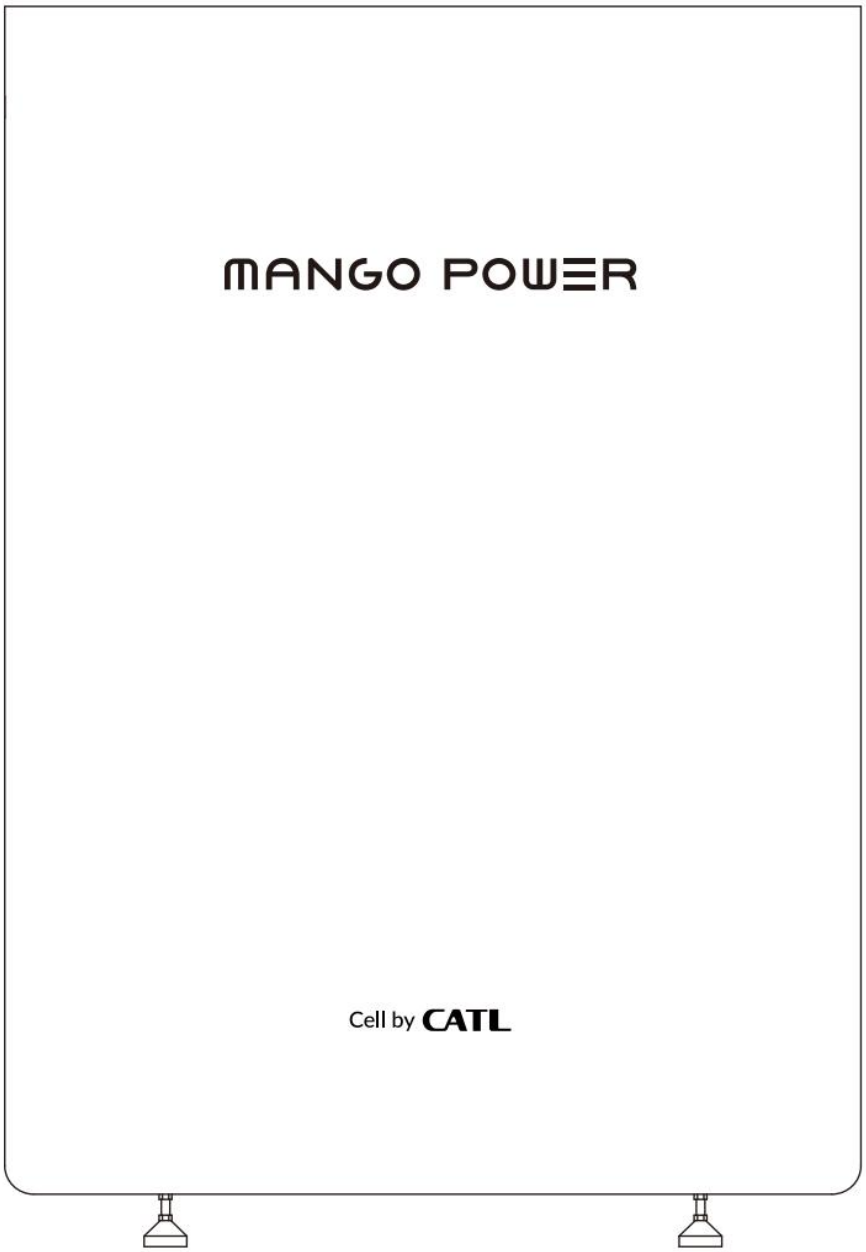
MANGO POWER




# M LFP Battery 280Ah
# User Manual

**Product Version: V 1.0**

## Legal Statement



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## Revise the history

| edition | Update instructions | date of issue |
|---|---|---|
| V 1.0 | First release | |
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| | | |
| | | |

# Preface

## Manual Description

This manual provides and describes the necessary instructions for the safe use of the M LFP Battery 280Ah module produced by our company, in order to correctly use this product. Our company reserves the right to modify and update this specification based on the actual situation in different periods

Note: This product is originally designed for energy storage systems and should not be used for other purposes.

## Reader Target

The readers of this manual are:

- System Engineer
- Technical Support Engineer
- Product User

Please read this manual carefully before using the device.

# Catalogue

# 1. Safety Precautions

## 1.1 General Safety

**Declaration**

When installing, operating and maintaining the equipment, please first read this manual and follow the identification on the equipment and all safety precautions in the manual.

- The "notice", "attention", "warning" and "dangerous" items in the manual do not represent all safety matters to be observed and are only complementary to all safety precautions. Mangopower shall not be liable for any violation of general safety operation requirements or any violation of safety standards for the design, production and use of equipment.
- The equipment shall be used in the environment that meets the design specification requirements, otherwise it may cause equipment failure, and the resulting abnormal equipment function or component damage, personal safety accidents and property loss are not within the scope of equipment quality assurance.
- The installation, operation and maintenance of equipment shall be followed by local laws, regulations and regulations. Safety precautions in the manual are only complementary to local laws, regulations and norms.
- It is strictly prohibited to disassemble, modify or damage the battery (such as removing the casing, inserting foreign objects, squeezing by external force, immersing in water or other liquids).

**The Company shall not undertake the warranty in any of the following circumstances**

- Not operating under the conditions described in this manual.
- The installation and use environment does not comply with the provisions of the relevant international or national and regional standards.
- Disassemble, change the product or modify the software code without authorization.
- Operation is not according to the operation instructions and safety warnings in the product and document.
- Equipment damage caused by abnormal natural environment (force majeure, such as earthquake, fire, storm, flood, debris flow, etc.).
- Transportation damage caused by the customer's own transportation.
- Damage caused by the storage conditions that do not meet the requirements of the product documentation.
- Damage to equipment hardware or data due to negligence, improper operation or intentional damage by the customer.
- System damage due to third parties or customer reasons, including handling and installation that do not meet the requirements of this manual, and adjustment, change or removal of identification marks that do not meet the requirements of this manual.

**General Requirements**

The equipment has a high voltage, and improper operation may cause electric shock or fire, resulting in death, serious personal injury or serious property loss. Please standardize the operation:

- It is strictly prohibited to install, use, and operate outdoor equipment and cables (including but not limited to handling equipment, operating equipment and cables, plugging and unplugging signal interfaces connected to the outdoors, working at heights, outdoor installation, etc.) in severe weather conditions such as lightning, rain, snow, and strong winds of level 6.
- Please observe the warning signs, cautions and protective measures on the equipment.
- Please observe the requirements of this manual, use the correct tools, and master the correct use of the tools.
- It is prohibited to carry out installation, wiring, maintenance, replacement and other operations with electricity
- Do not clean the equipment with water.
- Do not open the host panel of the device.
- Please check whether the device is free from damage, such as falling batteries, collisions, or other signs of damage such as dents in the casing.
- The voltage at the contact point shall be measured before touching any conductor surface or terminal to confirm that there is no danger of electric shock.
- The paint scratches in the transportation and installation of equipment must be repaired in time, and the scratches are strictly prohibited to be exposed to the outdoor environment for a long time.
- Do not affect the battery terminal components during handling, and do not lift and transport through the battery terminal bolts.
- Under no circumstances should the structure, installation sequence, etc. of the equipment be changed without the permission of the manufacturer.
- In case of fire, evacuate the building or equipment area and press the fire alarm bell, or call the fire alarm number. Under no circumstances, re-enter the burning building.
- During the transportation, turnover, installation, wiring and maintenance operations, it shall meet the laws, regulations and relevant standards of the country and region.
- The materials provided by the user and the tools required in the operation process shall meet the laws, regulations and requirements of relevant standards of the country and region.
- It is necessary to obtain the permission of the power department in the country or region where it is located before it can be connected to the grid.

It should be fully familiar with the composition and working principles of the whole grid-connected photovoltaic power generation.

**Explain:**
Reverse engineering, decompiling, disassembly, adaptation, implantation or other derived operation of the equipment software is prohibited. study the source code of the equipment software, stealing intellectual property rights, or to disclose the results of the performance test of the equipment software is prohibited.

## 1.2 Personnel Requirements

- Personnel responsible for the installation and maintenance of the equipment must first undergo strict training to understand various safety precautions and master the correct operation methods.
- Only qualified professionals or trained personnel are allowed to install, operate and maintain the equipment.
- Only qualified professionals are allowed to remove safety facilities and overhaul equipment.
- Personnel who operate equipment, including operators, trained personnel, and professionals, should have special operating qualifications required by local countries, such as high-voltage operation, climbing, and special equipment operation qualifications
- The replacement of the equipment or components (including software) must be replaced by a professional or authorized personnel.

**Explain**

- Professional personnel: individuals with experience in training or operating equipment, who can clearly identify potential sources and levels of danger during the installation, operation, and maintenance of equipment.
- Trained personnel: personnel who have received appropriate technical training and have the necessary experience to be aware of performing certain operations.He can also take measures to minimize the danger to himself or other personnel
- Operators: operators who may come into contact with the equipment, excluding trained personnel and professionals.

## 1.3 Electrical Safety

### 1.3.1 Grounding Requirements

- The protective ground wire must be installed first, and the protective ground wire must be removed last.
- Do not destroy the grounding conductor.
- Do not operate the equipment when the ground conductor is not installed.
- Equipment shall be permanently connected to the protective ground. Before operating the equipment, check the electrical connection of the equipment to ensure that the equipment is reliably grounded.

### 1.3.2 General Requirements

- Before electrical connection, make sure the equipment is not damaged, otherwise cause shock or fire.
- All electrical connections must meet the electrical standards of the country/region where they are located.
- It must obtain the permission from the power department of the country/region where it is located to be connected to the grid.
- The cables provided by the users shall meet the requirements of the local laws and regulations.
- For high-voltage operation, please use special insulation tools.

### 1.3.3 DC Operation

It is forbidden to install and remove the power lines with electricity. The power line core will generate an electric arc or spark when it comes into contact with the conductor, which can resulting in fire or personal injury.

- Before connecting the electrical equipment, the corresponding breaking device at the front stage of the equipment must be disconnected.
- Before connecting the power cord, you must confirm that the power cord label identifies correctly first.
- If the equipment has multiple input, the input of all of the equipment should be disconnected and the equipment can be operated after the equipment is fully powered down.

### 1.3.4 Wiring Requirements

- The use of cables in high temperature environment may cause aging and damage of the insulation layer, and the distance between the cable and the periphery of the heating device or heat source area should be at least 30mm.
- Similar cables should be tied together, and different types of cables should be placed at least 30mm apart.It is forbidden to intertwine or cross-lay cables.
- The cables used in the photovoltaic grid-connected power generation system must be firmly connected, well insulated, and have appropriate specifications.
- The position of cable crossing pipe or crossing hole must be protected to avoid damage by sharp edges and burrs.
- When the temperature is too low, the severe impact and vibration may lead to the brittle cracking of the plastic sheath of the cable. To ensure the construction safety, the following requirements shall be followed:

-All cables shall be laid and installed above 0℃. When handling cables, especially in low temperature environment, they should be handled gently.

-If the storage environment temperature of the cable is below 0℃, the cable must be moved at room temperature for more than 24h before placing the cable.

### 1.3.5 Anti-static Requirements

Notice:

The static electricity generated by the human body can damage the electrostatic-sensitive components on the board, such as large-scale integrated circuits (LSI).

- Anti-static gloves must be worn when contacting the equipment, and it is forbidden to wear clothes that can easily produce static electricity.

## 1.4 Battery Safety

**Statement**

The Company shall not be liable for abnormal equipment function or component damage, personal safety accidents or property loss caused by the following reasons:

- Due to the customer's failure to charge in time, the battery was overdue storage, causing capacity loss or irreversible damage to the battery.
- Battery damage, drop, liquid leakage due to improper operation or failure to connect the battery as required.
- The battery was installed on site and connected to the system, but the battery was over-discharged due to the failure of the customer.
- The user did not set the battery operation management parameters correctly.
- The customer or the third parties changed the battery application scenario,without notifying the company. For example, if you connect additional load to batteries or inverters; mix our batteries with other batteries, including but not limited to: mixing with other brand batteries and batteries with different rated capacity, etc.
- Direct damage to the battery caused by the operating environment of field equipment or external power parameters cannot meet the environmental requirements of normal operation. Including the actual operating temperature of the battery is too high or too low, and the power grid situation is unstable and frequent power failure.
- Improper customer maintenance causes frequent over-discharge of batteries, on-site expansion of customers, or long-term inability to fully charge batteries., etc.
- The customer did not carry out the correct maintenance of the battery according to the supporting equipment operation manual, including but not limited to: did not regularly check whether the battery terminal is locked, etc.
- The battery was stolen.
- Batteries exceeding the warranty period.

**Basic Requirements**

- Do not expose the battery to a high temperature environment or around the heating equipment, such as sunlight, fire source, transformer, heater, etc. Overheated battery may cause a fire and explosion.
- Do not disassemble, modify or destroy the battery (such as insertion of foreign objects,

immersion in water or other liquids.) to avoid battery leakage, overheating, fire or explosion.

- Battery energy storage system has a high risk of fire. The following safety risks should be fully considered before performing the battery operation:
  - The battery electrolyte is flammable, toxic, and volatile.
  - Thermal runaway of battery will produce flammable gases, as well as harmful gases such as CO and HF.
  - There is a risk of deflagration and explosion in the accumulation of flammable gas produced after battery thermal runaway.
  - When the battery leakage, structural deformation and other obvious appearance abnormalities, there will be potential safety risks, please contact the installer or professional operation and maintenance personnel for removal and replacement immediately.
  - The battery must be stored separately and in their original packaging, to avoid mixing with other items, open storage, and battery stacking too high.
  - Under normal circumstances, do not remove the battery packaging.. If the battery needs to be replenished, the professional personnel need to replenish the power according to the requirements.
  - When handling the battery, it should be carried in accordance with the direction required by the battery, with no inversion and tilt.
  - The battery should avoid impact.
  - Do not do welding, grinding and other similar work around the battery to avoid fire hazards caused by electric spark and arc.
  - Please use the battery within the operating temperature range specified in this manual.
  - Do not use damaged batteries (battery drops,collision,or case dents,etc.). Damaged batteries may cause the release of flammable gases, do not store damaged batteries near undamaged products.
  - Damaged batteries should not contain flammable materials, and non-professionals should not leave them away.
  - During the storage of damaged batteries, it shall be monitored to determine no signs of smoke, flame,electrolyte leakage or heating.

**Personal Security**

- Appropriate personal protective equipment should be worn during equipment operation. If faults that may cause personal injury or equipment damage, the operation shall be terminated immediately,report to the responsible person and effective protection measures shall be taken.
- Before using the tools, please master the correct use method of the tools to avoid hurting people and damaging the equipment.
- During equipment operation, the shell temperature is high,,and there is a burn danger.Plaese do not touch it.

- To ensure personal safety and normal use, reliable grounding shall be conducted before use.
- During battery failure, the temperature may exceed the burn threshold of the touchable surface, and contact should be avoided.
- Do not open or damage the battery. The released electrolytes are harmful to the skin and eyes, and you should avoid contact.
- Do not place unrelated items on the top of the device or insert into any position of the device.
- Do not place flammable items around the equipment.
- The battery is strictly prohibited to be placed in the fire to avoid explosion and personal safety.
- Do not place the battery module in water or other liquids.
- Do not short-circuit the battery terminals directly, it will cause combustion.
- The battery may cause a danger of electric shocks and large short-circuit current. When using batteries, the following precautions should be taken:

  a) Remove the watches, rings and other metal objects.

  b) Use tools with insulated handle.

  c) Wear rubber gloves and boots.

  d) Do not place tools or metal parts on top of the battery.

  e) Disconnect the charging power supply before connecting or disconnecting the battery terminals.

  f) Determine if the battery is accidentally grounded. If it is, remove the power supply from the ground.
- Do not clean the internal and external electrical parts of the cabinet with water or detergent.
- Do not stand,lean on or sit on the device.
- Do not damage the modules of the device.

**Battery Installation Requirements**

- Before installing the battery, check whether the packaging is intact. The damaged battery can not be used.
- During the process of battery installation, pay attention to the positive and negative poles, and do not short-circuit the positive and negative poles of the battery.
- During installation, use a torque wrench to ensure that the screws are tightened and check regularly.
- After installation of equipment, remove empty packing materials such as carton, foam, plastic, tie tape, etc.

**Hazard and Toxicity Instructions**

- Hazard: Battery terminals make contact with other metals and may cause heat or electrolyte leakage. The electrolyte is flammable, and if the electrolyte leaks, the battery should be immediately removed from the fire.

- Toxicity: Steam generated by battery combustion that may stimulate the eyes, skin, and throat.

**Emergency Measures for Abnormal Batteries**

- In case of electrolyte leakage or abnormal smell, avoid contact with the leaking liquid or gas. Non-professionals do not approach and please contact the professionals immediately. Professionals should wear goggles, rubber gloves, gas masks, protective clothing, etc., to prevent the harm caused by the electrolyte spillage
- Electrolyte is corrosive and contact cause skin irritation and chemical burns. f you come into contact with the battery electrolyte, the following measures need to be taken:

a) Inhalation: Evacuate the contaminated area, inhale fresh air immediately and seek medical assistance.

b) Eye contact: Immediately flush your eyes with plenty of water for at least 15 minutes without rubbing, and seek medical attention immediately.

c) Skin contact: Immediately wash the affected area with plenty of water and soap,and seek medical attention immediately.

d) Ingestion: Seek medical attention immediately.

**Emergency Measures for Fire**

- In case of a fire, the system should be powered down while ensuring safety.
- Use carbon dioxide or carbonic acid gas fire extinguishers to extinguish the fire. If the fire extinguisher is not available, cover the battery with sand or soil
- Firefighters need to avoid contact with high-voltage components during fire fighting, which may lead to the risk of electric shock.
- If the battery temperature is too high, the battery will be deformed, damaged and electrolyte spillage, leak toxic gas. Respiratory protection equipment should be worn and avoid close contact to avoid skin irritation and chemical burns.

**Emergency Measures for Flood**

- Power on the system for personal safety.
- If any part of the battery is flooded, do not touch the battery to avoid electric shock.
- Do not use the flooded batteries, and contact the battery recycling company for scrap treatment.

**Emergency Measures for Battery Drop**

- When installing the battery, if the battery falls or is subjected to strong impact, it may cause internal damage to the equipment. It is strictly prohibited to continue to use it,otherwise there will be safety risks (cell leakage,electric shock damage,etc.).
- After the battery falls,if there is obvious odor, damage, smoke,fire and other conditions, immediately evacuate the personnel,call the police in time,and contact the professionals. The professionals will use fire-fighting equipment to extinguish the fire and handle the situation while ensuring safety.

- After the battery falls, if there is no obvious deformation or damage to the appearance and no obvious smell, smoke, or fire, contact a professional to transport the battery to an open and safe place or contact a recycling company for disposal.

**Battery Recovery Treatment**

- Please dispose of the waste batteries according to the local laws and regulations. Do not dispose of batteries as household waste. Improper disposal of batteries may lead to environmental pollution.
- If the battery leaks or is damaged, please contact the technical support or battery recycling company for disposal.
- When the battery is beyond its useful life, please contact the battery recycling company for disposal.
- Avoid exposing waste batteries to high temperatures or direct sunlight.
- Avoid exposing waste batteries to high humidity or corrosive environments.

## 1.5 Storage Requirements

**General requirements**

- During the storage period, records should be made according to the product storage requirements of this manual, such as temperature,humidity and storage environment.
- Long-term battery storage is not recommended. There will be capacity loss in lithium batteries for long-term storage. After 12 months at the recommended storage temperature, the irreversible capacity loss is generally 3%~10%.
- The storage environment shall meet the requirements of the local regulations and standards.
- When stored beyond the specified period, it needs to be checked and tested by professionals before being put into use.
- When storing batteries, they should be placed correctly according to the packing box label, and do not be placed upside down or on their side.
- When stacking the battery packing boxes, it should meet the stacking requirements on the outer package.
- When handling batteries,it should be handled lightly,and strictly prohibit damaging them.

Storage Environment Equipment:

- Ambient temperature: -20℃ ~55℃, the recommended storage temperature: 25℃± 2℃.
- Relative humidity: 5% RH ~ 80% RH.
- Store in a dry, clean and well-ventilated area, and protect against dust and moisture. Avoid exposure to rain or standing water.
- Avoid contact with corrosive organic solvents, gases and other substances.
- Avoid direct sunlight.

## 1.6 Handling and Transportation Requirements

**Requirements for Loading and Unloading:**

The energy storage system should be loaded and unloaded in accordance with the local laws and regulations and industry standards, and rough handling will lead to short batteries in the box Road or damage, may lead to battery leakage, rupture, explosion or fire, etc.

Conditioning for shipment:

- Before the shipment, the battery must be checked as intact and no obvious odor, smoke, fire and other phenomena, otherwise the shipment is prohibited.

**Explain**

Products can be directly found on site and meet the transportation requirements of vehicles,ships,etc. The transportation packing box must be firm. During loading, unloading and transportation, we should be careful and take moisture-proof measures. Affected by the external environment (such as temperature, transportation, storage, etc.), the specifications of the product shall be subject to the factory date.

**Transportation Process Requirements:**

- Energy storage system does not support rail transportation and air transportation.
- The ocean shipping complies with the transportation requirements of the IMDG CODE and the International Maritime Dangerous Goods Rules.
- Land transport shall comply with the ADR or JT T617 transport requirements.
- Meet the regulatory requirements of the transport regulatory authorities in the transport starting country, route country and destination country.
- Comply with the international regulations for the transportation of dangerous goods and the regulatory requirements of the transportation regulatory authorities in the corresponding countries.

**Handling or Transportation shall be Prohibited during the Following Period:**

- Rain and snow directly shower or fall into the water.
- Drop or mechanical impact.
- Invert or pour.

If the above abnormal situation occurs, please handle it according to the emergency measures.

## 1.7 Installation Environment Requirements

- The device can be installed both indoors and outdoors. Since the device may produce noise during operation, if it is installed indoors, it is recommended to keep a distance from the bedroom.
- The installation and use environment shall comply with the local laws,regulations and relevant international national and regional standards for lithium battery products.
- The installation location is not accessible to children, far away from the daily work and living areas.

- For installation in a garage, it should be far away from the direction of the vehicle travel. It is recommended to install the energy storage on the wall that above the car bumper to avoid accidental collisions.
- For installation in the basement, ventilation should be maintained. Do not place inflammable and explosive items around the equipment. It is recommended to install on the wall to avoid water.
- Install it in a dry, well-ventilated environment and secure the equipment on a sturdy, flat support surface.
- Please choose an installation location with shelter or build a sunshade to avoid direct sunlight or rain
- The environment around the installation location should be clean, and there is no large amount of infrared radiation,organic solvents,corrosive gases,etc..
- In the areas with frequent natural disasters such as flood, mudslide, earthquake and typhoon, corresponding preventive measures should be taken for installation.
- The installation position is far away from the fire source and heat source. Do not place flammable and explosive items around the equipment.
- Installation position to avoid water accumulation, and away from water sources such as faucets,water pipes, sprinklers and other places, to avoid water infiltration.
- When the equipment is running, the temperature of the chassis and the cooling fins will be relatively high, do not install it in a location that is easily touched.
- When the equipment is running, do not block the vents or cooling system to prevent high temperature even fire.
- It is forbidden to place the equipment in an environment of flammable, explosive gas or smoke, and to prohibit any operation in this environment.
- Do not be installed in ships, trains, cars and other mobile scenarios.
- In backup scenarios, do not use the power supply for the following purposes:
  a. For medical equipment directly related to human life.
  b. For trains, elevators and other control equipment, which may cause personal injuries.
  c. For computer systems of social and public importance.
  d. For locations near medical devices.
  e. Equipment similar to the above description.
- Energy storage will be corroded when installed in salt areas. Do not install outdoors in salt areas. Salt damage area refers to the area within 500m from the coast or affected by the sea breeze. The areas affected by the sea breeze vary according to the meteorological conditions (e. g., typhoons, seasonal winds) or the terrain (with dikes, hills).

**Explain**

- The operation and service life of the energy storage are related to the working temperature. Please install the energy storage at the temperature equivalent to or better than the ambient temperature.
- The working environment temperature of battery is -20℃ ~60℃ and the optimal operating temperature is 10~30℃.

## 1.8 Mechanical safety

**Drilling Safety**

The following safety precautions should be considered when drilling on the wall and above the ground:

- Goggles and protective gloves should be worn when drilling holes.
- In the process of drilling, the equipment should be blocked to prevent the debris from falling into the equipment. After drilling, the debris should be cleaned and cleaned in time.

**Safety in handling Heavy Objects**

- When handling heavy objects, we should be prepared to avoid being crushed or sprained by heavy objects.
- When handling the equipment by hand, protective gloves should be worn to avoid injury.

## 1.9 Tuning and Testing

When the equipment is powered on for the first time, it is necessary for professionals to set the parameters correctly. The wrong setting may cause the equipment to disagree with the local country, region certification and affect the normal operation of the equipment.

## 1.10 Maintenance and Replacement

Note: During the operation of the equipment, there is a high voltage, which may produce electric shock, resulting in death, serious personal injury or serious property damage. Therefore, before any maintenance work, the equipment must be powered down and operated in strict accordance with the safety precautions listed in this manual and other relevant documents.

- Please maintain the equipment when you understand the contents of this manual and have suitable tools and test devices.
- Before the maintenance work, please power down the equipment first, then follow the instructions of the delay discharge label, and wait for the corresponding time to ensure that the equipment is powered off before operating the equipment.
- During maintenance, avoid irrelevant personnel entering the maintenance site, and temporary warning signs or fences must be erected for isolation.
- If the equipment fails, please contact your dealer in time for handing.
- The fault must be handled before the equipment can be powered on, otherwise the fault may

cause expansion or equipment damage.

- Unauthorized person do not open the cover plate, otherwise there will be a danger of electric shock, and the fault caused by this does not belong to the scope of warranty.
- Operation and maintenance personnel shall conduct adequate training in safe use and equipment maintenance, and shall operate with adequate precautions and equipped with personal protective equipment.
- When you need to move or rewire, the power input must be cut off. After waiting for 5 minutes, the internal energy can be discharged, and using a multimeter to confirm that there is no dangerous voltage on the DC bus and the internal parts of the machine to be repaired, maintenance can begin.
- Maintenance of the battery shall be performed or supervised by persons familiar with the battery and its required precautions.
- When replacing the battery, please replace the same type of battery or battery pack.
- After the maintenance operation, check to ensure that no tools or other parts are missing in the equipment immediately.
- If the equipment is not used for a long time, you need to store batteries and recharge it according to this manual.
- Remote maintenance service support. maintain the Ethernet or WIFI connection after the installation and normal operation, otherwise the remote maintenance will be affected.

# 2. Product Introduction

## 2.1 Product Introduction

**Function**

The M LFP Battery 280Ah module can stored and release power according to the requirements of the hybrid inverter management system.The input and output ports on the Nova2000 battery module are low-voltage DC.After matching with the bybrid inerter,it can support the output of single phase/three phase AC.

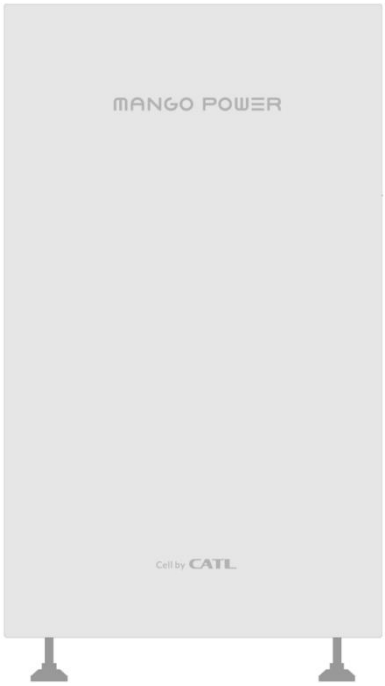
- Battery charging/discharging: The battery module is connected to the hybrid inverter e nergy storage terminal(BAT+,BAT-)in the hybrid inverter under the control of the dev ice,charge/discharge the battery.

**Description of Energy Storage Capacity**

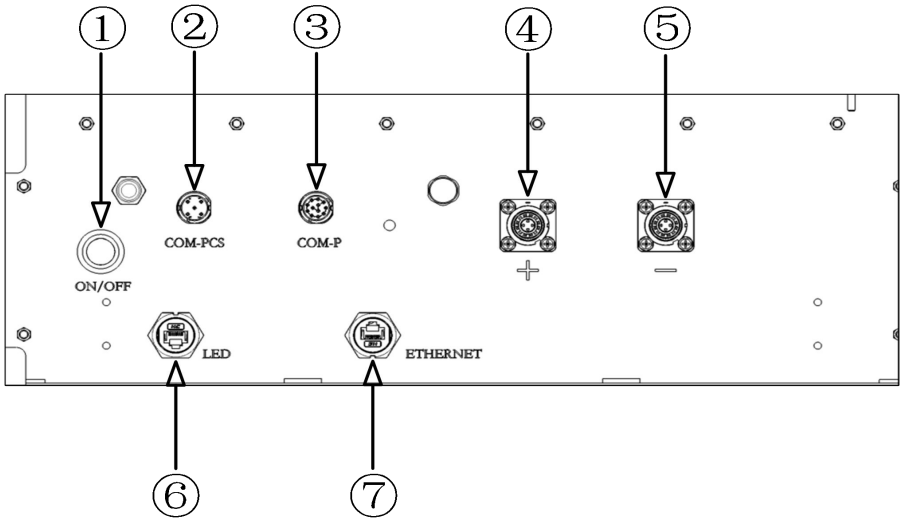
M LFP Battery 280Ah supports capacity expansion, the system can support up to 16 battery modules in parallel.

## 2.2 Appearance Description

**Home Storage System**




**Interface Definition of the Battery Module**



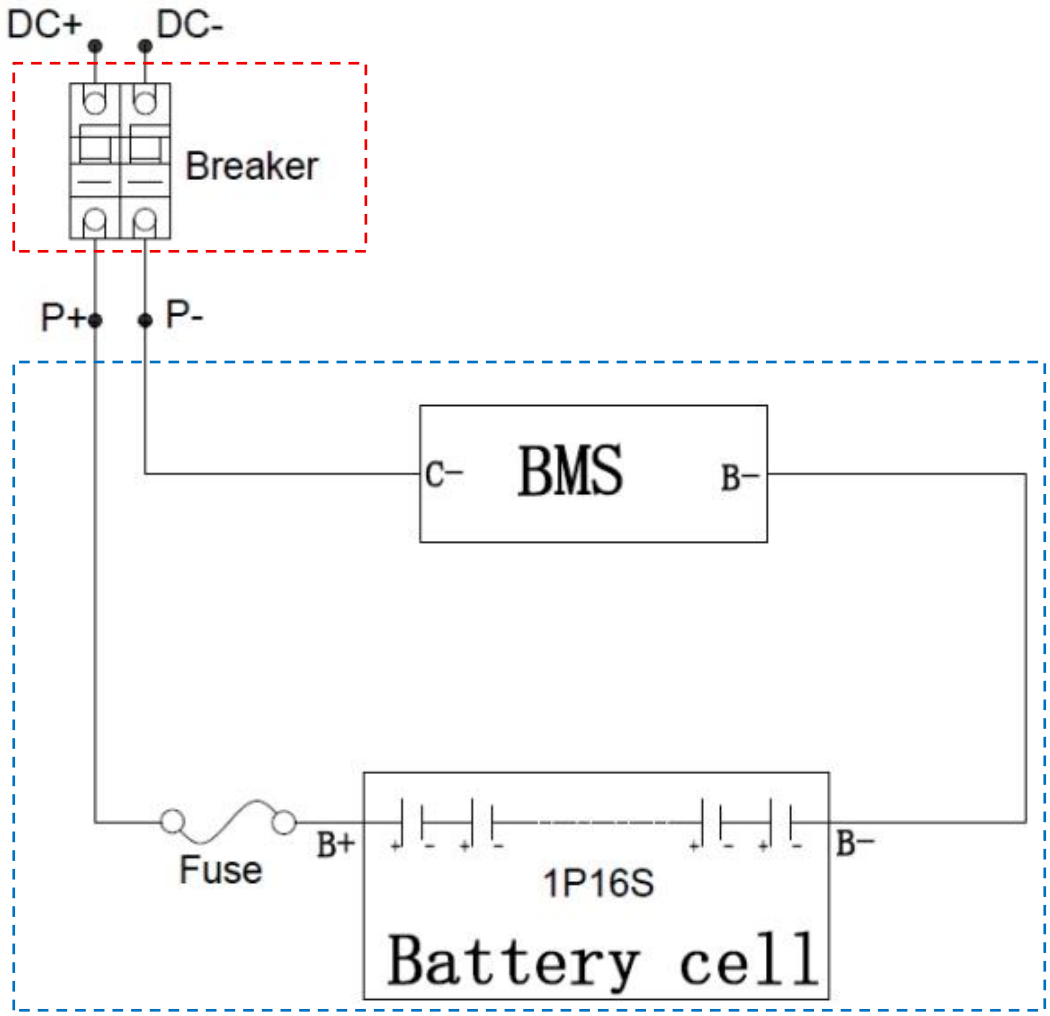

Description of the operation surface and the interface:

| No. | Name | Description |
|---|---|---|
| 1 | ON/OFF | The system enters the normal operation state or the shutdown state |
| 2 | COM-PCS | For connecting to the PCS communication module |
| 3 | And machine interface | For connecting the electric box parallel module |
| 4 | Positive electrode interface | For connecting the battery module positive electrode |
| 5 | Negative electrode interface | For connecting the battery negative electrode |

| | | |
|---|---|---|
| 6 | Light belt interface | For connecting the indicator light |
| 7 | Ethernet port | For connecting to the router |

**A Circuit breaker (as shown below) need to be installed between the positive and negative poles of the battery and the inverter.**

Output terminal connection diagram：




Recommended breaker specification:

Rated working current:250A; Number of poles:2P; Running short-circuit capability: Ics-10kA.

## 2.3 Labeling Description

**Warning Logo**


| Warning Logo | Marking Description | Meaning |
|---|---|---|
|  | Recycling Logo | Remind the operator that the recycling of scrapped products should be conducted through special recycling channels. |
|  | Battery Recycling Logo | Remind the operator to consult the local environmental protection authorities when the battery is scrapped and seek resource recovery at local disposal points. |
|  | Prohibition of Indiscriminate Disposal | Waste batteries are prohibited to be discarded at will, and operators should seek qualification authorities for legal and compliant disposal. |
|  | Wear Goggles | Remind operators to wear protective glasses during installation, repair and disassembly. |
|  | Check the Instructions | Remind the operator to check the instructions of the energy storage product along with the box |
|  | Take Care | Remind the operator to pay attention to the safe use of electricity when using the product |
|  | Be aware of the Explosion | Remind the operator to stay away from the inflammable and explosive places or areas when installing the product |

**Data Plate**

**Rechargeable Li-ion Battery System** MANGO POWER

| | |
|---|---|
| Product Model : | M LFP Battery 280Ah |
| Battery System Designation: | IFpP73/175/206[16S]M/-20+60/95 |
| Nominal Voltage: | 51.2Vd.c. |
| Short Circuit Current: | 1000A |
| Duration at Short Circuit Current: | 800μS |
| Rated Capacity: | 280Ah |
| Size: | 525(W)x297(D)x935(H)mm |
| Weight: | 99kg |
| IP Code: | IP66 |

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Note: The material of the nameplate is AL(aluminum) 1060 and physicallyengraved, the front surface finish is greater than 0.8 Ra, and meets the material standard requirements.

## 2.4 Product Characteristics

**Easy to Install**

- System installation is wall-mounted to save installation space.

**Flexible Expansion**

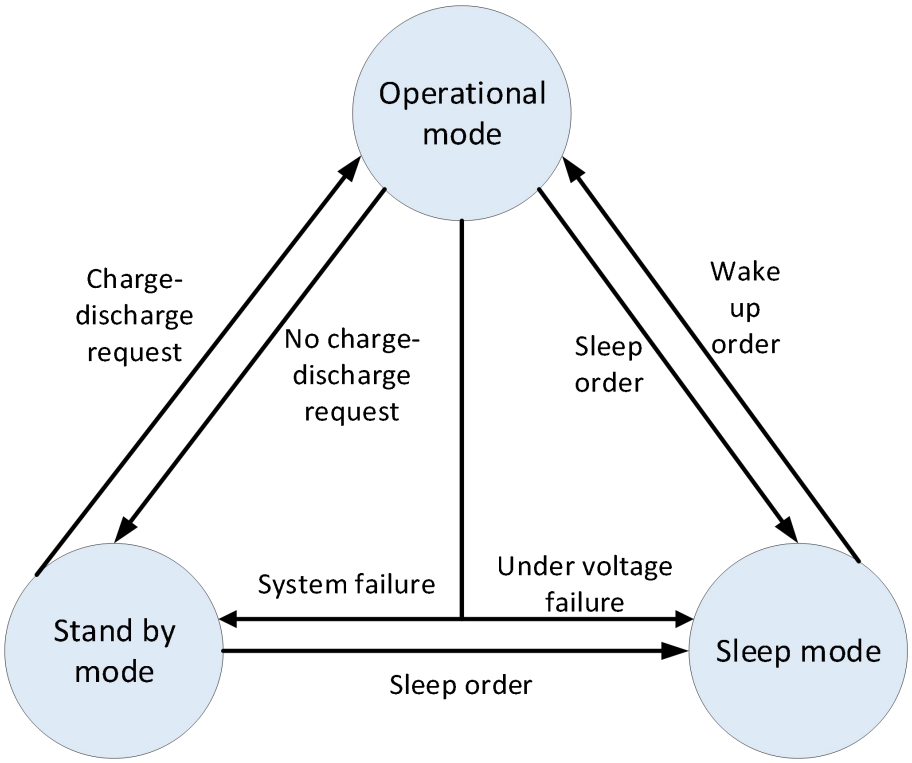
- The system supports the battery capacity expansion.

**Intelligent Operation and Maintenance**

- The factory Settings meet the default Settings of the main target market, and it can be started with one button.
- The mobile APP can be used to realize all remote and near end operations
- The cloud data management system is adopted to manage the energy storage system anytime and anywhere.

## 2.5 Operating Status

**Schematic Diagram of Running State Switching**




# 3. System Installation

## 3.1 Check before Installation

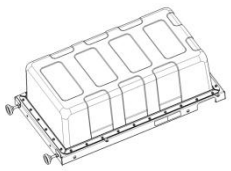
**Check the outer packaging**

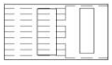
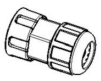
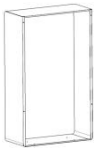
Before unpacking the storage package, check for visible damage, such as holes, cracks or other interior signs of possible damage. For any packaging packaging do not open and contact your dealer as soon as possible.

**Check delivery**

After unpacking the energy storage package, please check whether the deliverable is complete and complete for any obvious external damage. If there is any missing or damage, please contact your dealer.

**List of Delivery Boxes**

| No. | Product | Specifications | Quantity | unit | Accessories number | Remarks |
|---|---|---|---|---|---|---|
| 1 | Battery box | BB-LFP-280Ah-P | 1 | set | — |  |
| 2 | Accessories -electric | Backboard wall mount | 1 | pcs | A1 |  |

| | | | | | | |
|---|---|---|---|---|---|---|
| | box | M6*50 Bolt | 4 | pcs | A2 |  |
| | | Positive and negative pole line (25mm²/600V/-40~105℃/750mm; Crimp type 150A/1500V; SC25-6) | 2 | pcs | A3 |  |
| | | Ground lead (6mm² /600V/-40~105℃/ 1000mm; SC6-6) | 1 | pcs | A4 |  |
| | | RJ 45 Crystal head | 1 | pcs | A5 |  |
| | | Waterproof Grange Head | 1 | pcs | |  |
| | | Box body decoration | 1 | pcs | A6 |  |
| | | M4*16 combination bolts | 4 | pcs | A7 |  |
| | | User's manual | 1 | pcs | — |  |

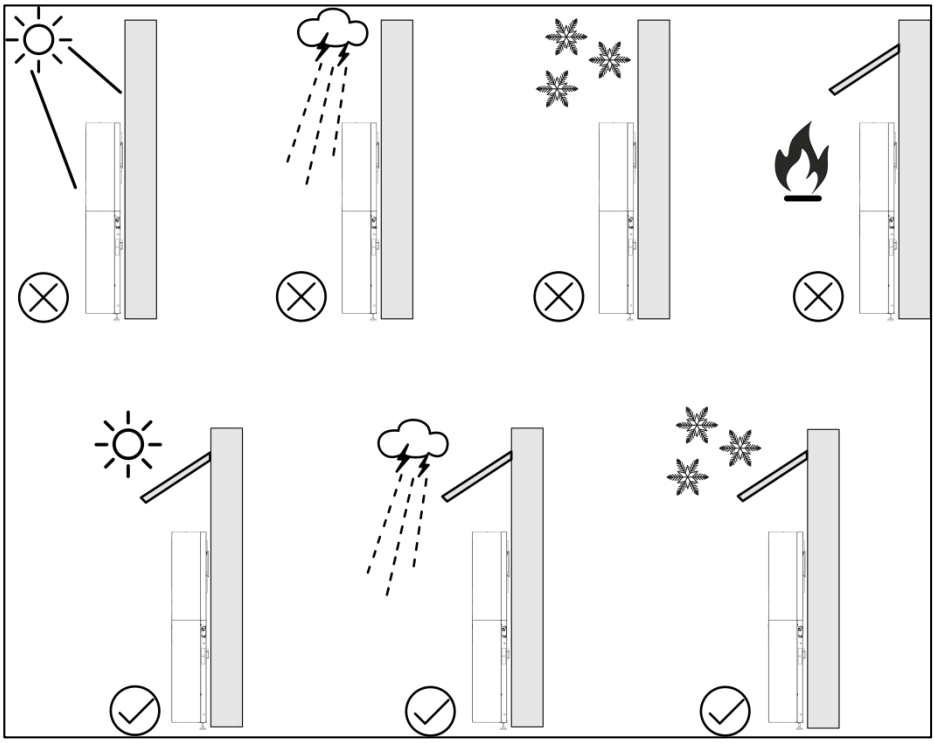
## 3.2 Select the Installation Location

Select a location to install the product, and consider the following factors:

- Do not install the product in an airtight confined space. In order to avoid overheating of the equipment, please ensure the mobility of the air around the product.
- Avoid direct sunlight and ambient high temperature, otherwise it will lead to its operating temperature is too high, thus affecting the normal service and life of the product.
- The designed charge and discharge temperature of M LFP Battery 280Ah series products range is-20~60℃, the optimal operating temperature is 10~30℃, and the ambient temperature of installation should be within the range.
- If more than one set of backup power system products is installed at the same time, a

minimum of 500mm clearance between adjacent equipment.

**The Recommended Installation Location Indicates**



It meets the requirements of Grade 0 in GB/T 1766 - 2008 under the test method of ISO 11507:2007.

Safety Tips: Do not store or place any items around the power supply product.

## 3.3 Installation Steps

## Step One

1. Select a wall area approximately 1200*900 mm. If the number of batteries installed is ≥ 2, please keep the distance ≥ 500mm

2. Open packages, and retrieve parts A1.

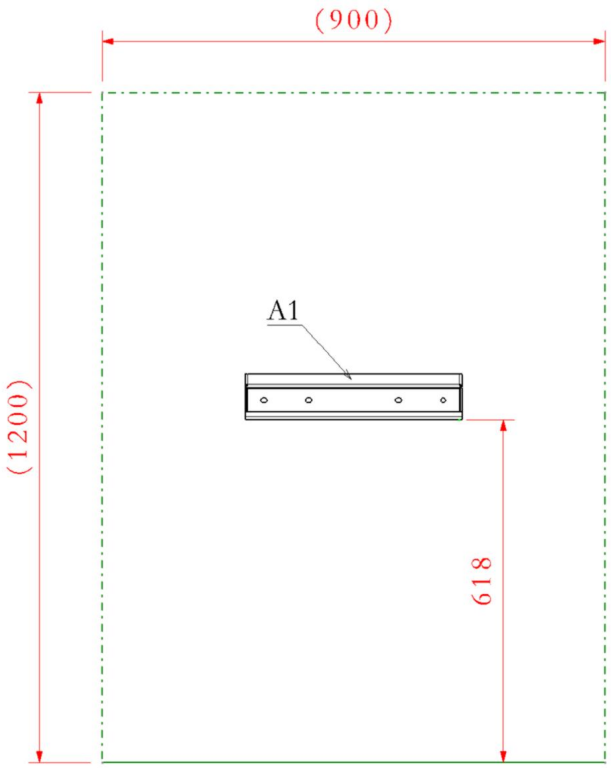
3. Position parts A1 according to the dimensions shown in Figures 1.1-1 and 1.1-3.

4. Mark the positions for parts A2 (M6*50 expansion bolts) by aligning them with the four holes in A1. Drill holes using an impact drill (recommended drill bit diameter: 8 mm), as shown in Figure 1.1-2.

5. Mount A1 on the wall with expansion bolts. Tighten the M6 expansion bolts with a cordless drill, recommending a torque of 5 N.m.

**Note:**

**You can use a band tape, spirit level, and marker pen to assist in positioning the holes.**




Unit: mm

**Figure 1.1-1**

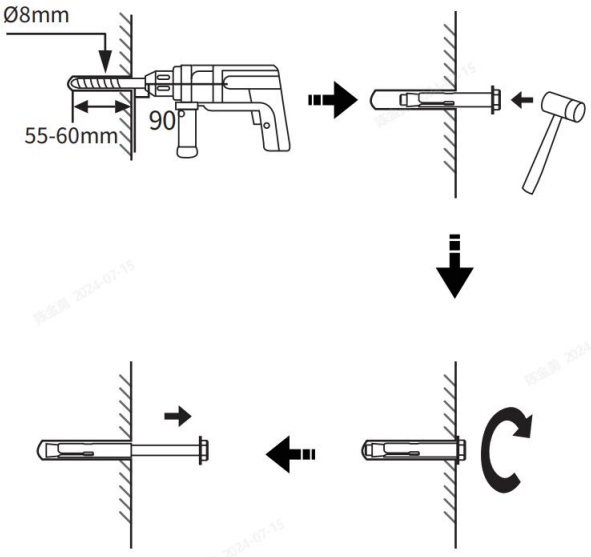



**Figure 1.1-2**

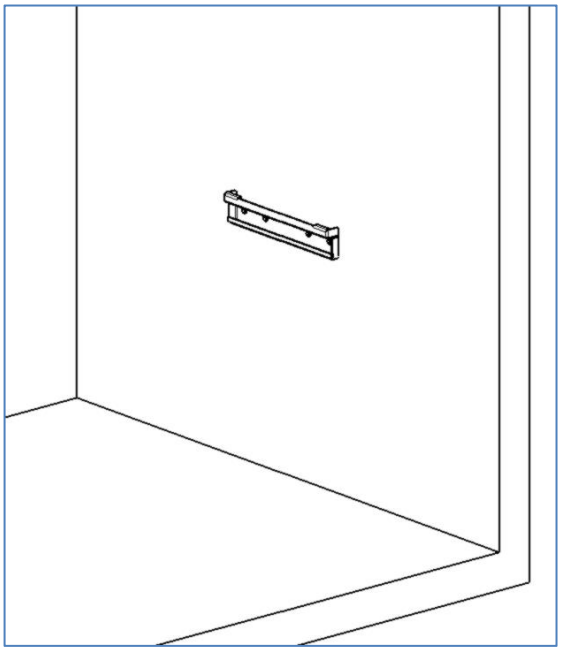


**Figure 1.1-3**

## Step Two

1. Use the recommended lifting trolley, as shown in Figure 2.2-2, to install the lifting arm and pins in the hoist hole positions on both sides of the Pack. Install the cordless drill in the indicated position and turn it on to lift the Pack approximately 150 mm, to the position shown in Figure 2.2-3.
2. Install the cordless drill in the position shown in Figure 2.2-3, turn it on to raise the Pack to a vertical position as shown in Figure 2.2-4. Note that the pins must be inserted into the U-shaped slot.

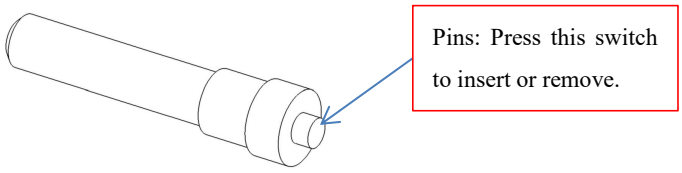



**Figure 2.2-1**

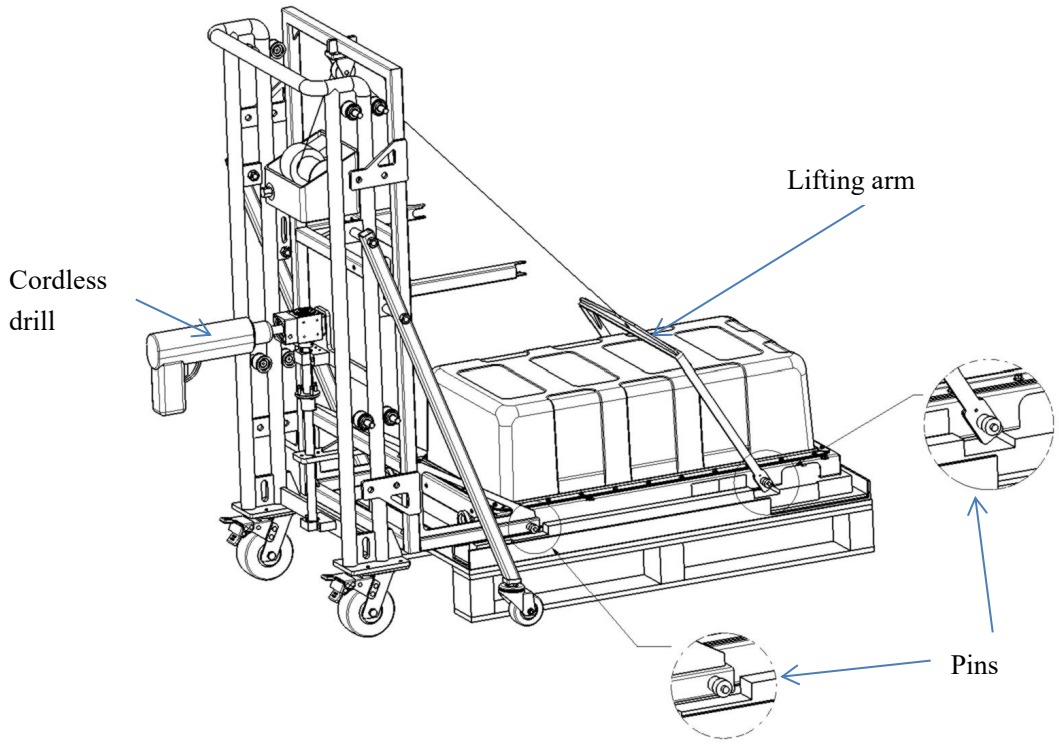



**Figure 2.2-2**

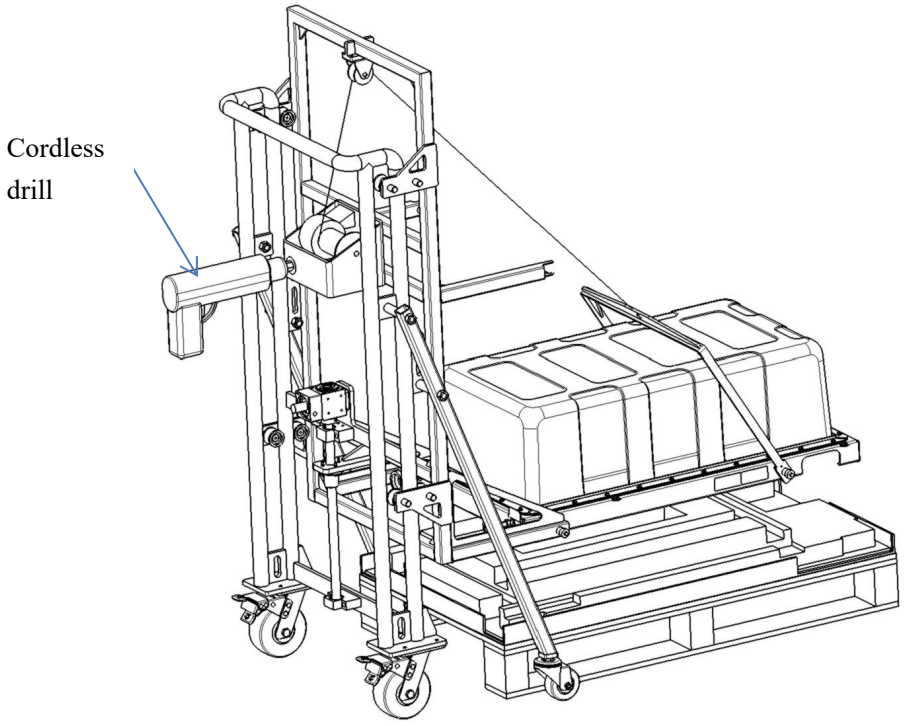



**Figure 2.2-3**

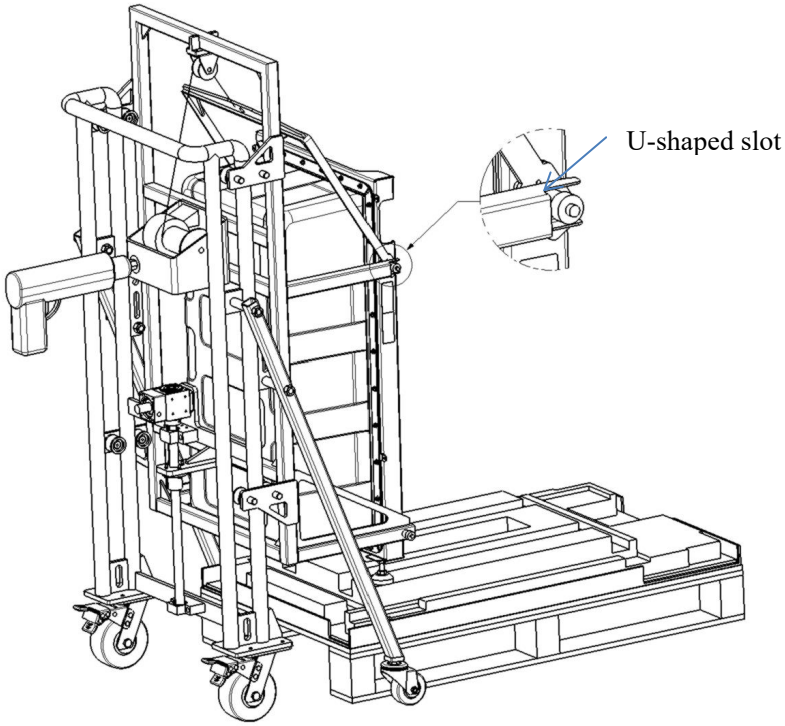



**Figure 2.2-4**

## Step Three (Optional)

As shown in Figure 2.3, if the recommended lifting trolley is not used, you can opt for four Manual lifting pins, which should be installed in the hoist hole positions on both sides of the Pack. Four people can lift and set the Pack upright.

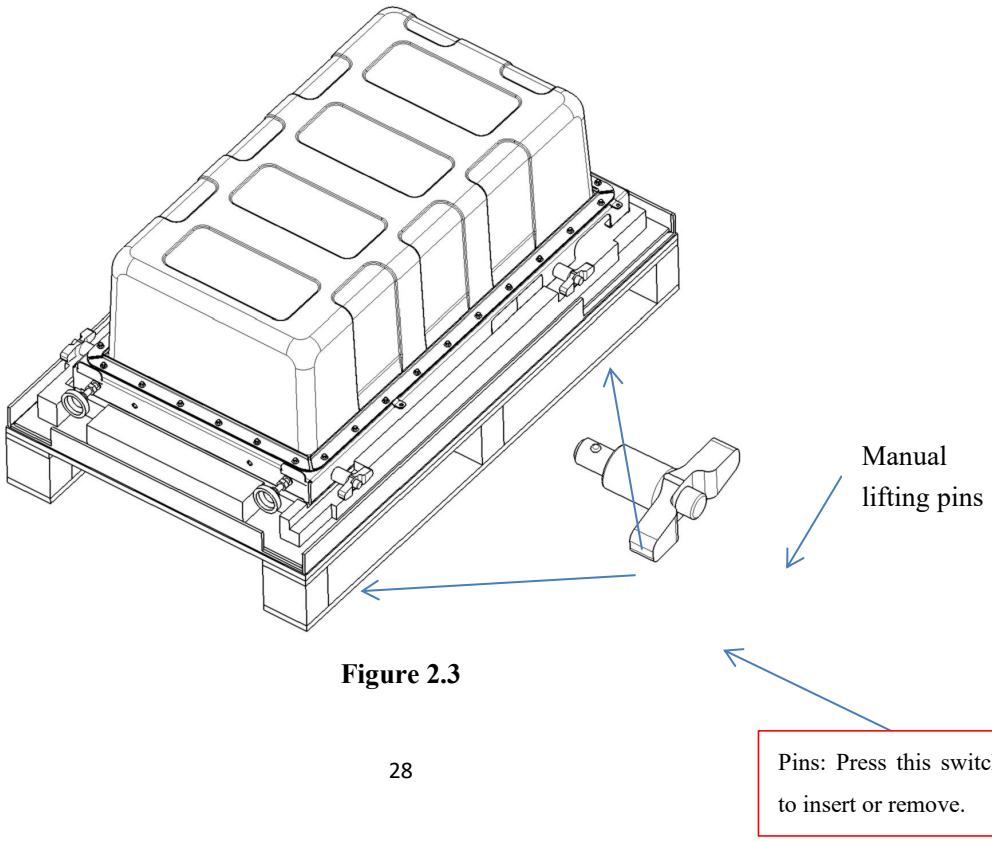
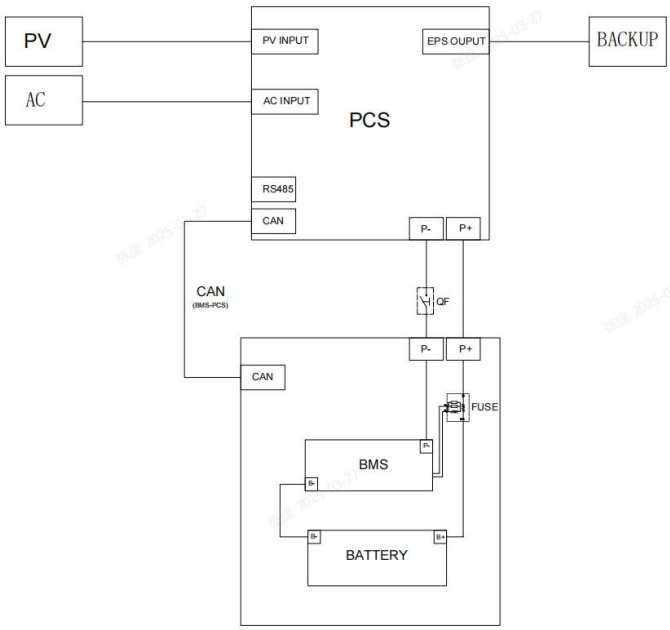



**Figure 2.3**

## Step Four

The system simplifies the circuit diagram.




*There is CAN communication line (BMS-PCS) connected between the battery and the inverter, ESD monitoring is achieved via inverter monitoring.

DC connection. As shown in Figure 2.4, connect A3 (the orange wire is the positive, the black wire is the negative) to the upright Pack.

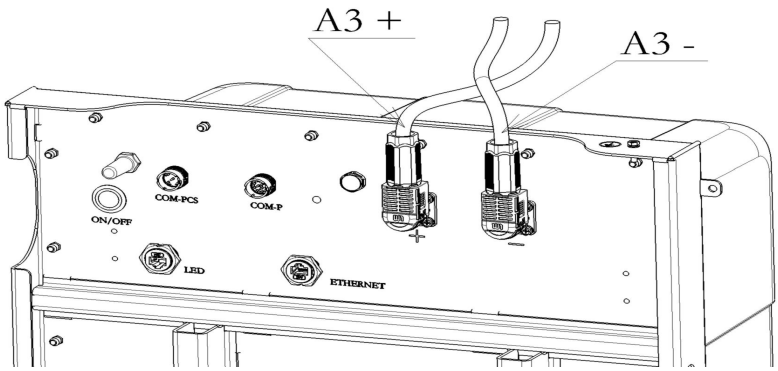



**Figure 2.4**

## Step Five

1. As shown in Figure 2.5-1, push the lifting trolley close to the wall and adjust it left and right to align with part A1. Turn on the cordless drill to adjust the Pack's vertical position, and finally hang the Pack on A1, as shown in Figure 2.5-2. Ensure the Pack is in an upright position.
2. Before removing the lifting trolley, adjust and lock the leveling feet of the Pack using an adjustable wrench for assistance..

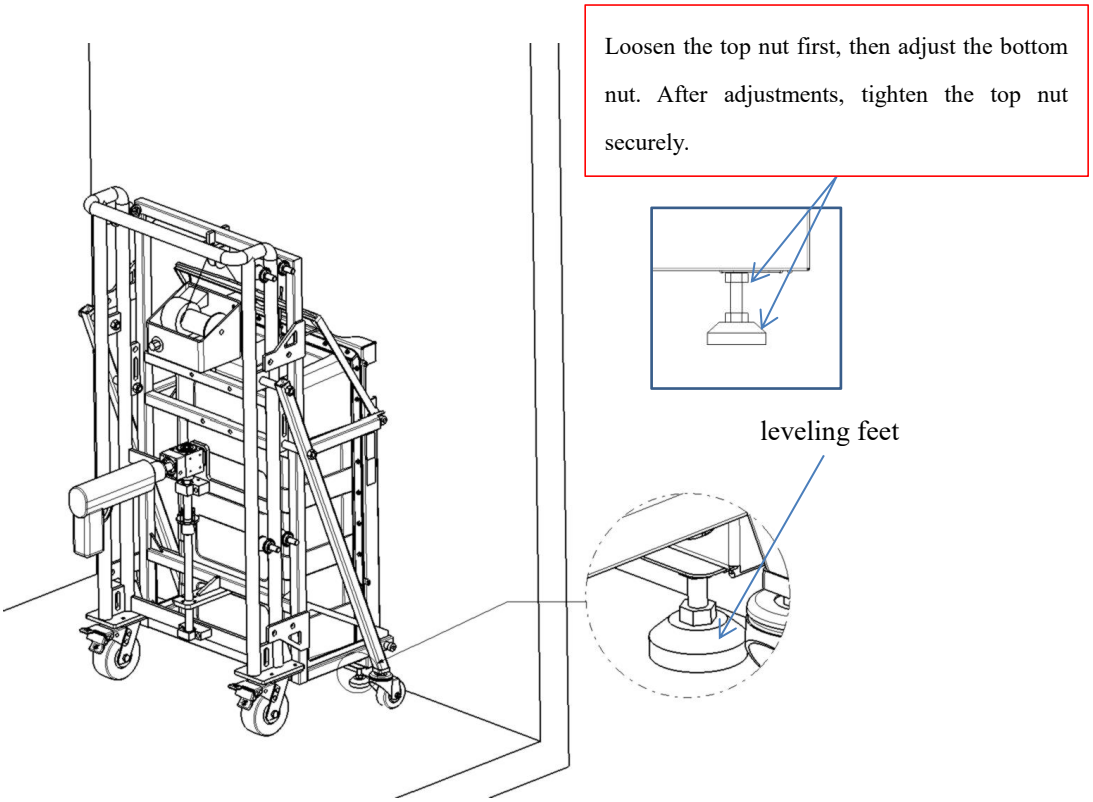



**Figure 2.5-1**

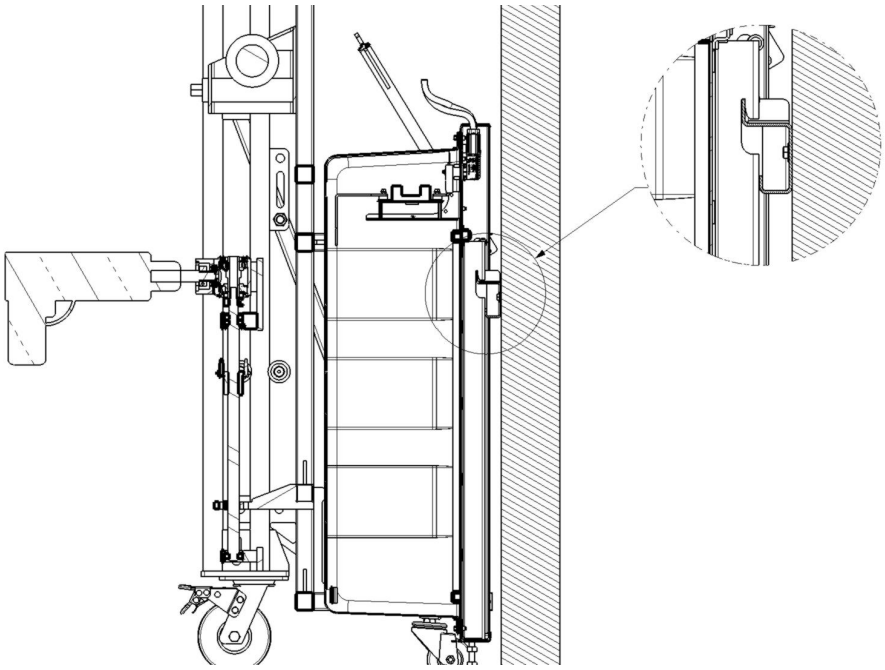


**Figure 2.5-2**

## Step Six

**Electrical Connections**

**Note:**

**•To prevent errors, connect the cables according to the following installation sequence!**

**•Ensure that the battery module switch is in the OFF position!**

**① Install the Internal Protective Grounding Cable**

As shown in Figure 2.6-1, use part A4 to connect the Pack ground point to the grounding network.

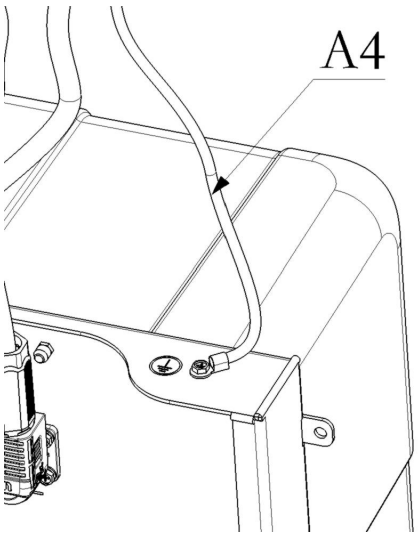



**Figure 2.6-1**

**② Install the inverter communication cable**

As shown in Figure 2.6-2, use part A5 to connect the Pack to the inverter. After the communication cable is connected, the settings will be automatically recognized by inverter. The battery uploads current, voltage, temperature and other data to the inverter.

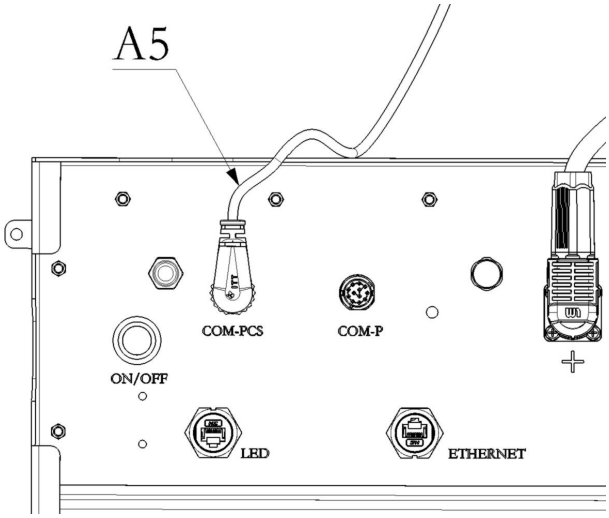



**Figure 2.6-2**

**③ Install the Router Communication Cable**

As shown in Figure 2.6-3, use part A6 to connect to the customer's router, and lay the cable according to the on-site survey.

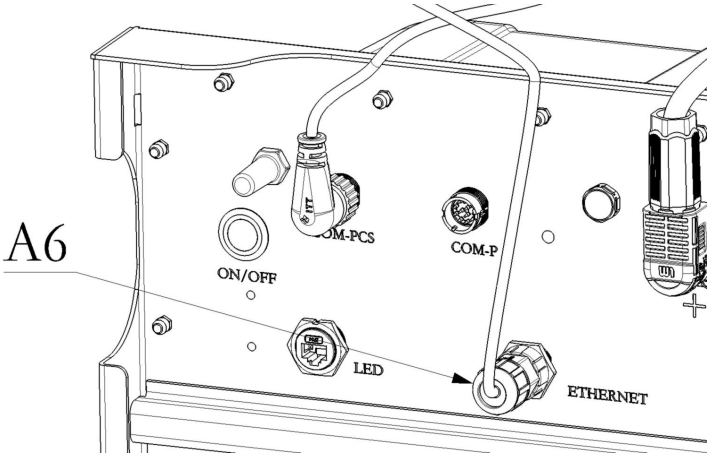


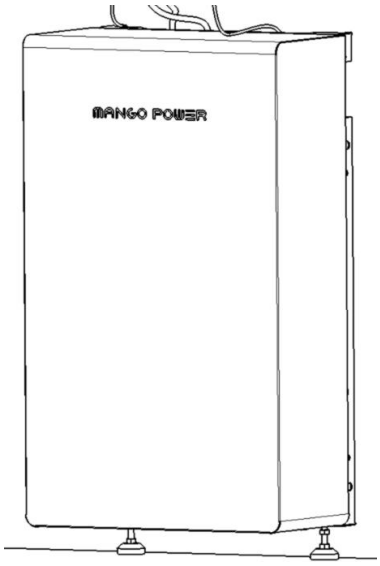

**Figure 2.6-3**

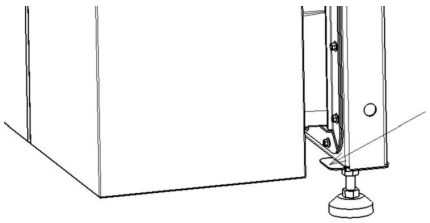
**Note: The home storage system can be connected to the router via Wi-Fi or an Ethernet cable.**

## Step Seven

1. Place the bottom of part A7 against the limit plates on both sides of the Pack's bottom, then use 4 bolts from part A8 to fix part A7 to the Pack, as shown in Figure 2.7-1.

2. After the pack is fully secured, first attach the decorative cover to the limit plates, then fasten it to the pack from the side using four screws.



Limit plate

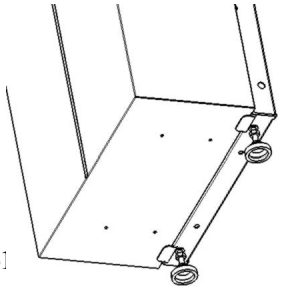


**Figure 2.7-1**

## 3.4 Check after Installation

| No. | Acceptance Level |
|---|---|
| 1 | The energy storage is installed correctly, firmly and reliably. |
| 2 | Cable layout is reasonable to meet user requirements. |
| 3 | Tie the line belt should be uniform, and leave no sharp corners at the cut. |
| 4 | The ground wire connection is correctly, firmly and reliably. |
| 5 | The metal push-button light is in the OFF state. |
| 6 | The DC input line and the signal line are connected correctly and firmly and reliably. |
| 7 | The installation space is reasonable, the environment is clean and tidy, and there is no construction remains. |

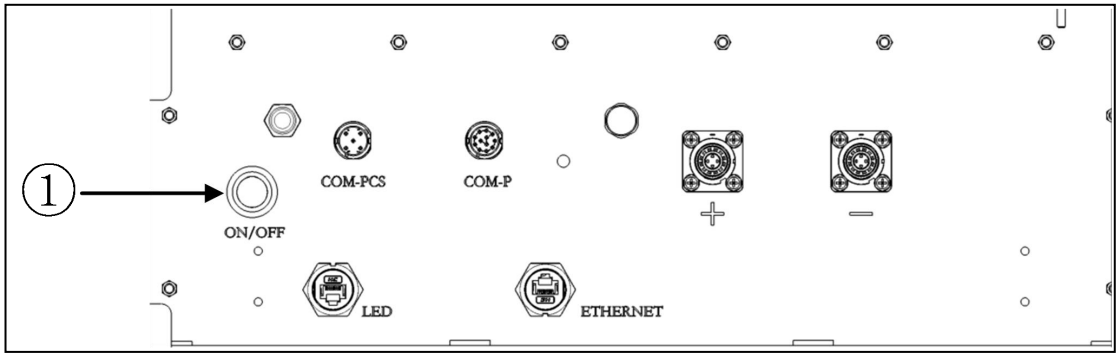
# 4. System on and off

# 4.1 Initial Power-on

Follow these steps to turn on the inverter

1) Ensure that the inverter is not working;
2) Close the AC circuit breaker between the inverter On Grid port and the Grid;
3) Turn on the PV DC switch on the inverter (when connected to PV);

4) Close the DC switch between the battery and the inverter
5) Turn on the battery ;




6) The inverter starts to run after the self-test is successful;
7) Close the AC circuit breaker between the inverter Back up port and the load.

# 4.2 System shutdown

1) Make sure all inverter loads are turned off;
2) Cut the AC circuit breaker between the inverter Back up port and the load.
3) Cut the AC circuit breaker between the inverter On Grid port and the Grid;
4) Turn off the PV DC switch on the inverter (when connected to PV);
5) Disconnect the DC switch between the battery and the inverter.
6) Turn off the battery and

# 5. System Maintenance

## 5.1 General Maintenance

Supplementary electrical treatment is required for a certain period of battery storage. Please refer to the user manual for details.

| Inspection Items | Check Methods | Maintenance Intervals |
|---|---|---|
| System Running State | ● Observe whether the energy storage appearance is damaged or deformed.<br>● Listen to whether there is abnormal sound during operation.<br>● When the energy storage is running, check whether the energy storage parameters are set correctly. | Once every six months |
| Electrical Connection | ● Check whether the cable connection is falling off and is loose.<br>● Check the cable for damage, paying | Half a year after the first test, every six months to a year |

| | | |
|---|---|---|
| | particular attention to the sheath near contact points with metal surfaces to check for signs of cuts or abrasions.<br>● Check whether the unused DC input terminal, energy storage terminal, COM interface, and waterproof cover are in a locked state. | |
| Ground Reliability | ● Check whether the grounding cable is reliably grounded. | Half a year after the first test, every six months to a year |

## 5.2 Problems and Troubleshooting

| No. | Fault Phenomenon | Analysis of Causes | Terms of Settlement |
|---|---|---|---|
| 1 | No DC output after startup | Low battery voltage, overdischarge protection | Charge |
| 2 | The indicator light is not on after starting | BMS sleep state | Restart the reset switch |
| 3 | Displays insufficient power | 1. The battery module voltage is too low or the core voltage in the module is low.<br>2. Not grid-connected storage for a long time. | 1. Timely connect to the grid for power supply.<br>2. If the alarm still exists after 1 hour of charging, please contact the dealer. |
| 4 | Short power supply time | The battery pack was not fully charged for a long time | Timely grid connection for full charge correction. |

# 6. Technical Data

## Product Specifications

| Product Model | **M LFP Battery 280Ah** |
|---|---|
| **System Parameter** | |
| Levels of Protection | IP66 |
| Working Temperature (℃)[*1] | -20 ~ 60 |
| Operating Humidity (%) | 5~95 (no condensation) |
| Working Altitude (m) | <2000 |

| | |
|---|---|
| Cycle Index*2 | 8000 times @ 25℃,0.5C charge and discharge @ 70% SOH |
| Cooling-down Method | Natural cooling |
| Display Mode | Battery indication / Operating status / APP |
| Communication Mode | Ethernet / WiFi / Bluetooth (Remote Query and Control) |
| Nominal Capacity (kWh)*3 | 14.3 |
| Dimensions (W*D*H) (mm) | 525*297*935 |
| Weight (kg) | 99 |
| **Attestation** | |
| Safety Regulations Certification | IEC 62109-1/ IEC 62109-2/IEC 61000-6-1/ IEC 61000-6-3 |
| Grid Certification | VDE-AR-N 4105/EN 50549-1/ TORErzeugerTypA /OVE-RichtlinieR25 |
| Battery System Certification | IEC 62619/UN 38.3/CE-EMC/IEC 60730-1 |

**Supplementary Specification:**

* 1 Operating temperature: When the ambient temperature is> 45℃, the battery module charge and discharge current (power) decreases from the temperature and SOC state.

* 2 Standard cycle times: refers to the cumulative number of the nominal capacity of each charge / charge under the condition that the cell voltage is 2.8V-3.6V, the cell temperature is 25℃± 2℃, and the charge and discharge current is 0.5C;

* 3 Nominal capacity: refers to the initial capacity of the battery module under the condition of 100% DOD, charge-discharge current 0.5C, and cell temperature 25℃± 2℃.

## Declaration of Compatibility between Battery System and Inverter

We

Certificate holder Shenzhen Xihe Future Technology Co., Ltd.

declare under our sole responsibility, that the selected inverter model is compatiblewith the specified battery system and possesses the following technicalspecifcations:

-Battery system model

| ***Product*** | ***Trade Name*** | ***Model Number*** |
|---|---|---|
| Rechargeable Li-ion Battery System | Mango Power | M LFP Battery 280Ah |

-Inverter model

| ***Inverter Brand*** | ***Inverter Logo*** | ***Model Number*** |
|---|---|---|
| Mango Power | MANGO POWER | M Hybrid Inverter 6kW |

-Note: The battery power of the matching inverter shall not be higher than the rated discharge power of the battery system.

-Compatibility Confirmation: It has been verified that the battery system and inverter meet the required technical specifcation, ensuring stable operation of the system and maximizing efficiency and performance.

This declaration applies only to the specifed battery system and inverter models

Additional confirmation and testing may be required for other models.

Manufacturer: Shenzhen Xihe Future Technology Co., Ltd

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Address: Room 1814-1815, Xusheng R&D Building, Zone Xifa B, Gonghe Industrial Road, Gongle Community, Xixiang Street, Baoan District, 518102, Shenzhen, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA

Signature and company chop: Zhifei Xiong

Name and Title: Zhifei Xiong, Senior Manager

Date：14-05-2025