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BAT-C 208.9-261.2kWh

Commercial and Industrial Battery System

User Manual

GOODWE

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CAUTION

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

Preface

Overview

This manual mainly introduces the product information, transportation and storage, installation and wiring, configuration and commissioning, troubleshooting, and maintenance of the battery system. Before installing and using the product, read this manual carefully to understand the product safety information and become familiar with the product functions and features. Keep this manual properly for future reference.

The illustrations in this manual are for conceptual understanding only and may differ from the actual product. The actual product shall prevail.

The manual is updated from time to time, Please obtain the latest version of the materials and more product information from the official website: en.goodwe.com.

Applicable Products

This document applies to the following battery system models:

- GW199.6-BAT-LC-G10 (Australia only)
- GW199.6-BAT-LCD-G10 (Australia only)
- GW208.9-BAT-LC-G10
- GW208.9-BAT-LCD-G10
- GW261.2-BAT-LCD-G10

CAUTION

The graphical examples in this manual are based on model BAT261.2-BAT-LCD-G10 and are for reference only. Devices of different models may vary slightly; refer to the actual product.

Symbol Definitions

 DANGER

Indicates a high potential hazard that, if not avoided, will result in death or serious injury.

 WARNING

Indicates a medium potential hazard that, if not avoided, could result in death or serious injury.

 CAUTION

Indicates a low potential hazard that, if not avoided, may result in moderate or minor injury.

CAUTION

Highlights and supplements the content, and may also provide tips or tricks for optimized product use that can help you resolve an issue or save time.

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1 Safety Precautions

The safety precautions contained in this document must always be observed when operating the equipment.

WARNING

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

1.1 General Safety

 DANGER

- Before making electrical connections, disconnect all upstream switches of the equipment and ensure that the equipment is de-energized. Live working is strictly prohibited; otherwise, hazards such as electric shock may occur.
- To prevent personal hazards or equipment damage caused by live working, a circuit breaker must be added on the voltage input side of the equipment.
- Applicable laws, regulations, standards, and specifications must be observed during all operations such as transportation, storage, installation, operation, use, and maintenance.
- The specifications of cables and components used for electrical connections shall comply with local laws, regulations, standards, and specifications.
- Use the cable connectors supplied with the package to connect equipment cables. If connectors of other models are used, any resulting equipment damage shall not be within the responsibility of the equipment manufacturer.
- Ensure that all equipment cables are correctly connected, tightened, and free from looseness. Improper wiring may cause poor contact or damage to the equipment.
- The protective ground conductor of the equipment must be securely connected.
- To protect the equipment and its components from damage during transportation, ensure that transport personnel have received professional training. Record the operation steps during transportation and keep the equipment balanced to prevent it from falling.
- The equipment is heavy. Please assign personnel according to the equipment weight to avoid the equipment exceeding the weight range that a person can carry and causing injury to personnel.
- Ensure that the equipment is placed stably and not tilted. Equipment tipping may cause equipment damage and personal injury.

 WARNING

- During equipment installation, avoid placing load on wiring terminals; otherwise, terminals may be damaged.
- Avoid excessive tensile force on cables; otherwise, poor connections may occur. Reserve an appropriate cable length during wiring to avoid cables being in a taut state.
- Correctly secure and support cables to prevent cable weight, tensile force, bending force, torsion, or other external mechanical stress from acting on terminals or connectors over the long term.
- Ensure that the protective grounding conductor is reliably connected and reserve an appropriate margin. Under external mechanical stress such as accidental pulling, ensure that the protective grounding conductor does not break before other conductors.
- Cables of the same type should be tied together. Cables of different types should be routed at least 30 mm apart; interlacing or crossing is prohibited.
- Using cables in high-temperature environments may cause insulation aging or damage. Keep cables at least 30 mm away from heat-generating devices or the perimeter of heat source areas.

CAUTION

- The content of this document may be updated from time to time due to product version upgrades or other reasons. Unless otherwise agreed, the content of this document does not replace the safety precautions on the product labels. All descriptions in this document are for guidance only.
- Read this document carefully before installing the equipment to understand the product and precautions.
- All operations on the equipment must be performed by professional and qualified electrical technicians, who must be familiar with the relevant standards and safety specifications of the project location.
- When operating the equipment, use insulated tools and wear personal protective equipment to ensure personal safety. When handling electronic components, wear ESD gloves, ESD wrist straps, anti-static clothing, etc., to protect the equipment from electrostatic damage.
- Unauthorized disassembly or modification may cause equipment damage, and such damage is not covered by the warranty.
- Equipment damage or personal injury caused by failure to install, use, or configure the equipment in accordance with this document or the corresponding user manual is not within the scope of the equipment manufacturer's responsibility. For more product warranty information, please visit the official website: <https://www.goodwe.com/warrantyrelated.html>.

1.2 Personnel Requirements

CAUTION

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

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

1.3 Battery Safety

DANGER

- This battery system is a high-voltage system, and high voltage is present during equipment operation. Before operating equipment in the system, ensure that the equipment has been powered off to avoid electric shock hazards. During operation of the equipment, strictly comply with all safety precautions in this

 DANGER

manual and the safety labels on the equipment.

- This battery system is a high-voltage system. Non-professional personnel must stay away. Do not touch or operate it without permission.
- This energy storage system is heavy equipment. During installation and maintenance, use appropriate equipment and tools and take protective measures. Improper operation may cause personal injury or product damage.
- Without official authorization from the equipment manufacturer, do not disassemble, modify, or repair the battery or control box; otherwise, electric shock hazards or equipment damage may occur, and losses caused thereby are not within the scope of the equipment manufacturer's responsibility.
- The equipment must be installed on concrete or another non-combustible surface. Ensure that the foundation is level, firm, flat, dry, and has sufficient load-bearing capacity; depressions or tilting are prohibited.
- Do not hit, pull, drag, squeeze, or step on the equipment, or use sharp objects to puncture the equipment enclosure. Do not place the battery in fire; otherwise, the battery may explode.
- Do not place the battery in a high-temperature environment. Ensure that there are no heat sources near the battery and that it is not exposed to direct sunlight. If the ambient temperature exceeds 60°C, a fire may occur.
- Do not use the battery or control box if there are obvious defects, cracks, damage, or other abnormalities.
- Battery damage may cause electrolyte leakage.
- Do not move the battery system while the battery is operating.
- When installing the battery system, pay attention to the positive and negative poles. Do not reverse the positive and negative poles; otherwise, a short circuit may occur, causing personal injury or property loss.
- It is strictly prohibited to short-circuit the positive and negative poles of the battery. A battery short circuit may cause personal injury. The instantaneous high current caused by a short circuit can release a large amount of energy and may cause a fire.
- When operating the equipment, ensure that the equipment is not damaged and the system has no faults; otherwise, electric shock and fire risks may exist.
- During equipment operation, do not open the equipment cabinet door or touch any wiring terminals or components. Otherwise, there is a risk of electric shock.
- During equipment operation, the enclosure temperature may exceed 60°C. Do

DANGER

not touch the enclosure before it cools down; do not install it within reach of non-professional personnel.

- During operation of the battery system, do not plug or unplug terminals and connecting cables; otherwise, safety hazards may occur.
- The same battery is only permitted to be connected to one energy storage inverter. It is prohibited to directly connect the same battery to multiple energy storage inverters. Multiple inverters sharing one battery may cause abnormal return currents or circulating currents, and may result in GFCI leakage protection and battery overcurrent; in severe cases, it may cause damage to the battery and inverter.
- During operation of the battery system, if any abnormality occurs, immediately power off the battery system and promptly contact relevant personnel for handling.
- The battery DC circuit breaker shall comply with the requirements of AS/NZS 5139.

WARNING

- Ensure that the battery is charged promptly after discharge; otherwise, over-discharge may cause battery damage.
Do not charge or discharge the battery at a current exceeding the rated charge/discharge current.
- Battery current may be affected by factors such as temperature, humidity, and weather conditions, which may cause battery current limiting and affect the load-carrying capability.
- If the battery fails to start, please contact the after-sales service center as soon as possible. Otherwise, the battery may be permanently damaged.
- If you need to replace or add battery modules, please contact the after-sales service center.
- Avoid charging the battery at low temperatures; otherwise, the battery system capacity may be reduced.
- Do not place unrelated objects into any part of the battery cabinet.

CAUTION

Emergency response measures for emergency situations:

- Battery electrolyte leakage

If the battery module leaks electrolyte, avoid contact with the leaked liquid or gas. The electrolyte is corrosive; contact may cause skin irritation and chemical burns. If you accidentally come into contact with leaked substances, perform 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 affected 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 fire risk; a burning battery may release toxic and hazardous gases.
- To avoid fire, ensure that CO₂, Novec 1230, or FM-200 fire extinguishers are available near the equipment.
- When extinguishing a fire, do not use ABC dry powder fire extinguishers; firefighters must wear protective clothing and self-contained breathing apparatus (SCBA).

1.4 EU Declaration of Conformity (Battery)

GoodWe Technologies Co., Ltd. hereby declares that the batteries available in the European market comply with 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 battery products comply with the hazardous substance limit requirements specified in this regulation.

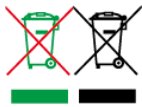
1.5 Description of Safety Symbols and Certification Marks

DANGER

- After equipment installation, the labels and warning signs on the enclosure must be clearly visible and must not be obscured, altered, or damaged.
- The following descriptions of enclosure warning labels are for reference only; the labels actually used on the equipment shall prevail.

No.	Symbol	Description
1		Potential hazards exist during equipment operation. Take proper protective measures when operating the equipment.
2		High voltage hazard. High voltage is present during equipment operation; ensure that the equipment is powered off before performing operations on it.
3		The equipment surface is hot. Do not touch it during operation; otherwise, burns may result.
4		Use the equipment properly. Using the equipment under extreme conditions may pose an explosion risk.
5		The battery contains flammable substances. Beware of fire.

No.	Symbol	Description
6		The equipment contains corrosive electrolyte. Avoid contact with leaked electrolyte or vapors.
7		Delayed discharge. After the equipment is powered off, wait 5 minutes for the equipment to fully discharge.
8		Keep the equipment away from open flames or ignition sources.
9		Keep the equipment away from areas accessible to children.
10		Use the equipment properly. Using the equipment under extreme conditions may pose an explosion risk.
11		The battery contains flammable substances. Beware of fire.
12		Do not lift the equipment after the battery system wiring is completed or while the battery system is in operation.
13		Do not extinguish with water.
14		Read the product manual carefully before operating the equipment.
		
15		Wear personal protective equipment (PPE) during installation, operation, and maintenance.

No.	Symbol	Description
16		Do not dispose of the equipment as household waste. Dispose of the equipment in accordance with local laws and regulations, or return it to the equipment manufacturer.
17		Protective earthing conductor connection point.
18		Recycling symbol. The equipment must be disposed of at an appropriate location and recycled in accordance with local environmental regulations.
19		CE certification mark.
20		RCM certification mark.

2 Product Introduction

2.1 Product Overview

The BAT-C 208.9–261.2 kWh battery system (hereinafter referred to as the battery system) mainly consists of battery PACKs, a high-voltage box, a liquid cooling unit, a fire protection system, etc., and can realize energy storage and release.

Model Description

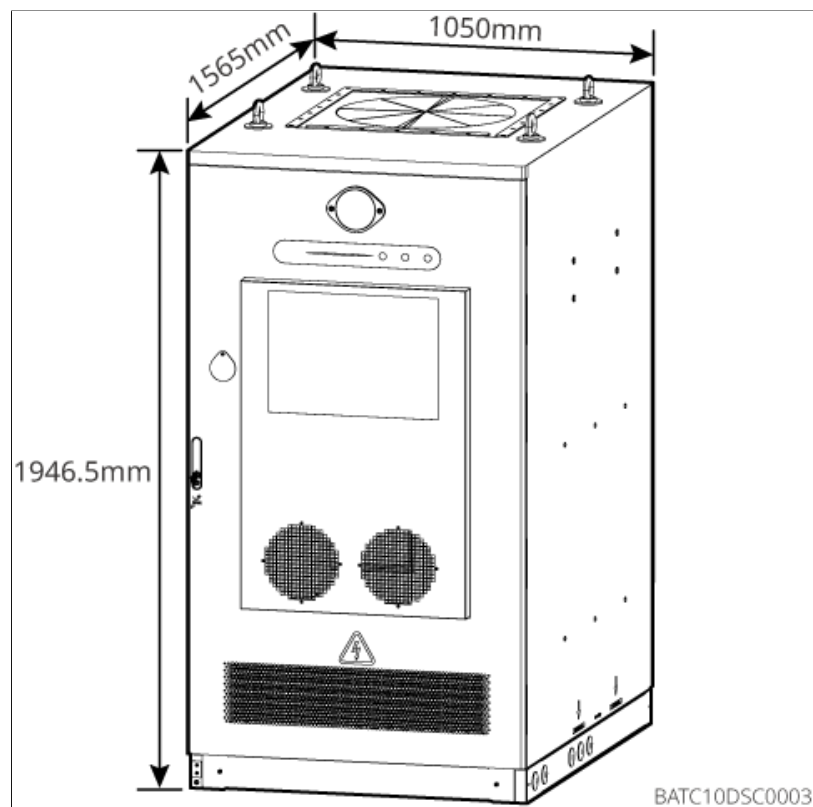


Symbol	Meaning	Description
1	Brand code	GW: GOODWE
2	Energy level	• 208.9: Rated energy is 208.9 kWh, and the cabinet contains 4 PACKs • 261.2: Rated energy is 261.2 kWh, and the cabinet contains 5 PACKs
3	Series name	BAT: BAT series
4	Cooling method & DC/DC function support	• LC: Liquid cooling, DC/DC function not supported, PCU without DC/DC module • LCD: Liquid cooling, DC/DC function supported, PCU with DC/DC module
5	Version code	G10: First-generation product

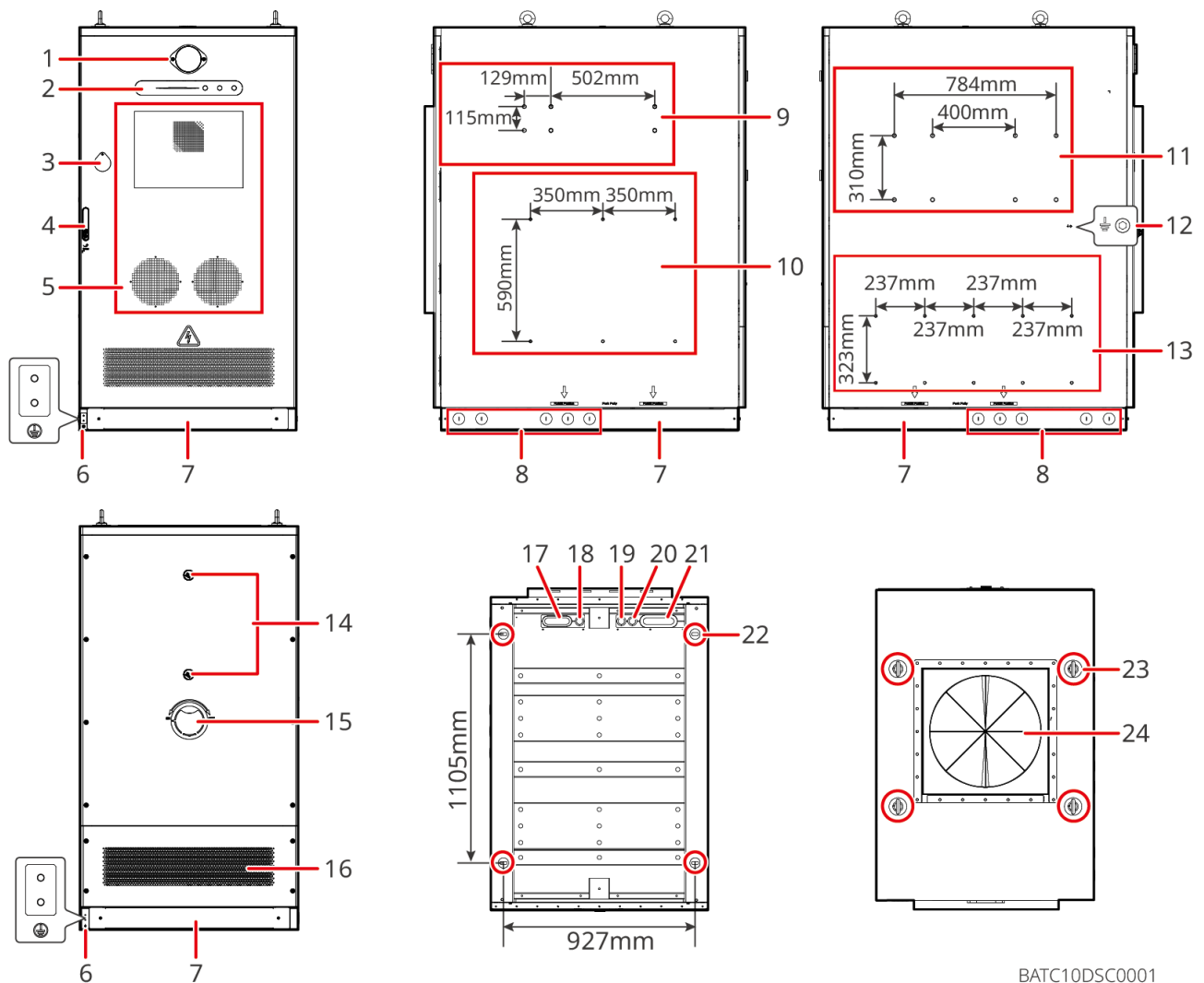
Product Highlights

- Full-stack in-house development of the system (PACK, BMS, DC/DC)
- Low cost (large-capacity cells), long lifespan
- Multiple detections, multiple safety protections
- Supports 8-hour long-duration backup power
- Equipped with intelligent thermal management system
- Door-mounted liquid cooling unit for easier O&M
- Strong compatibility, adaptable to multiple inverters, enabling flexible application of solutions.
- The battery system equipped with the DC/DC version supports mixed parallel connection of new and old batteries or battery clusters with different cells, and parallel connection between battery systems with different energy capacities, facilitating iterative use.
- The system platform can display cell-level information.

2.2 Dimensions Overview



2.3 Appearance Introduction



BATC10DSC0001

No.	Name	Description
1	Smoke Exhaust Fan	Used to quickly exhaust gas from the enclosure.
2	Indicator light	Indicates the operating status of the battery system.
3	Emergency stop switch	Pressing the emergency stop button will power off the battery system.
4	Door lock	-

No.	Name	Description
5	Liquid cooling unit	Used for heat dissipation and temperature control of the battery system.
6	Protective grounding point	Used to connect the battery grounding cable.
7	Bottom baffle	-
8	Side cable routing hole	-
9	SEC3000C mounting holes	Used to mount the SEC3000C and compatible with installation of both new and old versions of the SEC3000C.
10	SEC3000C cable tray mounting holes	Used to mount the SEC3000C cable tray.
11	Inverter mounting holes	Used to mount the inverter.
12	Inverter grounding point	Used to connect the inverter grounding cable.
13	Cable protection cover / circuit breaker waterproof box mounting holes	Used to install the cable protection box / circuit breaker waterproof box.
14	Explosion-Proof Valve	Prevents the battery system from exploding.
15	Firefighting water connection	In the event of a fire, water can be injected to extinguish the fire.
16	Rear cover plate	-
17	Cable routing hole 1	For routing the power cable connecting the battery to the inverter
18	Cable routing hole 2	For routing the communication cable connecting the battery to the inverter
19	Cable routing hole 3	For routing the power supply cable of the liquid cooling unit

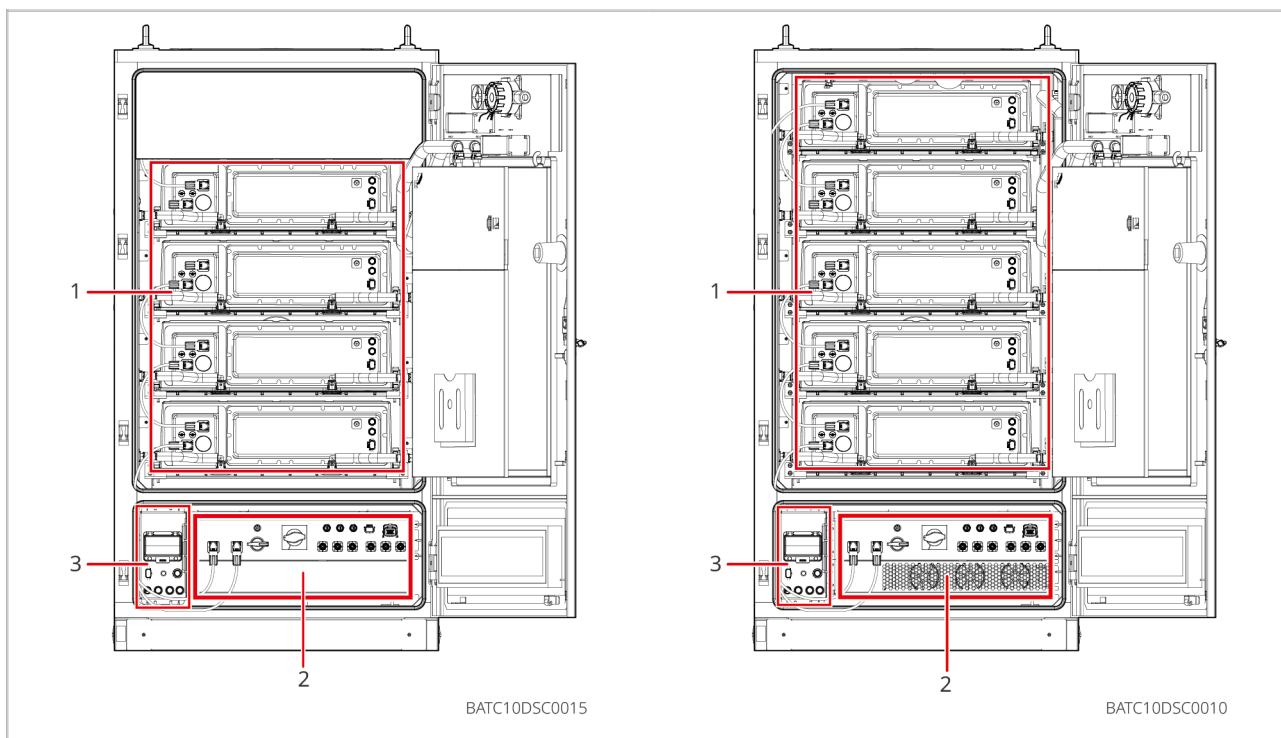
No.	Name	Description
20	Cable routing hole 4	For routing the communication cable for parallel battery clusters
21	Cable routing hole 5	For routing the power cable for parallel battery clusters
22	Battery system mounting hole	Used to secure the battery system to the foundation
23	Lifting eye	For lifting and handling
24	Explosion Vent Panel	(Optional) Prevents rupture of the battery pack enclosure.

2.4 Component Introduction

2.4.1 Power Supply and Distribution System

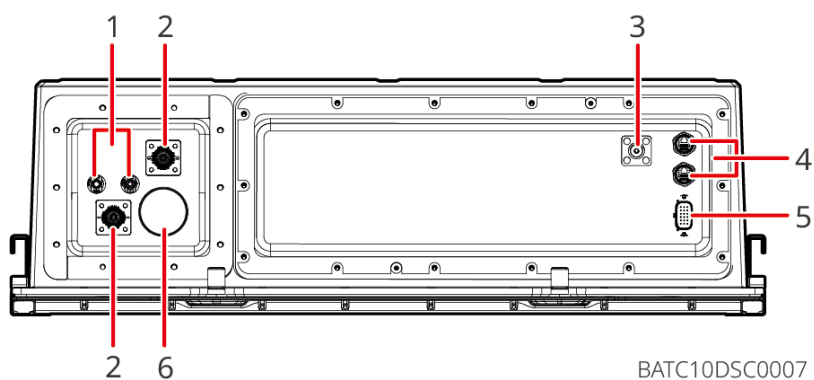
The power supply and distribution system mainly consists of PACK, PCU, and distribution box:

Without DC-DC module	With DC-DC module
----------------------	-------------------



1	2	3
PACK	PCU	Distribution Box

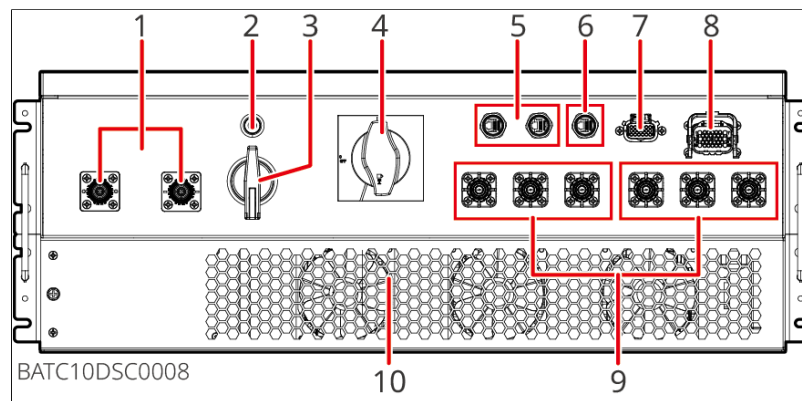
PACK



No.	Name	Description	Remarks
1	PBM- / PBM+	Positive and negative terminals of the PACK-level balancer.	Optional

No.	Name	Description	Remarks
2	B+ / B-	PACK positive and negative wiring terminals.	-
3	Fire nozzles	PACK fire suppression nozzle.	Optional
4	COM1 / COM2	Inter-PACK communication port.	-
5	COM3	Inter-PACK communication port.	Optional
6	Explosion-proof valves	Explosion-proof valve.	-

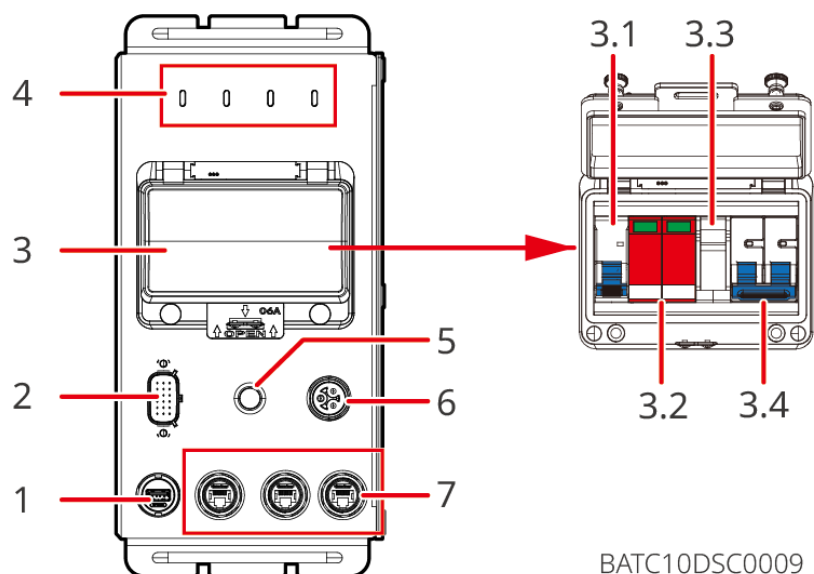
PCU



No.	Name	Description	Remarks
1	B+ / B-	Battery system positive and negative wiring terminals	-
2	BLACK START	Black start switch button	-
3	BMS PWR	BMS power supply circuit breaker	-
4	DC BREAKER	Output circuit breaker	-

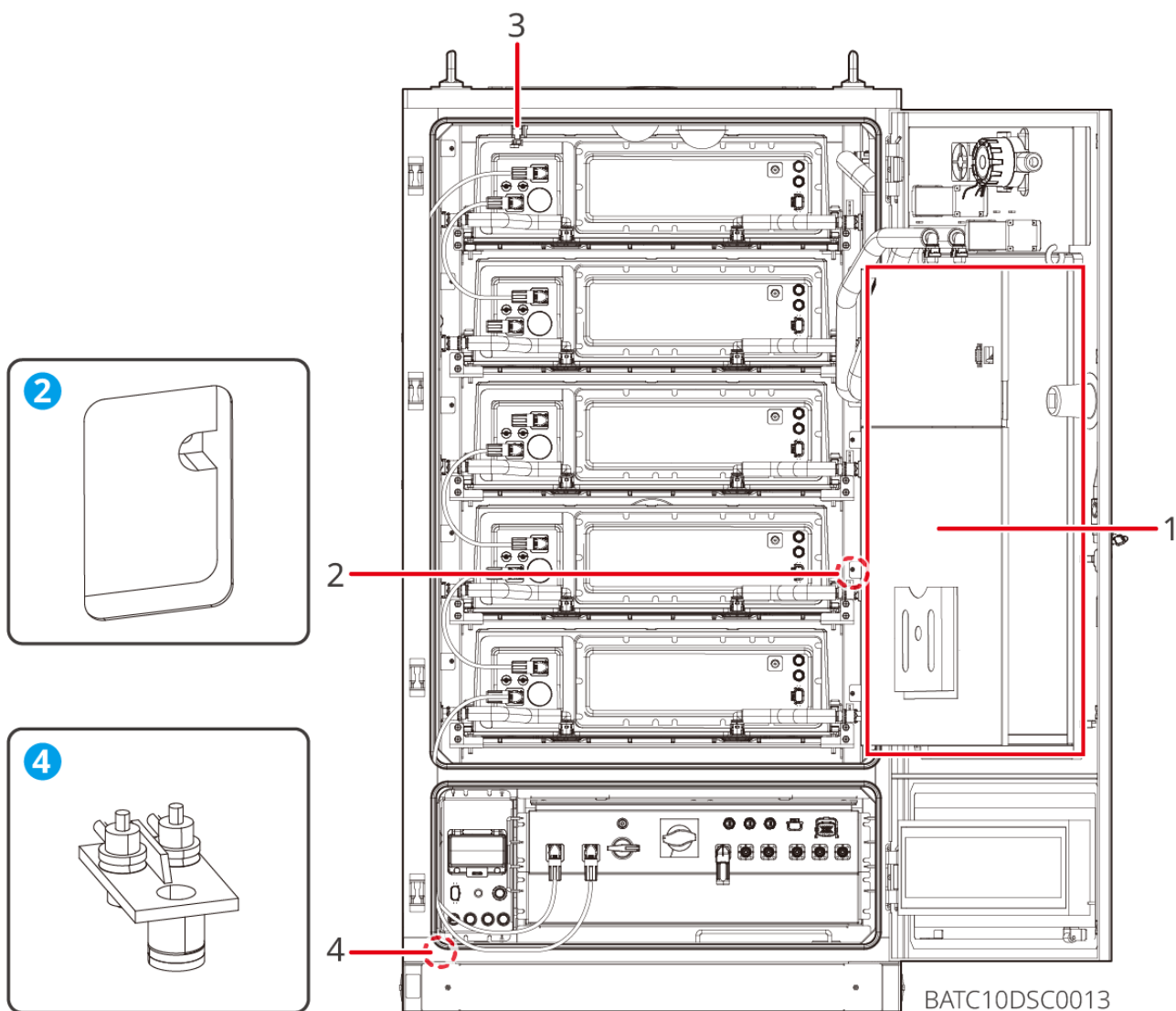
No.	Name	Description	Remarks
5	COM1	Used for the communication connection between the battery system and the inverter, or for cluster-parallel communication connection of the battery system	-
6	COM2	Used for the communication connection between PCU and PACK	-
7	COM3	Internal communication port of the battery cabinet	Isolated
8	COM4	Internal communication port of the battery cabinet	Non-isolated
9	P+ / P-	Power output positive and negative terminals.	-
10	Fan module	For heat dissipation.	Only models with DC-DC have

Distribution Box



No.	Name	Description	Remarks
1	USB	USB port	-
2	JX	Water immersion interface, used to connect a water immersion detector	-
3	6P circuit breaker protective cover	-	-
3.1	UPS BAT	UPS switch	Optional
3.2	SPD	SPD surge protection module	-
3.3	FU	FU2 fuse	-
3.4	AC BREAKER	AC circuit breaker	-
4	Indicator light	Indicates the operating status of the cloud board	For details, please refer to 2.5.Indicator Light Introduction(Page 34)
5	RST	Cloud board reset button	-
6	AC PWR	Liquid cooling unit power supply port	-
7	FE1 / FE2 / FE3	Cloud board communication port	-

2.4.2 Environmental Control System

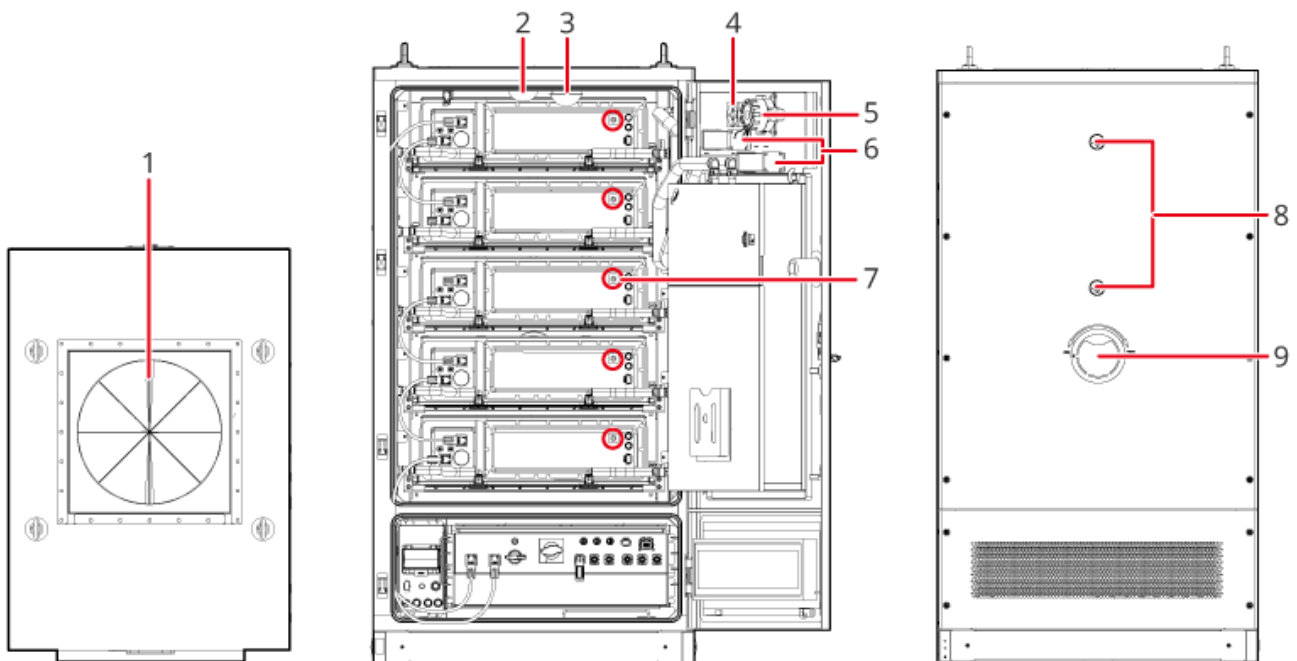


No.	Name	Description
1	Liquid cooling unit	The liquid cooling unit can precisely control the temperature and flow rate of the coolant to maintain the battery system within an appropriate temperature range and balance the temperature difference between battery cells, thereby ensuring battery performance, safety, and lifespan.
2	Temperature and humidity sensor	Monitors the temperature and humidity in the environment.

No.	Name	Description
3	Access control switch	The energy storage system automatically powers off after the door is opened.
4	Water immersion detector	Monitors in real time whether there is accumulated water or liquid leakage in the installation area of the energy storage equipment, and promptly issues an alarm or triggers linkage control actions in the event of water immersion to prevent equipment damage and safety incidents.

2.4.3 Fire Protection System

2.4.3.1 Fire Protection Component Introduction



BATC10DSC0014

1	2	3	4	5	6	7	8	9
Explosion vent panel (optional)	Heat detector or	Smoke detector or	Smoke Exhaust Fan	Combustible gas detection	Aerosol fire suppression device	PACK enclosure nozzle (optional)	Explosion-Proof Valve	Firefighting water connection

Explosion Vent Panel

Working principle: When the internal pressure of the battery pack rises sharply due to thermal runaway or other causes and exceeds the design threshold, the explosion vent panel will rupture or pop open first, forming a rapid pressure-relief channel to directionally discharge high-temperature, high-pressure gases and ejecta out of the pack, thereby preventing the battery pack enclosure from bursting and ensuring personnel and equipment safety.

Technical specifications	Explosion Vent Panel
Operating ambient temperature	-40°C ~ +125°C
Maximum pressure relief area	0.363609m ²
Flame retardant rating	UL94 V-0
Dust and water protection rating requirements	IP66

Heat Detector & Smoke Detector

Working principle:

- The temperature detector uses a negative temperature coefficient (NTC) thermistor as the sensor and obtains ambient temperature information based on the thermistor's sensitivity to ambient temperature. The internal circuit converts this information into a voltage signal and transmits it to the microcontroller. The microcontroller analyzes and processes the signal through built-in intelligent algorithms and simultaneously determines whether it is currently in a fire alarm or

fault state.

- The smoke detector uses the infrared scattering principle to detect fire. In a smoke-free state, it receives only very weak infrared light. When smoke and dust enter the optical smoke detection chamber, scattering enhances the received optical signal. When the smoke concentration reaches a certain level, an alarm signal can be output.

Technical specifications	Heat detector	Smoke detector
Dimensions	• Diameter 100 mm • Height 44.5 mm (without base)	• Diameter 100 mm • Height 43.3 mm (without base)
Weight	Approximately 110 g (without base)	Approximately 105 g (without base)
Mounting hole spacing	45mm~75mm	
Alarm confirmation indicator (red)	When the polling indicator is set to on, it flashes periodically once; when set to off, it is off; during an alarm, it remains on; in the event of a fault or dirty condition, it flashes periodically twice.	
Ambient temperature	-10°C~+50°C	
Relative humidity	≤95% (non-condensing)	

Smoke Exhaust Fan

Working principle: When the gas pressure/flammable gas concentration/temperature/smoke concentration in the sealed enclosure rises to a preset value, the sensors inside the enclosure, together with the control system, send a command to the intake/exhaust valve. The intake/exhaust valve then opens, and the sealed enclosure becomes fully connected to the outside. The gas inside the enclosure is rapidly discharged through the opened exhaust port (a feedback signal indicating that the valve has opened is provided simultaneously). When closing is

required, a signal is sent to the intake/exhaust valve, which then closes automatically (after fully closing, a feedback signal indicating that the valve has closed is provided simultaneously). Depending on actual operating conditions, different types of fans can also be installed to accelerate the discharge of harmful gases inside the enclosure, thereby preventing combustion and explosion.

Technical specifications	Intake/exhaust valve
Opening stroke	30mm
Exhaust area after opening	>6000mm ²
Exhaust volume after opening	>35000L/min@5kPa
Opening speed	4mm/s
Operating temperature	-20°C ~ +60°C
Ingress protection rating	IP66

Combustible Gas Detector

Working principle: When combustible gas is detected, the device will issue an alarm.

Technical specifications	Combustible gas detection device
Operating environment	
Temperature	-10°C ~ +55°C
Relative humidity	≤93% (non-condensing)
Gas pressure detection	86~106kPa
Combustible gas performance	
Detection principle	Catalytic combustion type
Detection target	Combustible gas
Detection method	Diffusion type
Indication error	±3%LEL

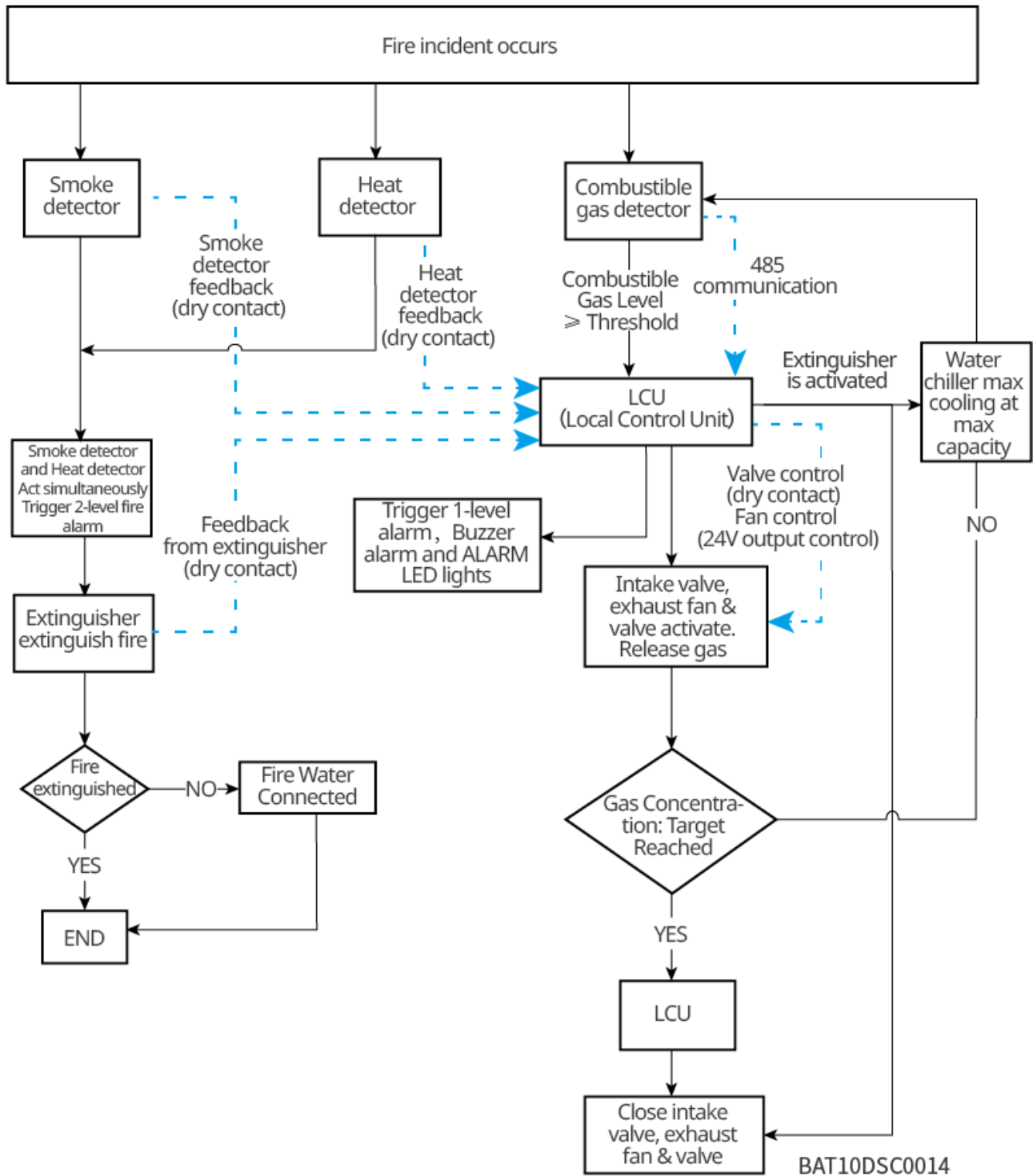
Technical specifications	Combustible gas detection device
Electrochemical performance	
Detection principle	Redox reaction
Detection target	Toxic and harmful gases
Detection method	Diffusion type
Indication error	±5%FS
Dimensions	
External dimensions (length × width × thickness)	200×178×98mm
Housing material	Die-cast aluminum
Weight	Approx. 2030 g
Ingress protection rating	IP65

Explosion-Proof Valve

Working principle: When the internal pressure of sealed products such as enclosures rises rapidly, the explosion-proof check valve vent opens to release the internal gas quickly and directionally, thereby preventing explosions in sealed products such as battery enclosures.

Technical specifications	Explosion-Proof Valve
Ingress protection rating	IP68
Opening area	570 mm ²
Operating temperature	-40°C ~ +130°C
Flame retardant performance	UL94-V0

2.4.3.2 Fire Protection Logic Introduction



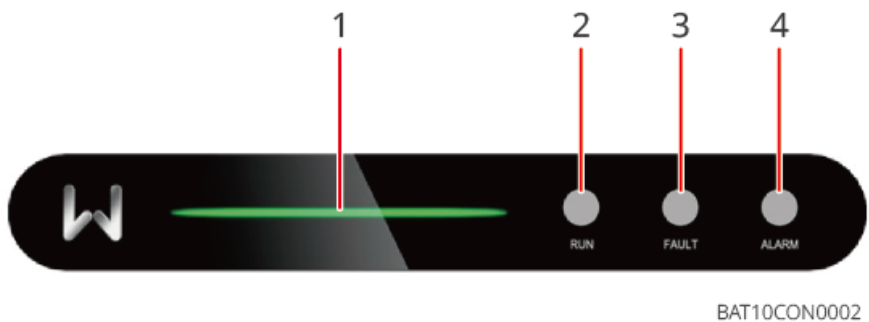
The battery system strictly complies with relevant standards and specifications and adopts an energy storage fire protection solution comprising an automatic fire suppression system + explosion-proof exhaust system + emergency water system, to ensure the scientificity, rationality, and effectiveness of the solution, fully guarantee the fire safety of the electrochemical energy storage system, and ensure safe operation and efficient response to fire accidents.

The battery system adopts a multi-level response fire protection system: PACK-level fire protection + battery cabinet-level fire protection, with multiple fire protection controls such as smoke detection, temperature detection, in-cabinet aerosol, PACK aerosol, exhaust system, explosion venting system, and water fire protection. When a PACK-level fire occurs, PACK-level aerosol fire suppression is triggered preferentially, eliminating hazards from the source. If the fire spreads into the cabinet, the cabinet-level fire protection system and exhaust system are interlocked; in the early stage of the fire, combustible gases are preferentially exhausted to reduce ignition risk. The aerosol has two trigger modes: electrical triggering and thermal-sensitive wire triggering, ensuring timely action when a fire occurs, suppressing the fire, and ensuring system safety and reliability. Fire protection triggering can also be quickly transmitted to back-office site personnel; the alarm and fault light can promptly alert personnel to fire protection abnormalities.

Under extreme conditions, i.e., after a fire occurs in the system and the fire protection system fails and cannot perform fire suppression, a fire water interface is reserved on the back of the cabinet; an emergency water system can be injected as the last resort, and the emergency water system can be connected manually.

The battery system can be optionally equipped with a top-mounted fixed explosion venting panel. During explosion venting, the panel will not pop out, avoiding the potential risk of injuring on-site personnel.

2.5 Indicator Light Introduction



No.	Indicator light	Status	Description
1			SOC: 75%~100%

No.	Indicator light	Status	Description
			SOC: 50%~75%
			SOC: 25%~50%
			SOC: 0%~25%
			SOC: 0%
2	 RUN	Steady on	The system operating status is normal
		Single flash	System idle state
		Double flash	System standby
3	 FAULT	Yellow LED steady on	Fault alarm
		Red LED steady on	System fault
4	 ALARM	Red LED steady on + buzzer	Fire alarm

Cloud Board Indicator Light

POWER	RUN	NET	FAULT
0	0	0	0
BATC10MTN0002			

Indicator light	Function	Status	Description
POWER	Hardware LED	Green LED steady on	Hardware operating normally
		Off	Hardware operation failure
RUN	System LED	Green LED flashing	System operating normally
		Off	System operation failure
NET	Network LED	Green LED steady on	Server connection successful
		Green LED flashing	Server connection failed
FAULT	Fault LED	Red LED steady on	BMS communication failed
		Off	BMS communication successful

3 Equipment Inspection and Storage

3.1 Equipment Inspection

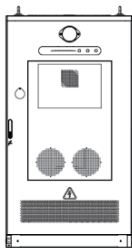
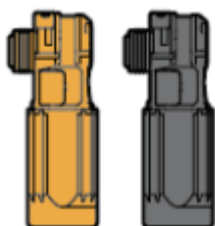
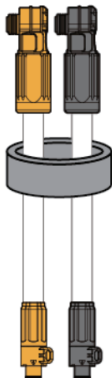
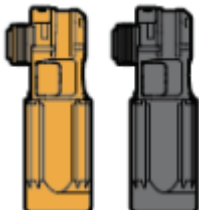
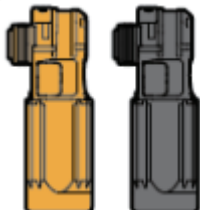
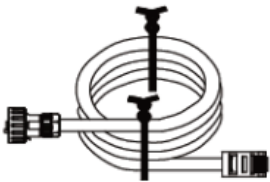
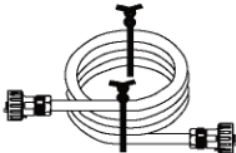
Before signing for receipt of the product, carefully check the following:

- Check the outer packaging for damage, such as deformation, holes, cracks, or other signs that may damage the equipment inside the packaging. If damaged, do not open the packaging and contact your dealer.
- Check the tip-over indicator label. If the window on the label turns red, it indicates that the equipment has tipped over; do not open the packaging and contact your dealer.
- Check whether the equipment model is correct. If it does not match, do not open the packaging and contact your dealer or after-sales service center.
- Check whether the types and quantities of the delivered items are correct and whether their appearance is damaged. If any item is missing or damaged, contact your dealer or after-sales service center.

3.2 Delivered Items

CAUTION

- Check that the types and quantities of the delivered items are correct and that there is no physical damage. If any damage is found, contact your dealer.
- During shipment, the power cables, communication cables, and liquid cooling unit drain hose are all placed separately in front of the high-voltage box.
- The optimizer terminal unlocking tool is placed in the document pocket inside the front door. This tool is not required during installation and is only needed for maintenance. Keep it properly.

Components	Description	Components	Description
	Battery system ×1		50mm ² power cable terminals ×2
	25mm ² power cable ×2 (Length: 3 m; supplied only with ET100 and ET G3)		70mm ² power cable ×1 (Length: 3 m; supplied only with ETR125)
	25mm ² power cable terminals ×2 (Only included with ET100 and ET G3)		70mm ² power cable terminal ×1 (Only included with ETR125)
	Communication cable (10 m) ×2		Communication cable (3.8 m) ×1
	Expansion bolts ×4		Grounding terminals ×3

Components	Description	Components	Description
	AC connector ×1		Tubular terminals ×3
	M8 screws ×12		Corrugated conduit connectors ×4
	Slotted screwdriver ×1		Firestop putty ×6
	Optimizer positive terminal unlocking tool ×1 (Optional)		Optimizer negative terminal unlocking tool ×1 (Optional)
	Cable ties ×20		Liquid cooling unit drain hose ×1
	Product documentation ×1		

3.3 Equipment Storage

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, resulting in irreversible chemical degradation, capacity fade, or even complete failure; therefore, use the battery promptly. After long-term storage, the battery must be inspected and confirmed by professional personnel before continued use. If the battery needs to be stored for a long period, perform maintenance according to the following requirements:

Initial SOC range for battery storage	Recommended storage temperature	Charge/discharge maintenance interval	Battery maintenance method
35%~45%	0~35°C	Temperature range is -20°C to 35°C, period: <12months Temperature range is 35°C~45°C, period: <6 months	For maintenance methods, please consult the dealer or after-sales service center.

CAUTION

After the charge/discharge maintenance has passed, if a Maintaining Label is affixed to the outer box, update the maintenance information on the Maintaining Label. If there is no Maintaining Label, record the maintenance time and battery SOC yourself and keep the data properly to facilitate retention of maintenance records.

Packaging Requirements:

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

Environmental Requirements:

1. Ensure that the equipment is stored in a cool place and avoid direct sunlight. When

the ambient temperature is too high, the battery system may pose a fire risk.

2. Ensure the storage environment is clean, with appropriate temperature and humidity ranges and no condensation; avoid storage in areas directly exposed to cold air such as air-conditioner outlets. If condensation is present at equipment ports, do not install the equipment.
3. Ensure the equipment is stored away from flammable, explosive, and corrosive materials.

Stacking Requirements:

1. Ensure the stacking height and orientation of the equipment follow the instructions on the packaging box labels.
2. Ensure there is no risk of tipping after stacking.

4 Installation

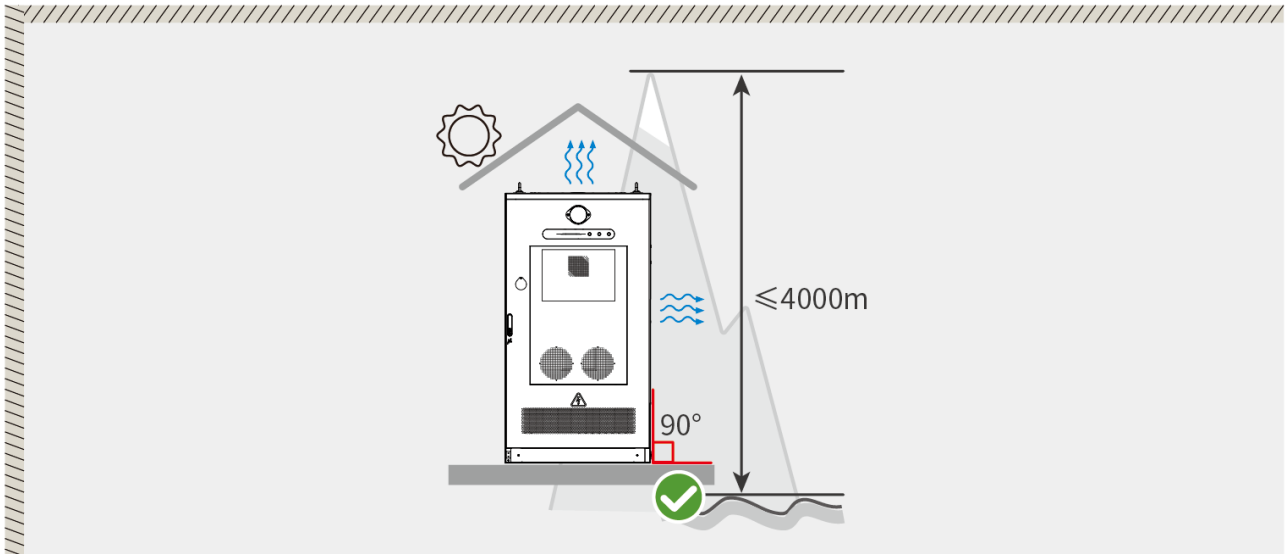
4.1 Installation Requirements

4.1.1 Environmental Requirements

1. Installation site selection must strictly comply with local laws, regulations, and relevant industry standards. It must not be installed in flammable, explosive, corrosive, or similar environments and should be installed near a fire hydrant.
2. The temperature and humidity of the equipment installation environment must be within the appropriate range.
3. The installation position must avoid areas accessible to children and avoid locations prone to accidental contact.
4. During equipment operation, the enclosure temperature may exceed 60°C. Do not touch the enclosure before it cools down to prevent burns.
5. It is recommended to avoid installation environments exposed to direct sunlight, rain, snow accumulation, etc. It is recommended to install in a sheltered location, and a sunshade can be erected if necessary.
6. The installation space must meet the equipment's ventilation and heat dissipation requirements and operating space requirements.
7. The equipment installation site should avoid areas directly blown by cold air such as air-conditioner outlets. Excessive local temperature differences may cause condensation inside the equipment, thereby damaging the equipment.
8. The installation environment must meet the equipment's protection rating. The battery system is suitable for indoor and outdoor installation.
9. Flood prevention and drainage shall be considered at the installation site:
 - Areas that are low-lying and prone to flooding should be avoided. The equipment installation site must be at least 250 mm above the local historical maximum water level.
 - Wind and waves from rivers, lakes, and seas may affect the device. The foundation should be at least 0.6 m above the historical maximum wave height.
 - If there is a large amount of water flowing into or through the equipment installation area on site, drainage facilities should be provided.
 - For installation sites prone to water accumulation, waterproof measures should be taken, including but not limited to installing water retaining plates, providing

drainage systems, or raising the foundation.

10. The equipment installation height must facilitate operation and maintenance, ensuring that equipment indicator lights, all labels, and wiring terminals are easy to view and operate.
11. The equipment installation altitude should be lower than the maximum operating altitude.
12. Before installing equipment outdoors in salt-damage areas, please consult the equipment manufacturer. Salt-damage areas mainly refer to areas within 500 m of the coast; the affected area depends on sea breeze, precipitation, topography, etc.
13. Do not install the equipment in noise-sensitive areas (such as residential areas, office areas, schools, etc.); otherwise, it may cause complaints from residents. If installation in the above areas is necessary, the installation location must be at least 40 m away from the noise-sensitive area.
14. If the equipment is installed in public places other than work and living areas (such as parking lots, stations, factories, etc.), please install a protective net outside the equipment and erect safety warning signs for isolation, prohibiting unauthorized personnel from approaching the equipment, to avoid personal injury or property loss caused by accidental contact by non-professional personnel or other reasons during equipment operation.
15. Keep away from strong magnetic field environments to avoid electromagnetic interference. If there is a radio station or wireless communication equipment operating below 30 MHz near the installation location, please install the equipment according to the following requirements:
 - Energy storage system: Add a ferrite core with multiple turns of winding at the DC input line or AC output line of the energy storage system, or add a low-pass EMI filter; or ensure the distance between the energy storage system and the wireless electromagnetic interference equipment exceeds 30 m.
 - Other equipment: The distance between the equipment and the wireless electromagnetic interference equipment exceeds 30 m.

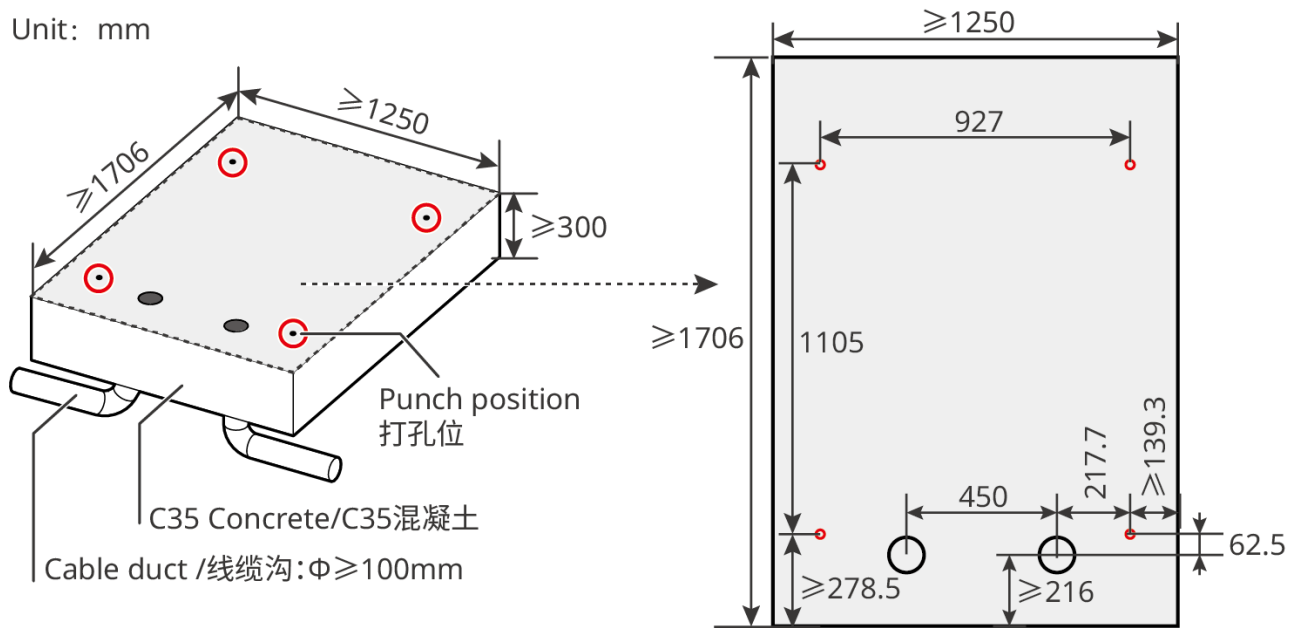


BATC10INT0015

4.1.2 Base Requirements

- The base material must be C35 or above plain concrete hardened surface or other non-combustible surface.
- The bottom of the foundation pit must be reinforced and filled to ensure that the foundation is solid, flat, level, dry, and has sufficient bearing capacity; foundations with depressions, settlement, or inclination are considered unqualified.
- The base shall be provided with embedded conduits or reserved cable outlets to facilitate equipment wiring.
- The equipment uses bottom cable entry. The foundation shall be dust-proof and rodent-proof to prevent foreign matter from entering.
- The base shall have a design that prevents water accumulation and moisture, preventing cables from aging or short-circuiting due to moisture and affecting normal equipment operation.
- The equipment cables are relatively thick. Embedded conduits or reserved cable outlets shall provide sufficient cable routing space to ensure smooth cable connection and avoid abrasion.
- The drawings are for reference only. Construction personnel shall review and adjust them according to actual site conditions, geological conditions, and seismic requirements.

Unit: mm

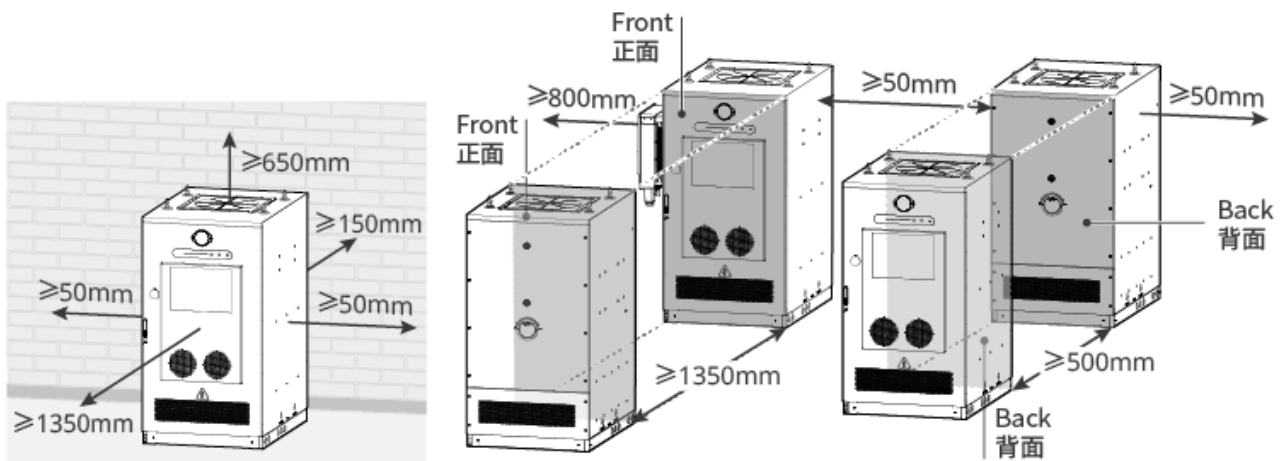


BATC10INT0002

4.1.3 Space Requirements

CAUTION

- When using a forklift, the front-to-back spacing of the energy storage system must be greater than or equal to 2.5 m.
- When installing two adjacent battery systems, it is not recommended that the back of one unit directly face the front of the other.



BATC10INT0003

4.2 Handling Requirements

WARNING

1. During transportation, transfer, installation, and other operations, the laws, regulations, and relevant standards of the country and region must be complied with.
2. Freight forwarders engaged in dangerous goods transportation must obtain relevant qualifications and strictly comply with local dangerous goods transportation regulations.
3. The tilt angle of the cabinet during transportation and movement must be less than 10 degrees.
4. Before installation, transport the equipment to the installation site. During handling, to avoid personal injury or equipment damage, observe the following:
 - Assign an appropriate number of personnel according to the equipment weight to prevent the equipment from exceeding the weight range that personnel can carry and causing crushing injuries.
 - Please wear safety gloves to prevent injury.
 - Please ensure that the equipment remains balanced during handling to prevent it from falling.
 - Please ensure that the cabinet doors are locked securely during equipment handling.
5. When handling the equipment by lifting, please use flexible lifting slings or straps; the load-bearing capacity of a single strap must be $\geq 2t$.
6. When handling the equipment with a forklift, the forklift load capacity must be $\geq 5t$.

 CAUTION

Forklift handling must meet the following requirements:

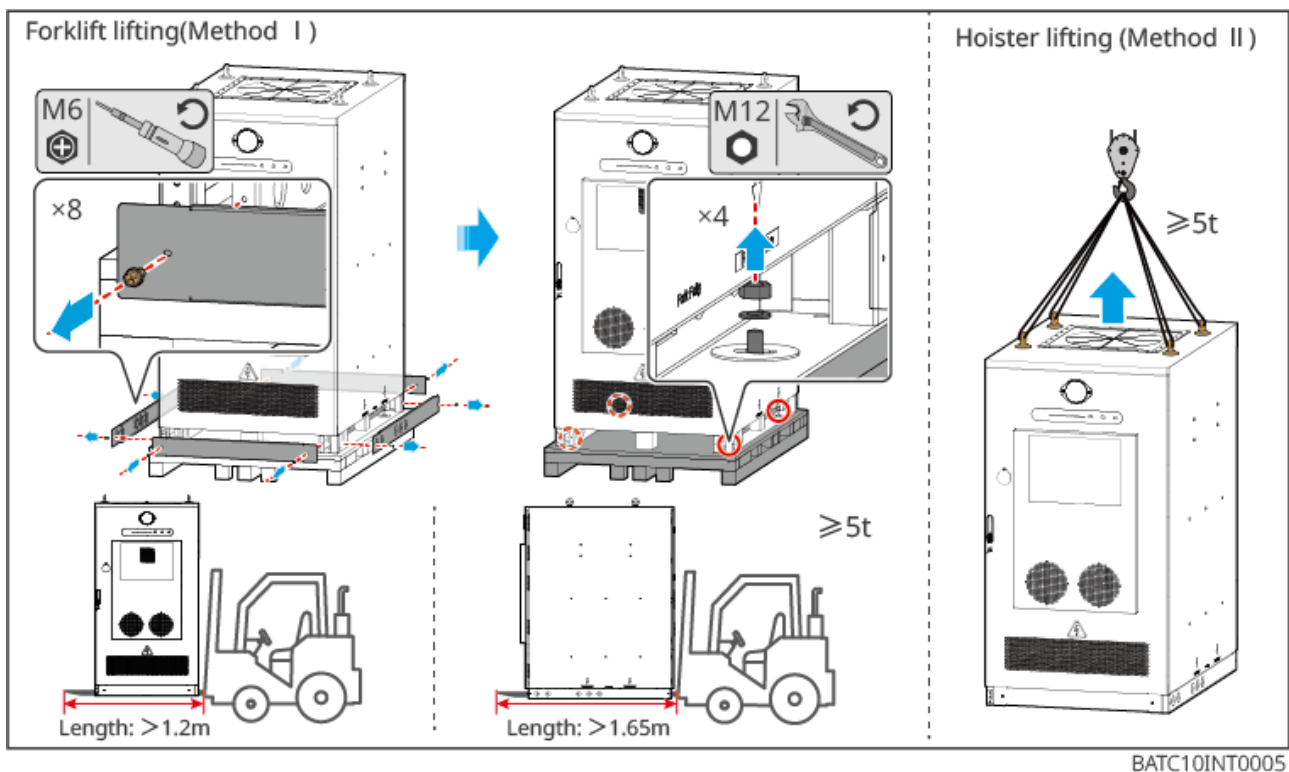
- Before use, confirm that the forklift load capacity is ≥ 5 tons, the fork width is 350–600 mm, and the fork thickness is 40–80 mm.
- If entering from the side, the fork length must be >1.2 m; if entering from the front, the fork length must be >1.65 m.
- Before moving the equipment, pay attention to the center of gravity of the equipment, and secure the equipment firmly to the forklift using ropes or binding straps and other fixing measures.
- During forklift transportation, designate a dedicated person for supervision.
- For the forklift fork entry position, refer to the label instructions on the equipment packaging.
- During forklift transportation, drive at low speed, smoothly, and slow down when turning.

Lifting handling must meet the following requirements:

- The crane operator must have good operating skills and safety awareness, must be trained and certified, and must operate in accordance with local laws and regulations.
- The crane lifting capacity must be ≥ 5 tons, and the lifting operation radius must be >2 meters.
- Before hoisting, confirm the following:
 1. Lifting tools must be complete, have been tested, and be fully safe.
 2. Equipment doors must be closed and locked to prevent accidental opening.
 3. The quality of lifting ropes must comply with standards, and they must be fully secured to prevent falling and wear.
- Do not perform outdoor lifting in adverse weather such as rain, snow, or strong winds.
- All four lifting rings must be used during lifting; using only two lifting rings is strictly prohibited.

CAUTION

- There is a baffle at the bottom of the battery system. Before using a forklift to handle the equipment, remove the baffle.
- When the battery system is shipped, screws are used to secure the battery system to the base. Before installation, remove the base first.

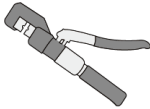
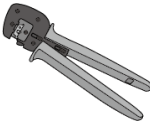
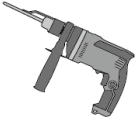
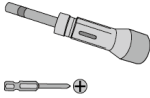
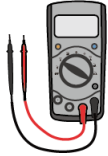
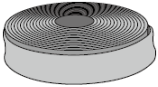


4.3 Tool Requirements

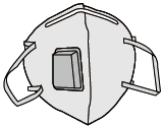
CAUTION

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

Installation Tools

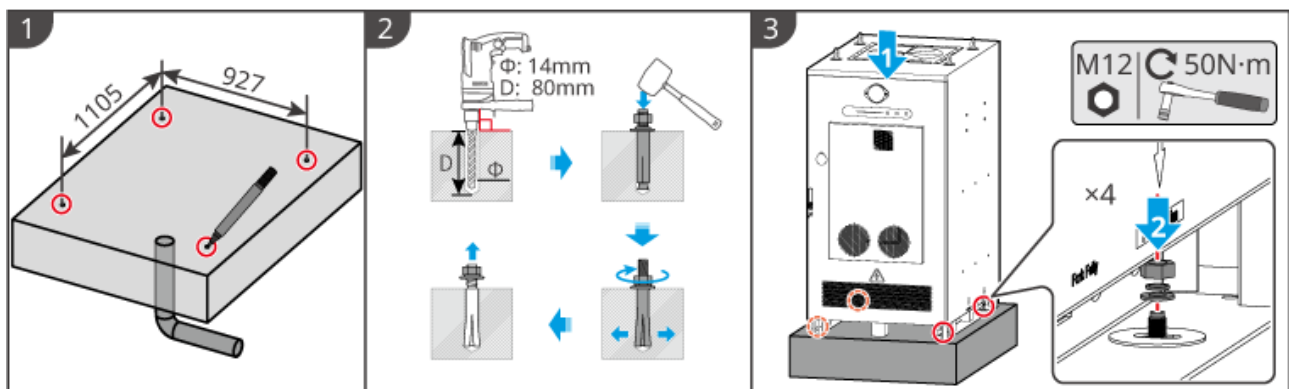
Tool Type	Description	Tool Type	Description
	Diagonal Pliers		RJ45 Crimping Tool
	Wire Stripper		YQK-70 Hydraulic Crimping Tool
	Open-End Wrench		PV Connector Crimping Tool PV-CZM-61100
	Impact Drill (Drill Bit Φ8 mm)		Torque Wrench
	Rubber Mallet		Socket Wrench Set
	Marker		Multimeter Measuring Range ≤ 1100 V
	Heat-Shrink Tubing		Heat Gun
	Cable Ties		Vacuum Cleaner

Personal Protective Equipment

Tool Type	Description	Tool Type	Description
	Insulating Gloves, Protective Gloves		Dust Mask
	Safety Goggles		Safety Shoes

4.4 Install the Equipment

1. Use a marker to mark the drilling positions on the foundation.
2. Install expansion bolts.
3. Secure the battery system to the foundation with expansion bolts.



BATC10INT0006

5 Electrical Connection

DANGER

- All operations during electrical connection and the specifications of cables and components used must comply with local laws and regulations.
- Before making electrical cable connections, ensure that all upstream switches of the equipment are disconnected.
- Before making electrical connections, ensure that the equipment is completely de-energized. Live operations are strictly prohibited; otherwise, hazards such as electric shock may occur.
- Cables of the same type shall be bundled together and routed separately from cables of different types; they shall not be intertwined or crossed.
- If the cable is subjected to excessive tensile force, it may cause a poor connection. During wiring, reserve a certain length of cable before connecting it to the equipment terminal.
- When crimping the terminal, ensure that the conductor part of the cable is in full contact with the terminal. Do not crimp the cable insulation together with the terminal; otherwise, the equipment may fail to operate, or after operation, unreliable connections may cause heating and damage to the equipment terminal block.
- Using cables in high-temperature environments may cause insulation aging or damage. Keep cables at least 30 mm away from heat-generating devices or the perimeter of heat source areas.
- Before operating the equipment, ensure that the equipment is reliably grounded and relevant protective measures are taken. Otherwise, there is a risk of electric shock.
- After wiring is completed, all unused cable entry holes and ports (including communication ports) must be reliably sealed with the dedicated terminals or plugs provided in the accessory kit; otherwise, the following risks may occur:
 - Electric shock hazard: Exposed electrical ports may cause personnel to accidentally contact live components, resulting in electric shock accidents.
 - Protection failure: Unsealed ports may allow dust, moisture, or foreign objects to enter the equipment, causing short circuits, equipment damage, or even fire.

CAUTION

- Before electrical connection, wear personal protective equipment such as safety shoes, protective gloves, and insulated gloves as required.
- Only trained professionals are permitted to perform electrical connection and related operations.
- The cable colors in the figures in this document are for reference only. The actual cable specifications must comply with local regulatory requirements.

5.1 Pre-Wiring Preparation

Cable Preparation

No.	Cable		Recommended specification	Description
1	Protective earth cable		• Single-core outdoor copper cable • Conductor cross-sectional area: 16–25 mm²	User-supplied
2	Battery DC cable	ET100	• Single-core outdoor copper cable • Conductor cross-sectional area: 25 mm² • Cable outer diameter: 9.4–10.6 mm	Finished cable harness is shipped with the unit. If the finished harness length is insufficient, users must provide their own cables.
		ET G3		

No.	Cable		Recommended specification	Description
		ETR125	• Single-core outdoor copper cable • Conductor cross-sectional area: 70 mm² • Cable outer diameter: 14.5–15.5 mm	
3	Battery cluster paralleling power cable		• Single-core outdoor copper cable • Conductor cross-sectional area: 50 mm² • Cable outer diameter: 13–14 mm	User-supplied
4	BMS communication cable		-	Shipped with the package
5	Battery cluster paralleling communication cable/cloud board communication cable		Shielded network cable with RJ45 connector, CAT 5E or higher, EIA/TIA 568B standard	Communication cables are included in the product package. If more cables are required for actual installation or the length is insufficient, please prepare them separately.

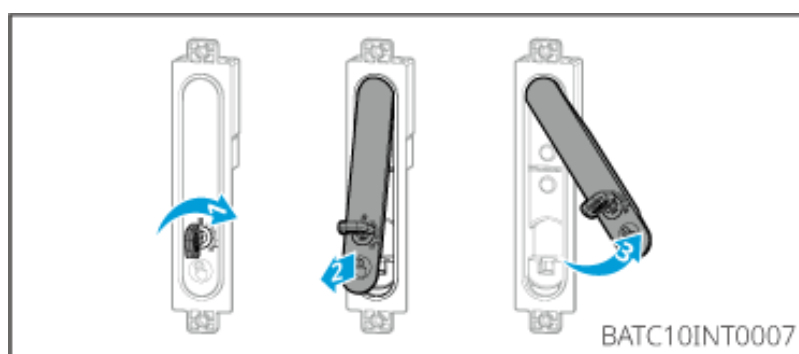
Circuit Breaker Preparation (Optional)

Circuit breaker	Matching inverter	Specifications	Description
Battery switch	ET 50-100kW	Optional according to local laws and regulations 2P DC switch × 2 (required for each battery port) - Rated current ≥ 125 A - Rated voltage ≥ 1000 V	User-supplied The circuit breaker must be disconnected before equipment maintenance to ensure personal safety!
	ETR 50-125kW	Optional according to local laws and regulations; must be equipped with overcurrent protection; 2P DC switch rated voltage ≥ 1100 V; rated current requirements are as follows: - GW125K-ETR-G10, GW124.99K-ETR-G10, GW110K-ETR-G10, GW75K-ETR-L-G10: rated current ≥ 250 A - GW100K-ETR-G10, GW99.99K-ETR-G10: rated current ≥ 200 A - GW80K-ETR-G10, GW75K-ETR-G10, GW50K-ETR-L-G10: rated current ≥ 160 A	

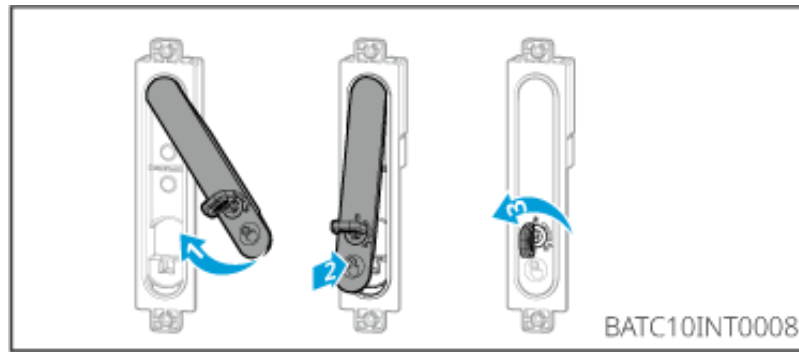
Circuit breaker	Matching inverter	Specifications	Description
	ET G3 series	Optional according to local laws and regulations 2P DC switch × 2 (required for each battery port) - Rated voltage ≥ 1000 V; rated current requirements are as follows: - GW25K-ET-G30, GW29.999K-ET-G30, GW30K-ET-G30, GW18K-ET-L-G30: ≥ 100A - GW37.5K-ET-G30, GW40K-ET-G30, GW49.999K-ET-G30, GW50K-ET-G30, GW25K-ET-L-G30, GW30K-ET-L-G30: ≥ 125A	

Cabinet Door Operation

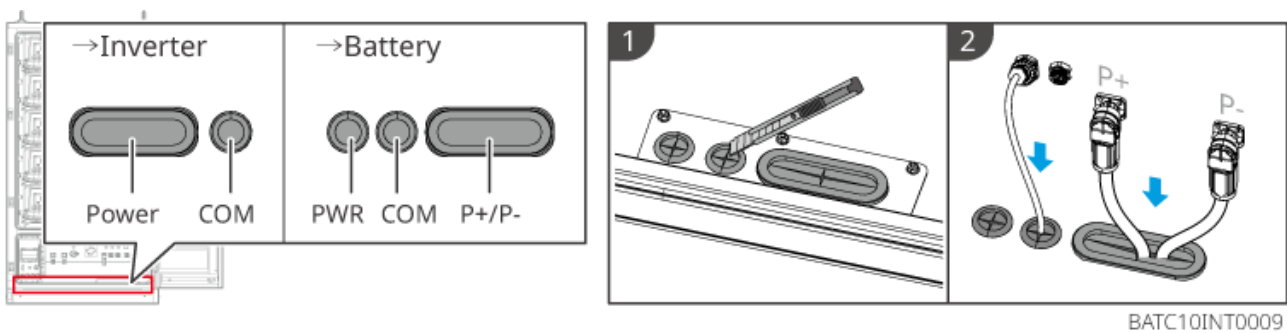
- Open the cabinet door



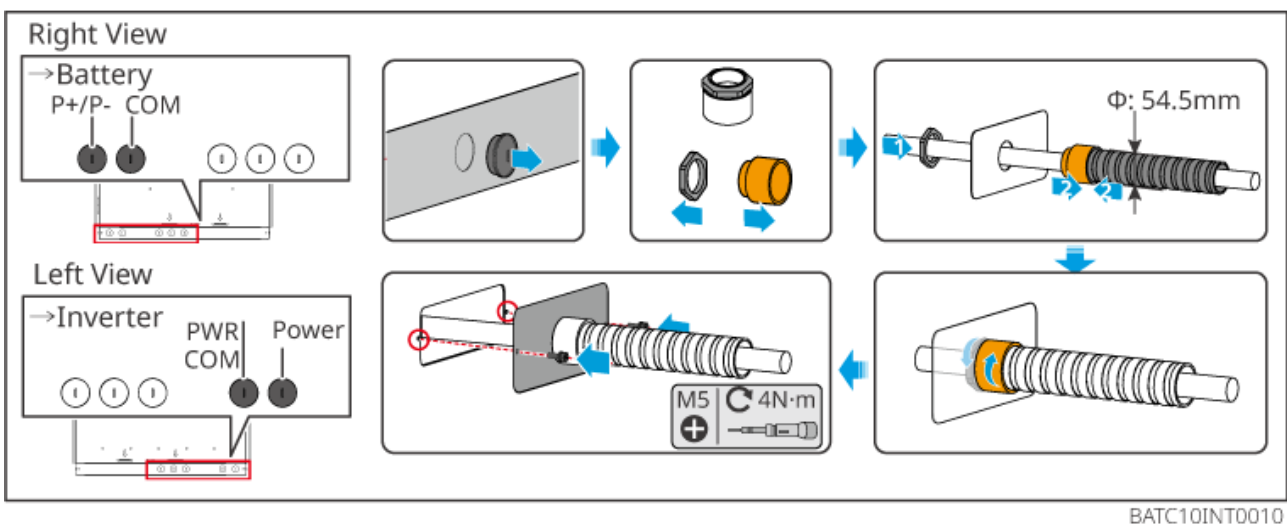
- Close the cabinet door



Introduction to Internal Cable Routing Holes in the Cabinet



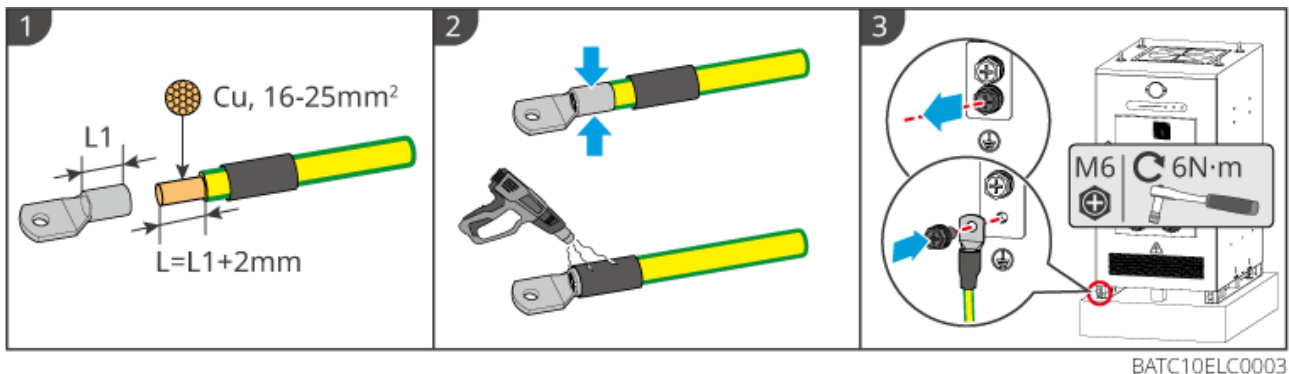
Introduction to Side Cable Routing Holes of the Cabinet



5.2 Connect the Protective Earth Cable

1. Prepare cables and terminals, and strip the wires as required.
2. Crimp the terminals.

3. Remove the screw at the grounding point, and use the screw to connect the crimped ground cable to the grounding point of the battery system.



5.3 Connect Power Cables

CAUTION

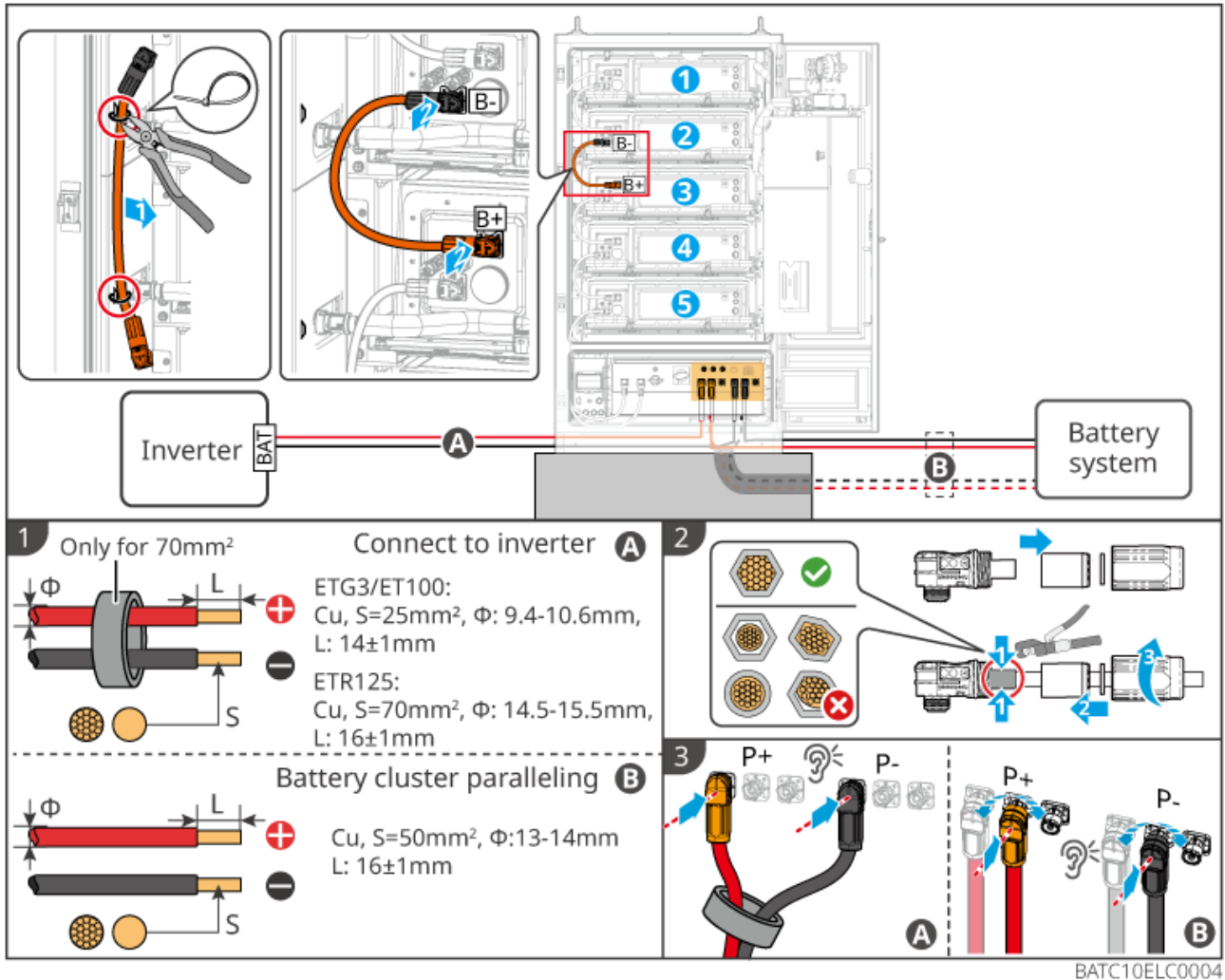
- When connecting the battery system to the inverter, use the factory-assembled cables supplied with the unit. If these cables are not long enough, select compliant cables and fabricate the cables yourself.
- If the factory-assembled cables have ferrite rings, after fabricating the cables yourself, remove the ferrite rings from the factory-assembled cables and install them on the fabricated cable harness.
- The BAT-C series 208.9kWh commercial and industrial battery system supports up to four battery cabinet clusters connected in parallel.

• Connect Power Cables Between Batteries

1. Use wire cutters to cut the cable ties and remove the power cables.
2. Connect the power cables to the positive and negative terminals of the PACK.

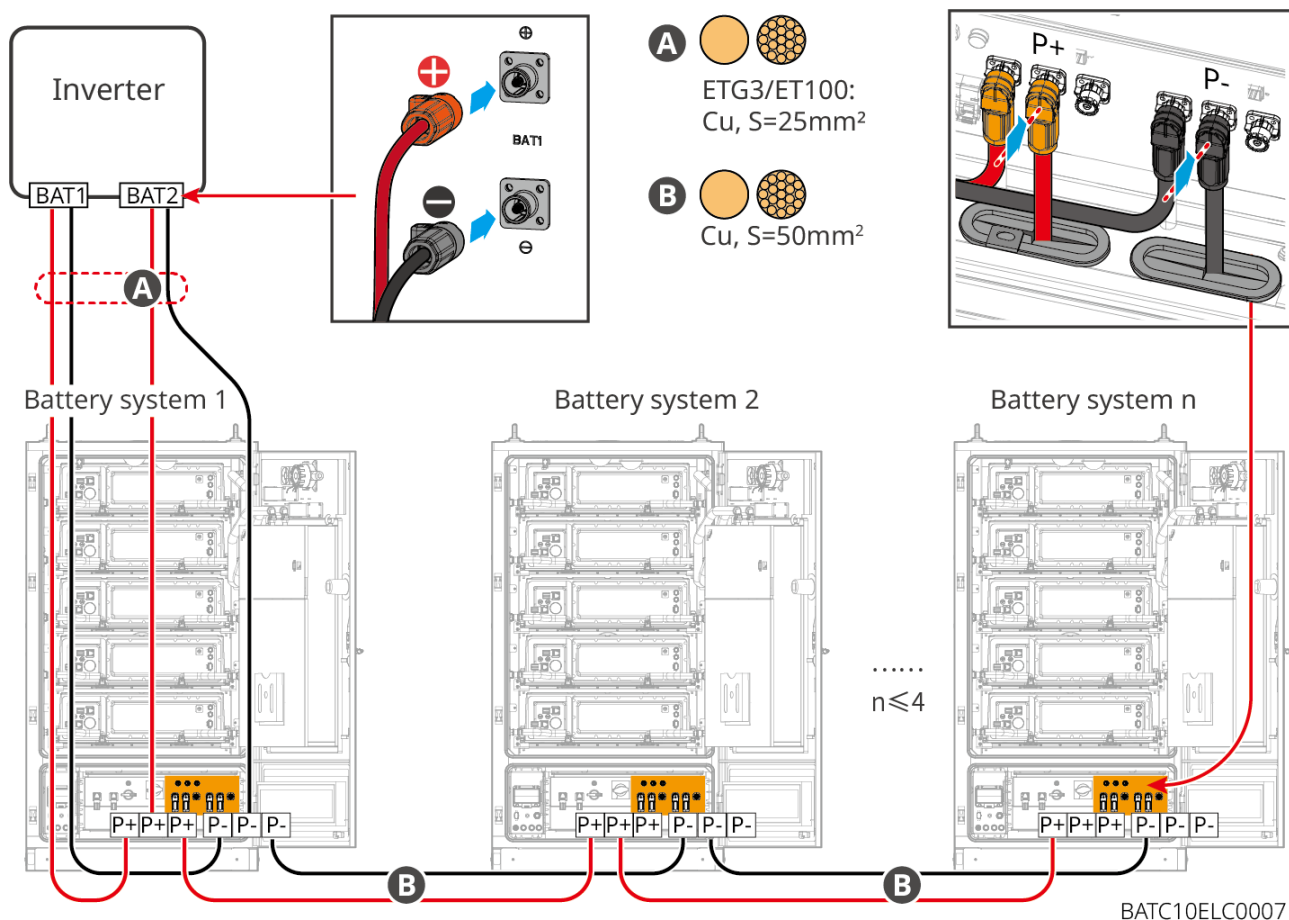
• Connect Battery System Power Cables

1. Prepare the cables.
2. Fabricate the cables.
3. Connect the cables to the corresponding ports.



Wiring Diagram

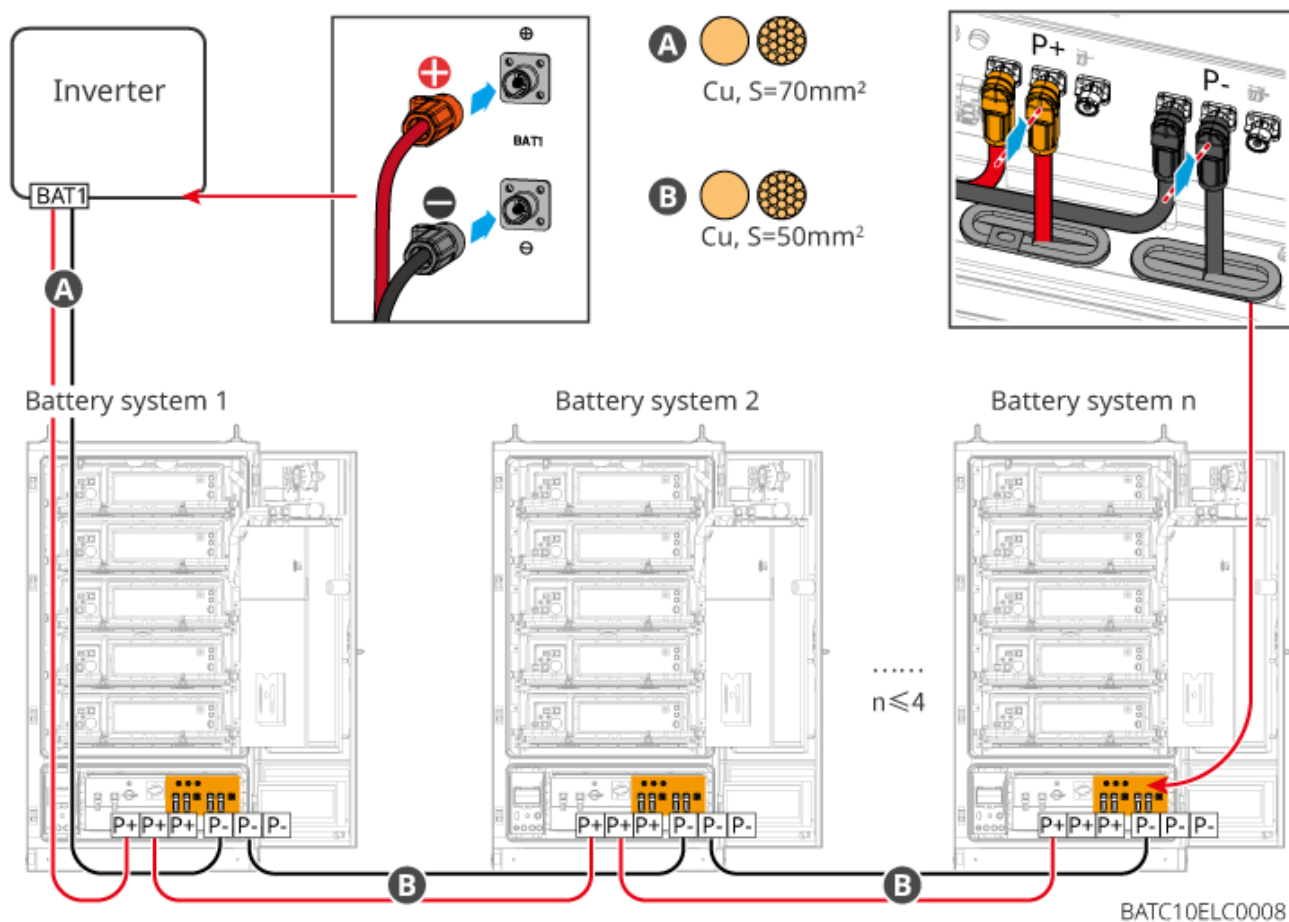
- Connect to ET100 / ET G3



- **Connect to ETR125**

CAUTION

When the ETR125 standard-voltage unit is paired with a battery system, the PV-side voltage must be higher than 650 V; otherwise, voltage-difference current limiting will occur.



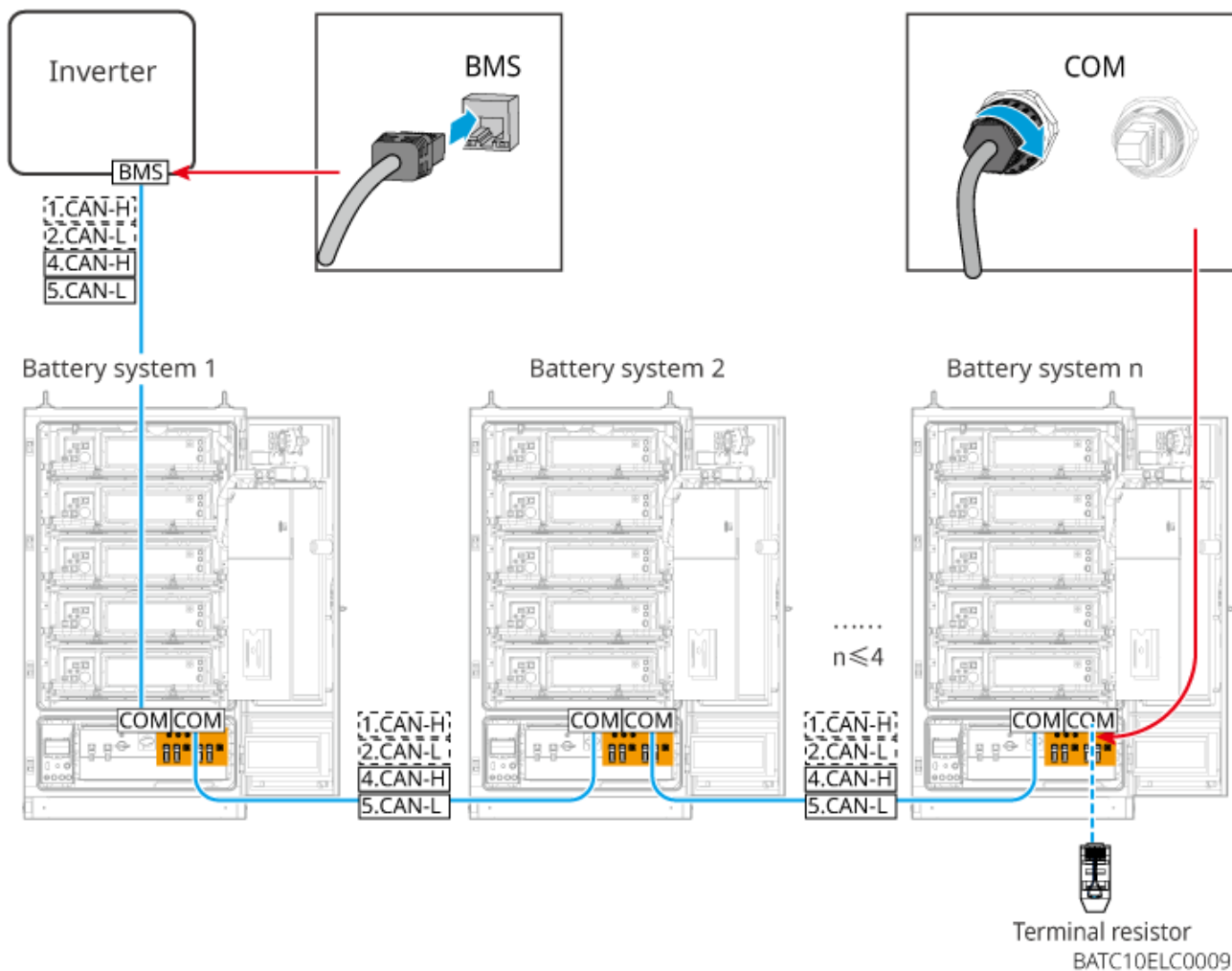
5.4 Connect Communication Cable

CAUTION

- The termination resistor is already connected to the external communication port of the battery system at the factory. If you need to connect a communication cable, remove the termination resistor. Keep the termination resistor on ports that are not connected to communication cables.
- Inter-battery cloud board communication supports transmission of cell-level information. For cloud board communication, use a shielded network cable with RJ45 connectors, CAT 5E or higher, compliant with EIA/TIA 568B, and a cable length of 100 m or less.
- When battery clusters are connected in parallel, to improve communication quality, the termination resistor must be retained on the COM port of the battery farthest from the inverter.
- For a battery directly connected to the inverter, the distance between the battery and the inverter must not exceed 3 m.
- When battery clusters are connected in parallel, ensure that the distance from the battery farthest from the inverter to the inverter does not exceed 50 m.
- When connecting communication cables, use the communication cable delivered with the unit.

BMS Communication Between Inverter and Battery

Port	Definition	Description
1	CAN_H	(Optional) DCDC-to-inverter communication & parallel-cluster CAN bus
2	CAN_L	
3	-	-
4	CAN_H	Battery system-to-inverter communication & parallel-cluster CAN bus.
5	CAN_L	
6-8	-	-

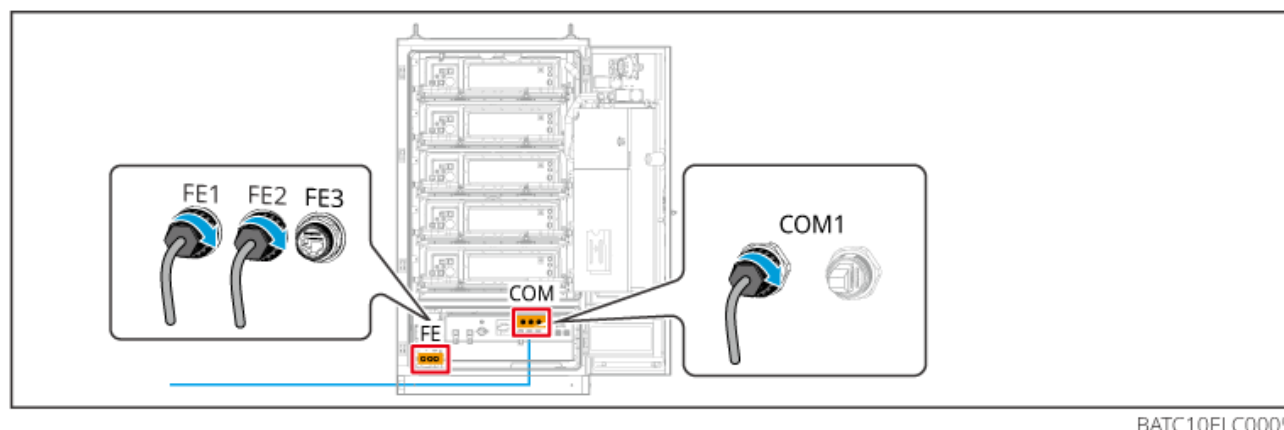
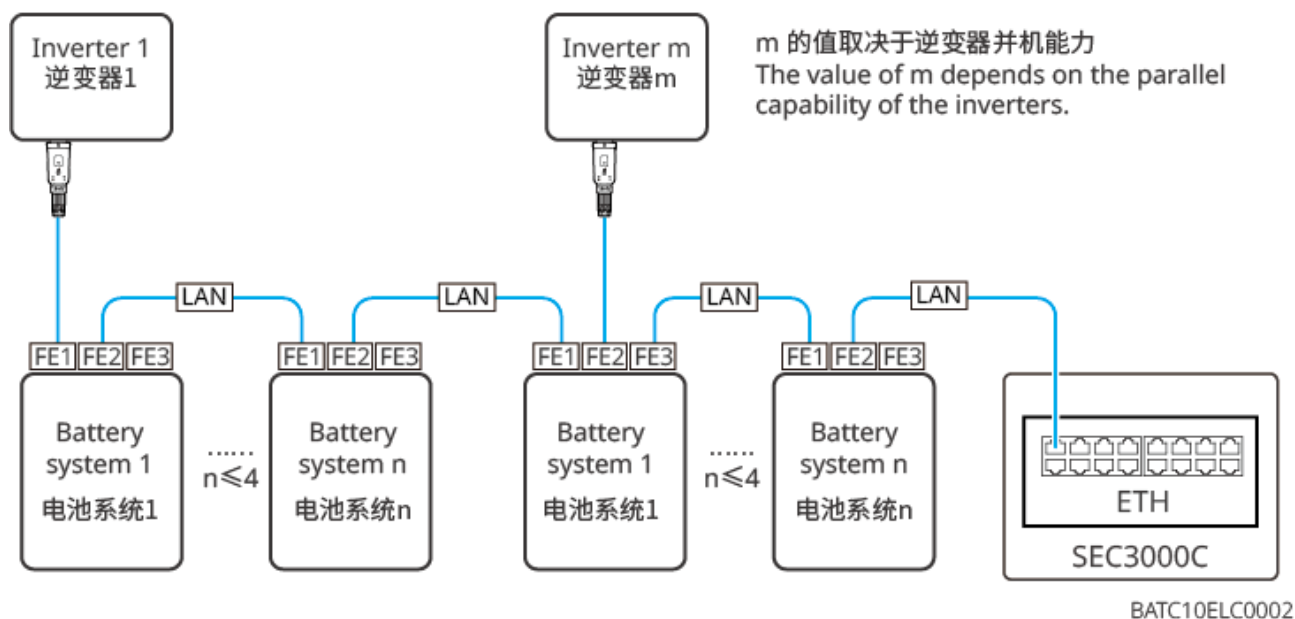


Inter-Battery Cloud Board Communication

Inter-battery cloud board communication supports transmission of cell-level information. The maximum number of parallel units is $m \times n$.

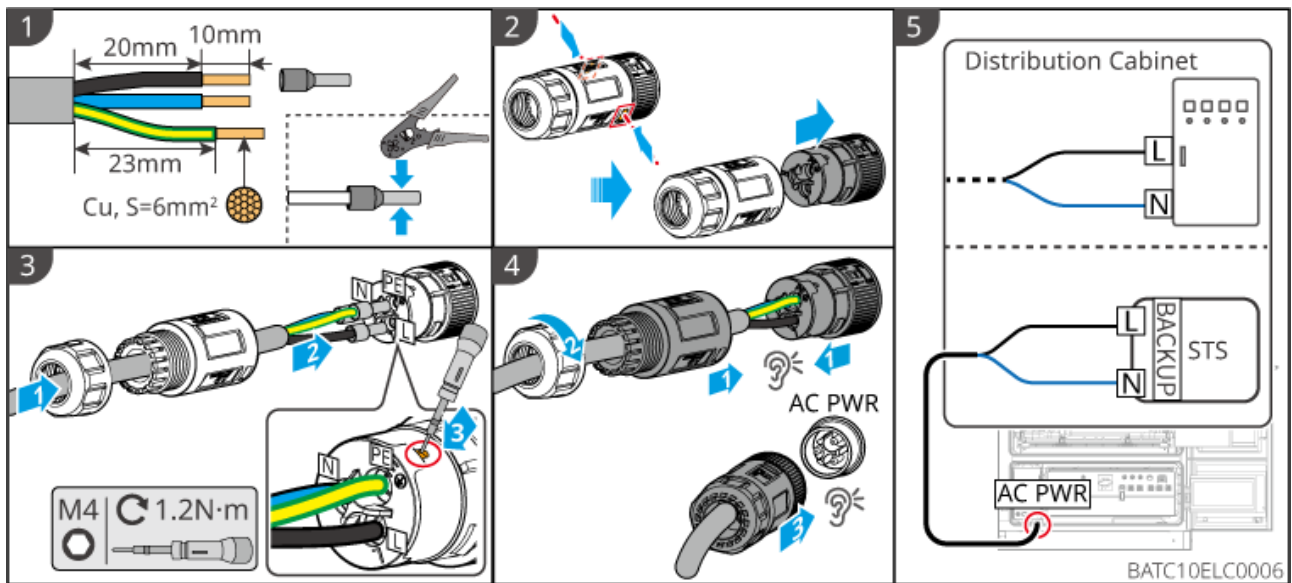
CAUTION

The device must be connected to the network to view cell-level information and PACK-level alarms; cluster-level system information and fault alarms can be viewed without network connection.



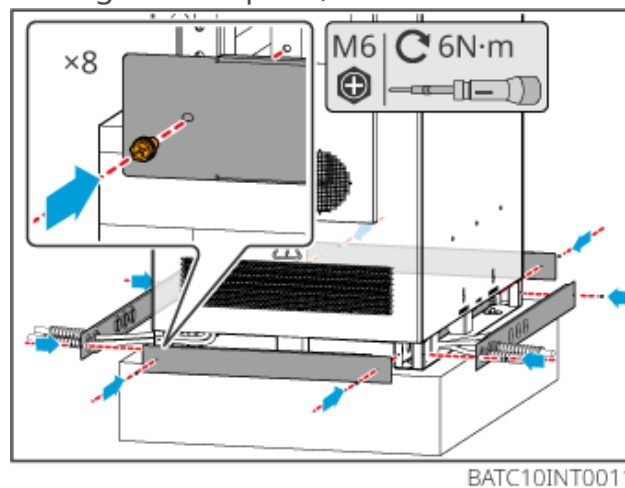
5.5 Connect the Power Cable for the Liquid Cooling Unit

1. Prepare the cable and crimp the terminals.
2. Open the AC connector.
3. Insert the crimped cable into the corresponding terminal hole, and use a flat-head screwdriver to press the conductor into place.
4. Assemble the connector and tighten the nut, then insert the connector into the AC PWR port.
5. Connect the other end of the cable to the distribution panel or the BACK-UP port.

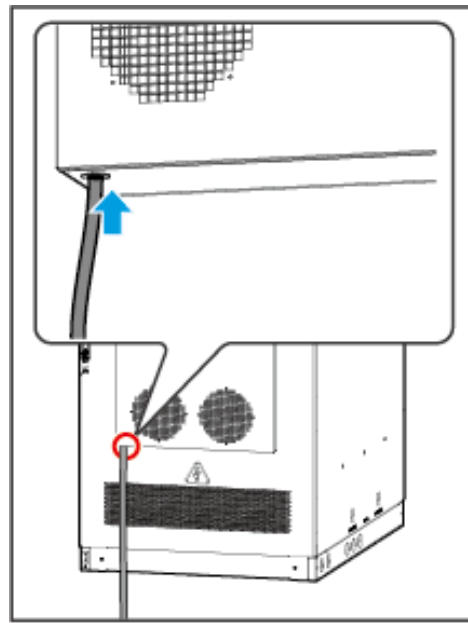


5.6 Operations After Wiring

1. After installation and wiring are complete, reinstall the removed bottom panel.

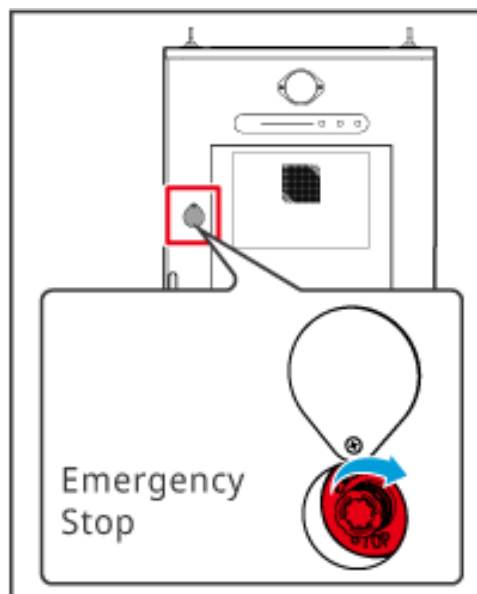


2. Install the liquid cooling unit drain pipe.



BATC10INT0017

3. Release the emergency stop switch.



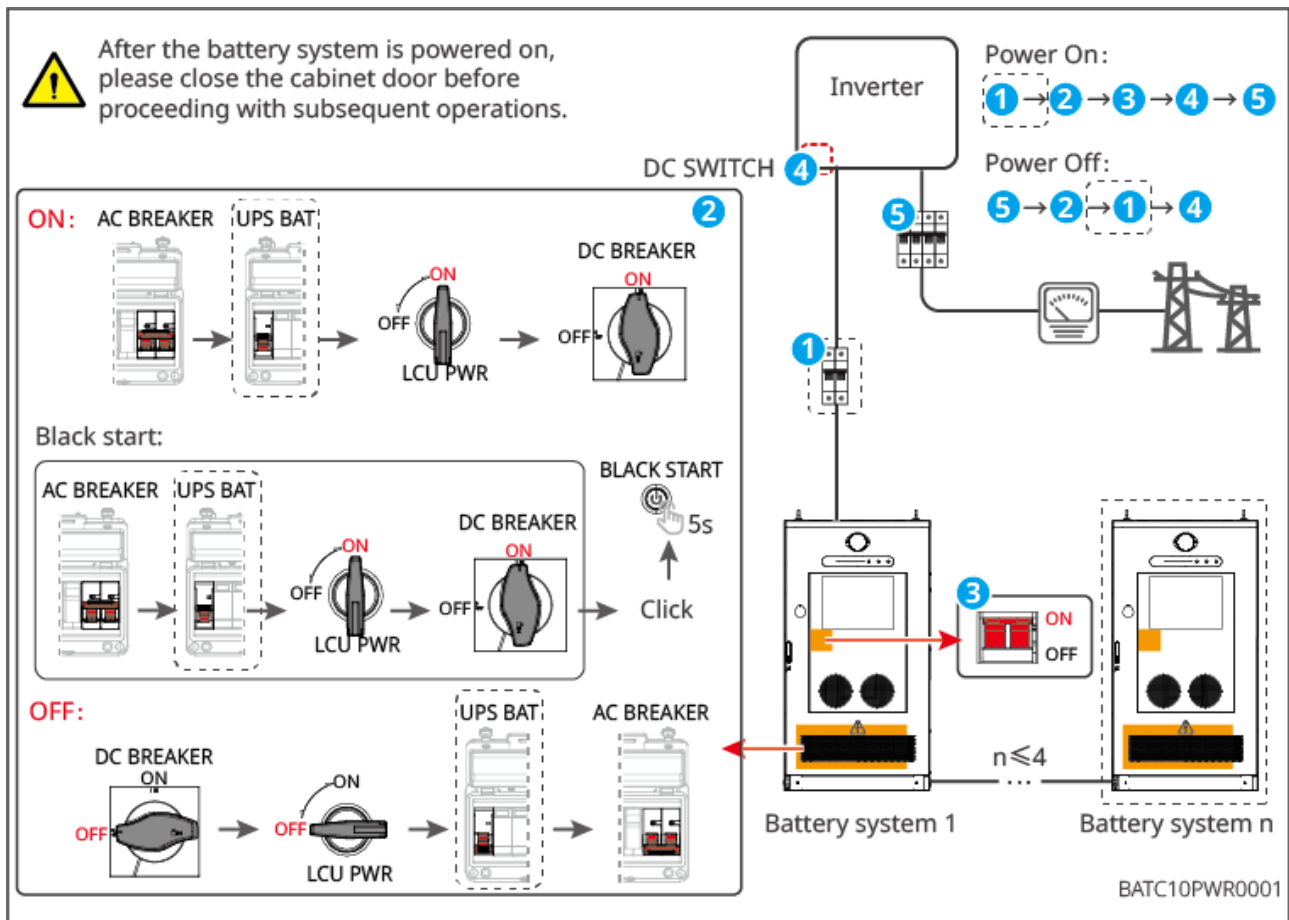
6 System Trial Operation

6.1 Pre-Power-on Checks

No.	Check Items
1	The equipment is securely installed; the installation position facilitates operation and maintenance; the installation space facilitates ventilation and heat dissipation; and the installation environment is clean and tidy.
2	The protective earth cable, power cables, communication cables, and termination resistors are correctly and securely connected.
3	Cables are bound in accordance with cable routing requirements, rationally distributed, and free from damage.
4	All cut cable routing holes have been sealed with fireproof putty.

6.2 Powering on the Equipment

1. Push the operating handle of the AC BREAKER to the "ON" position.
2. (Optional) Push the operating handle of the UPS BAT to the "ON" position.
3. Turn LCU PWR to the "ON" position.
4. Turn the DC BREAKER to the "ON" position.
5. Push the operating handle of the liquid cooling unit power switch to the "ON" position.



Black Start Procedure

1. Push the operating handle of the AC BREAKER to the "ON" position.
2. (Optional) Push the operating handle of the UPS BAT to the "ON" position.
3. Turn LCU PWR to the "ON" position.
4. Turn the DC BREAKER to the "ON" position.
5. After hearing a "click" sound, press and hold the BLACK START switch for 5 seconds.

7 System Commissioning and Plant Monitoring

7.1 Commissioning via SEC3000C

The SEC3000C Smart Energy Control Box is dedicated equipment for the monitoring and management platform of PV power generation systems. It can be used to collect data from devices in the PV power generation system, such as grid-tied inverters, energy storage inverters, and electricity meters, store logs, and send the data to the monitoring and management platform, thereby enabling centralized monitoring, operation, and maintenance of the PV system.

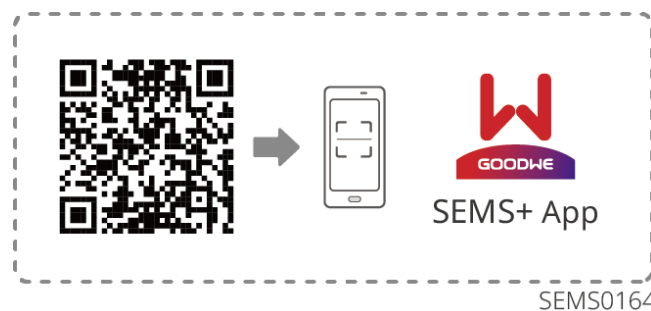
For detailed functions, refer to the "[SEC3000C User Manual](#)》。

7.2 Plant Monitoring via SEMS+

SEMS+ is a monitoring platform that can communicate with devices via WiFi, LAN, or 4G. The following are common functions of SEMS+:

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

Scan the QR code below to download and install.



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



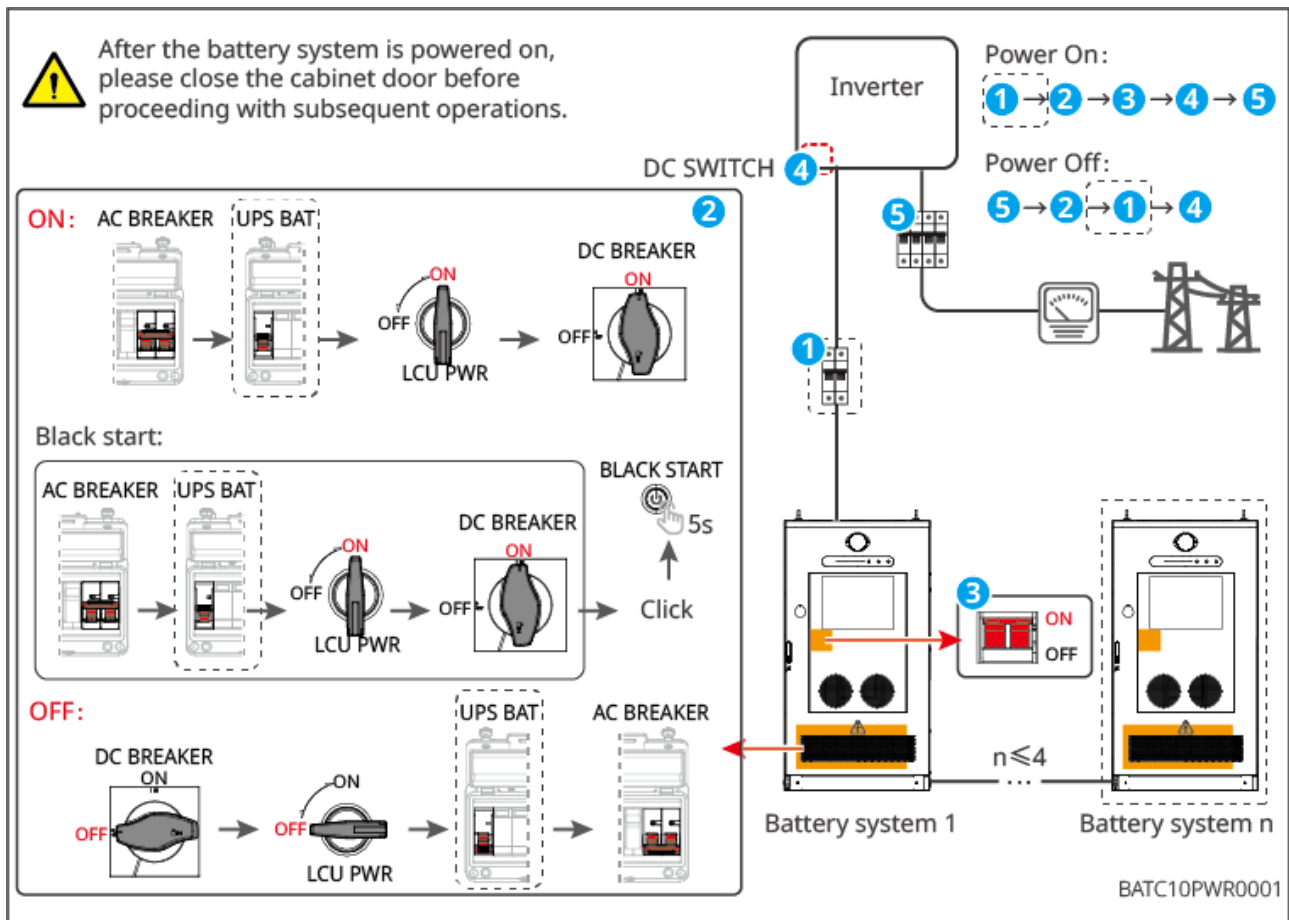
8 System Maintenance

8.1 Powering off the Equipment

DANGER

- When operating or maintaining the equipment, power off the equipment. Operating the equipment while energized may cause equipment damage or electric shock hazards.
- After the equipment is powered off, it takes some time for internal components to discharge. Wait until the equipment is fully discharged according to the time requirement on the label.

1. Turn the DC BREAKER to the "OFF" position.
2. Turn LCU PWR to the "OFF" position.
3. (Optional) Push the operating handle of the UPS BAT to the "OFF" position.
4. Push the operating handle of the AC BREAKER to the "OFF" position.



8.2 Regular Maintenance

⚠ WARNING

- If any problem that may affect the battery or system is found, contact after-sales personnel. Do not disassemble the equipment without authorization.
- If the internal copper wires of a conductive cable are exposed, do not touch it; high voltage danger. Contact after-sales personnel and do not disassemble the equipment without authorization.
- In case of other emergencies, contact after-sales personnel immediately, operate under their guidance, or wait for them to perform on-site operations.

Please refer to the [BAT-C 208.9-261.2kWh Commercial and Industrial Battery System Maintenance Manual](#)》。

8.3 Troubleshooting

Perform troubleshooting according to the following methods. If the troubleshooting methods cannot help you, contact the after-sales service center.

When contacting the after-sales service center, please collect the following information to facilitate rapid problem resolution.

1. Energy storage system information, such as serial number, software version, equipment installation time, fault occurrence time, fault occurrence frequency, etc.
2. Equipment installation environment, such as weather conditions, etc. For the installation environment, it is recommended to provide photos, videos, and other files to assist in problem analysis.
3. Grid conditions.

CAUTION

When the ambient temperature is higher than 25°C and the energy storage system fault indicator is illuminated, turn off the power switch of the liquid cooling unit before opening the door for inspection, then close the door and let it stand for at least 15 minutes, and only then open the door for troubleshooting.

No.	Fault Name	Possible Causes	Troubleshooting
1	Overvoltage Protection	1. Cell or total voltage too high 2. Voltage sampling harness abnormality	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
2	Undervoltage Protection	1. Cell or total voltage too low 2. Voltage sampling harness abnormality	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service

No.	Fault Name	Possible Causes	Troubleshooting
3	Overcurrent Protection	Current limiting abnormality, charging current too high	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
4	Overtemperature Protection	1. Cell temperature too high 2. Temperature sensor abnormality	1. Shut down and leave standing for 30 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
5	Low-temperature Protection	1. Cell temperature too low 2. Temperature sensor abnormality	1. Shut down and leave standing for 30 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
6	Imbalance Protection	Temperature difference: 1. Battery capacity degradation, resulting in excessive internal resistance and large temperature rise under overcurrent 2. Battery tab welding problem 3. Temperature sampling problem 4. Loose power cable connection Voltage difference: 1. Inconsistent battery aging 2. Harness problem	1. Shut down and leave standing for 30 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service

No.	Fault Name	Possible Causes	Troubleshooting
7	Insulation Protection	Insulation resistance damage	1. Shut down and leave standing for 30 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
8	Precharge Failure	Precharge relay closing failure	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
9	Harness abnormality	Sampling wire disconnection	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
10	Relay open circuit	Relay damage	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
11	Relay sticking	Relay damage	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service

No.	Fault Name	Possible Causes	Troubleshooting
12	Cluster Paralleling Fault	1. Slave cluster communication lost 2. Slave cluster registration failed	1. Replace the communication cable and check whether the fault is cleared 2. Fault not cleared; contact after-sales service
13	PCS communication lost	Communication cable disconnected	1. Replace the communication cable and check whether the fault is cleared 2. Fault not cleared; contact after-sales service
14	BMU communication lost	AFE internal communication lost	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
15	MCU communication lost	Communication lost between battery and DCDC	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
16	Air circuit breaker contact welding	Air circuit breaker/shunt trip abnormal	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service

No.	Fault Name	Possible Causes	Troubleshooting
17	Precharge Failure	Precharge relay closing failure	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
18	Reverse connection fault	P+P- port voltage < -500 V	1. Check whether the power cables between batteries are connected in reverse 2. Fault not cleared; contact after-sales service
19	Software fault	Software fails to operate normally	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
20	Hardware overcurrent	High current present when system is not operating	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
21	Microelectronic fault	Electronic component fault	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
22	General alarm	A single cluster has a fault and is bypassed	Check the single-cluster fault information and handle it according to the corresponding fault handling plan.

No.	Fault Name	Possible Causes	Troubleshooting
23	Main control overload	Output current exceeds system carrying capacity	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
24	Air circuit breaker abnormal	Molded case circuit breaker open	1. Close the molded case circuit breaker and check whether the fault is cleared 2. Fault not cleared; contact after-sales service
25	Fire protection fault	Fire protection actually triggered or falsely triggered	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
26	Emergency stop fault	Emergency stop button pressed	1. Reset the emergency stop button and check whether the fault is cleared. 2. Fault not cleared; contact after-sales service
27	Access control fault	1. Access control open 2. Access control switch damaged	1. Close the access control and check whether the fault is cleared. 2. Fault not cleared; contact after-sales service

No.	Fault Name	Possible Causes	Troubleshooting
28	Connector overtemperature	Power connector overtemperature	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
29	Water immersion fault	Water immersion inside cabinet	1. After draining, restart and check whether the fault is cleared. 2. If not recovered after restart, contact after-sales service
30	DCDC fault	DCDC internal fault	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service
31	PACK fault	PACK internal fault	1. Shut down and leave standing for 5 minutes, then restart to check whether the fault is cleared 2. If not recovered after restart, contact after-sales service

8.4 Equipment Removal

DANGER

- Before removal, ensure that the equipment is powered off.
- When operating the equipment, wear personal protective equipment.
- When removing wiring terminals, use proper removal tools to prevent damage to the terminals or equipment.
- Unless otherwise specified, the equipment removal procedure is the reverse of the installation procedure and is not repeated in this document.

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

8.5 Device Disposal

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

9 Technical Data

Technical Data	GW199.6-BAT-LC-G10	GW199.6-BAT-LCD-G10	GW208.9-BAT-LC-G10	GW208.9-BAT-LCD-G10	GW261.2-BAT-LCD-G10
Battery System					
Battery Type	LFP (LiFePO4)				
Rated Capacity (Ah)	300		314		
Pack Type/model	GW52.2-PACK-LC-G10				
Pack Rated Energy (kWh)	52.24				
Pack Configuration	1P52S				
Pack Weight (kg)	335±8				
Number of Packs	4	4	4	4	5
Rated Energy (kWh)* ¹	199.6 *2	199.6 *2	208.9	208.9	261.2
Usable Energy (kWh)* ¹	193.7@25 °C±2°C, 0.5P,100%DOD	191.8@25°C ±2°C, 0.5P,100%DOD	202.7@25 °C±2°C, 0.5P,100%DOD	200.7@25 °C±2°C, 0.5P,100%DOD	250.9@25°C ±2°C, 0.5P,100%DOD
Pack Nominal Voltage (V)	166.4	166.4	166.4	166.4	166.4
Nominal Voltage (V)	665.6	665.6	665.6	665.6	832

Technical Data	GW199.6-BAT-LC-G10	GW199.6-BAT-LCD-G10	GW208.9-BAT-LC-G10	GW208.9-BAT-LCD-G10	GW261.2-BAT-LCD-G10
Operating Voltage Range (System) (V)	596.96~750.88	700~1000	596.96~750.88	700~1000	746.2~1000
Rated Charging/Discharging Current (A) *3	157/157	/	157/157	/	/
Rated Input/Output Current (A)*3	/	157/157	/	157/157	157/157
Max.Charging/Discharging Current (A)*4	188.4/188.4	/	188.4/188.4	/	/
Max. Input/Output Current (A)	/	180/180	/	180/180	180/180
Max. Charging/Discharging power (kW)*4	125.3/125.3	/	125.3/125.3	/	/
Max. Input/Output Power (kW)	/	125.3/125.3	/	125.3/125.3	137.5/137.5
Max. Charging/Discharging Rate*4	0.6/0.6P	0.6/0.6P	0.6/0.6P	0.6/0.6P	0.6/0.6P

Technical Data	GW199.6-BAT-LC-G10	GW199.6-BAT-LCD-G10	GW208.9-BAT-LC-G10	GW208.9-BAT-LCD-G10	GW261.2-BAT-LCD-G10
Charging/Discharging Operating Temperature Range (°C)	-25~+55				
Cycle Life	10000Cycles				
Depth of Discharge	100%				
Efficiency					
Round-trip Efficiency	94%@100%DOD, 0.5P, 25±2°C	93%@100%DOD, 0.5P, 25±2°C	94%@100%DOD, 0.5P, 25±2°C	93%@100%DOD, 0.5P, 25±2°C	93%@100%DOD, 0.5P, 25±2°C
General Data					
Storage Temperature (°C)	+35°C~+45°C (< 6 Months); -20°C~+35°C (< 1 Year)				
Relative Humidity	4~100%, No condensation				
Max. Operating Altitude (m)	4000				
Cooling Method	Liquid Cooling				
Communication	CAN (RS485 Optional)				
Weight (kg)	≤2095	≤2105	≤2095	≤2105	≤2440

Technical Data	GW199.6-BAT-LC-G10	GW199.6-BAT-LCD-G10	GW208.9-BAT-LC-G10	GW208.9-BAT-LCD-G10	GW261.2-BAT-LCD-G10
Dimension (W×H×D mm)	1050*2025*1565				
Noise Emission (dB)	≤70				
Useable Extinguishing Agent	CO ₂ , H ₂ O				
Crucial Material	LiFePO ₄ , C, Cu, LiPF ₆ , Al, (C ₃ H ₆) _n				
Ingress Protection	IP55				
Protective Class	I				
Anti-Corrosion Class	C4-M (C5-M Optional)				
Fire safety equipment	Aerosol (Pack&Cabinet Level)				
Certification *5					
Safety Regulation	For details, please visit our official website				
EMC	For details, please visit our official website				

Technical Data	GW199.6-BAT-LC-G10	GW199.6-BAT-LCD-G10	GW208.9-BAT-LC-G10	GW208.9-BAT-LCD-G10	GW261.2-BAT-LCD-G10
Note: 1. Test conditions, 100% DOD, 0.5P/C Charging & Discharging at +25±2 °C for battery system at beginning life. Initial battery module capacity (at factory), actual capacity is affected by external environment (e.g., temperature, transportation, storage). 2. Shared PACK model; PACK rated capacity: 314 Ah; system rated capacity: 300 Ah 3. Only For Australia. 4. Actual Dis-/Charging Current and power derating will occur related to Cell Temperature and SOC. And, Max C-rate continuous time is affected by SOC, Cell Temperature, Atmosphere environment temperature. 5. Not all certifications & standards listed, check the official website for detail. 6. GW199.6-BAT-LC-G10&GW199.6-BAT-LCD-G10 is only for the Australia market.					

10 Contact Details

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