

# User Manual



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## Preface


### Statement

The products, services or features you purchase shall be subject to the business contract and terms of the Company, and all or part of the products and services features described in this document may not be within the scope of your purchase. Unless otherwise agreed in the contract, the company makes no express or implied representations or guarantees about the contents of this document.

### Keep the Manual Properly

This manual serves as an integral part of this equipment, and you may print out the electronic copy of the user's manual on paper as needed, and keep the paper and electronic files in a safe place for subsequent reference. Anyone operating the device at any time must follow the requirements of this manual.

### Trademark Statement

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## Overview




This manual mainly introduces the product introduction, application scenarios, installation and commissioning, system maintenance, and technical data of the energy storage system. Please read the product instructions carefully before installation, operation and maintenance. This manual contains important safety instructions and installation instructions that must be observed during the installation and maintenance of the equipment.



## Intended Audience

This manual is applicable to the professional electrical technicians responsible for the installation and commissioning of the energy storage system.

## Symbol Description

In order to ensure the personal and property safety of users when using the energy storage system, and the efficient use of the product, the manual provides the relevant safe operation information and the use of the corresponding symbols to highlight. The new party must fully understand and absolutely comply with these emphasized information to avoid personal injury and property damage. The following lists the symbols used in this manual.

	"Danger" indicates a high potential danger and failure to avoid it will lead to casualties.
<b>Danger</b>	
	"Warning" indicates a moderate potential danger and failure to avoid it will lead to casualties.
<b>Warning</b>	
	"Caution" indicates mild potential danger and failure to avoid it will lead to moderate or mild injury to the person.
<b>Caution</b>	

	"Attention" indicates a potential risk of failure to avoid conditions that may cause the equipment to operate properly or cause property damage.
Attention	
	"Tip" is the additional information in the manual, emphasizing and supplementing the content, and may also provide tips or tricks for optimizing the use of the product to help you solve a problem or save your time.
Tip	

### Statement

The "Danger", "Warning", "Caution", "Attention", "and" Tip" items in the manual do not represent all safety matters to be observed, and you must comply with relevant international, national or regional standards, and industry practices. **The Company shall not assume any liability for the violation of safe operation requirements or the safety standards for the design, production and use of equipment.**

**The Company is not liable for any of the following circumstances or the results caused:**


- The equipment is damaged due to force majeure such as earthquakes, floods, volcanic eruptions, debris flows, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, and other extreme weather conditions.
- The equipment is operated beyond the conditions specified in this document.
- The equipment is installed or used in environments that do not comply with international, national, or regional standards.
- The equipment is installed or used by unqualified personnel.
- You fail to follow the operation instructions and safety precautions on the product and in the document.
- You remove or modify the product or modify the software code without authorization.
- You or a third party authorized by you cause the equipment damage during transportation.



- The equipment is damaged due to storage conditions that do not meet the requirements specified in the product document.
- You fail to prepare materials and tools that comply with local laws, regulations, and related standards.
- The equipment is damaged due to your or a third party's negligence, intentional breach, gross negligence, or improper operations, or other reasons not related to the Company.

## 1. Basic safety information

Please read the safety precautions in this manual carefully, if ignored, may cause serious personal injury or death.

	If you encounter any questions while reading the following information, please contact Allsparkpower.
<b>Tip</b>	

### 1.1 Environmental Requirements for Installing and Maintaining an Energy Storage System

- Energy storage systems must be installed in full compliance with national and local grid standards and regulations.
- Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.
- Do not store any flammable or explosive materials in the equipment area.
- Do not place the equipment near heat sources or fire sources, such as smoke, candles, heaters, or other heating devices. Overheat may damage the equipment or cause a fire.
- Install the equipment in an area far away from liquids. Do not install it under areas prone to condensation, such as under water pipes and air exhaust vents, or areas prone to water leakage, such as air conditioner vents, ventilation vents, or feeder windows of the equipment room. Ensure that no liquid enters the equipment to prevent faults or short circuits.
- To prevent damage or fire due to high temperature, ensure that the ventilation

vents or heat dissipation systems are not obstructed or covered by other objects while the equipment is running.

- The product shall be placed on objects (walls, assembly bracket, etc.) and ensure that the product is placed perpendicular to the horizontal plane.
- Places suitable for the installation of electrical equipment shall be selected to ensure adequate fire access space for maintenance in case of failure.

Maintain appropriate ventilation conditions, ensure sufficient air circulation required for cooling, and air humidity is less than <90% during assembly.

### **Requirements for Installation and Maintenance Personnel**

When the energy storage system is running, some parts may be charged and some parts may heat hot. Inappropriate use, incorrect installation or incorrect operation may cause serious personal or property injury. Transportation, handling, installation, startup, and maintenance operations must be performed by qualified electrical engineers (all effective accident precautions in the user's country must be followed!) Allsparkpower is not liable for any personal or property injury caused by any erroneous use.

### **Precautions for Transportation**




When the product is delivered, it is already in the best electrical and mechanical state. When transporting the products, the original packaging or appropriate packaging of the products must be used to ensure the safety of the equipment in the transportation. Machine damage caused by the transportation process shall be the responsibility of the transportation company. When taking delivery, please conduct a thorough inspection of the product. If any packaging problems that may cause damage to the product, or any visible damage to the product, please notify the responsible transportation company immediately. If necessary, ask your installer or Allsparkpower for help.





## Equipment Label

Labels shall not be covered by other objects (rags, cartons, equipment, etc.), and shall be wiped regularly to keep them visible at all times.

**Electrical Installation and Connection Precautions** When handling electrified energy storage products, observe all current national regulations related to the prevention of electrical accidents.

	Before making an electrical connection, be sure to cover the photovoltaic panel with an opaque material or disconnect the DC circuit breaker.
<b>Danger</b>	When the battery is connected to the product, please close the direct switch between the product and the battery before connecting.  When installing the battery, confirm the positive and negative electrodes of the battery and turn off the battery.
	All installation operations must be performed by professional electrical engineers only.
<b>Warning</b>	The installer must be trained and have read this manual and understand the relevant safety matters.
	Products can be incorporated into the grid only when approved by the local power department and all electrical connections are completed by a professional electrical engineer.
<b>Attention</b>	



## Operation Precautions

	Touch the terminal of the power grid or the equipment, which may cause death by electric shock or catch fire!
<b>Danger</b>	Do not touch the terminals or conductors connected to the grid circuit.  Pay attention to any instructions or safety instructions related to the grid connections.
	Some internal components may heat up during operation., please wear protective




**Attention**


gloves.

**Maintenance and Repair Precautions**

	Prior to any repair work, first disconnect the product from the grid and then disconnect the DC side electrical connection.
<b>Danger</b>	Wait at least 5 minutes until the internal components are discharged fully before maintenance work.
	Any fault affecting the safety performance of the product must be removed before the product can be turned on again. If any repair work is required, please contact the local authorized repair center.
<b>Attention</b>	Do not disassemble the internal components of the product without authorization. As a result of the loss, Allsparkpower will not assume the warranty and joint and several liability.









**1.2 Description of the Safety Information Symbols**

	The high voltage circuit in the product will endanger the life safety!
<b>Danger</b>	Only professional electrical engineers can operate the product: minors, disabled people, mental patients shall not use the product; the product should be installed beyond the reach of children.
	Due to the high shell temperature during the product operation, be careful to be burned!
<b>Caution</b>	When the product is running, it can only touch the display screen and buttons of the product.
	The storage frame and bracket of the energy storage system should be safely grounded, and should meet the grounding requirements of the local power department!
<b>Attention</b>	

	Ensure that the maximum output voltage of the inverter (the open circuit voltage after low temperature correction) does not exceed the maximum input voltage of the product, resulting in product damage or other losses,
<b>Warning</b>	Allsparkpower has the right not to make warranty and joint or several liability.

### **Symbols on the Energy Storage System**

The energy storage system has some safety-related labels. Be sure to read and understand the labels carefully first before installing the device.

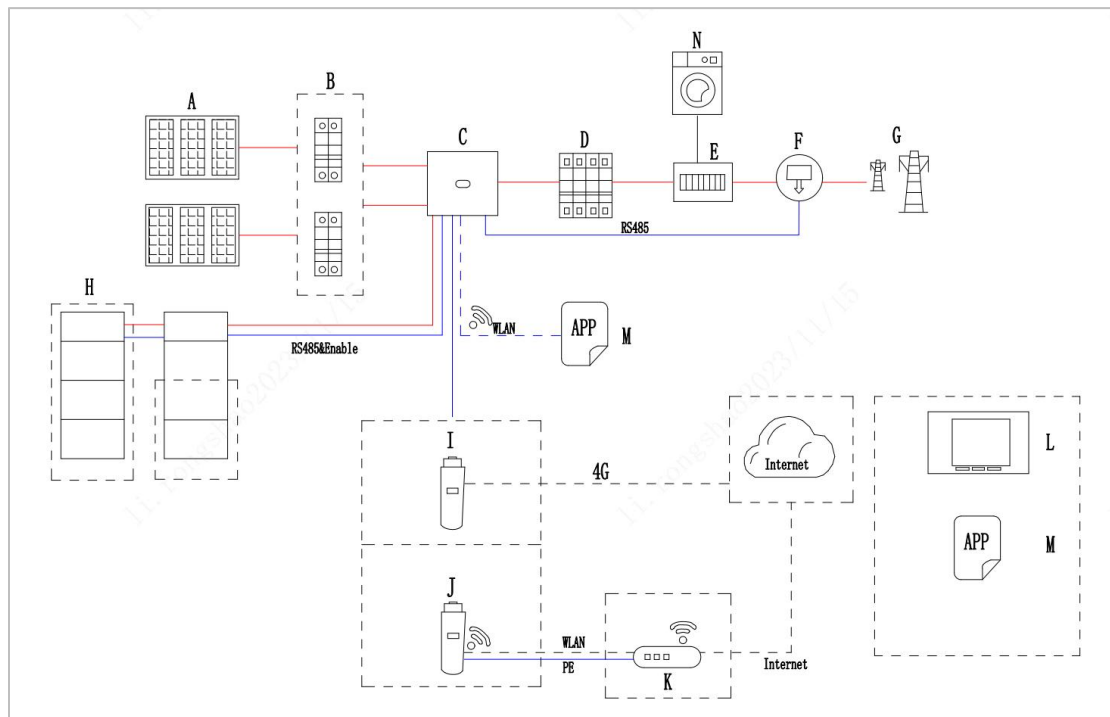
	Watch Out for High Pressure and Electric Shock.	This product has a high voltage in operation. All operations for the product must be performed by a trained professional electrical technician.
	Be Careful of the Hot Surfaces.	The shell temperature of the product is high during operation, and it is strictly forbidden to touch it
	Compliance with the European Standards (CE) Certification.	This product meets the CE certification standards.
	Ground Terminal.	Connect the product with the grounding row to achieve the purpose of grounding protection.
	Read the Instructions.	Read this instruction manual before installing the product.
	Electrical positive and negative electrode Identification.	Remind the user of the polarity of the electrical connection.
	Temperature Identification.	Indicates the allowable temperature range.
	This Side Up	The arrow always point up when the product is installed and used.

## 2. Product Description

### 2.1 Product Introduction

APB- (10-20) -P0 energy storage system contains power control module and battery module, which can store and release electricity according to the inverter requirements. The input and output ports of APB- (10-20) -P0 energy storage system are all low-voltage direct current.

### Product Application System Diagram

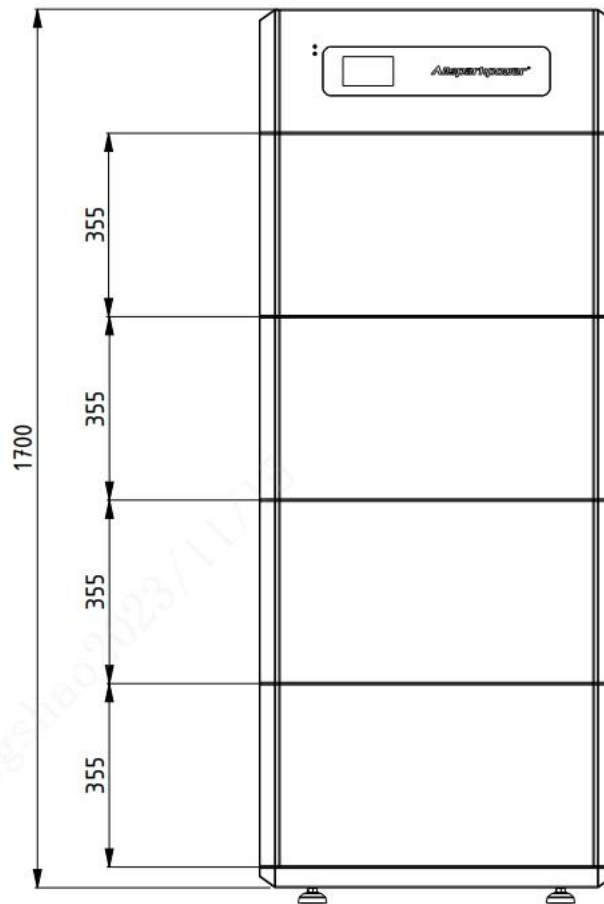


A: Photovoltaic Modules	B: DC Switch	C: Energy Storage Inverter
D: AC Switch	E: Distribution Box	F: Smart Power Sensor
G: Power Grid	H:APB-(10-20)-P0	I: 4G Smart Dongle
J: WLAN-FE Smart Dongle	K:Router	L: Photovoltaic Management System
M: Smart Photovoltaic App	N: Load	

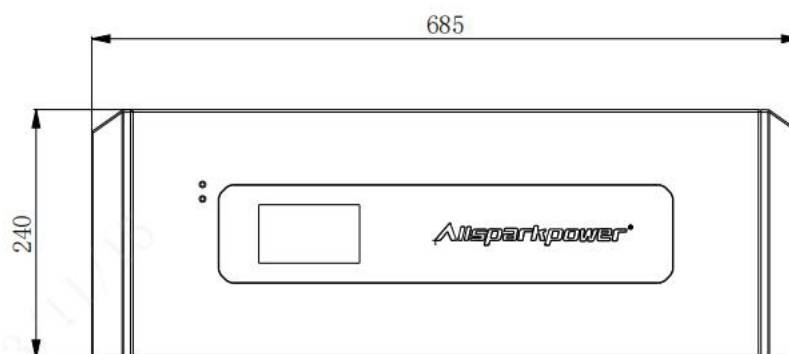
"—" indicates a power cable, "—" indicates a signal cable, and "----" indicates wireless communication.

## 2.2 Product Dimensions

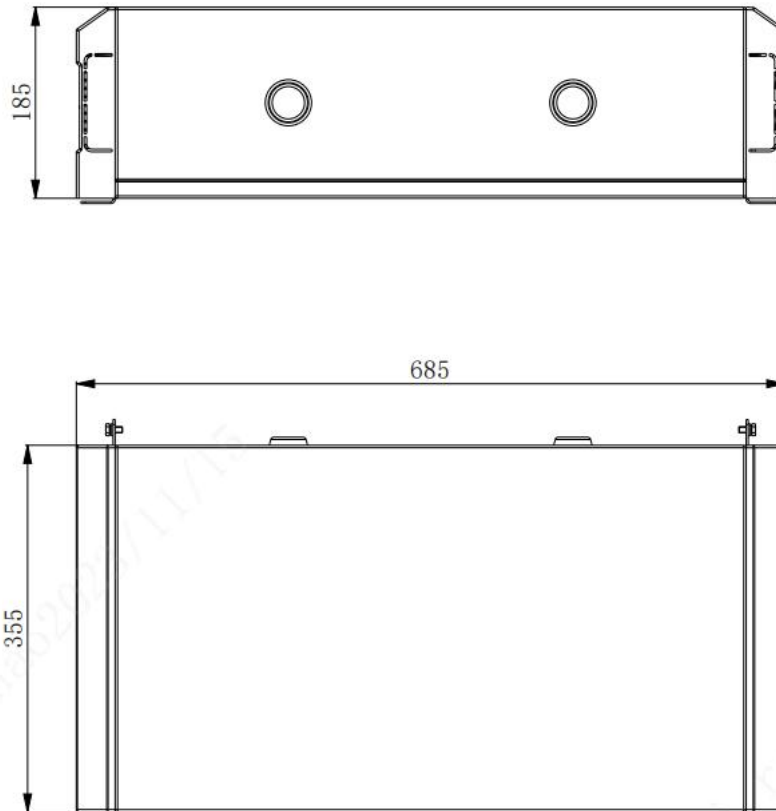
Product Size Drawing



Overall Appearance and Dimension Diagram of the Product



Controller Dimension Drawing



Single Battery Pack Size

## 2.3 Product Characteristics

- Supports multiple working modes such as grid-tied, grid-tied and off-grid, pure off-grid , self-consumption.
- Works with the inverter, and supports plug and play.
- The battery supports power expansion, battery capacity expansion, and hybrid use of old and new batteries.
- Small footprint, high efficiency, high power density, saving installation space.
- Use of lithium iron phosphate battery, high safety performance, long cycle life.
- Intelligent data management can be viewed through the cloud platform.
- Fast switching speed, do not need to worry about the device to power off.

## 3. Transportation and Storage

### 3.1 Transportation Requirements

- When handling heavy objects, we should be prepared to avoid being crushed or sprained by heavy objects.
- When handling equipment, wear protective gloves, wear protective shoes and other safety protective equipment to avoid injury.
- When moving a heavy object, be aware of the workbench, slope, staircase, and slippery places.
- When transporting the equipment using a pallet truck or forklift, ensure that the tynes are properly positioned so that the equipment does not topple. Before moving the equipment, secure it to the pallet truck or forklift using ropes. When moving the equipment, assign dedicated personnel to take care of it.
- Move a heavy object stably with balanced force at an even and low speed. Put down the object stably and slowly.
- Load or unload batteries with caution. Otherwise, the batteries may be short-circuited or damaged (such as leakage and crack), catch fire, or explode.
- Do not move a battery by holding its terminals, bolts, or cables. Otherwise, the battery may be damaged.
- Keep batteries in the correct direction during transportation. They must not be placed upside down or tilted, and must be protected against falling down, mechanical impact, rains, snows, and falling into water during transportation.
- Before unpacking, storage, and transportation, ensure that the packing cases are intact and the batteries are correctly placed according to the labels on the packing cases. Do not place a battery upside down or vertically, lay it on one side, or tilt it. Stack the batteries according to the stacking requirements on the packing cases. Ensure that the batteries do not fall or get damaged. Otherwise, they will need to be scrapped.

- Before transportation, ensure that the battery packaging is intact and there is no abnormal smell, leakage, smoke, or fire. Otherwise, the batteries must not be transported.
- Exercise caution when moving batteries to prevent bumping and ensure personal safety.
- Before transporting a faulty battery (with scorch, leakage, bulge, or water intrusion), insulate its positive and negative terminals, pack it, and place it in an insulated explosion-proof box as soon as possible. Record information such as the site name, address, time, and fault symptom on the box.
- When transporting faulty batteries, avoid approaching flammable material storage areas, residential areas, or other densely populated places, such as mass transit facilities or elevators.



### 3.2 Storage Requirements

- Ensure that batteries are stored in a dry, clean, and ventilated indoor environment that is free from sources of strong infrared or other radiations, organic solvents, corrosive gases, and conductive metal dust. Do not expose batteries to direct sunlight or rain and keep them far away from sources of heat and ignition
- If a battery is faulty (with scorch, leakage, bulge, or water intrusion), move it to a dangerous goods warehouse for separate storage. The distance between the battery and any combustible materials must be at least 3 m. The battery must be scrapped as soon as possible.
- Place batteries correctly according to the signs on the packing case during storage. Do not place batteries upside down, lay them on one side, or tilt them. Stack batteries in accordance with the stacking requirements on the packing cases.
- Store batteries in a separate place. Do not store batteries together with other devices. Do not stack batteries too high. If a large number of batteries are stored onsite, it is recommended that the site be equipped with qualified fire fighting facilities, such as fire sand and fire extinguishers.
- It is recommended that batteries be used soon after being deployed onsite. Batteries that have been stored for an extended period shall be charged periodically. Otherwise, they may be damaged.
- The storage environment must comply with local regulations and standards.
- The storage environment must be clean and dry. The product must be protected against rain and water.
- The ambient air shall not contain corrosive or flammable gases.
- Storage environment requirements:

Ambient temperature: -10°C ~55°C, the recommended storage temperature: 20°C ~30°C.

Relative humidity: 5% RH ~ 80% RH.

- If a battery has been stored for longer than the allowed period, it must be checked and tested by professionals before use.
- Proof that the product is stored according to the requirements must be available, such as temperature and humidity log data, storage environment photos, and inspection reports.
- Ensure that batteries are delivered based on the "first in, first out" rule.
- Ensure that the storage duration starts from the latest charge time marked on the battery packing case and that the latest charge time is updated after every charge.

## 4. System Installation

### 4.1 Precautions

- Note the polarities when installing batteries. Do not connect the positive and negative poles of a battery or battery string together. Otherwise, the battery may be short-circuited.
- Tighten the screws on copper bars or cables to the torque specified in this document. Periodically confirm whether the screws are tightened, check for rust, corrosion, or other foreign objects, and clean them up if any. Loose screw connections will result in excessive voltage drops and batteries may catch fire when the current is high.
- When installing batteries, do not place installation tools, metal parts, or sundries on the batteries. After the installation is complete, clean up the objects on the batteries and the surrounding area.
- After unpacking batteries, place them in the required direction. Do not place a battery upside down or vertically, lay it on one side, tilt it, or stack it. Ensure that the batteries do not fall or get damaged. Otherwise, they will need to be scrapped.
- Slowly push or move battery packs to prevent damage and collision.
- To prevent battery packs from falling off, start the pallet truck or forklift after confirming that battery packs are securely bound.
- When moving batteries, do not remove protective components such as protective covers or waterproof caps from battery terminals.
- Exercise caution when moving batteries to prevent bumping and ensure personal safety.
- Install and secure batteries horizontally from the bottom up and from left to right to prevent falling over due to imbalance.
- When connecting batteries, ensure that the spring washer on the screw is leveled, that the protruding part of the terminal on the cable faces outwards, and that the

cable is intact.

- Install and secure batteries horizontally from the bottom up and from left to right to prevent falling over due to imbalance.
- Ensure that the power circuit breaker is OFF before installing batteries.
- Keep the battery loop disconnected during installation and maintenance.
- Do not use a damaged battery (such as damage caused when a battery is dropped, bumped, bulged, or dented on the enclosure), because the damage may cause electrolyte leakage or flammable gas release. In the case of electrolyte leakage or structural deformation, contact the installer or professional O&M personnel immediately to remove or replace the battery. Do not store the damaged battery near other devices or flammable materials and keep it away from non-professionals.
- Battery pack exception is the occurrence of any of the following phenomena:
  - The battery pack shell is significantly deformed or damaged.
  - The total positive to total negative voltage of the battery pack is far below the specification range.

## 4.2 Checking Before the Installation

### Checking the Outer Packaging




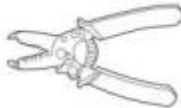

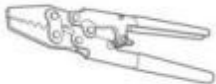




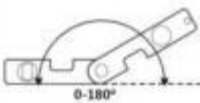
Packaging materials and components may be damaged during transportation. Therefore, before installing the product, check the outer packaging materials. Check whether the outer packaging materials are damaged, such as holes, cracks, etc. If you find any damage to the product or model failure, please do not open the package and contact the dealer as soon as possible.

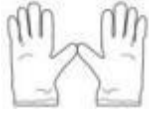


### Check the Delivery List

After unpacking the battery, check that the deliverables are intact and complete, and free from any obvious damage. If any item is missing or damaged, contact your dealer. For details about the number of deliverables delivered with the battery, see the *Packing List* in the packing case.

## 4.3 Tools

### Tools Required for Installation

No.	Tool	Description	Function
1		Hammer Drill	Wall punching
2		Slotted Screwdriver	Remove, install screws and wiring
3		Phillips Screwdriver	Remove and install the terminal screws
4		Wire Stripper	Wire stripping
5		Inner Hexagon Spanner	Disassemble and install the inner hexagon screws
6		Crimping Tool	Cable crimping at critical load end
7		Multimeter	Check whether the cable wiring is correct, whether the positive and negative battery electrode is correct, and whether the grounding is reliable
8		Wrench with Opening $\geq$ 32 mm	Use to tighten expansion bolts
9		Marker	The punch mark
10		Measuring Tape	Measuring distance
11		Level	Ensure the product level

12		Protective Glove	Wear it when installing the machine
13		Safety Goggles	Wear it when punching
14		Dust Mask	Wear it when punching

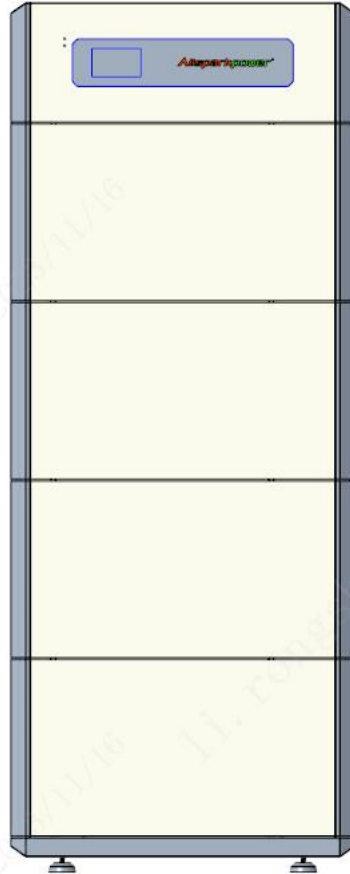
## 4.4 Installation Position and Environment Requirements

- Choose a dry, neat, and cool place for easy installation.
- Ambient temperature range: -25°C ~60°C.
- Relative humidity: 5 ~ 95% (no condensation).
- Install in a well-ventilated place.
- No flammable and explosive materials shall be allowed nearby.
- Maximum height: 4,000 meters.
- For the installation position, please choose solid brick concrete structure, concrete wall and ground. If other types of wall and ground are selected, the wall and ground must be built of flame retardant materials and can meet the load-bearing requirements of the equipment.
- When hanging the wall is installed, no items are allowed to be placed under the product.

## 4.5 Equipment Installation

### 4.5.1 Floor-Mounted Installation

**Floor-Mounted Installation Diagram:**



**Installation step 1:**

Align the floor mounting bracket with the wall, and the bracket is 10mm~15mm away from the wall surface.

**Installation step 2:**

Install the foot cup and use a level to level the support above the foot cup.

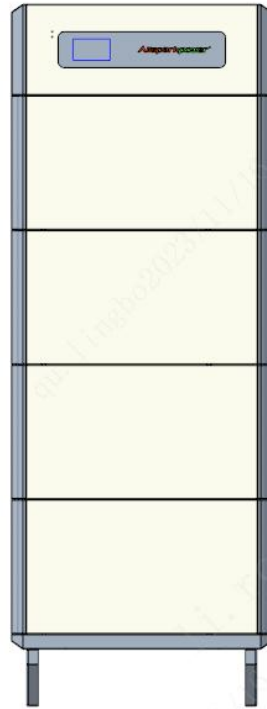
**Installation step 3:**

Line the first battery module on the floor mounting bracket, install both side connections, and tighten the 4 screws. Install the remaining battery modules and power modules from bottom to top.

**Installation step 4:**

Attach the power control module to the wall.

**Wall-mounted Installation Diagram:**



**Installation step 1:**

Determine the positions for drilling holes using the marking-off template. Level the positions of mounting holes using a level, and mark the positions with a marker.

**Installation step 2:**

Use the electric drill to make the hole position, and fix the bracket with the expansion screw.(Note: When drilling holes, avoid the water pipes and power cables buried in the wall.)

**Installation step 3:**

Place the first battery expansion module on the wall-mounted support, install the left and right connective pieces, and install the second battery expansion module, third battery expansion module, fourth battery expansion module, and power control module from bottom to top.

**Installation step 4:**

Secure the power control module and battery expansion modules to the wall.(Note: The power control module and battery expansion modules must be fixed on the wall to prevent them from falling down.)



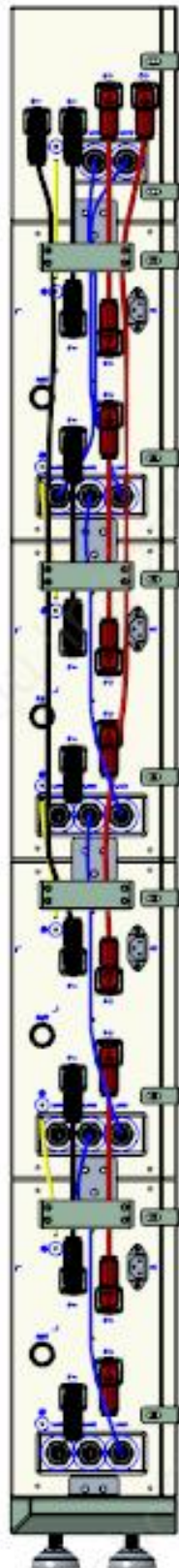
## 5. Electrical Connection

### 5.1 Precautions

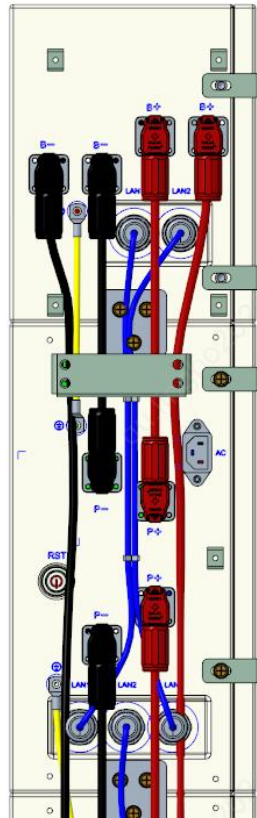
- Before connecting cables, ensure that all the switches connected to the battery are set to OFF. Otherwise, the high voltage of the battery may result in electric shocks.
- Pay attention to the polarities when installing batteries. It is strictly prohibited to connect the positive and negative poles of a battery or battery string together. Otherwise, the battery may be short-circuited.
- Use specialized protective equipment and insulated tools to avoid electric shocks or short circuits.
- Only certified electricians are allowed to connect cables.
- The equipment damage caused by incorrect cable connections is not covered under any warranty.
- Operation personnel must wear proper personal protective equipments when connecting cables.

### 5.2 Electrical Connection of the Products

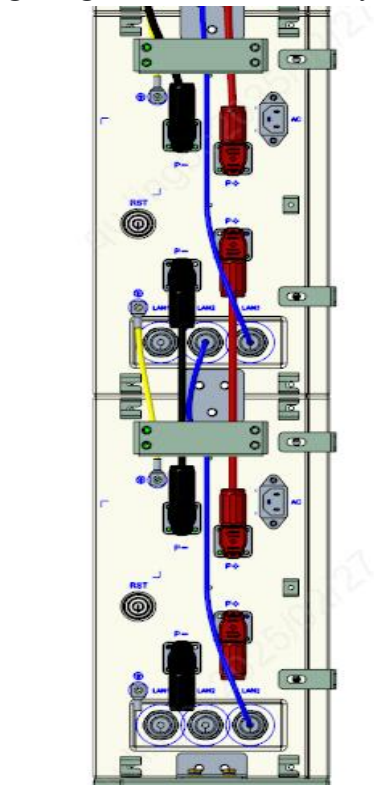
Product Overall Connection Diagram

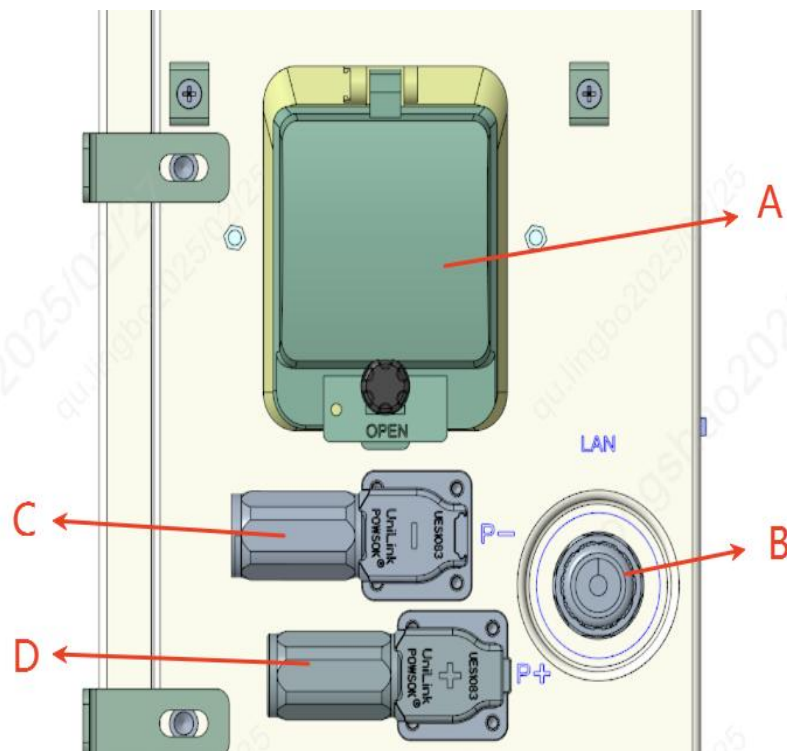


Wiring Diagram Between the Control Box and the Battery Box

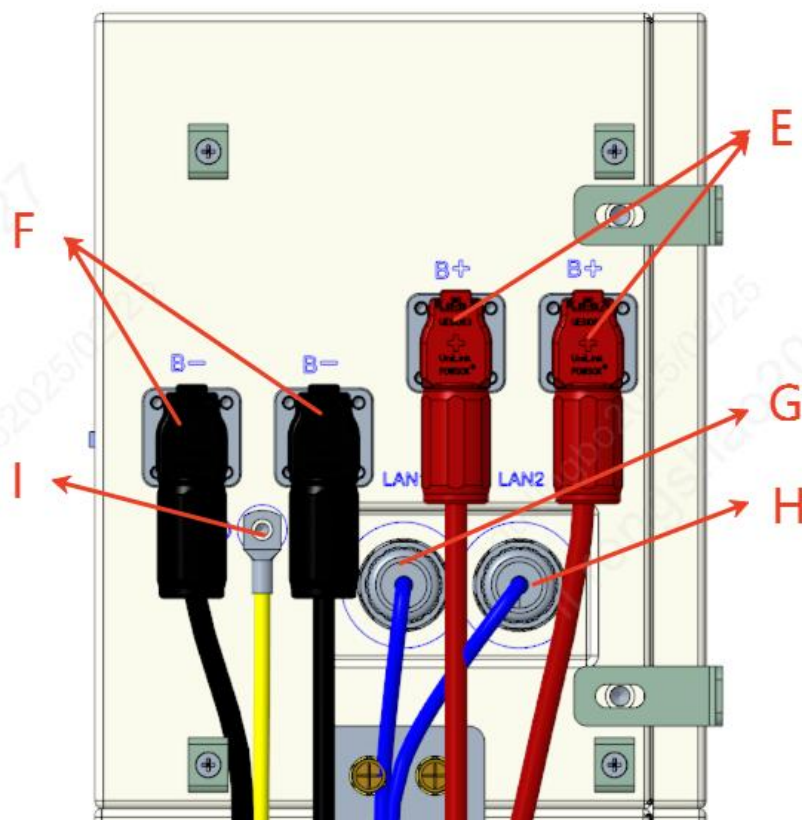


Wiring Diagram Between Battery Packs

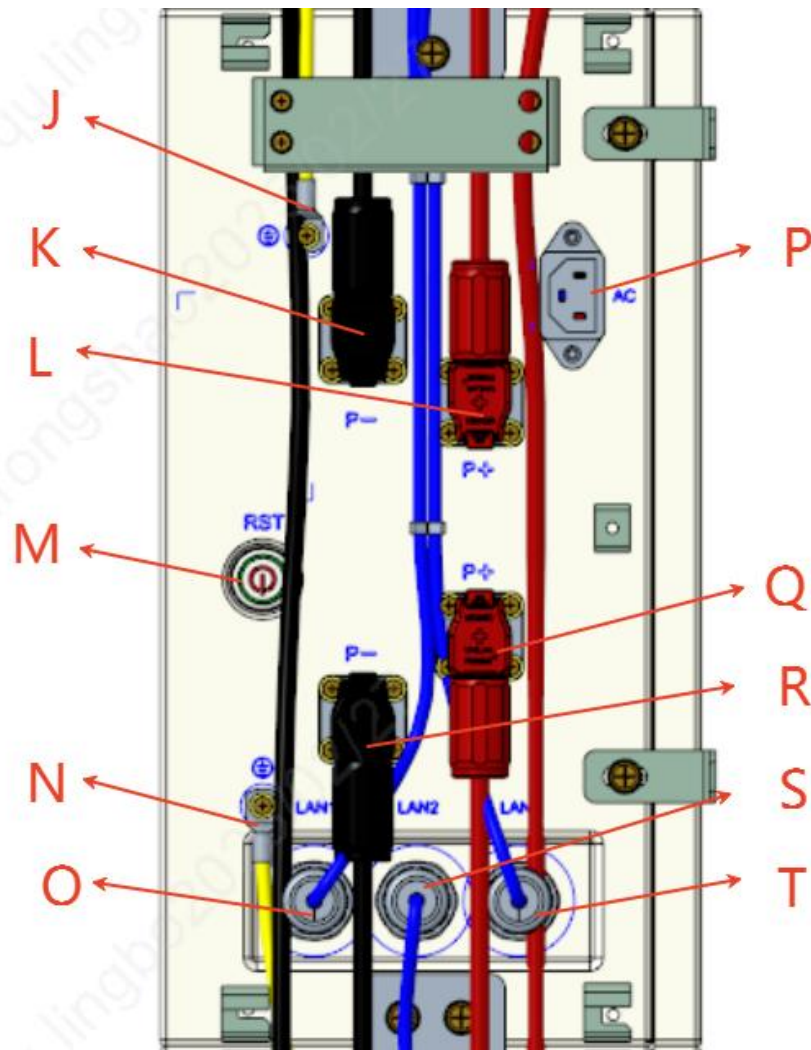




Interface Diagram of side-A Control Box



Interface Diagram of side-B Control Box



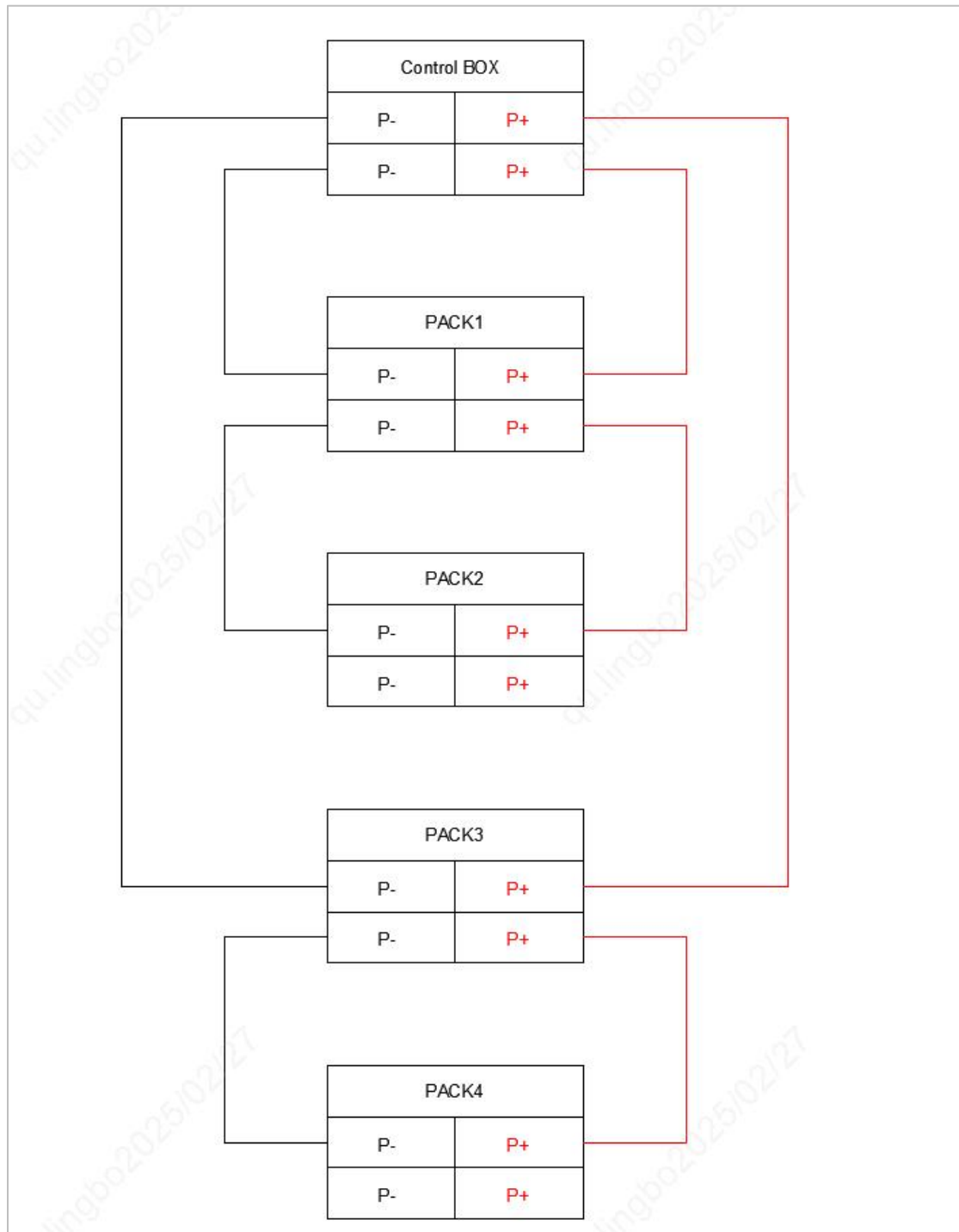
Schematic Diagram of the Battery Box Wiring

## Electrical Connection Specification Sheet

Number	Name	Instruction	Number	Name	Instruction
A	DC switch	Close and disconnect between the battery and the inverter	B	The control box Communication port	Connect to the inverter communication port and communicate with the inverter.
C	The control box connected to the inverter P -	Connect to the battery negative electrode input port of the inverter	D	The control box to inverter P+	Connect to the positive battery input port of the inverter
E	The control box connected to the battery P +	connected to the battery box P +	F	The control box connected to Battery P-	connected to the battery box P-
G	The control box Communication port 1	Connect to the communication port 2 of the battery box	H	The control box Communication port 2	Connect to the battery communication port 1
I	Communication box Ground port	Connect to the ground port of the battery box	J	Battery box Ground port	Connect to the ground port of the control box
K	Battery box P-	Connect to the control box, P - Or front battery box P -	L	Battery box P+	Connect to the control box, P + Or front battery box P +

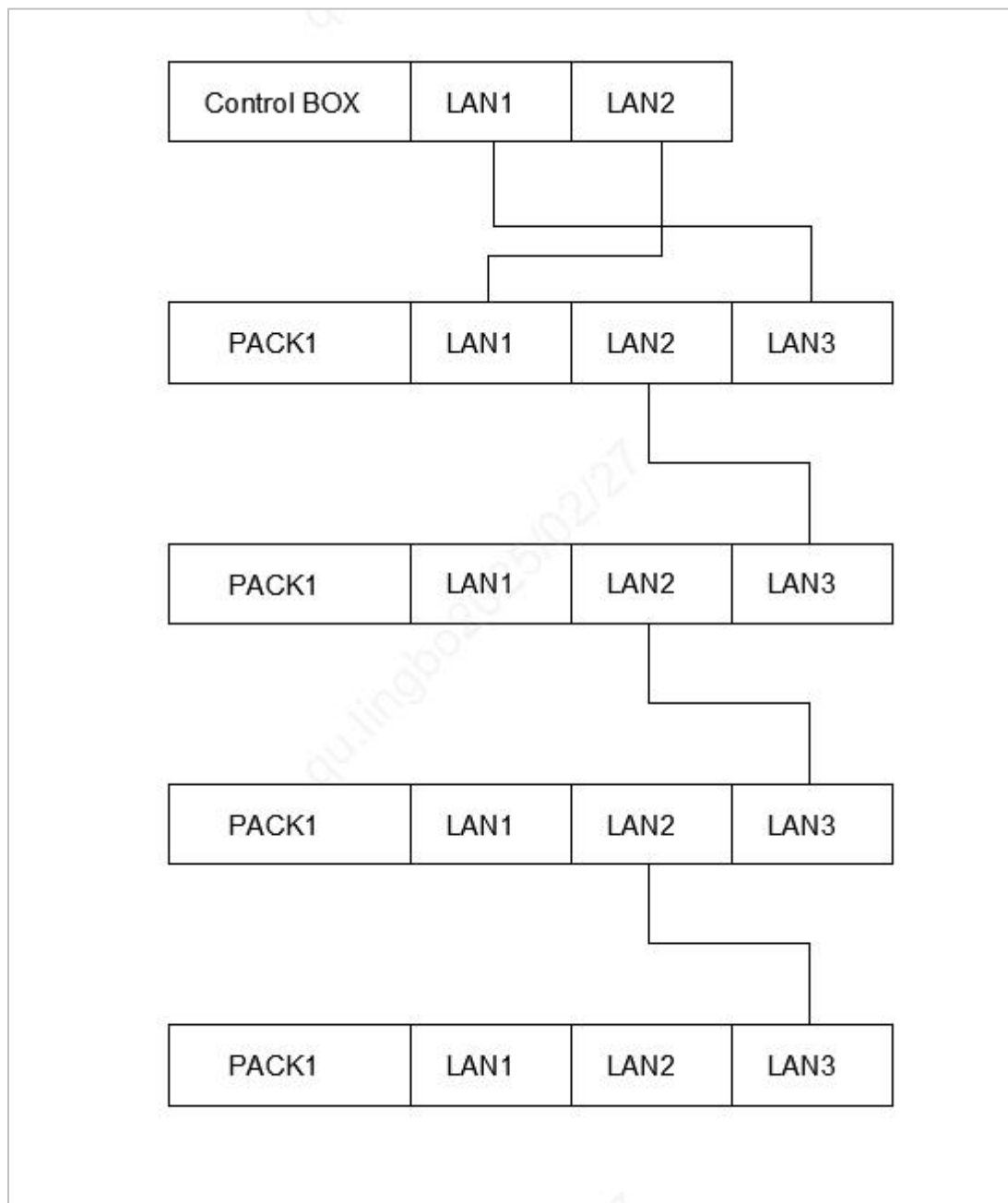
M	Battery box Reset switch	Battery box power on and off	N	Battery box Ground port	Connect to the ground port of the next battery box
O	Battery box Communication port 1	Connect to the communication port LAN2 of the control box or reserve it	P	The BMS AC activation port	Connect AC220V
Q	Battery box P+	Connect to the next battery box P +	R	Battery box P-	Connect to the next battery box P-
S	Battery box Communication port 2	Connect to the communication port LAN3 of the next battery box	T	Battery box Communication port 3	Connect to the communication port LAN2 of the previous battery box or the communication port LAN1 of the control box

# Schematic diagram of current line connection





Schematic diagram of communication cable connection



## 6. System Commissioning

### 6.1 Precautions

- Wear personal protective equipment and use dedicated insulated tools to avoid electric shocks or short circuits.
- During the power-on procedure, power off the batteries immediately if any fault is detected. Rectify the fault before proceeding with the procedure.
- After batteries are used for system commissioning or batteries have discharged, charge the batteries in time. Otherwise, batteries may be damaged due to overdischarge.
- Battery overdischarge and damage may occur if batteries with low SOC are stored. Batteries shall be recharged in a timely manner..
- Before the equipment is put into operation for the first time, ensure that the parameters are set correctly by professional personnel. Incorrect parameter settings may result in noncompliance with local grid connection requirements and affect the normal operations of the equipment.

### 6.2 Verification Before Power-On

Check items and acceptance criteria

No.	Check Item	Acceptance Criteria
1	Battery installation	The installation is correct and reliable.
2	Cables routing	Cables are routed properly as required by the customer.
3	Cable tie	Cable ties are evenly distributed and no burr exists.
4	Grounding	The PE cable is connected correctly, securely, and reliably.
5	Switch	The DC switch and all switches connected to the battery are OFF.
6	Cable connection	The AC output power cable, DC input power cable, battery cable, and signal cable are connected correctly, securely, and reliably.
7	Unused terminal and port	Unused terminals and ports are locked by

		watertight caps.
8	Installation environment	The installation space is proper, and the installation environment is clean and tidy.

### 6.3 System Power-On

- Power on within 24 hours after unpacking. The power-off time cannot exceed 24 hours during maintenance.
- After turning on the battery switch, power on the inverter. For details about how to power on the inverter, see the quick guide for the corresponding inverter model.
- Turn on the DC switch on the battery. After the battery is installed and powered on for the first time, view the device running status by observing the energy storage display panel.

### 6.4 Trial Operation of the System

- After the energy storage system is integrated into the grid, check whether the grid can charge the energy storage battery.
- Check whether the photovoltaic can charge the energy storage battery in the off-grid state.
- Check whether the energy storage system can supply power to the running loads when the battery system are connected to the grid.
- In the off-grid state, when the photovoltaic power is greater than the load power, check whether the photovoltaic can charge the energy storage battery, and when the photovoltaic power is less than the load power, check whether the energy storage battery supplies power to the load.

## 7. Overhaul and Maintenance

### 7.1 Precautions

- Wear personal protective equipment and use dedicated insulated tools to avoid electric shocks or short circuits.
- Do not smoke or have an open flame around batteries.
- Do not use wet cloth to clean exposed copper bars or other conductive parts.
- Do not use water or any solvent to clean batteries.
- Do not maintain batteries with power on. To power off the batteries before performing operations such as checking and tightening screw torques, explain the risks to the customer, obtain the customer's written consent, and take effective preventive measures.
- After batteries are discharged, charge them in time to avoid damage due to overdischarge.
- Before moving or reconnecting the equipment, disconnect the mains and batteries and wait for five minutes until the equipment powers off. Before maintaining the equipment, check that no hazardous voltages remain in the DC bus or components to be maintained by using a multimeter.
- Do not connect two or more cables to the positive or negative power port of a battery in parallel.
- Stay away from the equipment when preparing cables to prevent cable scraps from entering the equipment. Cable scraps may cause sparks and result in personal injury and equipment damage.

## 7.2 System Power-Off

Step 1: Turn off the AC switch between the inverter and the power grid.

Step 2: Turn off the DC switch at the bottom of the inverter

Step 3: Turn off the switch between the PV string and the inverter

Step 4: Turn off the DC switch between the energy storage battery and the inverter.

## 7.3 Routine Maintenance


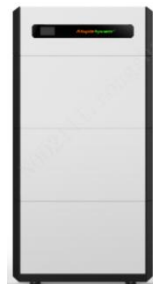

To ensure that the battery can operate properly for a long term, you are advised to perform routine maintenance on it as described in this chapter.

Before cleaning the system, connecting cables, and ensuring the grounding reliability, power off the system.

Check Item	Check Method	Maintenance Interval
System cleanliness	Check periodically that the heat sinks are free from obstacles and dust.	Once every 6 to 12 months
System running status	<p>Check that the battery is not damaged or deformed.</p> <p>Check that the battery does not generate abnormal sound when it is in operation.</p> <p>Check that the battery parameters are correctly set when the battery is running.</p>	Once every 6 months
Electrical connection	<p>Check that cables are secured.</p> <p>Check that cables are intact, and that in particular, the parts touching the metallic surface are not scratched.</p> <p>Check that unused DC input terminals, battery terminals, and COM ports are locked by watertight caps.</p>	The first inspection is 6 months after the initial commissioning. From then on, the interval can be 6 to 12 months.
Grounding reliability	Check that ground cables are securely connected.	The first inspection is 6 months after the initial commissioning. From then on, the interval can be 6 to 12 months.

## 8. Technical Specifications

### Specifications List

System parameter			
System schematic			
Battery Type	LFP		
Battery Module	APB-10-P0	APB-15-P0	APB-20-P0
Number of battery modules	2	3	4
Battery nominal energy	10.24kWh	15.36kWh	20.48kWh
Rated capacity <sup>[1]</sup>	200Ah	300Ah	400Ah
Rated power	10kW	10kW	10kW
Rated voltage	51.2V	51.2V	51.2V
Voltage range	50-58V	50-58V	50-58V
Max Charge Current	200A	200A	200A
Max Discharge Current	200A	200A	200A
Battery module parameters			
Model	APB-5-V0		
Nominal energy	5.12kWh		
Rated voltage	51.2V		
Rated power	5kW		
Size	685*355*185mm		
Weight	50kg		
General parameters			
Display method	LCD		
Communication method	485,CAN		
Size	685*1700*185mm		
Weight	215kg		
Protection grade	IP65		
Cooling method	Natural cooling		



Work Temperature	Charge: 0°C~55°C, Discharge: -20°C~55°C
Relative humidity range	5%~95%
Installation method	Floor mounted
Maximum working altitude	4000m
Scalability	Up to 3 systems running in parallel
Certification standards	
Authentication certificate	UN38.3, CE, IEC62619, UL1973, UL9540A etc.