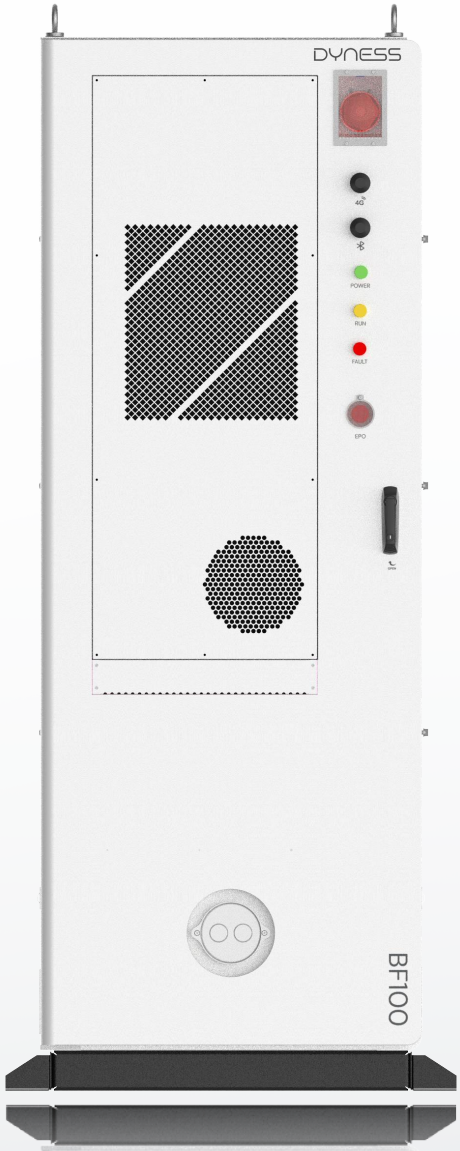
DYNESS




# BF100-C140
## USER MANUAL

**EnerCore**
Outdoor Air-cooling
Battery Cabinet

Version: 20260803-V1.2-EN, the version is subject to update without notice.

# Content

## Statement of Law


This product complies with the design requirements for environmental protection and personal safety. The storage, use and disposal of the product shall be in accordance with the product manual, relevant contract or relevant laws and regulations.
When products or technologies are updated, customers can check the information on the website of Dyness.
Website: http://www.dyness.com/
Please note that products can be modified without prior notice.

## Revised History

| Revised Version | Revision Date | Revision Reason |
|---|---|---|
| 1.0 | 2026.02.13 | First publication |
| 1.1 | 2026.04.13 | Rendered color map updated, installation requirements adjusted. |
| 1.2 | 2026.08.03 | Update installation layout requirements and add SOC calibration for system maintenance inspection， Update of Wiring Harness Specifications. |

# 1. Guideline

CAUTION: Read this manual carefully before installing or operating this product. Keep this manual in a safe place for future reference.

## 1.1. Use of Manuals

- Manual content: this manual mainly introduces the safety precautions, functions and specifications, delivery and storage, installation and wiring, power on/off process, HMI operation, maintenance and quality assurance of this ESS product.
- Applicable population: this manual is suitable for professional technicians who install and maintain the ESS product, as well as users who carry out daily operation. Readers should have some electrical knowledge.

## 1.2. Symbol and Abbreviation

This manual may contain the following symbols to emphasize important information, to ensure the safety of the user's personal and property when installing this product, or to facilitate the efficient operation. Please read it carefully.

Table 1-1 Symbol Mark

| | |
|---|---|
|  | Indicate that there is high voltage inside the ESS cabinet, so beware of electrocution, resulting in personal safety issues. |
|  | Indicate an electrical hazard, all external power connections must be disconnected before maintenance and operation. |
|  | Indicate that there is a protective earthing (PE) terminal, which is used to prevent electric shock in the event of a fault, and needs to be firmly earthed to ensure operator safety. |
|  | Recycle mark |
|  | Hazardous waste, needs professional recycling, can not be put into the trash can |
|  | Instruction (User Manual) mark |
|   | The cabinet may still be live within five minutes after power-off. All operations must be initiated at least five minutes after the cabinet is powered off. |

References to the following products in this manual are replaced by abbreviations for ease of presentation.

Table 1-2 Abbreviation Definition

| Abbreviation | Full name |
|---|---|
| ESS | Energy Storage System |
| EMS | Energy Management System |
| BMS | Battery Management System |
| PACK | Battery Module |
| BDU | Battery Distribution Unit |
| SPD | Surge Protection Device |
| SOC | State of Charge |
| SOH | State of Health |
| DC | Direct Current |
| AC | Alternating Current |
| RCD | Residual Current Device |
| CT | Current Transformer |
| PE | Protective Earthing |
| PCS | Power Conversion System |

# 2. Safety Instructions

## 2.1. Safety Principle

Related safety precautions need to be strictly followed during installation, operation and maintenance. This product is a combined high-voltage DC and three-phase AC system and should only be operated by Dyness authorized personnel.

**DANGER**

- Deadly high voltages are present inside the product. Please observe and comply with the warning labels on the product;
- Do not touch the power grid or the contacts connected to it inside the product to prevent the risk of fatal electric shock!
- Damage to the battery may result in electrolyte leakage. If the electrolyte leaks, do not touch the leaking electrolyte or volatile gases and contact the after-sales service team immediately for assistance.

WARNING

- Transportation, installation, maintenance must comply with local regulations and this user manual;
- Installation work must be assigned to a specialized full-time operator.

**PROHIBITION**

- Risk of damage to the battery system or personal injury or behavior is prohibited;
- Replacement of the modules by the user is prohibited and the company will not be responsible for any damages caused.

## 2.2. Operator Qualifications

Only qualified electricians or professional personnel can operate the product. The operator must meet the following requirements.

- Shall be familiar with local standards and relevant electricity safety regulations;
- The operator shall have received professional training related to the installation and commissioning of electrical equipment, and should have the ability to respond to emergencies or unexpected situations that may occur during installation or trial operation.
- The operator shall have certain specialized knowledge of electronics, electrical wiring and machinery, and be familiar with electrical and mechanical schematic diagrams;
- The operator should be fully familiar with equipment protection and

standard maintenance, and operations should comply with established safety standards.

## 2.3. Environmental Safety Requirements

- Do not install and use the product in environments with temperatures below -20°C or above 50°C;
- Do not install and use the product near any heat sources or combustible materials;
- Do not install and use the product in areas with frequent movement of personnel;
- Do not expose the product to corrosive gases or liquids;
- Keep the product installation and use away from children and animals;
- The maximum installation altitude for the product should not exceed 3000 m, and it should be derated when above 2000 m;
- Sufficient space should be reserved for product installation to ensure adequate ventilation;
- Isolation barriers must be set up during installation to prevent any unrelated personnel from entering the site.

## 2.4. Electrical Safety Requirements

The operator must ensure that: all basic information and step-by-step instructions are understood before commissioning and switching off the disconnecting circuit-breaker.

**DANGER**

**Battery Protection Safety**

Please ensure that during installation, maintenance of the equipment:

- The battery is completely disconnected;
- Have a visible warning sign at the break point to ensure no accidental reconnections.

**Ground Fault Protective Safety**

- When a ground fault occurs, the original non-electrified part may carry high voltage, and accidental electric shock can lead to personal safety! Ensure that there is no ground fault and take necessary protective measures before operation.

**Safety Of Live Line Measurements**

- Given the presence of high voltages in this equipment, protective measures (e.g., wear insulated gloves, etc.) must be taken during live line measurements, and the operator must be accompanied by a person to ensure personal safety.

**Arc Protection Safety**

- Avoid arc, fire and explosion hazards caused by improper operation;
- Prohibit touching uninsulated cables that may be energized;

- When a loose connection occurs in the power cable, or a screw or other component falls out accidentally, do not operate it without authorization, and it must be handled by a qualified professional to avoid causing a larger malfunction.

## 2.5. Transportation and Installation Safety Requirements

**WARNING**

**Personnel Operation Regulations**

- Forklifts, cranes and other construction machinery must be operated by qualified operators if required on site;
- The operator must wear insulated protective equipment that complies with safety regulations during installation;
- When connecting the power on-site, a professional guardian must be assigned to protect the switches that need to be turned off;
- Ensure that it has no electrical connections before installation;
- Each completed project must be checked at least once and cross-checked during the installation process;
- The equipment must be installed in sequence without skipping any steps.

**Wiring regulations**

- Appropriate measuring devices must be used, appropriate standards and directives must be followed;
- The operating manual of the measuring device must be known before any measurement is carried out;
- Only use equipment specified by Dyness. Failure to use equipment specified by Dyness may result in impaired protection as well as injury to personnel.

**Test run after installation**

- Only after confirmation by professionals and obtaining permission from local electrical authorities can the equipment be put into operation;
- Before operation, please switch off all distribution circuit breakers, and it is strictly prohibited to disconnect them during product running.

**DANGER**

- Do not change fuse size or rating value during installation;
- It is not allowed for two or more operators to connect a single wire simultaneously during the wiring process.

## 2.6. Daily Operation and Maintenance

All operations of the product should follow the instructions in the User Manual. Damage to the equipment caused by violation of these instructions will void the associated liability and warranty. If necessary, contact Dyness Customer

Service for repairs.

**WARNING**

- The software, shell and components of the product may not be changed without Dyness authorization. If changed, the corresponding liability and warranty shall be void;
- Do not remove or alter the nameplate;
- Do not open the cabinet doors in inclement weather such as rain or strong winds.

**Battery maintenance**

- Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
- When replacing batteries, replace with the same type and number of batteries or battery packs.
- General instructions regarding removal and installation of batteries.

a) CAUTION: Do not dispose of batteries in a fire. The batteries may explode.

b) CAUTION: Do not open or damage batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

c) CAUTION: A battery can present a risk of electrical shock and high short-circuit current.

- The following precautions should be observed when working on batteries:

a) Remove watches, rings, or other metal objects.

b) Use tools with insulated handles.

c) Wear rubber gloves and boots.

d) Do not lay tools or metal parts on top of batteries.

e) Disconnect charging source prior to connecting or disconnecting battery terminals.

f) Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

## 2.7. Product Obsolescence

When the product as a whole or individual internal components become aged or damaged and need to be discarded, they cannot be disposed of as regular waste. Some components inside the product can be recycled and reused. Improper disposal of certain components may cause environmental pollution. Please contact a qualified local professional recycling organization for proper disposal of the product and internal components.

# 3. Product Description

## 3.1. Product Overview

The product is an outdoor battery cabinet. The system storage capacity is 86/100 kWh, including PACK, BDU (integrated BMS and EMS), Security & fire protection system, Air conditioner system and so on. With the hybrid inverter converted to AC output, it can be widely used in charging stations, commercial buildings, manufacturing and other small-scale industrial and commercial scenarios.

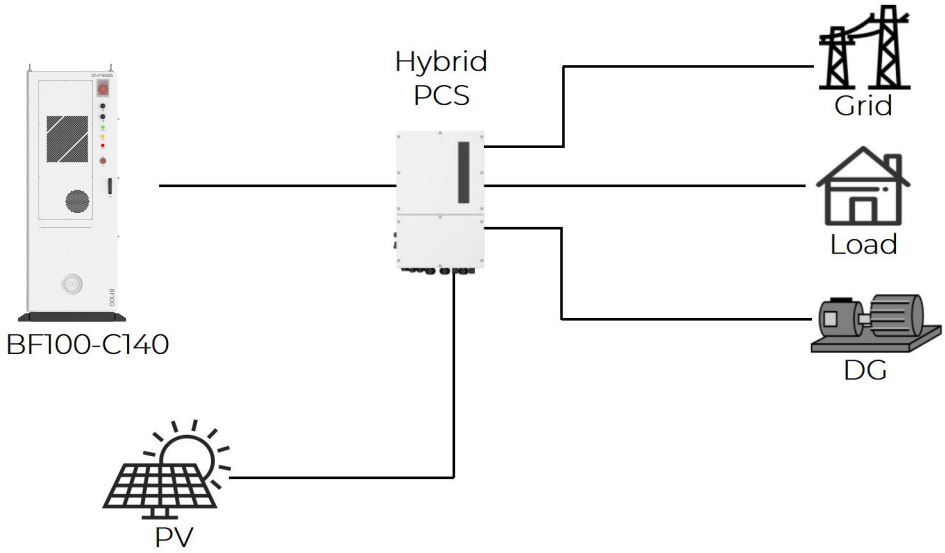



Figure 3-1 System Application Principle

The system topology is as follows:

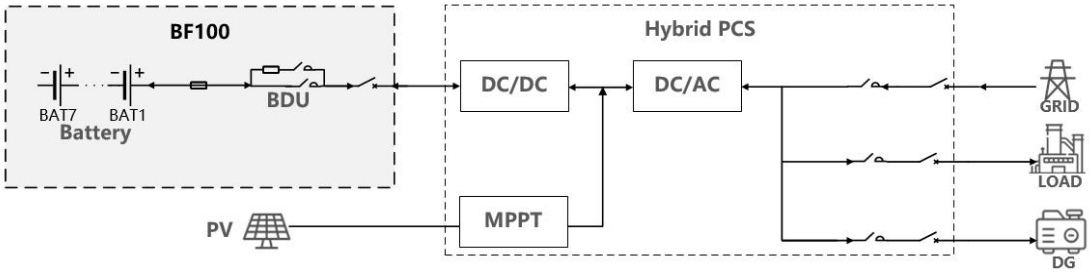



Figure 3-2 System Topology

## 3.2. Product Model

This manual applies to outdoor battery cabinet products (BF100-C140) of EnerCore series. The definitions are explained as below:

- EnerCore: Product series name
- B: Battery, Dyness battery series product
- F: Fan/air-cooling system
- 100: Battery capacity of standard model
- C: Indicate system capacity, the number after "C" means the initial system capacity of different models, unit: kWh

Table 3-1 Product Model

| No. | Model | Description |
|---|---|---|
| 1 | BF100-C100E | Battery cabinet, Nominal capacity: 100 kWh |
| 2 | BF100-C140 | Battery cabinet, Nominal capacity: 140 kWh |

## 3.3. Product Configuration

The product adopts a modular design, which is easy to install, operate, and maintain. Its configuration list is as follows:

Table 3-2 Product Configuration List

| Module | Function | Qty. | Config. |
|---|---|---|---|
| PACK | Used for energy storage, providing stable and continuous power output to the system. | 5/7 | Standard |
| BDU | System energy management and comprehensive control, battery control unit, and high-voltage power supply. | 1 | Standard |
| Security & Fire protection systems | Provide intrusion protection, fire prevention, and effective fire extinguishing for equipment. | 1 | Standard |
| Air conditioner system | Adjust the battery working temperature to ensure it works under optimal temperature. | 1 | Standard |

## 3.4. System Parameters

The parameter may vary without notice during product upgrade:

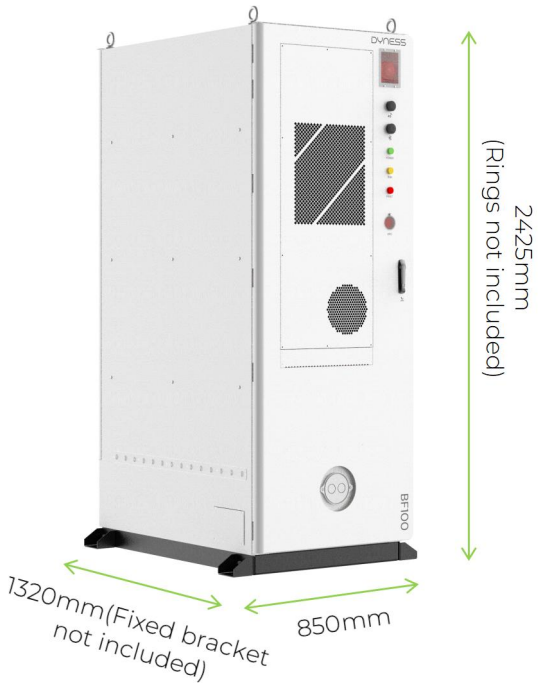
Table 3-3 BF100-C140 Parameter

| Model | BF100-C100E | BF100-C140 |
|---|---|---|
| **Battery** | | |
| Battery Type | LFP ($LiFePO_4$) | |
| Battery Capacity | 314Ah | |
| Rated Current | 157A | |
| Max. Current | 180A | |
| PACK Configuration | 1P20S*5 | 1P20S*7 |
| Rated Voltage | 320V | 448V |
| Voltage Range | 290~360Vdc | 406~504Vdc |
| Nominal Capacity | 100.4kWh | 140.6kWh |
| **System** | | |
| Weight | 1360 kg (TBD) | 1650 kg (TBD) |
| Dimension (W * D * H) | 850*1320*2425mm | |

| | |
|---|---|
| Max. Efficiency | 94% |
| Air Conditioner Power | 3.2 kW (Cooling), 1 kW (Heating) |
| Operating Temperature | -20~50℃ (Derating above 45℃) |
| Operating Humidity | 0~95% RH (Non-condensing) |
| Ingress Protection | IP55 |
| Anti-corrosion Grade | C3 (Optional C5) |
| Cooling Method | Air-cooling |
| Noise | ≤75dB (Add optional accessories≤65dB) |
| Elevation | 4,000m (Derating above 2000m) |
| Display | APP |
| Fire Protection | Aerosol, Multi-sensor/Water ingress, Explosion-proof ventilation |
| Communication | Ethernet/4G/RS485 |
| Certification | EN IEC 61000-6-2:2019/ EN IEC 61000-6-4:2019/ UN38.3/ IEC 62619/ IEC 63056/ IEC 62477-1/ EN 62477-1 |

## 3.5. Appearance Design

- Dimension (W*D*H): 725*1200*2260 mm (Fixed basement and hanging rings not included)
- Net weight: Approx 1650 kg (Model BF100-C140 as reference)
- Ingress protection grade: IP55
- Anti-corrosion level: C3 (Optional C5)




Front Left Rear Right

Figure 3-3 Product Appearance

The front panel of the product is equipped with 1 emergency stop button, 3 indicator lights showing the main operating status of the product, 2 antennas, and 1 sound and light alarm:

The antennas from top to bottom are: 4G antenna and Bluetooth antenna;

The indicator lights from top to bottom are: power indicator light "POWER", operation indicator light "RUN", alarm indicator light "FAULT", and emergency stop button "EPO".

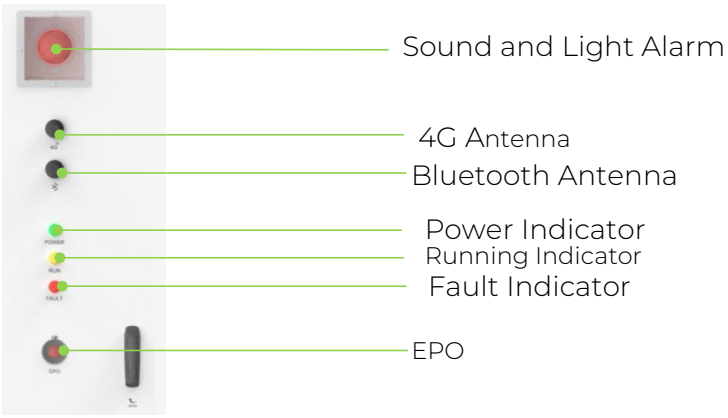



Figure 3-4 Appearance Function Diagram

Table 3-3 Function Definitions of Indicator Lights and Antennas

| No. | Appearance | Name | Function |
|---|---|---|---|
| 1 |  | Sound and Light Alarm | An alarm sound is emitted and the lights flash when safety hazards or system abnormalities are detected. |
| 2 | | 4G Antenna (Top) | Receives and transmits 4G signals |
| 3 | | Bluetooth Antenna (Bottom) | Receives and transmits Bluetooth signals |
| 4 | | Power Indicator | Constantly on indicates that the power is connected and the device can be operated |
| 5 | | Running Indicator | Constantly on indicates normal system operation, while off indicates standby mode. |
| 6 | | Fault Indicator | Constantly on indicated that there was a fault in the system. |
| 7 |  | Emergency Stop Button | Stops system operation when pressed |

Note: Do not operate the emergency stop button except in an emergency.

## 3.6. Internal Design

The product is an outdoor battery cabinet, including PACK, BDU, Security & fire protection system, air conditioner system, HMI screen.

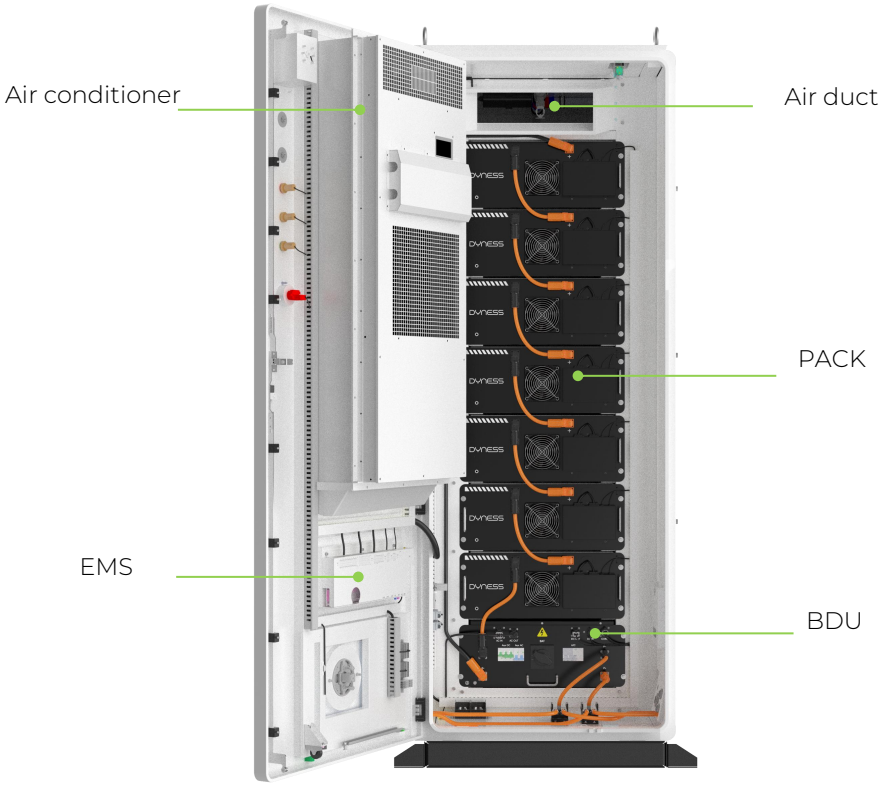



Figure 3-5 Internal Structure

## 3.7. Main Modules

### 3.7.1. PACK

**DANGER**

- Do not touch any batteries while the BESS is running;
- Only authorized operators should handle the batteries;
- End of life (should be decommissioned, disassembled and disposed of in accordance with the recycling program provided).

This system's PACK uses lithium iron phosphate batteries, with 314Ah cells. The stringing method is 1P20S, and the nominal capacity of the PACK is 20.0kWh, with a nominal voltage of 64V. Each battery PACK is equipped with 1 level 1 BIC module (slave control) for collecting the voltage and temperature parameters of the PACK, and it also has functions such as power balance and thermal management. The PACK module adopts air cooling for heat dissipation, with

an IP20 protection level. It has a high structural reliability and low maintenance cost.


Figure 3-6 PACK Appearance

Table 3-5 PACK Configuration

| **Model** | **HV64314F** |
|---|---|
| Parameter | Value / Specification |
| Cell Configuration | 1P20S |
| Energy (kWh) | 20 |
| Nominal Voltage (Vdc) | 64 |
| Nominal Capacity (Ah) | 314 |
| Standard Charge/Discharge Current (A) | 157 |
| Dimensions(mm) (W*D*H) | 565*887*228 |
| IP Rating | IP20 |
| Operating Temperature (℃) | Charge: 0 to +60<br>Discharge: -20 to +60 |
| Operating Humidity (RH) | 0% to 95% |
| Storage Temperature (℃) | 1 Month: -20 to +45<br>1 Year: 0 to +35 |

**WARNING**

- When battery leakage occurs, or there is an abnormal smell from the battery, if it is difficult to determine whether the electrolyte leaks, please stop using it immediately and contact Dyness or professionals;
- Please do not touch the electrolyte directly. If skin contact accidentally, please flush with plenty of water;
- When handling leaking batteries, make sure that the power supply connected to the battery is off to prevent fire and sparks, and keep the environment well ventilated;
- Wear rubber gloves (insulation voltage >10 kV) when handling leaking batteries;

- Please use gauze (ordinary medical gauze) or other liquid absorbent solids to clean the battery leakage;
- The treated battery should be placed in isolation and should not be used again;
- The above operations shall be completed by personnel designated by Dyness or qualified professionals.

## 3.7.2. BDU

The BDU is equipped with multiple control and protection devices, such as BMS (Battery Management System), high-voltage contactors, high-voltage fuses, and circuit breakers. It integrates control, protection, and monitoring functions into one, reducing external cables and independent components, and enhancing the system's compactness. Through efficient power distribution, multiple protections, and intelligent management, it ensures the stable operation of the system and provides data support and operational convenience for maintenance.


Figure 3-7 BDU Appearance

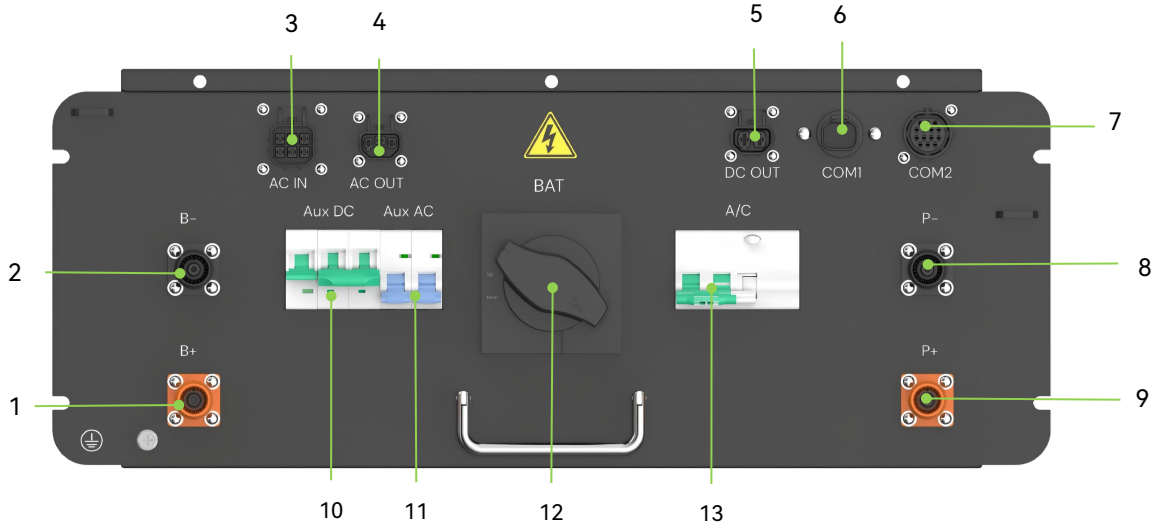



Figure 3-8 BDU Interface

Table 3-6 BDU Port Definition

| No. | Identifier | Function Description |
|---|---|---|
| 1 | B+ | Battery Cluster Positive Input |
| 2 | B- | Battery Cluster Negative Input |
| 3 | AC IN | Air Conditioning & AC/DC Auxiliary Power Input |
| 4 | AC OUT | BDU AC Power Output |
| 5 | DC OUT | Fan Power Supply Output |
| 6 | COM1 | Internal Communication |
| 7 | COM2 | BCU Communication / Secondary Power Output |
| 8 | P- | Battery Cluster Negative Output |
| 9 | P+ | Battery Cluster Positive Output |
| 10 | Aux DC | DC-side Auxiliary Power Supply Switch |
| 11 | Aux AC | AC-side Auxiliary Power Supply Switch |
| 12 | BAT | Main Switch On The Battery Side |
| 13 | A/C | Air Conditioning Switch |

### 3.7.3. Fire Protection System

BF100-C140 is equipped with an efficient and fire protection system, which can provide intrusion protection, fire prevention and effective fire extinguishing for the equipment.

- **Limit switch:** Install travel switches in the battery compartment to prevent the door from being opened accidentally during normal machine operation. It can detect whether the door is closed tightly to prevent rainwater from entering.
- **Water immersion detector:** Install a water immersion detector at the bottom of the battery compartment. When it detects water in the cabinet volume, EMS will report a water immersion fault and the system will shut down.

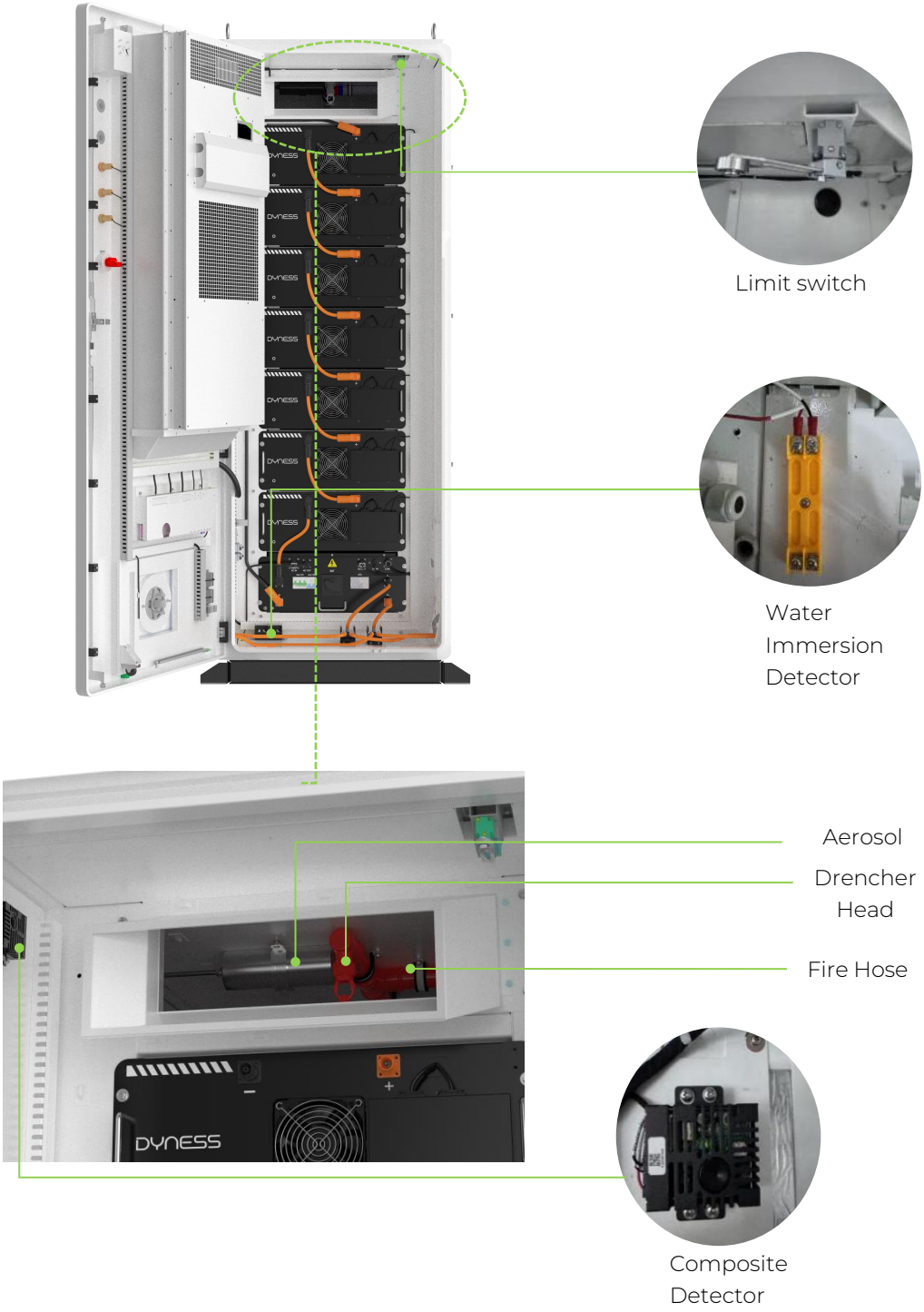



Figure 3-9 Fire Protection System Diagram

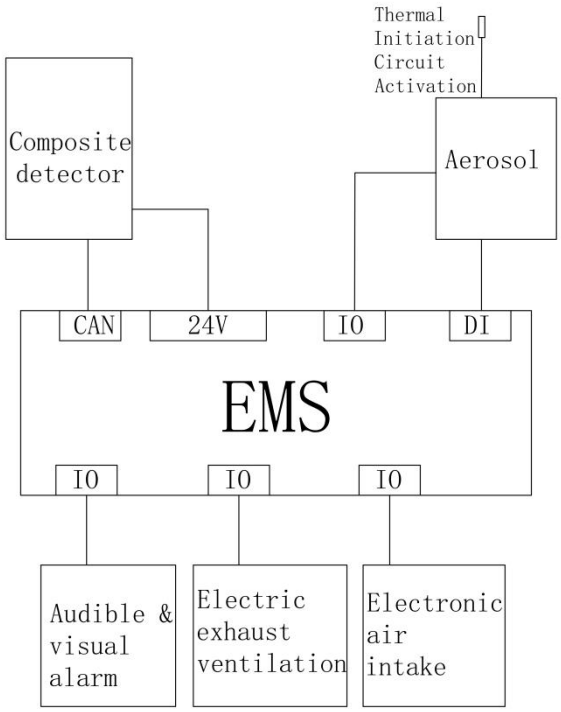



Figure 3-10 Fire Protection Principle Diagram

The maintenance of the fire protection system should comply with the fire regulations of the country/region where the project is located.

Fire protection equipment should be inspected and maintained regularly to ensure that all functional indicators are normal.

### 3.7.4.Air Conditioner System

The system is an air-cooled system equipped with one industrial air conditioner with a cooling capacity of 3.2 kW and a heating capacity of 1 kW.

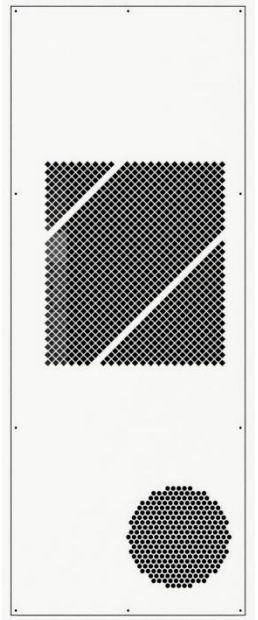


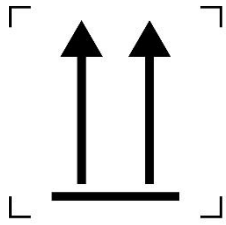
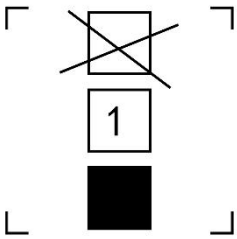
Figure 3-11 Air Conditioner Diagram

# 4. Transportation and Storage

Caution: Failure to transport and store in accordance with the requirements of this manual may void the warranty.

## 4.1. Packaging Marks

Table 4-1 Packaging Marks

| Mark | Explanation |
|---|---|
|  | Upward: Indicates that the package should be kept upright during transportation and storage. |
|  | Fragile: Indicates that the package contains fragile items and should be handled with care. |
|  | Keep Dry: Indicates that the package should be protected from rain. |
|  | Stacking Limit: The number "1" in the illustration indicates the maximum number of identical packages that can be stacked. Refer to the actual illustration for details. |
|  | Center of Gravity: Indicates the center of gravity of the package to facilitate lifting. |

| | |
|---|---|
|  | Forklift Insertion Point: Insert the forklift here for moving the equipment. |
|  | Lithium Battery Mark: Indicates that the device contains lithium-ion batteries or battery packs, which are Class 9 hazardous materials. |
|  | UN3480: A United Nations number indicating that the device contains lithium-ion battery packs. |

## 4.2. Unpacking and Checking

- After receiving the product, please check whether all the delivered components are complete against the "supply list";
- Please check whether the actual received cabinet and the received product mode are the same as the ordered model;
- Carefully check whether the product is in good condition. The transportation process may lead to damage due to transportation collisions. If any problems are found, please contact Dyness or the transportation company in time.

### Shipping Requirement

- All the necessary equipment in the product has been installed and fixed in the cabinet before leaving the factory, and the product can be transported as a whole during transportation;
- Please confirm that the cabinet doors of the equipment are tightly locked before transportation;
- The transportation of a single ESS cabinet requires wooden box packaging, a reserve buffer between the wooden box and the ESS cabinet;
- Be sure to set up warning signs or caution tape to prevent unauthorized personnel from entering the lifting and transportation area to avoid accidents;
- Remove any existing or potential obstacles during the moving process, such as trees, cables, etc;

- Whenever possible, choose favorable weather conditions for transporting the equipment.

### Requirements For Equipment Transportation Mobility

- Select a suitable crane or lifting tool according to the site conditions. The selected tool must have sufficient load-bearing capacity, arm length, and rotation radius;
- If movement on slopes or similar conditions is required, additional traction devices may be necessary;
- When carrying out ground transportation, be sure to use ropes to secure the top lifting ring of the equipment to the transport vehicle to prevent excessive tilting during transportation.

## 4.3. Lifting Transportation

This product is equipped with a lifting ring at the top for lifting, and can be transported by lifting. The following requirements must be met when lifting the products:

- Ensure site safety when lifting;
- When lifting and installing, professional personnel should be in charge of the whole process;
- The strength of the slings should be able to withstand the weight of the equipment;
- Ensure that all sling connections are safe and reliable, and ensure that each section of the sling connected to the corner piece is of equal length;
- The length of the slings can be adjusted appropriately according to the actual requirements of the site;
- Make sure that the equipment remains stable and does not tilt during the lifting process;
- The equipment shall be suspended after being lifted from the ground by 300 mm, and check that the lifting device is firmly connected before lifting;
- Take all necessary auxiliary measures to ensure safety.

Caution: The hanging rings need to be installed on site. Please ensure that the hanging ring bolts are tightened before lifting.


Figure 4-1 Lifting Transportation

## 4.4. Forklift Transportation

The bottom of this product is equipped with fork holes specially designed for forklift transportation. The product can be moved through the bottom fork holes on the left and right. If the installation site is flat, the product can be moved using a forklift. Forklift transportation methods should meet the following requirements:

- The forklift should be equipped with sufficient load capacity. The forklift must support over 2 metric tons.;
- The length of the pins should meet the requirements of the equipment;
- The pins should be inserted into the fork holes at the bottom of the workstation;
- Moving and lowering should be slow and steady during forklift transportation;
- Products should only be placed on stable surfaces. The area should be well-drained, free of any obstacles or protrusions;
- Under no circumstances should the unit be moved by inserting the pins into a position other than the fork holes.
- The distance between the outer edges of the two fork tines must not exceed 950 mm.

Correct Shipping Method:

False Shipping Method:

Figure 4-2 Forklift Transportation

## 4.5. Storage Requirement

### Storage Environment Requirements

- The product should be stored on dry, flat (flatness should be no more than 5 mm), solid ground with sufficient load-bearing capacity and without any vegetation cover;
- To prevent condensation inside the product or soaking of the bottom of the product during the rainy season, the product should be stored on higher ground;
- The basement must be raised, and the specific elevation height should be determined according to the site geology, meteorological conditions and other conditions;
- Storage environment temperature: 0~+35℃, Humidity: 0~95%(Non-condensation);
- Pay attention to cope with the harsh environment around, such as sudden cold, sudden heat, collision, etc., so as not to cause damage to the PACK.

### Storage Operating Requirements

- Packing boxes should not be tilted or inverted;
- Make sure that the cabinet doors are securely locked before storage;
- Effectively protect the product's air inlet/outlet to prevent rainwater, sand, and dust from entering the interior of the cabinet;
- Due to the capacity decay that occurs during long-term storage, it is not recommended to store batteries exceeding six months;
- For products stored for a long period (more than six months), inspecting visually before installation to ensure there is no condensation and verifying if the equipment is intact. Additionally, checking after powering on.

**NOTE**

Starting from the date of delivery, perform one charge and discharge cycle for the PACK every 6 months, to maintain the system SOC of 25~40%.

# 5. Installation and Wiring

Only a qualified electrical engineer can operate related electrical connections. Please comply with the requirements given in "Safety Instructions" in this manual and we shall not be liable for casualties or property loss caused by neglect of safety instructions.

**DANGER**

- Do not touch the live parts!
- Ensure both AC and DC sides are not energized before installation. All electrical connections must be operated under de-energized condition;
- Check the polarity of all input cables to ensure that each input polarity is correct before wiring;
- Do not place the equipment on surfaces that are flammable.

**WARNING**

- The ingress of sand and moisture may damage the electrical equipment inside the ESS cabinet or affect the performance of the equipment!
- During sandstorm seasons or when the relative environmental humidity exceeds 95%, electrical connection work should be avoided;
- Wait until there are no sandstorms and the weather is clear and dry before starting any connection work;
- Avoid pulling or tugging on cables or wires forcefully to prevent damage to their insulation performance during electrical installation.

**CAUTION**

- All cables and wires should be ensured to have a certain amount of bending space;
- Necessary auxiliary measures should be taken to reduce the stress on cables or wires;
- After completing each step of the wiring operation, careful inspection is required to ensure correct and secure connections;
- All electrical connections must be strictly in accordance with the wiring diagram.

## 5.1. Installation Environmental Requirements

### Site Requirements

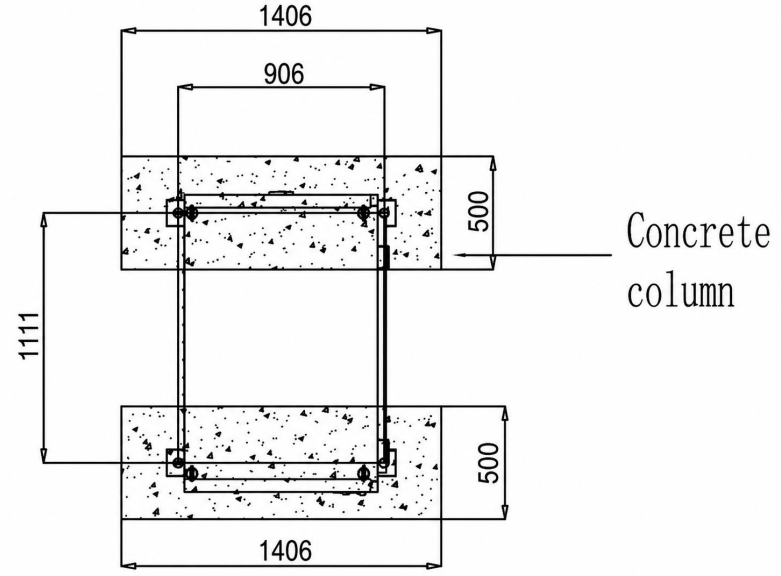
- When selecting the installation site, full consideration should be given to the surrounding environment (climate and geological conditions, such as stress wave emission, underground water level, no high cables in the vertical upper part of the installation site, no pipelines or other underground facilities in the lower part of the installation site, and a certain safety distance should be

maintained between the equipment and buildings and people. The length of the distance should be subject to the fire safety regulations of the project);

- The surrounding environment should be dry and well ventilated;
- Please ensure that there are no trees around the installation location to prevent branches or leaves from blocking the doors or air inlets of the energy storage integrated system during strong winds;
- The installation location should be away from toxic and harmful gases and flammable, explosive, corrosive, and dust-intensive materials;
- The installation location should be away from residential areas to avoid noise.

### Foundation Requirements

- The foundation must provide sufficient load-bearing support for the equipment, with a bearing capacity of >3t/m², a service life of >50 years, and a level of <3mm/m², The width of the cement column is 500mm.
- Under standard conditions, the height of the cement base ranges from 300 mm to 500 mm.
- The height of the base must be greater than the highest historical flood level. (Adjust flexibly according to the actual situation)
- Drainage facilities should be constructed in accordance with local geological conditions and municipal drainage requirements to ensure that no water accumulates at the base of the equipment. The foundation construction should meet the local maximum rainfall drainage requirements, and the discharged water should be treated in accordance with local laws and regulations.
- This product uses a right-side cable outlet design, eliminating the need for concrete pillars and reducing infrastructure installation costs.
- It is recommended that the cabinet be secured to the concrete foundation using M12 × 100 mm expansion bolts.
- The length of cement columns installed for a single BF100-C140 product is 1406 meters; the punching spacing on one side of the cement column is 906 millimeters.



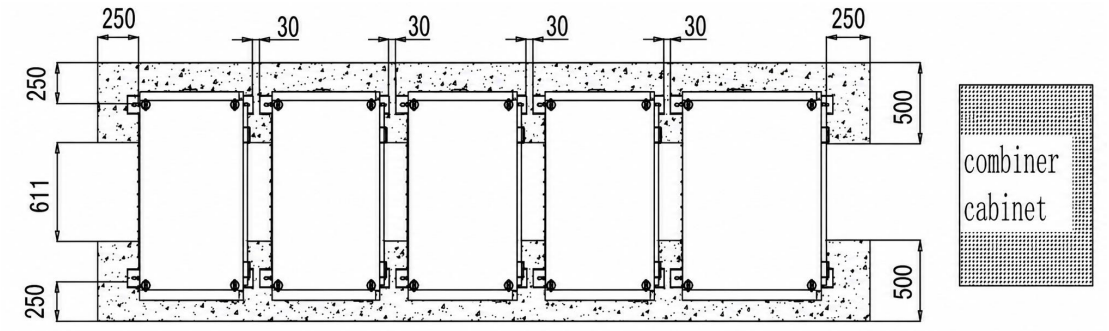
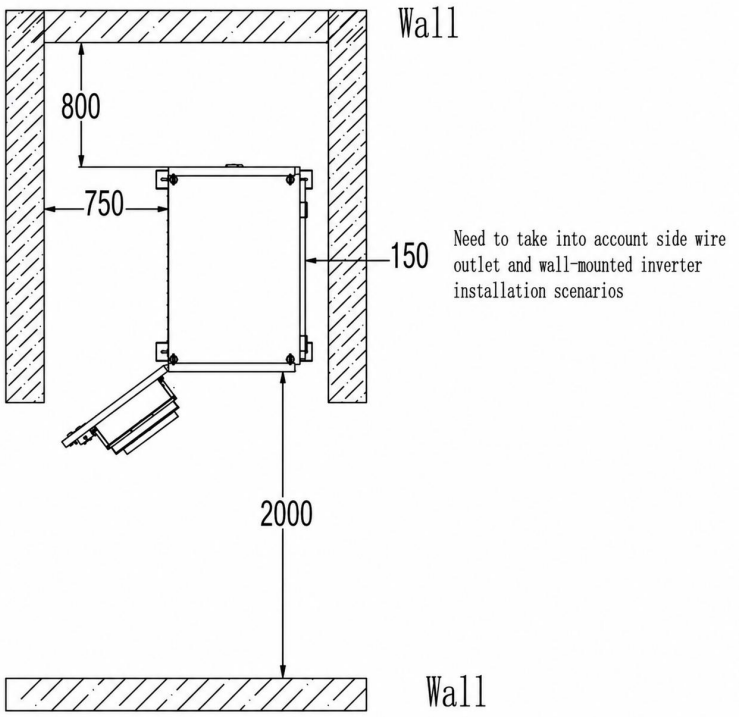



Figure 5-1 Product base schematic diagram

## 5.2. Installation Spatial Requirements

The product adopts front-rear ventilation. Make sure that the equipment has enough space for better cooling and maintenance. It is advised to reserve enough space around the cabinet installation position:

- The space reservation distance at the front of the product is not less than 2000 mm;
- The space reservation distance at the rear of the product is not less than 800 mm;
- The reserved space on the left side of the product shall be no less than 750mm
- The reserved space on the right side of the product shall be no less than 150mm
- The product supports side-by-side installation, requiring a minimum clearance of 30 mm between adjacent cabinets.
- The product supports back-to-back installation, and a rear clearance of 800 mm or more shall be reserved for back-to-back installation.



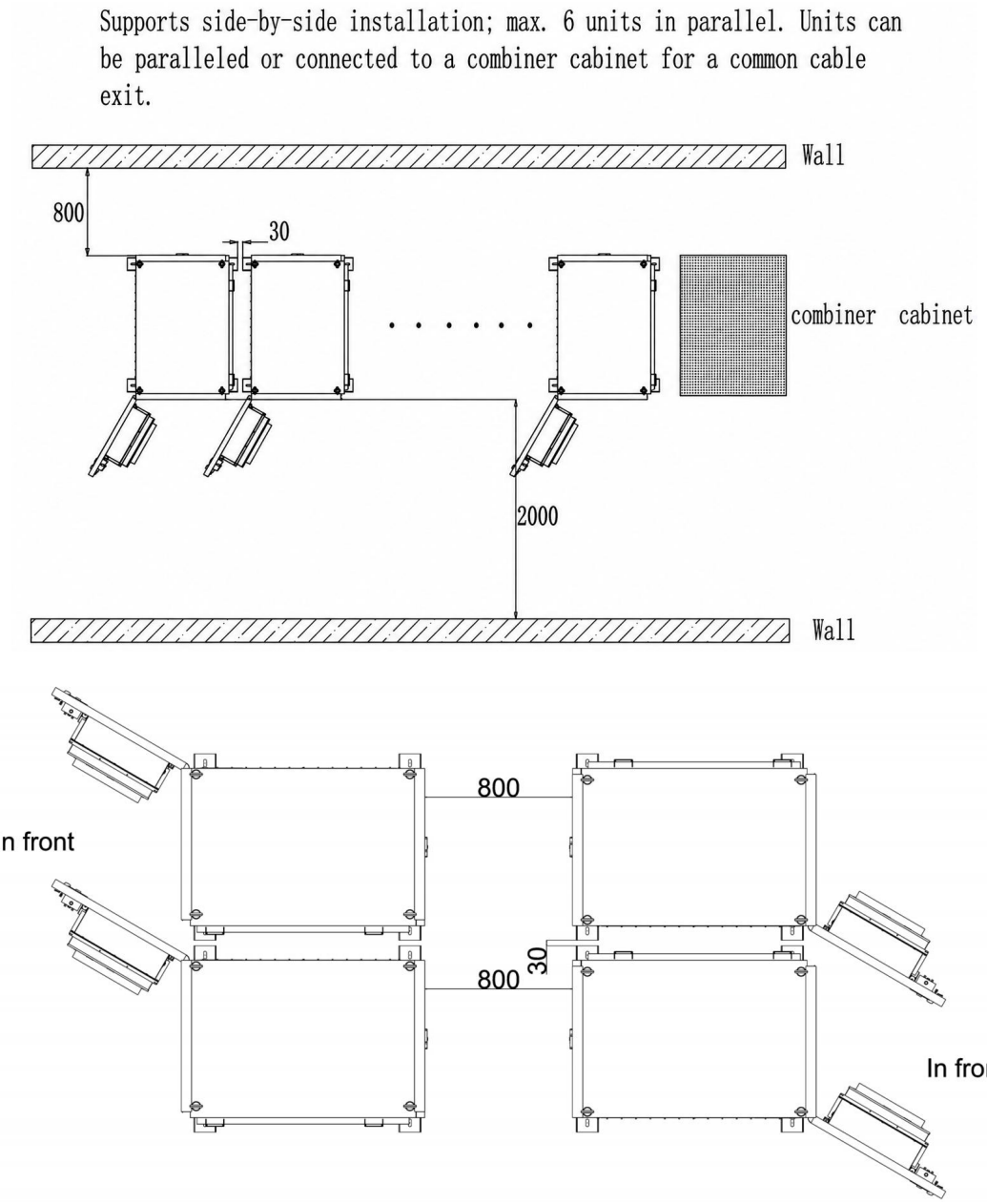



Figure 5-2 Space for Product Installation

## 5.3. Fixed Installation

### 5.3.1. Check Before Installation

**WARNING**

Please comply with local safety regulations and operational rules during installation.

Only complete and undamaged equipment can be installed! Please ensure that before installation:

- The product cabinet itself should be complete and intact;
- All equipment in the cabinet should be complete and intact.

### 5.3.2. Angle Steel Fixed Installation

After transporting the outdoor cabinet to the installation location, it must be secured in place. The product cabinet base has four L-shaped angle iron mounting brackets reserved at the front and rear, as shown in the figure below.

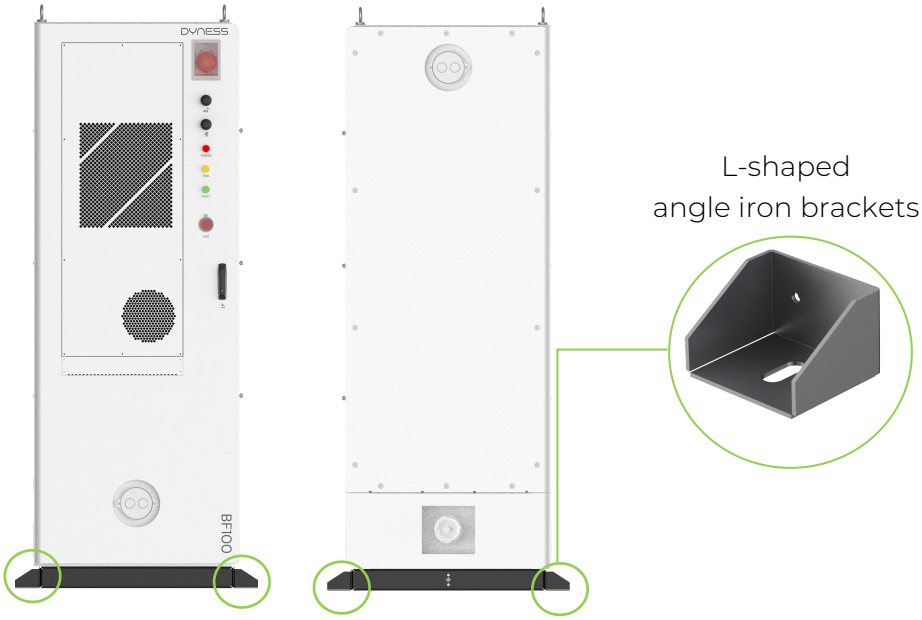



Figure 5-3 Angle Iron Brackets

Note: L-shaped angle steel fixed brackets can also be installed on the side of the product.

#### Angle steel fixing tool

The following tools may be required for installing the bracket: marker pen, electric drill, angle steel, M12 expansion bolts;
Tools are not included in the scope of supply and must be provided by the customer.

#### L-shaped Angle Iron Brackets Installation Steps

① Use a marker pen to mark the drilling positions;
② Choose an electric drill with a diameter matching the bolt's outer diameter, drill holes according to the bolt's length (hole depth slightly greater than the bolt length) until reaching the desired depth for installation;
③ Insert the bolt and expansion sleeve into the hole, tighten the nut to the end of the bolt, and use a wrench to tighten it.

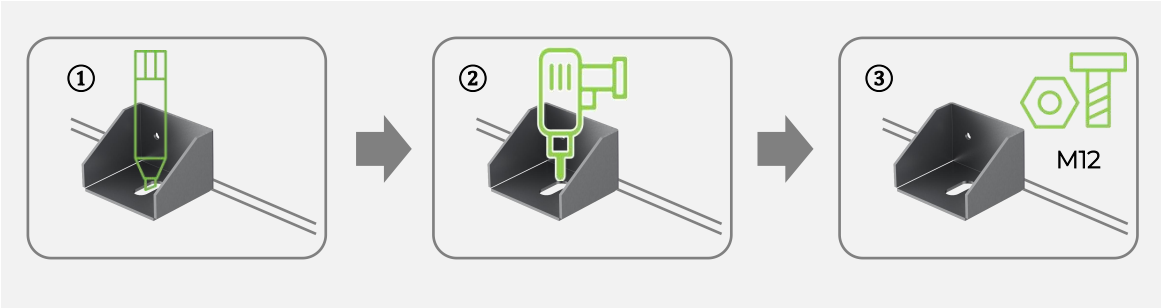



Figure 5-3 Angle Iron Brackets Installation Steps

### 5.3.3. Grounding Installation

The grounding connection must comply with local laws and regulations. Please consider the actual situation at the project site and follow the instructions of the power station staff during the process of ground connection. The grounding connection is shown as follows:

(1) Reserve grounding point, which can be grounded by cable/flat steel;

(2) Use 21.2 mm2/8.4 mm2 grounding cables. Refer to Section 5.6 of this chapter for grounding cables and terminals.

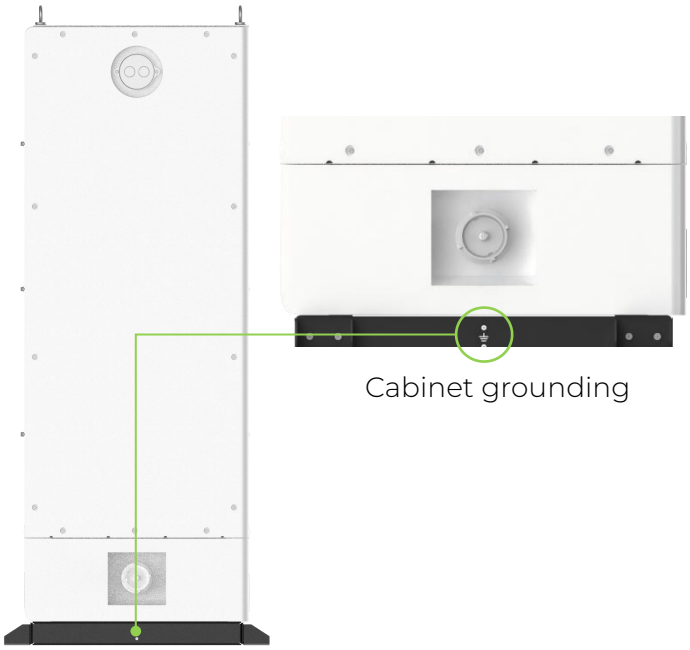



Figure 5-5 Battery Cabinet Grounding

After the grounding connection, the grounding resistance must be measured, and the specific grounding resistance value must comply with relevant region/local standards and regulations.

### 5.3.4. Door Operating Procedures

① Make sure that the equipment is in the locked state;
② Move the lid up above the locking hole;
③ Plug in the key in the door and turn it clockwise;
④ Rotating the handle clockwise to the position shown in the figure to open the door.

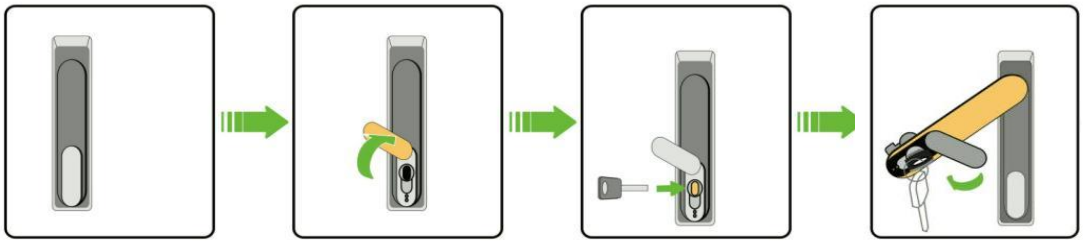


Figure 5-5 Door Open Steps

To close the cabinet door, please refer to the above opening steps (in reverse order) and pay attention to the following warning information!

**WARNING**

- Before closing the cabinet door, please ensure that there are no foreign objects obstructing it!
- When closing the cabinet door, ensure that both the top and bottom ends are fully closed, otherwise there is a risk of water leakage and rusting inside the cabinet.

## 5.4. Wiring Tools

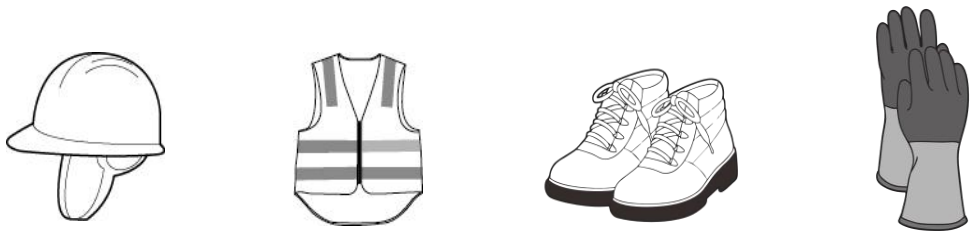



Figure 5-6 Safety Gear

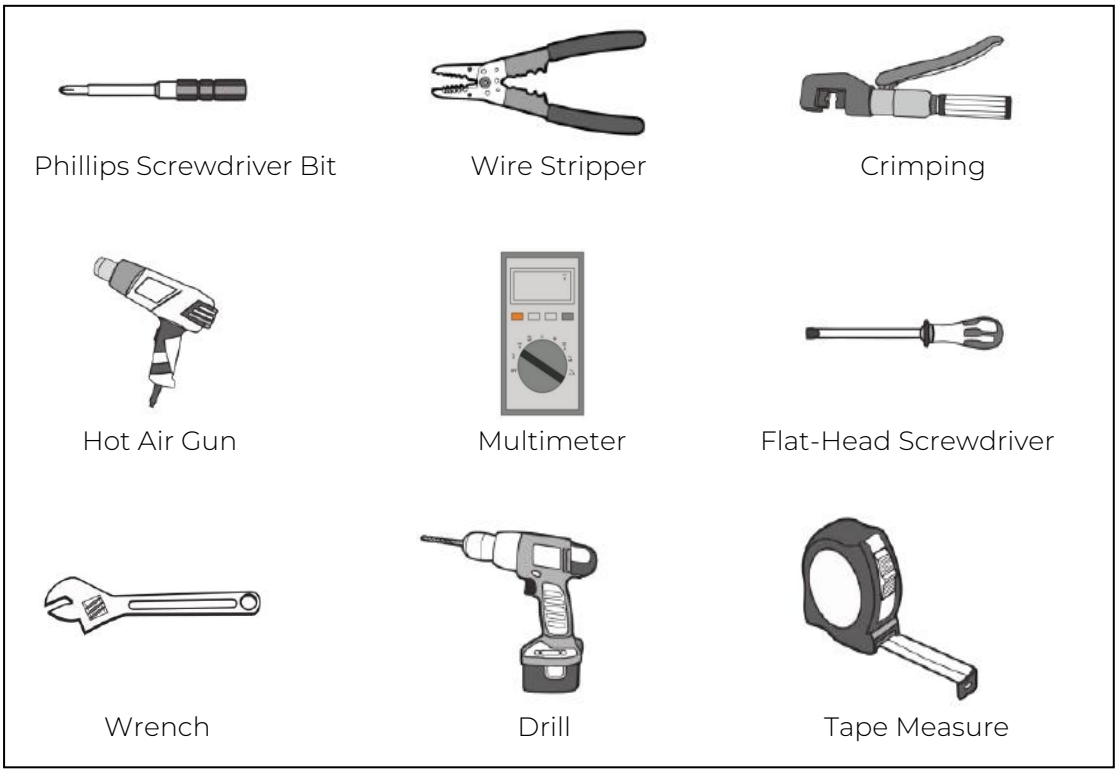



Figure 5-7 Tools

## 5.5. Wiring Requirements

- Based on the location and dimensions of the cable entry and exit points at the bottom of the product cabinet, sufficient space must be reserved for the AC-side cable tray during foundation construction, and cable conduits must be pre-embedded.
- Determine the specifications and quantity of perforated pipes based on the cable type and the number of incoming and outgoing cables.
- Both ends of all embedded pipes are temporarily sealed to prevent debris from entering and causing inconvenience during subsequent wiring.
- After connecting all cables, the cable entry and exit points, as well as the joints, are sealed with fire-resistant mortar or other suitable materials to prevent rodents from entering.

**WARNING**

- After completing the wiring, all wiring entry and exit points must be sealed!

## 5.6. Cable Requirements

- The conductor must have sufficient current-carrying capacity, which includes but is not limited to: environmental conditions, conductor insulation material type, cable laying method, cable material, and cross-sectional area.
- The cable diameter must be selected according to the maximum current-carrying capacity, and the length must allow for a margin.
- The specifications and materials of three-phase AC output cables must be consistent.
- Flame-retardant cables must be selected.
- The cables used must comply with local laws and regulations.

Notice: **Observe the specified torque during installation.** The following Table 5-1 power cables are provided by Dyness. The power cable from BDU to PCS, auxiliary power cable, communication cable, and cabinet grounding cable shall be provided by the customer. The lengths of some cables may vary depending on the specifications of different product systems.

Table 5-1 Wiring Accessories by Dyness

| No. | Type | Specifications | Length | Quantity | Terminal Mode | Connection Type |
|---|---|---|---|---|---|---|
| 1 | Power cable | BF141-PACK-Adapter Harness 1 70mm2 | 225mm | 6/4 | Futronics:FSE80180P-70A4Z / Orange | Quick insert |
| 2 | Power cable | BF141-PACK-Main Negative Wire Harness 70 mm² | 230mm | 1 | Futronics:FSE80180P-70A4Z / Orange | Quick insert |
| 3 | Power cable | BF141-PACK-Main Harness 70 mm² | 2170mm/ 1710mm | 1 | Futronics: FSE80180Q-70B4Z / Black | Quick insert |

**Note: The communication daisy-chain adapter wiring harness is pre-installed in the BF100-C100E, and this communication wiring harness is not required for the BF100-C140 , Products of two capacities correspond to different quantities of adapter cables and total positive harness lengths.*

Table 5-2 Wiring Accessories by Customer

| Item No. | Type | Specification | Length | Quantity | Terminal Model | Torque |
|---|---|---|---|---|---|---|
| 1 | Three-Phase AC Input(Auxiliary wires and cables) | Single-Core Outdoor Copper Cable, 16mm², rated voltage ≥600Vac | As Required | 2 | SC15-8 | 5 N·m |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | DC Power Cable (Positive) | Single-Core Outdoor Copper Cable, 70mm², rated voltage ≥1000Vac | As Required | 1 | SC70-8 | 22.6N·m |
| 3 | DC Power Cable (Negative) | Single-Core Outdoor Copper Cable, 70mm², rated voltage ≥1000Vac | As Required | 1 | SC70-8 | 22.6N·m |
| 4 | Cloud Platform Connection | UL2835 4P 24AWG (≈0.2mm²) FTP Cat5e Shielded Cable | As Required | 1 | RJ45 Plug | / |
| 5 | Connect to third-party EMS | UL2835 4P 24AWG (≈0.2mm²) FTP Cat5e Shielded Cable | As Required | 1 | RJ45 Plug | / |
| 6 | Grounding Cable | Outdoor single-core copper cable, green-yellow, 35mm² (when phase cable is 70mm²) | As Required | 1 | SC35-8 | 25 N.m |

**Note: For the cable from the inverter to the grid side, select an appropriate wire gauge for matching installation according to the inverter's power rating.*

## 5.7. Terminal Wiring Method

OT/DT/SC terminals connection step:

① Peel off the insulation skin from the cable terminal, and the length of which should be the depth of the wire hole on the copper terminal, plus an additional 2-3 mm;

② Install the heat-shrink sleeve at the cable terminal and insert the exposed copper core part of the stripped wire into the wire hole of the copper terminal (OT/DT/SC terminal);

③ Use hydraulic pliers to firmly crimp the copper terminally;

④ Slide the heat-shrink tube onto the copper terminal (OT/DT/SC terminal) to fully cover the wire hole. Use a heat gun to tighten the heat-shrink tube.

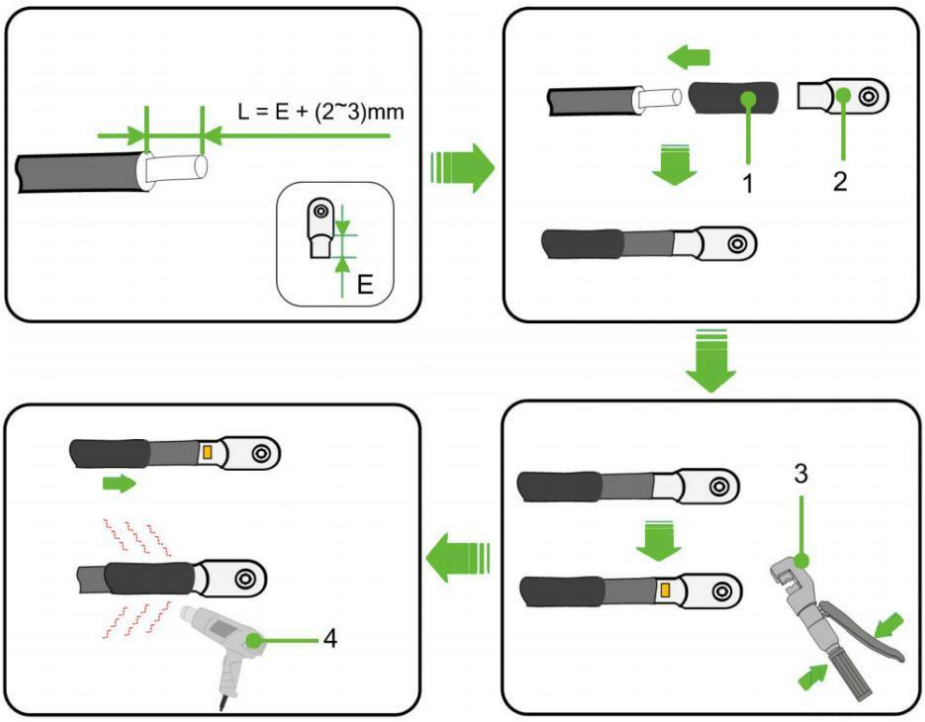



Figure 5-8 The Connection Sequence of Wiring Components

1:Heat-shrink tube

2: OT/DT/SC terminal

3:Crimping Pliers

4:Hot air gun

## 5.8. Checking Before Wiring

### 1) Checking Breakers

Check whether the next following circuit breakers are in the disconnected position:

- Air switch"Aux DC""Aux AC" on the front panel (As shown in position 1);
- Battery breaker ("BAT") on the front panel (As shown in position 2).

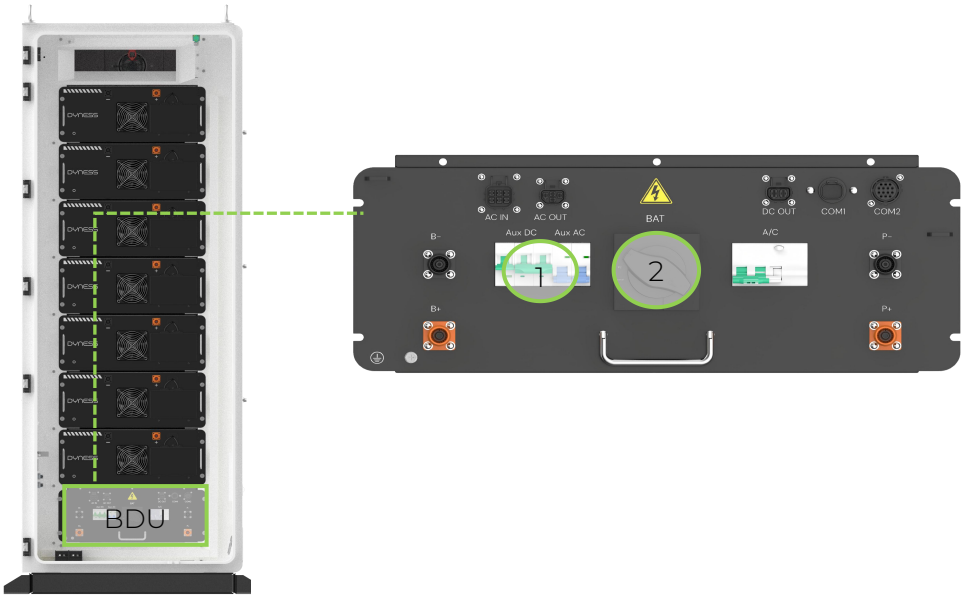



Figure 5-9 Breakers Location

### 2) Checking Before Wiring

Table 5-3 Checking List Before Wiring

| No. | Checklist | Confirm |
|---|---|---|
| 1 | The cables and terminals used should meet the requirements of wire diameter and shielding; | ☐ |
| 2 | The cables are labeled correctly; | ☐ |
| 3 | The related wiring accessories are ready; | ☐ |
| 4 | The wiring operator has worn protective devices; | ☐ |
| 5 | Checking if all the breakers are in the disconnected position. | ☐ |

## 5.9. Wiring Diagram

**Step 1 Internal Wiring**

To ensure the safety of the product, the PACK power cables for the batteries are shipped with the product and need to be installed on-site as follows:

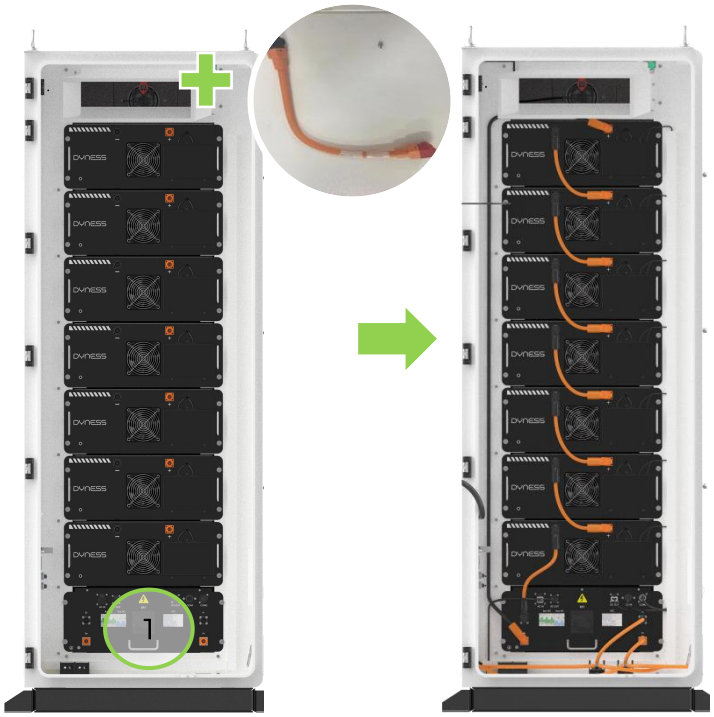
(1) Please reconfirm the battery switch is off (As shown in position 1);

(2) PACK cables connections: connect the PACK in series with cables, where the negative terminal of the upper PACK is connected to the positive terminal of the lower PACK. Please ensure the connection sequence is correct;

(3) PACK and BDU connection: the positive terminal of PACK is connected

to the positive terminal Connect the orange terminal to the orange terminal.of BDU, the negative terminal of PACK is connected to the negative terminal of BDU. (Connect the orange terminal to the orange terminal; Connect the black terminal to the black terminal.)

Notice : The color of PACK and BDU terminals: orange represents positive, black represents negative.



Before Wiring After Wiring

Figure 5-10 PACK Cables Connections

**Step 2 External wiring (If the wiring has been completed, do not reconnect.)**

The device integrates with the PCS. Connect the battery power cables as follows:

1) Verify that the battery switch on the Battery Distribution Unit (BDU) is set to the OFF position, as indicated in Position 1 of the accompanying illustration.
2) Battery Cluster to PCS Power Line Connection: At Position 2 (see diagram), connect the cables per "Table 5-1: Customer Cable Accessories List." Orange cable → PCS battery input (+); black cable → PCS battery input (−). Verify polarity before energizing.
3) Figure 5-12 shows the product's cable ports:

• Left side: "BAT+", "BAT−" (battery), and "AC IN" (AC input);

• Right side: "INV IN" (inverter communication) and "POM/LAN" (cloud platform, DC parallel I/O, and LAN).

These dual-side ports enable flexible cabinet wiring—including parallel connections between adjacent cabinets.

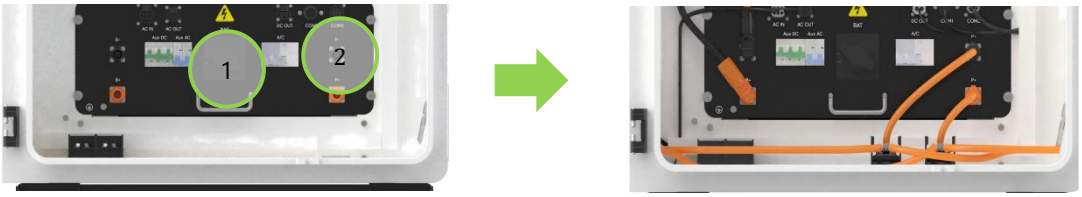



Figure 5-11 Battery-to-PCS Power Line Connection Diagram


Figure 5-12 Battery Cabinet Power Input Ports (Left and Right)

After all the power lines are connected, connect the communication lines between the battery cabinet and the PCS, as well as the communication lines between the battery cabinet and the cloud platform.

The following are the connection steps and schematic diagram of the communication line:

(1) Reserve the communication port between the battery cabinet and the PCS on the terminal on the left side of the battery cabinet interior. Use the cable specified in "Table 5-2 Customer Cable Accessories List" to connect from the terminal "INV IN" to the PCS, as shown in the approximate position 1 in the illustration.

(2) A LAN interface is located on the left side of the battery cabinet. As illustrated at position 2, connect the LAN1 port to the third-party Energy Management System (EMS) and the LAN2 port to the cloud platform, using the Ethernet cable specified in Table 5-2, "Customer Cable Accessories List."


Figure 5-13 External communication wiring diagram

Table 5-4 External Port Definition

| DZ Terminal | | |
|---|---|---|
| **Terminal sorting number** | **Label** | **Function Description** |
| 1 | EMS: CAN2_H | PCS Communication |
| 2 | EMS: CAN2_L | PCS Communication |
| 3 | PE | Grounding |
| 4 | EMS: 485-6A | PCS Communication |
| 5 | EMS: 485-6B | PCS Communication |
| 6 | SA: COM | Emergency Stop Input for PCS |
| 7 | SA: N0 | Emergency Stop Input for PCS |
| 8 | SA: NC | Emergency Stop Input for PCS |
| **Ethernet Conversion Terminal** | | |
| **No.** | **Label** | **Function Description** |
| 1 | LAN 1 | Connection to the MODBUS |
| 2 | LAN 2 | Connection to the cloud platform |

- LAN1 adheres to the TCP/IP protocol, enables communication through an Ethernet connection, and supports integration with third-party EMS platforms.
- The LAN2 interface is connected to Dyness's self-developed cloud platform to enable communication functionalities, including data monitoring and command transmission.

Note: For specific wiring procedures and methods, please refer to the *"Quick*

*Installation Manual".*

## 5.10.Checking After Wiring

Please check the following checklist after wiring to avoid equipment damage.

Table 5-5 Checklist Before Wiring

| NO. | Checklist | Confirm |
|---|---|---|
| 1 | Please disconnect the user's grid-side switch and the DC-side switch of the battery cabinet. Please ensure the AC side and DC side of the PCS are not energized; | ☐ |
| 2 | Please check if the negative and positive connections of the battery, and the AC phase of the PCS are connected correctly. Measure the resistance between the three phases, which should be in the MΩ level. If it is in kΩ level or smaller, please check the circuit; | ☐ |
| 3 | Check if external cables, PE cables and communication cables are well connected. | ☐ |
| 4 | The PE cable resistance should be less than 4 Ω, the cable is intact and has no damage or cracks; | ☐ |
| 5 | Clean the installation area and ensure that there are no tools or other irrelevant objects left inside the ESS cabinet; | ☐ |
| 6 | Use fireproof and waterproof materials to tightly seal the openings and gaps around the ESS cabinet's entry and exit holes. | ☐ |

- LAN1 adheres to the TCP/IP protocol, enables communication through an Ethernet connection, and supports integration with third-party EMS platforms.
- The LAN2 interface is connected to Dyness's self-developed cloud platform to enable communication functionalities, including data monitoring and command transmission.

Note: For specific wiring procedures and methods, please refer to the *"Quick Installation Manual".*

# 6. Power-on and Power-off

## 6.1. Power-on Process

### Precautions

- The product can only be put into operation after being confirmed by professionals and approved by the local power department.
- For products with a long shutdown time, before powering on, a comprehensive and detailed inspection must be carried out on the equipment to ensure that all indicators meet the requirements before powering on.

### Check before power-on

Table 6-1 Checklist Before Power-on

| NO. | Checklist | Confirm |
|---|---|---|
| 1 | Check if the wiring is correct; | ☐ |
| 2 | Check if the emergency stop button is released; | ☐ |
| 3 | Check the PE cable connection to make sure there are no ground faults; | ☐ |
| 4 | Check if the AC and DC voltages meet the start-up conditions and there is no risk of over-voltage with a multimeter; | ☐ |
| 5 | Check to make sure no tools or parts are left inside the device; | ☐ |
| 6 | Check if there is condensation. If so, open the ESS cabinet for ventilation until the condensation disappears; | ☐ |
| 7 | Check if there are no wire ends, metal shavings and other objects that may cause short circuits in signal or power cables. | ☐ |

### Power-on step

- Step 1: Turn on the battery circuit breaker ("BAT") on the BDU;
- Step 2: Sequentially turn on the switches (circuit breakers) labeled "Aux DC", "Aux AC", and "A/C" on the BDU.

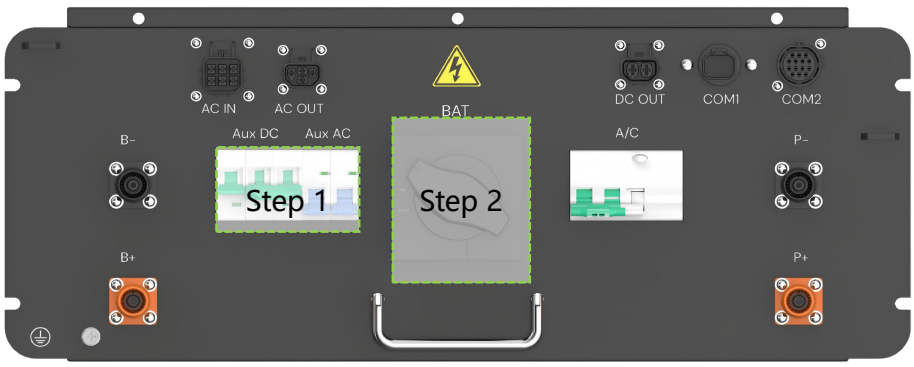



Figure 6-1 Power-on Operation

After operating the steps one by one, check whether the indicator light of the product is on and whether the screen is displayed. If the product status is normal, the "POWER" and "RUN" indicator lights are on, and the "FAULT" indicator is off. The screen starts to display the system running status and parameters.

## 6.2. Power-off Process

### Power-off steps (operation process could refer to the above image)

Step 1: Disconnect "Aux DC", "Aux AC", "A/C" breakers on the BDU in sequence;
Step 2: Disconnect "Battery" breaker on the BDU.

**WARNING**

After operating step by step, the system will stop running, and the product indicators and screen will go out. After the inspection is completed, wait for five minutes to perform maintenance and inspection operations.

## 6.3. Emergency Stop

Press the "EPO" red button on the front door in an emergency.

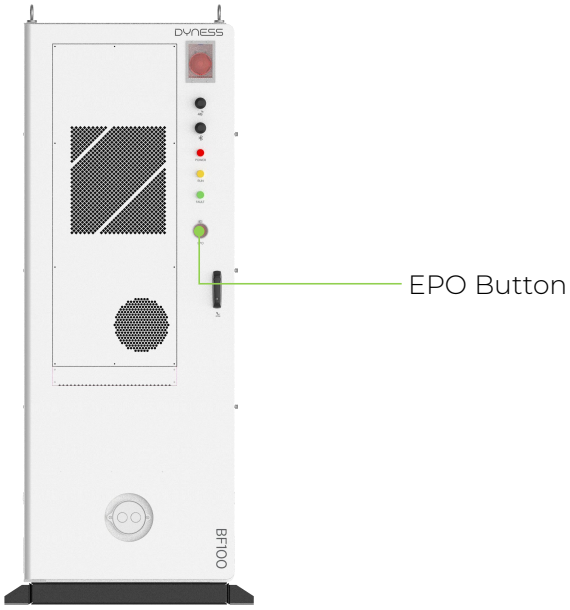



Figure 6-2 EPO Location

**WARNING**

Under normal circumstances, please use the normal shutdown procedure to power off the product! In emergency situations, it is necessary to use EPO to ensure quick response and protect personal and equipment safety!

# 7. Bluetooth Proximity Debugging Operation Guide

## 7.1. Introduction to Proximity Debugging

Bluetooth proximity debugging refers to the process in which users operate within an approximate range of 10 meters from the device. Upon establishing a local connection with the device via the Bluetooth functionality of the "Dyness" application, users can perform operations such as device overview inspection, real-time data reception, alarm notification review, and device parameter configuration.

## 7.2. APP Download Navigation

Proximal debugging requires operation through the "Dyness" application. You may download the app by scanning the QR code provided below.

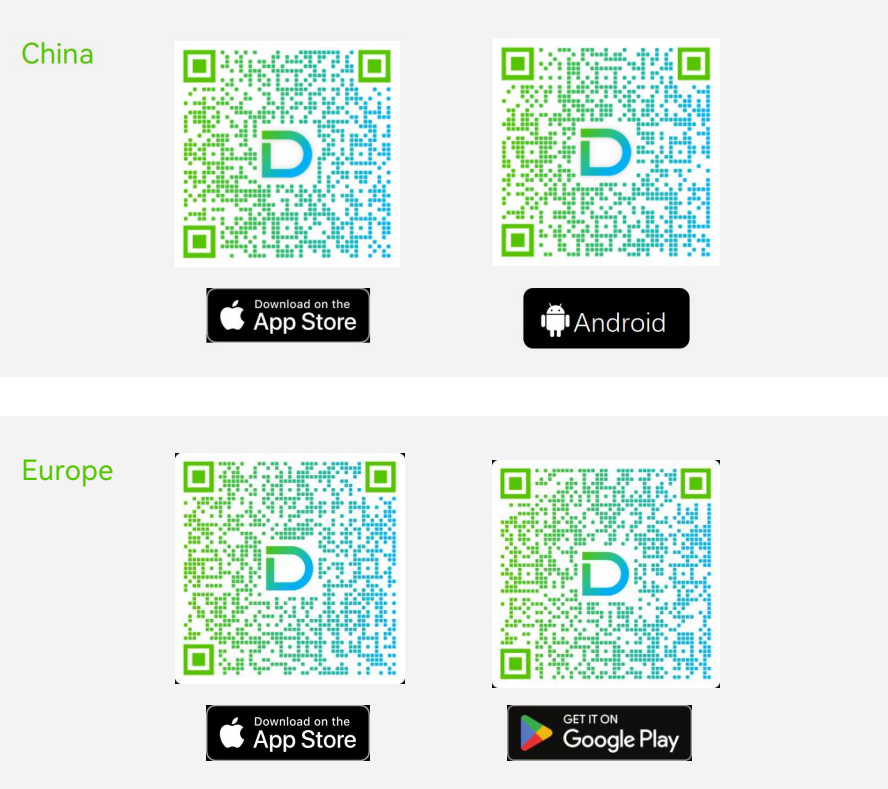



Figure 7-1 QR code of the application

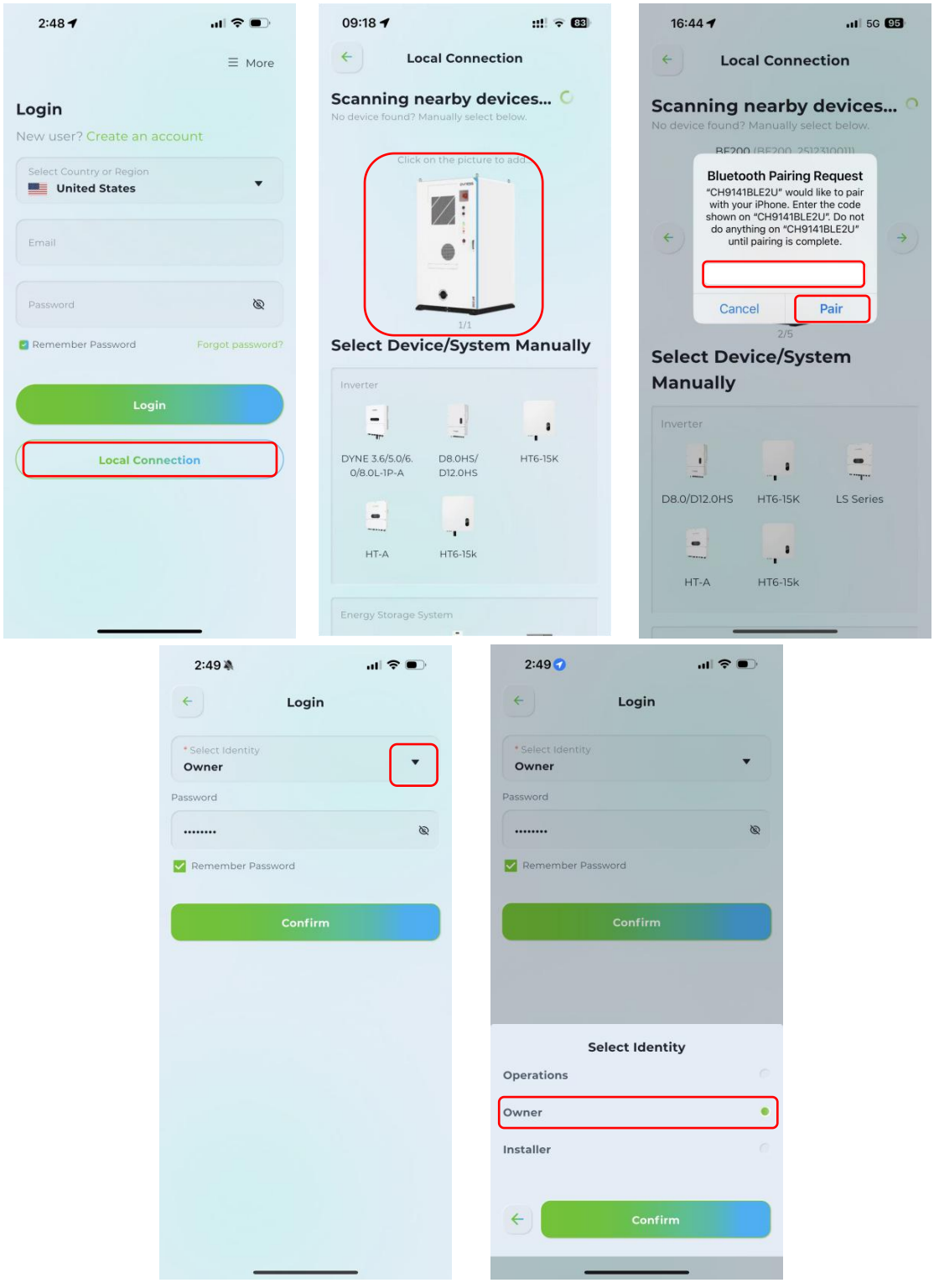
## 7.3. User Login

The home page of the APP has a login entry for the cloud platform and a local connection entry. Bluetooth near-end debugging enters the user login interface through the local connection entry. The login interface for iOS is

different from that for Android. The login steps for iOS and Android interfaces are listed separately below.

### iOS Login Steps

- Step 1: Tap on **"Local Connection"** on the **[login]** interface;
- Step 2: After the phone finishes scanning nearby devices, tap the BF100 -C140 picture of the nearby device on the **[local connection]** interface;
- Step 3: Enter the code displayed on the "BF100-C140" device in the Bluetooth pairing request box. The default code is **"111444"**. After entering, tap **"Pair"**;
- Step 4: On the login interface, select **"Owner"** from the identity tab, then enter the password (default: **"12345678"**), and finally tap **"Confirm";**
- Step 5: If you only want to select the identity and enter the password for the first login, check the "**Remember Password**" option box and tap "**Confirm**".




## Android login steps

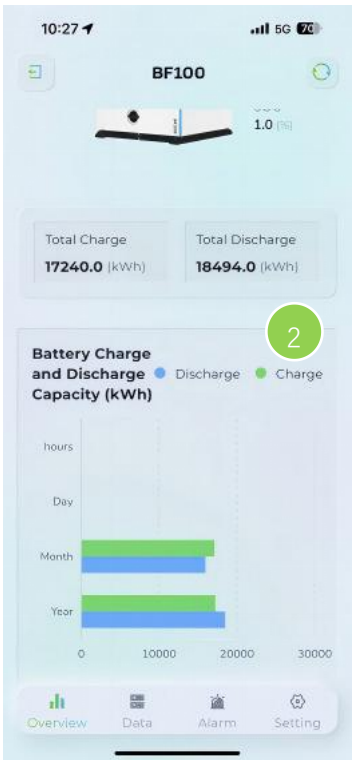
- Step 1: Tap on **"Local Connection"** on the **[login]** interface;
- Step 2: After the phone completes scanning nearby devices, tap on the picture of the nearby device BF100-C140 on the **[local connection]** interface;
- Step 3: In the pop-up pairing request box above, tap **"Pair & Connect"**;

- Step 4: In the pop-up window below, tap **"Pair"** (if this step fails, repeat Step 3);
- Step 5: In the pop-up window, enter the **pairing code.** The default code is **"111444"**, then tap **"OK"**;
- Step 6: On the **[Login]** interface, tap **"drop-down list"** from the select identity tab, tap "Owner", then enter the password (default: **"12345678")**, and finally tap "Confirm";
- Step 7: If you only want to select the identity and enter the password for the first login, tap the **"Remember Password"** option box, then tap **"Confirm".**——End

## 7.4. Operating Information

Upon successful login, the application will automatically navigate to the "**Overview**" page. If you are currently on a different page, you may access the "**Overview**" by selecting the corresponding tab located at the bottom of the screen.

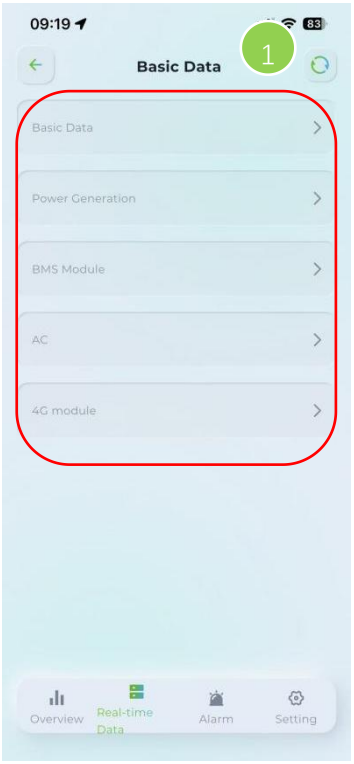
The upper left code on the device overview page is the SN. When the device is normal, "**Ready**" appears in the upper right, marked as "1". During charge or discharge, a real-time line graph shows at position "2".

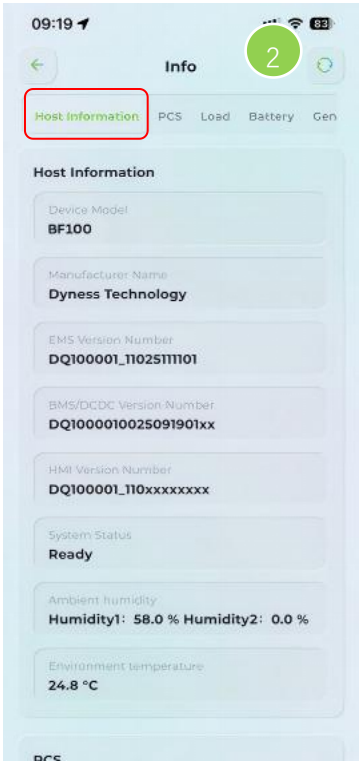



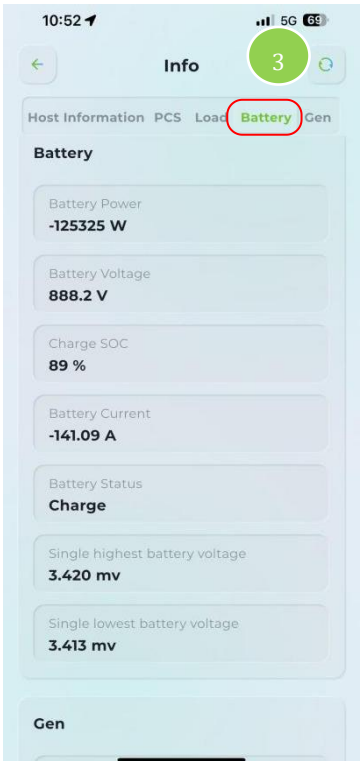
## 7.5. Query data

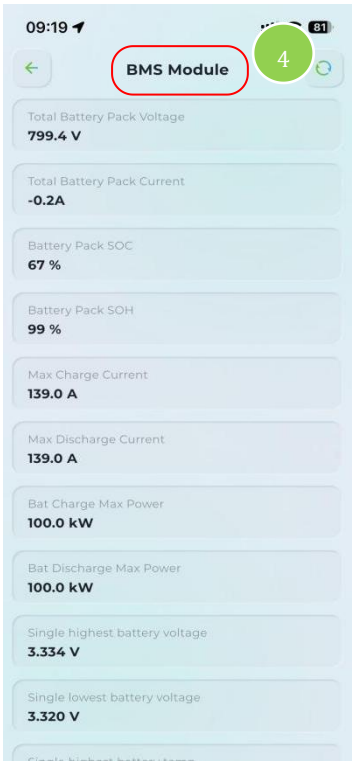
- Step 1: On the main interface of "1", select "**Real-time Data**" from the primary menu located at the bottom.
- Step 2: In the basic data interface labeled "1", users can access corresponding information by selecting different category tabs. Currently, the available tabs include "**Basic Data**", "Power Generation", "**BMS Module**", "**Air Conditioning (AC)**", and "**4G Module**".
- Step 3: Click on "**Basic Data**" to view the basic content of the host information, as shown in "2".
- Step 4: Click on "**Battery**" to view the basic information and content of the battery, as shown in "3".
- Step 5: Click on "**BMS Module**" to view the relevant information about battery energy, as shown in "4".
- Step 6: Click on "**AC**" to view the operation and working information of the air conditioner, as shown in "5".
- Step 7: Click on "**4G Module**" to view the hardware and software version information of the 4G module.

------End





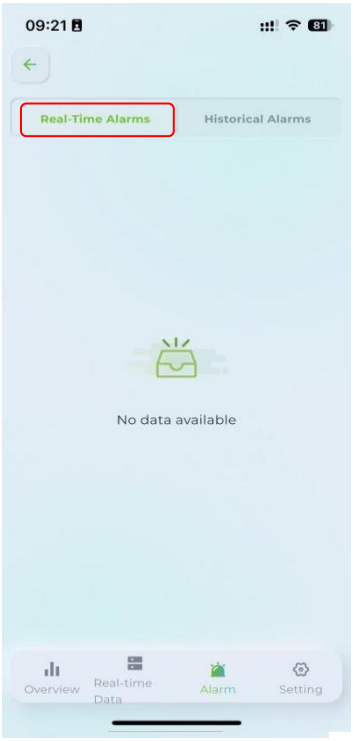



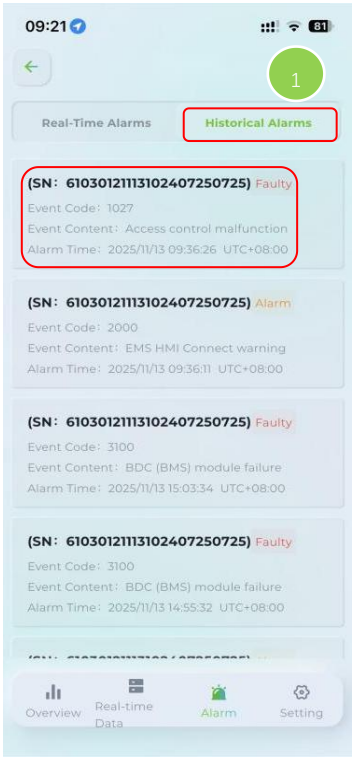


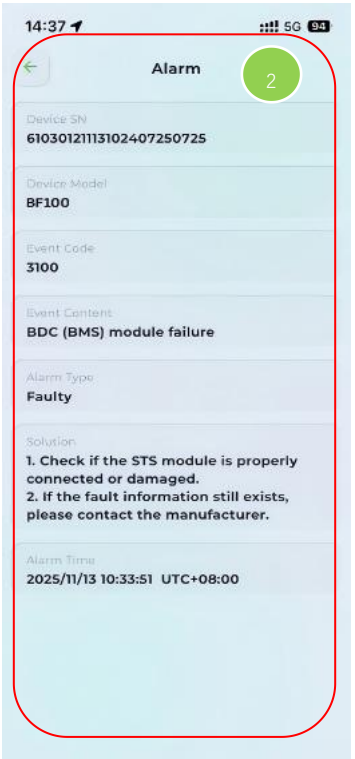
## 7.6. Warning Information

- Step 1: Click on "**Alarm**" in the main menu at the bottom of the [BF100-C140] interface;
- Step 2: Click on the "**Real-Time Alarms**" section within the [BF100-C140] interface to review the device's real-time alarm status. If no alarms are present, the system will display "**No data available**," as illustrated in the figure below.
- Step 3: Click on the [BF100-C140] interface and select "**Historical Alarms**" to access the device's historical alarm records. To view detailed information for a specific alarm, click on the corresponding alarm entry in the alarm information column (indicated by "1"), which will direct you to the detailed alarm page (shown as "2").

------End

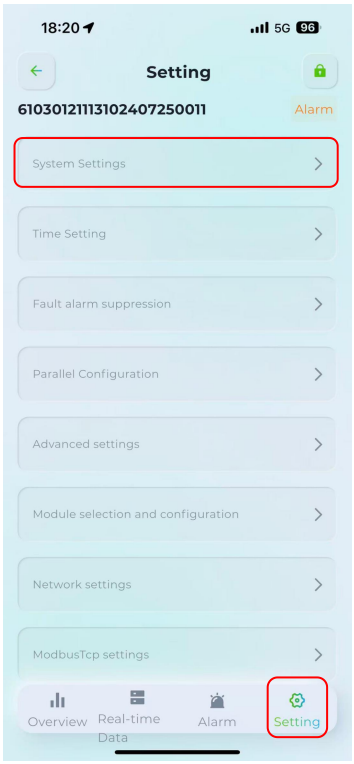


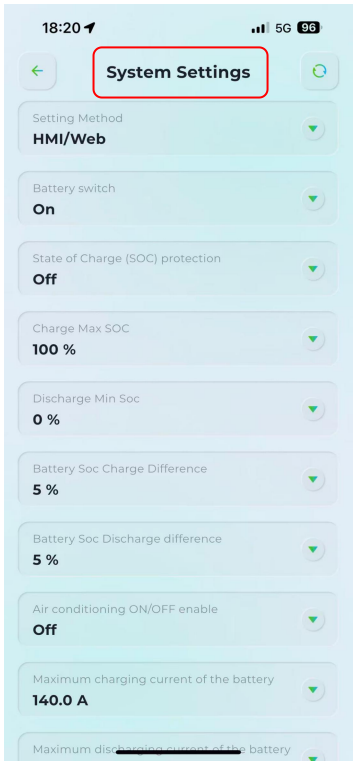




## 7.7. System Settings

Click "**Settings**" on the bottom main menu bar. This opens configuration options for system settings, time, fault alarms, parallel operation, advanced settings, and network connectivity. Under "**System Settings**" at the top, configure operation mode, battery switch, SOC protection, air conditioner enablement, and max charge/discharge current.

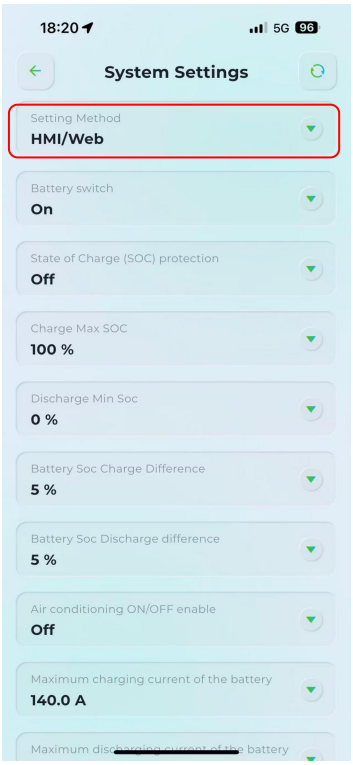


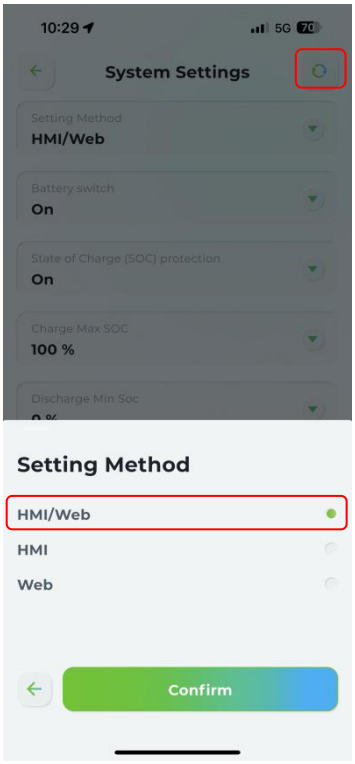




## 7.7. 1. Setting Mode

- Step 1: Click "**Settings**" in the main menu bar at the bottom of the main interface.
- Step 2: Click "**System Settings**" in the settings interface.
- Step 3: Click on the "**Setting Method**" tab and select according to your needs. For example, if you choose "**Web**", the remaining operations will be carried out on the Dyness cloud platform. If you select "**HMI/Web**" or "**HMI**", click "**Confirm**".

-----End

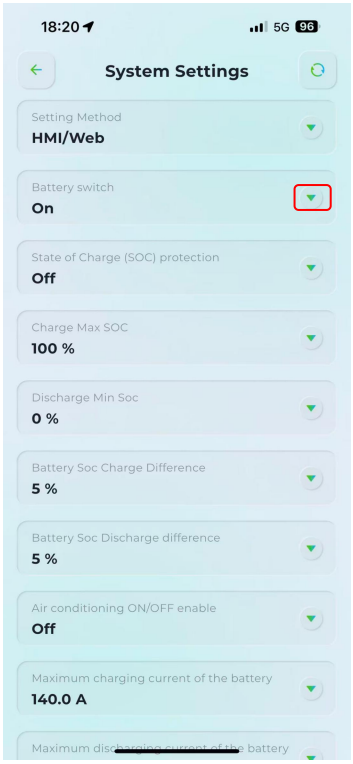


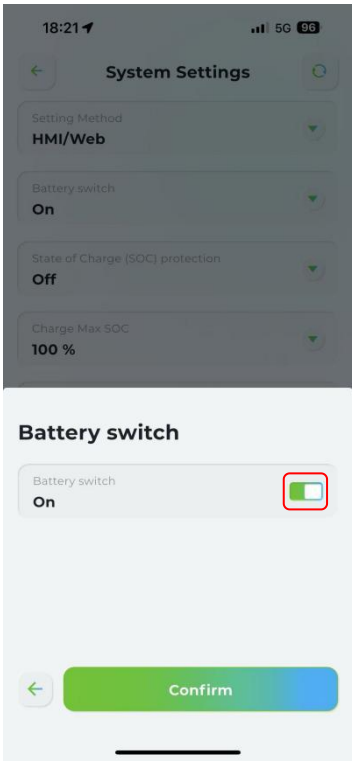




## 7.7. 2. Battery Switch

- Step 1: Click "**Settings**" in the main menu bar at the bottom of the main interface.
- Step 2: Click "**System Settings**" in the settings interface.
- Step 3: Click the battery switch drop-down tab. In the drop-down list, click " " to turn on the battery switch according to your actual needs, or click " " to switch it to the off state. Then click Confirm.

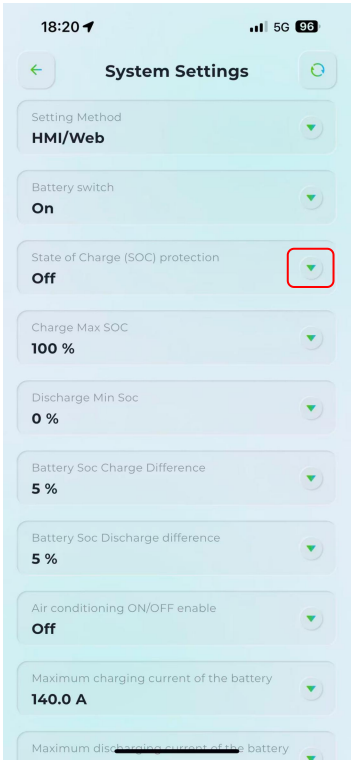
------End

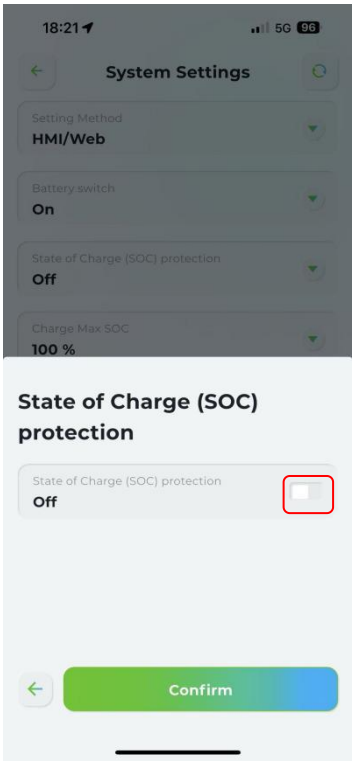


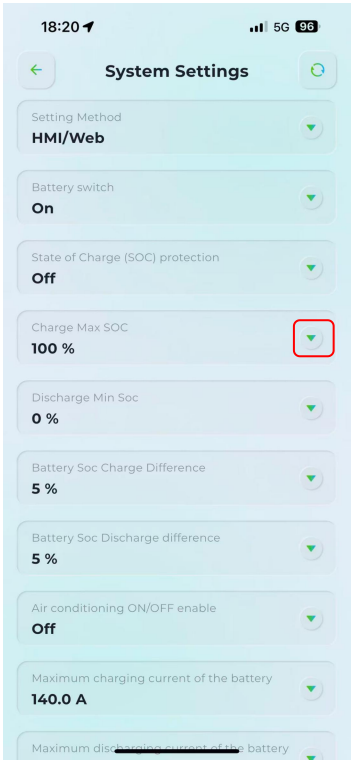

## 7.7. 3. SOC Settings

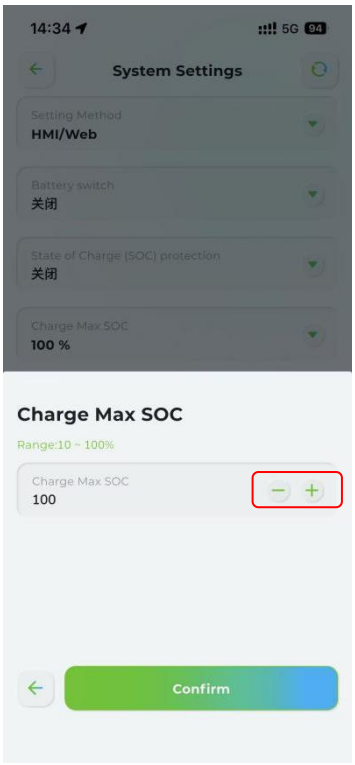
- Step 1: In the "**System Settings"** interface, click the drop-down TAB "▾" on the right side of the "**State of Charge (SOC) protection"** option bar.
- Step 2: Click the SOC protection switch button according to actual needs. A green "▣" on the switch button indicates it is enabled, and a gray "▢" indicates it is off.



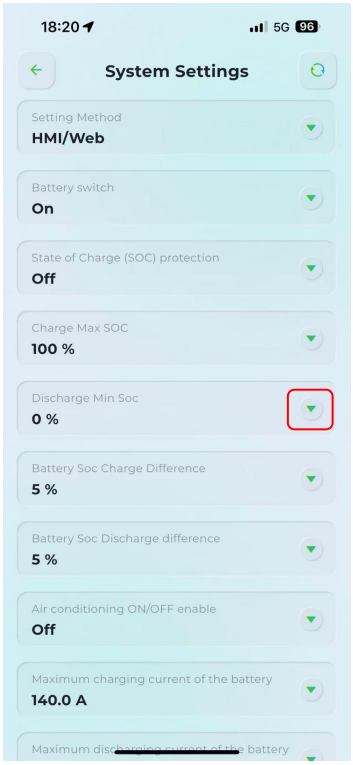

- Step 3: In the "**System Settings"** interface, click on the "**Charge Cut-off Maximum SOC**" drop-down TAB to the right of this option bar "▾".
- Step 4: Adjust the maximum state of SOC for charging cutoff as needed. The permissible adjustment range is from 10% to 100%.

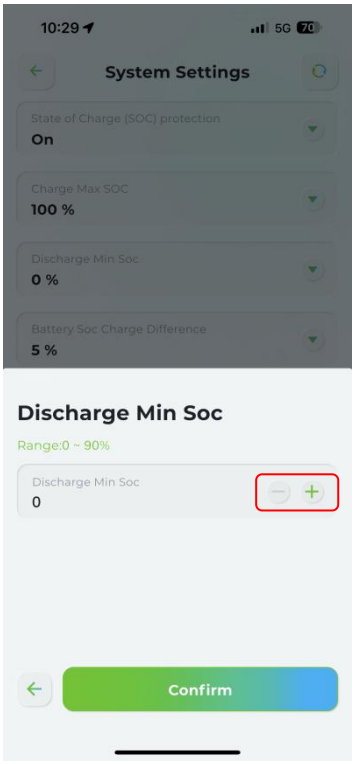


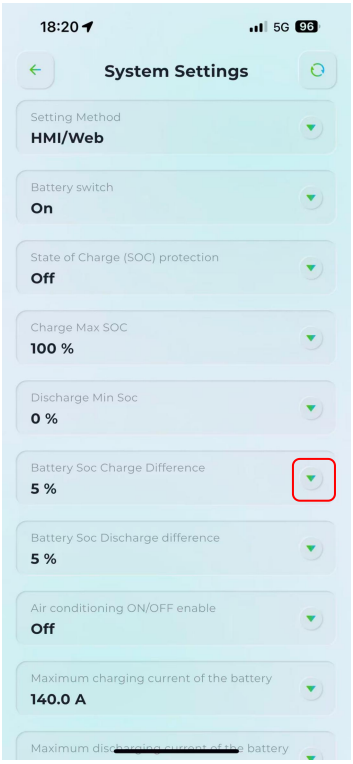

- Step 5: In the "**System Settings**" interface, click the drop-down TAB to the right of the "**Discharge Min SOC**" option bar "▾".

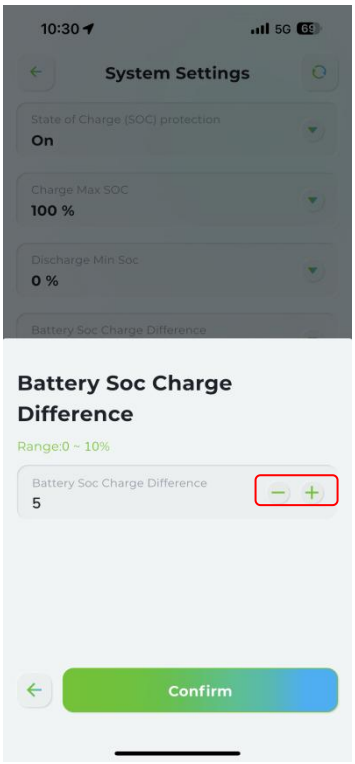
- Step 6: Adjust the minimum SOC for discharge cutoff as needed by clicking the setting option. The permissible adjustment range is from 0% to 90%.




- Step 7: In the "**System Settings"** interface, click the drop-down TAB to the right of the "**Battery SOC charge difference"** option bar "▼".
- Step 8: Adjust the battery SOC charge difference according to actual requirements. The permissible adjustment range is from 0% to 10%.



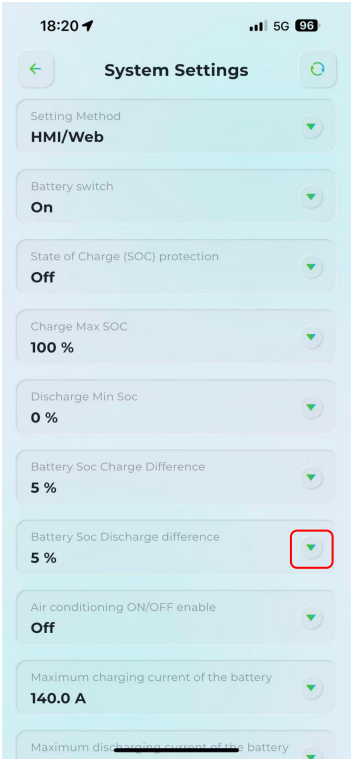



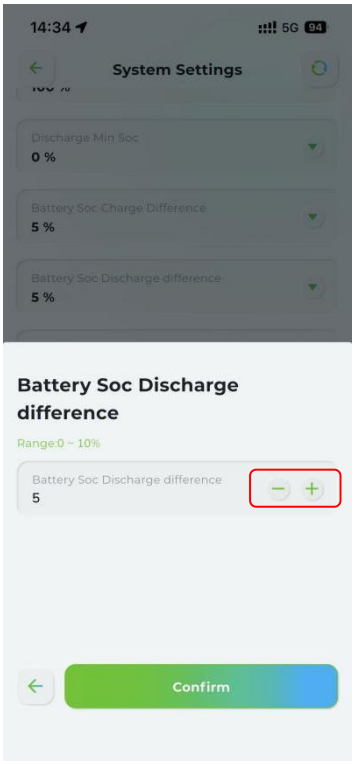

- Step 9: In the "**System Settings"** interface, click the drop-down TAB to the

right of the **Battery SOC discharge difference** option bar "▾".

- Step 10: Adjust the Battery SOC discharge difference as needed by clicking the appropriate control. The permissible adjustment range is from 0% to 10%.

------End

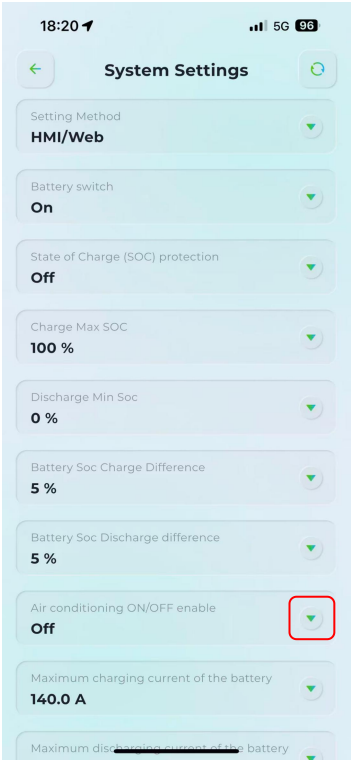


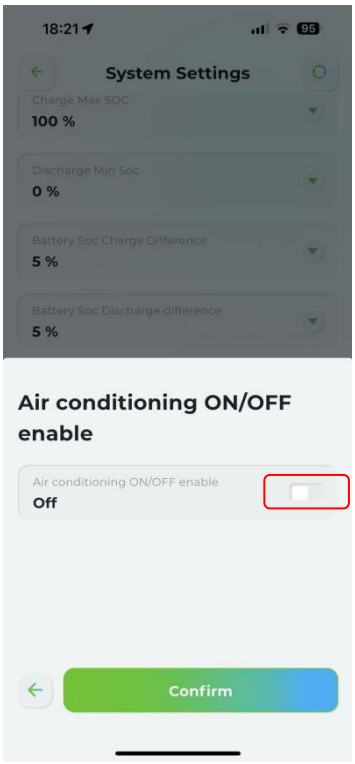




## 7.7. 4. Air Conditioning Switch Enable

- Step 1: In the "**System Settings**" interface, click the **Air conditioning ON/OFF enable** the drop-down TAB to the right of this option bar "▾".
- Step 2: Enable the air conditioner function as needed, based on actual requirements.

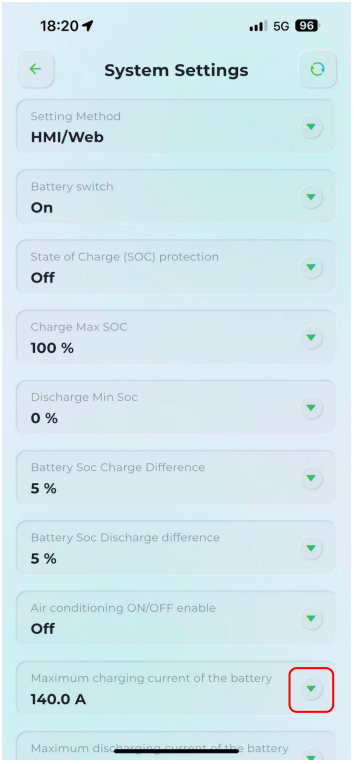
------End

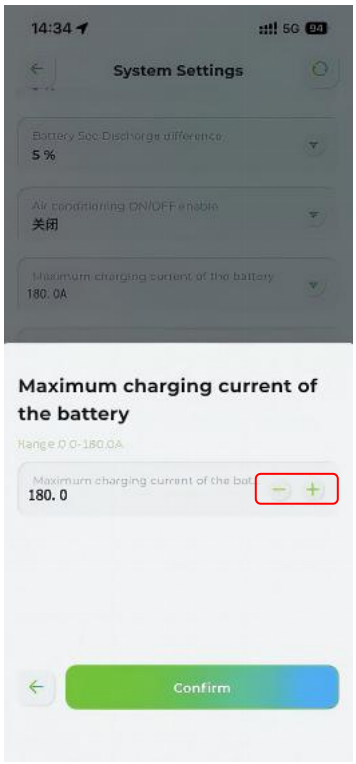


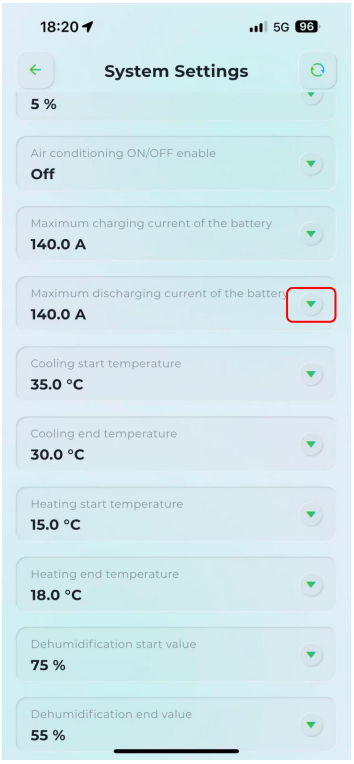

## 7.7. 5. Battery charging and discharging current

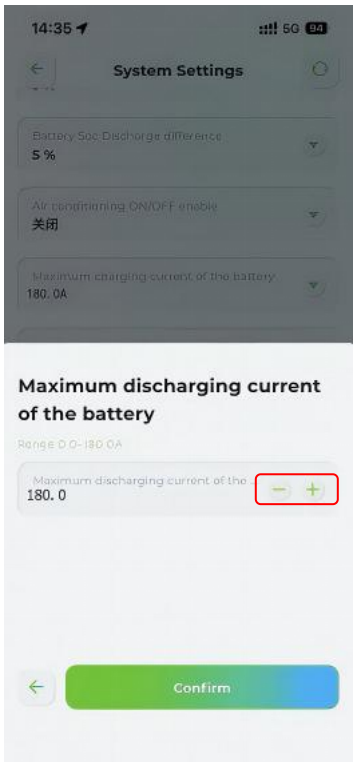
- Step 1: In the "**System Settings**" interface, click on the drop-down TAB to the right of the "**Maximum charging current of the battery**" option bar "▾".
- Step 2: Adjust the **maximum battery charging current** in accordance with actual requirements. The permissible adjustment range is from 0.0 to 180.0 A.



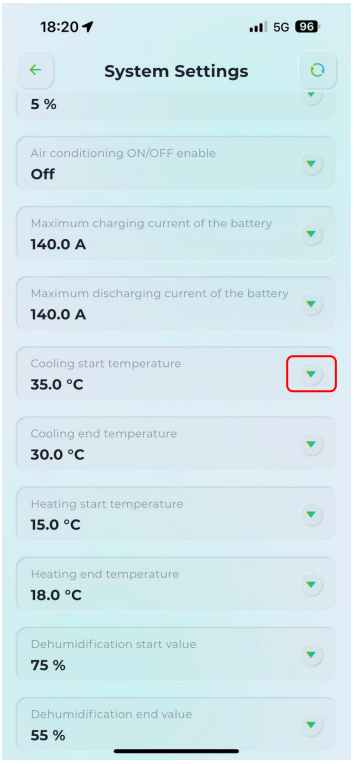

- Step 3: In the "**System Settings**" interface, click on the drop-down TAB to the right of the "**Maximum discharging current of the battery**" option bar "▼".
- Step 4: Adjust the **maximum battery discharging current** in accordance with actual requirements. The permissible adjustment range is from 0.0 to 180.0 A.

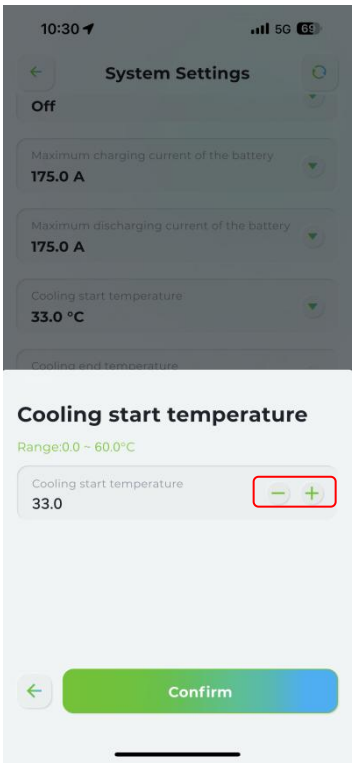


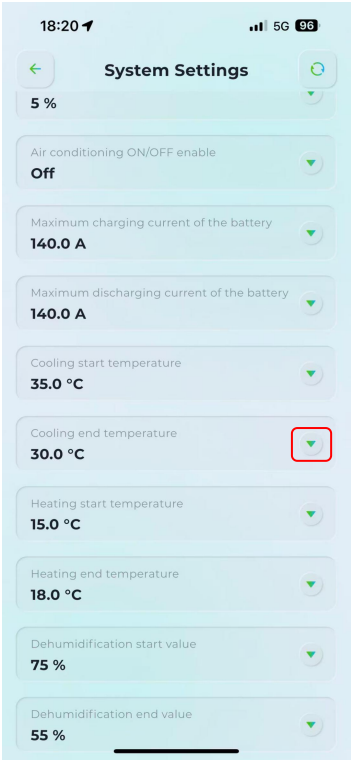
## 7.7.6 Cooling & Heating and Dehumidification Settings

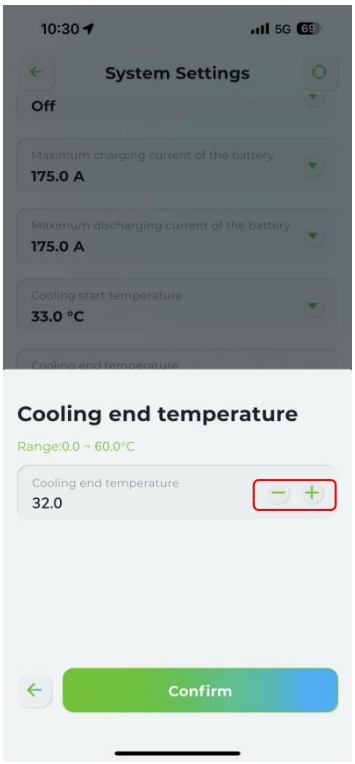
- Step 1: In the "**System Settings**" interface, click on the drop-down TAB to the right of the "**Cooling start temperature**" option bar "▼".
- Step 2: Adjust the **cooling start temperature** according to actual requirements. The permissible adjustment range is from 0.0°C to 60.0°C.



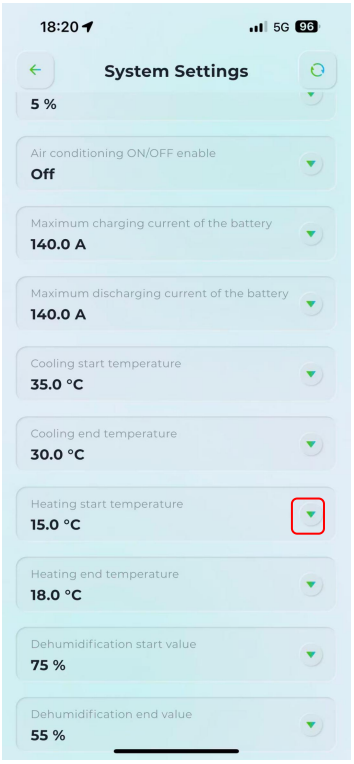



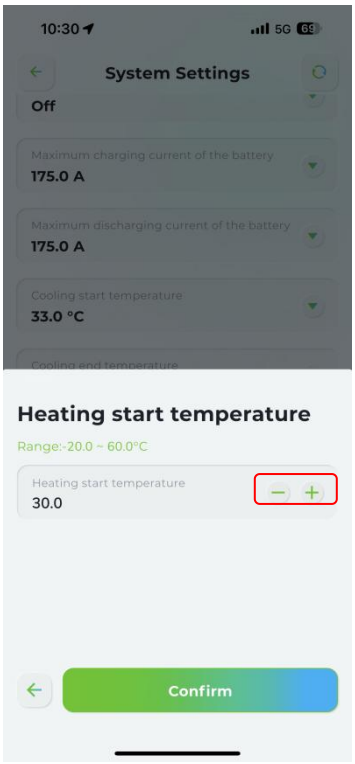

- Step 3: In the "**System Settings**" interface, click on the drop-down TAB to the right of the "**Cooling end temperature**" option bar"▼".
- Step 4: Adjust the **cooling end temperature** according to actual requirements. The permissible adjustment range is between 0.0°C and 60.0°C.



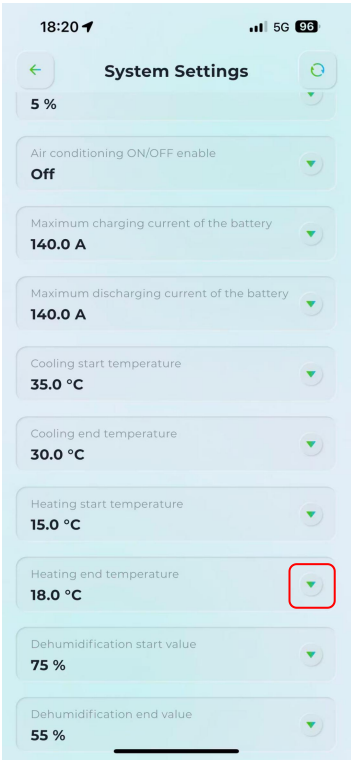

- Step 5: In the "**System Settings**" interface, click on the drop-down TAB to the right of the "**Heating start temperature**" option bar"▾".
- Step 6: Adjust the **heating start temperature** based on actual requirements. The permissible adjustment range is from -20.0°C to 60.0°C.

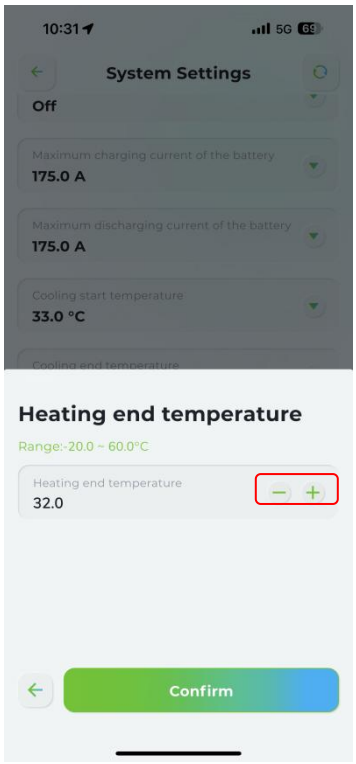


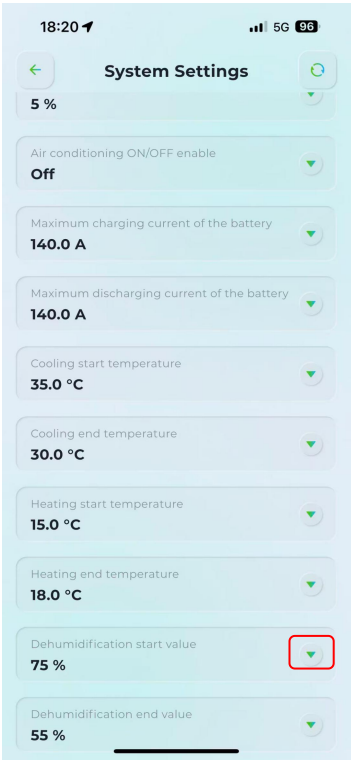

- Step 7: In the "**System Settings**" interface, click on the drop-down TAB to the right of the "**Heating end temperature**" option bar "▾".

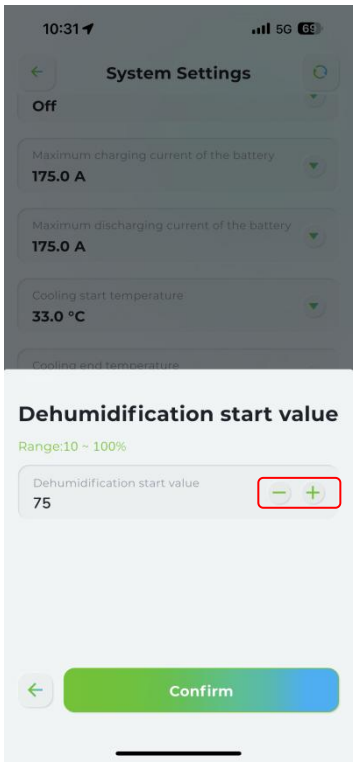
- Step 8: Adjust the **heating end temperature** according to actual requirements. The permissible adjustment range is from -20.0°C to 60.0°C.




- Step 9: In the "**System Settings**" interface, click on the **dehumidification start value** drop-down TAB to the right of this option bar "▾".
- Step 10: Adjust the dehumidification activation threshold according to actual requirements. The permissible adjustment range is from -20.0°C to 60.0°C.



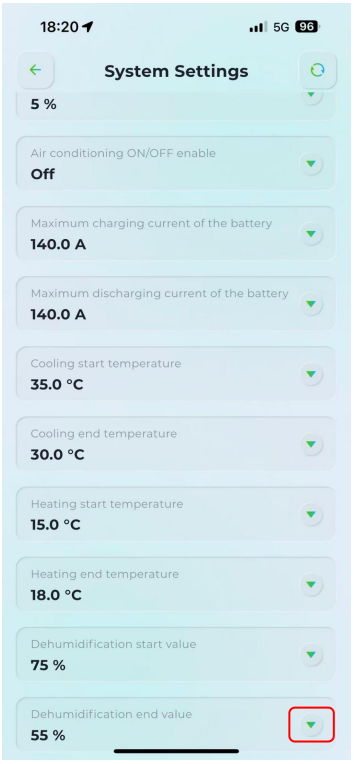



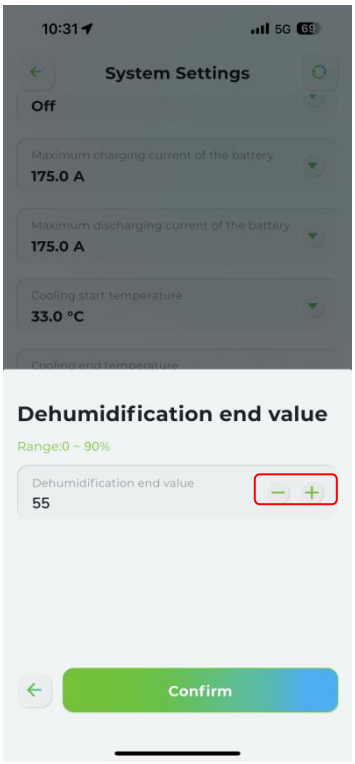

- Step 11: In the "**System Settings**" interface, click on the **dehumidification**

**end value** drop-down TAB to the right of this option bar

- Step 12: Adjust the **dehumidification end value** according to actual requirements. The permissible adjustment range is from -20.0°C to 60.0°C.

------End

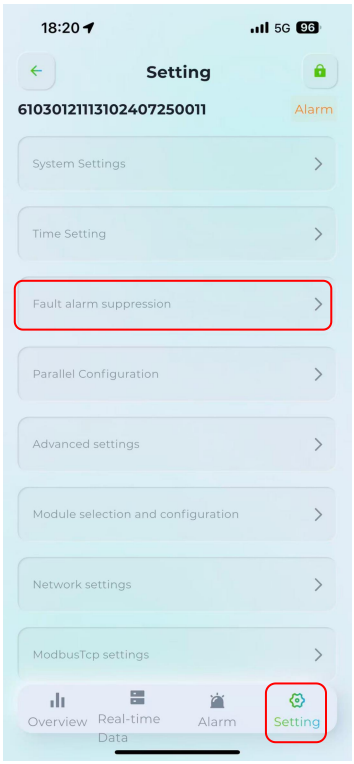


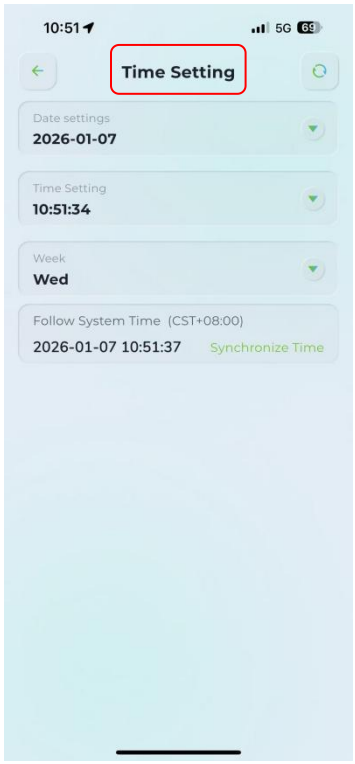




## 7.8. Time Setting

In the settings interface, click "**Time Settings**". Upon entering the time configuration page, users can adjust the date, time, and weekday settings. A system time synchronization option is available at the bottom of the page.

------End

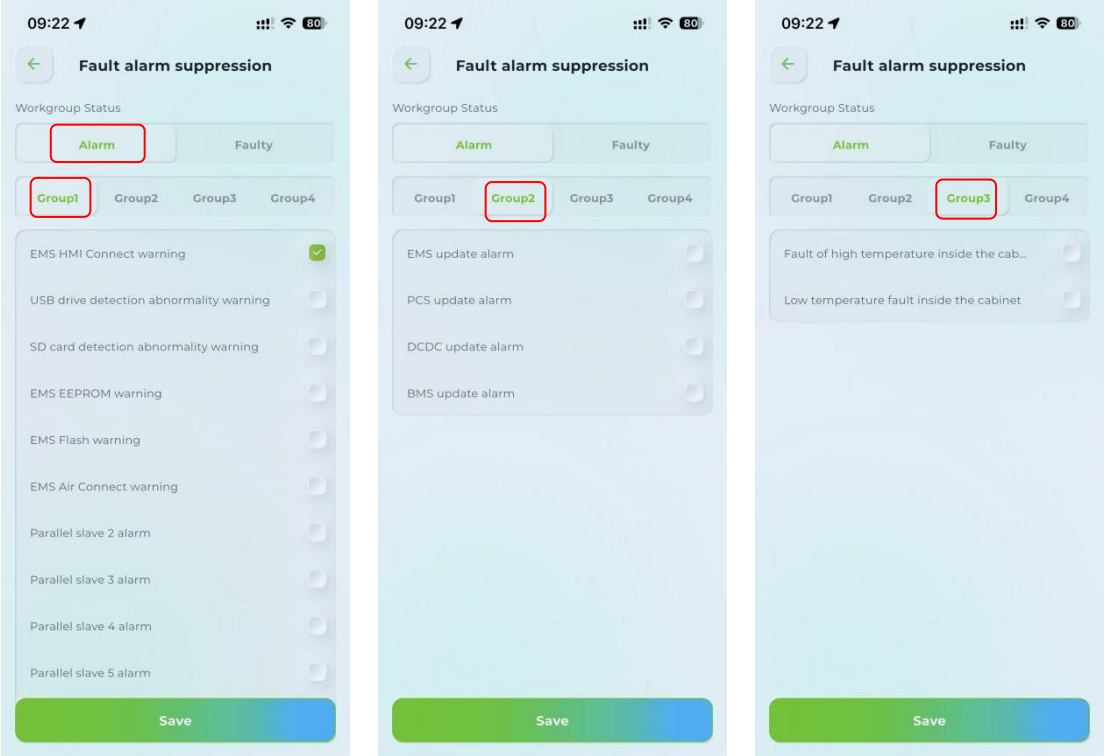


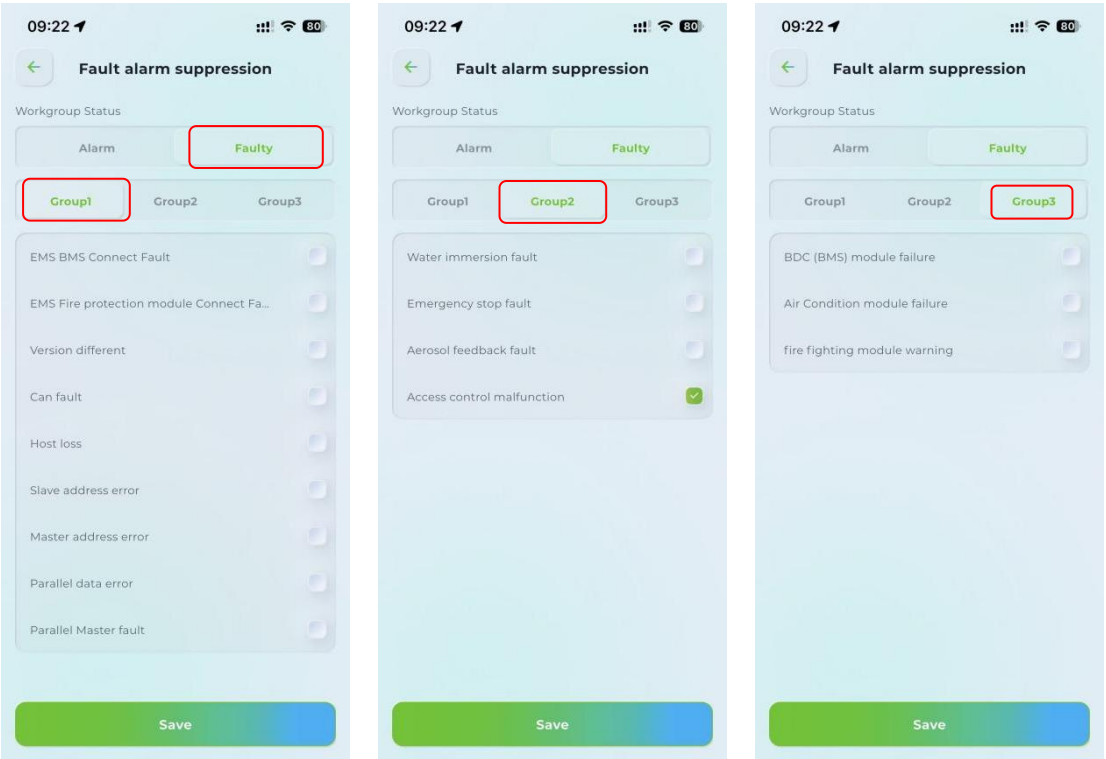




## 7.9. Fault alarm suppression

- Step 1: Click on "**Fault Alarm suppression**" in the "Settings" interface;
- Step 2: On the "**Fault Alarm suppression**" interface, click "**Alarm**", then select one of the groups from "**Group 1**" to "**Group 4**" to view the corresponding alarm information.
- Step 3: On the "**Fault Alarm suppression**" interface, select "**Faulty**", then choose a group from "**Group 1**" to "**Group 3**" to view the alarm information for each respective group.
- Step 4: To block alarm or fault information, click the corresponding group list and select the items intended for blocking.

------End



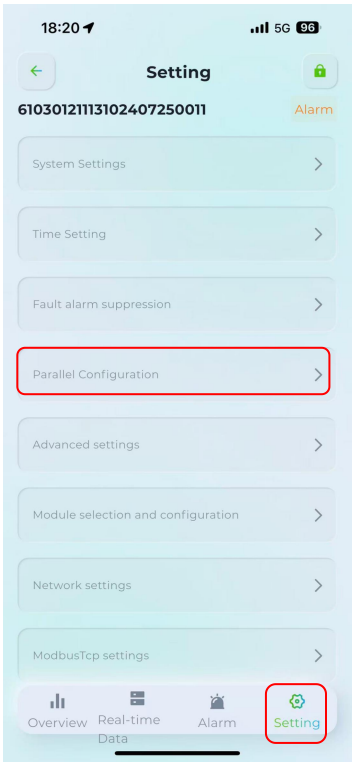

## 7.10. Parallel Configuration

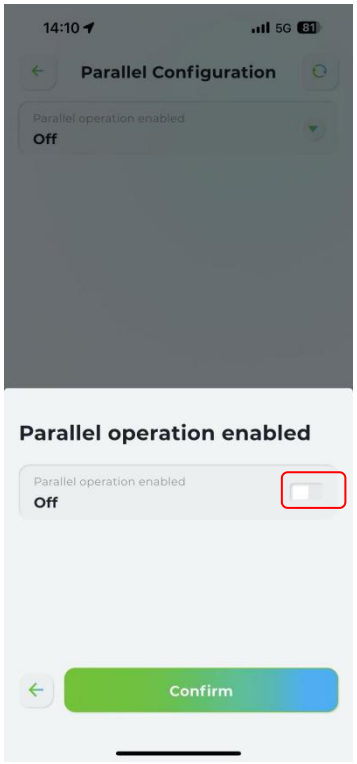
- Step 1: Click "**Settings**" in the main menu bar at the bottom of the main interface.
- Step 2: Click "**Parallel Configuration**" in the Settings interface;
- Step 3: Click "**Parallel Configuration**" and select any position within the

"**Parallel operation Enable**" column, or click the drop-down menu located on the right side of the option bar"▾".

- Step 4: As required, click the "**Parallel operation enable**" in the pop-up window. The button appears green when parallel operation is enabled and gray when disabled. Subsequently, click "**Confirm**".

------End



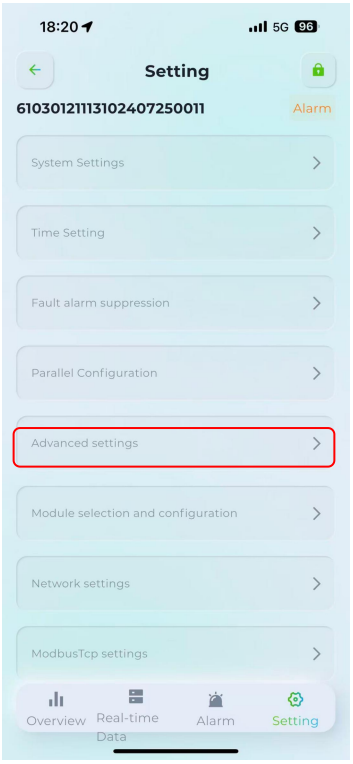




## 7.11. Advanced settings

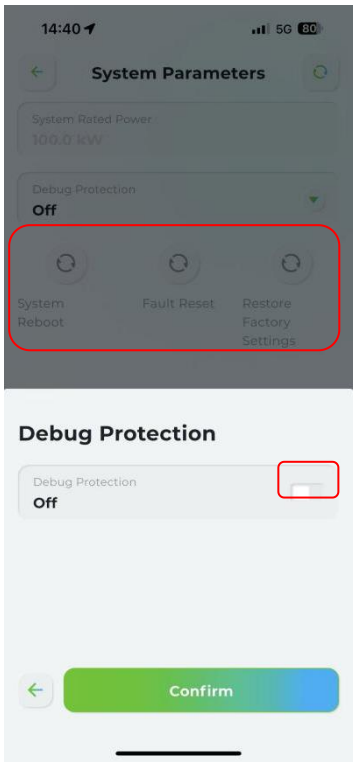
- Step 1: Click "**Advanced Settings**" in the "**Settings**" interface.
- Step 2: In the "**Advanced Settings**" interface, click "**System Parameters**"
- Step 3: In the "**System Parameters**" interface, if you need to restart EMS, click "**System Reboot**", and then click "**Confirm**" in the pop-up window.
- Step 4: In the "**System Parameters"** interface, click the "**Debug Protection"** column or its drop-down menu. In the pop-up, use the "**Debug Protection"** Switch Button to enable or disable the feature—green means enabled, gray means disabled. Then click "**Confirm"**.
- Step 5: In the "**System Parameters**" interface, if you need to clear the current user-end settings and restore the factory state, click "**Restore Factory Settings**", and then click "**Confirm**" in the pop-up window.

-----End

Note: Please do not click "**System Reboot**" when the system is operating under normal conditions.





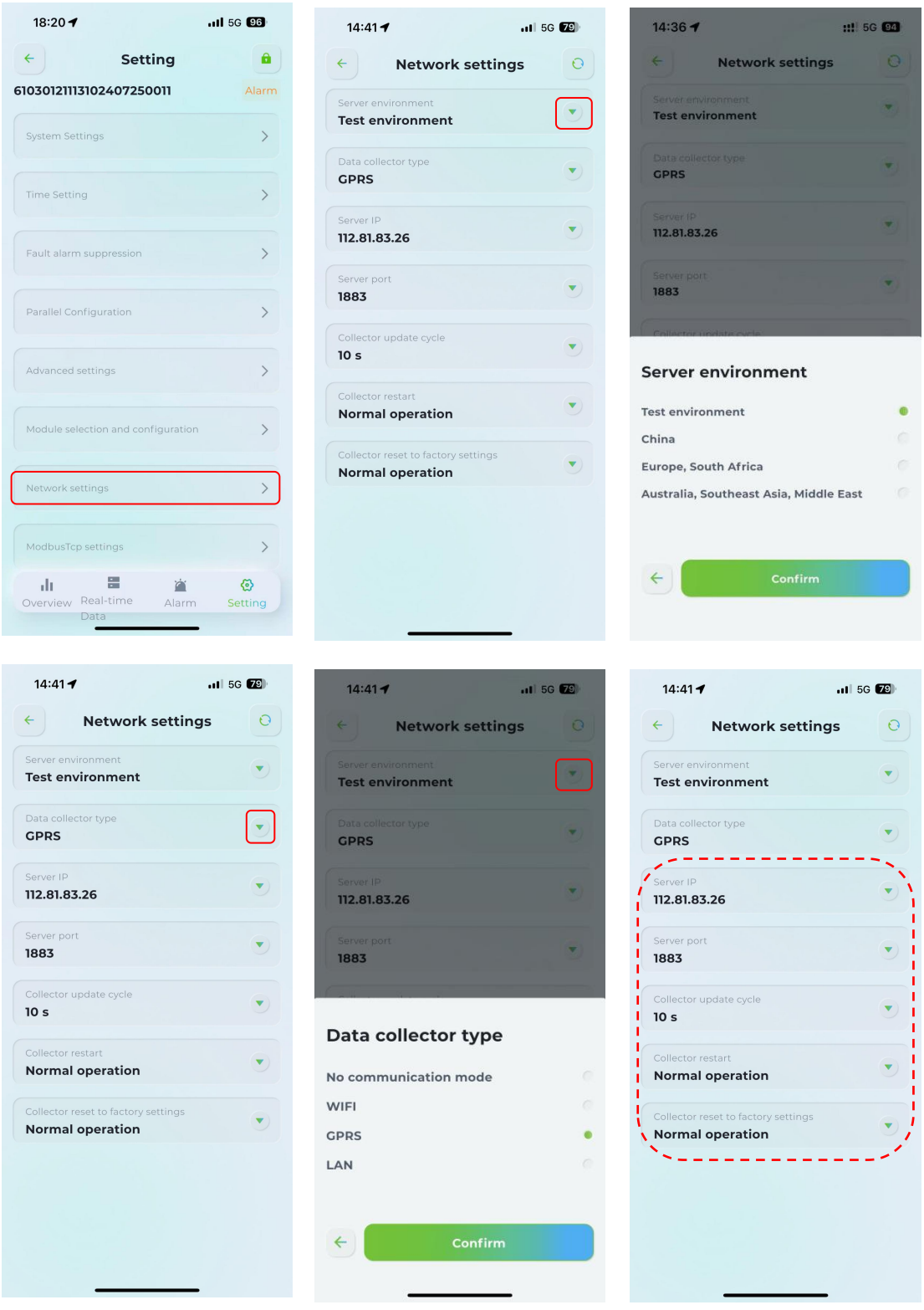



## 7.12 Network settings

- Step 1: Click on "**Network Settings**" in the "**Settings**" interface.
- Step 2: On the "**Network Settings**" interface, click anywhere in the "**Server Environment**" column or the drop-down tab on the right side of the option bar"".
- Step 3: In the pop-up window, select "**Server environment**" based on the actual situation, and then click "**Confirm**".
- Step 4: On the "**Network Settings**" interface, click anywhere in the "**Data Collector Type**" column or the drop-down tab on the right side of the option bar"";
- Step 5: In the pop-up window, select the "**Data Collector Type**" based on the actual situation, and then click "**Confirm**".

-------End

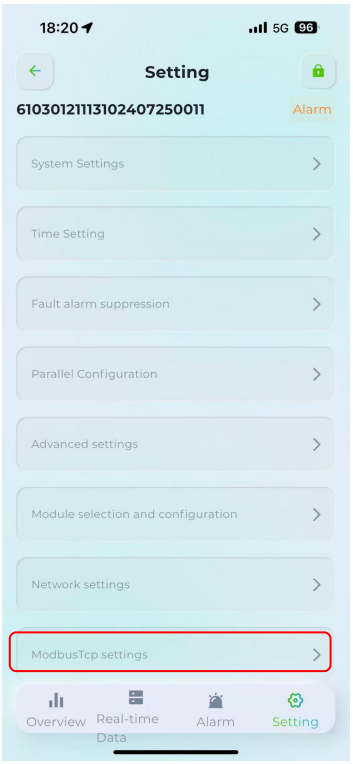
Note: The items enclosed within the dashed box in the figure below represent the default settings and do not require user configuration.

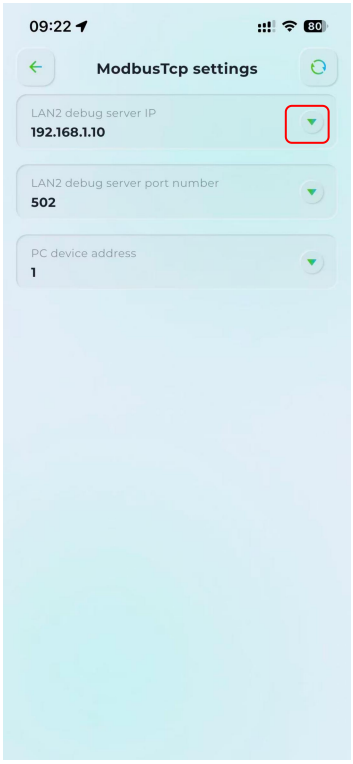


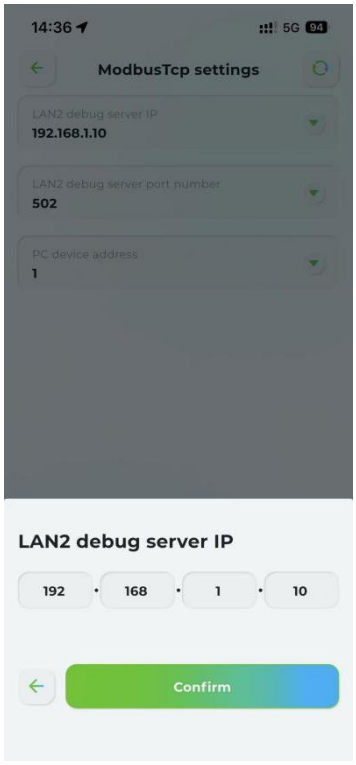

## 7.12 Modbus TCP Settings

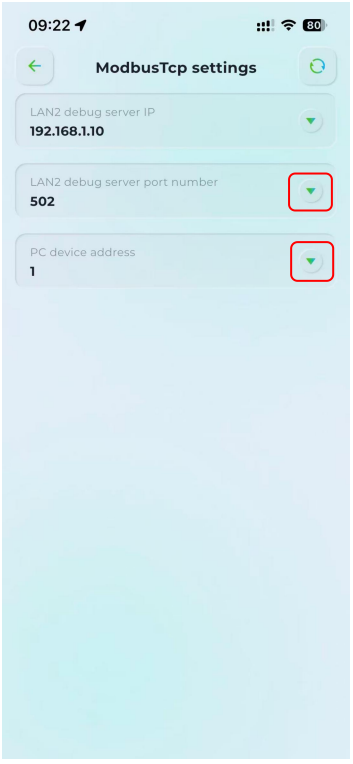
- Step 1: Click "**Modbus TCP Settings**" in the "**Settings"** interface;
- Step 2: On the "**Modbus Tcp Settings**" interface, click on the "**LAN 2 debug server IP**" column or the drop-down option bar"▾"; Adjust to the correct debugging IP address.

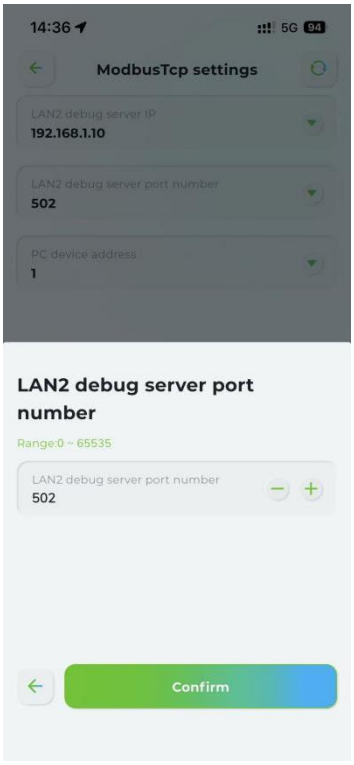
- Step 3: On the "**Modbus TCP Settings**" interface, click on the "LAN 2 **debug server port number**" column or the drop-down option bar"▼"; Adjust it to the correct server port number.
- Step 4: On the "**Modbus TCP Settings**" interface, click the "**PC device address**" field or the adjacent drop-down option bar"▼"; configure it with the correct PC device address.

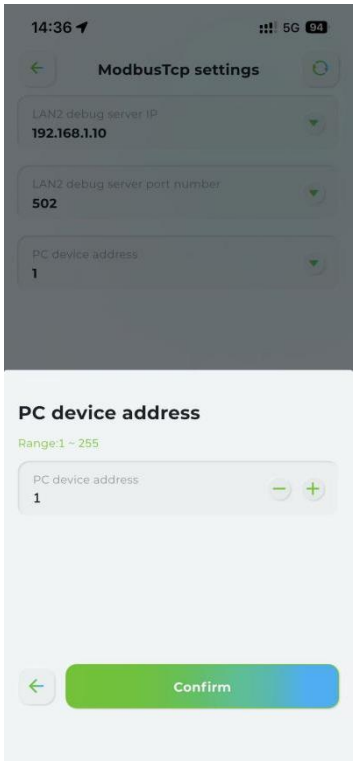


# 8. Fault Description

If the solution provided below still does not solve the problem, please contact Dyness.

Table 8-1 Fault Description and Solution

| Fault Phenomenon | Solution |
|---|---|
| Power light off | • Check that each circuit breaker is closed. |
| Running light off | • Check if EMS is in running state. |
| Alarm light on | • Check whether there is any alarm through the screen or the web, whether it is caused by improper operation. If not, please contact the supplier. |
| System Anomaly Noise | • Check the air inlet and outlet for blockages or foreign objects. If you hear unusual noise, contact the supplier immediately. |
| Show access alarm | • Check if the door is closed. |
| Show flood alarm | • Check whether the system is flooded, or whether the water sensor line is disconnected or damaged. |
| Show emergency stop alarm | • Check whether the emergency stop switch is in the released state. |
| Show SPD alarm | • Check whether the surge protector is damaged and whether the fault light is on. If damaged, contact the supplier for replacement. |
| Show gas detector alarm | • Stop using immediately and contact the supplier. |
| Show temperature detector alarm | • Stop using immediately and contact the supplier. |
| Show smoke detector alarm | • Stop using immediately and contact the supplier. |
| Show other alarm | • Except for grid-side abnormalities, contact the supplier for other cases. |
| Abnormal communication between EMS and BMS | • Shutdown to check if the communication cable is firmly connected and correct;<br>• Restart the EMS and check if it functions normally;<br>• If the error message still exists, please contact the supplier. |
| Abnormal communication between EMS and fire protection module | • Shutdown to check if the communication cable is firmly connected and correct;<br>• Restart the EMS and check if it functions normally;<br>• If the error message still exists, please contact the |

| | |
|---|---|
| | supplier. |
| Abnormal communication between EMS and PCS | • Shutdown to check if the communication cable is firmly connected and correct;<br>• Restart the EMS and check if it functions normally;<br>• If the error message still exists, please contact the supplier. |
| Abnormal communication between EMS and air conditioning system | • Shutdown to check if the communication cable is firmly connected and correct;<br>• Restart the EMS and check if it functions normally;<br>• If the error message still exists, please contact the supplier. |
| SD card detect abnormality | • Check if the SD card is normal. If not, please replace the SD card;<br>• If the error message still exists, please contact the supplier. |
| Network abnormality - (default blocked) | • Check the 4G/WIFI/LAN antenna;<br>• If the error message still exists, please contact the supplier. |
| Data loss due to EMS no power supplied | • If the error message still exists, please contact the supplier. |
| EMS external Flash abnormality | • If the error message still exists, please contact the supplier. |
| System version inconsistency abnormality | • Update software to consistent version;<br>• If the error message persists, contact the vendor. |
| Incompatible software versions prevent parallel operation | • If the error message still exists, please contact the supplier. |
| Inconsistent capacities prevent parallel operation | • If the error message still exists, please contact the supplier. |

# 9. System Maintenance

System Maintenance Items

**WARNING**

- Operation and maintenance work must comply with local laws and regulations and the precautions in this manual.
- System maintenance work must be performed by professionals with electrical and power engineering knowledge and relevant qualifications.
- When performing system maintenance, wait until the outdoor cabinet's internal equipment is completely powered down before beginning inspection work. If any non-conformities are found during inspection, correct them immediately.

The system needs to be checked regularly. Here are some items to check and the frequency specified. For more details, check out the *Operating and Maintenance Manual*.

Table 9-1 System maintenance checklist

| Items | Checklist | Frequency |
|---|---|---|
| Cabinet exterior | Check if there are any flammable materials on the ESS cabinet; | Once/year |
| | Check if the ESS cabinet and expansion bolts are secure and free from rust; | |
| | Check if there is any damage, peeling paint, and oxidation on the ESS cabinet casing; | |
| | Check if the cabinet door locks can open smoothly; | |
| | Check if the sealing strips are securely fixed. | |
| System status | Check if the ESS cabinet and internal equipment are damaged or deformed; | Once/year |
| | Check if the warning signs and labels are clear and visible. Replace them if necessary; | |
| | Check if there are any loose or missing screws inside the ESS cabinet; | |
| | Check if the cable shielding layer is in good contact with the insulation sleeve; | |
| | Check if the grounding copper bar is securely fixed in place. | |
| | Check if there is any oxidation or rust inside the ESS cabinet; | |

| | | |
|---|---|---|
| | Check if the ESS cabinet and internal equipment are damaged or deformed. | |
| Wiring and cable arrangement | Check if all the inlet/outlet of the ESS cabinet are sealed properly; | Once/year |
| | Check if there is any water leakage inside the ESS cabinet; | |
| | Check if the power cables are loose, tighten them according to the previously specified torque; | |
| | Check if there are any damage to power cables and control cables, especially check for cuts on the insulation where they contact metal surfaces; | |
| | Check if the insulation wrapping of cable terminals is falling off; | |
| | Check if the PE cable connection is correct, the grounding resistance value should not exceed 4 Ω; | |
| | Check if the equipotential connections inside the ESS cabinet are correct. | |
| System cleanliness | Check if the inlet/outlet of the ESS cabinet are blocked. Please clean them if needed; | Once/ half year |
| | Check if the humidity inside the ESS cabinet is within the normal range. Please clean them if needed; | |
| | check if there are foreign objects, dust, dirt and condensation inside the ESS cabinet; | |
| | Check if there is condensation inside the ESS cabinet regularly:<br>Once a year for areas with low relative humidity;<br>One half year for areas with medium relative humidity;<br>Once every one to three months for areas with high relative humidity. | |
| System function | Check if there is abnormal noise inside the ESS cabinet during operation; | Once / two years |
| | Check if the temperature is too high inside the ESS cabinet; | |
| | Check if the system operates normally for startup and shutdown. | |
| Fan | Check the operation status of the fan; | Once/year |
| | Check if the fan is blocked; | |
| | Check if there is abnormal noise during fan operation. | |

| | | |
|---|---|---|
| Air conditioner | Check the operation status of the air conditioner;<br>Check if the air conditioner is blocked;<br>Check if there are abnormal noises during air conditioner operation. | Once/year |
| Safety function | Check the stop function of EPO and screen, and simulate shutdown for test;<br>Check the warning signs and other labels. Please replace them if there is any damage or blur. | Once/half year |
| Device maintenance | Perform a regular inspection for rust condition of all metal components (once every half year);<br>Annual inspection of the contactor (auxiliary switch and micro-switch) to ensure that the product runs well;<br>Check the operating parameters (especially voltage and insulation parameters). | Once/half year |
| SOC Calibration | Complete the calibration operation through full charge and full discharge cycles. | Once/month |

# 10. Quality Assurance

Warranty period please refer to *Warranty Agreement.*

Service within warranty period: For Dyness ESS products that fail within the warranty period, we will be responsible for handling and providing proper replacement or repair solution, offering free services or replacement of failure products. We will require valid invoices and receipts of purchase for warranty. Meanwhile, the Dyness trademark should be visible to ensure the validity of the assurance.

We reserve the right not to provide warranty in the following situations:

- The ESS products exceed the free warranty period;
- Improper installation, modification or usage;
- Operation under harsh environments beyond those specified in this document or the "Warranty Agreement" or "Technical Agreement", or damage caused by abnormal natural environmental factors;
- Damage or failure caused by installation, modification and disassembly by unauthorized agencies or individuals;
- Damage or failure caused by the use of non-standard products or unauthorized components and software.

For failures caused by the above situations, Dyness could provide paid maintenance services if the customer requires.

If you have any problems with this product, please contact us. In order to solve your problem more quickly, please provide the following information:

- Original purchase receipt or invoice;
- Contact information, including name, phone number, email address and shipping address.
- Product information, including product model, product serial number, installation date and location, fault date and fault description, etc.

# 11. Appendix

Please check if the following checklist has been completed before the product runs.

Table 11-1 Checklist before operation

| Items | Checklist | Confirm |
|---|---|---|
| 1 | Check if the appearance is damaged and if the internal equipment is intact; | ☐ |
| 2 | Check if the assembly is firm; | ☐ |
| 3 | Check if the logo and labels of the ESS cabinet and components are clear or damaged; | ☐ |
| 4 | Check if the communication cable connection is complete; | ☐ |
| 5 | Check if there are any faults in the PE cable; | ☐ |
| 6 | Check if all the connection points are correct and have good contact; | ☐ |
| 7 | Check if there are normal situations of manual components; | ☐ |
| 8 | Check if the circuit breakers are functioning normally; | ☐ |
| 9 | Check if all the buttons and indicators are functioning normally; | ☐ |
| 10 | Check if the power indicator is normal; | ☐ |
| 11 | Check if the running indicator is normal; | ☐ |
| 12 | Check if the fan and air conditioner are running well and there is no abnormal sound; | |
| 13 | Check if there are any tools or components left inside the ESS cabinet; | ☐ |
| 14 | Check if the door of the ESS cabinet can open and close smoothly; | ☐ |

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