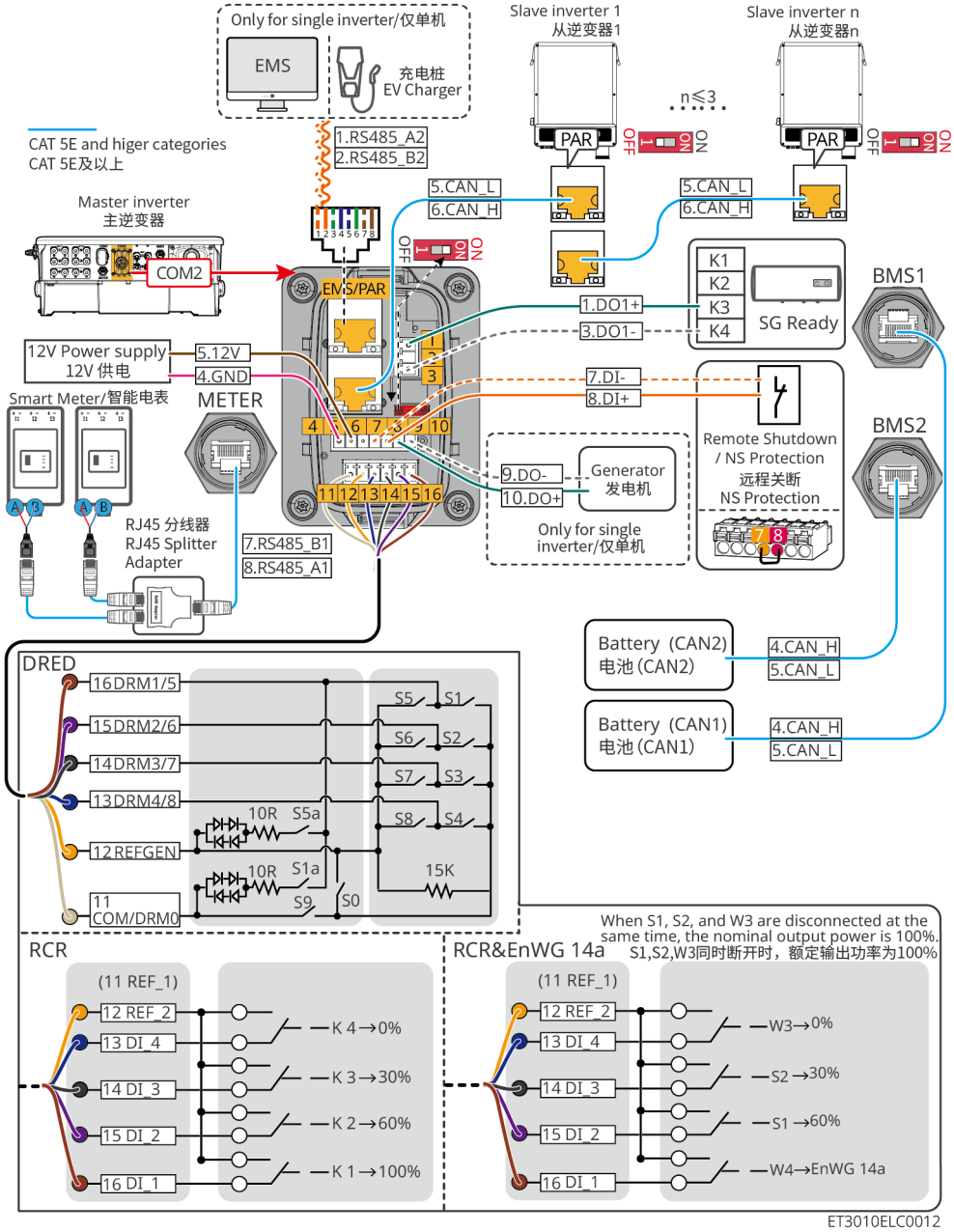
NOTICE

- To ensure the meter and CT can function properly, please ensure the following:
  - Ensure the CT is connected to the corresponding phase line: CT1 to L1, CT2 to L2, CT3 to L3.
  - Connect according to the direction indicated on the CT; otherwise, a CT reverse fault may occur.
  - When replacing or maintaining the CT later, use the "Meter/CT Auxiliary Detection" function in the SolarGo APP to allow the Inverter to readapt to the CT's current sampling direction.
- If you need to use the DRED, RCR, or remote shutdown function, please enable it in the SolarGo APP after wiring is completed.
- Do not enable the function in the SolarGo APP if the Inverter is not connected to a DRED device or remote shutdown device, otherwise the Inverter will not be

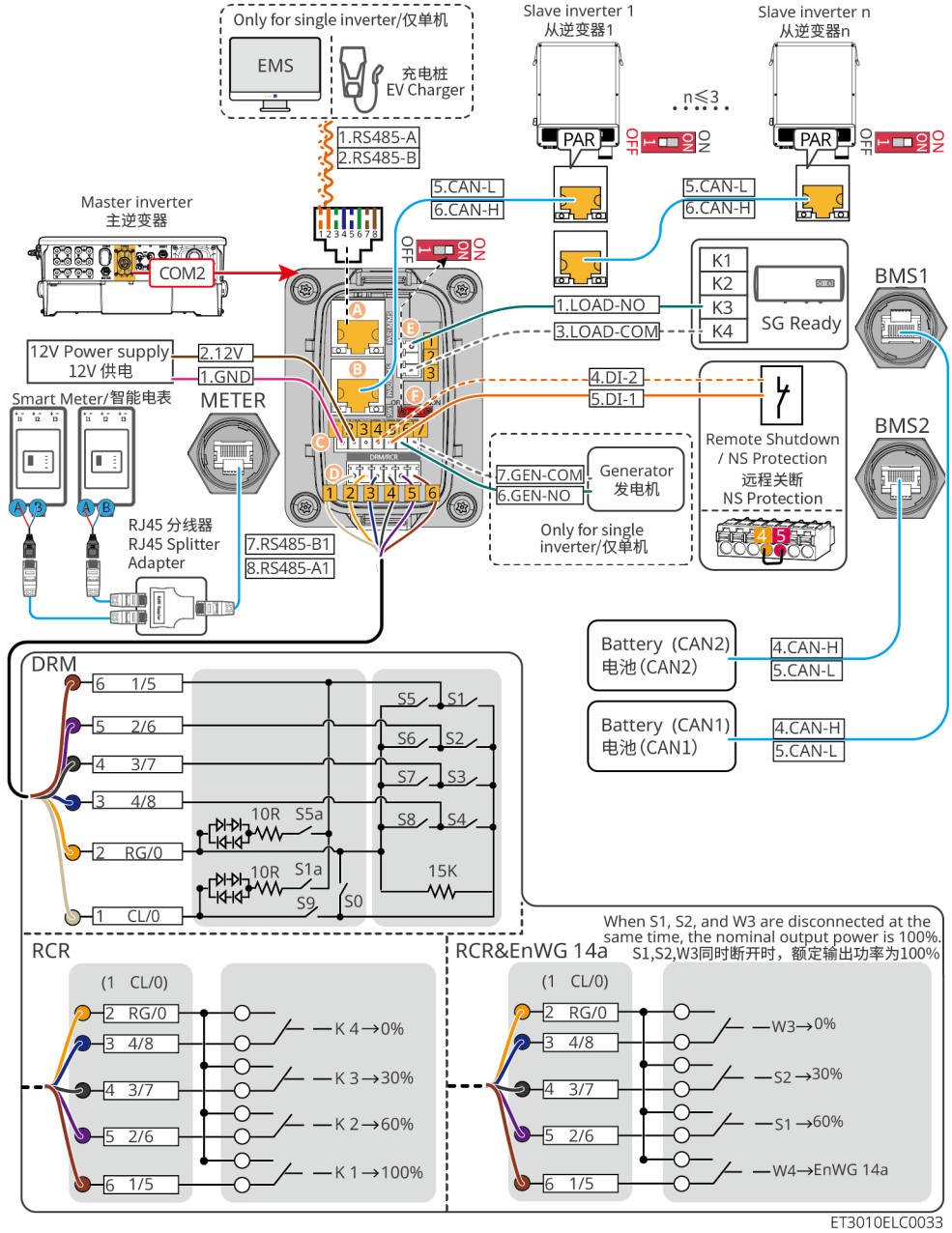
NOTICE

able to connect to the grid.
- In a parallel system, to implement DRED or RCR functions, only connect the DRED/RCR communication lines to the master Inverter.
- Dry contact signal specifications for the Inverter's DO signal communication port: Max ≤ 24Vdc, 1A.
- The Inverter supports connecting via 4G, Bluetooth, WiFi, or LAN to a mobile phone or WEB interface to set device parameters, view device operation information and error messages, and stay informed of system status.
- In a single-unit system, the installation of a WiFi/LAN Kit-20 or 4G Kit-CN-G20 smart communication stick is supported.
- In a parallel system, both the master and slave Inverters need to be installed with a WiFi/LAN Kit-20 smart communication stick for networking.
- When using the 4G Kit-CN-G20:
  - If parallel system networking is required, please contact Growatt to purchase the WiFi/LAN Kit-20.
  - For the China region, it comes standard with a Micro-SIM card from China Mobile. Please ensure the device is installed in an area with operator signal coverage. If local China Mobile signal is not covered, please contact the operator to optimize the signal.
  - Supports connection to third-party monitoring platforms via the MQTT communication protocol.
- The 4G Kit-CN-G20 is an LTE single-antenna device suitable for application scenarios with lower data transmission rate requirements.
- If you need to use dual meters to achieve grid-tied machine generation monitoring and load power consumption monitoring, please use an RJ45 splitter for connection. Prepare the RJ45 splitter yourself or contact Growatt to purchase it.
- To maintain the Inverter's waterproof rating, do not remove the waterproof plugs from unused communication ports on the Inverter.
- The Inverter's communication functions are optional; please select according to the actual usage scenario.

Type 1


Only for single inverter/仅单机
EMS
充电桩
EV Charger
Slave inverter 1
从逆变器1
Slave inverter n
从逆变器n
n≤3
PAR
CAT 5E and higer categories
CAT 5E及以上
1.RS485_A2
2.RS485_B2
5.CAN_L
6.CAN_H
Master inverter
主逆变器
COM2
EMS/PAR
1.DO1+
3.DO1-
K1
K2
K3
K4
SG Ready
BMS1
BMS2
12V Power supply
12V 供电
5.12V
4.GND
Smart Meter/智能电表
METER
7.DI-
8.DI+
Remote Shutdown
/ NS Protection
远程关断
NS Protection
9.DO-
10.DO+
Generator
发电机
Only for single
inverter/仅单机
RJ45 分线器
RJ45 Splitter
Adapter
7.RS485_B1
8.RS485_A1
Battery (CAN2)
电池(CAN2)
4.CAN_H
5.CAN_L
Battery (CAN1)
电池(CAN1)
DRED
16 DRM1/5
15 DRM2/6
14 DRM3/7
13 DRM4/8
12 REFGEN
11 COM/DRM0
10R
S5a
S1a
S9
S0
15K
When S1, S2, and W3 are disconnected at the same time, the nominal output power is 100%.
S1,S2,W3同时断开时，额定输出功率为100%
RCR
RCR&EnWG 14a
(11 REF_1)
12 REF_2
13 DI_4
14 DI_3
15 DI_2
16 DI_1
K 4→0%
K 3→30%
K 2→60%
K 1→100%
W3→0%
S2→30%
S1→60%
W4→EnWG 14a
ET3010ELC0012

Type 2



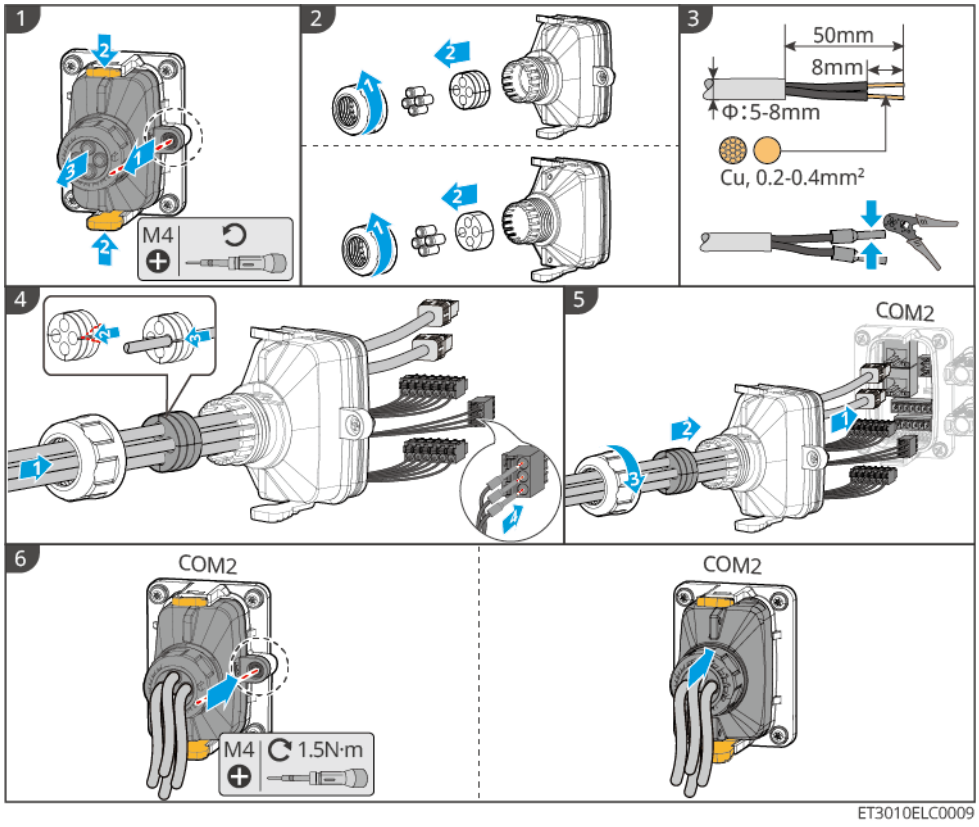
ET3010ELC0033

Silkscreen	Function	Description
DO / LOAD	load control（SG Ready）	• Supports connection to dry contact signals to implement functions such as load control. The DO contact rating is 24V DC@1A, with NO/COM normally open contacts. • Supports SG Ready heat pump connection, controlling the heat pump via dry contact signals. • Supported operating modes: ◦ Operating mode 2 (Signal: 0:0): Energy-saving Mode. In this mode, the heat pump operates in energy-saving mode. ◦ Operating mode 3 (Signal: 0:1): Boost Recommendation. In this mode, while maintaining current operation, the heat pump increases hot water reserve to store heat.
GND 12V RSD	12V Power Supply	The inverter provides a 12V power supply port, supporting a maximum of 5W device connection. This port has short-circuit Protection.
DI	Remote Shutdown/NS Protection	Provides a signal control port for Remote Shutdown of the device or to implement NS Protection Function. Remote Shutdown function: • Can control the device to stop working in case of an unexpected event. • The Remote Shutdown device must be a normally closed type switch. • When the inverter uses the RCR or DRED function, ensure the Remote Shutdown device is connected, or the Remote Shutdown port is shorted.

Silkscreen	Function	Description
DO2 / GEN	Generator Start/Stop Control Port	• Only supports connection to generator control signals in single inverter scenarios. • The generator control mode is disabled by default, with the dry contact signal open; after enabling the control mode, the dry contact signal becomes shorted.
DRM&RCR /	RCR, DRED, or EnWG 14a Function Connection Port	• RCR (Ripple Control Receiver): Provides an RCR signal control port to meet grid dispatch requirements in regions like Germany. • DRED (Demand Response Enabling Device): Provides a DRED signal control port to meet DERD certification requirements in regions like Australia. • EnWG (Energy Industry Act) 14a: All controllable loads must accept emergency dimming from the grid. Grid operators can temporarily reduce the maximum grid import power of controllable loads to 4.2kW.
EMS/PAR/PAR-1/PAR1&EMS	• EMS Communication or EV Charger Communication Port • Parallel Communication Port	• CAN and BUS port: Parallel communication port. CAN communication is used to connect to other inverters in a parallel system network; the BUS is used to control the on-grid/off-grid status of each inverter in the parallel system. • RS485 port: Used to connect to third-party EMS devices and EV chargers. Connecting to third-party EMS devices and EV chargers is not supported in parallel system scenarios.

Silkscreen	Function	Description
EMS/PAR / PAR1&EMS / PAR2&EMS	Parallel Communication Port	• CAN and BUS port: Parallel communication port. CAN communication is used to connect to other inverters in a parallel system network; the BUS is used to control the on-grid/off-grid status of each inverter in the parallel system.
S1	Parallel DIP Switch	Inverter parallel connection DIP switch. By default, it is set to the ON position from the factory. In multi-unit parallel scenarios, the parallel DIP switches of the first and last inverters need to be set to the ON position, while other inverters are set to the 1 position.
METER	Smart Meter Connection Port	Connects to a smart meter to implement functions such as output power control and load monitoring.
BMS1 / BMS2	Battery Communication Connection Port	Connects to batteries using CAN communication. GW12KL-ET, GW15K-ET, GW20K-ET: 1 GW18KL-ET, GW25K-ET, GW29.9K-ET, GW30K-ET: 2

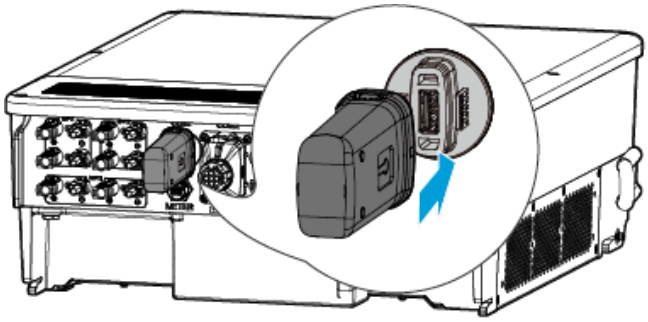
Method for Connecting the Communication Cable



5.10 Connecting the Smart Communication Stick

NOTICE

- The inverter supports connecting to a mobile phone or WEB interface via Bluetooth, 4G, WiFi, LAN smart dongle to set device-related parameters, view device operation information and error messages, and keep track of the system status in a timely manner.
- When the system contains multiple inverters for networking in parallel, the master inverter needs to be equipped with an Ezlink3000 smart dongle for networking.
- For an energy storage system with a single inverter, a WiFi-Kit, WiFi/LAN Kit-20, or 4G smart dongle can be used.
- When using the WiFi communication method to connect the inverter to a router, a WiFi-Kit, WiFi/LAN Kit-20, or Ezlink3000 smart dongle can be installed.
- When using the LAN communication method to connect the inverter to a router, a WiFi/LAN Kit-20 or Ezlink3000 smart dongle can be installed.
- When using the 4G communication method to upload energy storage system operation information to the monitoring platform, an LS4G Kit-CN, 4G Kit-CN, 4G Kit-CN-G20, or 4G Kit-CN-G21 smart dongle can be installed. When using LS4G Kit-CN or 4G Kit-CN, the smart dongle shipped with the inverter must be used to configure the parameters of the energy storage system. After configuration is complete, replace it with LS4G Kit-CN or 4G Kit-CN for data transmission. When using 4G Kit-CN-G20 or 4G Kit-CN-G21, please use the Bluetooth signal emitted by the module for local device configuration.
- The 4G module is an LTE single-antenna device, suitable for application scenarios with lower requirements for data transmission rates.
- The built-in SIM card in the 4G module is a China Mobile communication card. Please confirm whether the device is installed in an area with China Mobile 4G signal coverage.
- After installing the 4G Kit-CN-G20 or 4G Kit-CN-G21 smart dongle, please contact the after-sales service center to bind the inverter with the smart dongle. After binding, if you need to install the smart dongle on another inverter, please contact the after-sales service center to unbind it first.
- To ensure 4G signal communication quality, do not install the device indoors or in areas with metal interference signals.



ET3010ELC0034

6 System Commissioning

6.1 Check Before Power ON

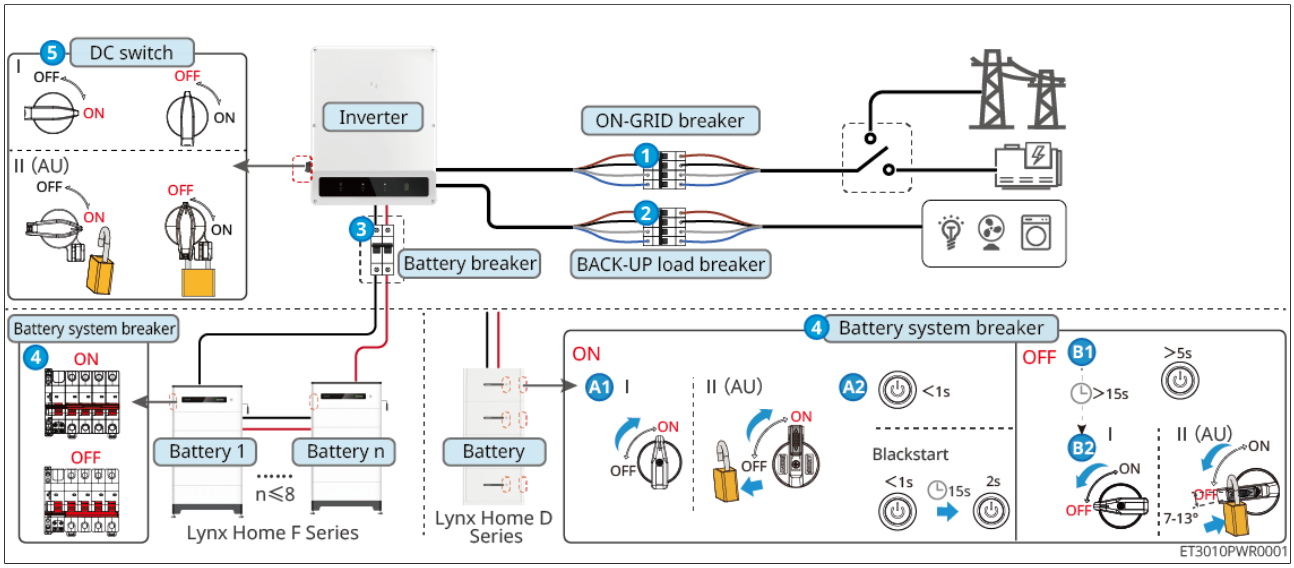
No.	Inspection Item
1	The equipment is securely installed, positioned for easy operation and maintenance, with adequate space for ventilation and heat dissipation, and the installation environment is clean and tidy.
2	The PE cable, DC cable, AC cable, Communication cable, and terminal resistor are connected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

6.2 Power ON

⚠WARNING

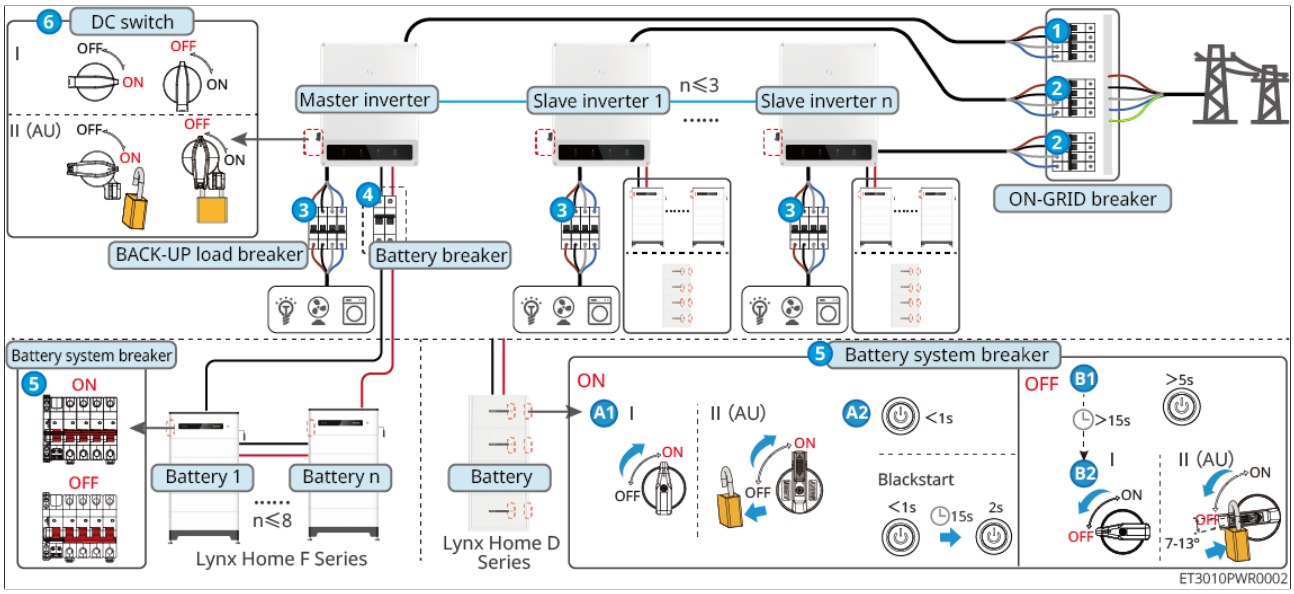
- Battery Black Start Function: When the PV system has no power generation and the grid is abnormal, if the inverter cannot operate normally, the battery black start function can be used to force the battery to discharge and start the inverter. The inverter can then enter off-grid mode, with the battery supplying power to the loads.
- After the battery system is started, please ensure that communication between the inverter and the battery system is normal within 15 minutes. If normal communication cannot be established, the battery system switch will automatically disconnect, powering down the battery system.

Single Unit Scenario



1. Close the inverter ON-GRID circuit breaker.
2. Close the BACK-UP circuit breaker.
3. (Select according to local regulations) Close the switch between the inverter and the battery.
4. Start the battery system.
   - Lynx Home F Series: Close the battery system switch.
   - Lynx Home D: Turn the battery power switch to the ON position and briefly press the battery multifunction button. All batteries need to be powered ON separately.
5. Close the DC switch of the inverter.

parallel system

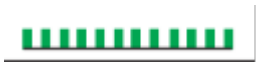


1. Close the main inverter ON-GRID circuit breaker.
2. Close the slave inverter ON-GRID circuit breaker.
3. Close the BACK-UP circuit breaker.
4. (Select according to local regulations) Close the switch between the inverter and the battery.
5. Start the battery system.
   - Lynx Home F Series: Close the battery system switch. For a parallel cluster system, close the battery system switches in sequence.
   - Lynx Home D: Turn the battery power switch to the ON position and briefly press the battery multifunction button. All batteries need to be powered ON separately.
6. Close the DC switch of the inverter.

6.3 Indicators

6.3.1 Inverter Indicators

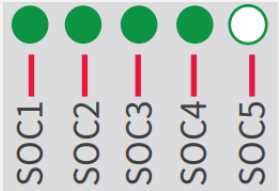
indicator	Status	Description
		The inverter is powered on and in standby mode
		The inverter is starting up and in self-test mode

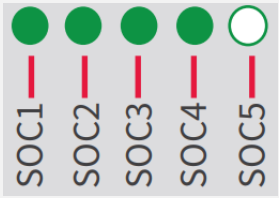
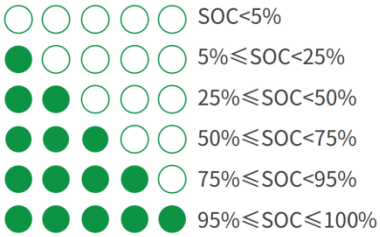
indicator	Status	Description
		The inverter is operating normally in grid-tied or off-grid mode
		BACK-UP output overload
		System fault
		The inverter is powered off
		Grid abnormal, inverter BACK-UP port power supply normal
		Grid normal, inverter BACK-UP port power supply normal
		BACK-UP port has no power supply
		Inverter monitoring module resetting
		Inverter and communication terminal not connected
		Communication failure between communication terminal and cloud server
		Inverter monitoring normal
		Inverter monitoring module not started

6.3.2 Battery Indicators

6.3.2.2 Lynx Home D

Normal Status

SOC indicator 	Button indicator 	Battery System Status
	Green blinking	Battery system is in standby

SOC indicator 	Button indicator 	Battery System Status
SOC indicator shows the battery system's charge level 	Green steady	Battery system is charging Note: Charging stops when the battery SOC reaches the charge cut-off SOC.
Highest SOC indicator blinks at 1 time/s • When 5%≤SOC<25%, SOC1 blinks • When 25%≤SOC<50%, SOC2 blinks • When 50%≤SOC<75%, SOC3 blinks • When 75%≤SOC<95%, SOC4 blinks • When 95%≤SOC≤100%, SOC5 blinks	Green steady	Battery system is discharging Note: The battery will stop discharging when there is no need to supply power to the load in the system or when the battery SOC is below the set depth of discharge.

Abnormal Status

Button Indicator Light 	Battery System Status	Description
Red Blinking	Battery system alarm occurs	After a battery system alarm occurs, the battery system will perform a self-check. Wait for the self-check to complete, and the battery system will enter normal operation status or fault status. You can view the alarm information via the SolarGo APP.
Red Steady On	Battery system fault occurs	You can determine the type of fault that occurred by combining it with the display pattern of the SOC indicator light, or view the fault information via the SolarGo APP, and handle it according to the methods recommended in the fault handling section.

6.3.3 Smart Meter Indicator

GM330&GMK330

Type	Status	Description
Power Light 	Steady on	The meter is powered on, with no RS485 communication
	Flashing	The meter is powered on, RS485 communication is normal
	Off	The meter is powered off
Communication Light 	Off	Reserved
	Flashing	Press and hold the Reset button for ≥5s, the Power Light and Buy/Sell Light flash: Meter reset
Buy/Sell Light 	Steady on	buy power from the grid
	Flashing	sell power to the grid
	Off	Neither buying nor selling power
	Reserved	

GM3000

Type	Status	Description
Power Light 	Steady On	The meter is powered on.
	Off	The meter is powered off.
Buy/Sell Electricity Light 	Steady On	buy power from the grid
	Flashing	Selling power to the grid
Communication Light 	Flashing	Communication is normal.
	Flashing 5 times consecutively	• Press the Reset button for <3s: Meter reset. • Press the Reset button for 5s: Meter parameters restored to factory settings. • Press the Reset button for >10s: Meter parameters restored to factory settings, and energy data cleared.
	Off	No communication from the meter.

6.3.4 Smart Dongle Indicator

- **Wi-Fi Kit**

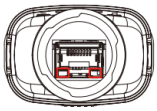
Indicator	Color	Status	Description
Power light 	Green	On	Wi-Fi Kit is powered on.
		Off	Wi-Fi Kit is not powered on or is restarting.
Communication light 	Blue	On	WiFi AP hotspot is connected.
		Off	• Wi-Fi Kit communication is abnormal. • Wi-Fi Kit is restarting.

- **WiFi/LAN Kit-20**

NOTICE
• After double-clicking the Reload button to enable Bluetooth, the communication indicator will switch to a single-flash state. Please connect to the SolarGo APP within 5 minutes, otherwise Bluetooth will automatically turn off. • The single-flash state of the communication indicator only occurs after enabling Bluetooth by double-clicking the Reload button.

Indicator	Status	Description
Power Light		Steady on: The Smart Communication Stick is powered on.
		Off: The Smart Communication Stick is not powered on.
Communication Light		Steady on: Communication is normal in WiFi mode or LAN mode.
		Single blink: The Smart Communication Stick's Bluetooth signal is on, waiting to connect to the SolarGo app.
		Double blink: The Smart Communication Stick failed to connect to the router.
		Four blinks: The Smart Communication Stick communicates normally with the router but failed to connect to the server.
		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
	Green	Solid	The 100Mbps wired network connection is normal.

Indicator	Color	Status	Description
LAN Port Communication Indicator 		Off	• The network cable is not connected. • The 100Mbps wired network connection is abnormal. • The 10Mbps wired network connection is normal.
	Yellow	Solid	The 10/100Mbps wired network connection is normal, with no communication data being transmitted or received.
		Flashing	Communication data is being transmitted or received.
		Off	The network cable is not connected.

Button	Description
Reload	Hold for 0.5~3 seconds to reset the Smart Communication Stick.
	Hold for 6~20 seconds to restore the Smart Communication Stick to factory settings.
	Double-click quickly to enable Bluetooth signal (only maintained for 5 minutes).

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

Indicator	Status	Description
		Steady on: The Smart Communication Stick is powered on.
		Off: The Smart Communication Stick is not powered on.
		Steady on: The Smart Communication Stick is connected to the server, communication is normal.
		Double flash: The Smart Communication Stick is not connected to the communication base station.
		Quadruple flash: The Smart Communication Stick is connected to the communication base station, but not connected to the server.

Indicator	Status	Description
		Sextuple flash: The communication between the Smart Communication Stick and the inverter is disconnected.
		Off: The Smart Communication Stick is undergoing a software reset or is not powered on.

Button	Description
RELOAD	Hold for 0.5~3 seconds, the Smart Communication Bar will restart.
	Hold for 6~20 seconds, the Smart Communication Bar will restore factory settings.

- **LS4G Kit-CN, 4G Kit-CN**

Indicator	Color	Status	Description
Power Light 	Green	On	Module is secured and powered on
		Off	Module is not secured or not powered on
Communication Light 	Blue	slow blinking (on for 0.2s, off for 1.8s)	• Inverter communication light blinks 2 times: Dialing, searching for network • Inverter communication light blinks 4 times: Failed to connect to cloud due to no data flow
		slow blinking (on for 1.8s, off for 0.2s)	• Inverter communication light blinks 2 times: Dialing successful • Inverter communication light steady on: Cloud connection successful • Inverter communication light blinks 4 times: Failed to connect to cloud due to no data flow
		fast blinking (on for 0.125s, off for 0.125s)	Inverter communicating with cloud via module

		0.2s on, 8s off	No SIM card installed or poor SIM card contact

- **Ezlink3000**

Indicator/Silkscreen	Color	Status	Description
Power Light 	Blue		Flashing: The communication stick is operating normally.
			Off: The communication stick is powered off.
Communication Light 	Green		Steady on: The communication stick is connected to the server.
			Double flash: The communication stick is not connected to the router.
			Quadruple flash: The communication stick is connected to the router, but not connected to the server.
RELOAD	-	-	Press and hold for 1-3 seconds to restart the communication stick. Press and hold for 6-10 seconds to restore factory settings. Double-click quickly to enable Bluetooth signal (maintained for 5 minutes only).

7 System Commissioning and Power Plant Monitoring

7.1 Device Testing and Power Plant Monitoring via SEMS+ App

SEMS+ App is a software for remote power plant monitoring or local device testing. It supports installers or owners to:

- Remotely monitor power plant operation status and configure power plant and device operating parameters.
- Locally connect to devices to view device operation status and configure device parameters.

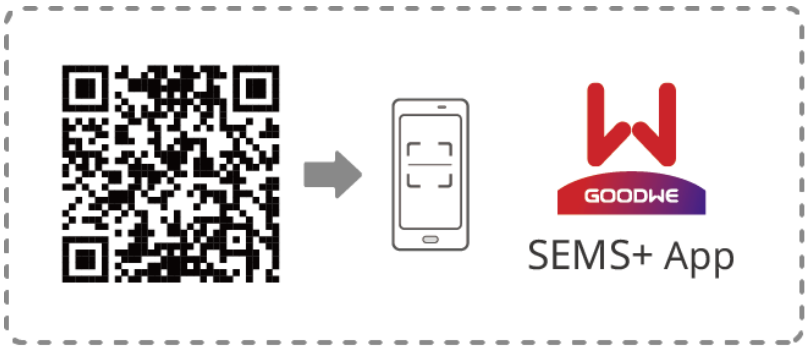
Downloading and Installing SEMS+ App
Mobile Phone Requirements:

- Operating System: Android 7.0 or above, iOS 15.1 or above.
- Mobile phone supports a web browser and can connect to the Internet.
- Mobile phone supports 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.

SEMS0163

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



SEMS0164

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.

7.2 Device Debugging and Power Plant Monitoring via SEMS+ WEB

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

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

For detailed functions, please refer to the SEMS+ WEB User Manual.

SEMS+ WEB User Manual

8 Maintenance

8.1 Power OFF the System

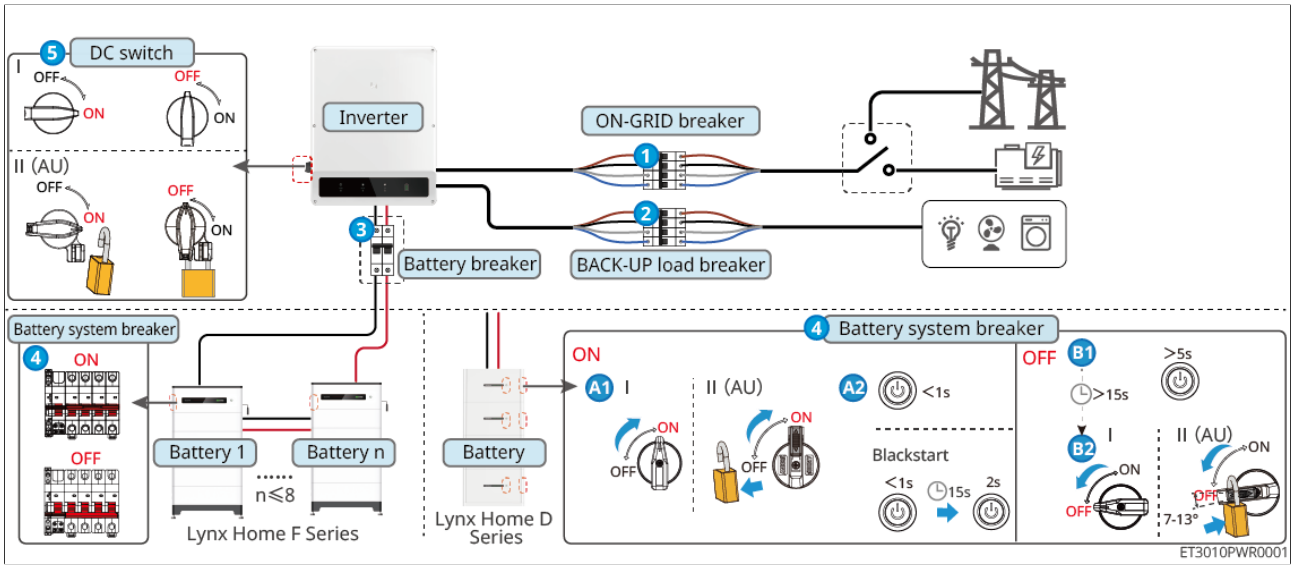
⚠DANGER

- When performing operation and maintenance on devices in the system, please power down the system. Operating devices with power on may cause device damage or electric shock DANGER.
- After the device is powered off, internal components require some time to discharge. Please wait until the device is completely discharged according to the label time requirements.
- Restarting the battery should be done using the air switch power-on method.
- When shutting down the battery system, 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 can power down all batteries.

NOTICE

- 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, the cover plate of the battery system switch should remain closed. The protective cover should automatically close after being opened. If the battery system switch will not be used for an extended period, secure it with screws.

Single System Scenario

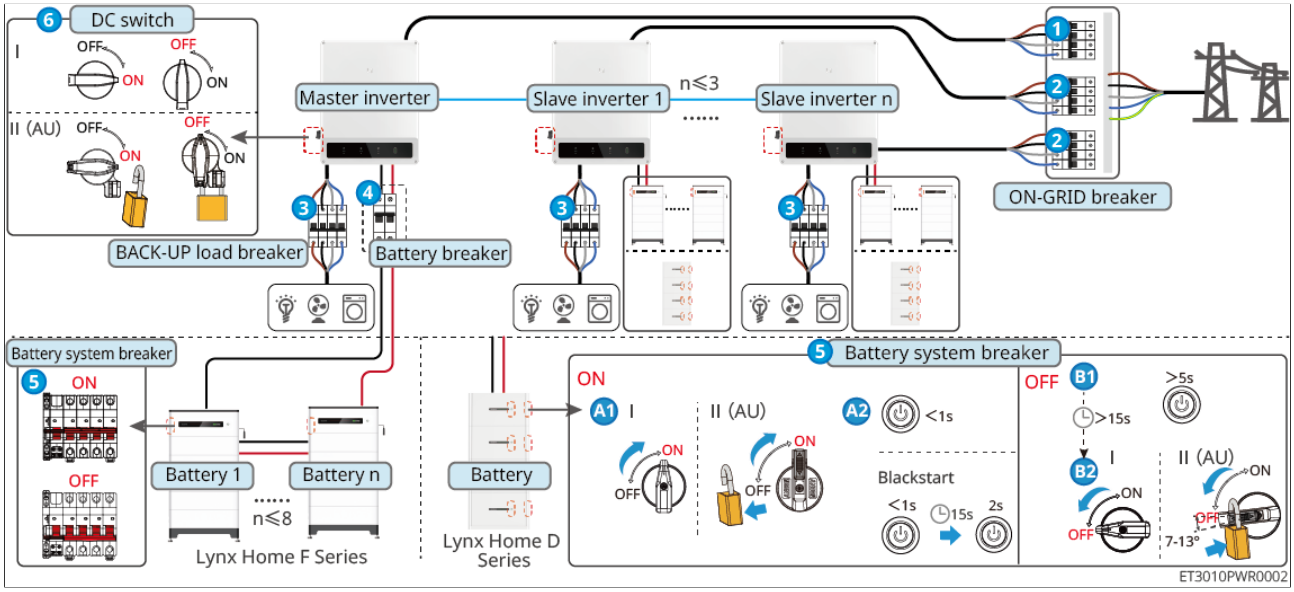


Power ON/OFF Steps:

❶→❷→❸→❹→❺

❸ : Configure according to local laws and regulations.

parallel system



Power ON/OFF Steps:

❶→❷→❸→❹→❺→❻

❹ : Configure according to local laws and regulations.

8.2 Removing the Equipment

DANGER

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

1. Power down the system.
2. Label the cables connected in the system to indicate their type.
3. Disconnect the cables in the system for the Inverter, Battery, and smart meter, such as: DC cables, AC cables, Communication cable, and PE cable.
4. Remove devices such as the smart communication stick, Inverter, Battery, and smart meter.
5. Store the equipment properly. If it will be put into use again later, ensure the storage conditions meet the requirements.

8.3 Disposing of the Equipment

When the equipment can no longer be used and needs to be disposed of, please dispose of the equipment according to the electrical waste disposal requirements of the country/region where the equipment is located, and do not treat the equipment as general household waste.

8.4 Routine Maintenance

WARNING

- If any issues that may affect the battery or energy storage inverter system are found, contact after-sales personnel. Disassembly by unauthorized personnel is prohibited.
- If exposed copper wires are found inside the conductive cable, do not touch them due to high voltage danger. Contact after-sales personnel. Disassembly by unauthorized personnel is prohibited.
- In case of any other emergencies, contact after-sales personnel immediately. Operate only under the guidance of after-sales personnel or wait for them to perform on-site operations.

Maintenance Content	Maintenance Method	Maintenance Cycle	Maintenance Purpose
System Cleaning	Check the heat sink, fan, and air inlet/outlet for foreign objects or dust. Check if the installation space meets requirements, and inspect for debris accumulation around the equipment.	Once every 6 months	Prevent cooling failures.
System Installation	Check if the equipment installation is secure, and if fastening screws are loose. Check the equipment exterior for damage or deformation.	Once every 6 months to once a year	Confirm equipment installation stability.
Electrical Connections	Check electrical connections for looseness, inspect cable exteriors for damage or exposed copper.	Once every 6 months to once a year	Confirm electrical connection reliability.
Sealing	Check if the sealing of equipment cable entry holes meets requirements. Re-seal if gaps are too large or unblocked.	Once a year	Confirm machine sealing and water resistance are intact.

Maintenance Content	Maintenance Method	Maintenance Cycle	Maintenance Purpose
Battery Maintenance	If the battery has not been used or fully charged for an extended period, periodic charging is recommended.	Once every 15 days	Protect battery service life.

8.5 fault

NOTICE
Manual fault content is updated irregularly. Faults may vary slightly across different models. Please refer to the device's real-time display for specifics.

8.5.1 Viewing Fault/Alarms Information

All detailed fault and alarm information for the energy storage system is displayed in the [SEMS+ App] and [SEMS+ WEB]. If your product malfunctions and you do not see related fault information in the [SEMS+ App] or [SEMS+ WEB], please contact the after-sales service center.

- SEMS+ App

1. Open the SEMS+ App and log in with any account.
2. Go to [power station] > [Alarms] to view all fault information for the power stations.
3. Click on a specific fault name to view details such as the time of occurrence, possible causes, and solutions.

- SEMS+ WEB

1. Open SEMS+ WEB and log in with any account.
2. On the power station details interface, click [Alarms] to view all alarm information for the current power station.

8.5.2 Fault Information and Troubleshooting

Please perform troubleshooting according to the following methods. If the troubleshooting methods cannot help you, 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 frequency, etc.
2. Device installation environment, such as: weather conditions, whether components are obstructed, have shadows, etc. It is recommended to provide photos, videos, and other files to assist in problem analysis.
3. Grid conditions.

8.5.2.1 System Failure

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

No.	fault	Resolution
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 solid on. 4. Ensure the smart device is within the communication range of the Smart Communication Stick. 5. Refresh the App's device list. 6. Restart the inverter.
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 Communication Stick, and try to connect to the Smart Communication Stick's wireless signal again. 3. Ensure Bluetooth has been successfully encrypted and paired.

No.	fault	Resolution
3	Unable to find the router's SSID	1. Place the router closer to the Smart Communication Stick, or add a WiFi repeater to enhance the WiFi signal. 2. Reduce the number of devices connected to the router.
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 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.

8.5.2.2 Inverter Fault

8.5.2.2.1 Troubleshooting (Fault Codes F01-F40)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F01	Grid Power Outage	1. Grid power outage. 2. AC lines or AC switch are disconnected.	1. The alarm will disappear automatically after grid power is restored. 2. Check whether the AC lines or AC switch are disconnected.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F02	Grid Overvoltage Protection	Grid voltage is higher than the allowable range, or the duration of high voltage exceeds the high voltage ride-through setting.	1. If it occurs occasionally, it may be due to a short-term grid abnormality. The inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check whether the grid voltage is within the allowable range. If not, contact the local power operator. If yes, also modify the grid overvoltage protection point after obtaining consent from the local power operator. 3. If normal operation cannot be restored for a long time, check whether the AC side circuit breaker and output cables are properly connected.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F03	Grid Undervoltage Protection	Grid voltage is lower than the allowable range, or the duration of low voltage exceeds the low voltage ride-through setting.	1. If it occurs occasionally, it may be due to a short-term grid abnormality. The inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check whether the grid voltage is within the allowable range. If not, contact the local power operator. If yes, also modify the grid undervoltage protection point after obtaining consent from the local power operator. 3. If normal operation cannot be restored for a long time, check whether the AC side circuit breaker and output cables are properly connected.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F04	Grid Rapid Overvoltage Protection	Grid voltage detection is abnormal or ultra-high voltage triggers the fault.	1. If it occurs occasionally, it may be due to a short-term grid abnormality. The inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check whether the grid voltage is within the allowable range. If not, contact the local power operator. If yes, also modify the grid undervoltage protection point after obtaining consent from the local power operator. 3. If normal operation cannot be restored for a long time, check whether the AC side circuit breaker and output cables are properly connected.
F05	10min Overvoltage Protection	The sliding average of grid voltage within 10min exceeds the range specified by safety regulations.	Check whether the grid voltage has been operating at a high voltage for a long time. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, contact the local power operator. If yes, also modify the grid 10min overvoltage protection point after obtaining consent from the local power operator.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F06	Grid Overfrequency	Grid abnormality: The actual grid frequency is higher than the local grid standard requirements.	1. If it occurs occasionally, it may be due to a short-term grid abnormality. The inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, contact the local power operator. If yes, also modify the grid overfrequency protection point after obtaining consent from the local power operator.
F07	Grid Underfrequency	Grid abnormality: The actual grid frequency is lower than the local grid standard requirements.	1. If it occurs occasionally, it may be due to a short-term grid abnormality. The inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, contact the local power operator. If yes, also modify the grid overfrequency protection point after obtaining consent from the local power operator.

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

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F11	HVRT Overvoltage	Grid abnormality: The duration of abnormal grid voltage exceeds the time specified for high/low voltage ride-through.	1. If it occurs occasionally, it may be due to a short-term grid abnormality. The inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check whether the grid voltage and frequency are within the allowable range and stable. If not, contact the local power operator.
F12	30mAGFCI Protection	The insulation impedance from the input to ground becomes low during inverter operation.	1. If it occurs occasionally, it may be caused by occasional external line abnormalities. It will resume normal operation after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or cannot be restored for a long time, check whether the PV string's impedance to ground is too low.
F13	60mAGFCI Protection	The insulation impedance from the input to ground becomes low during inverter operation.	1. If it occurs occasionally, it may be caused by occasional external line abnormalities. It will resume normal operation after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or cannot be restored for a long time, check whether the PV string's impedance to ground is too low.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F14	150mAGFCI Protection	The insulation impedance from the input to ground becomes low during inverter operation.	1. If it occurs occasionally, it may be caused by occasional external line abnormalities. It will resume normal operation after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or cannot be restored for a long time, check whether the PV string's impedance to ground is too low.
F15	GFCI Gradual Change Protection	The insulation impedance from the input to ground becomes low during inverter operation.	1. If it occurs occasionally, it may be caused by occasional external line abnormalities. It will resume normal operation after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or cannot be restored for a long time, check whether the PV string's impedance to ground is too low.
F16	DCI Level 1 Protection	The DC component of the inverter output current is higher than the safety regulation or the machine's default allowable range.	1. If it is caused by an external fault, the inverter will automatically resume normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting the normal power generation of the power station, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F17	DCI Level 2 Protection	The DC component of the inverter output current is higher than the safety regulation or the machine's default allowable range.	1. If it is caused by an external fault, the inverter will automatically resume normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting the normal power generation of the power station, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F18	Low Insulation Resistance	1. PV string is short-circuited to protective earth. 2. The PV string is installed in a humid environment for a long time and the line has poor insulation to ground. 3. Low insulation impedance from the battery port line to ground.	1. Check the impedance from the PV string/battery port to protective earth. A value greater than 80kΩ is normal. If the measured value is less than 80kΩ, locate and rectify the short circuit point. 2. Check whether the inverter's protective earth wire is correctly connected. 3. If it is confirmed that the impedance is indeed lower than the default value in rainy/cloudy environments, reset the inverter's "Insulation Impedance Protection Point" via the App. For inverters in the Australian and New Zealand markets, when an insulation impedance fault occurs, the alarm can also be indicated in the following ways: 1. The inverter is equipped with a buzzer. When a fault occurs, the buzzer sounds continuously for 1 minute; if the fault is not resolved, the buzzer sounds again every 30 minutes. 2. If the inverter is added to the monitoring platform and alarm notification methods are set, alarm information can be sent to the customer via email.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F19	Grounding Abnormal	1. The inverter's protective earth wire is not connected. 2. When the PV string output is grounded, the inverter output side is not connected to an isolation transformer.	1. Please confirm whether the inverter's protective earth wire is not connected normally. 2. In scenarios where the PV string output is grounded, please confirm whether the inverter output side is connected to an isolation transformer.
F20	Hardware Anti-backflow Protection	Load abnormal fluctuation	1. If it is caused by an external fault, the inverter will automatically resume normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting the normal power generation of the power station, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F21	Internal Comm Loss	Slave DSP1 communication timeout - Master DSP, Slave DSP2 communication timeout - Master DSP, Slave DSP2 communication timeout - Slave DSP1, Master DSP communication timeout - Slave DSP1, Master DSP communication timeout - Slave DSP2, or Slave DSP1 communication timeout - Slave DSP2: 1. Chip not powered on 2. Chip program version error	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault still exists, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
		Master DSP CAN module error, Slave DSP1 CAN module error, or Slave DSP2 CAN module error: 1. Frame format error 2. Parity check error 3. CAN bus offline 4. Hardware CRC check error 5. Control bit is receive (transmit) when transmitting (receiving) 6. Transmission to a disallowed unit	
F22	Generator Waveform Detection Fault	1. This fault will be displayed continuously when the generator is not connected; 2. When the generator is operating, failure to meet generator safety regulations will trigger this fault.	1. Ignore this fault when the generator is not connected; 2. When this fault appears due to a generator fault, it is normal. After the generator recovers, wait for a period of time for the machine, and the fault will be cleared automatically; 3. This fault will not affect the normal operation of the off-grid mode. 4. When both the generator and the grid are connected and meet safety requirements, the grid has priority for grid connection, and the system will operate in grid-connected state.
F23	Generator Abnormal Connection		
F24	Generator Voltage Low		
F25	Generator Voltage High		
F26	Generator Frequency Low		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F27	Generator Frequency High		
F28	Parallel Unit I/O Self-check Abnormal	Parallel communication cable is not securely connected or the parallel IO chip is damaged	Check if the parallel communication cable is securely connected, then check if the IO chip is damaged. If yes, replace the IO chip.
F29	Paralell Grid Line Reversed	Grid lines of some units are reversed with others	Reconnect the grid lines.
F30	AC HCT check Abnormal	AC sensor has sampling abnormality	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault still exists, contact the distributor or after-sales service center.
F31	GFCI HCT Check Abnormal	Leakage current sensor has sampling abnormality	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault still exists, contact the distributor or after-sales service center.
F32	Inverter Internal Failure	Inverter has a fault	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault still exists, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F33	Flash Read/Write Error	Possible causes: Flash content changed; Flash lifespan exhausted;	1. Upgrade to the latest program version 2. Contact the distributor or after-sales service center
F34	AFCI Check Failure	During the arc fault self-check process, the arc fault module did not detect an arc fault as expected	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault still exists, contact the distributor or after-sales service center.
F35	Cabinet Overtemperature	Cabinet temperature is too high. Possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check whether the ventilation at the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If ventilation is poor or ambient temperature is too high, improve its ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F36	Bus Overvoltage	BUS overvoltage. Possible causes: 1. PV voltage is too high; 2. Inverter BUS voltage sampling is abnormal; 3. The isolation effect of the dual-split transformer at the inverter rear end is poor, causing mutual interference when two inverters are connected in parallel, with one inverter reporting DC overvoltage during grid connection;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault still exists, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F37	PV Input Overvoltage	PV input voltage is too high. Possible cause: PV array configuration error, too many PV panels in series in the string, causing the string's open-circuit voltage to be higher than the inverter's maximum operating voltage	Check the series configuration of the corresponding PV array string to ensure the string's open-circuit voltage does not exceed the inverter's maximum operating voltage. After the PV array configuration is corrected, the inverter alarm will disappear automatically.
F38	PV Continuous Hardware Overcurrent	1. Component configuration is unreasonable 2. Hardware damage	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault still exists, contact the distributor or after-sales service center.
F39	PV Continuous Software Overcurrent	1. Component configuration is unreasonable 2. Hardware damage	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault still exists, contact the distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F40, F98	String Reverse Connection (String 1-n) n: determined based on the actual number of inverter strings	PV string reverse connection	Check if the string is reversed.

8.5.2.2.2 Troubleshooting (Fault Codes F41-F80)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F41	Generator Port Overload	1. Off-grid side output exceeds specifications. 2. Off-grid side short circuit. 3. Off-grid side voltage is too low. 4. When used as a large load port, the large load exceeds specifications.	Confirm the off-grid side output voltage, current, power, and other data to identify the cause of the issue.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F42	DC Arcing Failure (String 1-n) n: Determined by the actual number of inverter strings.	1. DC side connection terminals are loose. 2. DC side connection terminals have poor contact. 3. DC cable cores are damaged or have poor contact.	1. After the unit reconnects to the grid, check if the voltage and current of each circuit abnormally decrease or become zero. 2. Check if the DC side terminals are securely connected.
F43	Grid Waveform Abnormal	Utility grid abnormality: Abnormal grid voltage detection triggers the fault.	1. If it occurs occasionally, it may be due to a short-term grid abnormality. The inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage and frequency are within the allowable range and stable. If not, contact the local power utility operator.
F44	Grid Phase Loss	Utility grid abnormality: Single-phase voltage dip in the grid.	1. If it occurs occasionally, it may be due to a short-term grid abnormality. The inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage and frequency are within the allowable range and stable. If not, contact the local power utility operator.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F45	Grid Voltage Imbalance	Excessive difference in grid phase voltages.	1. If it occurs occasionally, it may be due to a short-term grid abnormality. The inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage and frequency are within the allowable range and stable. If not, contact the local power utility operator.
F46	Grid Phase Sequence Failure	Inverter and grid wiring abnormality: Wiring is not in positive sequence.	1. Check if the inverter and grid wiring are in positive sequence. The fault will automatically disappear after correct wiring (e.g., swapping any two live wires). 2. If the fault persists despite correct wiring, contact the dealer or after-sales service center.
F47	Grid Rapid Shutdown Protection	Rapidly shuts down output after detecting a grid power outage condition.	The fault automatically disappears after grid power supply is restored.
F48	Grid Neutral Wire Loss (Split-phase Grid)	Loss of neutral wire in a split-phase grid.	1. The alarm automatically disappears after grid power supply is restored. 2. Check if the AC wiring or AC switch is disconnected.
F49	L-PE Short Circuit	Low impedance or short circuit between output phase line and PE.	Measure the impedance between the output phase line and PE, locate the point with low impedance and repair it.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F50	DCV Level 1 Protection	Abnormal load fluctuation.	1. If caused by external fault-induced abnormalities, the inverter will automatically resume normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting normal power generation of the plant, contact the dealer or after-sales service center.
F51	DCV Level 2 Protection	Abnormal load fluctuation.	
F52	Leakage current (GFCI) Multiple Fault Shutdown	North American safety regulations require manual recovery or waiting 24h after multiple faults, no automatic recovery.	Please check if the PV string-to-ground impedance is too low.
F53	DC Arcing (AFCI) Multiple Fault Shutdown	North American safety regulations require manual recovery or waiting 24h after multiple faults, no automatic recovery.	1. After the unit reconnects to the grid, check if the voltage and current of each circuit abnormally decrease or become zero. 2. Check if the DC side terminals are securely connected.
F54	External Communication Link Broken	Inverter external device communication lost, possibly due to peripheral power issues, communication protocol mismatch, or unconfigured corresponding peripheral.	Judgment is based on the actual model and detection enable bits. Peripherals not supported by some models will not be detected.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F55	Back-up Port Overload Fault	Prevents the inverter from continuously outputting overload.	Turn off some off-grid loads to reduce the inverter's off-grid output power.
F56	Back-up Port Overvoltage Fault	Prevents inverter output overvoltage from damaging loads.	1. If it occurs occasionally, it may be caused by load switching and requires no manual intervention. 2. If it occurs frequently, contact the dealer or after-sales service center.
F57	External Box Fault	Waiting for Box relay switching time is too long during grid-to-off-grid transition.	1. Check if the Box is working normally. 2. Check if the Box communication wiring is correct.
F58	CT Loss Fault	CT connection wire disconnected (Japanese safety regulation requirement).	Check if the CT wiring is correct.
F59	Parallel Unit CAN Communication Abnormal	Parallel communication cable not securely connected or some units are offline.	Check if all units are powered on and the parallel communication cables are securely connected.
F60	Parallel Unit Back-up Connection Reversed	Back-up lines of some units are reversed with others.	Reconnect the back-up lines.
F61	Inverter Soft Start Failure	Inverter soft start failure during off-grid cold start.	Check if the inverter module is damaged.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F62	AC HCT Failure	HCT sensor is abnormal.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F63	GFCI HCT Failure	Leakage current sensor is abnormal.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F64	Inverter Internal Failure	Inverter has a fault.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F65	AC Terminal Overtemperature	AC terminal temperature is too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the inverter installation location has good ventilation and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are both normal, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F66	INV Module Overtemperature	Inverter module temperature is too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the inverter installation location has good ventilation and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are both normal, contact the dealer or after-sales service center.
F67	Boost Module Overtemperature	Boost module temperature is too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the inverter installation location has good ventilation and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are both normal, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F68	AC Capacitor Overtemperature	Output filter capacitor temperature is too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the inverter installation location has good ventilation and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are both normal, contact the dealer or after-sales service center.
F69	PV IGBT Short Circuit Fault	Possible causes: 1. IGBT short circuit. 2. Inverter sampling circuit abnormality.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F70	PV IGBT Open Circuit Fault	1. Software issue causing no PWM generation. 2. Drive circuit abnormality. 3. IGBT open circuit.	
F71	NTC Abnormal	NTC temperature sensor is abnormal.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F72	PWM Abnormal	PWM abnormal waveform detected.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F73	CPU Interrupt Abnormal	CPU interrupt is abnormal.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F74	Microelectronics Fault	Functional safety detection detected an abnormality.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F75	PV HCT Fault	Boost current sensor abnormal.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F76	1.5V Reference Abnormal	Reference circuit fault.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F77	0.3V Reference Abnormal	Reference circuit fault.	
F78	CPLD Version Identification Error	CPLD version identification error.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F79	CPLD Communication Fault	CPLD and DSP communication content error or timeout.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F80	Model Identification Fault	Fault regarding model identification error.	Disconnect the AC output side switch and DC input side switch, wait 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.

8.5.2.2.3 Troubleshooting (Fault Code F81-F121)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F81	P-Bus Overvoltage		Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F82	N-Bus Overvoltage	BUS overvoltage, possible causes: 1. PV voltage is too high; 2. Inverter BUS voltage sampling is abnormal; 3. Poor isolation effect of the dual-split transformer behind the inverter, causing mutual interference when two inverters are grid-connected, with one inverter reporting DC overvoltage during grid connection;	
F83	Bus Overvoltage (Sub CPU1)		Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F84	P-Bus Overvoltage (Sub CPU1)		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F85	N-Bus Overvoltage (Sub CPU1)	BUS overvoltage, possible causes: 1. PV voltage is too high; 2. Inverter BUS voltage sampling is abnormal; 3. Poor isolation effect of the dual-split transformer behind the inverter, causing mutual interference when two inverters are grid-connected, with one inverter reporting DC overvoltage during grid connection;	
F86	Bus Overvoltage (Sub CPU2)		Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F87	P-Bus Overvoltage (Sub CPU2)		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F88	N-Bus Overvoltage (Sub CPU2)	BUS overvoltage, possible causes: 1. PV voltage is too high; 2. Inverter BUS voltage sampling is abnormal; 3. Poor isolation effect of the dual-split transformer behind the inverter, causing mutual interference when two inverters are grid-connected, with one inverter reporting DC overvoltage during grid connection;	
F89	P-Bus Overvoltage (CPLD)		Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F90	N-Bus Overvoltage (CPLD)	BUS overvoltage, possible causes: 1. PV voltage is too high; 2. Inverter BUS voltage sampling is abnormal; 3. Poor isolation effect of the dual-split transformer behind the inverter, causing mutual interference when two inverters are grid-connected, with one inverter reporting DC overvoltage during grid connection;	
F91	FlyCap Software Overvoltage	FlyCap overvoltage, possible causes: 1. PV voltage is too high; 2. Inverter FlyCap voltage sampling is abnormal;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F92	FlyCap Hardware Overvoltage		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F93	FlyCap Undervoltage	FlyCap undervoltage, possible causes: 1. Insufficient PV energy; 2. Inverter FlyCap voltage sampling is abnormal;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F94	FlyCap Precharge Failure	FlyCap precharge failure, possible causes: 1. Insufficient PV energy; 2. Inverter FlyCap voltage sampling is abnormal;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F95	FlyCap Precharge Abnormal	1. Control loop parameters are unreasonable 2. Hardware damage	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F96, F97	String Overcurrent (String 1-n) n: Determined based on the actual number of inverter strings	Possible causes: 1. String overcurrent; 2. String current sensor abnormal	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F99, F100	String Loss (String 1-n) n: Determined based on the actual number of inverter strings	String fuse blown (if present)	Check if the fuse is blown.
F101	Battery 1 Precharge Fault	Battery 1 precharge circuit fault (precharge resistor burned out, etc.)	Check if the precharge circuit is in good condition, and if the battery voltage matches the bus voltage after only the battery is powered on. If they do not match, please contact the dealer or after-sales service center.
F102	Battery 1 Relay Failure	Battery 1 relay cannot operate normally	After powering on the battery, check if the battery relay is working and if a closing sound is heard. If it does not operate, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F103	Battery 1 Connection Overvoltage	Battery 1 connection voltage exceeds the machine's rated range	Confirm if the battery voltage is within the machine's rated range.
F104	Battery 2 Precharge Fault	Battery 2 precharge circuit fault (precharge resistor burned out, etc.)	Check if the precharge circuit is in good condition, and if the battery voltage matches the bus voltage after only the battery is powered on. If they do not match, please contact the dealer or after-sales service center.
F105	Battery 2 Relay Failure	Battery 2 relay cannot operate normally	After powering on the battery, check if the battery relay is working and if a closing sound is heard. If it does not operate, please contact the dealer or after-sales service center.
F106	Battery 2 Connection Overvoltage	Battery 2 connection voltage exceeds the machine's rated range	Confirm if the battery voltage is within the machine's rated range.
F107	On-grid PWM Sync Failure	Abnormalities occurred during carrier synchronization grid connection	1. Check if the synchronization line connection is normal 2. Check if the master/slave settings are normal; 3. Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F108	DSP Communication Fault	-	-

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F109	External STS Fault	Abnormal cable connection between inverter and STS	Check if the wiring sequence between the inverter and the STS harness is correctly matched one-to-one.
F110	Export Limit Protection	1. Inverter reports error and disconnects from grid 2. Meter communication is unstable 3. Reverse power flow condition occurs	1. Check if the inverter has other error messages. If yes, perform targeted troubleshooting; 2. Check if the meter connection is reliable; 3. If this alarm occurs frequently, affecting normal power plant generation, please contact the dealer or after-sales service center.
F111	Bypass Overload	-	-
F112	Black Start Failure	-	-
F113	Offgrid AC Ins Volt High	-	-
F114	Relay Failure 2	Relay abnormal, causes: 1. Relay abnormal (relay short circuit) 2. Relay sampling circuit abnormal. 3. AC side wiring abnormal (possible loose connection or short circuit)	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F115	SVG Precharge Disabled	SVG precharge hardware failure	Contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F116	Nighttime SVG PID Prevention Fault	PID prevention hardware abnormal	
F117	DSP Version Identification Error	DSP software version identification error	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F118	MOS Continuous Overvoltage	1. Software issue causing inverter drive to turn off earlier than flyback drive: 2. Inverter drive circuit abnormal causing failure to turn on: 3. PV voltage too high; 4. Mos voltage sampling abnormal;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F119	Bus Short Circuit Fault	Hardware damage	If the BUS short circuit fault occurs and the inverter remains off-grid, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendation
F120	Bus Sampling Abnormal	1. BUS voltage sampling hardware fault	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F121	DC Side Sampling Abnormal	1. BUS voltage sampling hardware fault 2. Battery voltage sampling hardware fault 3. Dcrly relay fault	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

8.5.2.2.4 Troubleshooting (Fault Codes F122-F163)

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestion
F122	PV Access Mode Setting Error	There are three modes for PV Access Mode. Taking four-channel MPPT as an example: 1. Parallel Mode: i.e., AAAA mode (Same Source Mode), PV1-PV4 share the same source, all 4 PV channels are connected to the same solar panel. 2. Partial Parallel Mode: i.e., AACC mode, PV1 and PV2 share a source connection, PV3 and PV4 share a source connection. 3. Independent Mode: i.e., ABCD mode (Non-same Source), PV1, PV2, PV3, PV4 are connected independently, each of the 4 PV channels connects to one solar panel. This fault is reported if the actual PV	Check if the PV Access Mode is set correctly (ABCD, AACC, AAAA), and reset the PV Access Mode correctly. 1. Confirm that each actual PV input channel is correctly connected; 2. If the PV is correctly connected, check via the APP or screen whether the currently set "PV Access Mode" corresponds to the actual access mode; 3. If the currently set "PV Access Mode" does not match the actual access mode, use the APP or screen to set the "PV Access Mode" to the mode consistent with the actual situation. After setting, disconnect and restart the PV and AC power supply; 4. After setting, if the current "PV Access Mode" matches the actual access mode but this fault is still reported, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestion
		access mode does not match the PV access mode set on the device.	
F123	Multi-channel PV Phase Error	PV Input Mode Setting Error	Check if the PV Access Mode is set correctly (ABCD, AACC, AAAA), and reset the PV Access Mode correctly. 1. Confirm that each actual PV input channel is correctly connected; 2. If the PV is correctly connected, check via the APP or screen whether the currently set "PV Access Mode" corresponds to the actual access mode; 3. If the currently set "PV Access Mode" does not match the actual access mode, use the APP or screen to set the "PV Access Mode" to the mode consistent with the actual situation. After setting, disconnect and restart the PV and AC power supply; 4. After setting, if the current "PV Access Mode" matches the actual access mode but this fault is still reported, please contact the dealer or after-sales service center.
F124	Battery 1 Reverse Connection fault	Battery 1 positive and negative poles are reversed	Check if the polarity of the battery and the machine's terminals is consistent.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestion
F125	Battery 2 Reverse Connection fault	Battery 2 positive and negative poles are reversed	Check if the polarity of the battery and the machine's terminals is consistent.
F126	Battery Abnormal Connection	Battery Abnormal Connection	Check if the battery is working properly.
F127	BAT Overtemperature	Battery temperature is too high. Possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.
F128	Ref Voltage Abnormal	Reference circuit fault	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.
F129	Cabinet Under Temperature	Cabinet temperature is too low. Possible cause: Ambient temperature is too low.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestion
F130	AC Side SPD fault	AC side surge protective device failure	Replace the AC side surge protective device.
F131	DC Side SPD fault	DC side surge protective device failure	Replace the DC side surge protective device.
F132	Internal Fan Abnormal	Internal fan abnormal. Possible causes: 1. Fan power supply abnormal; 2. Mechanical fault (locked rotor); 3. Fan aging or damaged.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.
F133	External Fan Abnormal	External fan abnormal. Possible causes: 1. Fan power supply abnormal; 2. Mechanical fault (locked rotor); 3. Fan aging or damaged.	
F134	PID Diagnosis Abnormal	PID hardware fault or PV voltage too high causing PID pause	No action needed for PID pause warning caused by high PV voltage. For PID hardware fault, clear the PID fault by turning the PID switch off and then on, replace the PID device.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestion
F135	Trip-Switch Trip Warning	Possible causes: Overcurrent or PV reverse connection caused the trip switch to open;	Contact the dealer or after-sales service center; The reason for tripping is a PV short circuit or reverse connection. It is necessary to check if there is a historical PV short circuit warning or a historical PV reverse connection warning. If present, maintenance personnel need to check the corresponding PV condition. After checking and confirming no fault, you can manually close the trip switch and clear this warning via the APP interface's clear historical fault operation.
F136	Historical PV IGBT Short Circuit Warning	Possible causes: Overcurrent caused the trip switch to open;	Contact the dealer or after-sales service center; Maintenance personnel need to check the Boost hardware and external string for faults according to the historical PV short circuit warning subcode; After checking and confirming no fault, this warning can be cleared via the APP interface's clear historical fault operation.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestion
F137, F138	Historical PV Reverse Connection Warning (String 1-n) (n: determined by the actual number of inverter strings)	Possible causes: PV reverse connection caused the trip switch to open;	Contact the dealer or after-sales service center; Maintenance personnel need to check the corresponding string for reverse connection according to the historical PV reverse connection warning subcode, and check if there is a voltage difference in the PV panel configuration; After checking and confirming no fault, this warning can be cleared via the APP interface's clear historical fault operation.
F139	Flash Read/Write Error Warning	Possible causes: 1. Flash content has changed; 2. Flash lifespan exhausted;	1. Upgrade to the latest program version; 2. Contact the dealer or after-sales service center.
F140	Meter Comm Loss	This warning may only be reported after enabling anti-reverse flow function. Possible causes: 1. Meter not connected; 2. Communication cable connection between meter and inverter is incorrect.	Check the meter wiring, connect the meter correctly. If the fault still exists after checking, please contact the dealer or after-sales service center.
F141	PV Panel Type Identification Failure	PV panel identification hardware abnormal	Contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestion
F142	PV String Mismatch	PV string mismatch, two strings under the same MPPT have different open-circuit voltage configurations	Check the open-circuit voltage of the two strings, configure strings with the same open-circuit voltage under the same MPPT. Long-term string mismatch poses safety risks.
F143	CT Not Connected	CT not connected	Check CT wiring.
F144	CT Reverse Connection	CT reverse connection	Check CT wiring.
F145	PE Loss	Protective earth (PE) not connected	Check the protective earth (PE) wire.
F146	String Terminal Temperature High (String 1~8)	Register 37176 PV terminal temperature alarm subcode 1 is set	-
F147	String Terminal Temperature High (String 9~16)	Register 37177 PV terminal temperature alarm subcode 2 is set	-
F148	String Terminal Temperature High (String 17~20)	Register 37178 PV terminal temperature alarm subcode 3 is set	-

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestion
F149	Historical PV Reverse Connection Warning (String 33~48)	Possible causes: PV reverse connection caused the trip switch to open;	Contact the dealer or after-sales service center; Maintenance personnel need to check the corresponding string for reverse connection according to the historical PV reverse connection warning subcode, and check if there is a voltage difference in the PV panel configuration; After checking and confirming no fault, this warning can be cleared via the APP interface's clear historical fault operation.
F150	Battery 1 Low Voltage	Battery voltage is below the set value	-
F151	Battery 2 Low Voltage	Battery voltage is below the set value	-
F152	Low Voltage of Battery Power	Battery in non-charging mode, voltage below shutdown voltage	-
F153	Battery 1 High Voltage	-	-
F154	Battery 2 High Voltage	-	-

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestion
F155	Online Low Insulation Resistance	1. PV string shorted to protective earth. 2. PV string installed in a long-term humid environment and the line has poor insulation to ground.	1. Check the impedance of the PV string to protective earth. If a short circuit is found, rectify the short circuit point. 2. Check if the inverter's protective earth wire is correctly connected. 3. If it is confirmed that the impedance is indeed below the default value in rainy/overcast environments, please reset the "Insulation Resistance Protection Point".
F156	Micro-grid Overload Warning	backup port input current too high	Occasional occurrence requires no action; If this alarm occurs frequently, please contact the dealer or after-sales service center.
F157	Manual Reset	-	-
F158	Generator Phase Sequence Abnormal	-	-
F159	Multiplexed Port Configuration Abnormal	Multiplexed (Generator) port is configured as micro-grid or large load, but a generator is actually connected	Use the APP to change the Multiplexed (Generator) port configuration.
F160	EMS Forced Off-grid	EMS issued forced off-grid command, but off-grid function is not enabled	Enable the off-grid function.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestion
F161	Passive Anti-islanding Protection	-	-
F162	Grid Type Fault	Actual grid type (two-phase or split-phase) does not match the set safety standard	Switch to the corresponding safety standard according to the actual grid type.
F163	Grid Phase Instability	Grid abnormal: Grid voltage phase change rate does not comply with local grid standard.	1. If it occurs occasionally, it may be a temporary grid anomaly. The inverter will resume normal operation after detecting the grid is normal, no manual intervention is required. 2. If it occurs frequently, please check if the grid frequency is within the allowable range. If not, please contact the local power operator.

8.5.2.2.5 Troubleshooting

Fault Name	Fault Cause	Fault Handling Suggestions
Generator Failure	1. This fault will be displayed continuously when the generator is not connected. 2. When the generator is operating, if it does not meet the generator safety regulations, this fault will be triggered.	1. Ignore this fault when the generator is not connected; 2. When this fault appears due to generator failure, it is normal. After the generator recovers, wait for a period of time, and the fault will be automatically cleared; 3. This fault does not affect the normal operation of off-grid mode. 4. When both the generator and grid are connected and meet safety regulations, the grid has priority for grid connection, and the system will operate in grid-connected state.
BMS Status Bit Error	BMS module failure	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.
Ambient Overtemperature	1. Poor ventilation of the machine 2. Hot air flow back to the ambient temperature sampling point	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.

Fault Name	Fault Cause	Fault Handling Suggestions
PV Terminal Overtemperature	PV terminal overtemperature, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the ventilation at the inverter installation location is good and if the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If it is not ventilated or the ambient temperature is too high, improve its ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.
BAT Terminal Overtemperature	BAT terminal overtemperature, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high.	1. Check if the ventilation at the inverter installation location is good and if the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If it is not ventilated or the ambient temperature is too high, improve its ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.
AC Terminal Overtemperature Warning	AC terminal overtemperature, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	

Fault Name	Fault Cause	Fault Handling Suggestions
BAT Terminal Overtemperature Warning	BAT terminal overtemperature, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high.	1. Check if the ventilation at the inverter installation location is good and if the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If it is not ventilated or the ambient temperature is too high, improve its ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.
Three-phase on-grid fault	Three-phase external wiring error	Rewire.
External STS Failure	Abnormal connection cable between inverter and STS	Check if the wiring sequence of the harness connection between the inverter and STS corresponds one by one in order.

Fault Name	Fault Cause	Troubleshooting Recommendation
Parallel Comm Timeout Shutdown	In parallel operation, if a slave unit does not communicate with the master for more than 400 seconds	Check if the parallel communication harness is securely connected. Check if slave addresses are duplicated.
Three-phase off-grid phase loss fault	Phase loss in a three-phase system group	1. Check if all inverters are powered on; 2. Check if each phase in the three-phase group is connected to an inverter;

Fault Name	Fault Cause	Troubleshooting Recommendation
EPO	External hardware EPO button triggered or remote EPO command triggered	1. If it was triggered intentionally via remote shutdown, it can be ignored; 2. If not intentionally triggered, please contact the distributor or after-sales service center.
High Combustible Gas Concentration	Automatically triggered when the combustible gas device detects a concentration of 20% LEL or higher	1. After the fault occurs, the machine will automatically open the air valve to exhaust and reduce the concentration. The fault will clear automatically after the concentration remains below 5% LEL for 15 minutes. 2. If a cluster-level fire protection fault is triggered after this fault occurs, the air valve will automatically close. Confirm the air valve status within 30s to ensure the cluster-level fire protection operates in an enclosed space. 3. Please contact the distributor or after-sales service center.
Air Valve Open Signal Mismatch with Feedback Signal (Combustible Gas Device)	Control signal to open the air valve does not match the feedback signal	1. Check the harness signal connection for issues. 2. Please contact the distributor or after-sales service center.
One-Key Shutdown	Check via the App if the one-key shutdown function is enabled	Disable the one-key shutdown.

Fault Name	Fault Cause	Troubleshooting Recommendation
Offline Shutdown	-	-
Remote Shutdown	-	-
On-Grid SPD Fault	-	1. Try restarting the machine and observe if the fault clears; 2. If the fault persists after restart, please contact the distributor or after-sales service center.
Off-Grid SPD Fault	-	1. Try restarting the machine and observe if the fault clears; 2. If the fault persists after restart, please contact the distributor or after-sales service center.
Child Node Communication Failure	Internal Comm Abnormal	1. Try restarting the machine and observe if the fault clears; 2. If the fault persists after restart, please contact the distributor or after-sales service center.
Dehumidifier Communication Fault	Communication link abnormality between the dehumidifier and the LC control box	1. Check the communication harness for the link, observe if the fault clears; 2. Try restarting the machine, observe if the fault clears; 3. If the fault persists after restart, please contact the distributor or after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendation
Combustible Gas Detection Device Communication Fault	1. The combustible gas device left the factory with an incorrect 485 address configuration (not set to 2). 2. Communication link abnormality between the combustible gas device and the LC control box	1. Check the communication harness for the link, observe if the fault clears; 2. Try restarting the machine, observe if the fault clears; 3. Use the method provided by the combustible gas device manufacturer to check if the device address is 2. If not, modify it; 4. If the fault persists after restart, please contact the distributor or after-sales service center.
DG Communication Failure	Communication link abnormality between the control board and the diesel generator	1. Check the communication harness for the link, observe if the fault clears; 2. Try restarting the machine, observe if the fault clears; 3. If the fault persists after restart, please contact the distributor or after-sales service center.
Battery Over Voltage	1. Single cell voltage too high 2. Voltage sensing line abnormality	Record the fault phenomenon, restart the battery, wait a few minutes, confirm if the fault disappears. If the problem persists after restart, please contact the after-sales service center.
	1. Total battery voltage too high 2. Voltage sensing line abnormality	
Battery Undervoltage	1. Single cell voltage too low 2. Voltage sensing line abnormality	

Fault Name	Fault Cause	Troubleshooting Recommendation
	1. Total battery voltage too low 2. Voltage sensing line abnormality	
Battery Overcurrent	1. Charging current too high, battery current limiting abnormality: sudden changes in temperature and voltage values 2. Inverter response abnormality	
	Battery discharge current too high	
Battery Overtemperature	1. Ambient Overtemperature 2. Temperature sensor abnormality	
Battery Undertemperature	1. Ambient temperature too low 2. Temperature sensor abnormality	
Battery Terminal Overtemperature	Terminal temperature too high	

Fault Name	Fault Cause	Troubleshooting Recommendation
Battery Imbalance	1. Excessive temperature difference. At different stages, the battery will limit its power, i.e., limit charge/discharge current. Therefore, this issue is generally difficult to occur. 2. Cell capacity degradation leads to excessive internal resistance, causing large temperature rise during overcurrent and thus large temperature difference. 3. Poor welding of cell tabs leads to rapid cell temperature rise during overcurrent. 4. Temperature sampling issue; 5. Power cable connection looseness	

Fault Name	Fault Cause	Troubleshooting Recommendation
	1. Inconsistent cell aging levels 2. Slave board chip issues can also cause excessive cell voltage difference; 3. Slave board balancing issues can also cause excessive cell voltage difference 4. Caused by harness issues	
Insulation Resistance	Insulation resistance damaged	Check if the ground wire is properly connected, restart the battery. If the problem persists after restart, please contact the after-sales service center.
Pre-charging Failure	Pre-charging Failure	Indicates that during pre-charging, the voltage across the pre-charge MOS always exceeds the specified threshold. Power off and restart to observe if the fault persists. Check if wiring is correct and if the pre-charge MOS is damaged.
Sensing Line Fault	Battery sensing line poor contact or disconnected	Check wiring, restart the battery. If the problem persists after restart, please contact the after-sales service center.
	Cell voltage sensing line poor contact or disconnected	Check wiring, restart the battery. If the problem persists after restart, please contact the after-sales service center.
	Cell temperature sensing line poor contact or disconnected	

Fault Name	Fault Cause	Troubleshooting Recommendation
	Dual-channel current comparison error too large, or current sensing line circuit abnormal	
	Dual-channel voltage comparison error too large or MCU vs AFE voltage comparison error too large, or voltage sensing line circuit abnormal	
	Temperature sensing line circuit abnormal or poor contact/disconnected	
	Overvoltage level 5 or overtemperature level 5, tripping the three-terminal fuse	The three-terminal fuse is blown, contact the after-sales service center to replace the main control board.
Relay or MOS Overtemperature	Relay or MOS overtemperature	This fault indicates the MOSFET temperature exceeds the specified threshold. Power off and let it sit for 2h for temperature recovery.
Shunt Overtemperature	Shunt overtemperature	This fault indicates the shunt temperature exceeds the specified threshold. Power off and let it sit for 2h for temperature recovery.

Fault Name	Fault Cause	Troubleshooting Recommendation
BMS1 Other Fault 1 (Residential Storage)	Relay or MOS open circuit	1. Upgrade software, power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If it persists, replace the battery pack
	Relay or MOS short circuit	1. Upgrade software, power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If it persists, replace the battery pack
	Communication abnormal between master cluster and slave cluster, or cell inconsistency between clusters	1. Check the slave unit's battery information and software version, and if the communication cable connection to the master unit is normal 2. Upgrade software
	Battery system loop harness abnormal, causing interlock signal not to form a loop	Check if the terminal resistor is installed correctly
	BMS to PCS communication abnormal	1. Confirm if the communication cable interface definition between the inverter and the connected battery is correct; 2. Please contact the after-sales service center to check backend data and observe if the inverter and battery software match correctly.
	BMS master control to slave control communication harness abnormal	1. Check wiring, restart the battery; 2. Upgrade battery firmware, if the problem persists after restart, please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendation
	Communication loss between main negative chips	
	Circuit breaker, shunt trip abnormal	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. Observe the PACK and PCU bottom blind-mate connectors, check if communication pins are loose or bent;
	MCU self-test failure	Upgrade software, restart the battery. If the problem persists after restart, contact the after-sales service center.
	1. Software version too low or BMS board damaged 2. Large number of inverters in parallel, excessive inrush current during battery pre-charge	1. Upgrade software, observe if the fault persists. 2. For parallel systems, black-start the battery first, then start the inverters.
	MCU internal fault	Upgrade software, restart the battery. This usually indicates MCU or external component damage. If the problem persists after restart, please contact the after-sales service center.
	Total control current exceeds specified threshold	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. Check if the inverter power setting is too high, exceeding the bus load capacity;
	Cell inconsistency in parallel battery clusters	Confirm if the cells in the parallel battery clusters are consistent.

Fault Name	Fault Cause	Troubleshooting Recommendation
	Reverse polarity connection of parallel battery clusters	Check if the positive and negative terminals of the parallel battery clusters are reversed.
	Severe overtemperature/overvoltage etc. triggering the fire protection system	Contact the after-sales service center.
Air Conditioner Failure	Air conditioner abnormal failure	Try restarting the system. If the fault is not resolved, please contact the after-sales service center.
	Cabinet door not closed	Check if the cabinet door is properly closed
	Supply voltage too high	Confirm if the supply voltage meets the air conditioner input voltage requirements. Confirm compliance before reapplying power.
	Insufficient supply voltage	
	No voltage input	
	Unstable supply voltage	
	Compressor voltage unstable	Try restarting the system. If the fault is not resolved, please contact the after-sales service center.
	Sensor poor contact or damaged	
	Air conditioner fan abnormal	
	DCDC internal voltage or current abnormality	Refer to specific DC fault content.

Fault Name	Fault Cause	Troubleshooting Recommendation
BMS1 Other Fault 2 (Residential Storage)	DCDC overload or heatsink overtemperature, etc.	
	Cell sensing abnormality or inconsistent aging levels	Please contact the after-sales service center.
	Fan action not executed normally	Please contact the after-sales service center.
	Output port screw loose or poor contact	1. Power off the battery, check wiring and output port screw condition. 2. After confirmation, restart the battery, observe if the fault persists. If it persists, please contact the after-sales service center.
	Battery used for too long or cells severely damaged	Please contact the after-sales service center to replace the pack.
	1. Software version too low or BMS board damaged 2. Large number of inverters in parallel, excessive inrush current during battery pre-charge	1. Upgrade software, observe if the fault persists. 2. For parallel systems, black-start the battery first, then start the inverters.
	Heating film damaged	Please contact the after-sales service center.
	Heating film three-terminal fuse blown, heating function unavailable	Please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendation
	Software model, Cell Type, hardware model mismatch	Check if the software model, SN, Cell Type, and hardware model are consistent. If not, please contact the after-sales service center.
	Thermal management board communication wire break	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If the fault does not recover, contact after-sales to replace the pack.
	Pack fan fault signal triggered	
DCDC Fault	Output port voltage too high	Check the output port voltage. If the output port voltage is normal and the fault does not clear itself after restarting the battery, please contact the after-sales service center.
	DCDC module detects battery voltage exceeds maximum charging voltage	Stop charging, discharge to below 90% SOC or let it sit for 2h. If ineffective and the fault persists after restart, please contact the after-sales service center.
	Heatsink overtemperature	Let the battery sit for 1h for heatsink temperature to drop. If ineffective and the fault persists after restart, please contact the after-sales service center.
	Battery discharge current too high	Check if the load exceeds the battery's discharge capability. Turn off the load or stop PCS operation for 60s. If ineffective and the fault persists after restart, please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendation
	Output port power harness positive/negative reversed with parallel battery clusters or PCS	Turn off the battery manual switch, check if the output port wiring is correct, restart the battery.
	Output power relay cannot close	Check if the output port wiring is correct, check for short circuits. If ineffective and the fault persists after restart, please contact the after-sales service center.
	Power device overtemperature	Let the battery sit for 1h for internal power device temperature to drop. If ineffective and the fault persists after restart, please contact the after-sales service center.
	Relay welded/stuck	If the fault persists after restart, please contact the after-sales service center.
Battery Rack Circulating Current Failure	1. Cell imbalance 2. First power-on without full charge calibration	Record the fault phenomenon, restart the battery, wait a few minutes, confirm if the fault disappears. If the problem persists after restart, please contact the after-sales service center.
BMS1 Other Fault 3 (Utility Storage)	Communication abnormal with linux module	1. Check if the communication cable connection is normal 2. Upgrade software, restart the battery and observe if the fault persists. If it persists, please contact the after-sales service center.
	Cell temperature rise too fast	Cell abnormal, contact after-sales to replace the pack.
	SOC below 10%	Charge the battery.
	SN writing does not conform to rules	Check if the SN digit count is normal. If abnormal, please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendation
	1. Daisy-chain communication abnormal within battery cluster 2. Inconsistent cell aging levels between battery clusters	1. Check the pack contact condition within a single battery cluster 2. Confirm the usage status of each cluster battery, such as cumulative charge/discharge capacity, cycle count, etc. 3. Please contact the after-sales service center.
	High humidity inside pack	-
	Fuse blown	Contact after-sales to replace the pack.
	Battery low power	Charge the battery.
BMS1 Other Fault 4 (Utility Storage)	Circuit breaker abnormal	Contact after-sales to replace the pack.
	External device abnormal	Contact after-sales to replace the pack.
Contactor Failure 1	-	-
Contactor Failure 2	-	-
Overload Protection (Ksic)	Sustained overload (exceeding 690KVA) for 10s	Please contact the after-sales service center.
Overload Protection (Smart Port)	Sustained overload (exceeding 690KVA) for 10s	Please contact the after-sales service center.
Overcurrent Protection (Ksic)	-	-

Fault Name	Fault Cause	Troubleshooting Recommendation
Overcurrent Protection (Smart Port)	-	-
Master AC On Meter Comm Error	1. Possibly the meter is not connected to the master unit 2. Possibly the meter communication cable is loose	1. Check if the meter is connected to the master unit 2. Check if the meter communication cable is loose
Parallel Slave Meter Error	Meter connected to slave unit	Set the machine with the meter connected as the master unit
Slave AC On Timeout with Master	1. Slave address setting error 2. Slave communication cable loose	1. Check if slave addresses are duplicated 2. Check if the parallel communication cable is loose

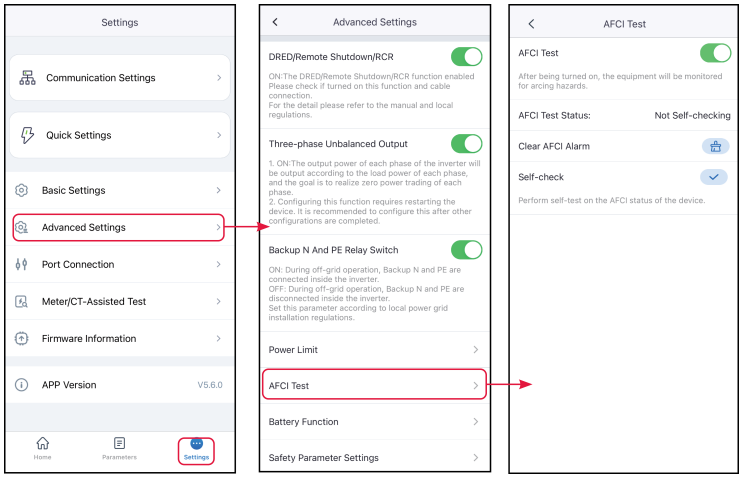
8.5.3 Post-Fault Clearance Processing

In energy storage systems, after some faults are handled, post-processing is required for the system to resume normal operation.

8.5.3.1 Clear AFCI Fault Warning

[Software Used]: SolarGo APP
[Clear Method]:

1. Navigate to **[Home]** > **[Settings]** > **[Advanced Settings]** > **[DC Arc Detection]**.
2. Click the **[Clear AFCI Fault Alarm]** button.



8.5.4 Lynx Home D Battery Fault

When a fault occurs in the battery system, it may cause the battery system to shut down automatically or result in abnormal functionality. Please follow the troubleshooting methods below. If these methods do not resolve the issue, 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. Battery information, such as: serial number, software version, device installation time, fault occurrence time, fault frequency, etc.
2. Device installation environment, such as: weather conditions, etc. It is recommended to provide photos, videos, and other files of the installation environment to assist in problem analysis.
3. When an alarm or fault occurs, only the multi-function button indicator light on the main battery flashes or stays lit.
4. In a multi-battery system, the battery with the smaller SN value is the main battery by default. The installation order of the batteries does not affect the master-slave relationship.

Multi-function Button Indicator	SOC Indicator	Fault Category	Solution
 Constantly On	○○○○●	Battery Overvoltage	Power off and leave idle for 2 hours. If the problem persists after restarting, please contact the after-sales service center.
 Constantly On	○○○●○	Battery Undervoltage	Please contact the after-sales service center.
 Constantly On	○○○●●	High Cell Temperature	Power off and leave idle for 2 hours. If the problem persists after restarting, please contact the after-sales service center.
 Constantly On	○○●○○	Low Charging Temperature	Power off and wait for the temperature to recover. If the problem persists after restarting, please contact the after-sales service center.
 Constantly On	○○●○●	Low Discharging Temperature	Power off and wait for the temperature to recover. If the problem persists after restarting, please contact the after-sales service center.
 Constantly On	○○●●○	Charging Overcurrent	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.

Multi-function Button Indicator	SOC Indicator	Fault Category	Solution
 Constantly On	○○●●●	Discharging Overcurrent	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
 Constantly On	○●○○●	Excessive Temperature Difference	Power off and leave idle for 2 hours. If the problem persists after restarting, please contact the after-sales service center.
 Constantly On	○●○●●	Excessive Cell Voltage Difference	Restart the battery and leave it idle for 12 hours. If the problem persists, please contact the after-sales service center.
 Constantly On	○●●○●	Harness Abnormality	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
 Constantly On	○●●●○	MOSFET Unable to Close	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
 Constantly On	○●●●●	MOSFET Sticking	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.

Multi-function Button Indicator	SOC Indicator	Fault Category	Solution
 Constantly On	●○○○○	Parallel Cluster Fault	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.
 Constantly On	●○○●○	BMU Communication Fault	Restart the battery. If the problem persists after restarting, please contact the after-sales service center.

9 technical parameter

9.1 Inverter Parameters

Technical Data	GW15K-ET	GW20K-ET	GW25K-ET	GW29.9K-ET	GW30K-ET
Battery Input Data					
Battery Type	Li-Ion	Li-Ion	Li-Ion	Li-Ion	Li-Ion
Nominal Battery Voltage (V)	500	500	500	500	500
Battery voltage range (V)	200~800	200~800	200~800	200~800	200~800
Start-up Voltage (V)	200	200	200	200	200
Number of Battery Input	1	1	2	2	2
Max. Continuous Charging Current (A)	50	50	50×2	50×2	50×2
Max. Continuous Discharging Current (A)	50	50	50×2	50×2	50×2
Max Charge Power (W)	15000	20000	25000	30000	30000
Max Discharge Power (W)	15000	20000	25000	30000	30000
PV String Input Data					
Max. Input Power (W)*1	22500	30000	37500	45000	45000
Max. Input Voltage (V)*2	1000	1000	1000	1000	1000
MPPT Operating Voltage Range (V)	200~850	200~850	200~850	200~850	200~850
MPPT Voltage Range at Nominal Power (V)	400~850	400~850	450~850	450~850	450~850
Start-up Voltage (V)	200	200	200	200	200

Technical Data	GW15K-ET	GW20K-ET	GW25K-ET	GW29.9K-ET	GW30K-ET
Nominal Input Voltage (V)	620	620	620	620	620
Max. Input Current per MPPT (A)	30	30	30	30	30
Max. Short Circuit Current per MPPT (A)	38	38	38	38	38
Max. Backfeed Current to The Array (A)	0	0	0	0	0
Number of MPPT	2	2	3	3	3
Number of Strings per MPPT	2/2	2/2	2/2/2	2/2/2	2/2/2
AC Output Data (On-grid)					
Nominal Output Power (W)	15000	20000	25000	29900	30000
Max. Output Power (W)	15000	20000	25000	29900	30000
Nominal Output Power at 40 ℃(W) *14	15000	20000	25000	29900	30000
Max. Output Power at 40 ℃ (W)*14	15000	20000	25000	29900	30000
Nominal Apparent Power Output to Utility Grid (VA)	15000	20000	25000	29900	30000
Max. Apparent Power Output to Utility Grid (VA)*3 *15	16500	22000	27500	29900	33000
Nominal Apparent Power from Utility Grid(VA)	15000	20000	25000	30000	30000
Max. Apparent Power from Utility Grid (VA) *12	15000	20000	25000	30000	30000

Technical Data	GW15K-ET	GW20K-ET	GW25K-ET	GW29.9K-ET	GW30K-ET
Nominal Output Voltage (V)	380/400, 3L/N/PE	380/400, 3L/N/PE	380/400, 3L/N/PE	380/400, 3L/N/PE	380/400, 3L/N/PE
Output Voltage Range (V)*4	0~300	0~300	0~300	0~300	0~300
Nominal AC Grid Frequency (Hz)	50/60	50/60	50/60	50/60	50/60
AC Grid Frequency Range (Hz)	45~65	45~65	45~65	45~65	45~65
Max. AC Current Output to Utility Grid (A) *11	23.9	31.9	39.9	43.3	47.8
Max. AC Current From Utility Grid (A) *13	22.7	30.3	37.9	45.3	45.5
Nominal AC Current From Utility Grid (A)	21.7 @230V 22.7 @220V	29.0 @230V 30.3 @220V	36.2 @230V 37.9 @220V	43.3 @230V 45.3 @220V	43.5 @230V 45.5 @220V
Max. Output Fault Current (Peak and Duration) (A)	241.5A@126ms	241.5A@126ms	241.5A@126ms	241.5A@126ms	241.5A@126ms
Inrush Current (Peak and Duration) (A)	264A@53us	264A@53us	264A@53us	264A@53us	264A@53us
Nominal Output Current (A)*5	21.7	29	36.2	43.3	43.5

Technical Data	GW15K-ET	GW20K-ET	GW25K-ET	GW29.9K-ET	GW30K-ET
Power Factor	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)
Max. Total Harmonic Distortion	≤3.05%	≤3.05%	≤3.05%	≤3.05%	≤3.05%
Maximum Output Overcurrent Protection (A)	94	94	94	94	94
AC Output Data (Back-up)					
Back-up Nominal Apparent Power (VA)	15000	20000	25000	29900	30000
Max. Output Apparent Power without Grid(VA)*6	15,000(18,000@60s , 24,000@3s)	20,000(24,000@60s , 32,000@3s)	25,000(30,000@60s)	30,000(36,000@60s)	30,000(36,000@60s)
Max. Output Apparent Power with Grid (VA)	15000	20000	25000	29900	30000
Nominal Output Current (A)	22.7	30.3	37.9	45.5	45.5
Max. Output Current (A)	22.7(27.3@60s, 36.4@3s)	30.3(36.4@60s, 48.5@3s)	37.9(45.5@60s)	45.5(54.5@60s)	45.5(54.5@60s)
Max. Output Fault Current (Peak and Duration) (A)	94	94	94	94	94

Technical Data	GW15K-ET	GW20K-ET	GW25K-ET	GW29.9K-ET	GW30K-ET
Inrush Current (Peak and Duration) (A)	264@53 us	264@53 us	264@53 us	264@53 us	264@53 us
Maximum Output Overcurrent Protection (A)	94	94	94	94	94
Nominal Output Voltage (V)	380/400	380/400	380/400	380/400	380/400
Nominal Output Frequency (Hz)	50/60	50/60	50/60	50/60	50/60
Output THDv (@Linear Load)	<3%	<3%	<3%	<3%	<3%
Efficiency					
Max. Efficiency	98.0%	98.0%	98.0%	98.0%	98.0%
European Efficiency	97.5%	97.5%	97.5%	97.5%	97.5%
Max. Battery to AC Efficiency	97.5%	97.5%	97.5%	97.5%	97.5%
MPPT Efficiency	99.9%	99.9%	99.9%	99.9%	99.9%
Protection					
PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated

Technical Data	GW15K-ET	GW20K-ET	GW25K-ET	GW29.9K-ET	GW30K-ET
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated	Integrated
DC Switch*7	Integrated	Integrated	Integrated	Integrated	Integrated
DC Surge Protection	Type II	Type II	Type II	Type II	Type II
AC Surge Protection	Type III	Type III	Type III	Type III	Type III
AFCI*16	Optional	Optional	Optional	Optional	Optional
Rapid Shutdown	Optional	Optional	Optional	Optional	Optional
Remote Shutdown	Integrated	Integrated	Integrated	Integrated	Integrated
General Data					
Operating Temperature Range (℃)	-35~+60	-35~+60	-35~+60	-35~+60	-35~+60
Operating Environment	Outdoor	Outdoor	Outdoor	Outdoor	Outdoor
Relative Humidity	0 ~ 95%	0 ~ 95%	0 ~ 95%	0 ~ 95%	0 ~ 95%
Max. Operating Altitude (m)	4000	4000	4000	4000	4000
Cooling Method	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling

Technical Data	GW15K-ET	GW20K-ET	GW25K-ET	GW29.9K-ET	GW30K-ET
Display	LED, WLAN+APP	LED, WLAN+APP	LED, WLAN+APP	LED, WLAN+APP	LED, WLAN+APP
Communication with BMS	RS485 / CAN	RS485 / CAN	RS485 / CAN	RS485 / CAN	RS485 / CAN
Communication with Meter	RS485	RS485	RS485	RS485	RS485
Communication with Portal	WiFi+LAN+Bluetooth	WiFi+LAN+Bluetooth	WiFi+LAN+Bluetooth	WiFi+LAN+Bluetooth	WiFi+LAN+Bluetooth
Weight (kg)	48	48	54	54	54
Dimension W×H×D (mm)	520×660×220	520×660×220	520×660×220	520×660×220	520×660×220
Noise Emission (dB)	<45	<45	<45	<60	<60
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W) *8	<15	<15	<15	<15	<15
Ingress Protection Rating	IP66	IP66	IP66	IP66	IP66
DC Connector	Stäubli Electrical Connectors AG	Stäubli Electrical Connectors AG	Stäubli Electrical Connectors AG	Stäubli Electrical Connectors AG	Stäubli Electrical Connectors AG
AC Connector	OT	OT	OT	OT	OT
Environmental Category	4K4H	4K4H	4K4H	4K4H	4K4H
Pollution Degree	III	III	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III

Technical Data	GW15K-ET	GW20K-ET	GW25K-ET	GW29.9K-ET	GW30K-ET
Protective Class	I	I	I	I	I
Storage Temperature (℃)	-45~+85	-45~+85	-45~+85	-45~+85	-45~+85
The Decisive Voltage Class (DVC)	Battery：C PV：C AC：C Com：A	Battery：C PV：C AC：C Com：A	Battery：C PV：C AC：C Com：A	Battery：C PV：C AC：C Com：A	Battery：C PV：C AC：C Com：A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	AFDPF + AQDPF *9	AFDPF + AQDPF *9	AFDPF + AQDPF *9	AFDPF + AQDPF *9	AFDPF + AQDPF *9
Type of Electrical Supply System	Three phase Grid	Three phase Grid	Three phase Grid	Three phase Grid	Three phase Grid
Country of Manufacture	China	China	China	China	China

*1: In Australia, for most PV modules, the max. input power can reach 2*Pn. For example, the max. input power of the GW15K-ET can reach 30000W. Furthermore, the Max. Input Power is not continuous for 1.5 times the normal power.
*2: For a 1000V system, the maximum operating voltage is 950V.
*3: According to local grid regulations.
*4: Output Voltage Range: phase voltage.
*5: For a 380V grid, the Nominal Output Current is 22.7A for the GW15K-ET, 30.3A for the GW20K-ET, 37.9A for the GW25K-ET, 45.3A for the GW29.9K-ET, and 45.5A for the GW30K-ET.
*6: Can only be reached if PV and battery power is sufficient.
*7: DC Switch: GHX6-55P (for Australia).
*8: No Backup Output.
*9: AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback.

*10: Not all certifications & standards are listed; check the official website for details.
*11: For a 380V grid, the Max. AC Current Output to Utility Grid is 25A for the GW15K-ET, 33.3A for the GW20K-ET, 41.7A for the GW25K-ET, 49.8A for the GW29.9K-ET, and 50A for the GW30K-ET.
*12: When the load is connected to the inverter's backup port, the Max. Apparent Power from Utility Grid can reach 22.5kVA for the GW15K-ET, 30kVA for the GW20k-ET, 33kVA for the GW25K-ET, 33kVA for the GW29.9K-ET, and 33kVA for the GW30K-ET respectively.
*13: When the load is connected to the inverter's backup port, the Max. AC Current From Utility Grid can reach 34A for the GW15K-ET, 45A for the GW20k-ET, 50A for the GW25K-ET, 50A for the GW29.9K-ET, and 50A for the GW30K-ET respectively.
*14: Nominal Output Power at 40 ℃(W) and Max. Output Power at 40 ℃ (W) are for Brazil only.
*15: For Austria, the Max. Output Power (W) is 15k for the GW15K-ET, 20k for the GW20K-ET, 25k for the GW25K-ET, 29.9k for the GW29.9K-ET, and 30k for the GW30K-ET.
*16: For Brazil, AFCI is integrated.

Technical Data	**GW12KL-ET**	**GW18KL-ET**	**GW20K-ET**	**GW30K-ET**
Battery Input Data				
Battery Type	Li-Ion	Li-Ion	Li-Ion	Li-Ion
Nominal Battery Voltage (V)	500	500	500	500
Battery Voltage Range (V)	112~650	112~650	200~800	200~800
Start-up Voltage (V)	112	112	180	180
Number of Battery Input	1	2	1	2
Max. Continuous Charging Current (A)	50	50*2	50	50*2
Max. Continuous Discharging Current (A)	50	50*2	50	50*2
Max Charge Power (kW)	12	18	20	30

Technical Data	GW12KL-ET	GW18KL-ET	GW20K-ET	GW30K-ET
Max Discharge Power (kW)	12	18	20	30
PV String Input Data				
Max. Input Power (kW)	24	36	30	45
Max. Input Voltage (V)*1	800	800	1000	1000
MPPT Operating Voltage Range (V)	200~650	200~650	200~850	200~850
MPPT Voltage Range at Nominal Power (V)	260~650	260~650	400~850	450~850
Start-up Voltage (V)	200	200	200	200
Nominal Input Voltage (V)	380	380	620	620
Max. Input Current per MPPT (A)	30	30	30	30
Max. Short Circuit Current per MPPT (A)	38	38	38	38
Max. Backfeed Current to The Array (A)	0	0	0	0
Number of MPPT Trackers	2	3	2	3
Number of Strings per MPPT	2/2	2/2/2	2/2	2/2/2
AC Output Data (On-grid)				
Nominal Output Power (kW)	12	18	20	30
Max. Output Power (kW)	12	18	20	30
Nominal Output Power at 40 ℃(kW) *8	12	18	20	30

Technical Data	GW12KL-ET	GW18KL-ET	GW20K-ET	GW30K-ET
Max. Output Power at 40 ℃ (kW)*8	12	18	20	30
Nominal Apparent Power Output to Utility Grid (kVA)	12	18	20	30
Max. Apparent Power Output to Utility Grid (kVA)	13.2	19.8	22	33
Nominal Apparent Power from Utility Grid(kVA)	12	18	20	30
Max. Apparent Power from Utility Grid (kVA) *6	12	18	20	30
Nominal Output Voltage (V)	220, 3L/N/PE	220, 3L/N/PE	380, 3L/N/PE	380, 3L/N/PE
Output Voltage Range (V)*2	0~165	0~165	0~300	0~300
Nominal AC Grid Frequency (Hz)	60	60	60	60
AC Grid Frequency Range (Hz)	55~65	55~65	45~65	45~65
Max. AC Current Output to Utility Grid (A)	34.6	52	33.3	50
Max. AC Current From Utility Grid (A) *7	31.5	47	30.3	45.5
Nominal AC Current From Utility Grid (A)	31.5	47	30.3	45.5
Max. Output Fault Current (Peak and Duration) (A)	241.5A@126 ms	241.5A@126 ms	241.5A@126 ms	241.5A@126 ms
Inrush Current (Peak and Duration) (A)	264A@53us	264A@53us	264A@53us	264A@53us

Technical Data	GW12KL-ET	GW18KL-ET	GW20K-ET	GW30K-ET
Nominal Output Current (A)	31.5	47	30.3	45.5
Power Factor	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)	~1 (Adjustable from0.8 leading~0.8 lagging)
Max. Total Harmonic Distortion	<3%	<3%	<3%	<3%
Maximum Output Overcurrent Protection (A)	94	94	94	94
AC Output Data (Back-up)				
Back-up Nominal Apparent Power (kVA)	12	18	20	30
Max. Output Apparent Power without Grid(kVA)*3	12.0(14.4@60s , 19.2@3s)	18.0(21.6@60s)	20.0(24.0@60s , 32.0@3s)	30.0(36.0@60s)
Max. Output Apparent Power with Grid (kVA)	12	18	20	30
Nominal Output Current (A)	31.5	47	30.3	45.5
Max. Output Current (A)	31.5(37.8@60s, 50.4@3s)	47(56.4@60s)	30.3(36.4@60s, 48.5@3s)	45.5(54.5@60s)
Max. Output Fault Current (Peak and Duration) (A)	94	94	94	94
Inrush Current (Peak and Duration) (A)	264@53us	264@53us	264@53us	264@53us

Technical Data	GW12KL-ET	GW18KL-ET	GW20K-ET	GW30K-ET
Maximum Output Overcurrent Protection (A)	94	94	94	94
Nominal Output Voltage (V)	220, 3L/N/PE	220, 3L/N/PE	380, 3L/N/PE	380, 3L/N/PE
Nominal Output Frequency (Hz)	60	60	60	60
Output THDv (@Linear Load)	<3%	<3%	<3%	<3%
Switching from Grid Connected Mode to Standalone Mode	20ms	20ms	20ms	20ms
Switching from standalone mode to Grid connected mode	20ms	20ms	20ms	20ms
Efficiency				
Max. Efficiency	98.0%	98.0%	98.0%	98.0%
European Efficiency	97.5%	97.5%	97.5%	97.5%
Max. Battery to AC Efficiency	97.5%	97.5%	97.5%	97.5%
Protection				
PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated

Technical Data	GW12KL-ET	GW18KL-ET	GW20K-ET	GW30K-ET
PV Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated
Battery Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated	Integrated
DC Surge Protection	Type II	Type II	Type II	Type II
AC Surge Protection	Type III	Type III	Type III	Type III
AFCI	Integrated	Integrated	Integrated	Integrated
Rapid Shutdown	Optional	Optional	Optional	Optional
Remote Shutdown	Integrated	Integrated	Integrated	Integrated
General Data				
Operating Temperature Range (℃)	-35~+60	-35~+60	-35~+60	-35~+60
Storage Temperature (℃)	-45~+85	-45~+85	-45~+85	-45~+85
Relative Humidity	0 ~ 95%	0 ~ 95%	0 ~ 95%	0 ~ 95%
Max. Operating Altitude (m)	4000	4000	4000	4000
Cooling Method	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling

Technical Data	GW12KL-ET	GW18KL-ET	GW20K-ET	GW30K-ET
User Interface	LED, WLAN+APP	LED, WLAN+APP	LED, WLAN+APP	LED, WLAN+APP
Communication with BMS	RS485 / CAN	RS485 / CAN	RS485 / CAN	RS485 / CAN
Communication	RS485, WiFi+LAN+Bluetooth, 4G+Bluetooth(Optional)	RS485, WiFi+LAN+Bluetooth, 4G+Bluetooth(Optional)	RS485, WiFi+LAN+Bluetooth, 4G+Bluetooth(Optional)	RS485, WiFi+LAN+Bluetooth, 4G+Bluetooth(Optional)
Communication Protocols	Modbus-RTU (SunSpec Compliant), Modbus-TCP	Modbus-RTU (SunSpec Compliant), Modbus-TCP	Modbus-RTU (SunSpec Compliant), Modbus-TCP	Modbus-RTU (SunSpec Compliant), Modbus-TCP
Weight (kg)	48	54	48	54
Dimension W×H×D (mm)	520×660×220	520×660×220	520×660×220	520×660×220
Noise Emission (dB)	<45	<60	<45	<60
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W) *4	<15	<15	<15	<15
Ingress Protection Rating	IP66	IP66	IP66	IP66
Anti-corrosion Class	C4	C4	C4	C4
DC Connector	MC4	MC4	MC4	MC4
AC Connector	OT	OT	OT	OT
Environmental Category	4K4H	4K4H	4K4H	4K4H
Pollution Degree	III	III	III	III

Technical Data	GW12KL-ET	GW18KL-ET	GW20K-ET	GW30K-ET
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I	I
The Decisive Voltage Class (DVC)	Battery：C PV：C AC：C Com：A	Battery：C PV：C AC：C Com：A	Battery：C PV：C AC：C Com：A	Battery：C PV：C AC：C Com：A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	FDPF + AQDPF *5	FDPF + AQDPF *5	AFDPF + AQDPF *5	AFDPF + AQDPF *5
Type of Electrical Supply System	Three phase Grid	Three phase Grid	Three phase Grid	Three phase Grid
Country of Manufacture	China	China	China	China

*1: For a 1000V system, the maximum operating voltage is 950V.
*2: Output Voltage Range: phase voltage.
*3: Can only be reached if PV and battery power is sufficient.
*4: No Backup Output.
*5: AFDPF: Active Frequency Drift with Positive Feedback, AQDPF: Active Q Drift with Positive Feedback.
*6: When the load is connected to the inverter’s backup port, the Max. Apparent Power from Utility Grid can reach 18kVA for the GW12KL-ET, 19.8kVA for the GW18KL-ET, 30kVA for the GW20k-ET, and 33kVA for the GW30K-ET respectively.
*7: When the load is connected to the inverter’s backup port, the Max. AC Current From Utility Grid can reach 47.2 A for the GW12KL-ET and 52A for the GW18KL-ET; and can reach 45A for the GW20k-ET and 50A for the GW30K-ET respectively.
*8: Nominal Output Power at 40 ℃(W) and Max. Output Power at 40 ℃ (W) are for Brazil only.

9.2 Battery Parameters

9.2.1 Lynx home F

Technical parameters	LX F6.6-H	LX F9.8-H	LX F13.1-H	LX F16.4-H
Usable Energy(kWh)*1	6.55	9.83	13.1	16.38
Battery Module	LX F3.3-H: 38.4V 3.27kWh			
Number of Modules	2	3	4	5
Cell Type	LFP（$LiFePO_4$）			
Cell Configuration	64S1P	96S1P	128S1P	160S1P
Nominal Voltage (V)	204.8	307.2	409.6	512
Operating Voltage Range (V)	182.4~230.4	273.6~345.6	364.8~460.8	456~576
Nominal Dis-/Charge Current(A)*2	25			
Nominal Power (kW)*2	5.12	7.68	10.24	12.8
Operating Temperature (℃)	Charge: 0 ~ +50; Discharge: -20 ~ +50			
Relative Humidity	0~95%			
Max. Operating Altitude (m)	2000			
Communication	CAN			
Weight (kg)	115	158	201	244
Dimensions (W×H×D mm)	600*625*380	600*780*380	600*935*380	600*1090*380
Enclosure Type	IP55			

Technical parameters		LX F6.6-H	LX F9.8-H	LX F13.1-H	LX F16.4-H
Installation Location		Grounded			
Standard and Certification	Safety	IEC62619, IEC62040, CEC			
	EMC	CE，RCM			
	Transportation	UN38.3			
*1: Test conditions, 100% DOD, 0.2℃ charge & discharge at +25±2 °C for battery system at beginning life. System Usable Energy may vary with different Inverter. *2: Nominal Dis-/Charge Current and power derating will occur related to Temperature and SOC.					

9.2.2 Lynx home F Plus+

Technical parameters	LX F6.6-H	LX F9.8-H	LX F13.1-H	LX F16.4-H
Usable Energy(kWh)*1	6.55	9.83	13.10	16.38
Battery Module	LX F3.3-H: 38.4V 3.27kWh			
Number of Modules	2	3	4	5
Cell Type	LFP($LiFePO_4$)			
Cell Configuration	64S1P	96S1P	128S1P	160S1P
Nominal Voltage (V)	204.8	307.2	409.6	512
Operating Voltage Range (V)	182.4~230.4	273.6~345.6	364.8~460.8	456~576
Nominal Dis-/Charge Current (A)*2	25			

Technical parameters		LX F6.6-H	LX F9.8-H	LX F13.1-H	LX F16.4-H
Nominal Power (kW)*2		5.12	7.68	10.24	12.8
Operating Temperature (°C)		Charge: 0 ~ +50; Discharge: -20 ~ +50			
Relative Humidity		0~95%			
Max. Operating Altitude (m)		2000			
Communication		CAN			
Weight (kg)		115	158	201	244
Dimensions (W×H×D mm)		600*610*380	600*765*380	600*920*380	600*1075*380
Enclosure Type		IP55			
Storage Temperature (°C)		-20 ~ +45 (≤ One Month); 0 ~ +35 (< One Year)			
Mounting Method		Grounded			
Round-trip Efficiency		96.4%			
Cycle Life		≥ 3500 @1C/1C			
Standard and Certification	Safety	IEC62619, IEC 62040, VDE2510-50, CEC			
	EMC	CE, RCM			
	Transportation	UN38.3			

*1: Test conditions: 100% DOD, 0.2C charge & discharge at +25±2 °C for the battery system at beginning of life.
System Usable Energy may vary with different inverters.
*2: Nominal Dis-/Charge Current and power derating will occur depending on Temperature and SOC.
*3: Based on 2.5~3.65V voltage range @25±2°C of the cell under 1C/1C test condition and 80% EOL.

9.2.3 Lynx home F G2

Technical Data	LX F6.4-H-20	LX F9.6-H-20	LX F12.8-H-20	LX F16.0-H-20	LX F19.2-H-20	LX F22.4-H-20	LX F25.6-H-20	LX F28.8-H-20
Usable Energy (kWh)*1	6.4	9.6	12.8	16.0	19.2*2	22.4*2	25.6	28.8
Battery Module	LX F3.2-20：64V 3.2kWh							
Number of Modules	2	3	4	5	6	7	8	9
Cell Type	LFP ($LiFePO_4$)							
Cell Configuration	(20S)2S1P	(20S)3S1P	(20S)4S1P	(20S)5S1P	(20S)6S1P	(20S)7S1P	(20S)8S1P	(20S)9S1P
Nominal Voltage (V)	128	192	256	320	384	448	512	576
Operating Voltage Range (V)	114.8~144.4	172.2~216.6	229.6~288.8	287~361	344.4~433.2	401.8~505.4	459.2~577.6	516.6~649.8
Nominal Dis-/Charge Current (A)*3	35							
Max. Continuous Dis-/Charge Current (A)	35							
Nominal Power (kW)*3	4.48	6.72	8.96	11.2	13.44	15.68	17.92	20.16

Technical Data		LX F6.4-H-20	LX F9.6-H-20	LX F12.8-H-20	LX F16.0-H-20	LX F19.2-H-20	LX F22.4-H-20	LX F25.6-H-20	LX F28.8-H-20
Operating Temperature Range (℃)*4		-20~+50							
Relative Humidity		0 ~ 95%							
Max. Operating Altitude (m)		3000							
Communication		CAN							
Weight (kg)		86	120	154	188	222	256	290	324
Dimensions (W×H×D mm)		600×559×380	600×715×380	600×871×380	600×1027×380	600×1183×380	600×1339×380	600×1495×380	600×1651×380
Ingress Protection Rating		IP55							
Storage Temperature (℃)		-20~+45(≤One Month) ; 0~+35(≤One Year)							
Mounting Method		Grounded							
Round-trip Efficiency		94%							
Cycle Life*5		> 4000							
	Safety	IEC62619、IEC62040-1、IEC63056、VDE2510、 CE							
	EMC	CE, RCM							

Technical Data		LX F6.4-H-20	LX F9.6-H-20	LX F12.8-H-20	LX F16.0-H-20	LX F19.2-H-20	LX F22.4-H-20	LX F25.6-H-20	LX F28.8-H-20
Standard and Certification	Transportation	UN38.3							

9.2.4 Lynx home D

Technical parameters		LX D5.0-10
Usable energy (kWh)*1		5
Cell Type		LFP (LiFePO4)
Cell Configuration		16S1P
Nominal Voltage (V)		Charge: 435V; Discharge: 380V
Operating Voltage Range (V)		320~480V
Nominal Charge/Discharge Power (kW)		3
Peak Power		5KW, 10s
Operating Temperature Range (℃)		Charge: 0~+53; Discharge: -20~+53
Relative Humidity		0~95%
Max. Operating Altitude (m)		4000
Communication		CAN
Weight (kg)		52
Dimension (W×H×D mm)		700×380×170
Ingress Protection Rating		IP66
Storage Temperature (℃)		-20~0 (≤ One Months), 0~+35 (≤ One Year)
Mounting Method		Floor stacked, Wall Mounted
Cycle Life *2		4500
Standard and Certification	Safety	IEC62619、IEC60730、VDE2510-50、 CE 、CEC
	EMC	CE, RCM

Technical parameters		LX D5.0-10
	Transportation	UN38.3
*1: Test conditions, 100% DOD, 0.2C charge & discharge at +25±3 °C for battery system at beginning life. Usable energy may vary with different inverter. *2: Based on 2.87~3.59V voltage rang @25+2 °C of Cell under 0.6C/0.6C test condition and 80% EOL		

9.3 Smart Meter Technical Data

9.3.1 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
Communication Parameters	Communication Method	RS485
	Communication Distance (m/ft)	1000/3280
Accuracy Parameters	voltage/current	Class 0.5
	Active Energy	Class 0.5
	Reactive Energy	Class 1
General Parameters	Dimensions (WxHxD mm/in)	72x85x72/2.83x3.35×2.83
	Housing	4 Module
	Weight (g/lb)	240/0.53
	Mounting Method	DIN Rail
	User Interface	4 LEDs, Reset Button
	Power Consumption (W)	≤5
	IP Rating	IP20

technical parameter		GM330
Environmental Parameters	Operating Temperature Range (℃/°F)	-30~+70/-22~+158
	Storage Temperature Range (℃/°F)	-30~70/-22~+158
	Relative Humidity (non-condensing)	0~95%
	Max. Operating Altitude (m/ft)	3000/9842
Certification Parameters	Certification	UL1741/ANSI

9.3.2 GM3000

Technical Parameter		GM3000
Application		Three-phase
Voltage	Nominal Voltage	3L+N/400V
	Voltage Range	100V~240V
	Frequency	50Hz/60Hz
Current	Rated Current	CT in: 120A/40mA;
	Current Range	0.48A~120A
Power Consumption		<3W
Data Detection		Voltage/Current/Active Power/Reactive Power/Power Factor/Frequency
Energy Calculation		Active/Reactive Power
Accuracy	Voltage/Current	Class I
	Active	Class I
	Reactive	Class II
Communication		RS485 (Max. Speed 9600/ModBus Protocol/Max. Cable Length 100m)
Display		LED, USB, Reset Button
Device	Dimensions (L x W x H mm)	36 x 85 x 66.5
	Weight (g)	450

	Ingress Protection Rating	IP20(Indoor)
	Mounting Method	Backplate Mounting
Operating Temperature		-25 ~ +60° C
Storage Temperature		-25 ~ +60° C
Humidity		<95% Non-condensing
Operating Altitude(m)		< 2000m
Safe Service Life (Years)		≥25

9.3.3 GMK330

model	GMK330
Measurement Range	
Supported Grid Types	1P2W/3P3W/3P4W
Operating voltage (Vac)*	3P4W: 90~264 L-N 3P3W: 90~264 L-L
Frequency (Hz)	50/60
CT ratio	120A: 40mA 200A: 50mA*
Number of CTs	3
Accuracy Parameters	
voltage/current	Class 0.5
Active Energy	Class 0.5
Reactive Energy	Class 1
Communication Parameters	
Communication Method	RS485
Communication Distance (m)	1000

model	GMK330
General Parameters	
Dimensions (W*H*D mm)	72*85*72
Housing	4-module
Weight (g)	240
Mounting Method	DIN rail
User Interface	4 LEDs, Reset button
Power Consumption (W)	< 5
Environmental Parameters	
IP Rating	IP20
Operating Temperature Range (℃)	-30-+70
Storage Temperature Range (℃)	-30-+70
Relative Humidity (non-condensing)	0-95%
Max. Operating Altitude (m)	3000

*Supports 1.1 times voltage input.
*The standard CT for the meter has been uniformly updated to the 120A:40mA specification. Meters equipped with the 200A:50mA specification CT will no longer be sold after June 2026.

9.4 Smart Dongle Technical Data

9.4.1 4G Kit-CN-G21

Product Model	4G Kit-CN-G21
Device Management	
Max. Supported Inverters	1
Power Parameters	
Input Voltage (V)	5
Power Consumption (W)	≤4
Interface	USB
Communication Parameters	
4G/3G/2G	LTE-FDD：B1/B3/B5/B8 LTE-TDD：B34/B39/B40/B41
GNSS Positioning	Beidou, GPS
Bluetooth	Bluetooth V5.0
Mechanical Parameters	
Dimensions (W×H×D mm)	48.3*95.5*32.1
Weight (g)	87
indicator	LED* 2
Mounting Method	Plug and Play
SIM Card Size	Micro sim, 15mm*12mm
Environmental Parameters	
Operating Temperature Range (℃)	-30~+65
Storage Temperature Range (℃)	-40~+70
Relative Humidity	0-100%
IP Rating	IP66
Max. Operating Altitude (m)	4000
Compliant Standards	
Certification	SRRC、CTA

9.4.2 4G Kit-CN-G20

Product Model	4G Kit-CN-G20
Device Management	
Max. Supported Inverter Quantity	1
Power Parameters	
Input Voltage (V)	5
Power Consumption (W)	≤4
Interface Method	USB
Communication Parameters	
4G/3G/2G	LTE-FDD：B1/B3/B5/B8 LTE-TDD：B34/B39/B40/B41
GNSS Positioning	/
Bluetooth	Bluetooth V5.0
Mechanical Parameters	
Dimensions (W×H×D mm)	48.3*95.5*32.1
Weight (g)	87
indicator	LED* 2
Mounting Method	Plug and Play
SIM Card Size	Micro sim, 15mm*12mm
Environmental Parameters	
Operating Temperature Range (℃)	-30~+65
Storage Temperature Range (℃)	-40~+70
Relative Humidity	0-100%
IP Rating	IP66
Max. Operating Altitude (m)	4000
Compliant Standards	
Certification	SRRC、CTA

9.4.3 WiFi/LAN Kit-20

technical parameter		WiFi/LAN Kit-20
Output Voltage (V)		5
Power Consumption (W)		≤2
Communication Interface		USB
Communication Parameters	Ethernet	10M/100Mbps Auto-negotiation
	Wireless	IEEE 802.11 b/g/n @2.4 GHz
	Bluetooth	Bluetooth V4.2 BR/EDR and Bluetooth LE Standard
Mechanical Parameters	Dimensions (Width × Height × Thickness mm)	48.3*159.5*32.1
	Weight (g)	82
	Ingress Protection Rating	IP65
	Mounting Method	USB Port Plug-and-Play
Operating Temperature Range (℃)		-30~+60
Storage Temperature Range (℃)		-40~+70
Relative Humidity		0-95%
Max. Operating Altitude (m)		4000

10 Appendix

10.1 FAQ

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

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

- Method 1:

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

- Method 2:

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

10.1.2 How to Upgrade the Device Version

Through the firmware information, you can view or upgrade:
The inverter's DSP version, ARM version, communication module software version, battery's BMS version, DCDC version, etc.

- **Prompt Upgrade:**

When the user opens the App, an 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 screen.
Tap "Check for Updates". If a new version is available, follow the on-screen

instructions to complete the upgrade.

- **Forced Upgrade:**

The App pushes upgrade information. The user must upgrade as prompted; otherwise, the App cannot be used. Follow the on-screen instructions to complete the upgrade.

Inverter Software Version Upgrade

- The inverter supports software upgrade via a U disk.
- Before using a U disk to upgrade the device, please contact the after-sales service center to obtain the software upgrade package and upgrade method.

10.2 Abbreviations

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

Abbreviation	English Description	Chinese Description
fAC,r	Nominal AC Grid Frequency	Nominal AC Grid Frequency
IAC,max(to grid)	Max. AC Current Output to Utility Grid	Max. AC Current Output to Utility Grid
IAC,max(from grid)	Max. AC Current From Utility Grid	Max. Current from Grid
P.F.	Power Factor	Power Factor
Sr	Back-up Nominal apparent power	Off-grid Nominal Apparent Power
Smax	Max. Output Apparent Power (VA) Max. Output Apparent Power without Grid	Max. Apparent Power to Grid
IAC,max	Max. Output Current	Max. Current to Grid
UAC,r	Nominal Output Voltage	Max. Output Voltage
fAC,r	Nominal Output Freqency	Nominal Output Voltage Frequency
Toperating	Operating Temperature Range	Operating Temperature Range
IDC,max	Max. Input Current	Max. Input Current
UDC	Input Voltage	Input Voltage
UDC,r	DC Power Supply	DC Input
UAC	Power Supply/AC Power Supply	Input Voltage Range/AC Input
UAC,r	Power Supply/Input Voltage Range	Input Voltage Range/AC Input
Toperating	Operating Temperature Range	Operating Temperature Range
Pmax	Max Output Power	Maximum Power
PRF	TX Power	Transmit Power
PD	Power Consumption	Power Consumption
PAC,r	Power Consumption	Power Consumption
F (Hz)	Frequency	Frequency
ISC PV	Max. Input Short Circuit Current	Max. Input Short Circuit Current
Udcmin-Udcmax	Range of input Operating Voltage	Operating Voltage range
UAC,rang(L-N)	Power Supply Input Voltage	Adapter Input Voltage Range

Abbreviation	English Description	Chinese Description
Usys,max	Max System Voltage	Max. System Voltage
Haltitude,max	Max. Operating Altitude	Max. Operating Altitude
PF	Power Factor	Power Factor
THDi	Total Harmonic Distortion of Current	Current Harmonic Distortion
THDv	Total Harmonic Distortion of Voltage	Voltage Harmonic Distortion
C&I	Commercial & Industrial	Commercial & Industrial
SEMS	Smart Energy Management System	Smart Energy Management System
MPPT	Maximum Power Point Tracking	Maximum Power Point Tracking
PID	Potential-Induced Degradation	Potential-Induced Degradation
Voc	Open-Circuit Voltage	open-circuit voltage
Anti PID	Anti-PID	Anti-PID
PID Recovery	PID Recovery	PID Recovery
PLC	Power-line Commucation	Power Line Carrier Communication
Modbus TCP/IP	Modbus Transmission Control / Internet Protocol	Modbus over TCP/IP
Modbus RTU	Modbus Remote Terminal Unit	Modbus over Serial Link
SCR	Short-Circuit Ratio	Short-Circuit Ratio
UPS	Uninterruptable Power Supply	Uninterruptible Power Supply
ECO mode	Economical Mode	Economic Mode
TOU	Time of Use	Time of Use
ESS	Energy Stroage System	energy storage system
PCS	Power Conversion System	Power Conversion System
RSD	Rapid shutdown	Rapid Shutdown
EPO	Emergency Power Off	Emergency Poweroff
SPD	Surge Protection Device	Surge Protection
ARC	zero injection/zero export Power Limit / Export Power Limit	Power Limit
DRED	Demand Response Enabling Device	Demand Response Enabling Device

Abbreviation	English Description	Chinese Description
RCR	Ripple Control Receiver	-
AFCI	AFCI	AFCI DC Arc Fault Protection
GFCI	Ground Fault Circuit Interrupter	GFCI
RCMU	Residual Current Monitioring Unit	Residual Current Monitoring Unit
FRT	Fault Ride Through	Fault Ride Through
HVRT	High Voltage Ride Through	High Voltage Ride Through
LVRT	Low Voltage Ride Through	Low Voltage Ride Through
EMS	Energy Management System	Energy Management System
BMS	Battery Management System	Battery Management System
BMU	Battery Measure Unit	Battery Measurement Unit
BCU	Battery Control Unit	Battery Control Unit
SOC	State of Charge	State of Charge
SOH	State of Health	State of Health
SOE	State Of Energy	State of Energy
SOP	State Of Power	State of Power
SOF	State Of Function	State of Function
SOS	State Of Safety	State of Safety
DOD	Depth of discharge	depth of discharge

10.3 Explanation of Terms

- **Definition of Overvoltage Categories**
  - **Overvoltage Category I**: Equipment connected to circuits with measures to limit transient overvoltages to a relatively low level.
  - **Overvoltage Category II**: Energy-consuming equipment supplied by fixed distribution installations. 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, Overvoltage Category III is adopted.
  - **Overvoltage Category III**: Equipment in fixed distribution installations, where the reliability and suitability of the equipment must meet special requirements. Includes switchgear in fixed distribution installations and industrial equipment permanently connected to fixed distribution installations.
  - **Overvoltage Category IV**: Equipment used in the power supply of distribution installations, including measuring instruments and preceding overcurrent protection devices, etc.

- **Definition of Damp Location Categories**

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

- **Definition of Environmental Categories:**
  - **Outdoor Inverter**: Ambient air temperature range is -25 to +60°C, suitable for environments with Pollution Degree 3;
  - **Indoor Type II Inverter**: Ambient air temperature range is -25 to +40°C, suitable for environments with Pollution Degree 3;
  - **Indoor Type I Inverter**: Ambient air temperature range is 0 to +40°C, suitable for environments with Pollution Degree 2;
- **Definition of Pollution Degree Categories**
  - **Pollution Degree 1**: No pollution or only dry non-conductive pollution;
  - **Pollution Degree 2**: Generally, only non-conductive pollution, but occasional temporary conductive pollution due to condensation must be considered;
  - **Pollution Degree 3**: There is conductive pollution, or non-conductive pollution becomes conductive due to condensation;
  - **Pollution Degree 4**: Persistent conductive pollution, such as pollution caused by conductive dust or rain/snow.

10.4 Battery SN Code Meaning

LXD10DSC0002

Digits 11-14 of the product SN code represent the production date code.
The production date in the image above is 2023-08-08.

- Digits 11 and 12 represent the last two digits of the production year, e.g., 2023 is represented as 23;
- Digit 13 represents the production month, e.g., August is represented as 8; Details are as follows:

Month	Jan~Sep	Oct	Nov	Dec
Month Code	1~9	A	B	C

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

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

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

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

10.5 Safety Standard Countries

No.	Safety Regulation Name	No.	Safety Regulation Name
Europe			
1	IT-CEI 0-21	56	IE-LV-72A
2	IT-CEI 0-16	57	IE-ESB-C&D(< 110kV)
3	DE LV with PV	58	IE-EirGrid-110kV
4	DE LV without PV	59	PT-D
5	DE-MV	60	EE

No.	Safety Regulation Name	No.	Safety Regulation Name
6	ES-A	61	NO
7	ES-B	62	FI-A
8	ES-C	63	FI-B
9	ES-D	64	FI-C
10	ES-island	65	FI-D
11	BE	66	UA-A1
12	FR-LV	67	UA-A2
13	FR-island-50Hz	68	EN 50549-1
14	FR-island-60Hz	69	EN 50549-2
15	type A-PL_V.1.1	70	DK-West-B-MVHV
16	type B-LV-PL_V.1.1	71	DK-East-B-MVHV
17	type C-PL_V.1.1	72	DK-West-C-MVHV
18	type D-PL_V.1.1	73	DK-East-C-MVHV
19	NL-16/20A	74	DK-West-D-MVHV
20	NL-A	75	DK-East-D-MVHV
21	NL-B	76	FR-Reunion
22	NL-C	77	BE-LV（>30kVA）
23	NL-D	78	BE-HV
24	SE-A	79	CH-B
25	SE MV	80	NI-G99-A
26	SK-A	81	NI-G99-B
27	SK-B	82	NI-G99-C
28	SK-C	83	NI-G99-D

No.	Safety Regulation Name	No.	Safety Regulation Name
29	HU	84	IE-LV-170kVA
30	CH-A	85	IE-MV&HV-200kVA
31	CY	86	DE-HV
32	GR	87	FR-MV
33	DK-West-A	88	CZ-A1/A2-09
34	DK-East-A	89	DE-EHV
35	DK-West-B	90	IE-EirGrid-400KV
36	DK-East-B	91	IE-EirGrid-220KV
37	AT < 1kV	92	IE-EirGrid-66KV
38	AT > 1kV	93	IE-ESB-B
39	BG	94	IE-ESB-D(≥110kV)
40	Czech	95	type B-MV-PL_V.1.1
41	CZ-A1-09	96	GB-G99-A HV
42	CZ-A2-09	97	GB-G99-B LV
43	CZ-B1/B2-09	98	GB-G99-C LV
44	CZ-C	99	UA-B
45	CZ-D	100	UA-C
46	RO-A	101	UA-D
47	RO-B	102	UK-G98
48	RO-D	103	UK-G99-A LV
49	GB-G98	104	UK-G99-B LV
50	GB-G99-A LV	105	UK-G99-C LV
51	GB-G99-B HV	106	CZ-A1

No.	Safety Regulation Name	No.	Safety Regulation Name
52	GB-G99-C HV	107	UK-A-MV
53	GB-G99-D	108	UK-B-MV
54	NI-G98	109	UK-C-MV
55	IE-LV-16/25A	-	-
Global			
1	60Hz-Default	6	IEC 61727-60Hz
2	50Hz-Default	7	Warehouse
3	127Vac-60Hz-Default	8	IEC61727-480Vac-60Hz
4	127Vac-50Hz-Default	9	IEC61727-480Vac-50Hz
5	IEC 61727-50Hz		
Americas			
1	Argentina-220V-LV	38	LUMAPR-2024-220Vac-3P
2	US-208Vac	39	LUMAPR-2024-240Vac-3P
3	US-240Vac	40	Cayman
4	Mexico-220Vac	41	Brazil-220Vac
5	Mexico-440Vac	42	Brazil-208Vac
6	US-480Vac	43	Brazil-230Vac
7	US-208Vac-3P	44	Brazil-240Vac
8	US-220Vac-3P	45	Brazil-254Vac
9	US-240Vac-3P	46	Brazil-127Vac
10	US-CA-208Vac	47	Brazil-ONS
11	US-CA-240Vac	48	Barbados
12	US-CA-480Vac	49	Chile-BT
13	US-CA-208Vac-3P	50	Chile-MT-A

No.	Safety Regulation Name	No.	Safety Regulation Name
14	US-CA-220Vac-3P	51	Chile MT-B
15	US-CA-240Vac-3P	52	Colombia
16	US-HI-208Vac	53	Colombia<0.25MW-208Vac-1P
17	US-HI-240Vac	54	Colombia<0.25MW-120Vac-3P
18	US-HI-480Vac	55	IEEE 1547-208Vac
19	US-HI-208Vac-3P	56	IEEE 1547-220Vac
20	US-HI-220Vac-3P	57	IEEE 1547-240Vac
21	US-HI-240Vac-3P	58	IEEE 1547-230Vac
22	US-Kauai-208Vac	59	Colombia<0.25MW-127Vac-3P
23	US-Kauai-240Vac	60	Colombia>5MW
24	US-Kauai-480Vac	61	Mexico-127V
25	US-Kauai-208Vac-3P	62	Mexico-240V
26	US-Kauai-220Vac-3P	63	US-O&R-208Vac
27	US-Kauai-240Vac-3P	64	US-O&R-240Vac
28	US-ISO-NE-208Vac	65	US-O&R-480Vac
29	US-ISO-NE-240Vac	66	US-O&R-208Vac-3P
30	US-ISO-NE-480Vac	67	US-O&R-220Vac-3P
31	US-ISO-NE-208Vac-3P	68	US-O&R-240Vac-3P
32	US-ISO-NE-220Vac-3P	69	Brazil-277Vac
33	US-ISO-NE-240Vac-3P	70	Chile-BT ≤9MW
34	LUMAPR-2024-208Vac	71	Chile-MT ≤9MW
35	LUMAPR-2024-240Vac	72	Chile > 9MW
36	LUMAPR-2024-480Vac	73	Mexico-277Vac

No.	Safety Regulation Name	No.	Safety Regulation Name
37	LUMAPR-2024-208Vac-3P		
Oceania			
1	Australia-A	4	Newzealand
2	Australia-B	5	Newzealand:2015
3	Australia-C	6	NZ-GreenGrid
Asia			
1	China A	33	Israel-MV
2	China B	34	Israel-HV
3	China Higher Voltage	35	Vietnam
4	China Highest Voltage	36	Malaysia-LV
5	China Power Station	37	Malaysia-MV
6	China Shandong	38	DEWA-LV
7	China Hebei	39	DEWA-MV
8	China PCS	40	Saudi Arabia-220V-LV
9	Taiwan	41	JP-690Vac-50Hz
10	Hong Kong	42	JP-690Vac-60Hz
11	China Northeast	43	Srilanka-MV/HV
12	Thailand-MEA	44	IEC 61727-127Vac-50Hz
13	Thailand-PEA	45	IEC 61727-127Vac-60Hz
14	Mauritius	46	JP-550Vac-50Hz
15	Korea	47	JP-550Vac-60Hz
16	India	48	India-Higher
17	India-CEA	49	JP-220Vac-50Hz
18	Pakistan	50	JP-220Vac-60Hz

No.	Safety Regulation Name	No.	Safety Regulation Name
19	Philippines	51	Saudi Arabia-127V-LV
20	Philippines-127Vac	52	Srilanka-LV >1MW
21	JP-200Vac-50Hz	53	China-YN
22	JP-200Vac-60Hz	54	GB/T 29319-LV
23	JP-440Vac-50Hz	55	GB/T 29319-MV
24	JP-440Vac-60Hz	56	Philippines-277Vac
25	JP-420Vac-50Hz	57	JP-360Vac-50Hz
26	JP-420Vac-60Hz	58	JP-360Vac-60Hz
27	JP-480Vac-50Hz	59	JP-320Vac-50Hz
28	JP-480Vac-60Hz	60	JP-320Vac-60Hz
29	Srilanka-LV<1MW	61	JP-340Vac-50Hz
30	Singapore	62	JP-340Vac-60Hz
31	Israel-OG	63	JP-380Vac-50Hz
32	Israel-LV	64	JP-380Vac-60Hz
Africa			
1	Mauritius	5	Ghana-LV
2	South Africa-LV	6	Ghana-HV
3	South Africa-B-MV	7	South Africa-A3-LV
4	South Africa-C-MV	8	Nigeria

10.6 Australia Safety Regulations

For the Australian market, to comply with AS/NZS 4777.2:2020, please select from Australia A, Australia B, Australia C, or New Zealand. Please contact your local electricity grid operator on which Region to select.
Selecting Region B should then automatically load all Region B setpoints for volt-

watt, volt-var, underfrequency, overfrequency, etc.

Volt–var Response Set-point Values

Region	Default value	U1	U2	U3	U4
Australia A	Voltage	207V	220V	240V	258V
	Inverter reactive power level (Q) % of S_{rated}	44 % supplying	0%	0%	60 % absorbing
Australia B	Voltage	205V	220V	235V	255V
	Inverter reactive power level (Q) % of S_{rated}	30 % supplying	0%	0%	40 % absorbing
Australia C	Voltage	215V	230V	240V	255V
	Inverter reactive power level (Q) % of S_{rated}	44 % supplying	0%	0%	60 % absorbing
New Zealand	Voltage	207V	220V	235V	244 V
	Inverter reactive power level (Q) % of S_{rated}	60 % supplying	0%	0%	60 % absorbing
Allowed range	Voltage	180 to 230 V	180 to 230 V	230 to 265 V	230 to 265 V
	Inverter reactive power level (Q) % of S_{rated}	30 to 60 % supplying	0%	0%	30 to 60 % absorbing

NOTE 1: Inverters may operate at a reactive power level with a range up to 100 % supplying or absorbing.
NOTE 2: The Australia C parameter set is intended for application in isolated or remote power systems.

Volt–watt Response Default Set-point Values

Region	Default value	U3	U4
Australia A	Voltage	253V	260V
	Inverter maximum active power output level (P) % of S_{rated}	100%	20%
Australia B	Voltage	250V	260V
	Inverter maximum active power output level (P) % of S_{rated}	100%	20%
Australia C	Voltage	253V	260V
	Inverter maximum active power output level (P) % of S_{rated}	100%	20%
New Zealand	Voltage	242 V	250V
	Inverter maximum active power output level (P) % of S_{rated}	100%	20%
Allowed range	Voltage	235 to 255 V	240 to 265 V
	Inverter maximum active power output level (P) % of S_{rated}	100%	20%

NOTE: The Australia C parameter set is intended for application in isolated or remote power systems.

Passive Anti-islanding Voltage Limit Values

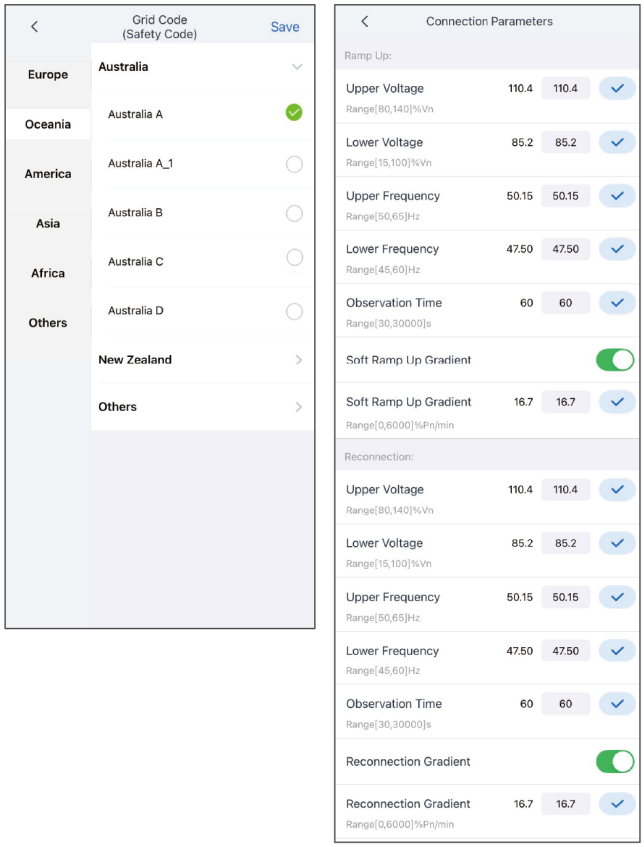
Protective function	Protective function limit	Trip delay time	Maximum disconnection time
Undervoltage 2 (V < <)	70 V	1 s	2 s
Undervoltage 1 (V <)	180 V	10 s	11 s

Protective function	Protective function limit	Trip delay time	Maximum disconnection time
Overvoltage 1 (V >)	265 V	1 s	2 s
Overvoltage 2 (V > >)	275 V	-	0.2 s

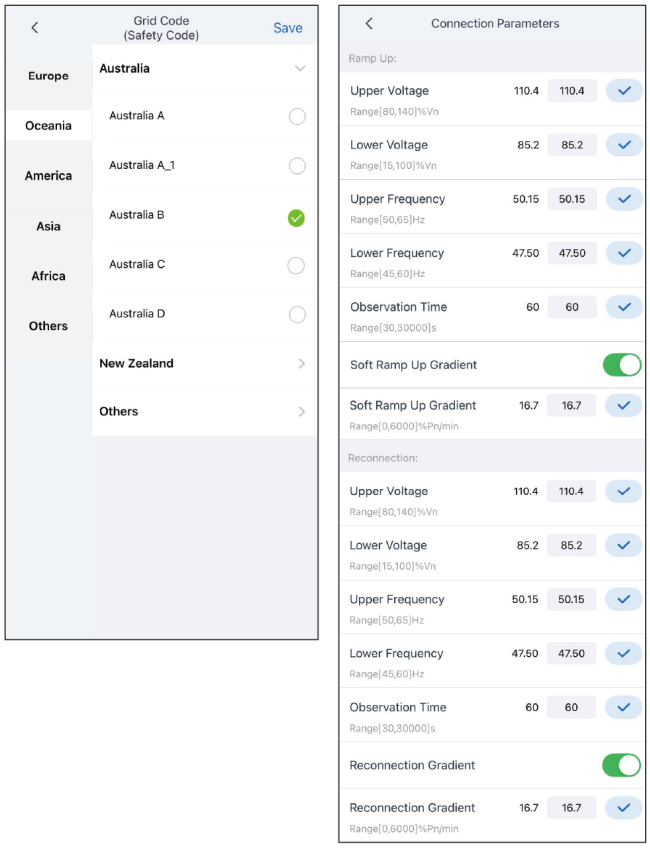
Upper Connection and Reconnection Frequency (f_{URF})

Region	f_{URF}
Australia A	50.15 Hz
Australia B	50.15 Hz
Australia C	50.50 Hz
New Zealand	50.15 Hz

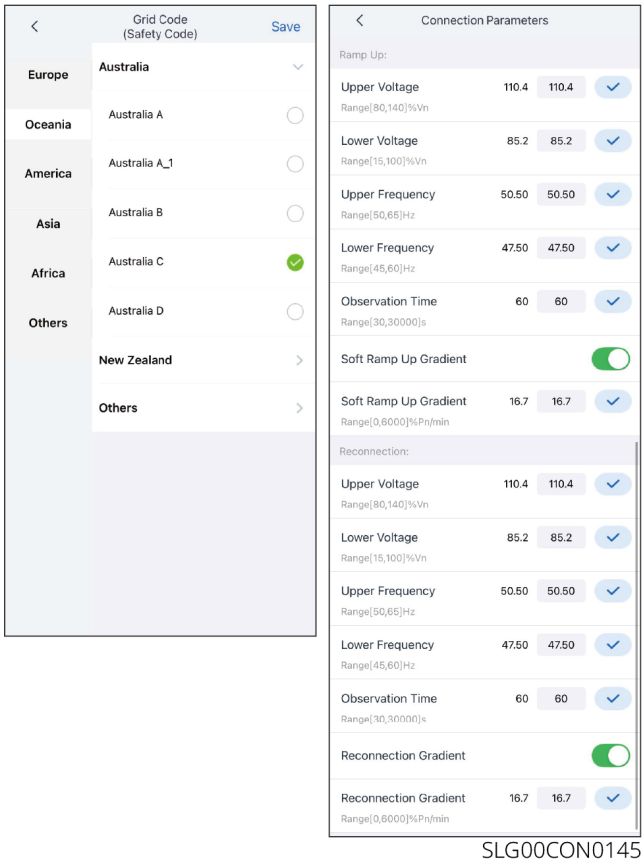
Setting Steps:
Step 1: Set the safety code to Australia A/B/C/New Zealand on the Quick Settings page based on actual needs.
Step 2: Set the frequency parameters accordingly.



SLG00CON0144



SLG00CON0146



SLG00CON0145

11 Contact Details

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