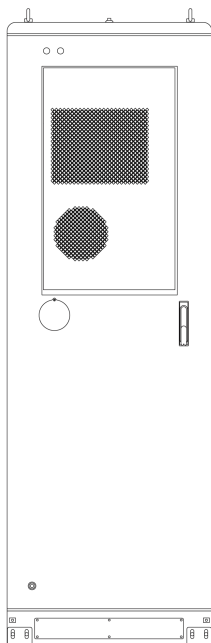


## Rechargeable Li-ion Battery Storage System GE-FH60&FL60

---



# Preface

This manual provides information on safety, installation, electrical connection, operation, maintenance, and other relevant aspects of the product.

In this manual, the terms “equipment”, “device”, and “product” refer to the product or its components; the terms “manufacturer”, “producer”, and “the Company” refer to NINGBO DEYE ESS TECHNOLOGY CO., LTD. or its authorized agents.

The illustrations in this manual are for reference only and may differ from the actual product. The Company reserves the right to modify the content without prior notice. For the latest version, please visit our official website or contact our after-sales service.

The Company assumes no liability for any losses arising outside the scope of the warranty policy.

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## Technical Assistance

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## **FCC Statement**

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## **FCC Radiation Exposure Statement**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

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# 1 Safety

## 1.1 Symbols

| Symbols                                                                             | Description                                                           |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
|    | Warning; Electricity                                                  |
|    | General Warning                                                       |
|    | Symbol for separate collection for batteries.                         |
|    | Refer to instruction manual                                           |
|    | Operator's manual                                                     |
|    | No chasing                                                            |
|    | No open flame; Fire, open ignition source and smoking prohibited      |
|    | Do not touch                                                          |
|   | Do not step on the equipment                                          |
|  | General symbol for recovery/recyclable                                |
|  | Warning; Explosive material                                           |
|  | Class 9 Miscellaneous Dangerous Goods Label for Lithium ion Batteries |
|  | This way up                                                           |
|  | Fragile                                                               |

|                                                                                   |                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|
|  | Keep away from rain                                 |
|  | Do not roll                                         |
|  | Do not stack                                        |
|  | Center of gravity                                   |
|  | Insert the forklift forks at the position indicated |
|  | Connect an earth terminal to the ground             |

## 1.2 Safety Precautions

This manual uses the following signal words to indicate imminently or potentially hazardous situations. Observe all safety instructions to avoid personal injury, property damage, or equipment malfunction.

| Symbols                                                                                          | Description                                                                                                       |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|  <b>DANGER</b>  | Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.        |
|  <b>WARNING</b> | Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.       |
|  <b>CAUTION</b> | Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.      |
| <b>NOTE</b>                                                                                      | Indicates supplementary explanation, clarification, or emphasis on a particular content for better understanding. |

### Personal safety



#### **DANGER**

- Keep the battery storage system out of reach of children and animals.
- Only personnel authorized by the company are permitted to repair or disassemble the system. Unauthorized operations may cause fatal electric shock.



### **WARNING**

- Wiring and electrical connections must be performed by personnel with knowledge of electronics, electrical wiring, and mechanics, and who are familiar with the electrical and mechanical schematics of this equipment.
- In case of electrolyte contact with eyes or skin, flush thoroughly with clean water for at least 10 minutes and seek immediate medical attention.



### **CAUTION**

- Personnel planning to install, operate, or maintain this equipment must:
  - Read, understand and strictly comply with all safety instructions specified in this manual and relevant document.
  - Follow applicable local standards and regulations.
  - Be qualified professionals or trained personnel (as defined in the **NOTE** below).
- Avoid direct contact with equipment components to prevent scalding caused by high temperatures generated during malfunction.

### **NOTE**

- Qualified professionals: Personnel familiar with the working principles and structure of the equipment, who have received training or have operation experience, and are fully aware of the sources and risk levels of potential hazards during equipment installation, operation and maintenance.
- Trained personnel: Personnel who have completed technical and safety training, have qualified practical operation experience, are aware of potential hazards to themselves and others during specific operations, and are capable of taking protective measures to minimize those hazards.

## **Electrical Safety**



### **DANGER**

- Dangerous lethal high voltage is present inside the unit. Contact with live terminals and internal charged parts will result in fatal electric shock.



### **WARNING**

- Before any installation, maintenance or inspection work, cut off and isolate all external and internal power sources. Confirm the unit is fully de-energized before operation.
- The battery may retain charge even after power disconnection. Wait for at least 5

minutes and verify zero voltage with a standard professional voltmeter before any operation.

- Incorrect wiring to the voltage terminals may cause undervoltage or overvoltage, resulting in equipment startup failure. The on-site supply voltage must be measured before installation. Connect conductors strictly to the designated terminals for the corresponding voltage level. Never apply a supply voltage to terminals of an unmatched voltage terminals.
- The battery system must be reliably grounded with a grounding resistance complying with local regulations.
- During all operations, use insulated tools and wear personal protective equipment. Remove all metal accessories such as watches and rings.
- Keep terminals away from exposed wires and metal objects.
- Do not place any tools or metal parts on the battery module or high-voltage control box.
- All adjacent exposed live parts must be fully covered and shielded with insulating materials.
- Connecting batteries of different models is strictly prohibited.



#### **CAUTION**

- Ensure correct wiring. Distinguish positive and negative poles strictly to prevent short circuits with external devices.
- Do not use faulty or incompatible power conversion equipment.
- Verify that battery system parameters are fully compatible with connected equipment.

## **Mechanical Safety**



#### **DANGER**

- Installation or operation of the battery system in explosive or high-humidity areas is strictly prohibited.



#### **WARNING**

- Do not insert foreign objects into any part of the equipment.
- Set up standard warning signs and safety barriers near the equipment to prevent accidents caused by mis-operation or unauthorized access.



### **CAUTION**

- Route all cables in designated positions. Exposed and irregular cable layout is susceptible to mechanical damage.

### **NOTE**

- Maintain a State of Charge (SOC) above 5% during use. Recharge within 48 hours after full discharge to avoid over-discharging.

## **Maintenance Safety**



### **DANGER**

- Disassembling, modifying, or opening the battery is strictly prohibited.



### **WARNING**

- Fully de-energize the battery unit before equipment relocation or any maintenance work.
- All battery terminals and circuit connectors must be disconnected before maintenance.
- Maintenance shall follow the sequence: equipment de-energization, lockout/tagout to prevent re-energization, zero-voltage verification, residual charge discharge and equipment grounding, and insulation shielding of adjacent live parts.
- Failure to observe warnings, improper installation, or operation by untrained personnel will lead to potential safety hazards.

### **NOTE**

- Do not paint any internal or external components of equipment.
- Do not clean batteries with cleaning solvents.
- The battery storage system should be commissioned no later than six months after delivery.

## **Environmental Safety**



### **DANGER**

- Open flames, sparks, and other ignition sources must be kept away from the system at all times.
- Damaged or failed batteries may leak electrolyte and produce hazardous substances such as hydrofluoric acid, which may cause severe chemical burns.



## **WARNING**

- Do not expose the battery to flammable substances, corrosive chemicals, or their vapors.
- Do not submerge the battery in water or expose it to excessive moisture. The ingress protection rating of the equipment is only valid for fully assembled and intact configuration.
- If a battery is damaged or leaking, avoid direct contact with the substance. Contact technical support or a qualified recycling facility for proper handling.

## **NOTE**

- Where this manual does not cover a specific scenario, applicable safety regulations and occupational health standards shall prevail.
- You are obliged to handle waste batteries in compliance with applicable regulations, including removing any personal data from associated devices, and to return them to a designated or authorized recovery point. Used batteries must never be disposed of as household waste.
- Batteries contain important recyclable raw materials such as iron and lithium.

# 2 Product Introduction

## 2.1 Product Overview

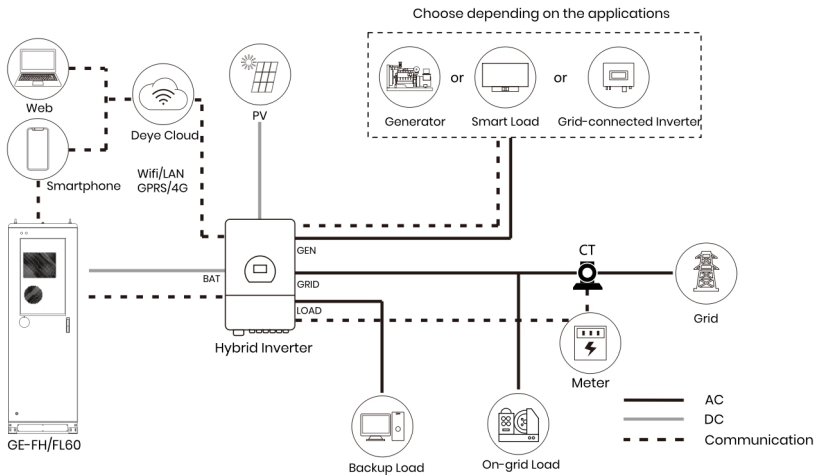
The Rechargeable Li-ion Battery Storage System mainly consists of lithium battery packs, a power distribution unit (PDU), a thermal management system, and a fire suppression system. It plays a significant role in reducing electricity costs, ensuring power reliability, integrating renewable energy, and optimizing energy management.

This manual is valid for models GE-FH60 and GE-FL60. Refer to [Chapter 9 Technical Specifications](#) for differences between models.

## 2.2 Application Scenarios

The following illustration shows basic application of this battery system. A complete operational system may require these core components:

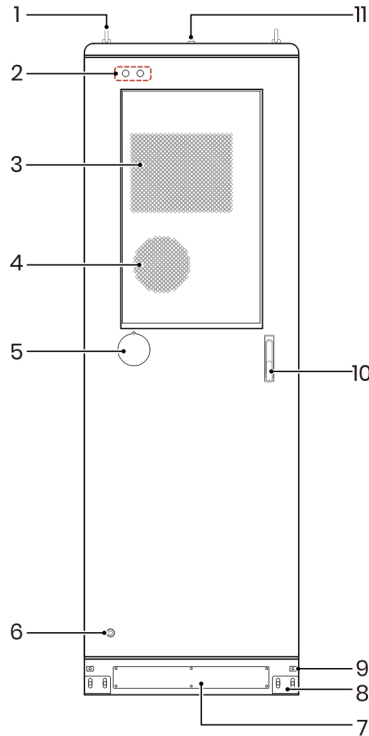
- Generator or Utility;
- PV modules;
- Hybrid inverters.



The system supports remote monitoring and control via Deye Cloud, accessible through mobile devices, web portals, or communication terminals on the inverter. Consult with your system integrator for other possible system architectures depending on your requirements.

## 2.3 Product Appearance

### Front View



| No. | Item                             | No. | Item                                |
|-----|----------------------------------|-----|-------------------------------------|
| 1   | Eye Bolt ×4                      | 7   | Forklift Pocket Cover               |
| 2   | Status Indicator*                | 8   | Cabinet Mounting Brackets           |
| 3   | Air Outlet of Air Conditioner    | 9   | Protective Earth Terminal           |
| 4   | Air Inlet of Air Conditioner     | 10  | Door Lock                           |
| 5   | EPO (Emergency Power Off) Button | 11  | Sprinkler System External Connector |
| 6   | Drain Outlet                     | /   | /                                   |

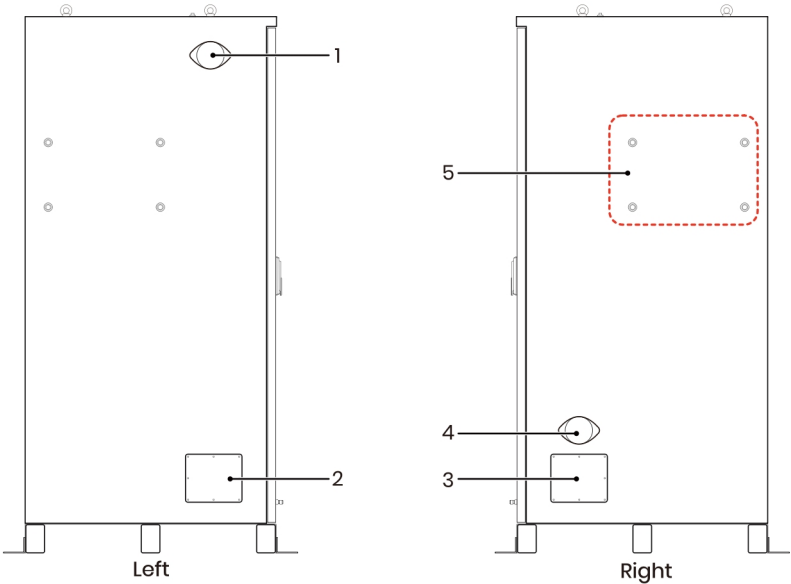
**\*Status Indicator**



The cabinet is fitted with two status indicators: RUN (green) and ALARM (red). The operating status of the cabinet is indicated by the ON/OFF state of the indicators. For the detailed fault information, refer to [Appendix I Troubleshooting](#).

| Indicator   | Status | Description                                                                          |
|-------------|--------|--------------------------------------------------------------------------------------|
| RUN (Green) | ON     | The green indicator illuminates when the cabinet is powered on and runs normally.    |
|             | OFF    | The green indicator remains off when an alarm is triggered or any fault is detected, |
| ALARM (Red) | ON     | The red indicator illuminates when an alarm is triggered or any fault is detected,   |
|             | OFF    | The red indicator remains off when the cabinet runs normally.                        |

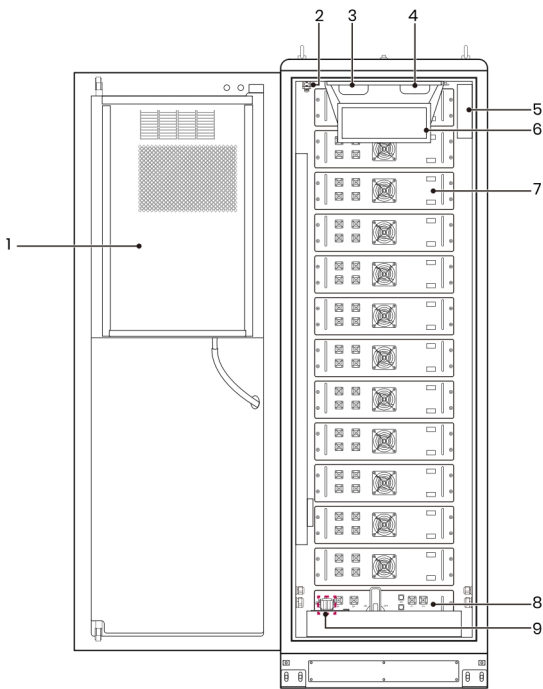
**Side View**



| No. | Item                     | No. | Item                    |
|-----|--------------------------|-----|-------------------------|
| 1   | Exhaust Fan              | 4   | Intake Fan              |
| 2   | Cable Inlet (left side)  | 5   | Inverter Mounting Holes |
| 3   | Cable Inlet (Right side) | /   | /                       |

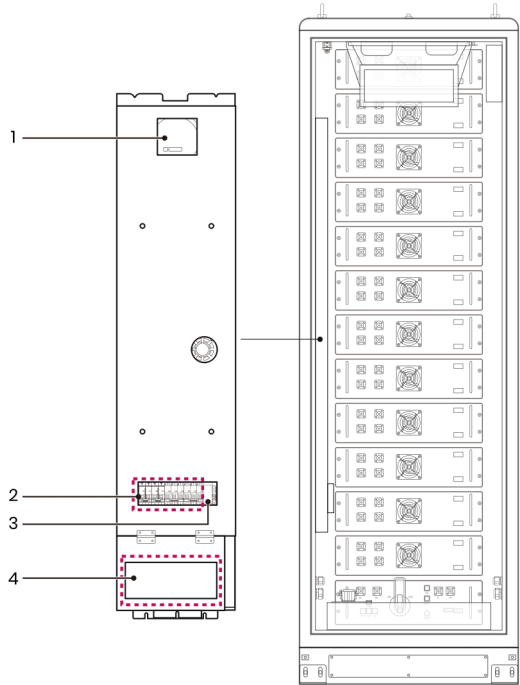
# 2.4 Internal Structure

## Internal Front View



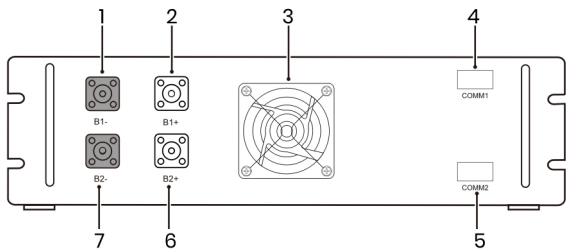
| No. | Item            | No. | Item                            |
|-----|-----------------|-----|---------------------------------|
| 1   | Air Conditioner | 6   | Air Duct                        |
| 2   | Limit Switch    | 7   | Battery Pack ×12                |
| 3   | Smoke Detector  | 8   | PDU (Power Distribution Unit)   |
| 4   | Heat Detector   | 9   | MSD (Manual Service Disconnect) |
| 5   | Aerosol Device  | /   | /                               |

Internal Left Side View



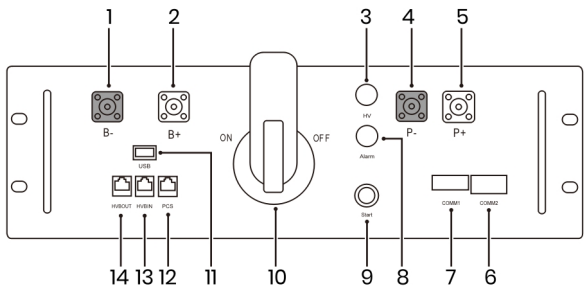
| No. | Item                     | No. | Item                           |
|-----|--------------------------|-----|--------------------------------|
| 1   | Combustible Gas Detector | 3   | Water Immersion Sensor         |
| 2   | Circuit Breakers         | 4   | Auxiliary Power Terminal Block |

## 2.4.1 Battery Pack



| No. | Item  | Description                                                 |
|-----|-------|-------------------------------------------------------------|
| 1   | B1-   | Battery module negative connection terminal (Black).        |
| 2   | B1+   | Battery module positive connection terminal (Orange).       |
| 3   | Fan   | Drives airflow circulation inside the battery pack.         |
| 4   | COMM1 | Communication terminal for the next battery pack.           |
| 5   | COMM2 | Communication terminal for the previous battery pack or HVB |
| 6   | B2+   | Battery module positive connection terminal (Orange).       |
| 7   | B2-   | Battery module negative connection terminal (Black).        |

## 2.4.2 DC PDU



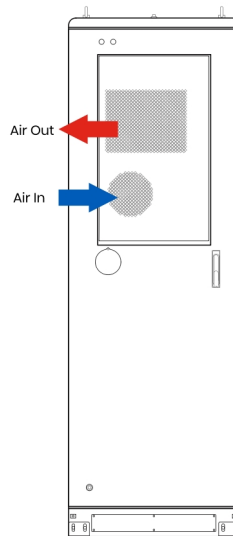
| No. | Item            | Description                                                                            |
|-----|-----------------|----------------------------------------------------------------------------------------|
| 1   | B-              | Battery module negative connection terminal (Black).                                   |
| 2   | B+              | Battery module positive connection terminal (Orange).                                  |
| 3   | HV Indicator    | High-voltage live indicator. It illuminates yellow when high voltage is present.       |
| 4   | P-              | PCS negative connection terminal (Black).                                              |
| 5   | P+              | PCS positive connection terminal (Orange).                                             |
| 6   | COMM2           | Battery module communication and power output interface.                               |
| 7   | COMM1           | Battery module communication and power input interface.                                |
| 8   | Alarm Indicator | Battery system fault indicator. It illuminates red when a battery system fault occurs. |

|    |                    |                                                                                                |
|----|--------------------|------------------------------------------------------------------------------------------------|
| 9  | Start Button       | A start switch of 12VDC power inside the DC PDU.                                               |
| 10 | DC Circuit Breaker | Manual disconnect switch for connecting / isolating the battery cabinet from external devices. |
| 11 | USB                | BMS upgrade port and storage expansion port.                                                   |
| 12 | PCS COMM           | PCS-battery communication terminal; used to transmit battery data to the inverter.             |
| 13 | HVBIN COMM         | Communication input terminal for connecting to the previous GE-F-PDU.                          |
| 14 | HVBOUT COMM        | Communication output terminal for connecting to the next GE-F-PDU.                             |

### 2.4.3 Thermal Management System (TMS)

The battery cabinet is equipped with an air conditioner, an air outlet, and an air inlet. Based on real-time cell temperature data, the thermal management system adjusts the operating power of the air conditioner and fans to maintain the average cell temperature within the normal range.

When the air conditioner operates, airflow circulates inside the cabinet. Fans on each battery pack delivers constant-temperature airflow into the pack for heat exchange, then exhausted it out of the pack.

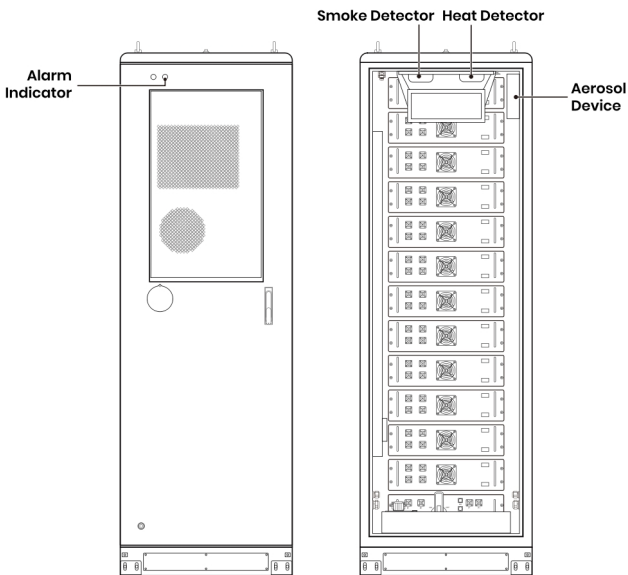


## 2.4.4 Fire Suppression System

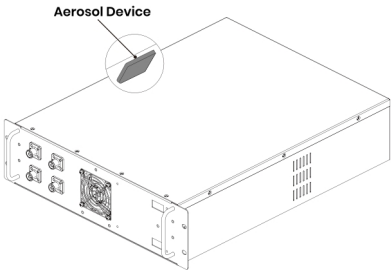
The fire suppression system consists of a fire alarm system and aerosol fire extinguishing system, an CCR (Combustible Concentration Reduction) system, and a sprinkler system.

### Fire Alarm System and Aerosol Fire Extinguishing System

The cabinet is equipped with a heat detector, a smoke detector, and an alarm indicator, and each battery pack contains an aerosol device. The detectors and sensors shall trigger an alarm signal upon detection of abnormal conditions. The alarm signal interlocks with the cabinet's aerosol device to activate fire suppression.

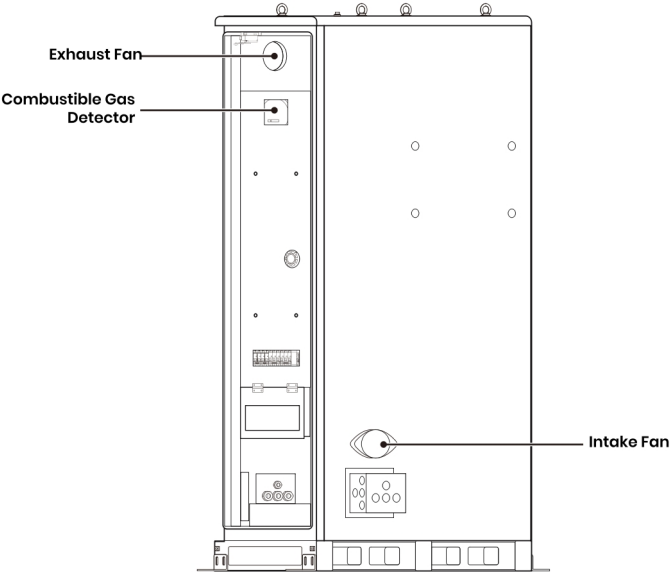


Each battery pack is also equipped with an aerosol device.



**CCR System**

The CCR system is composed of a gas detector, an intake valve, and an exhaust valve. The detector detects abnormal conditions and trigger an alarm, then the exhaust fan exhaust combustible gases quickly.



## Sprinkler System



### **DANGER**

- In case of severe fire, evacuate immediately and call the fire department.



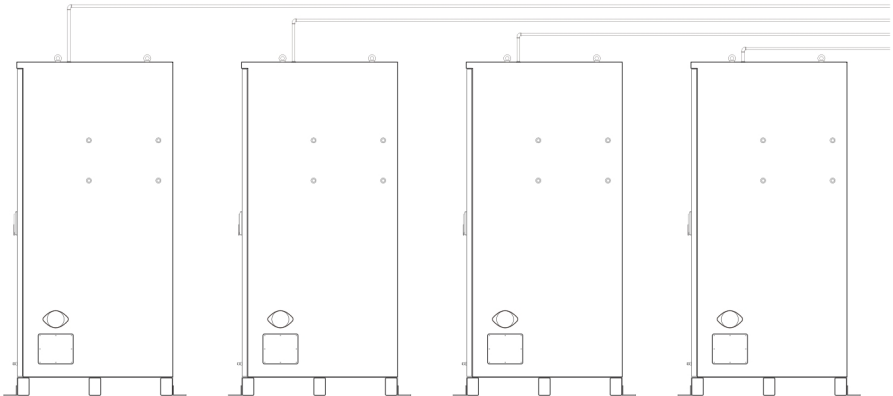
### **CAUTION**

- Consult a professional engineer for sprinkler system connection. The final layout of sprinkler system is subject to review and approval by the local Authority Having Jurisdiction (AHJ).
- Keep the pipeline free of water under normal conditions. Water supply is permitted only in emergencies.

This sprinkler system serves as the final protective barrier for the energy storage system. It can be activated manually according to on-site requirements.

Extension pipes (prepared by the customer) must be connected to the 1-1/4 NPT female threaded port on the cabinet. The inlet plug must be removed before connection. A control valve shall be installed on the extension pipe of each cabinet, positioned at least 3 m away from the cabinet, to serve as the manual activation for the water supply.

It is recommended that the inlet pressure of the water connection port be not less than 0.1 MPa.



## 3 Transportation

### 3.1 Transportation Precautions



#### **DANGER**

- Transportation of end-of-life, damaged or recalled batteries may be prohibited in some regions. Confirm local regulations before transportation; illegal transportation is strictly prohibited.
- It is strictly prohibited to mix dangerous goods with food, medicine, animal feed and their additives in the same vehicle or container, and to transport with sharp objects in the same vehicle or container.
- Transport is strictly prohibited if the equipment shows any abnormalities such as unusual odor, leakage, smoke, or fire before departure.
- When transporting faulty batteries, avoid flammable and explosive material storage areas, residential areas, public transit facilities, elevators and other densely populated places.



#### **WARNING**

- Lithium-ion battery products are classified as Class 9 miscellaneous dangerous goods. During transportation, the applicable UN number, packaging requirements, dangerous goods labels, and other required marks shall be determined based on the actual shipping configuration, mode of transport, and applicable dangerous goods regulations.
- Comply with all applicable safety rules and regulations of the local country or region during loading, unloading, and transportation.
- Transport and storage service providers must hold valid dangerous goods handling certifications as required by local laws and standards. Undertaking relevant business without proper qualifications is strictly prohibited.
- Before removing the transport protector, inspect the packaging for damage and check whether the impact indicator on the outer packaging has been triggered; if triggered, potential transport damage cannot be ruled out.
- Keep the equipment upright and securely fixed during sea or land transportation. The inclination angle of equipment shall not exceed 15° throughout the transportation process.
- Throughout the transportation process, protect the equipment from severe vibration, impact, and crushing. Avoid exposure to direct sunlight, rain, and moisture.

Take appropriate rainproof, moisture-proof, and sun-protection measures.

- Smoking is strictly prohibited in transportation, loading and unloading areas.
- Freight personnel are strictly prohibited from opening the outer packaging of the equipment without authorization.
- All loading and unloading operations must be carried out by authorized and trained personnel.



#### **CAUTION**

- Handle with care during moving to prevent bumping.
- Transport operators must wear protective gloves and toe-cap safety shoes for personal protection, and pay special attention to avoiding scratches by sharp metal panels and crushing injuries by heavy objects.

#### **NOTE**

- Complete compliant and accurate declaration before transportation, and carefully check whether the packaging, labels and markings are intact.
- Do not remove the product transport packaging before arrival at the installation site.

## **3.2 Transportation Modes**

Recommended transportation modes: sea freight and land freight.

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sea freight  | <ul style="list-style-type: none"><li>● Sea transportation shall comply with the requirements of the International Maritime Dangerous Goods Code (IMDG Code).</li><li>● Obtain Material Safety Data Sheet (MSDS)MSDS certification before sea transportation.</li><li>● Seal all external gaps of the equipment and affix marks certified by the classification society.</li><li>● Equip the outer packaging with rainproof canvas covers to avoid paint finish scratches.</li></ul>                                                                                                                    |
| Land freight | <ul style="list-style-type: none"><li>● Land transport shall comply with ADR or JT/T 617 standards, as applicable.</li><li>● Remove obstacles along the transport route.</li><li>● Ensure that dangerous goods transport vehicles are equipped with two tested and certified CO<sub>2</sub> fire extinguishers.</li><li>● Speeding is strictly prohibited. Speed limits: 70 km/h on highways, 40 km/h on urban roads, and 50 km/h when turning. Sudden acceleration and emergency braking are also prohibited.</li><li>● If the equipment exceeds the weight limit for ordinary roads, obtain</li></ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>an overweight transportation permit from the local authorities.</p> <ul style="list-style-type: none"> <li>• Transport vehicles with twist locks are recommended. If twist locks are unavailable, the product shall be fixed at both the top and bottom with lashing straps to prevent shifting and rollover.</li> <li>• If transportation on sloped roads is necessary, equip the vehicle with additional traction equipment.</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 3.3 Equipment Handling



#### **DANGER**

- This equipment is equipped with integrated lithium batteries. Improper hoisting and handling can cause cell damage, fire, explosion, equipment damage, severe injury or death.



#### **WARNING**

- Only certified authorized personnel can operate forklifts and perform hoisting and handling of the equipment. Unauthorized operation is strictly prohibited. All safety procedures and work instructions must be strictly observed. Any equipment damage or personal injury caused by non-compliant operations shall be the responsibility of the relevant personnel.
- Establish warning signs and a restricted area to prevent unauthorized personnel from entering the handling zone.
- Equipment handling operations are prohibited in severe weather such as typhoons, heavy rain, dense fog and thunderstorms.
- Ensure all equipment doors are closed and secured prior to hoisting and forklift handling.
- Personnel are prohibited from standing on the suspended load. Loose or movable items shall not be placed on the load during lifting and handling operations

#### **NOTE**

- Refer to the shipping marks or equipment label for exact cabinet weight and dimension parameters.

### 3.3.1 Forklift



#### **DANGER**

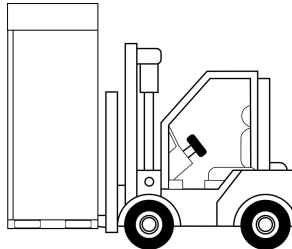
- Unauthorized personnel must maintain a minimum safe distance of 2 m from the forklift and load during operation. Standing or riding on the forklift or cargo is strictly prohibited.
- Overloading and lifting to excessive heights shall be forbidden to avoid risks of forklift instability and overturning.

#### **Forklift Requirements**

| Item          | Requirement |
|---------------|-------------|
| Load capacity | > 1.5 t     |
| Fork length   | ≥ 1145 mm   |

#### **Fork Positioning & Loading**

When lifting heavy or unbalanced loads, observe the center-of-gravity position of the load, and then insert the forks precisely into the reserved forklift pockets located below the "Forklift Fork Insertion" marking on the packaging.



#### **Driving & Steering**

- Forklift driving speed shall not exceed 3 miles per hour (3mph). Sharp turns are strictly prohibited to avoid load shifting and imbalance.
- The forklift operator shall fully inspect the rear area and verify safety before reversing. A dedicated spotter shall be arranged for full-time guidance during reversing within confined spaces.
- Operating forklifts on slopes with a gradient  $\geq 5^\circ$  is strictly prohibited. Slow down and operate carefully when lifting loads on uneven roads.
- Tilting or inverting the cabinet is forbidden throughout the entire handling process. If tilting or inversion is unavoidable under exceptional circumstances, restore the cabinet to an upright position promptly and keep it stationary for 2 hours prior to power-on.

### 3.3.2 Hoisting

#### Hoisting Requirements

The crane capacity shall be calculated and evaluated by a professional hoisting company before operation to meet the following requirements.

| Item                   | Requirement   |
|------------------------|---------------|
| Crane lifting capacity | > 25 t        |
| Boom length            | 38.5 - 40.5 m |



#### **DANGER**

- No personnel are allowed within the fall zone of the moving suspended load. No one shall stand under the crane boom, directly beneath the load or within the crane operating radius.
- Do not perform lifting operations in limited visibility conditions.
- Ensure lifting tools are correctly and securely connected to the equipment, and verify slings at equipment corner fittings are of equal length. Improper connection may result in product damage, serious injury, or death.
- Use only approved and certified lifting equipment.
- Hoisting shall be performed only by qualified personnel.



#### **WARNING**

- Before hoisting, inspect the crane, slings, and other rigging equipment to confirm that their load ratings meet the product's weight requirements.
- Position the crane appropriately; long-distance hoisting is strictly prohibited.
- A designated signal person must direct the entire hoisting operation to ensure coordinated movement.
- Keep the equipment stable and level during hoisting. Do not swing the crane to avoid sudden drops or impacts on the equipment.



#### **CAUTION**

- Adjust sling lengths as required by site conditions to maintain hoisting balance.
- Hoist gently and lower the equipment slowly and smoothly into position. Avoid any impact or collision.
- Use vertical hoisting only. Do not drag the equipment on any surface during lifting, or when attaching or detaching lifting tools, to prevent scratches.
- It is recommended to hoist the equipment while keeping it horizontally stable to ensure a smooth operation.

## 4 Installation



### **DANGER**

- Do not expose the equipment to, or operate it in, flammable or explosive gases, smoke, or any corrosive environment. Otherwise, it may cause fire, explosion or equipment damage.
- Do not expose the equipment to flammable or explosive gases, smoke, or any explosive environments, and do not operate the equipment in such environments. Otherwise, it may cause serious safety accidents such as fire, explosion, or equipment damage.
- There is a risk of static overload during the entire installation process, which may cause damage to building structures. Be sure to verify the site bearing capacity and anti-static measures in advance.



### **WARNING**

- The installation and usage environment must comply with relevant international and local laws and regulations. The user is obligated to protect the ESS against fire and other hazards.
- Product assembly must be carried out in strict accordance with the design scheme, process requirements, relevant regulations and national standards; unauthorized changes to assembly procedures and technical parameters are strictly prohibited.



### **CAUTION**

- Only qualified or trained personnel, who have mastered all necessary safety precautions and relevant applicable regulations, are permitted to install the equipment.
- Keep the equipment out of the reach of children and away from daily working or living areas.

## 4.1 Pre-Installation Preparation

### 4.1.1 Site Requirements



#### **DANGER**

- Do not install the equipment in low-lying areas where it may become submerged. The installation level must be at least 300 mm above the highest historical water level in the area. Do not install in any position that could be submerged in water.



#### **WARNING**

- Install the equipment in an outdoor area far from liquids. Do not install it under areas prone to condensation (e.g., under water pipes, air exhaust vents) or water leakage (e.g., air conditioner vents, ventilation vents, equipment room feeder windows). Liquid ingress may cause equipment faults, short circuits, fires, or electric shock.
- To prevent high-temperature damage or fire, ensure that the equipment's ventilation vents and heat dissipation systems are not obstructed or covered by other objects during operation. Poor heat dissipation can lead to equipment overheating, fire, or explosion.
- To protect the equipment from wildfires caused by high summer temperatures, ensure there are no vegetation or flammable plants within 3 meters of the equipment. Wildfires can spread to the equipment, causing explosions or fires.
- For safety purposes, the distance between the equipment and residential buildings must be more than 12m, and the distance between the equipment and densely populated buildings (such as schools, hospitals) must be more than 30.5m. If this safety distance cannot be met, a firewall must be built between the equipment and the building to prevent fire or explosion hazards from affecting people.
- Outdoor storage systems must be at least 10 feet away from boundaries, public roads, buildings, flammable materials, hazardous materials, high piles, and other non-grid-related hazards to reduce the risk of fire, explosion, or collision-induced accidents.
- The ESS area shall be enclosed by lockable solid walls or fences with height over 2.2m; fire walls can serve as partial or full enclosure substitutes.
- The distance between the battery cabinet's exhaust device and the air intakes of heating, ventilation, and air conditioning systems, windows, doors, discharge platforms, and fire sources of other buildings or facilities must be more than 4.6m to prevent the spread of harmful gases or fire.
- Do not install the equipment in places without proper fire-fighting facilities or where

firefighters cannot easily access. In the event of a fire, lack of fire protection or accessibility will lead to the rapid spread of fire, resulting in serious injury or death.

- Do not install the equipment in an easily accessible location. The enclosure and heat sink of the ESS reach high temperatures during operation, which may cause severe burns.
- Do not install the equipment in the following locations (including but not limited to):
  - Areas subject to severe vibration (such as ships, trains, or cars), intense noise, or strong electromagnetic interference;
  - Locations with dust, oil fumes, harmful gases, corrosive gases, and other pollutants;
  - Spaces where corrosive, flammable, or explosive substances are stored;
  - Areas with existing underground facilities;
  - Ground with poor geological conditions, such as mucky soil and soft soil layers, which is prone to water accumulation and subsidence;
  - Spaces underneath reservoirs, water features, and water intake structures;
  - Seismic fault zones and regions with a seismic fortification intensity exceeding Grade 9.
  - Zones directly threatened by mudslides, landslides, quicksand, karst caves, and other geological disasters.
  - Areas within the scope of mining subsidence and ground displacement.
  - Regions inside blasting hazard zones.
  - Areas vulnerable to inundation caused by dam or dike failure.
  - Sanitary protection zones for key domestic water sources.
  - Protected zones of historical relics and cultural heritage sites.
  - Crowded public areas, high-rise buildings, and underground structures.
  - Urban road intersections and major traffic arteries.
- During the installation, commissioning, and operation of the equipment, ensure that each unit is equipped with no less than 2 fire extinguishers nearby. Insufficient fire-fighting equipment may result in uncontrollable fires, leading to death or serious injury.



#### **CAUTION**

- To avoid electromagnetic interference, install the device at a distance of more than 30 m from third party wireless communication facilities.
- Do not install the equipment in areas conducive to the growth of microorganisms. Microbial growth may damage the equipment's surface or internal components, leading to malfunctions and potential minor injuries during maintenance.

- Do not install the equipment in salt-damaged or polluted areas. Corrosion caused by these environments may damage the equipment, leading to malfunctions and minor injuries during handling or maintenance. The equipment must be installed in locations that meet the following criteria:

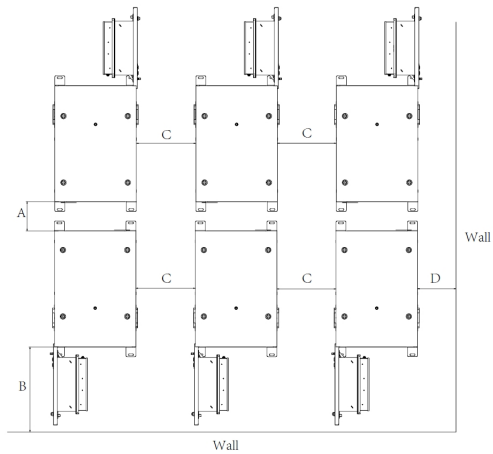
| Condition                       | Required Distance                         | Examples                                                                                               |
|---------------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Distance from coast             | More than 2000 m                          | /                                                                                                      |
| Distance from pollution sources | Heavy pollution sources: $\geq 1500$ m    | Smelters, coal mines, thermal power plants                                                             |
|                                 | Moderate pollution sources: $\geq 1000$ m | Chemical, rubber, electroplating                                                                       |
|                                 | Mild pollution sources: $\geq 500$ m      | Food, leather, heating boilers, slaughter houses, centralized garbage dumps, sewage treatment stations |

**NOTE**

- The safe distance between the equipment and production buildings shall comply with local fire codes or standards.
- Install the equipment in a clean, dry, and well-ventilated area with appropriate temperature, humidity, and altitude. For detailed parameters, refer to [Chapter 9 Technical Specifications](#).
- Reserve sufficient space for expansion according to the whole-life cycle needs of the energy storage system.

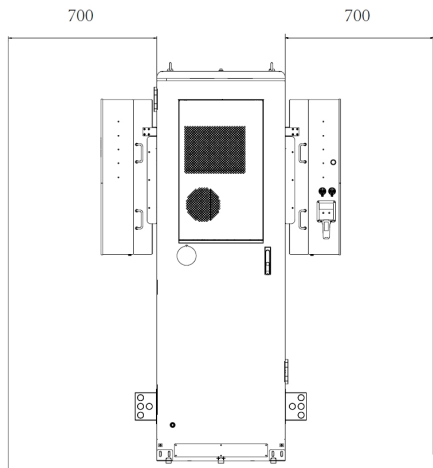
**Recommended Clearance**

To ensure adequate heat dissipation and facilitate installation and maintenance, minimum clearances shall be maintained around the cabinet.



| Item | Distance (mm) |
|------|---------------|
| A    | 100           |
| B    | 750           |
| C    | 200           |
| D    | 700           |

A clearance of 700 mm shall be reserved on the side where a transformer and an inverter are to be installed.



### 4.1.2 Foundation Requirements

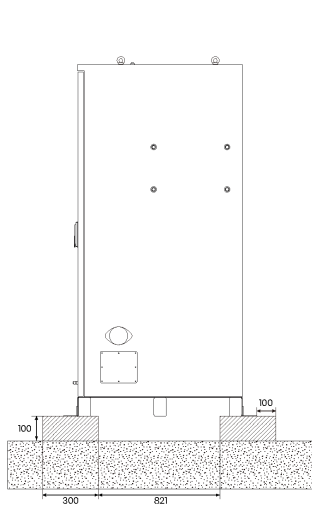
An inadequately designed foundation can cause installation difficulties, compromise cabinet door operation, and undermine overall system performance. Therefore, the foundation for the Energy Storage System (ESS) must be carefully designed and constructed in strict compliance with applicable industry and local standards to ensure proper mechanical support, cable routing, and future maintenance access.

At a minimum, the following requirements shall be met.

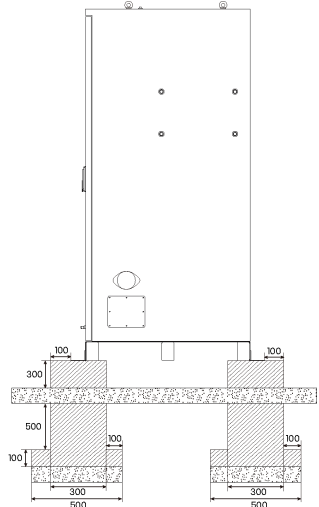
| General Requirements                   |                                                                                                                                       |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Requirement                            | Description                                                                                                                           |
| Surface material                       | Install cabinets on concrete or other non- combustible surfaces.                                                                      |
| Surface condition                      | The surface must be level, stable, flat, and free of depressions or tilts, with sufficient load- bearing capacity.                    |
| Load capacity                          | The foundation must support the total weight of the equipment. If the bearing capacity is insufficient, re- verification is required. |
| Extension beyond cabinet               | 100 mm on each side                                                                                                                   |
| Foundation Construction Requirements   |                                                                                                                                       |
| Requirement                            | Description                                                                                                                           |
| Concrete grade & thickness             | Default C30 with a thickness of 200mm, unless otherwise specified                                                                     |
| Bedding layer                          | 100 mm thick C15 concrete below the slab                                                                                              |
| Reinforcing steel bars                 | HRB400 (Grade III), 12 mm diameter, spaced 150 mm apart                                                                               |
| Corrosion protection                   | Apply standard anti- corrosion measures to steel bars after rust removal.                                                             |
| Bearing stratum                        | Undisturbed soil with characteristic bearing capacity $\geq 100$ kPa.                                                                 |
| Construction & Excavation Requirements |                                                                                                                                       |
| Requirement                            | Description                                                                                                                           |
| Foundation pit compaction              | The bottom of the pit must be compacted and leveled before construction.                                                              |
| Construction dewatering                | Implement dewatering to prevent waterlogging in the pit.                                                                              |
| Excavation safety                      | Ensure proper safety measures for excavation support.                                                                                 |
| Water prevention                       | The pit must not be soaked. If water intrusion occurs, further                                                                        |

|                                           |                                                                                                                                                                                                                                                                        |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| after excavation                          | excavation and replacement filling are required.                                                                                                                                                                                                                       |
| Surface leveling tolerance                | Levelness error between foundation and cabinet contact surface $\leq 3$ mm.                                                                                                                                                                                            |
| <b>Height &amp; Drainage Requirements</b> |                                                                                                                                                                                                                                                                        |
| <b>Requirement</b>                        | <b>Description</b>                                                                                                                                                                                                                                                     |
| Height above ground                       | Foundation must be higher than the local historical highest water level, and at least 300 mm above the surrounding ground level.                                                                                                                                       |
| Drainage system                           | Drainage facilities should be based on local geology and municipal requirements to prevent water accumulation at the foundation. The system must accommodate the local historical maximum rainfall. Discharged water must comply with local environmental regulations. |
| <b>Cable Management &amp; Sealing</b>     |                                                                                                                                                                                                                                                                        |
| <b>Requirement</b>                        | <b>Description</b>                                                                                                                                                                                                                                                     |
| Cable outlets/trenches                    | Foundation design shall accommodate ESS cable outlet positions, with pre-reserved trenches or entry holes as required.                                                                                                                                                 |
| Sealing                                   | All reserved foundation holes and equipment bottom inlet ports shall be fully sealed post-installation.                                                                                                                                                                |

The recommended foundation construction details are provided below and may be adjusted based on actual site conditions.



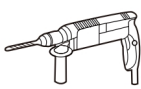
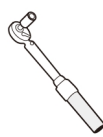
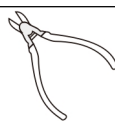
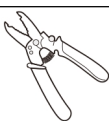
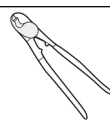
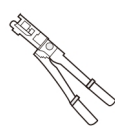
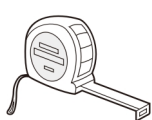
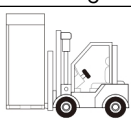
Ground with qualified bearing capacity



Ground with insufficient bearing capacity

### 4.1.3 Tool Requirements

Recommended installation tools are listed below and the pictures are for reference only.

| Tools                                                                               |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|    |    |    |    |
| Hammer drill                                                                        | Phillips insulated torque screwdriver                                               | Flat-head insulated torque screwdriver                                              | Insulated torque socket wrench                                                      |
|    |    |    |    |
| Diagonal pliers                                                                     | Wire stripper                                                                       | Cable cutter                                                                        | Ferrule crimping pliers                                                             |
|    |    |    |    |
| Hydraulic pliers                                                                    | Needle-nose pliers                                                                  | Single open-end spanner                                                             | Marker                                                                              |
|    |   |   |   |
| Utility knife                                                                       | Steel tape measure                                                                  | Spirit Level                                                                        | Multimeter                                                                          |
|  |  |  |  |
| Heat shrink tubing                                                                  | Heat gun                                                                            | Cable tie                                                                           | Insulated ladder                                                                    |
|  |  |                                                                                     |                                                                                     |
| Forklift                                                                            | Crane                                                                               |                                                                                     |                                                                                     |

| Personal Protective Equipment                                                     |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |  |  |
| Insulated gloves                                                                  | Protective gloves                                                                 | Safety goggles                                                                    | Dust mask                                                                         |
|  |  |  |                                                                                   |
| Insulated shoes                                                                   | Safety helmet                                                                     | Protective suit                                                                   |                                                                                   |

## 4.2 Unpacking



### WARNING

- If the installation environment is not conducive to equipment protection, take measures to prevent internal battery failure caused by condensation or dust corrosion (e.g., cover with woven cloth or dust cover).
- During component handling and storage, collision and scratch are strictly prohibited. Keep parts dry and rust-free to avoid damage and part failure.



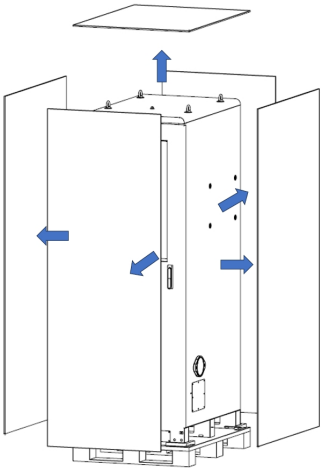
### CAUTION

- If possible, do not remove the transport packaging until the equipment arrives at the installation site.
- After preparing the equipment for installation, unpack it carefully to avoid scratching the equipment.
- Keep the equipment stable during unpacking.

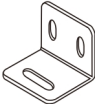
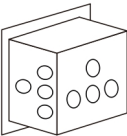
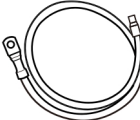
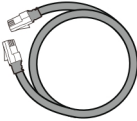
### NOTE

- Keep the packaging material for future transportation or long-term storage.
- All components must be thoroughly cleaned before assembly to remove burrs, flash edges, oxide layers, rust, sand particles, dust and stains, ensuring a clean and impurity-free surface.

Unpack and inspect the equipment immediately upon receipt. If the unit is damaged or missing accessories are found, contact the local distributor or the after-sales service department.

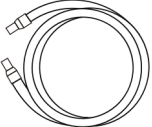
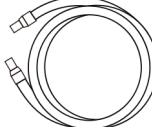


**Accessory Kit for GE-FH60&FL60**

|                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|    |    |    |
| M12×80 Expansion Bolt<br>×4 pcs                                                     | M10×25 Hex Head Bolt<br>Assembly<br>×8 pcs                                          | Cabinet Mounting<br>Bracket<br>×4 pcs                                               |
|  |  |  |
| Cable Entry Box<br>×1 pc                                                            | 6AWG PCS-PDU Positive<br>Power Cable (3000mm)<br>×2 pcs                             | 6AWG PCS-PDU Negative<br>Power Cable (3000mm)<br>×2 pcs                             |
|  |  |  |
| 16 AWG BMU-PDU<br>Communication Cable<br>(200 mm) ×1 pc                             | 24AWG CAT5E FTP<br>Communication Cable<br>(5000mm) ×1 pc                            | 22AWG Termination<br>Resistor<br>×1 pc                                              |

|                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |  |
| 4AWG PDU-Busbar<br>Negative Power Cable<br>×1 pc                                  | 4AWG PDU-Busbar Positive<br>Power Cable<br>×1 pc                                  | 4AWG BMU-PDU Positive<br>Power Cable<br>×1 pc                                     |
|  |  |  |
| 4 AWG BMU Parallel<br>Negative Power Cable<br>×6 pcs                              | 4 AWG BMU Parallel Positive<br>Power Cable<br>×6 pcs                              | 16 AWG BMU Series<br>Communication Cable<br>(110mm)<br>×11 pcs                    |
|  |  |                                                                                   |
| 4 AWG BMU Series Power<br>Cable (215mm)<br>×11 pcs                                | MSD Plug<br>×1 pc                                                                 |                                                                                   |

**Accessory Kit for GE-F60-TF-4 Transformer (Only applies to GE-FH60)**

|                                                                                     |                                                                                     |                                                                                   |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|    |    |  |
| M6×20 Hex Head Bolt<br>Assembly<br>×4 pcs                                           | M6×12 Hex Head Bolt<br>Assembly<br>×3 pcs                                           | Slotted Grommet Strip<br>×1 pc                                                    |
|  |  |                                                                                   |
| 12 AWG Auxiliary Power L<br>Line<br>×1 pc                                           | 12 AWG Auxiliary Power N<br>Line<br>×1 pc                                           |                                                                                   |

**NOTE**

- The illustrations in the tables above are for reference only. Refer to the actual delivered accessories.

## Recommended Torque

| Nominal thread diameter (mm) | T      | 0.5T   | 1.8T  | 2.4T  |
|------------------------------|--------|--------|-------|-------|
|                              | N-m    | N-m    | N-m   | N-m   |
| M1                           | 0.0195 | 0.0098 | 0.035 | 0.047 |
| (M1.1)                       | 0.027  | 0.0135 | 0.049 | 0.065 |
| M1.2                         | 0.037  | 0.0185 | 0.066 | 0.088 |
| (M1.4)                       | 0.058  | 0.029  | 0.104 | 0.14  |
| M1.6                         | 0.086  | 0.043  | 0.156 | 0.205 |
| (M1.8)                       | 0.128  | 0.064  | 0.23  | 0.305 |
| M2                           | 0.176  | 0.088  | 0.315 | 0.42  |
| (M2.2)                       | 0.23   | 0.116  | 0.41  | 0.55  |
| M2.5                         | 0.36   | 0.18   | 0.65  | 0.86  |
| M3                           | 0.63   | 0.315  | 1.14  | 1.5   |
| (M3.5)                       | 1.0    | 0.5    | 1.8   | 2.4   |
| M4                           | 1.5    | 0.76   | 2.7   | 3.6   |
| (M4.5)                       | 2.15   | 1.08   | 3.9   | 5.2   |
| M5                           | 3.0    | 1.5    | 5.4   | 7.2   |
| M6                           | 5.2    | 2.6    | 9.2   | 12.2  |
| (M7)                         | 8.4    | 4.2    | 15.0  | 20.0  |
| M8                           | 12.5   | 6.2    | 22.0  | 29.5  |
| M10                          | 24.5   | 12.5   | 44    | 59    |
| M12                          | 42     | 21.0   | 76    | 100   |
| M14                          | 68     | 34     | 122   | 166   |
| M16                          | 106    | 53     | 190   | 255   |
| (M18)                        | 146    | 73     | 270   | 350   |
| M20                          | 204    | 102    | 370   | 490   |
| (M22)                        | 282    | 140    | 500   | 670   |
| M24                          | 360    | 180    | 650   | 860   |
| (M27)                        | 520    | 260    | 940   | 1240  |

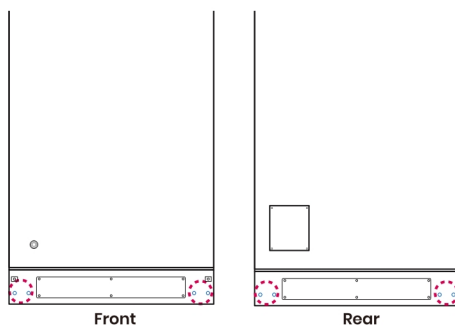
### NOTE

- Strictly adhere to the specified torque values to prevent over-tightening or under-tightening.
- The torque value is for reference only for standard bolts during normal assembly; adjust appropriately for special working conditions (high vibration/harsh environment).
- Use a calibrated torque wrench for installation to ensure torque accuracy.

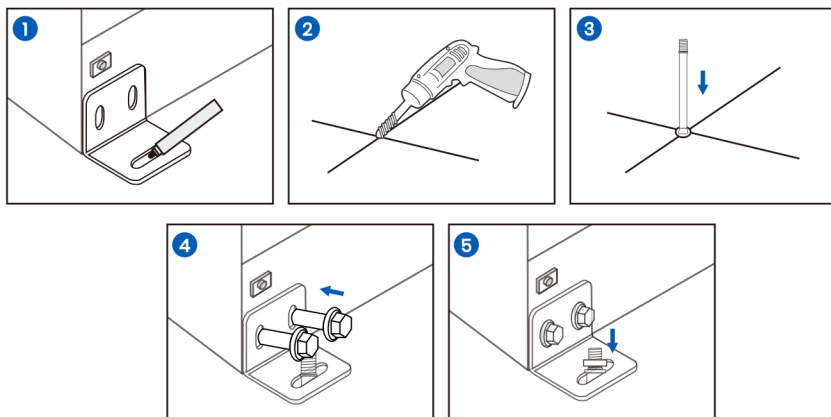
## 4.3 Installation Procedures

### 4.3.1 Mount the Cabinet

Before mounting the cabinet, position the cabinet at the installation site and locate the four mounting holes at the front and rear sides.



Follow the steps below to secure the cabinet to the foundation:



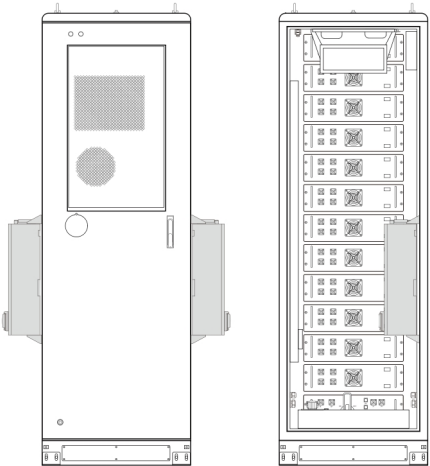
1. Attach the mounting bracket to the mounting holes and mark drill holes on the foundation with a marker.
2. Remove the mounting bracket. Then drill holes with a hammer drill.
3. Insert the provided four M12×80 expansion bolts (without washer and nuts) into the drilled holes and tap them until they are fully seated.
4. Secure the mounting brackets to the cabinet with the provided four M10×25 screws.
5. Place the washers onto the expansion bolts and tighten the nuts to secure the mounting brackets to the foundation.

### 4.3.2 Install the Transformer (Only for GE-FH60)

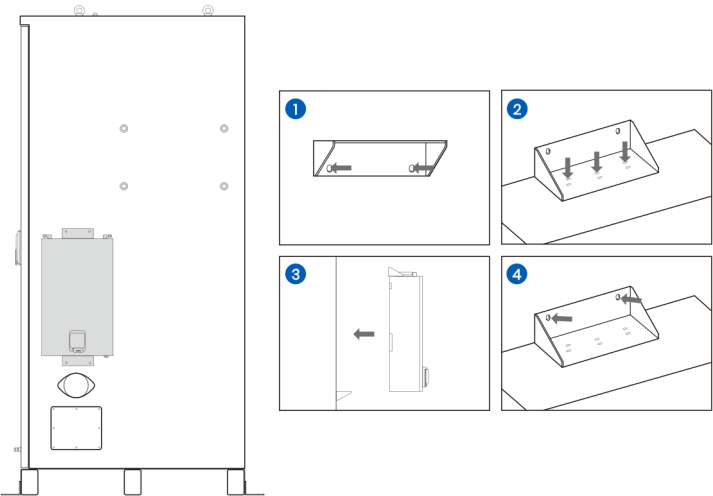
**NOTE**

- Transformer installation is required for GE-FH60 only.

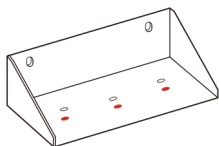
The transformer can be installed on the left or right side of the cabinet, or inside the cabinet on the right side. The installation procedure is the same for all three positions, except for the mounting holes used on the upper support bracket.



Before securing the transformer to the cabinet, locate the four mounting holes. The following illustrations show the installation on the right side of the cabinet.



1. Secure the lower support bracket of the transformer to the cabinet with two M6×20 screws.
2. Secure the upper support bracket to the top of the transformer with three M6×12 screws. Select the mounting holes according to the installation position:
  - **For installation outside the cabinet (right side):** Use the three outer mounting holes on the upper support bracket to avoid interference with the cabinet door.

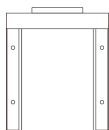


- **For installation outside the cabinet (left or right side):** either the three inner or outer mounting holes are available.
3. Place the transformer on the installed lower support bracket.
  4. Secure the upper support bracket to the cabinet using two M6×20 screws.

### 4.3.3 Install the Inverter

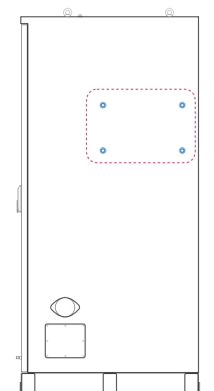
The compatible inverter can be mounted on either the left or right side of the cabinet based on site requirements. The following illustrations show the installation on the right side of the cabinet.

Before installing the inverter, remove the French Cleat from the inverter accessory kit.

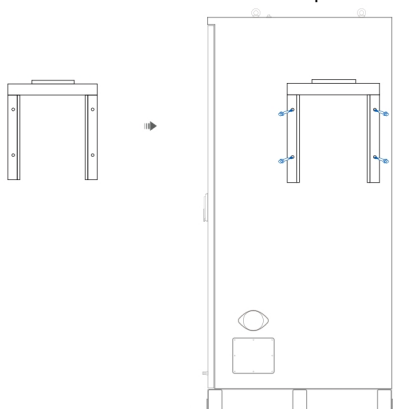


Follow the steps below to install the inverter:

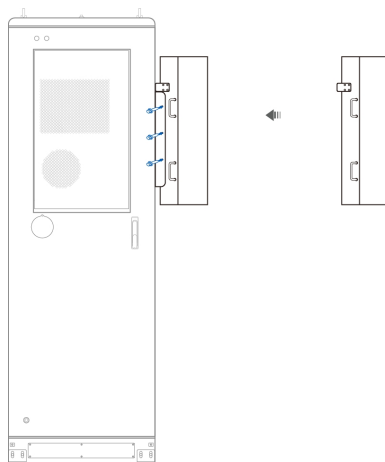
1. Remove the pre-installed M12 screws from the cabinet, and keep the screws for later use.



2. Align the French Cleat with the four Inverter Assembly Holes on the cabinet. Secure it to the cabinet with the M12 screws removed in Step 1.



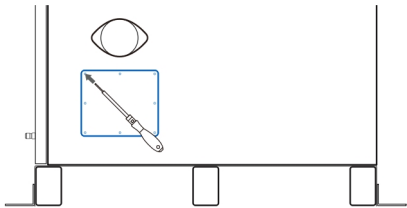
3. Secure the inverter to the French Cleat using the six screws supplied with inverter (three on each side).



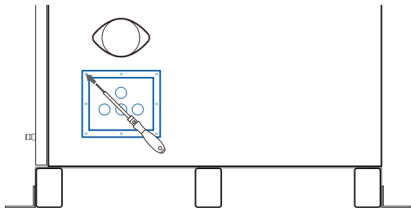
### 4.3.4 Install the Cable Entry Box

The cable entry box should be installed on the side where cables are routed. The following illustrations show the installation on the right side of the cabinet.

1. Locate the cable entry cover on the cabinet, and remove the pre-installed M4 screws from the cabinet. Keep the screws for later use.



2. Secure the cable entry box with the M4 screws removed in Step 1.



# 5 Electrical Connection

## 5.1 Safety Precautions



### **DANGER**

- All electrical connections must be performed only when the equipment is completely de-energized and isolated from all power sources.
- Do not expose the equipment to flammable or explosive gases, smoke, or any explosive environments.
- Always wear appropriate PPE and use only dedicated insulated tools when working on energized circuits to prevent electric shock, personal injury, or equipment damage.



### **WARNING**

- Only qualified electrical professionals can perform the electrical connection.
- The product can only be used in situations equipped with overvoltage protection devices..
- Do not perform electrical connection in the event of severe weather.
- Do not contact live parts directly without protection.
- Before cable connection, ensure that there is no voltage on the AC side and DC side.
- Ensure correct polarity during wiring: connect positive (+) to positive (+) and negative (-) to negative (-).
- Before connecting cables, check that the polarity of all input cables is correct. Do not pull wires and cables forcibly during electrical installation; otherwise, the insulation performance may be affected. Ensure all cables have sufficient bending space and take necessary auxiliary measures to reduce cable stress.
- Keep the equipment clear of the cable preparation area. Cable scraps entering the equipment can cause sparks, resulting in personal injury or equipment damage.
- All grounding connections must be completed and verified before connecting any high-voltage circuits.

### **NOTE**

- After cable connection, carefully verify that all connections are correct and secure.
- When connecting to inverters or operating in parallel mode, please use the cables provided in the unpacking list. If other cables must be used under special circumstances, ensure they comply with relevant standards.

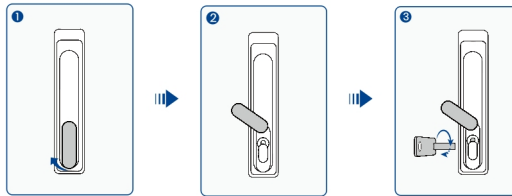
## 5.2 Access the Cabinet Interior

### 5.2.1 Open the Cabinet Door

#### NOTE

- After completing all connections and wiring, close and securely lock the cabinet door, and keep the key.

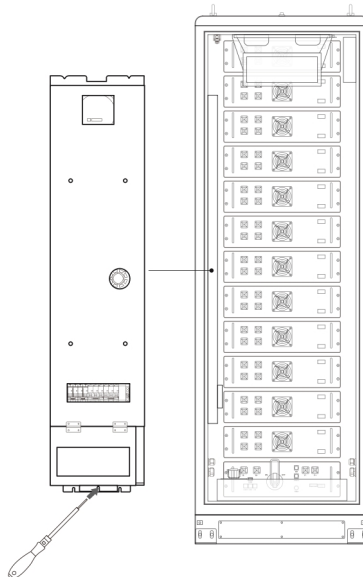
1. Slide the protective cover upward to expose the keyhole.
2. Insert the door key and turn it clockwise until the handle extends outward.
3. Rotate the door handle as indicated to unlock and open the door.



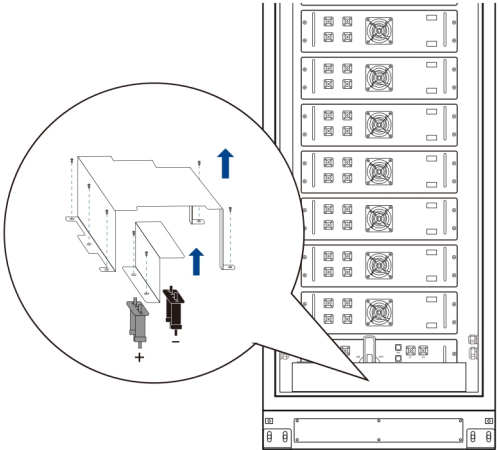
### 5.2.2 Remove the Protective Baffle

To access the terminals and ports for internal and external wiring, the protective baffles on the DC PDU and auxiliary power ports must be removed.

1. Locate the auxiliary power ports on the left on the left interior side of the cabinet, and then loosen the screws with a screwdriver.



2. Locate the the DC PDU in the lower part of the cabinet. Loosen the screws with a screwdriver to remove the protective baffle for the DC PDU and positive busbar, then remove the baffle for the negative busbar.

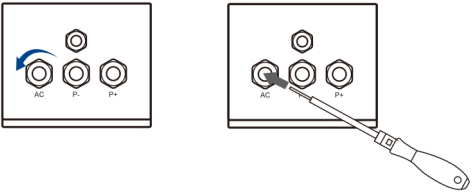


### 5.2.3 Prepare the Cable Inlet

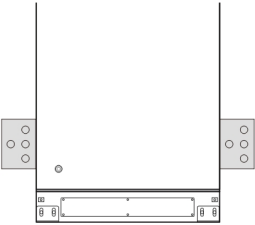
#### NOTE

- Select the appropriate cable inlet according to your cable routing plan to ensure neat cable management.

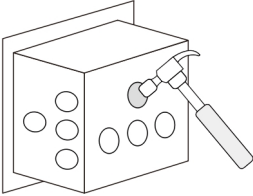
1. Open the cabinet door, loosen the cable gland, and pierce the rubber seal with a screwdriver from the cabinet interior.



2. Locate the cable entry box that you installed on either the right or left side of the cabinet.



3. Select suitable cable entry ports on the cable entry box and knock out its corresponding round blanking plates with a hammer. Then, clear away all debris.



## 5.3 Cable Preparation

### 5.3.1 Recommended Cables

Prepare corresponding cables for GE-FH60 and GE-FL60 respectively in accordance with the cable list below.

#### Cable List for GE-FH60

| Item                            | Wire Gauge | Terminal Lug                            | Qty | Note          |
|---------------------------------|------------|-----------------------------------------|-----|---------------|
| Grounding                       |            |                                         |     |               |
| Grounding Cable                 | 6 AWG      | SC16-8                                  | 1   | User-supplied |
| Cabinet Internal Connection     |            |                                         |     |               |
| BMU Series Power Cable          | 4 AWG      | Quick connector                         | 11  | Included      |
| BMU Series Communication Cable  | 16 AWG     | /                                       | 11  |               |
| BMU-PDU Positive Power Cable    | 4 AWG      | Quick connector                         | 1   |               |
| BMU-PDU Communication Cable     | 16 AWG     | /                                       | 1   |               |
| PDU-Busbar Positive Power Cable | 4 AWG      | PDU: Quick connector;<br>Busbar: SC25-8 | 1   |               |
| PDU-Busbar Negative Power Cable | 4 AWG      |                                         | 1   |               |
| External PCS Connection         |            |                                         |     |               |
| PCS-PDU Positive Power Cable    | 6 AWG      | PDU: SC16-8;<br>PCS: ENY16-12           | 2   | Included      |
| PCS-PDU Negative Power Cable    | 6 AWG      |                                         | 2   |               |
| CAT5E FTP Communication Cable   | 24 AWG     | /                                       | 1   |               |

| Auxiliary Power Supply Connection |        |          |   |               |
|-----------------------------------|--------|----------|---|---------------|
| Auxiliary Power L Line            | 12 AWG | ENY40-12 | 1 | Included      |
| Auxiliary Power N Line            |        |          | 1 |               |
| Auxiliary Power PE Conductor      |        |          | 1 | User-supplied |

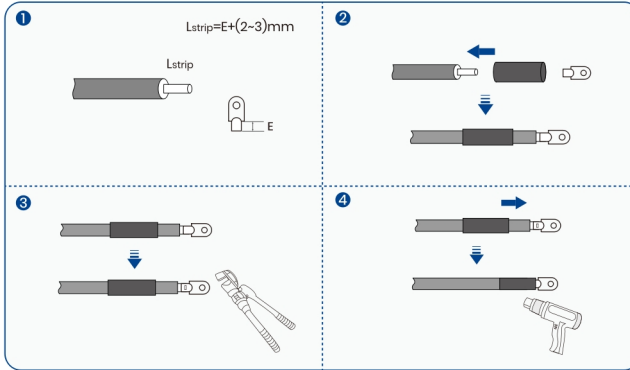
#### Cable List for GE-FL60

| Item                               | Wire Gauge | Terminal Lug                            | Qty. | Note          |
|------------------------------------|------------|-----------------------------------------|------|---------------|
| Grounding                          |            |                                         |      |               |
| Grounding Cable                    | 6 AWG      | SC16-8                                  | 1    | User-supplied |
| Single Cabinet Internal Connection |            |                                         |      |               |
| BMU Series Power Cable             | 4 AWG      | Quick connector                         | 5    | Included      |
| BMU Series Communication Cable     | 16 AWG     | /                                       | 11   |               |
| BMU Parallel Positive Power Cable  | 4 AWG      | Quick connector                         | 6    |               |
| BMU Parallel Negative Power Cable  | 4 AWG      |                                         | 6    |               |
| BMU-PDU Positive Cable             | 4 AWG      |                                         | 1    |               |
| BMU-PDU Communication Cable        | 16 AWG     | /                                       | 1    |               |
| PDU-Busbar Positive Cable          | 4 AWG      | PDU: Quick connector;<br>Busbar: SC25-8 | 1    |               |
| PDU-Busbar Negative Cable          | 4 AWG      |                                         | 1    |               |
| External PCS Connection            |            |                                         |      |               |
| PCS-PDU Positive Power Cable       | 6 AWG      | PDU: SC16-8;<br>PCS: ENY16-12           | 2    | Included      |
| PCS-PDU Negative Power Cable       |            |                                         | 2    |               |
| CAT5E FTP Communication Cable      | 24 AWG     | /                                       | 1    |               |
| Auxiliary Power Supply Connection  |            |                                         |      |               |
| Auxiliary Power L1 Line            | 12 AWG     | ENY40-12                                | 1    | User-supplied |
| Auxiliary Power L2 Line            |            |                                         | 1    |               |
| Auxiliary Power PE Conductor       |            |                                         | 1    |               |

### 5.3.2 Cable Crimping

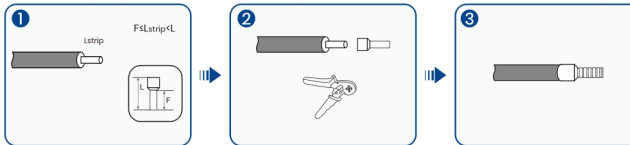
#### Crimp OT/DT/SC Cable Lugs

1. Strip the cable insulation to a length 2-3mm longer than the cable lug barrel length.
2. Slide the heat shrink tubing onto the cable, and insert the core wire fully to the bottom of the lug barrel.
3. Crimp the terminal firmly with a matching hydraulic crimping tool.
4. Slide the heat-shrink tubing over the lug barrel and heat it with a heat gun until it fits tightly around the joint.



#### Crimp Ferrules

1. Strip the cable insulation to the specified stripping length  $L_{strip}$  ( $F \leq L_{strip} < L$ ).
2. Insert the core wire fully to the ferrule barrel.
3. Crimp the ferrules securely with ferrule crimping pliers.



### 5.4 Grounding



#### WARNING

- Ensure the ground cable is securely connected to prevent electric shock.
- Either cabinet grounding or auxiliary power grounding is mandatory.



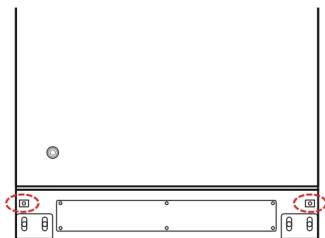
#### CAUTION

- After connecting the ground cable, it is recommended to apply silicone grease or paint around the ground terminal.

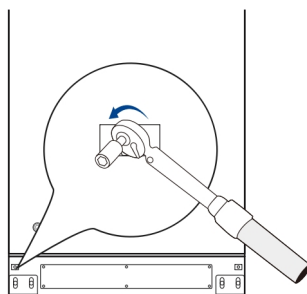
- After completing the grounding connection, grounding resistance must be measured and must comply with applicable national/local standards and regulations.

Follow the steps below to connect the grounding cable:

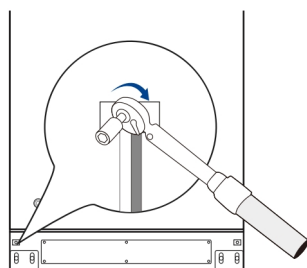
1. Locate the protective earth terminal on the cabinet



2. Remove the screw on the protective earth terminal of the cabinet with a screwdriver. Keep the screw for later connection.



3. If required, crimp the designated lug (SC16-8) onto the grounding cable as per section [5.3.2](#).
4. Align the crimped lug with the protective earth terminal, then tighten the screw using a socket wrench to ensure a secure connection.

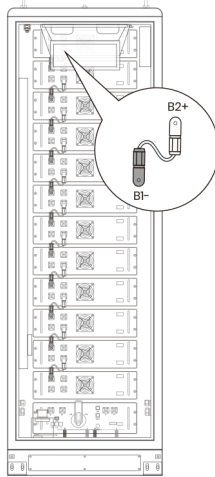


# 5.5 Cable Connections Inside Cabinet

1. Connect power cables between battery packs.

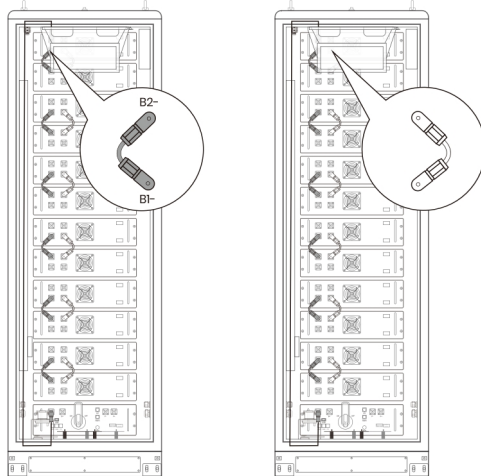
➤ **GE-FH60 (Series Connection)**

Use the **11 BMU Series Power Cables** to connect the B2+ port of the preceding battery pack to the B1- port of the next battery pack.

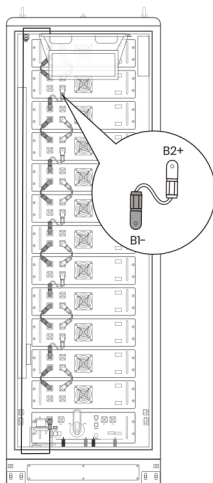


➤ **GE-FL60 (Pair-wise parallel then series connection)**

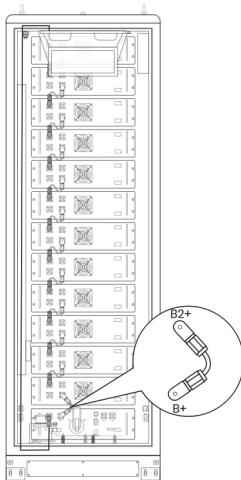
a. Use the **6 BMU Parallel Positive Power Cables** and **6 BMU Parallel Negative Power Cables** to connect every two battery packs in parallel to form one parallel unit (B2- and B2+ of the preceding pack to B1- and B1+ of the next pack).



- b. Then, use the **5 BMU Series Power Cables** to connect the preceding parallel unit to the next parallel unit (B2+ of the preceding unit to B1- of the next unit).

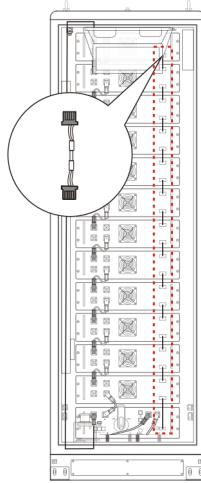


2. Use the **BMU-PDU Positive Power Cable** to connect the bottom-most battery pack and the DC PDU (B2+ of the bottom-most battery pack to B+ of the DC PDU).

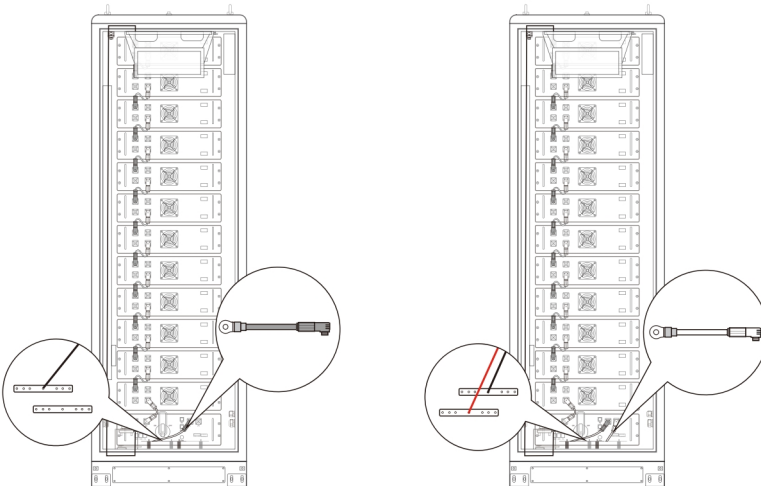


3. Connect communication cables.

- For battery pack communication, connect the **11 BMU Series Communication Cables** from COMM2 of the preceding pack to COMM1 of the next pack.
- For communication between the BMU and DC PDU, connect the **BMU-PDU Communication Cable** from COMM2 of the bottom-most pack to COMM2 of the DC PDU. Then, connect the supplied termination resistor to COMM1 on the topmost battery pack.



4. Use the **PDU-Busbar Positive Power Cable** and the **PDU-Busbar Negative Power Cable** to connect P+ and P- of the DC PDU to the internal positive and negative busbars respectively.



# 5.6 Connecting to Inverter



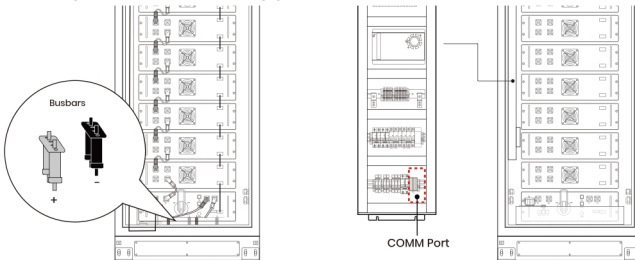
## WARNING

- Strictly follow polarity: P+ to positive busbar, P- to negative busbar.

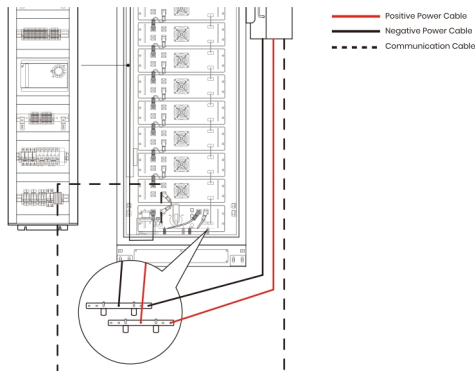
## NOTE

- It is recommended to connect GE-FL60 to a 30 kW inverter, and GE-FH60 to a 60 kW inverter.

1. Ensure the equipment and external power supply are completely de-energized.
2. Open the cabinet door and identify the DC positive and negative busbars and communication port on the auxiliary power terminal block.



3. Check that terminal markings are intact and clearly legible.
4. Route the 2 PCS-PDU Positive Power Cables, 2 PCS-PDU Negative Power Cables, and the CAT5E FTP Communication Cable through the dedicated openings of the cable entry box and their respective cable glands.
5. Connect the power cables to the busbars inside the cabinet. Then, connect the communication cable to the communication port on the auxiliary power terminal block.



## 5.7 Auxiliary Power Supply Connection

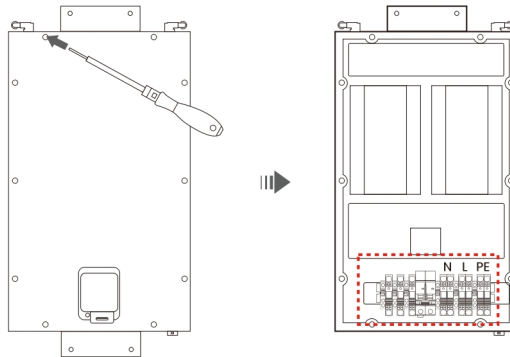


### CAUTION

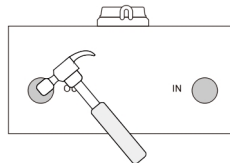
- The GE-FL60 supports AC208V and AC240V two-phase auxiliary power configurations. The GE-FH60 supports an AC277V single-phase auxiliary power supply and must be fed via a transformer.
- For off-grid auxiliary power supply, route single-phase or two-phase auxiliary power cables to the LOAD port of the inverter.

### 5.7.1 Auxiliary Power Connection for GE-FH60

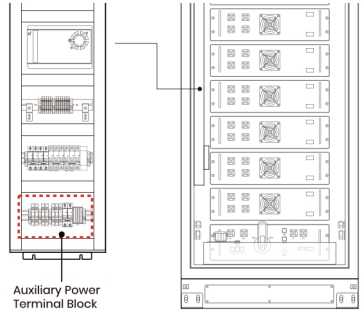
1. Ensure the cabinet and the auxiliary power source are fully de-energized.
2. Verify that the transformer is installed on the cabinet. Refer to section [4.3.2](#) for transformer installation.
3. Remove the screws on the transformer cover and take off the plate to expose the auxiliary power terminal block.



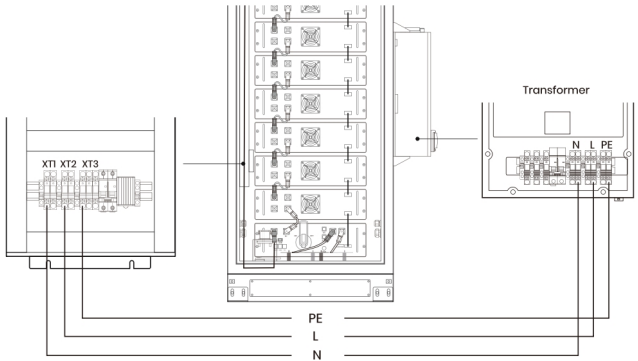
4. Then, knock out the round blanking plates at the bottom cable inlet and outlet of the transformer using a hammer for cable routing.



5. Open the cabinet door to locate the auxiliary power terminal block



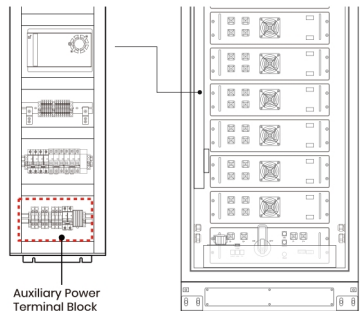
6. Route the auxiliary power L, N and PE conductors from the transformer through the cable outlet into the dedicated openings of the cable entry box and their corresponding cable glands.
7. Connect the L1, L2 and PE conductors from the transformer to the corresponding ports.



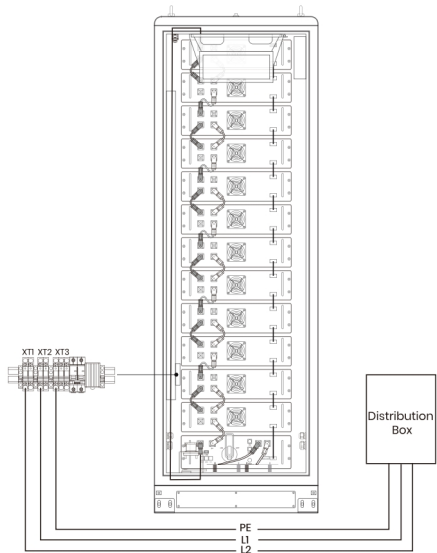
| Port  | Description                     | Recommended Cable  |
|-------|---------------------------------|--------------------|
| XT1:1 | Auxiliary power N line (AC277V) | 12 AWG<br>ENY40-12 |
| XT2:1 | Auxiliary power L line (AC277V) |                    |
| XT3:1 | Auxiliary power PE conductor    |                    |

### 5.7.2 Auxiliary Power Connection for GE-FL60

1. Ensure the cabinet and the auxiliary power source are fully de-energized.
2. Open the cabinet door to locate the auxiliary power terminal block



3. Verify all the terminal markings are intact and legible.
4. Route the auxiliary power L1, L2 and PE conductors from the on-site external distribution box through the dedicated openings of the cable entry box and their respective cable glands.
5. Connect the L1, L2 and PE conductors to the corresponding ports.



| Port   | Description                        | Recommended Cable  |
|--------|------------------------------------|--------------------|
| XT1: 1 | Auxiliary power L2 (AC208V/AC240V) | 12 AWG<br>ENY40-12 |
| XT2:1  | Auxiliary power L1 (AC208V/AC240V) |                    |
| XT3:1  | Auxiliary power PE conductor       |                    |

## 5.8 Multi-Cabinet Parallel Connection

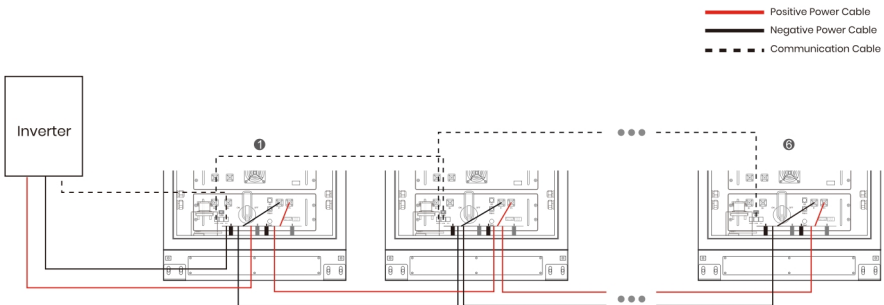


### CAUTION

- The GE-FH60/FL60 supports parallel connection of up to 6 units.

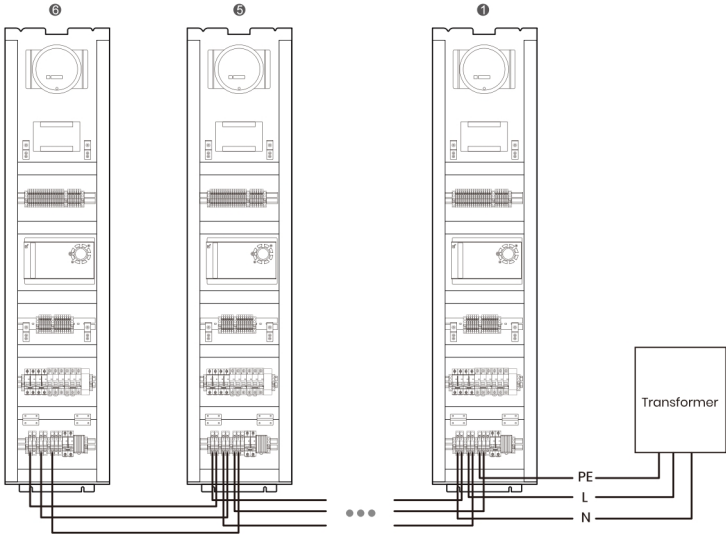
Follow the procedures below to complete communication networking and power wiring for multi-cabinet parallel operation.

1. Disconnect the mains power supply and confirm that all cabinets are fully de-energized before any wiring work.
2. Open the cabinet door to locate the DC PDU and positive and negative busbars.
3. Perform single cabinet wiring in accordance with [5.5](#), [5.6](#), and [5.7](#).
4. For parallel connection, remove the pre-installed quick connectors with an open-end spanner on the PCS side of the PCS-PDU positive and negative power cables as shown below. Then, crimp the SC16-8 terminals onto the DC power conductors as per section [5.3.2](#).
5. Connect the DC power cables.
  - Connect one end of each power cable to the busbar of the first cabinet and the other end to the busbar of the second cabinet. Strictly follow polarity: P+ to positive busbar, P- to negative busbar.
  - Repeat the above wiring for the remaining cabinets.
6. Connect the communication cables.
  - Connect the CAT5E FTP communication cable from the **HVBOUT port** of the first cabinet to the **HVBIN** port on the second cabinet.
  - Repeat the above wiring for the remaining cabinets. For the final cabinet, use the Termination Resistor to block the HVBOUT Port.

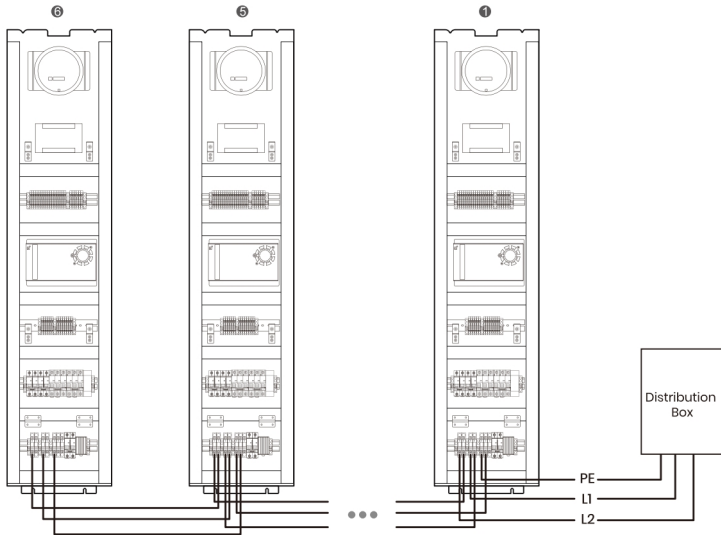


7. Connect the auxiliary power cables. Follow the diagram below to wiring the auxiliary power cables between cabinets.

➤ **GE-FH60**



➤ **GE-FL60**

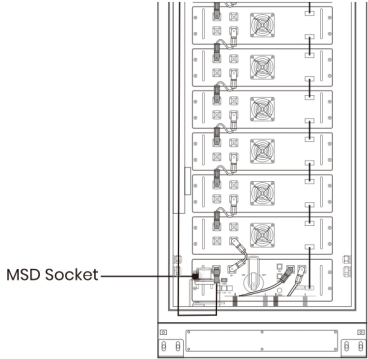


# 5.9 Post Connection Procedures

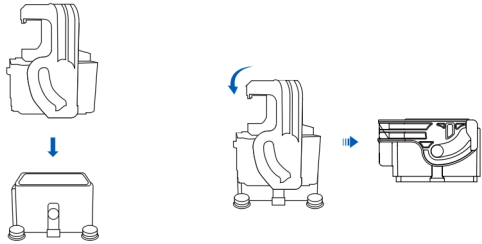
## 5.9.1 Install the MSD Plug

After cable connection, install the MSD plug as the steps below:

1. Ensure all mechanical installation and cable connection is completed and the system is completely de-energized.
2. Locate the MSD socket.



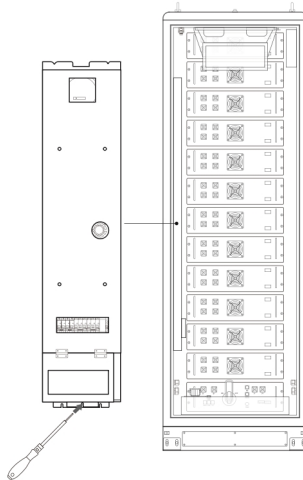
3. Align the MSD plug with the socket guide grooves and insert in vertically until a "click" is heard. Press down the lever and check the MSD is installed in place.



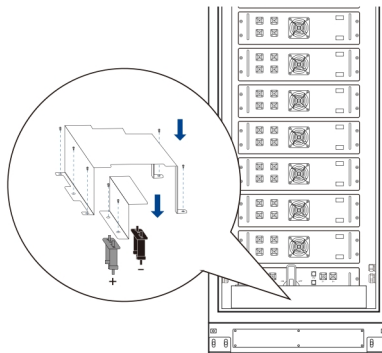
### 5.9.2 Reinstall the Protective Baffles

Once all wiring is complete, reinstall the protective baffle to shield live parts for safe operation.

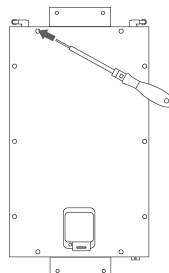
1. Secure the cover for the auxiliary power terminal block.



2. Reinstall the protective baffle for DC PDU and internal busbars.



For GE-FH60, reinstall the cover for the transformer on the cabinet side.



# 6 Operation

## 6.1 Check Before Power-On

| No. | Item                         | Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Equipment Appearance         | <ul style="list-style-type: none"> <li>Equipment is intact, no rust or paint flake-off; Repair damaged paint if any.</li> <li>Device labels are clear. Replace damaged labels if any.</li> <li>Door lock of each cabinet functions properly.</li> </ul>                                                                                                                                                                                                                         |
| 2   | Cabinet Installation         | <ul style="list-style-type: none"> <li>Installation site and foundation meets design requirements.</li> <li>Cabinet is level and secured by mounting feet.</li> <li>Clearance around the cabinet meets requirements.</li> </ul>                                                                                                                                                                                                                                                 |
| 3   | Cabinet Grounding            | <ul style="list-style-type: none"> <li>Cabinet grounded correctly with the ground cable securely connected to the cabinet PE terminal.</li> </ul>                                                                                                                                                                                                                                                                                                                               |
| 4   | Switch/circuit breaker       | <ul style="list-style-type: none"> <li>All circuit breakers are in the "OFF".</li> <li>All disconnectors are in correct position.</li> </ul>                                                                                                                                                                                                                                                                                                                                    |
| 5   | Cable                        | <ul style="list-style-type: none"> <li>Cables are intact with sheathings wrapped properly.</li> <li>Cable specifications meet the requirements and terminals are prepared as required.</li> <li>Cables are connected in designated positions</li> <li>Labels at both ends of cables are clear.</li> <li>Cables are placed properly and with slack at bending points to avoid stress.</li> <li>Cables are routed neatly without twists or crossovers in the cabinets.</li> </ul> |
| 6   | Cable Inlet Sealing          | <ul style="list-style-type: none"> <li>Cable inlets are sealed using cable cover.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                    |
| 7   | Ventilation/Heat Dissipation | <ul style="list-style-type: none"> <li>Fans and cooling vents are unobstructed.</li> <li>Air conditioner functions properly.</li> </ul>                                                                                                                                                                                                                                                                                                                                         |

## 6.2 Power-On



### **DANGER**

- Wear insulated gloves and use insulated tools at all times to prevent electric shock or short circuits.
- Monitor the system during power-on. If any fault is detected, power off the system immediately, rectify the fault, then resume operation.



### **WARNING**

- If the batteries become fully discharged or over-discharged during installation or commissioning, charge them immediately.
- If the installed system remains unused for 6 months or longer, it must be inspected and test by qualified personnel before being put back into operation.
- If any circuit breaker inside the system trips, inspect the corresponding load side for faults.
- Only restore the circuit breaker after confirming no short circuit or other abnormality exists, to prevent fault escalation and potential hazards.

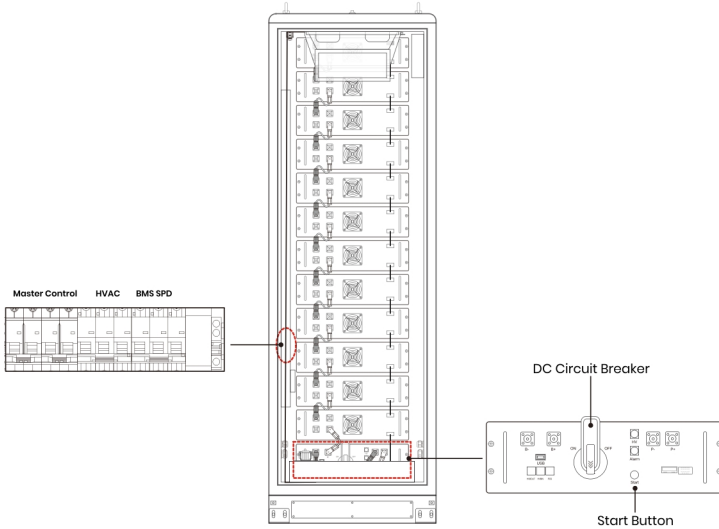
### **NOTE**

- Remove all desiccant from the ESS before initial power-on and long-term operation, and dispose of them in accordance with local waste regulations.
- Clear the equipment working area, and strictly prohibit unrelated personnel and animals from entering the operation range.
- Keep foreign objects, especially metal debris, away from the battery pack to avoid short circuit risks.
- The black start function is available when both of the two conditions are met:
  - The ambient temperature is between -10 °C and 50 °C;
  - The AC auxiliary power supply of the battery cabinet is fed from the LOAD ports of the designated hybrid inverter.

### Steps to power on the system:

Locate the circuit breakers inside the cabinet on the left side and the PDU.

1. Flip up the circuit breakers **Master, Control** and **HVAC**.
2. Rotate the **DC Circuit Breaker** on the PDU to the "ON" position.
3. Press the **Start Button** on the PDU.
4. Flip up the circuit breaker **BMS**.



## 6.3 Power-Off

### 6.3.1 Normal Power-Off Procedure

Steps to power off the system:

1. Flip down the circuit breaker **BMS**.
2. Press the **Start Button** on the PDU.
3. Rotate the **DC Circuit Breaker** on PDU to the "OFF" position.
4. Flip down the circuit breakers **HVAC, Control** and **Master**.

### 6.3.2 Emergency Power-Off Procedure



#### **DANGER**

- Do not use the EPO to stop the ESS during normal operation or when no emergency condition exists.
- Only after confirming that the fault has been completely cleared can you start the system again.

In an emergency, break the EPO cover and press EPO button to shut down the system immediately.



# 7 Product Monitoring

## 7.1 DEYE Cloud Website

### NOTE

- The DEYE Cloud Website can be used to monitor your ESS system only if you have purchased a DEYE inverter.
1. Log in to the Deye Cloud website (<https://www.deyecloud.com/login>) using your account and password.
  2. Enter the inverter collector's SN code in the search bar. The corresponding device information will be displayed in the table below. Click the device's SN code in the table to access the **Device Details Page**.
  3. On the Device Details Page, click Architecture to navigate to the Inverter Architecture Page.
  4. Then, click **Battery Module** to view the corresponding battery data.

## 7.2 DEYE Cloud APP

The device can connect to the Deye Cloud App via Bluetooth. After successful login and registration, you can view information about the entire system.

### Download the Deye Cloud App

Scan the correct code to download the app.



For Android



For iOS

For more detailed instructions on using the Deye Cloud App, refer to the operation manual by scanning the provided QR code.



## 8 Maintenance

### 8.1 Safety Precautions



#### **DANGER**

- Fully de-energize the equipment before any maintenance work.
- Maintenance shall be performed or supervised by qualified professional personnel.
- Wear personal protective equipment (PPE) and use dedicated insulated tools to avoid electric shocks or short circuits.
- Do not smoke or have open flames in the vicinity of the equipment.
- All terminals and circuit connectors must be disconnected before maintenance.
- It is forbidden to dismantle, dissect or open the battery; no serviceable parts are contained inside the battery.
- Do not wear jewelry, watches or other metallic accessories during maintenance.
- Do not service or maintain the equipment in extreme weather conditions.



#### **WARNING**

- Residual voltage may remain in the high-voltage circuit even after power is disconnected. Wait for at least 5 minutes and verify zero voltage with a standard professional voltmeter before any operation.
- Maintenance shall follow the sequence: equipment de-energization, lockout/tagout to prevent re-energization, zero-voltage verification, residual charge discharge and equipment grounding, and insulation shielding of adjacent live parts.
- Install a lockout device on the switch and attach a warning tag to indicate that the switch must not be operated.
- Improper decommissioning may cause damage to equipment. Ensure the product is decommissioned in accordance with relevant provisions before maintenance.
- Do not clean the equipment with water or any solvent.



#### **CAUTION**

- Before maintenance, set up warning signs or safety barriers to prevent unauthorized access.
- Use an electroscope of the proper voltage level to verify the equipment is completely de-energized.
- Before maintenance or repair, securely connect the circuit to be serviced to the main grounding system. Remove the grounding connection upon completion.

- Ensure that the air inlets and outlets are not blocked. Remove any debris around the vents to guarantee proper heat dissipation.
- Insert and remove cables in accordance with regulations; violent or forced operations are prohibited.
- Clean tools and materials promptly after maintenance, and check for any metallic objects left inside or on top of the product.
- Contact the customer service center for any operation and maintenance queries; unauthorized operation is prohibited.
- A full inspection and test shall be performed upon completion of maintenance before the equipment is powered on again.

## 8.2 Maintenance Schedule

### NOTE

- Perform maintenance as required by site conditions.
- Ensure that the explosion vent panels are not blocked. Clear any debris from around these openings to prevent damage to the pressure relief devices during operation
- In sandstorm-prone areas, clean the air conditioner filter after each sandstorm with a high-pressure water gun.

| Item                   | Description                                                                                      | Frequency |
|------------------------|--------------------------------------------------------------------------------------------------|-----------|
| Environment & Safety   | Check that temperature and humidity inside/outside the equipment are within reasonable ranges.   | 1 day     |
|                        | Ensure no flammable or explosive materials around the equipment.                                 | 1 day     |
|                        | Check that warning labels are legible and intact.                                                | 1 day     |
|                        | Check heat dissipation modules and vents for blockage; clean with a vacuum cleaner if necessary. | 12 months |
|                        | Check if the fire-proof mud is with good adhesion and foundation intact and smooth               | 12 months |
| Appearance & Structure | Check that status indicators are in normal condition.                                            | 1 day     |
|                        | Ensure no foreign objects wrap or cover the equipment enclosure.                                 | 1 day     |
|                        | Check the equipment for paint peeling/ rust, door lock damage and blocked vents.                 | 3 months  |
|                        | Verify normal function of EPO button and equipment shutdown switches.                            | 3 months  |

|                        |                                                                                                                                                                                                             |           |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                        | Check internal screws for loss and rust.                                                                                                                                                                    | 12 months |
| Internal Components    | Battery packs: Check batteries work in proper temperature/humidity with normal voltage and current.                                                                                                         | 3 months  |
|                        | Power distribution unit: Verify normal operation, with no alarms, abnormal voltage or temperature, and that all connections are secure.                                                                     | 3 months  |
|                        | Power distribution area: Check that all connections are tight and free of corrosion or overheating; clean internal dust to maintain proper heat dissipation                                                 | 3 months  |
|                        | UPS: Check that connections are secure and input/output parameters are normal.                                                                                                                              | 3 months  |
|                        | Fire protection and water immersion components: Verify that smoke and heat detectors are working normally, and perform a water drip test to confirm the water immersion sensor triggers an alarm correctly. | 6 months  |
| Electrical Connections | Check all cables for loose connection, damage and water ingress.                                                                                                                                            | 3 months  |
|                        | Reliable grounding and equipotential bonding                                                                                                                                                                | 12 months |

## 8.3 Post-Maintenance Requirements

After completing maintenance operations, follows the steps below to restore the site and archive the maintenance records:

| Step                       | Operation                                                                                                                                                                                                |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Cleaning & Restoration  | Remove all temporary measures (e.g., grounding and warning signs) and wiring is restored to original condition. Prevent foreign objects from being left behind or personnel from inadvertently entering. |
| 2. Power-up & Verification | Restore system power step by step per the power-up procedure. Verify that the system has no alarms and operating parameters are normal.                                                                  |
| 3. Recording & Archiving   | Create traceable maintenance records, including the time, personnel and equipment status, and archive the records.                                                                                       |

## 8.4 Storage

### NOTE

- For long-term storage, keep the original packaging and check it regularly.



### WARNING

- Keep the product far away from high-temperature heat sources, open flames, flammable and explosive areas, and all ignition sources, and do not expose it to direct sunlight or rain.
- During storage, ensure the product is completely disconnected from external equipment, with all operation indicators off.
- Store the product in a dry, clean, well-ventilated indoor area on flat, solid ground, away from strong infrared radiation, organic solvents, corrosive gases, and conductive metal dust.
- Handle with care. Dropping, collision, overturning, side placement, or tilting are strictly prohibited. Do not stack or roll the product improperly.
- Strictly comply with the storage requirements of the warning signs and other information on the packaging to avoid device damage.
- The storage area must be equipped with qualified fire-fighting facilities, including fire sand and special fire extinguishers.

### ESS Cabinet Storage Requirements

- **Storage Temperature:** 0°C ~ 35°C
- **Humidity:** 5% ~ 85% relative humidity, non-condensing;
- **Altitude:** ≤2000 m

### Long-Term Storage:

- Replace desiccants with the same specifications and quantity regularly.
- Check the outer packaging every 3 months, and replace damaged packaging immediately.
- Storage duration is calculated from the latest charge date marked on the packaging. If the allowable storage period is exceeded, report to the person in charge immediately.
- Maintain temperature and humidity per the storage requirements.

Since the batteries have been installed in the cabinet in the factory, the following **battery storage requirements** should also be aided:

1. For long-term battery storage, keep the SOC no less than 50%, complete at least one charge-discharge cycle every 6 months, charge the battery in a timely manner, and calibrate the SOC to 50%. Low SOC storage is strictly prohibited to avoid battery damage caused by over-discharge.
2. Check the battery voltage monthly if stored for more than 6 months. Storage can be continued if the voltage is higher than 51.2V; charge immediately in accordance with the specified charging strategy if the voltage is lower than 51.2V.
3. To reduce self-discharge losses during extended storage, disconnect one terminal of the positive power cable from the high-voltage box. This action cuts off the internal 12V auxiliary power supply and minimizes battery depletion.
4. Long-term storage of lithium batteries will cause capacity attenuation, so overdue storage shall be avoided as much as possible. If the allowable storage period is exceeded, contact the qualified personnel for inspection and maintenance. Do not attempt to start or operate the equipment without prior inspection.

# 9 Technical Specifications

| Model                               |                                 | GE-FL60                                                    | GE-FH60   |
|-------------------------------------|---------------------------------|------------------------------------------------------------|-----------|
| Cell Chemistry                      |                                 | LiFePO <sub>4</sub>                                        |           |
| Module Energy (kWh)                 |                                 | 5.12                                                       |           |
| Module Nominal Voltage (V)          |                                 | 51.2                                                       |           |
| System Capacity (Ah)                |                                 | 200                                                        | 100       |
| Battery Module Qty In Series        |                                 | 6                                                          | 12        |
| System Nominal Voltage (V)          |                                 | 307.2                                                      | 614.4     |
| System Operating Voltage (V)        |                                 | 268.8 ~ 350.4                                              | 480 ~ 700 |
| System Energy (kWh)                 |                                 | 61.44                                                      |           |
| System Usable Energy (kWh)          |                                 | 55.29                                                      |           |
| Rated DC Power                      |                                 | 61.44                                                      |           |
| Charge/<br>Discharge<br>Current (A) | Recommend                       | 50                                                         |           |
|                                     | Nominal                         | 100                                                        |           |
|                                     | Peak Discharge<br>(2 min, 25°C) | 125                                                        |           |
| Status Indicator                    |                                 | Green: Battery System Running<br>Red: Battery System Alarm |           |
| Communication Port                  |                                 | CAN2.0 / RS485                                             |           |
| Humidity                            |                                 | 5% ~ 85% RH                                                |           |
| Altitude                            |                                 | ≤2000m                                                     |           |
| IP Rating of Enclosure              |                                 | IP55                                                       |           |
| Dimension (W x D x H, mm)           |                                 | 735 x 1045 x 2235                                          |           |
| Weight Approximate (kg)             |                                 | 1015                                                       |           |
| Installation Method                 |                                 | Floor-Mounted                                              |           |
| Storage Temperature (°C)            |                                 | 0 ~ 35                                                     |           |
| Operating Temperature (°C)          |                                 | -30 ~ 60 (>45 derating)                                    |           |
| Recommend Depth of Discharge        |                                 | 90%                                                        |           |
| Cycle Life                          |                                 | ≥6000 (25±2°C, 0.5C / 0.5C, EOL70%)                        |           |
| Certification                       |                                 | UN38.3, UL1973, UL9540A, UL9540                            |           |

## Appendix I Troubleshooting

This section lists the fault codes and corresponding troubleshooting methods for the battery system. In the event of any fault, refer to the table below and follow the relevant troubleshooting recommendations. If the problem persists, contact after-sales service for further assistance.

| Code | Description                           |
|------|---------------------------------------|
| F001 | Total Voltage Too High                |
| F002 | Total Voltage Too Low                 |
| F003 | Charge Temperature Too High           |
| F004 | Discharge Temperature Too High        |
| F005 | Charge Temperature Too Low            |
| F006 | Discharge Temperature Too Low         |
| F007 | Voltage Difference Too Large          |
| F008 | Temperature Difference Too Large      |
| F009 | Cell Overvoltage                      |
| F010 | Cell Undervoltage                     |
| F011 | Pre-charge Resistor Over-temperature  |
| F012 | BMS Connector Over-temperature        |
| F013 | BMU Connector Over-temperature        |
| F014 | Charge Current Fault                  |
| F015 | Discharge Current Fault               |
| F016 | SOC Too High Fault                    |
| F017 | Insulation Fault                      |
| F018 | Heating Film Over-temperature Fault   |
| F019 | SOC Too Low Fault                     |
| F020 | Discharge Relay Adhesion              |
| F021 | Positive Main Relay Adhesion          |
| F022 | Charge Relay Adhesion                 |
| F023 | Heat Relay Adhesion                   |
| F024 | Ultimate Protection                   |
| F025 | Power Supply Voltage Abnormal         |
| F026 | Fuse Blown                            |
| F027 | BMU Address Duplicate Fault           |
| F028 | BMS Address Duplicate Fault           |
| F029 | Internal CAN Communication Failure    |
| F030 | PCS CAN Communication Failure         |
| F031 | PCS RS485 Communication Failure       |
| F032 | PCS RS485 Communication Error         |
| F033 | Fuse Total Voltage Sampling Error     |
| F034 | Internal Total Voltage Sampling Error |
| F035 | Motor Total Voltage Sampling Error    |

|      |                                                                      |
|------|----------------------------------------------------------------------|
| F036 | Heating Total Voltage Sampling Error                                 |
| F037 | Voltage Sampling Fault                                               |
| F038 | Temperature Sampling Fault                                           |
| F039 | Current Sampling Fault                                               |
| F040 | Current Module Fault                                                 |
| F041 | Positive Main Relay Drive Failure                                    |
| F042 | Charge Relay Drive Failure                                           |
| F043 | Discharge Relay Drive Failure                                        |
| F044 | Heat Relay Drive Failure                                             |
| F045 | EEPROM Storage Fault                                                 |
| F046 | Pre-charge Failure                                                   |
| F047 | Charge Voltage Too Low                                               |
| F048 | BMU Communication Fault                                              |
| F049 | BMU Quantity Abnormal                                                |
| F050 | BMS Connector Temperature Acquisition Error                          |
| F051 | BMU Connector Temperature Acquisition Error                          |
| F052 | Pack Thermal Runaway Fault                                           |
| F053 | Pack Fire Fault                                                      |
| F054 | TCP Connection Failure                                               |
| F055 | W5500 SPI Communication Failure                                      |
| F056 | LC Communication Lost                                                |
| F057 | BMU AFE Communication Failure                                        |
| F058 | Bluetooth Initialization Failure                                     |
| F059 | Cell Type Mismatch                                                   |
| F060 | Single Cluster Emergency Power-off                                   |
| F061 | Negative Main Fuse Blown                                             |
| F062 | Heating Abnormality                                                  |
| F063 | Heating Fuse Blown                                                   |
| F064 | Water Immersion Fault                                                |
| F065 | Dual Protection Board MOS Open Fault                                 |
| F066 | Arc Fault Detection Fault                                            |
| F067 | Arc Fault Detection Board Communication Lost                         |
| F068 | System Self-check Completed                                          |
| F069 | Environmental Control Board AC Communication Loss Alarm              |
| F070 | Environmental Control Board AC General Alarm                         |
| F071 | Environmental Control Board Lightning Protection Alarm               |
| F072 | Environmental Control Board Exhaust Valve Alarm                      |
| F073 | Environmental Control Board Lead-acid Battery Alarm                  |
| F074 | Environmental Control Board Cabin Combustible Gas Alarm              |
| F075 | Environmental Control Board Battery Door Open Fault                  |
| F076 | Environmental Control Board Cabin Extinguishing Agent Feedback Fault |
| F077 | Environmental Control Board Smoke Detector Fault                     |
| F078 | Environmental Control Board Temperature Sensor Fault                 |

|      |                                                         |
|------|---------------------------------------------------------|
| F079 | Environmental Control Board Cabin Combustible Gas Fault |
| F080 | Environmental Control Board Emergency Stop Fault        |
| F081 | Environmental Control Board Water Immersion Fault       |
| F082 | Environmental Control Board Communication Loss Fault    |
| F083 | Environmental Control Board CO Detector Alarm           |

## Appendix II Emergency Handling



### **DANGER**

- In the event of natural disasters (earthquake, typhoon, flood, wildfire, etc.): Prioritize personnel safety, cut off power and stop the ESS immediately.
- Do NOT operate damaged equipment without professional inspection and qualified testing after the disaster.
- Keep away from waterlogged or fire-damaged units and contact our service engineers for professional handling.



### **WARNING**

- When the air intake/exhaust system is operating, do NOT face the exhaust vents under any circumstance.
- Refer to the user manual/product manual for product information. Do NOT open the cabinet door if internal safety cannot be guaranteed.

### ➤ **Fire/Explosion Hazards**

- Do not open the door. Evacuate immediately to at least 50 meters away from the site and call the fire department.
- Wear respiratory protection. Disconnect the upstream power supply only when safe.
- Isolate the accident area only when safe to keep unauthorized personnel away.
- Post-incident maintenance must be performed by professionals or our after-sales engineers.

### ➤ **Electric Shock**

- Ensure personal safety, then disconnect the power supply immediately to avoid secondary electric shock.
- Use an insulated object to separate the victim from the power source and perform first aid such as cardiopulmonary resuscitation (CPR).
- Call the emergency medical number immediately to obtain professional medical treatment.
- Protect the accident scene for investigation and evidence preservation.
- Contact professionals to conduct a comprehensive inspection of the ESS. The system may only be put back into use after repair or replacement and passing qualified testing.

➤ **Chemical Hazards**

- In case of electrolyte leakage, evacuate personnel from the affected area and notify the relevant personnel immediately. Professionals shall conduct safe collection and proper disposal of leaked substances.
- Toxic gases may be released during battery combustion or damage; evacuate personnel to a safe area immediately. If personnel are exposed or injured, call the emergency medical number for professional treatment. Respiratory protection, protective clothing and other safety equipment must be worn during hazard handling.

➤ **Mechanical Injury**

- In the event of equipment tipping, battery pack dropping or component detachment, disconnect power and stop ESS operation immediately.
- In case of personnel injury, administer first aid (hemostasis, bandaging, etc.) and call the emergency medical number immediately.
- If obvious odor, damage, smoke or fire is detected, evacuate personnel immediately, call the fire department, and allow professionals to handle firefighting and subsequent treatment.
- If any abnormalities are observed, professionals shall use move the battery pack to an open, safe area, let it stand for 1 hour while monitoring temperature, and contact the engineers.
- Contact professionals to repair or replace damaged components. The system may only be returned to service after passing inspection and testing.

➤ **Natural Disasters**

- In the event of natural disasters including earthquake, typhoon, flood, wildfire, etc., disconnect the power supply and stop ESS operation immediately.
- If the ESS is submerged or flooded, do not touch the equipment and keep clear of the waterlogged area.
- Do not use water-soaked batteries under any circumstances. Contact a qualified battery recycling service for proper disposal and scrapping.
- Before a wildfire approaches, establish a firebreak around the ESS and prepare adequate fire-fighting equipment such as fire extinguishers, fire sand, fire hoses, etc.
- After the disaster, contact professionals to fully inspect the support structure, electrical connections, etc. The system may only be reused after repair/replacement and qualified testing.