



PowerMount (860kWh-1720kWh)

User Manual

Notice

This manual contains important safety instructions, installation, electrical connections, commissioning, maintenance, and troubleshooting of the equipment.

Save the manual!

This manual must be stored carefully and be available at all times.

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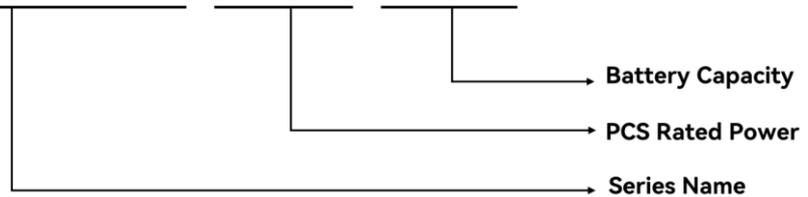
About This Manual

Overview

Please read the product manual carefully before installation, operation, or maintenance of the PowerMount (860kWh-1720kWh). This manual contains important safety instructions and installation instructions that must be followed during installation and maintenance of the equipment.

Designation explanation of the PowerMount (860kWh-1720kWh):

PowerMount-P800-1720kWh



No.	Meaning	Description
1	Series Name	PowerMount: Battery energy storage system
2	PCS Rated Power	P400: System power is 400kW P500: System power is 500kW P600: System power is 600kW P700: System power is 700kW P800: System power is 800kW
3	Battery Capacity	1720K: Nominal capacity is 1720kWh

Intended Audience

This manual is intended for technical professionals for installation, commissioning and maintenance of the product. The technical personnel have to be familiar with the product, local standards, and electric systems.

Symbol Conventions

The following types of safety instructions and general information appear in this document as described below:

Symbol	Description
 	'Danger' indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.
 	'Warning' indicates a hazard with a medium level of risk that, if not avoided, will result in death or serious injury.
 	'Caution' indicates a hazard with a low level of risk that, if not avoided, could result in minor or moderate injury.
NOTICE 	'Notice' indicates a situation that, if not avoided, could result in equipment or property damage.
 	'Note' provides tips that are valuable for the optimal operation of the product.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

Issue 01 (2024-12-12)

This issue is used for first application

1 Safety Precautions

This user manual is about Dunext Technology Suzhou Co., Ltd. (hereinafter referred to as "Dunext") installation and operation of PowerMount container battery energy storage system. Please read this user manual carefully before installation.

PowerMount container battery energy storage systems must be commissioned and maintained by an engineer designated by the manufacturer or an authorized service partner. Otherwise, personal injury and device failure may occur. The resulting damage to the equipment is not covered by the warranty.

This manual contains important instructions for PowerMount container battery energy storage systems, which should be followed during installation and maintenance.

1.1 Safety Information



DANGER!

- Any touching of the energized portions of the exposed conductors inside the device, such as battery posts, DC copper plates, contacts, and terminals may result in burning or fatal electric shock!
- Batteries have high short-circuit currents and improper touching will cause electrocution and even serious injury or death.
- Batteries can explode if no approved battery type is used in the device, use only batteries approved by the manufacturer who made them.
- Excessively heavy parts during installation, removal and transportation can cause injury and require reasonable handling of the device.

	<ul style="list-style-type: none"> ● Do not touch when thunder strikes. ● Danger of electric shock exists. ● Dangerous voltages that can cause accidental electric shock may be present in the system even when the system is shut down. ● Wait at least 15 minutes after turning off the system. ● Incorrect operation can result in an electric shock hazard and may even be fatal. ● If the system is switched on without authorization, an electric shock hazard may occur and the electric shock may be fatal. ● High voltage is present in the system during operation and if you leave the key in the lock, unauthorized persons will be able to open the equipment cabinet door, which could result in death by electric shock.
<div style="text-align: center;">  WARNING! </div>	<ul style="list-style-type: none"> ● All operations of the energy storage system must follow the instructions in the installation instruction manual. If the equipment is damaged due to non-compliance with the instructions in the installation instruction manual, the liability and warranty will be void. ● Non-professional operators are not allowed to install. ● Before installation, ensure that the onsite power supply devices are disconnected, that is, there is no voltage output. ● The battery system should be installed by trained personnel, and no unrelated personnel are allowed to enter the working area. The power line of each battery string should be connected by one person and supervised by one person. ● When connecting batteries, wear insulation gloves (withstand voltage greater than 3000V) and insulation shoes (withstand voltage greater than 6000V). ● During installation, ensure that circuit breakers and isolation switches (including but not limited to battery cluster isolation switches, BMS control box DC circuit breakers, and DCDC isolation switches) are off.
	<ul style="list-style-type: none"> ● There may be electric shock hazard inside the equipment! ● Any operation related to this equipment must be carried out by a professional.

 <p>CAUTION!</p>	<ul style="list-style-type: none"> ● Pay attention to the safety precautions listed in the safety instructions and installation documentation. ● Pay attention to the safety precautions listed in the operation and installation manuals and other documents. ● Before running, ensure that the ground is reliable. ● The device must be grounded and comply with local electrical regulations. ● When operating equipment components, remove watches, rings, and other metal accessories. ● Use only tools with insulated handles. ● The temperature of the parts of the device may reach 100 °C, which may cause burns. After the power is off, wait 10 minutes to test the temperature before touching any parts. ● Do not short circuit the battery, do not reverse the polarity of the battery, do not overcharge the battery.
<p>NOTICE</p> <p>NOTICE!</p>	<ul style="list-style-type: none"> ● Do not climb the equipment and do not place debris on the equipment. ● It is forbidden to disassemble, transform or repair the equipment. ● Do not perform internal electrical maintenance on the device. Contact the manufacturer for maintenance. ● Do not put any objects inside the device. ● Do not store flammable materials near the equipment. ● Do not touch, pull, or cut cables from the device. ● Do not place heat sources (such as electric furnaces) nearby. ● Do not wipe the device with a wet cloth or medicine (diluent, etc.). ● Do not forcibly pull the power cable of the device. ● Do not install it in a place with high static electricity.
 <p>NOTE!</p>	<ul style="list-style-type: none"> ● The safety equipment specified by the system must be intact and functional. ● The device must be placed on a sufficiently firm foundation plane to support it. ● The transport, assembly, installation and commissioning of the equipment should only be carried out by authorized

professionals.

- The transportation, assembly, installation and commissioning of the equipment can only be carried out under the specified conditions.
- Personnel assigned to perform work need to be able to assess their assigned work and identify possible risks in advance.
- Installation, commissioning, and alteration of equipment settings and connections should only be carried out by authorized trained power engineers.
- Before installation and operation, all potentially dangerous goods need to be alerted and the necessary safety measures placed in this place.
- Allow the commissioning personnel to read and fully understand the safety instructions in the manual when performing their tasks.
- There must be a corresponding live warning sign before powering on.

2 Product Introduction

2.1 Appearance

Figure 2-1 PowerMount appearance

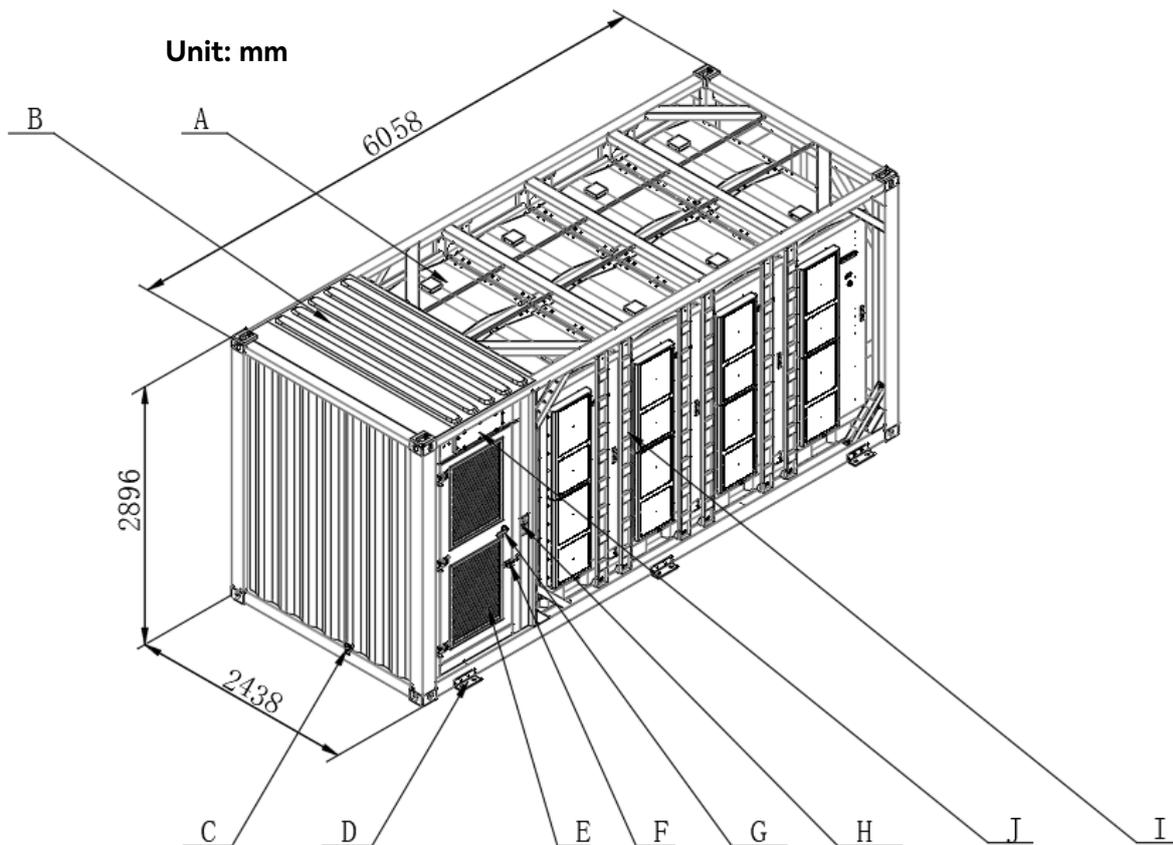


Table 2-1 PowerMount appearance

Position	Description
A	Outdoor battery cabinet
B	Container electrical equipment warehouse
C	Container location
D	Container fixation bracket
E	Container operation door
F	Container door latch
G	Container door lock
H	Container External Emergency Stop switch (EPO)
I	Container transport supports
J	Alarm bell, sound and light alarm

2.2 Horizontal Layout

The floor plan for PowerMount-P800-1720kWh is shown below, with the battery cabinets numbered in clockwise order from cabinet #1 at the top:

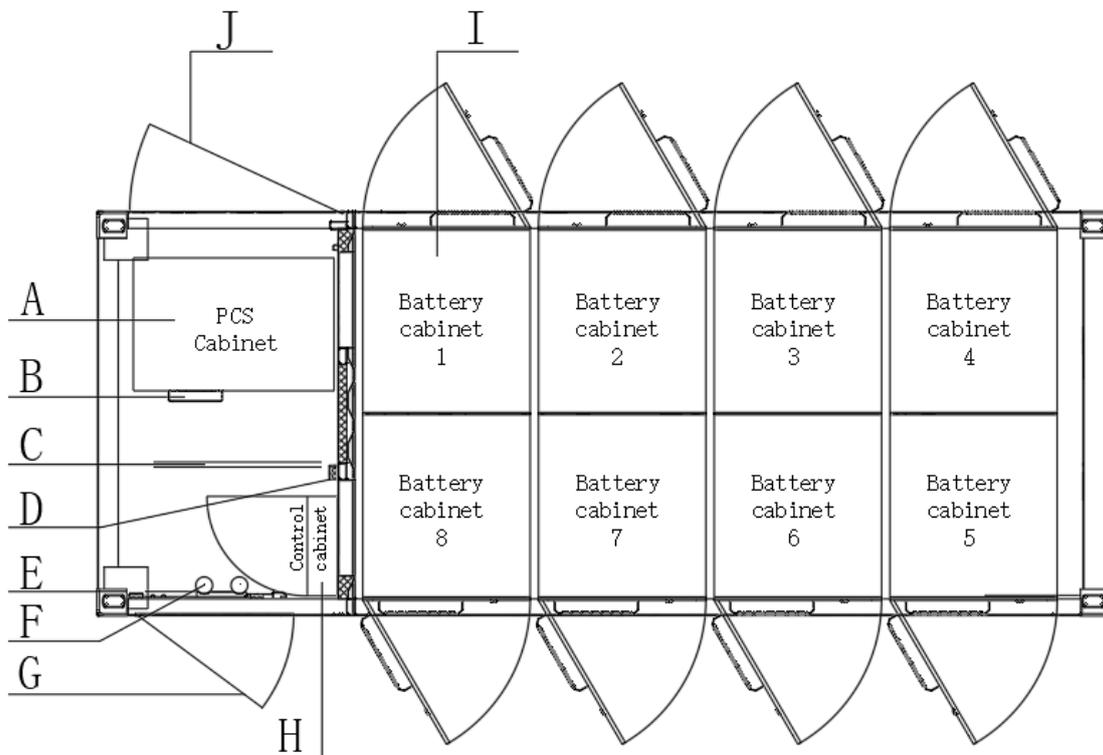
Figure 2-2 PowerMount floor plan (top view)


Table 2-2 PowerMount floor plan (top view)

Location	Description
A	PCS Cabinet
B	EMS
C	Container lighting lamp
D	Sockets (commissioning spare)
E	Lighting switch
F	Emergency lighting
G	Container operating doors
H	Distribution control box
I	Outdoor Battery Cabinet
J	Container maintenance doors

The floor plan for the full model of PowerMount containers is shown in the table, with the battery cabinets numbered as follows, depending on the configuration:

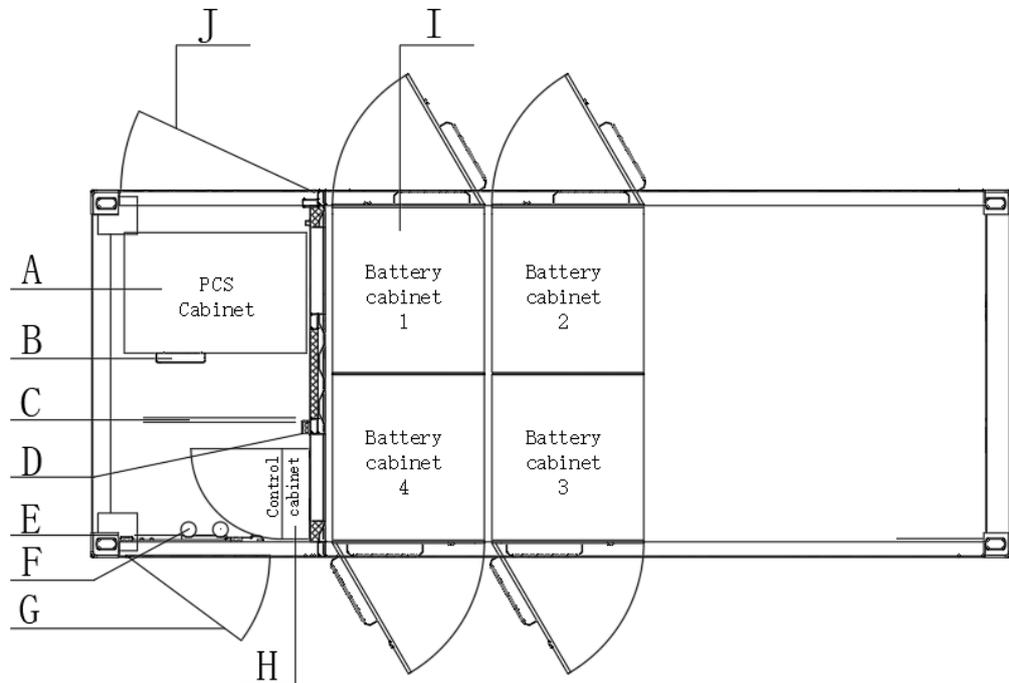
Figure 2-3 Floor plan for PowerMount-P400-860kWh (top view)


Figure 2-4 Floor plan for PowerMount-P500-1075kWh (top view)

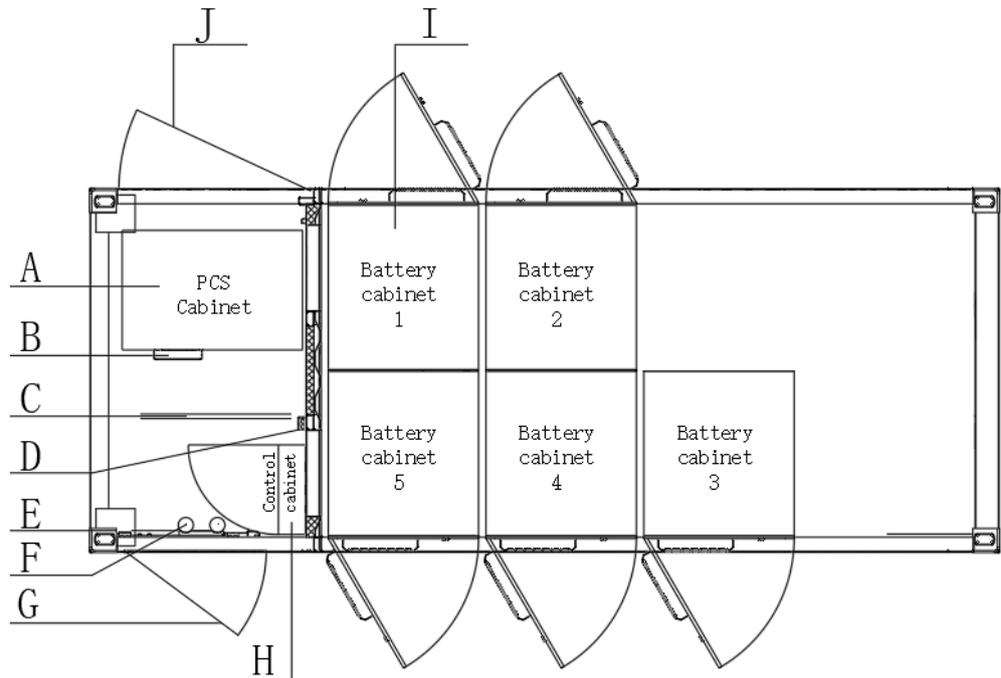


Figure 2-5 Floor plan for PowerMount-P600-1290kWh (top view)

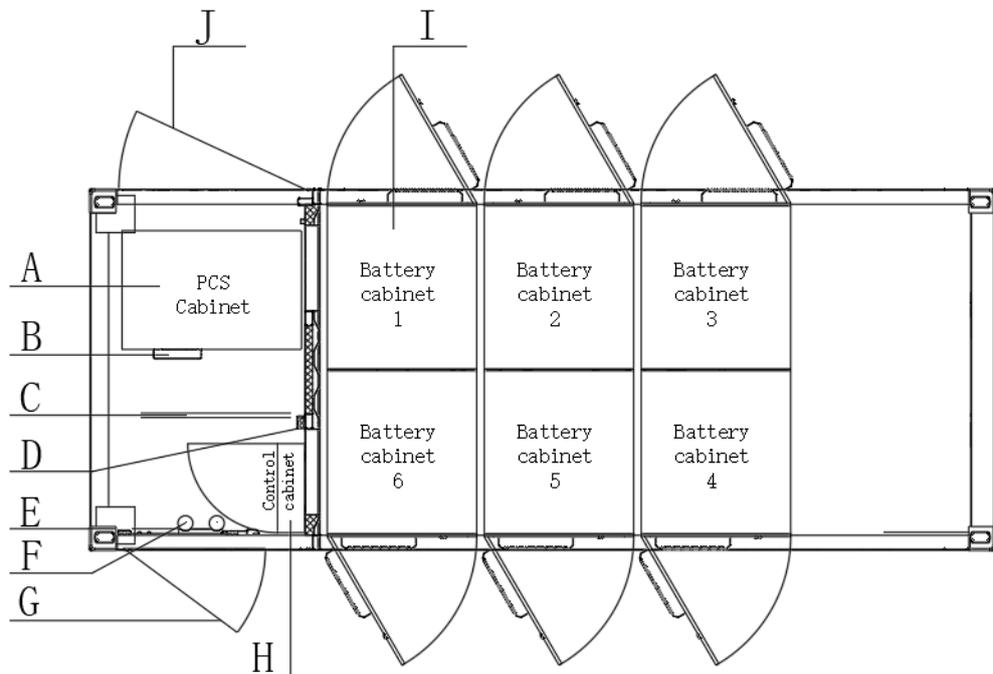
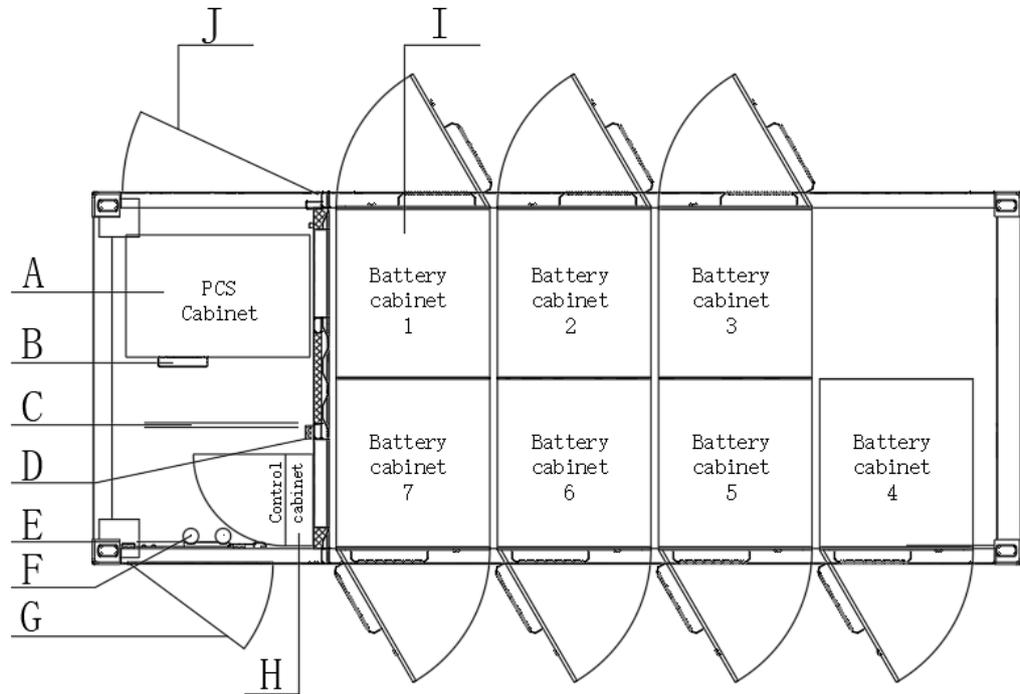


Figure 2-6 Floor plan for PowerMount-P700-1505kWh (top view)



The following figure shows the application scenarios of PowerMount and the grid-connected scenarios of multiple machines.

Figure 2-7 Pure BESS scenarios - 1 BESS

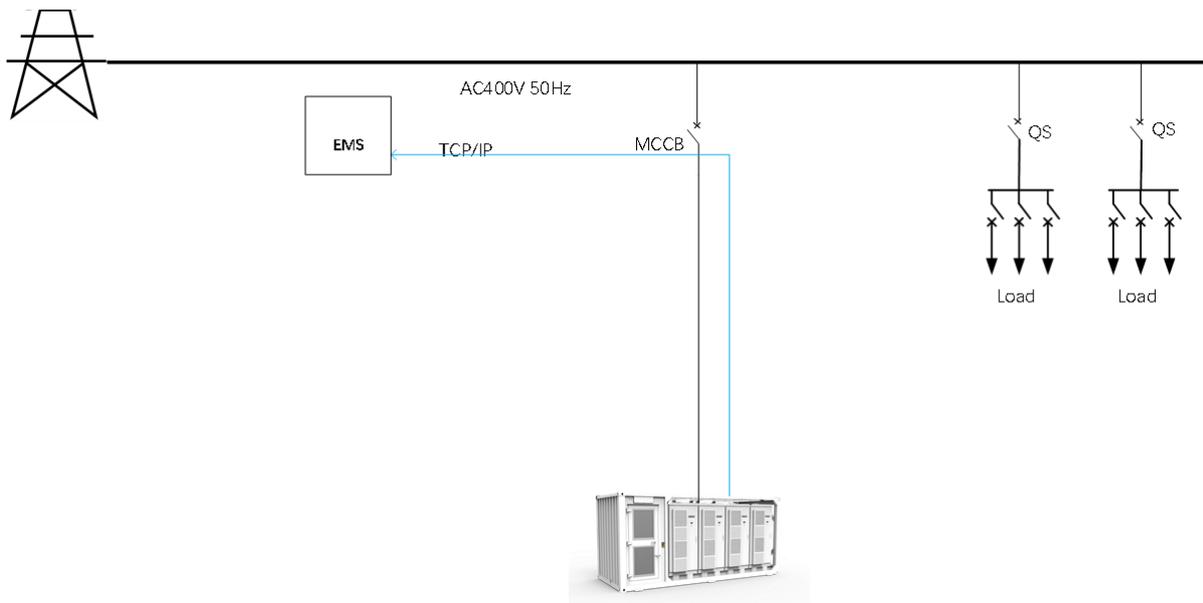


Figure 2-8 PV + BESS scenarios - max 12 BESS

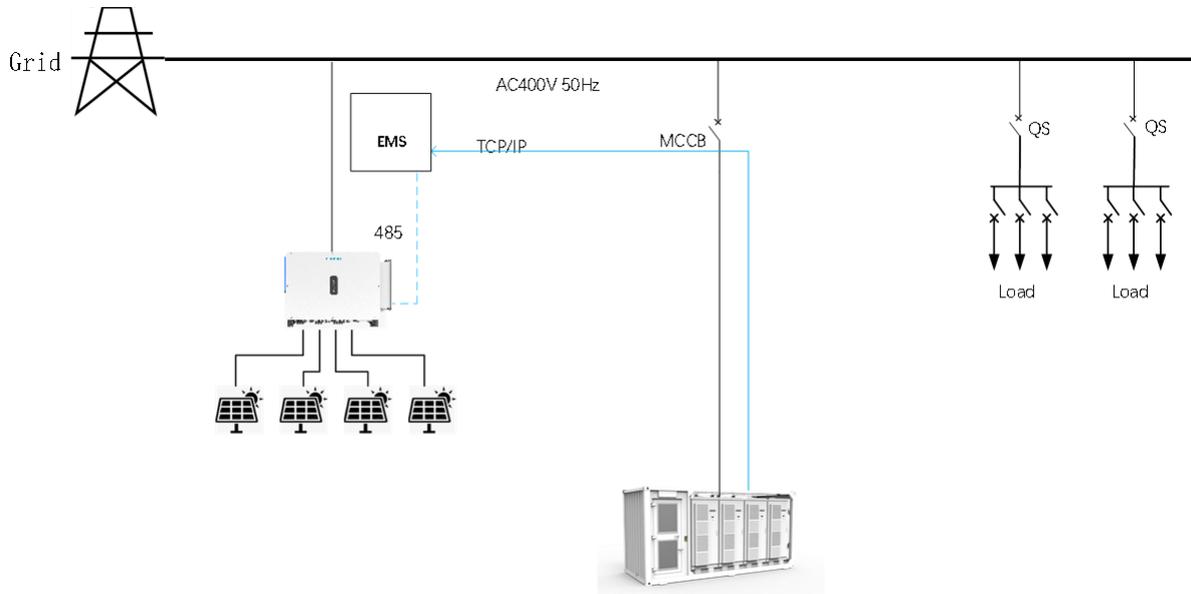


Figure 2-9 Grid-connected scenarios of multiple PowerMount - max 12 BESS

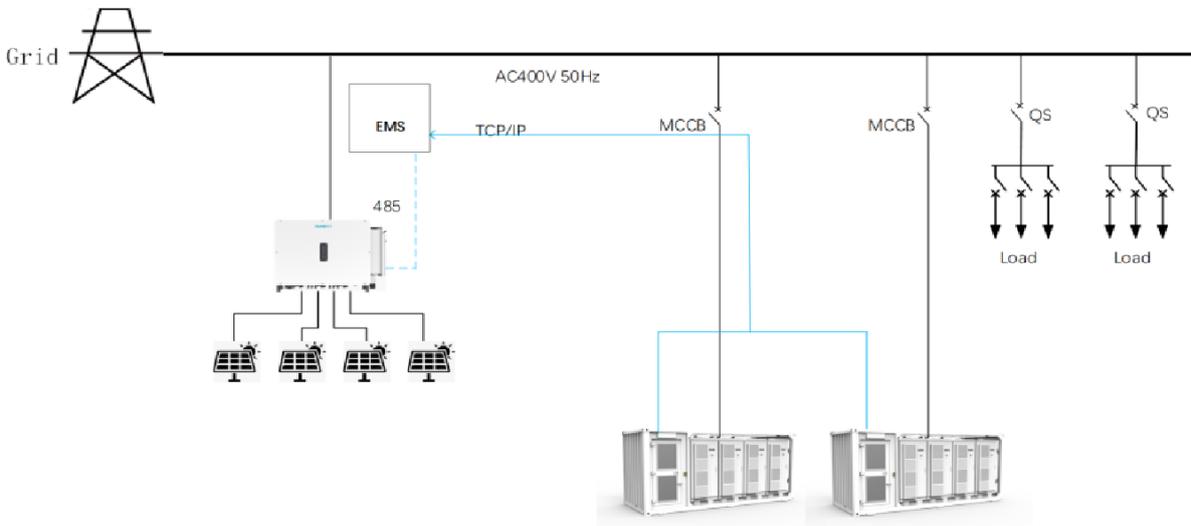
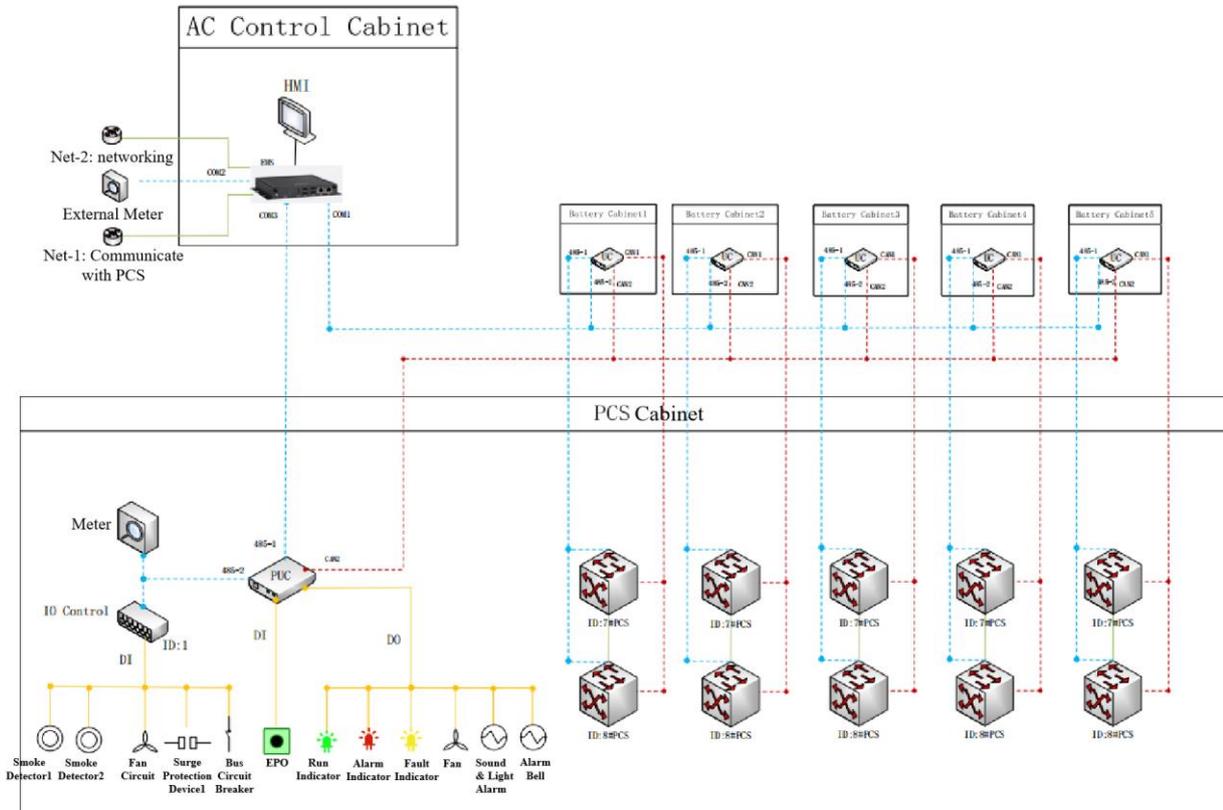


Figure 2-10 Communication topology



PowerMount requirements for external cables and communication cables:

External AC power line:

All cables must be suitable for temperatures up to +90°C and must comply with national standards and directives.

The recommended connecting cables are made of copper wire and the installation requires a single core with a cross-sectional area of not less than two 240 mm² phase busbars, in accordance with the relevant norms for power distribution design and in compliance with local national standards and directives.

The current-carrying capacity of the cables must be calculated in accordance with IEC 60287 and the maximum current must not exceed the current-carrying capacity of the cables.

External communication cables:

Ethernet cable requirements:

- Cables must be shielded category;

- Insulated conductors must be twisted in pairs;
- Cables must be at least Category 5 (CAT 5).

RS485/CAN communication cable requirements:

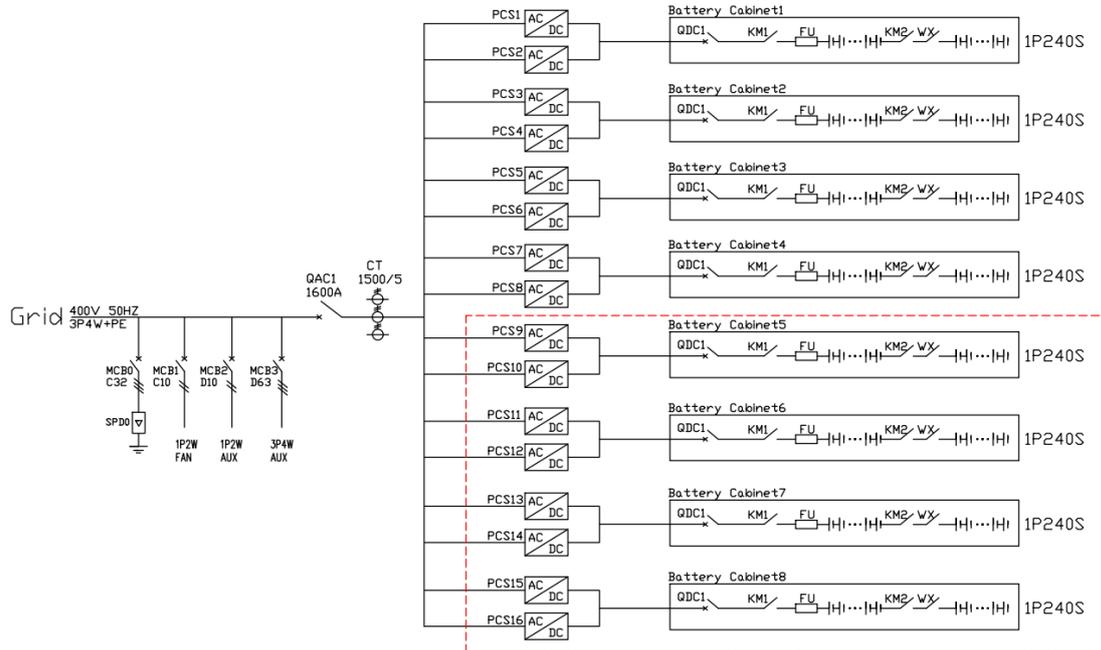
- Cables must be shielded;
- The insulated conductors must be twisted in pairs;
- RS485 communication cables are recommended to use 2 x 0.75mm² type cables.

2.3 Electrical Schematic

A single PowerMount containerized battery storage system is fully equipped with 8 battery cabinets and 16 PCS modules, with two PCS in parallel (rated at 100kW) connected to a set of batteries.

A single battery cabinet consists of 240 280Ah cells connected in series, with an energy of 215kWh. 8 cabinets are fully equipped with a system energy of 1,720kWh. 4, 5, 6 and 7 cabinets can be configured, with an energy of 860kWh, 1,075kWh, 1,290kWh and 1,505kWh, respectively, with the corresponding model number of the PowerMount-P400-860kWh, PowerMount-P500-1075kWh, PowerMount-P600-1290kWh, PowerMount-P700-1505kWh.

Note: The parameter information shown in the diagram is only for the full configuration of 8 battery cabinets, the dotted box indicates the optional battery cabinets, and the parameter information of the electrical components is slightly different according to the different configurations of the number of battery cabinets. The electrical topology of the system is shown below:

Figure 2-11 Electrical schematic

Table 2-3 Electrical schematic

Identifiers	Location	Description
MCB0	PCS cabinets	4P miniature circuit breaker, surge protector backup protection device
MCB1	PCS cabinets	2P miniature circuit breaker, secondary load supply switch in PCS cabinet
MCB2	PCS cabinets	2P miniature circuit breaker, reserved for connection to the control circuit of the distribution box (the circuit is isolated via an isolating transformer)
MCB3	PCS cabinets	4P miniature circuit breaker, reserved for connecting to the control circuit of distribution box
SPD0	PCS cabinets	Surge protector
QAC1	PCS cabinets	AC molded case circuit breakers
CT	PCS cabinets	Current transformer
PCS	PCS cabinets	An energy storage converter module, wherein PCS1 and PCS2 are a set of
QDC1	Battery cabinet	DC circuit breaker
KM1	Battery cabinet	DC contactor
FU	Battery cabinet	DC fuses
Battery	Battery cabinet	Battery pack

Identifiers	Location	Description
KM2	Battery cabinet	DC contactor
WX	Battery cabinet	MSDS repair switches

2.4 Outdoor Battery Cabinet

A single Cube battery cabinet is composed of a 12-pack battery module in series configuration, with a single module consisting of 1P20S 280Ah cells.

The internal integrated BMS battery management system adopts a three-layer structure management (BC, BCM, BMM).

BMM is the slave control module, which is mainly used to collect the temperature, voltage and other information of a single battery cell;

BCM is the master control management module, which collects and calculates the overall parameters of the battery cluster, such as the total current, total voltage, the highest and lowest single cell voltage, the highest and lowest temperature point temperature, and the insulation detection value of the battery cluster to ground;

BC is the local controller of the battery cabinet, communicating with BCM for information interaction and control.

Figure 2-12 Outdoor battery cabinet components (door closed)

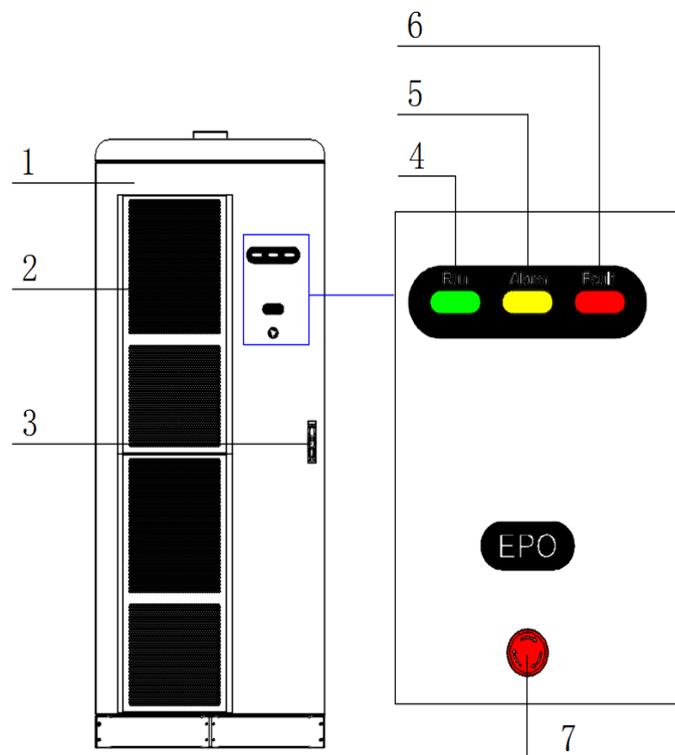
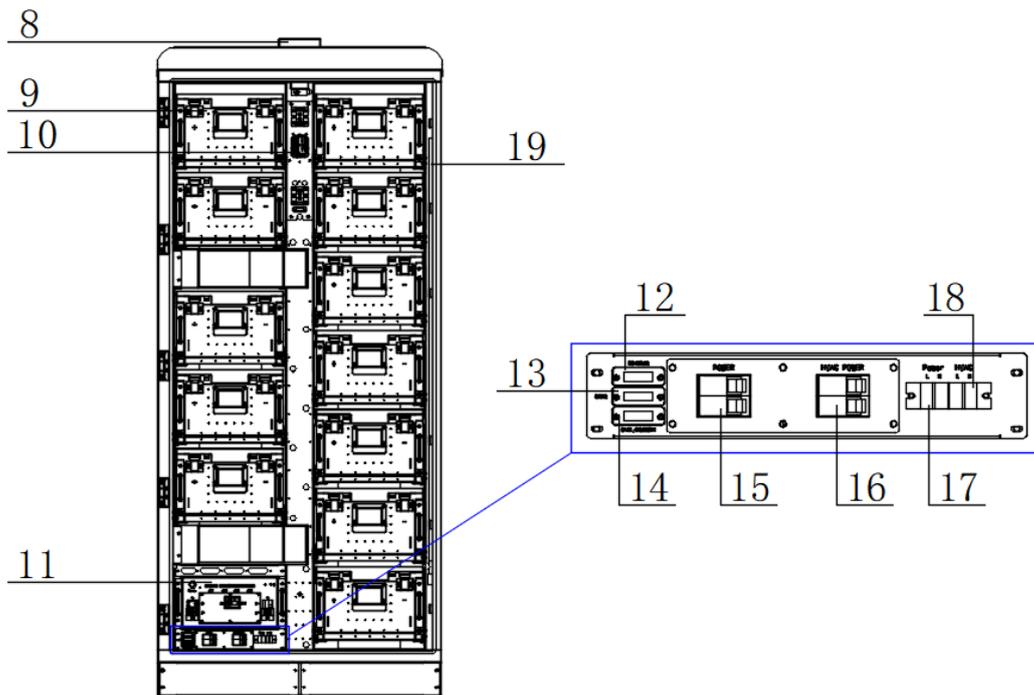


Table 2-4 Components introduction (door closed)

No.	Name	Function
1	Cabinet	Battery cabinet enclosure
2	Air conditioner.	Regulating temperature
3	Door lock	The cabinet door is locked and requires a specific key to open
4	Running light	Steady green indicates running and blinking indicates standby
5	Alarm light	Steady yellow indicates the system has an alarm but does not affect the system running
6	Fault light	Steady red indicates the system is faulty and stops running.
7	Emergency stop button	The system stops when the button is pressed

Figure 2-13 Outdoor battery cabinet components (front door opened)

Table 2-5 Components introduction (front door opened)

No.	Name	Function
8	Battery cabinet pressure relief valve	Balance the pressure inside and outside the battery cabinet

No.	Name	Function
9	Battery module	For electrical energy storage
10	Repair switches	Perform an intermediate break on the battery cluster
11	High pressure control box	Internal integrated BCM master module and local controller for real-time monitoring of battery status
12	RS485-2 Communication	RS485-2 communication (2-way, hand-to-hand connection)
13	CAN#2 Communication	CAN-2 communication (2-way, hand-to-hand connection)
14	RS485#1/CAN#1 communication	CAN-1/RS485-1 communication (1 channel each)
15	Power microswitch	Control circuit power supply control
16	HVAC microswitch	Air conditioning power supply circuit control
17	Control power supply terminals	Control circuit 220V L/N line access
18	Air conditioner power supply terminals	Air conditioning circuit 220V L/N line access
19	Firefighting devices	Tube fire extinguishing systems

Table 2-6 Battery parameters

Item	Specifications
Battery cell type & capacity	LiFePO4 - 280Ah
Battery cluster configuration	1P240S (12 modules)
Battery storage capacity range	215kWh
Battery voltage range	672V-864V
General Parameters	
Dimensions (W*H*D)	1000mm*2334mm*1186mm
Maximum weight	2200kg
Degree of protection	IP55 (outdoor)
Cooling method type	Air conditioner
Firefighting system	FM200 automatic fire extinguishing
Anti-corrosion grade	C3
Relative humidity	0-95% (non-condensing)
Operating temperature	-20°C ~ 50°C
Altitude	< 3000m
Noise level	≤75dB
Communication interface	RS485, Ethernet
Communication protocol	Modbus RTU, Modbus TCP/IP
Cycle life	6000 cycles

2.5 PCS Cabinet

Each 2 PCS modules is a group with a cluster of batteries, rated power 100kW, the system charge/discharge multiplier is 0.5C, the system power according to the different battery clusters selected, the corresponding PCS configuration is also different.

If 4, 5, 6, 7 and 8 battery cabinets are configured, the corresponding system power is 400kW, 500kW, 600kW, 700kW and 800kW respectively.

Figure 2-14 PCS layout

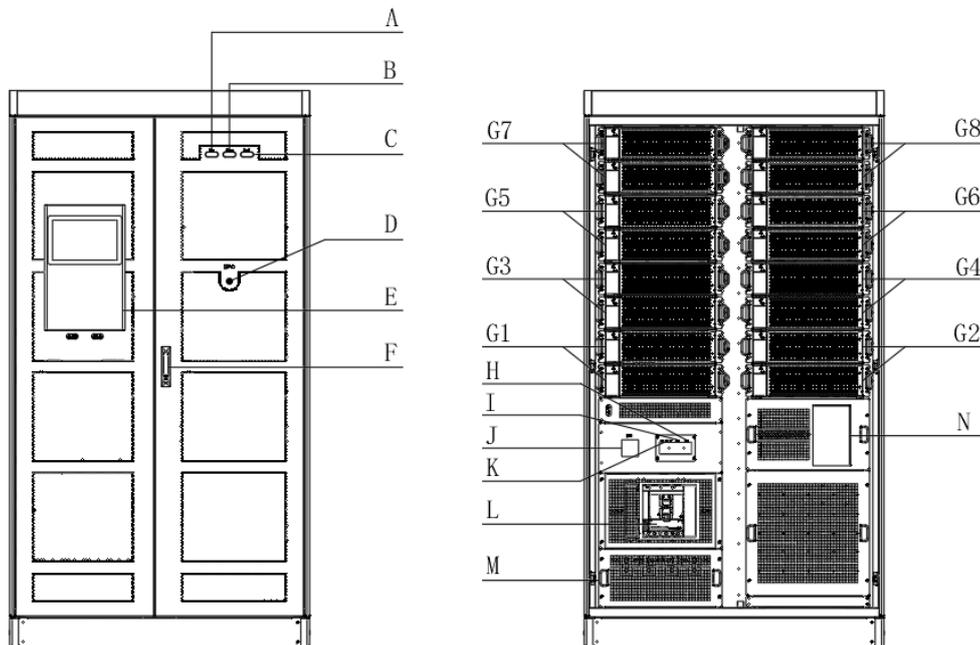


Table 2-7 PCS layout

No.	Name	Function	Remarks
A	Run indicator (RUN)	Green, always on when the system is running, blinking in standby, off when faulty	
B	Alarm indicator (Alam)	Yellow, always on when system alarm is on	
C	Fault indicator (Fault)	Red, always on when there is a system fault	
D	Emergency stop button (EPO)	In case of system emergency, press to trigger an emergency stop	
E	EMS box	EMS Energy Management System	
F	PCS cabinet door Locks	Open/Close PCS cabinet	

No.	Name	Function	Remarks
G1	PCS1/PCS2	Two inverters DC-side coupled to a #1 battery cabinet	
G2	PCS3/PCS4	Two inverters DC-side coupled to a #2 battery cabinet	
G3	PCS5/PCS6	Two inverters DC-side coupled to a #3 battery cabinet	
G4	PCS7/PCS8	Two inverters DC-side coupled to a #4 battery cabinet	
G5	PCS9/PCS10	Two inverters DC-side coupled to a #5 battery cabinet	Optional, system with 5 cluster battery
G6	PCS11/PCS12	Two inverters DC-side coupled to a #6 battery cabinet	Optional, system with 6 batteries
G7	PCS13/PCS14	Two inverters DC-side coupled to a #7 battery cabinet	Optional, system with 7 batteries
G8	PCS15/PCS16	Two inverters DC-side coupled to a #8 battery cabinet	Optional, system with 8 batteries
H	MCB2	2P miniature circuit breaker, reserved for connection to distribution box	
I	MCB1	2P miniature circuit breaker, 220V power switch in PCS cabinet	
J	EM1	AC side meter	
K	FU1, FU2, FU3	AC fuses, meter sampling circuits	
L	QAC1	Molded case circuit breaker, PCS AC power interface	
M	MCB3	4P miniature circuit breaker, connected to the power switch of the distribution control box (installed on the side of the wind panel)	
N	UPS	UPS power supply	Optional, depending on the application
O	Communication and control area	Open the sealing plate, the internal communication and control circuit is integrated, the customer's EMS communication interface needs to be accessed here.	

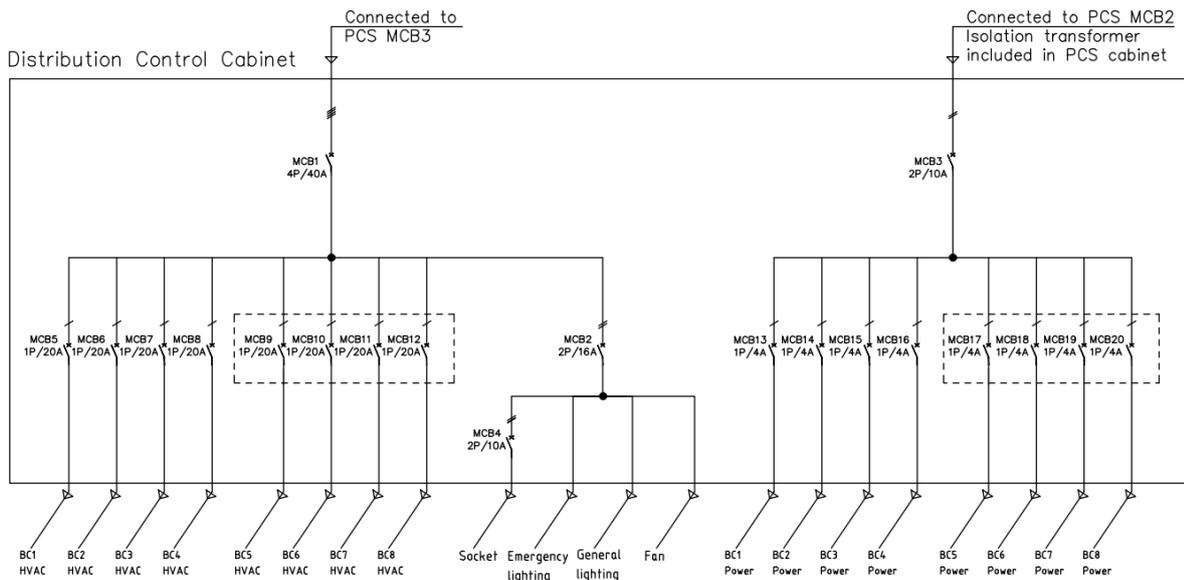
Table 2-8 PCS specifications

Item	Specifications
Weight	600KG
Size	1200*1100*2220 (W*H*D)

2.6 Distribution Control Box

The main role of the distribution control box for the secondary auxiliary power distribution control, integration of multiple miniature circuit breakers and multiple power supply lines, auxiliary power distribution schematic diagram shown in the figure below, which according to the different number of battery cabinet options, the corresponding number of micro-break is also different.

Figure 2-15 Auxiliary distribution schematic for power distribution boxes



The structural outline drawing and layout of the distribution box are shown below:

Figure 2-16 Distribution box structure outline

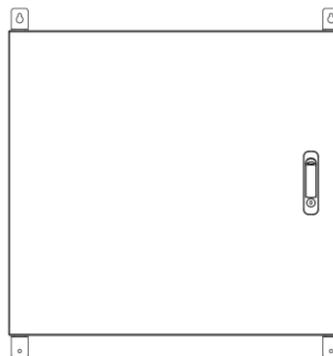
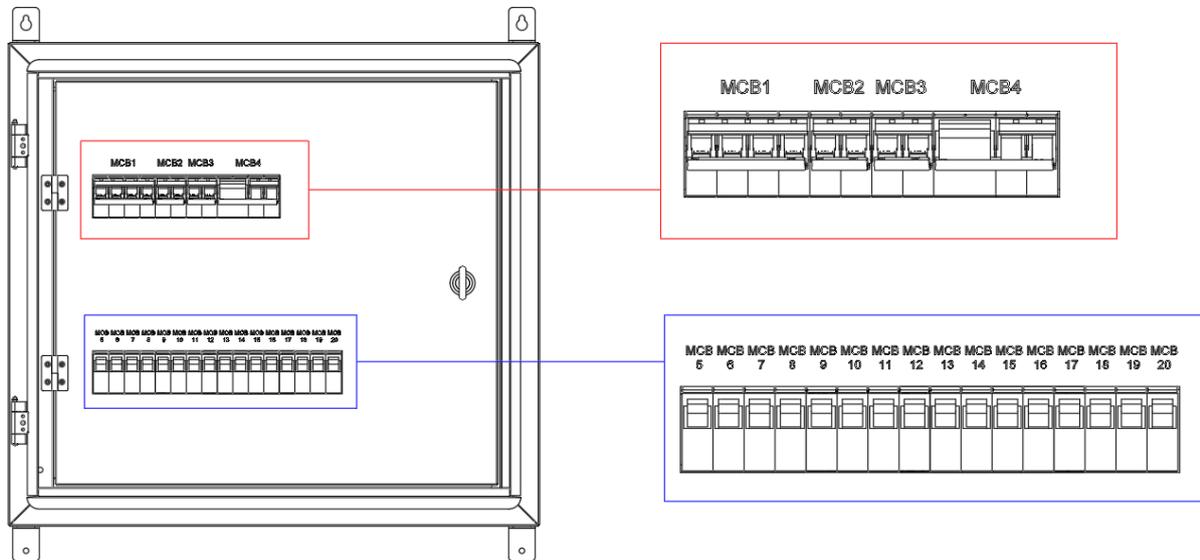


Figure 2-17 Distribution box layout

Table 2-9 Distribution box layout

No.	Name	Function	Remarks
1	MCB1	4P miniature circuit breaker, main switch for power supply circuits for air conditioners and fans, etc.	
2	MCB2	Main switch for power supply circuits for lighting, sockets, emergency lights and fans	
3	MCB3	Battery cabinet control circuit main switch	
4	MCB4	Leakage protection switch for socket	
5	MCB5	No. 1 battery cabinet air conditioning circuit switch	
6	MCB6	No. 2 battery cabinet air conditioning circuit switch	
7	MCB7	No. 3 battery cabinet air conditioning circuit switch	
8	MCB8	No. 4 battery cabinet air conditioning circuit switch	
9	MCB9	No. 5 battery cabinet air conditioning circuit switch	Optional, system with 5 cluster battery
10	MCB10	No. 6 battery cabinet air conditioning circuit switch	Optional, system with 6 cluster battery
11	MCB11	No. 7 battery cabinet air conditioning circuit switch	Optional, system with 7 cluster battery
12	MCB12	No. 8 battery cabinet air conditioning circuit switch	Optional, system with 8 cluster battery
13	MCB13	No. 1 battery cabinet control circuit switch	

No.	Name	Function	Remarks
14	MCB14	No. 2 battery cabinet control circuit switch	
15	MCB15	No. 3 battery cabinet control circuit switch	
16	MCB16	No. 4 battery cabinet control circuit switch	
17	MCB17	No. 5 battery cabinet control circuit switch	Optional, system with 5 cluster battery
18	MCB18	No. 6 battery cabinet control circuit switch	Optional, system with 6 cluster battery
19	MCB19	No. 7 battery cabinet control circuit switch	Optional, system with 7 cluster battery
20	MCB20	No. 8 battery cabinet control circuit switch	Optional, system with 8 cluster battery

Table 2-10 Distribution control box specifications

Item	Specifications
Weight	20KG
Size	600*550*220 (W*H*D)

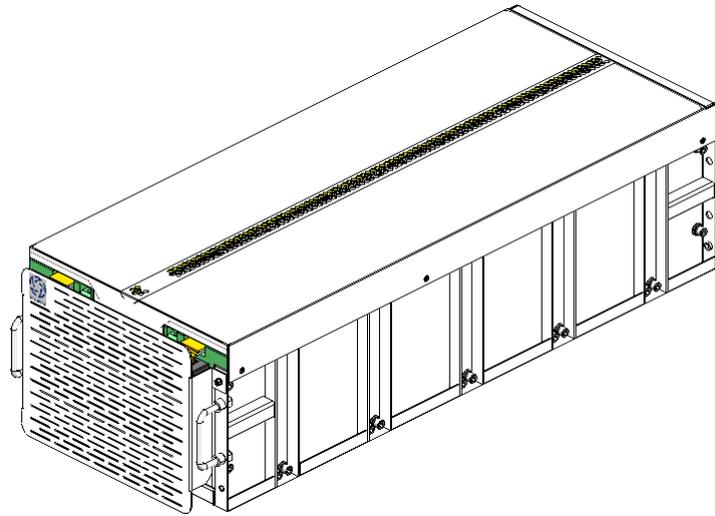
2.7 Key Components

2.7.1 Battery Pack



DANGER!

- Do not touch any batteries when BESS is running.
- Only authorized operators can operate the battery.
- End of life (decommissioning, dismantling and disposal in accordance with the provided recycling program).

Figure 2-18 Battery module

Table 2-11 Battery specifications

Item	Specifications
Rated voltage	64V
Rated capacity	280Ah 17920Wh
Dimensions	378*985*260 (W*D*H)
Weight	150kg
Composition	1P20S
Standard charging current	140A
Standard discharge current	140A
Charge termination voltage	3.6V/Cell
Discharge termination voltage	2.8V/Cell
Working environment temperature	Charge: 0°C ~ +60°C, Discharge: -30°C ~ +60°C
Storage temperature	Short-term storage: -20°C ~ +45°C (<1 month SOC: 20%~60%) Long-term storage: 0°C ~ +35°C (<1 year SOC:30%~60%)
Storage humidity	5% to 95%
Long-term storage requirements	6 months ambient power supply: charge and discharge once, then reverse charge to 25% SOC

2.7.2 EMS

Figure 2-19 EMS appearance

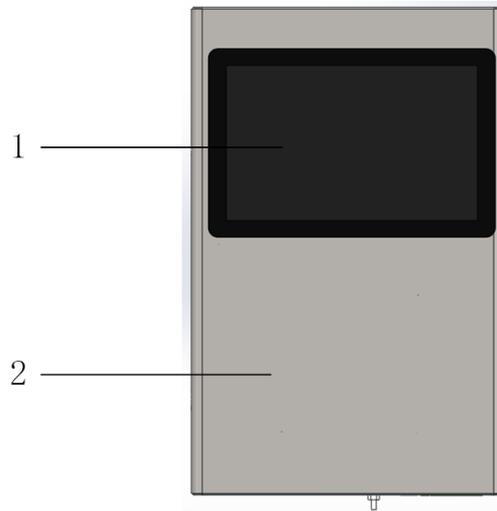


Table 2-12 EMS appearance

Item	Name	Function
1	Display	Display EMS interface information
2	EMS box	Cabinet

Table 2-13 EMS parameters

Item	Specifications	Remarks
Control function	Peak and valley mode, backup mode, smooth photovoltaic	
PCS module quantity	16	
Number of BMS clusters	8	
System rated power	800kW	
User interface	Display interface, Ethernet	
Communication interface	1 way Ethernet	
Letter of agreement	Ethernet: Modbus TCP	
Power input	DC12V	
Working temperature	-20 ~ 55°C	
Altitude	≤2000m	
Ambient relative humidity	5 ~ 95%	No condensation

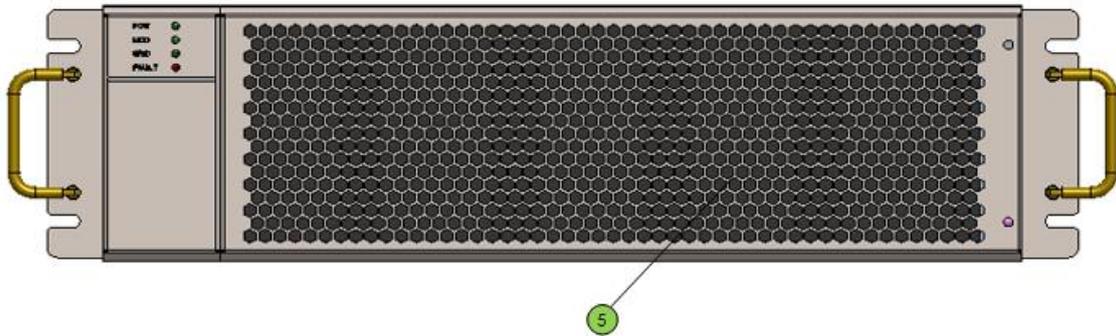
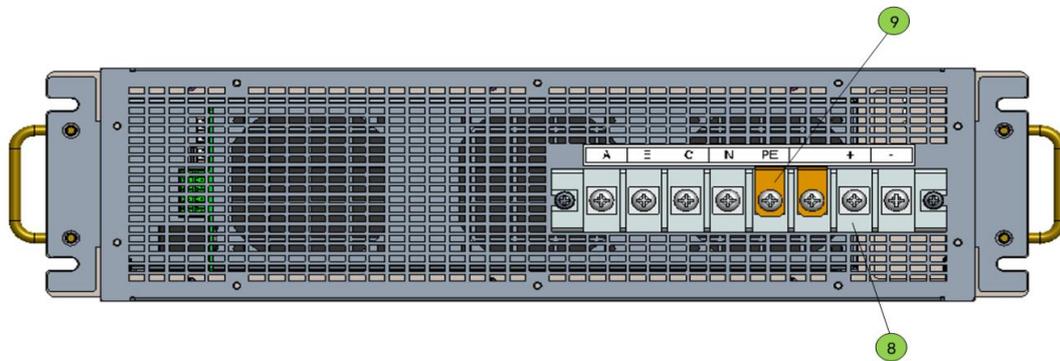
Item	Specifications	Remarks
Protection level	IP21	
Width* Height* Depth	320mm*500mm*60mm	
Weight	9.3kg	
Installation method	Indoor, hanging installation	

Table 2-14 Function list

Item	Function	Description
1	System start and stop control	It can control the start and stop operations of the battery energy storage system, and decide whether to put the system into use or suspend operation according to needs.
2	System power delivery	With the ability to issue power commands, the power output of the system can be adjusted as needed to meet changes in power demand.
3	System operating mode switching	Supports switching between different operating modes, such as grid-connected mode, independent operating mode or hybrid mode, to adapt to different application scenarios and needs.
4	System data query	Provides a query function to obtain real-time data, historical data, status information and operating parameters of the battery energy storage system to monitor and evaluate the performance and operation of the system.
5	System data export	Supports exporting system data to external devices or storage media for further analysis, recording, or report generation.
6	System control switch	The control switching function allows the control of the system to be transferred from one control device or system to another to achieve flexibility and reliability in monitoring, management and operation.

2.7.3 PCS Module

Figure 2-20 Front panel (remove the dust cover)


Figure 2-21 Front panel

Figure 2-22 Back panel

Table 2-15 Panel components

No.	Name	No.	Name
①	LED Status Indicator	②	Communication Resistance DIP Switch
③	RJ45 Communication Interface	④	BMS & EMS Communication Interface
⑤	Dust Cover	⑥	Parallel Communication Interface
⑦	RS485&DI/DO Signal Interface	⑧	DC&AC Terminals
⑨	PE Short Circuit Metal Sheet		

Table 2-16 PCS parameters

Category	Technical Specifications	Parameters
Model	MA1000K60	/
DC parameters	Maximum voltage [Vd.c.]	1000
	Rated voltage [Vd.c.]	800
	Battery voltage range [Vd.c.]	680 ~ 1000
	Maximum charging / discharging current [Ad.c.]	88
AC input parameters	Maximum input apparent power [kVA]	60
	Maximum input active power [kW]	60
	Rated input voltage [Va.c.]	230/400, 3P+N+PE
	Maximum continuous input current [Aa.c.]	86
	Rated input frequency [Hz]	50
AC output parameters	Rated output voltage [Va.c.]	230/400, 3P+N+PE
	Rated output frequency [Hz]	50
	Maximum continuous output current [Aa.c.]	86
	Maximum continuous output active power [kW]	60
	Maximum continuous output apparent power [kVA]	60
	Unbalanced loads	100%
	Overload capacity	1.1 1min;1.2 5s
	Power factor	0.8 un ~ 0.8 ov
General	Operating temperature range [°C]	-30 ~ +60 (>45°C derating)
	Ingress protection	IP20
	Operating altitude range [m]	3000
	Maximum efficiency	98.5%
	AC / DC start function	Integrated
	Size (W*D*H) [mm]	436*550*130
	Weight [kg]	28
Communication	BMS communication interface	CAN, RS485
	EMS communication interface	Ethernet, RS485
	EMS communication protocol	ModbusTCP / ModbusRTU
	General-purpose IO	3-way DI, 2-wayDO

3 Installation Process

3.1 Unpacking

Before opening the package, please check whether the packing box is complete and whether there is any damage, soaked in water; if the package is incomplete or obviously damaged, please contact the supplier. If the package is complete, please open the box to check whether the contents are complete against the material list or as shown in the figure below; if there is any omission or damage, please contact the supplier.

Table 3-1 Packing list

No.	Item	Model and Specifications	Qty
1	Container	400kW/860kWh	1 PC
2	Repair switch plugs	GCMSDP000-DC1500V350A	4 PCS
3	L-shaped fixing bracket	/	6 PCS
4	304 stainless steel screw combination	M12*40	12 PCS
5	Spring-pads	M12	12 PCS
6	Flat pads	M12*24*2mm	12 PCS
7	Stainless steel expansion screws	M16*150mm	12 PCS
8	Anti-reverse current secondary meter	SDM630MCT-40mA	1 PC
9	Current transformer	ESCT-TA16-10A/40mA	3 PCS
10	DC fuse	RSZ307-L2E-250A1000V	2 PCS
11	BMM slave controller module	BMM-2412-HV4.0.0	2 PCS
12	BMS box main harnesses	/	1 PC
13	System status indicator	12V/24V-PCB-LED	1 PC
14	120Ω matched resistance	120Ω, black	10 PCS
15	Switching acquisition module	EIO0808	1 PC

No.	Item	Model and Specifications	Qty
16	Switching power supply	RS-50-24	1 PC
17	Switching power supply	NDR-120-12	1 PC
18	Switching power supply	NDR-120-24	1 PC
19	AC contactor	NDC1Z-0910 DC24V	1 PC
20	16A AC fuse	RT28-32 16A	1 PC
21	2A AC fuse	RT28-32 2A	3 PCS
22	Intermediate relay	DRM570024L	1 PC
23	Retaining clip	DRM/DRL CLIP M	1 PC
24	Base	FS 4CO	1 PC
25	Air conditioner	LS200-W 518832D AC230V 50HZ	1 PC
26	Fire extinguisher A tube	150030HS-F-A	1 PC
27	Fire extinguisher B tube	150030HS-F-B	1 PC
28	Utai UT-890A USB to 485	UT-890A/1.5m	1 PC
29	ST-LINK downloader	ST-LINK/V2	1 PC
30	Control panel	/	1 PC
31	SIM card holder	/	1 PC
32	Battery cabinet door key	/	4 PCS
33	Container door key	/	2 PCS
34	PCS cabinet door key	/	2 PCS
35	Distribution box door key	/	2 PCS
36	Padlock key	/	1 PC


NOTE!

Actual packing materials and quantity shall be subject to the packing list in the packing box.

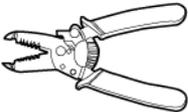
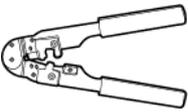
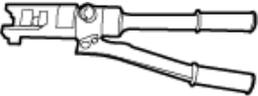
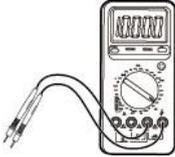
3.2 Installation Preparation

3.2.1 Installation Tools


NOTE!

- The tool pictures are for reference only.
- The tools table may not list out some tools required onsite. Onsite installation personnel and the customer need to prepare the tools based on the site requirements.

Figure 3-1 Tools list

 <p>Phillips Insulated Torque Screwdriver</p>	 <p>Insulated Torque Socket Wrench (Including Extension Bar)</p> <ul style="list-style-type: none"> • Socket specifications: 7mm~19mm • Socket depth $\geq 32\text{mm}$ • Sleeve interface and torque • Matching with torque wrench • Torque range: 1.2N-m~45N-m 	 <p>Slotted Insulated Torque Screwdriver</p>	 <p>Diagonal Nose Pliers</p>
 <p>Wire Strippers Pliers</p>	 <p>Wire Cutting Pliers</p>	 <p>Rubber Hammer</p>	 <p>Knife</p>
 <p>Crystal Head Crimping Pliers</p>	 <p>Hydraulic Pliers</p>	 <p>Multi-meter DC Voltage Range $\geq 1500\text{V DC}$</p>	 <p>Marking Pen</p>

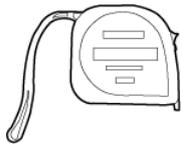
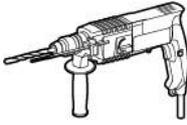
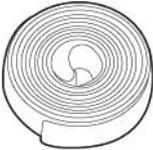
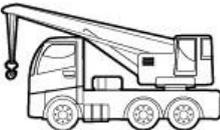
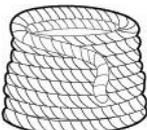
 <p>Steel Tape Measure</p>	 <p>Horizontal Ruler</p>	 <p>Vacuum Cleaner</p>	 <p>Impact Drill</p>
 <p>Impact Drill Φ16mm</p>	 <p>Heat Shrink Tubing</p>	 <p>Hot Air Gun</p>	 <p>Wire Tie</p>
 <p>Insulation Ladder</p>	 <p>Crane</p>	 <p>Lanyard Rope Rope length\geq1845mm\times4</p>	 <p>Electric Forklift/</p>
 <p>Manual Forklift</p>	<p>-</p>	<p>-</p>	<p>-</p>

Table 3-2 Key equipment and tools for installation

No.	Recommended Tools	Quantity	Usage
1	Forklifts	1 unit	Rated load $\geq 3.5T$. For unloading and handling
2	Drill and M12 tip	1 group	Drilling in the ground. Place the expansion screws (M12*150)
3	Hammer	1 piece	Knock the expansion bolt into the fixed position
4	Sleeve tool	1 group	M12 sleeve: For tightening expansion bolts M8 sleeve: Terminal block fixed
5	Insulated torque wrench	1 piece	Check and mark the torque value
6	Adjustable wrench	1 piece	Tighten the bolts to which the cable is connected
7	Diagonal jaws	1 piece	Cut off the nylon tie from the bag
8	Slotted screwdriver/crowbar	1 piece	Unpacking operation

Figure 3-2 Personal protective equipment (PPE)

 Insulated Gloves	 Protective Gloves	 Goggles	 Dust Mask
 Insulated Shoes	 Reflective Undershirt	 Safety Helmet	 Safety Belt

3.2.2 Installation Environmental Requirements

Table 3-3 Installation environment requirements

No.	Item	Requirements
1	Environmental temperature range	-20°C~ 50°C (Output power decreases when battery temperature exceeds 40°C)
2	Allow altitude	<2000m (drop over 2000m)
3	Allowed humidity	0 ~ 95% (no condensation)
4	Install base requirements	See Chapter 3.4 for specific requirements
5	Install base requirements	See Chapter 3.4 for specific requirements

Refer to the NFPA 855 Standard for the Installation of Stationary Energy Storage Systems and local laws and regulations. General requirements see below:

- The horizontal level of the installation site shall be above the highest water level of that area in history and at least 300 mm above the ground. The site must not be located in a low-lying land.
- The ESS and the site must be in an environment free from explosion risks.
- Transportation to the site shall be convenient and fire suppression facilities shall be reliable.


NOTE!

- When installing, commissioning, and operating the ESS, ensure that at least two gas fire extinguishers, such as heptafluoropropane, perfluorohexanone, or carbon dioxide fire extinguishers, are provided near each unit to ensure fire safety.
- Reserve sockets for the water fire suppression system at the ESS site.
- The site shall be in a well-ventilated place.

Do not select the sites that are not recommended by industry standards and regulations, including but not limited to the following areas:

- Areas with sources of strong vibration, loud noises, and strong electromagnetic interference.
- Areas with dust, oil fumes, harmful gases, corrosive gases, etc.
- Areas with corrosive, flammable, and explosive materials
- Areas with adverse geological conditions such as rubbery soil and soft soil layer, or prone to waterlogging and land

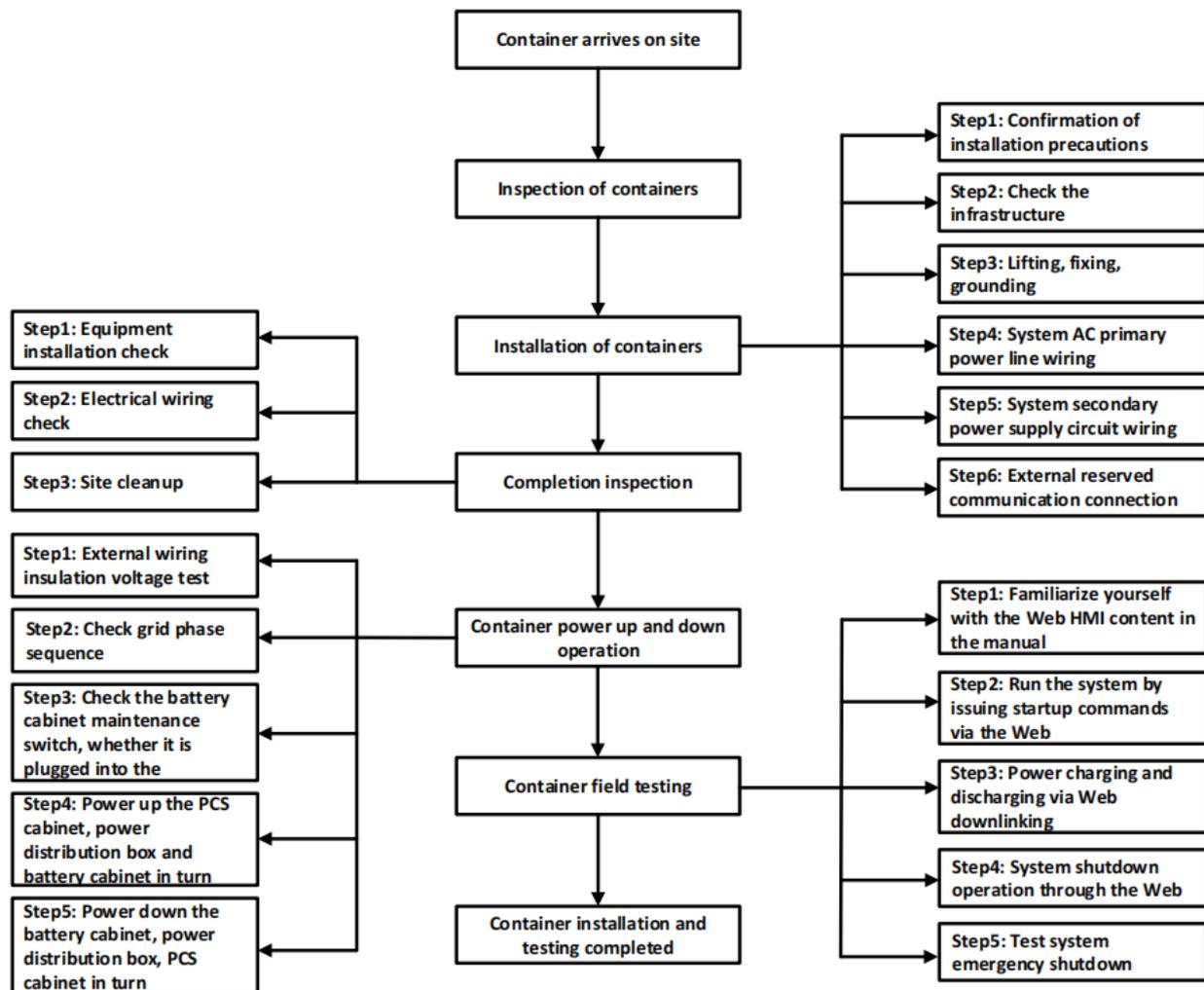
subsidence Under a reservoir, water landscape, and water room.

- If areas prone to waterlogging cannot be avoided, install water blocking and drainage facilities or raise the ground.
- Cable trenches shall not be used for drainage. Fire retardant sealing shall be implemented at cable holes (such as holes through partition walls and floors).
- Areas prone to earthquakes and with seismic fortification intensity higher than 9.
- Areas prone to debris flow, landslide, quicksand, karst caves, and other direct hazards.
- Areas within the mining land subsidence (dislocation) zone.
- Areas within the scope of blasting hazard.
- Areas prone to flood due to a dam or level failure Protection areas for important water supply sources.
- Protection areas for historic relics Populated areas, high-rise buildings, and underground buildings Intersections and busy roads of urban main roads.

Requirements for flood and waterlogging prevention in site selection:

- The site design elevation of a medium- or small-scale electrochemical energy storage system shall be higher than the flood level with a probability of 2% or the historical highest waterlogging level.
- If the site design elevation cannot meet the preceding requirements, change the site location or take different flood and waterlogging prevention measures based on the site requirements.
- For energy storage plants prone to wind and waves from rivers, lakes, and seas, the elevation of flood prevention facilities shall consider the wind and wave height with a probability of 2% and an additional safety height of 0.5m.
- When a large amount of catchment water flows into or passes through the site, it is recommended that side ditches or drainage ditches be built to drain water from the ground in an organized manner.

Once the PowerMount container arrives on site, the installation and fixing, wiring and commissioning process is shown in the figure:

Figure 3-3 PowerMount installation and test process


Before the container arrives at the site, it is necessary to prepare the site construction tools in advance, due to the different site conditions, please site installers and users to prepare the appropriate tools according to the actual situation, including but not limited to the following tools:

- a. Personal protection tools: insulated gloves, protective gloves, insulated shoes, reflective undershirts, helmets, safety belts, goggles, protective masks and so on.
- b. On-site installation tools: cross insulated screwdriver, one-word insulated screwdriver, insulated torque socket wrenches, wire strippers, crimping pliers, multi-meters, marking pens, steel tape measure, impact drills, insulated ladders, hoists, steel wire lifting ropes, hoists, and so on.

After the container arrives at the site, before unpacking the equipment, please check whether there is visible damage to the outer packaging, confirm that the

transportation process did not cause deformation of the container load-bearing beams and other frame structures or other signs of possible damage to the interior, and check the equipment model.

Note that the container transportation support columns cannot be dismantled, and need to be lifted and fixed before dismantling!

If you have the above problems, please contact us at the first time!

3.3 Installation Precautions

 <p>DANGER!</p>	<ul style="list-style-type: none"> ● In the process of container handling and hoisting, personal injury may occur due to excessive weight or collision of the device. It is necessary to carry and lift containers reasonably and in a planned manner. ● There is a risk of electric shock if there is voltage in the live parts. ● There are high voltages in the live parts of the device, and touching the parts can result in death or severe electrical damage. ● Please wear appropriate personal protective equipment for work. ● Do not touch any live parts. ● Please read carefully and meet the requirements in all warning messages that appear in the device and documentation. ● Follow all safety precautions provided by the battery manufacturer. ● The reverse polarity connection of the DC cable can cause a short circuit in the device. A short circuit can result in death or serious injury. ● Before connecting, make sure that the DC cable is of the correct polarity.
 <p>WARNING!</p>	<ul style="list-style-type: none"> ● It is forbidden to carry out container lifting operations in rain, snow, hail and other weather that is not conducive to hoisting; It is forbidden to carry out lifting work when the wind speed is level 6 (wind speed: 10.8-13.8m/s) or above level 6. ● If excessive force is applied while connecting the cables, the connecting busbar may be bent or damaged. This will

	<p>reduce clearance and creepage distances. Reducing clearance and creepage distances can lead to arc faults.</p> <ul style="list-style-type: none"> ● Cut the cable to the correct length and prepare it for connection. ● Place the terminal blocks on the busbar to ensure that the contact surface is large. ● Tighten to the specified torque. ● Failure to comply with the specified torque reduces the current carrying capacity of the live bolted connection and increases the contact resistance. This can cause the parts to overheat and catch fire. This could result in death or fatal injury. ● Make sure to always tighten the live bolted connection according to the exact torque specified in this document. ● Only suitable tools should be used when operating the equipment. ● Avoid repetitive tightening of live bolted joints, as this may result in high torques that are not allowed.
<p>NOTICE NOTICE</p>	<p>Before the hoisting operation, the surrounding site is inspected, and obvious safety cordons and vigilant personnel are set up to take care of them, remove potential safety hazards, and confirm that there are no problems before they can be formally hoisted; During the hoisting process, irrelevant personnel are not allowed to enter the hoisting danger area.</p>

3.4 Infrastructure Requirements

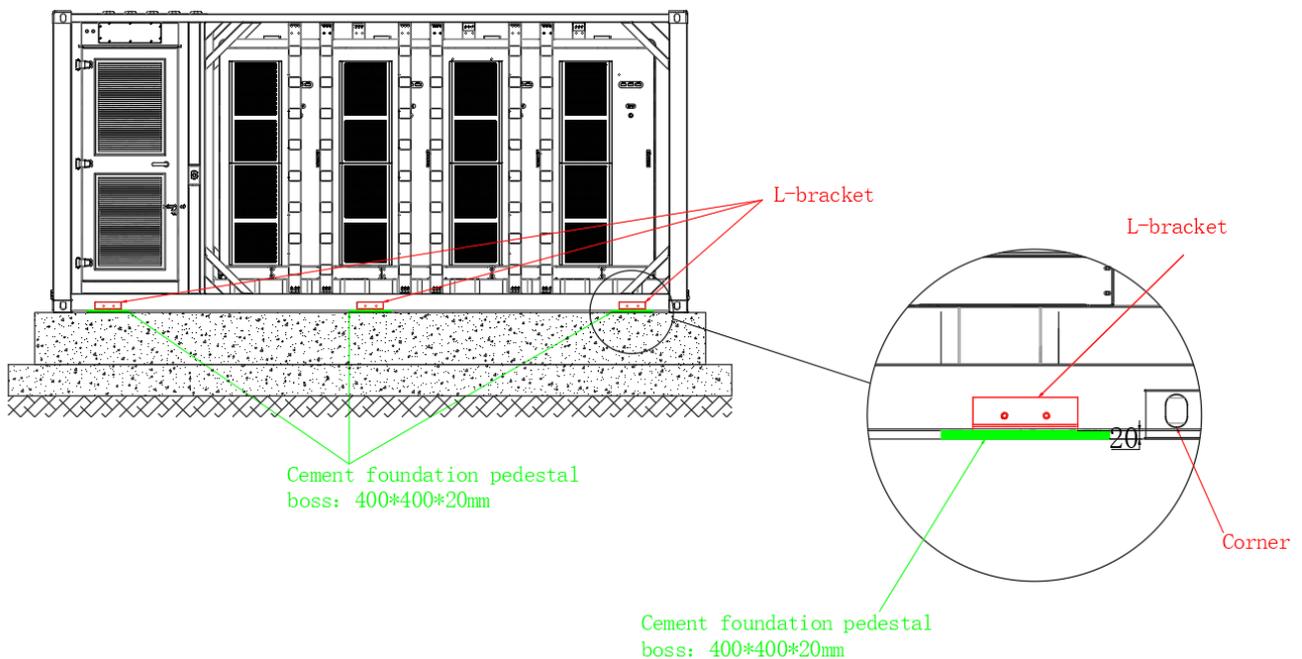
The foundation construction for on-site installation of containers needs to meet the following technical requirements (including but not limited to), and the foundation drawings are not to be taken as final construction drawings and are for reference only. Users shall review the design parameters of the foundation of the energy storage system according to the installation environment, geology and seismic requirements of the project site, relying on local civil engineering design and other units with relevant qualifications to provide construction drawings:

1. The container installation site shall not be flooded, and the height of the container placement plane must be kept above the local historical flood level line and 300mm above the ground;
2. The total weight of the container is about 16 tons, the container is recommended to use the rod foundation, internal pre-embedded steel, bearing

capacity shall not be less than 20 tons, the foundation installation diagram for the schematic, on-site construction, please rely on the local civil engineering design units to provide specific construction drawings;

3. Container base surface need to consider the "convex" design, the purpose is to four corner pieces fixed, the bottom beam can be kept horizontal with the corner pieces, so that the container force balance, the required size 400 * 400mm, thickness of 20mm, allowing negative tolerance 3mm, does not allow positive tolerance.

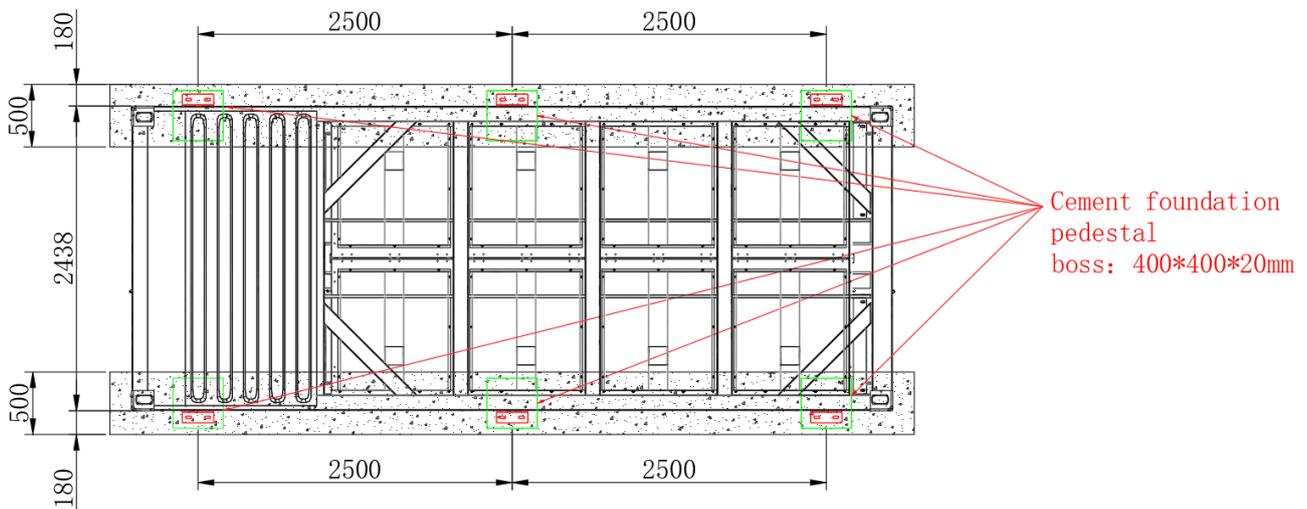
Figure 3-4 PowerMount base bump design description



4. The container needs to be installed with 6 L-type brackets, one side of the L-type bracket is fixed on the bottom beam of the container, the other side is kept level with the base and fixed downward with M16 expansion bolts (see PowerMount fixation instructions in chapter 3.6 for detailed operation);
5. When constructing the equipment foundation, it is necessary to consider the cable outlet of the energy storage system and reserve a trench or an inlet hole;
6. The holes reserved for the equipment foundation and the inlet holes at the bottom of the equipment should be blocked.

The schematic diagram of cam positioning is shown below:

Figure 3-5 PowerMount bump design positioning



3.5 Recommended Lifting Method

 <p>WARNING!</p>	<p>In the process of hoisting, the container should be avoided to be subjected to torque; the ground involved in the crane walking route should be hardened ground, and the steel plate and other objects should be covered when the crane crosses the existing road surface; the angle between the rope and the horizontal plane is $60^\circ \pm 10^\circ$ when lifting.</p>
<p>NOTICE</p> <p>NOTICE</p>	<p>Before hoisting, you need to carefully read and fully understand the safety instructions in the manual. Please follow the manual to recommend the hoisting method for hoisting, incorrect hoisting method will lead to deformation or damage to the equipment.</p>

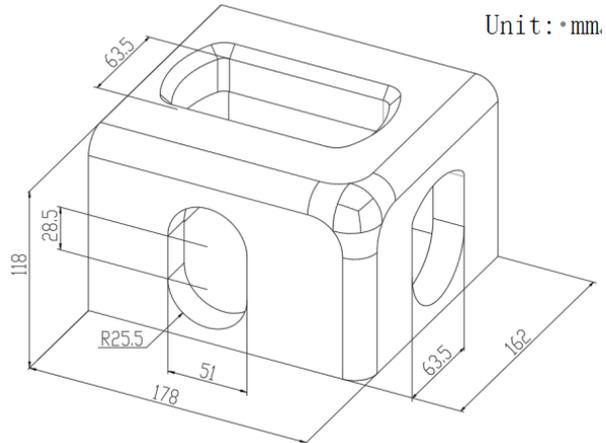
Container lifting points should be selected from the four corners of the container top load-bearing, the main considerations:

Recommended lifting method, but not limited to this method, the user can choose the optimal lifting method according to the actual situation.

Recommended number of cranes: 1 crane with force not less than 25t is required.

According to the size of the corner pieces, choose suitable hooks or ropes, and fix the four corner pieces of the container with lifting equipment.

Figure 3-6 PowerMount container corner piece dimensions



Lift the container with lifting equipment and place it on the pre-prepared base, with the effect shown in the figure below, aligning the container with the base at all points.

Figure 3-7 PowerMount lifting

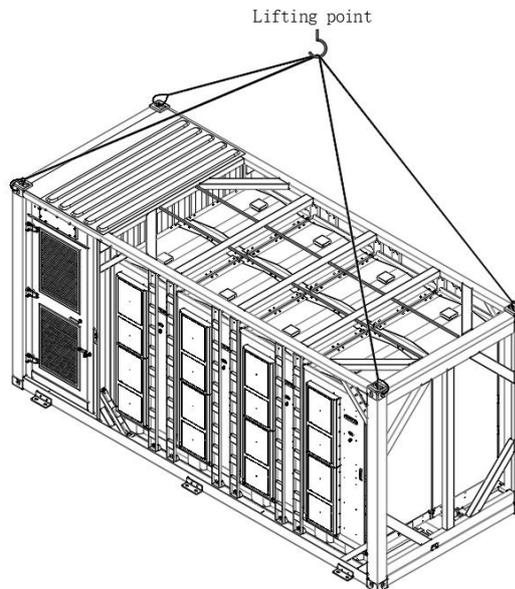
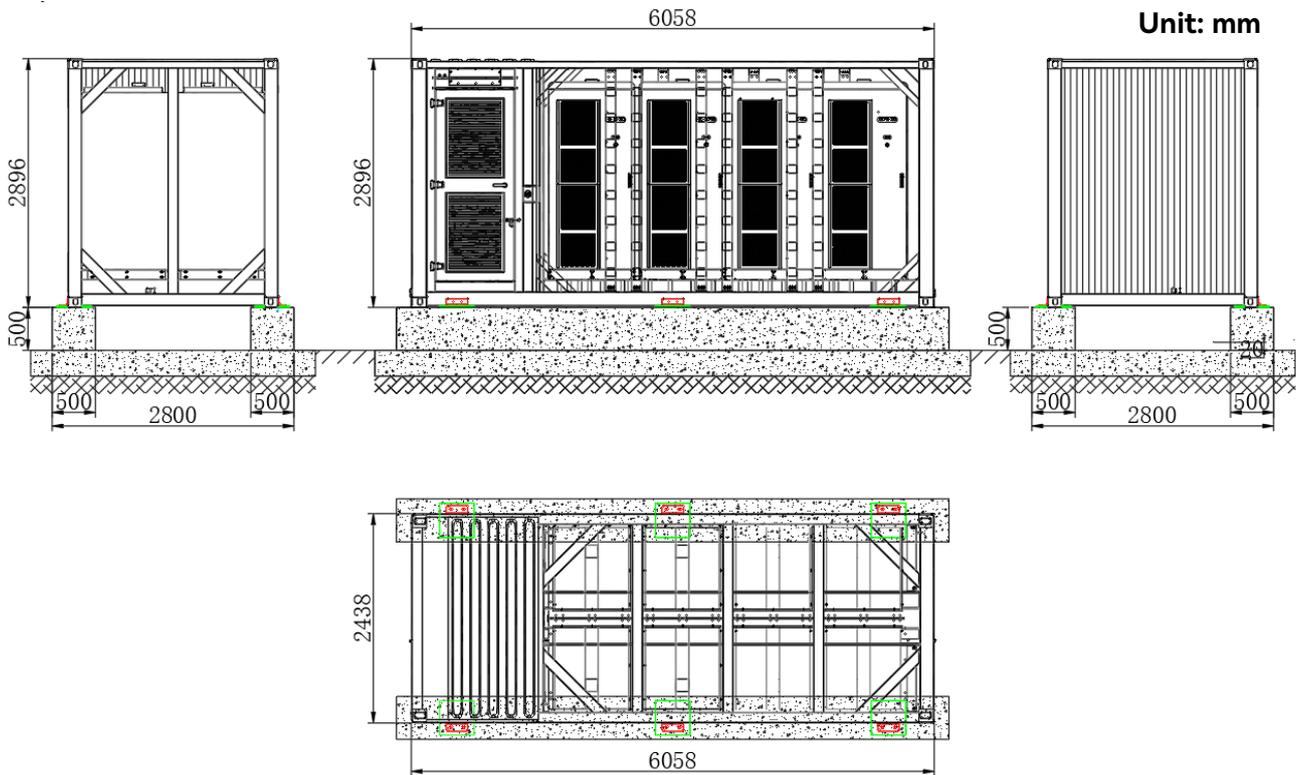


Figure 3-8 PowerMount installation completion


3.6 Product Fixation

After the container is placed on the base, it needs to be fixed with L-type bracket and base, the material recommendation is shown in the table, customers can choose according to the standard of the project installation place, outdoor use needs to have rust, corrosion and wear-resisting performance.

Use M12 (torque: 50N.m) screws to fix the L bracket on the crossbeam at the bottom of the base.

Figure 3-9 PowerMount fixing

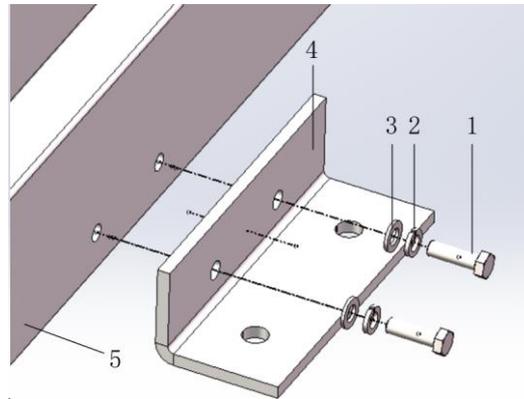


Table 3-4 PowerMount fixing

Location	Description
1	Screw (carbon steel)
2	Spring washer (carbon steel)
3	Fender washer (carbon steel)
4	L-shaped fixing bracket (galvanized sheet)
5	Transom (Q235)

Then the expansion bolt of M16 is fixed on the basis of the customer, and the nut of M16 (torque: 110N.m) is fixed.

Figure 3-10 PowerMount bolt-on

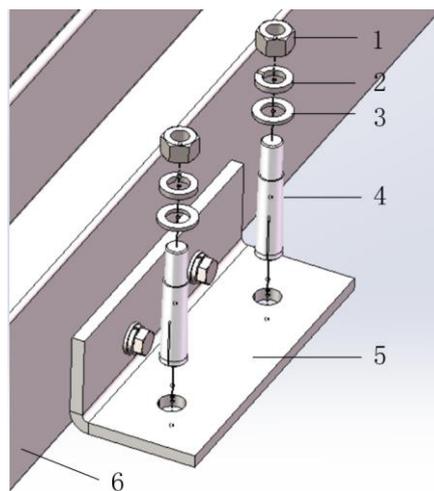


Table 3-5 PowerMount bolt-on

Location	Description
1	Nut (carbon steel)
2	Spring washer (carbon steel)
3	Fender washer (carbon steel)
4	M16 expansion bolt (carbon steel)
5	L-shaped fixing bracket (galvanized sheet)
6	Transom (Q235)

3.7 Cable Preparation

Table 3-6 Cable preparation

Product Model	Rated Current (A)	Cable Type	Cable Material	Cross-section Area (mm ²)	Remarks
PowerMount-P8 00-1720kWh	1241	Live Cable	Copper	4* (3*240 mm ² + 2*120mm ²)	
			Aluminum	4* (3*300 mm ² + 2*150mm ²)	
	1241	Neutral/ Ground	Copper	2*240mm ²	
			Aluminum	2*300mm ²	
	/	RS485	Shielded Twisted Pair Cable	1.5	Characteristic Impedance: 120Ω
	/	Network cable	CAT 5E outdoor		

3.8 Product Earthing

3.8.1 Grounding Requirements

To protect against dangerous voltages, the PowerMount containerized battery storage system must be grounded.

Connection to the grounding device can be made by means of a grounding cable or a grounding flat iron.

The cross-sectional area of the cable or grounding flat iron to which the grounding conductor is connected depends on the overcurrent protection device of the device.

Calculation of the required cross-section depends on national standards and directives.

The earthing must be designed in accordance with national standards and directives and is the responsibility of the installer.

3.8.2 Grounding Installation

Each PowerMount containerized battery storage system is provided with two $\Phi 12$ size grounding connection points, which are distributed at both ends of the container and can be fixed with a grounding conductor through M12 bolts.

Figure 3-11 PowerMount grounding point

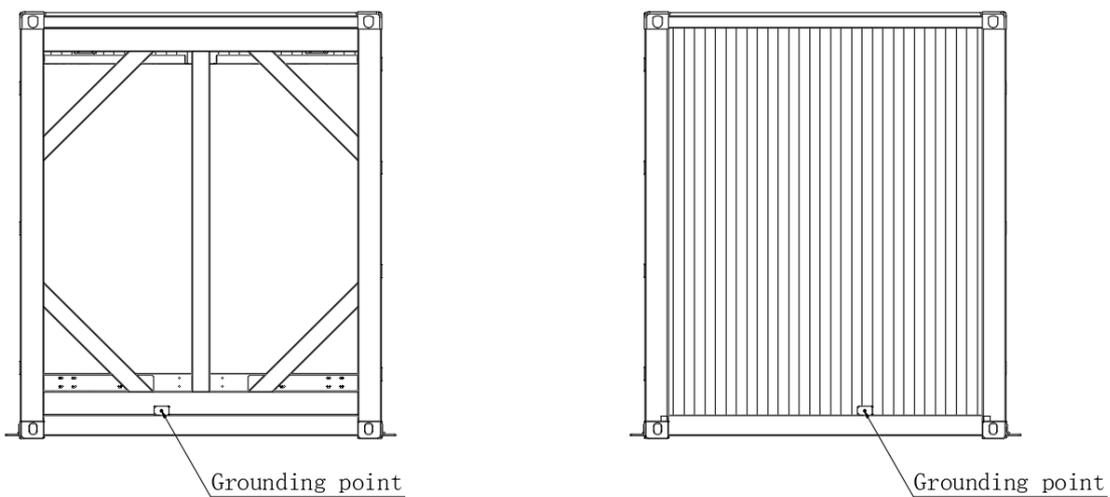
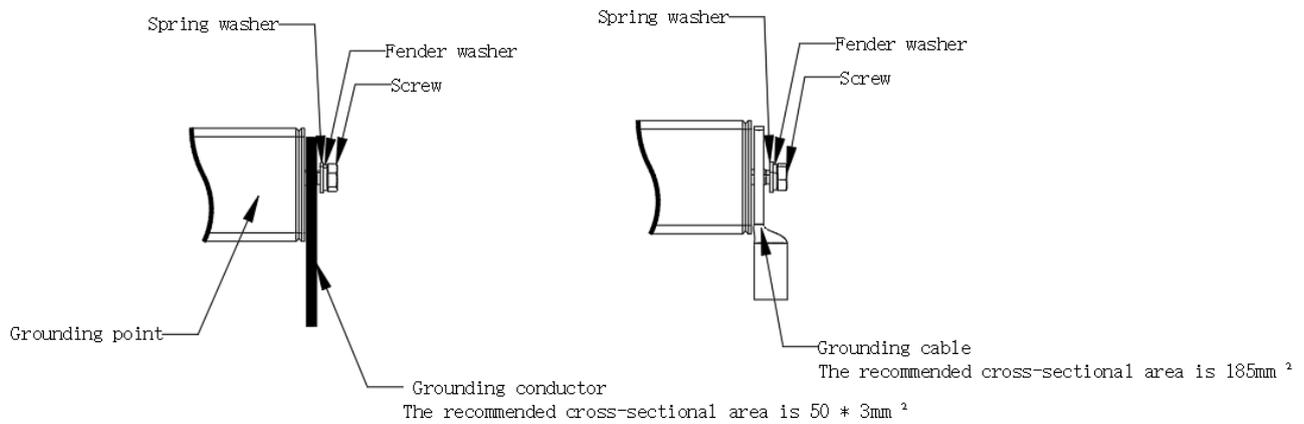


Figure 3-12 PowerMount ground fixing


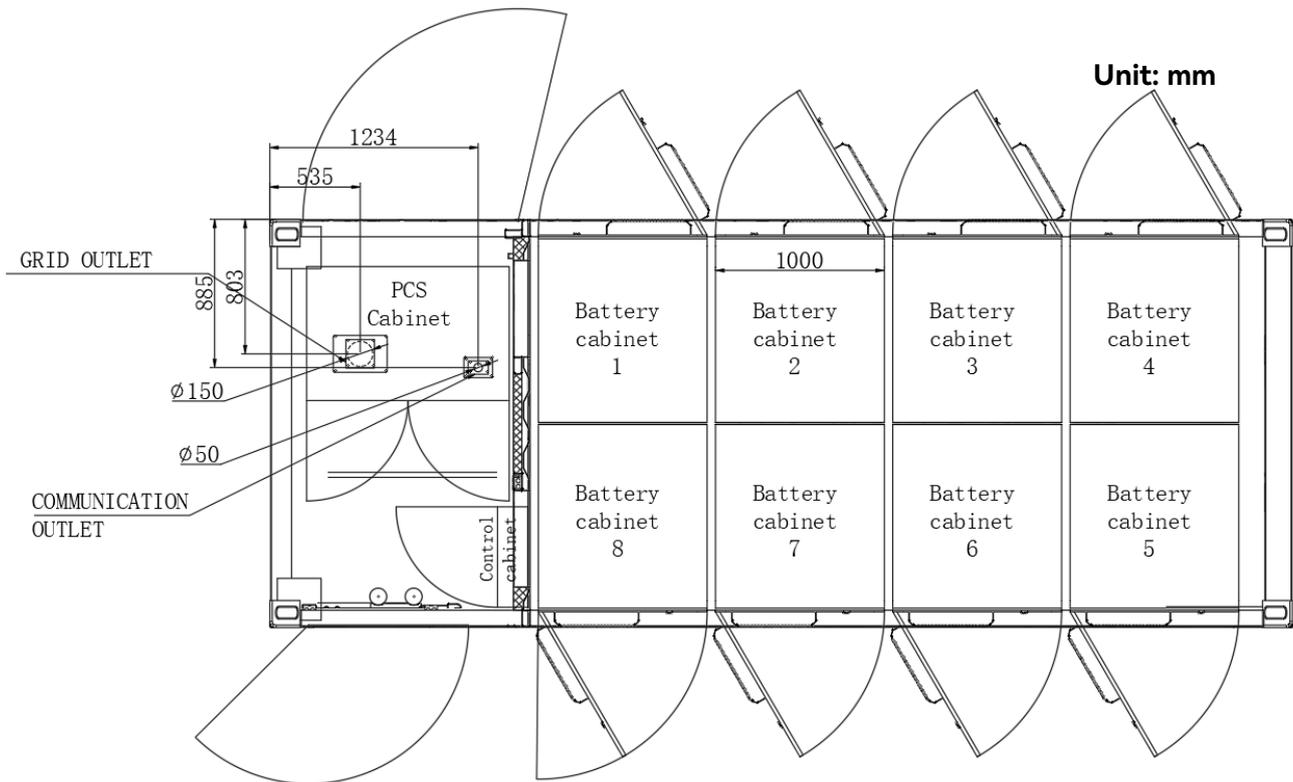
Ensure that the equipment is not connected to voltage before grounding. If cables are used for the grounding conductor, strip off the cable resolution and crimp the terminals, clean the contact surface of the terminal lugs with a clean cloth and ethanol detergent, connect the grounding conductor to the grounding point of the PowerMount Containerized Battery Storage System, secure it with M12 bolts (torque: 55Nm), and connect the other end of the conductor to a grounding device in the vicinity of the grounding device.

3.9 System Primary Circuit Wiring

The bottom of the container is reserved for an AC power interface and auxiliary power supply, communication interface, AC primary power line threading interface size of $\Phi 150$, auxiliary power supply, communication interface size of $\Phi 50$, the specific size of the hole needs to be based on the actual situation of the customer to develop the location and size of the hole, wiring recommended to customers to use the cable connector blocking, as shown in the figure below.


NOTE!

Cables must be laid through the same hole. Single conductors, if laid separately through different closed steel tubes, will generate eddy currents due to electromagnetic induction, leading to heating of the line, which may easily cause fire in serious cases.

Figure 3-13 Power cable wiring location on the AC side of the PCS


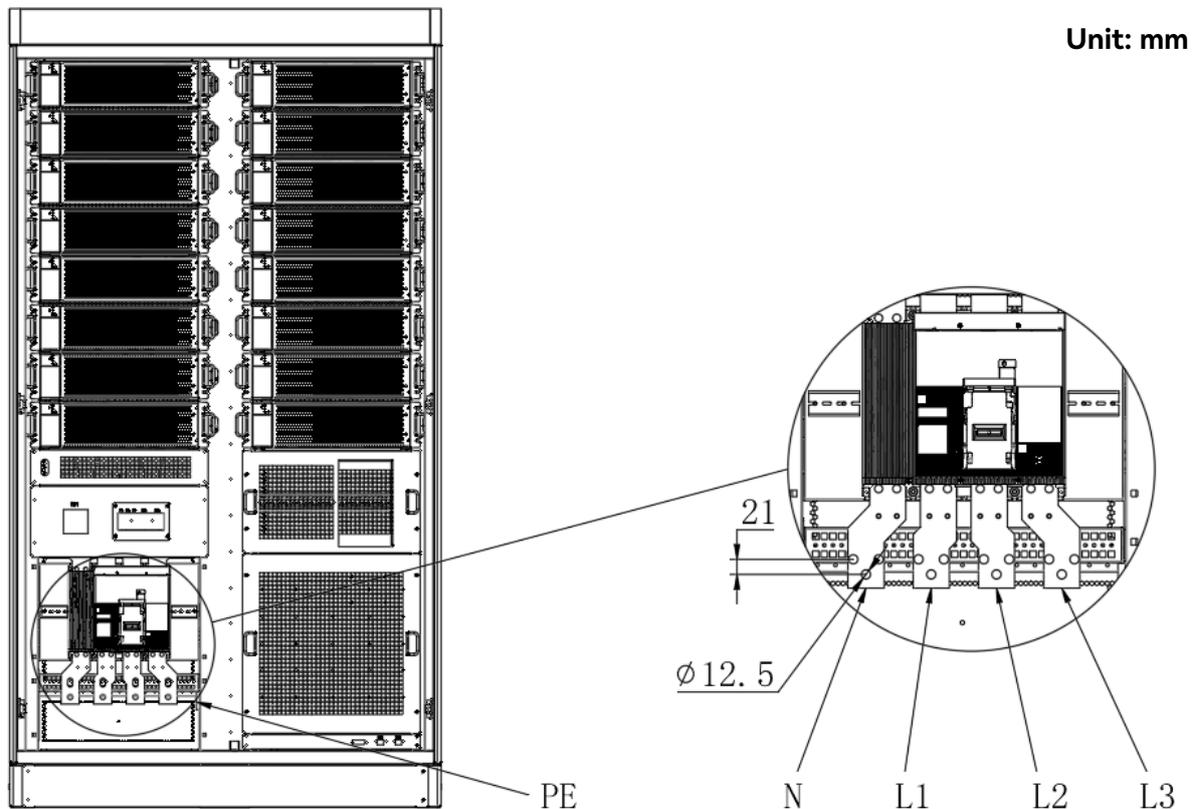
3.9.1 Requirements for AC Cables

The interface for the external AC connection cable is located at the circuit breaker at the upper end of the isolation transformer cabinet at the following location.

Bus bars "L1", "L2" and "L3" are connected to the lower end of the circuit breaker, and the "PE" ground wire is connected to the grounding copper at the side of the PCS cabinet. The ground wire "PE" is connected to the grounding copper row on the side of PCS cabinet, using M12 screws, see the following figure for details.

Attention when installing:

- Circuit breaker and copper row on the identification, do not connect the wrong leakage;
- Three-phase power phase sequence for L1, L2, L3, note that the wiring position from left to right are N, L1, L2, L3.

Figure 3-14 PCS AC side circuit breaker power cable wiring

DANGER!

- Reverse polarity connections in DC cables will cause short circuit of the unit. A short circuit could result in death or serious injury.
- Before connecting, make sure the AC cable is wired in the correct order, noting N/L1/L2/L3 from left to right.

3.9.2 Cable Fixation

The cable is fixed on the female copper row by M12 bolts, and is installed at the lower end of the circuit breaker. Cable fixing needs to be equipped with bolts, spring washers, flat washers, nuts, copper wire lugs (used for crimping cables, specifications are selected according to the cross-section of the cables installed at

the site), and copper rows (porous copper rows have been designed for the lower end of the system circuit breaker).

Related material recommendations are detailed in the table, the installation should meet the following process requirements, the project should be installed in the place of higher standard requirements should be based on local standards:

- The torque of M12 aperture port fixing shall meet 50N-M;
- The threaded exposed length requirement of bolts shall meet 1/2d, and M12 bolts shall be exposed 6mm;
- The use of wiring lugs should be consistent with the cable material, recommended copper wire and copper lugs installation.

Figure 3-15 Cable fixing

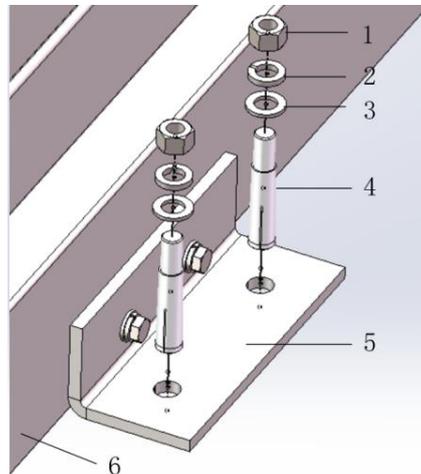


Table 3-7 Cable fixing

Location	Description
1	Bolt (carbon steel)
2	Bulppad (stainless steel)
3	Flat pad (stainless steel)
4	Copper nose (copper)
5	Bronze medal (copper)
6	Nuts (stainless steel)

3.10 System Secondary Circuit Wiring

No separate external wiring is required for the secondary circuit of this system, which is designed to draw power from the AC bus bar inside the PCS cabinet.

3.11 External Reserved Communication Wiring

As shown in the below figure, PowerMount containerized battery energy storage system provides 3 Ethernet communication interfaces and 2 RS485 interfaces externally.

The 3 Ethernet interfaces are NET3, NET4 and NET5, and the 2 RS485 interfaces are at X13 and X14 terminal rows.

Figure 3-16 External reserved communication locations

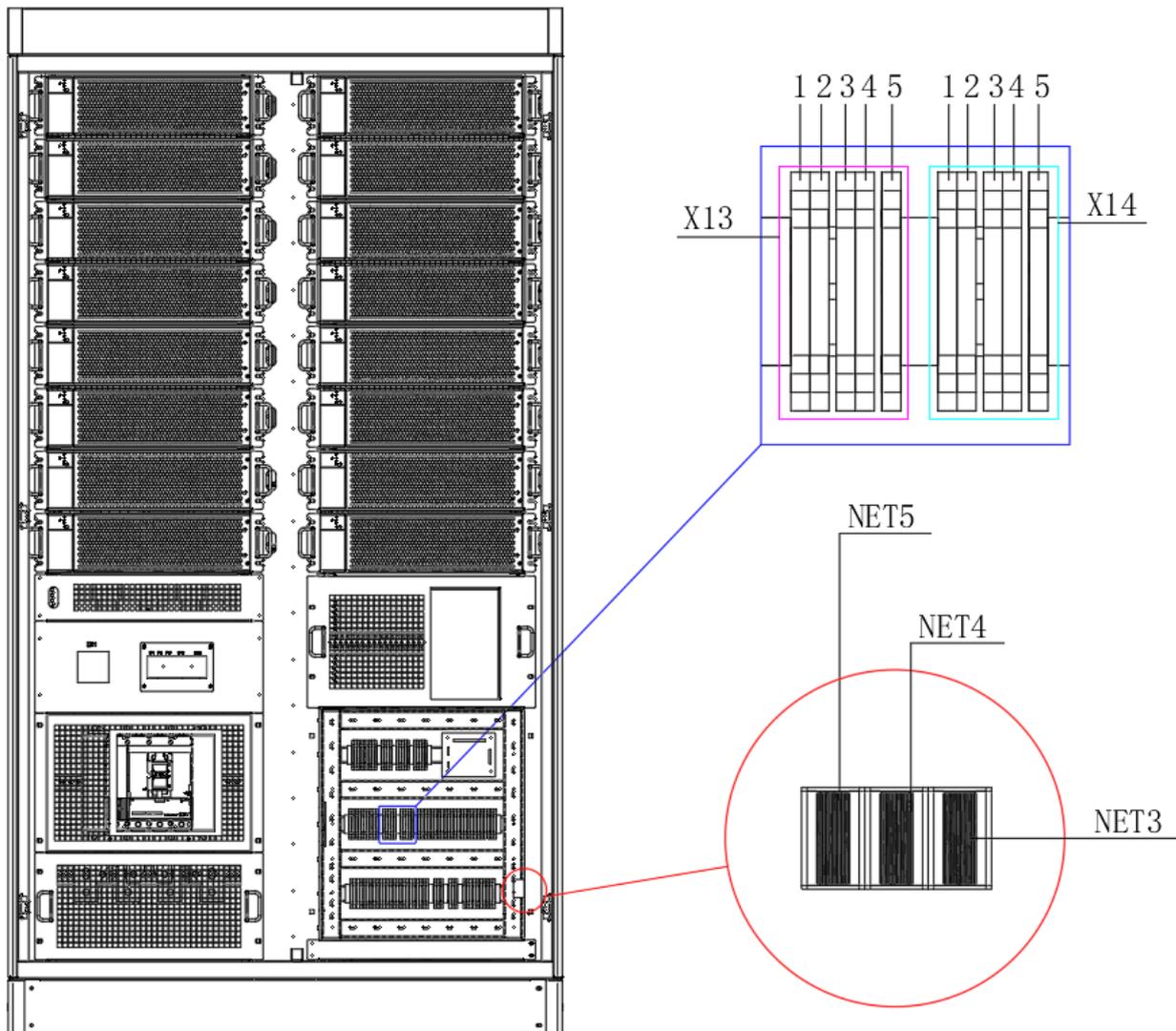


Table 3-8 External reserved communication locations

No.	Item	Function
1	NET3	PUC's 485 communication through the TCP module transfer to the outside world, IP address 192.168.1.100, high-speed interface, it is recommended that the control commands are sent from this high-speed interface
2	NET4	EMS external communication network port, IP address is automatically obtained, can be networked
3	NET5	EMS through the switch external communication network port, IP address 192.168.1.200, low-speed interface, it is recommended to use this low-speed interface to read data
4	X13 Terminal Block	External anti-reverse current meter communication interface: RS485-A at pin 1/2, RS485-B at pin 3/4, RS485-G at pin 5
5	X14 Terminal Block	External PV inverter communication interface: RS485-A at pin 1/2, RS485-B at pin 3/4, RS485-G at pin 5

4 Completion Inspection

4.1 Facility Installation Review

Please check following items after installation:

- All 4 corner pieces of the container are resting on the concrete support body.
- The container's 6 L-shaped fixing brackets are secured to the base.
- Screws are not missed.

Figure 4-1 Container corner piece placement

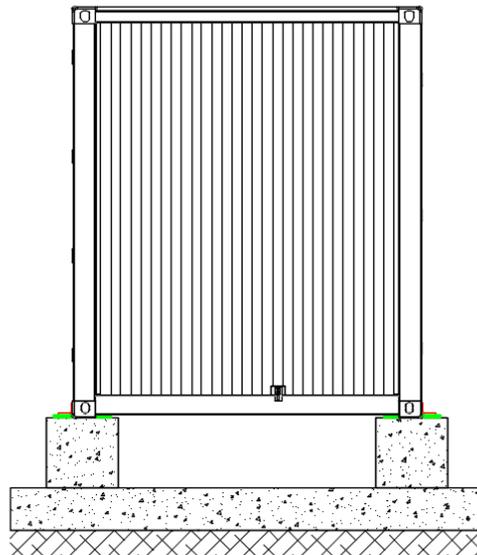
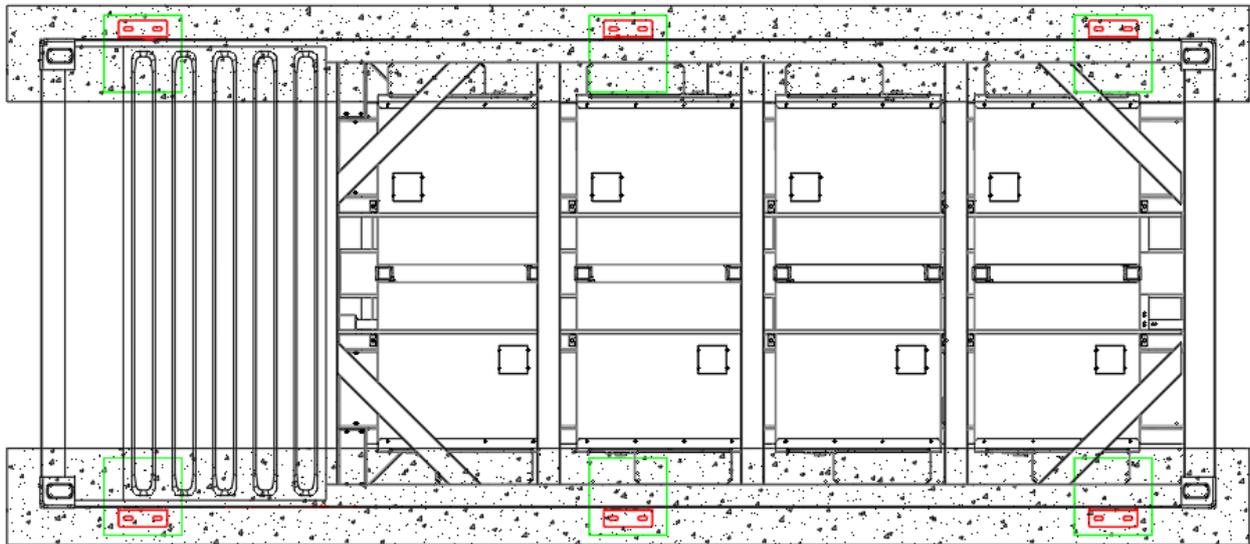


Figure 4-2 Container L-type fixing bracket



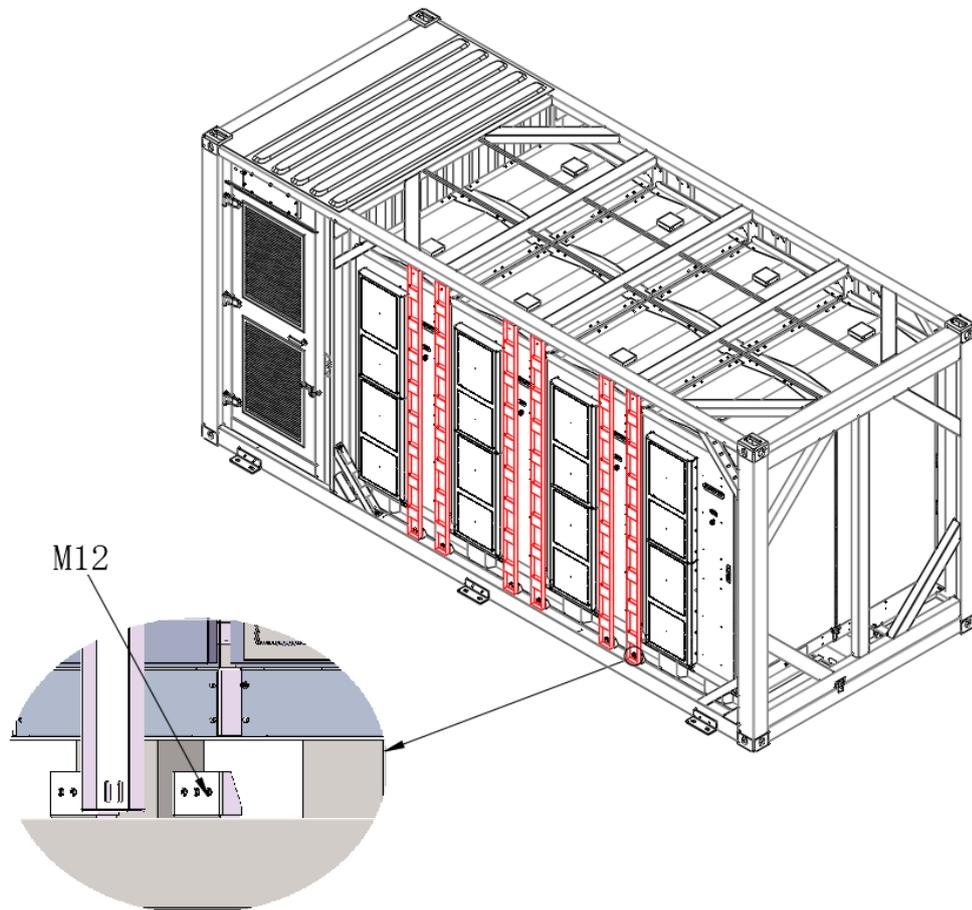
4.2 Equipment Column Removal

Container site installation, fixing, wiring is completed, to ensure that the container no longer need to lift, move, at this time you need to dismantle the container transportation columns to open the battery cabinet door for subsequent operations, need to use M12 socket wrench, see the following figure.



NOTE!

Please keep the dismantled column in a safe place, the column must be reinstalled for the second transportation to avoid tilting during lifting and causing serious fall accidents!

Figure 4-3 Container transportation column disassembly

4.3 Electrical Wiring Inspection

Once the wiring is complete, check the cable connections between the containers and the external cable connections to ensure that the connections are correct and secure.

For electrical connections inside the containers, refer to the documentation and wiring diagrams provided, if necessary. Pay special attention to the following matters:

- AC power lines are connected in the wrong phase sequence and DC power lines are connected in the wrong polarity.
- Check that the bolts in the connections are locked and well-marked for torque.
- Check that the PE ground wire connection is good.
- Check the connections and make sure they are all secured in place.

- Check the polarity of the DC cable.
- Follow the wiring diagram to check for correct connections.
- Checks the electrical characteristics of inter-container cables.
- Check the inter-container cables for broken skins and damage.
- Line pipe orifices are free of burrs and sharp edges.
- A waterproof interface is required between the cable and the outlet sealing plate, and it should be fixed securely.
- All incoming and outgoing container cables must be routed through conduit.
- Inlet and outlet ports must be blocked.
- Power cables, secondary cables and communication cables must be laid in separate ducts.
- Cable area should not exceed 40% of the total cross-sectional area of the pipe.

4.4 On-site Cleaning

- Waste wires and some residual waste generated during the installation process should be sorted into trash cans and disposed of by the installer.
- Due to the laying of wire pipe or wire groove on the ground grooving caused by the ground unevenness must be filled in the ground, the gap fill blocking.

5 System Commissioning

5.1 System Power-on Operation

5.1.1 Check the Insulation Resistance and Voltage Withstand

For the externally laid lines need to carry out insulation withstand voltage test, insulation resistance trial voltage level 1000V test, line three-phase shorting to ground insulation resistance should not be less than 10MΩ (According to the standard IEC_62109-1).

Line frequency withstand voltage should be in accordance with the following table conditions:

Table 5-1 Reference for voltage and insulation

System voltage (V)	Insulation and Pressure Resistance			
	Basic Insulation (V)		Reinforced Insulation (V)	
	AC	DC	AC	DC
≤50	1250	1770	2500	3540
100	1300	1840	2600	3680
150	1350	1910	2700	3820
300	1500	2120	3000	4240
600	1800	2550	3600	5090
1000	2200	3110	4400	6220
1600	2900	4200	5800	8400

System voltage: The voltage of the TT system relative to the ground.

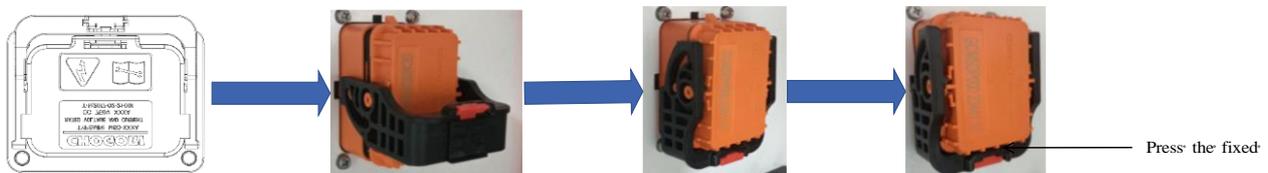
5.1.2 Check the Grid Phase Sequence

Before the system is powered on for the first time, it is necessary to use a phase sequence tester to check whether the phase sequence of the power grid and the power connection port in the PCS cabinet is normal. The phase sequence is "L1", "L2", "L3" and they are connected to the lower end of the circuit breaker in the PCS cabinet, note that the N line of the ABB molded case circuit breaker is the leftmost. For details, please refer to the description of system primary circuit wiring in section 3.9.

5.1.3 Check the Installation of Battery Cabinet's Service Switch

The Switch Plug for each battery cabinet is not inserted into the Maintenance Switch Base in its initial state, insert the Switch Plug into each Maintenance Switch Base and lock it in place.

Figure 5-1 Installation environment requirement



Step 1: First start by inserting the maintenance switch into the maintenance switch base

Step 2: Press the service switch handle

Step 3: Finally, press the lower red fixing latch down and press firmly to fix it

5.1.4 PCS Cabinet Power-on



Before powering on the system, check the power grid voltage. The power grid voltage must be $400V \pm 10\%$. If the power grid voltage is too high, components in the system may be faulty or damaged. If the power grid voltage is too low, the system may not work properly.

Step 1: Check that the EPO push buttons in the container enclosure and PCS cabinet are in reset; if not, turn the push buttons clockwise to reset;

Step 2: Close the QAC1 molded case circuit breaker in the PCS cabinet;

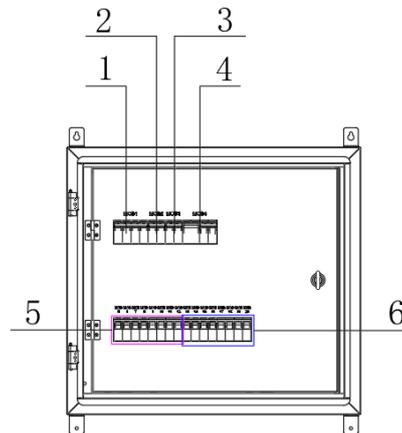
Step 3: Close the MCB1, MCB2 and MCB3 micro break switches in the PCS cabinet;

See the description in the PCS cabinet introduction section in chapter 2.5.

Verify that the power supply is normal and there are no abnormalities such as tripping.

5.1.5 Distribution Box Power-on

Figure 5-2 Distribution box miniature circuit breaker



(1) 4P micro circuit breaker, air conditioner and fan and other power supply circuit main switch DC circuit breaker

(2) Main switch of lighting, socket, emergency light, fan power supply circuit

(3) Battery cabinet control circuit main switch

(4) Socket electric leakage protection switch

(5) Battery cabinet air conditioning circuit switch

(6) Battery cabinet control circuit switch

Step 1: Turn on MCB1, MCB2, MCB3, MCB4 circuit breakers in the distribution control box in turn;

Step 2: Close MCB5 to MCB20 circuit breaker

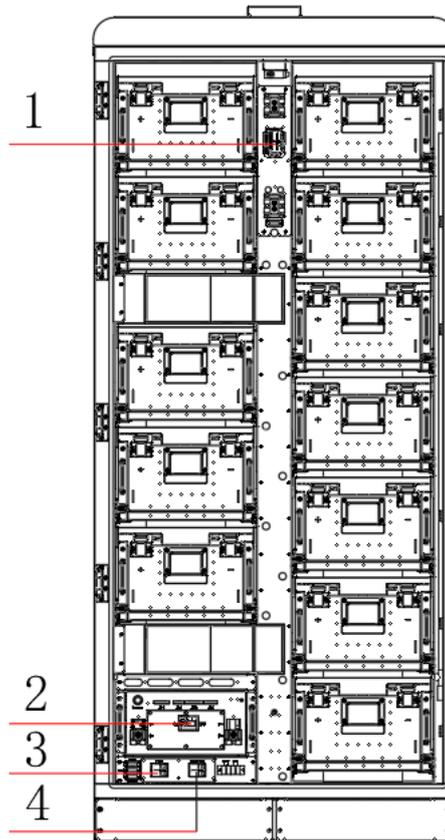


NOTE!

The number of micro terminals varies according to the number of battery cabinets. For details, see section 2.6.

5.1.6 Battery Cabinet Power-on

Figure 5-3 Battery cabinet power-on



- (1) Maintenance switch
- (2) Main circuit breaker of the high-voltage control box
- (3) Power Micro broken switch

(4) HVAC Micro broken switch

Battery cabinet power-on procedure

Step 1: Check whether the EPO button on each battery cabinet is in the reset state; if not, rotate the button clockwise to reset;

Step 2: Close the MCB1 (Power) and MCB2 (HVAC) miniature circuit breakers at the bottom of each battery cabinet, check whether the power indicator light on the BMS control box is lit normally, and check whether the indicator light on the battery cabinet door is lit normally;

Step 3: Then close the DCQ1 DC circuit breaker.

Step 4: Repeat until all battery cabinets are powered up.

5.2 System Power-off Operation

When the system is powered off, make sure that the system is shut down.



- Please turn off the system when it is not in use for a long period of time, otherwise it may cause the battery to be over-discharged.
- When the system is not used for a long time, please charge the system equipment every 3 months to keep the battery SOC at about 30%.

5.2.1 Battery Cabinet Power-off

Step 1: Turn off the QDC1 DC circuit breaker in each set of battery cabinets;

Step 2: Disconnect switches such as MCB1 and MCB2 miniature circuit breakers in each set of battery cabinets;

Step 3: Unplugging the maintenance disconnect switches in each set of battery cabinets.

5.2.2 Distribution Control Box Power-off

Step 1: Turn off switches such as MCB1, MCB2, MCB3, MCB4 miniature circuit breakers in each set of distribution control box;

Step 2: Turn off switches such as MCB5 through MCB20 miniature circuit breakers.

5.2.3 PCS Cabinet Power-off

Step 1: Turn off the MCB1, MCB2, and MCB3 miniature circuit breaker light switches in the PCS cabinet;

Step 2: Turn off the QAC1 AC molded case circuit breaker and other switches in the PCS cabinet.

5.3 System Field Test

To conduct field test with EMS, please refer to the EMS user manual for more information.

6 Maintenance and Troubleshooting

6.1 Maintenance Precautions

1. Operation and maintenance should be carried out by qualified professionals.
2. In order to avoid the risk of electric shock to the personnel, it is required to disconnect the power to the system before installation or maintenance, and after disconnecting the power, it should be static for at least 15 minutes, and then carry out power test to confirm that there is no power before operation.
3. Personnel operating and maintaining the system should be qualified to operate energized equipment and trained in the relevant safety knowledge.
4. Failure to follow these instructions may result in serious bodily injury or even death to personnel, or damage to equipment.

The PowerMount manufacturer will not be held responsible for the consequences of the following non-compliance with these regulations.

- Non-compliance with safety operating procedures;
- Improper maintenance by non-professionals;
- Transportation damage not in accordance with the installation and use instructions;
- Use and operation in violation of the law;
- Private modification of the energy storage cabinet coefficients without the authorization of a professional. and charging/discharging power of the system.

6.2 Maintenance of Security Instructions

1. High voltage is present in energized parts of the product. Touching the energized may result in death or severe shock damage.
2. Wear appropriate personal protective equipment when performing maintenance.
3. Do not touch any energized parts.
4. Initially visually inspect the equipment for damage or other hazardous conditions before operation.
5. Review all warning messages in the product and documentation.
6. Always start by disconnecting the external power supply unit before performing any work.
7. Ensure that disconnected equipment cannot be connected automatically.
8. After turning off the equipment, wait at least 15 minutes before turning it back on to allow the capacitor-type devices in the system to discharge completely.
9. You must ensure that at least two people are present during maintenance.
10. After maintenance make sure that all installation and maintenance tools and other unnecessary things are not left inside the equipment.

6.3 Equipment Inspection and Maintenance Methods

After the PowerMount is put into operation, it is necessary to carry out regular inspection and maintenance of the system equipment, and make inspection and maintenance records in accordance with the corresponding form. According to the maintenance time and maintenance items, the inspection and maintenance of equipment is divided into two types:

1. Regular inspection and maintenance (recommended quarterly) and annual maintenance (once a year).
2. Customers can make an adjustment according to the environment and actual needs of the equipment installation site.

6.3.1 Regular Inspection and Maintenance (Quarterly)

Table 6-1 Regular inspection and maintenance (quarterly)

Subsystem	Inspection & Maintenance Items	Method	Troubleshooting	Inspection Result	Remarks
Container	Container appearance	Check whether the exterior is damaged or rusted, and whether it needs to be repainted	Painting repair		
	Container flooding	Check the inside of the container for signs of flooding	Contact the manufacturer to check the cause of flooding		
	Container nameplate	Check for any falling off of the nameplate on the container	Post nameplates again		
	Container door lock	Check whether the cabinet door lock can be opened smoothly	Contact the manufacturer to troubleshoot the cause of the fault		
	Container interior cleaning	Check and clean up the debris inside the container	Clean up internal debris		
	Container top	Check and clean up the top of the cabinet for any accumulation of fallen leaves, branches or debris.	Clean up the fallen leaves, branches or debris on the top of the cabinet.		
	Container tape	Check whether the container tape falls off or is damaged	Fix or replace the adhesive tape		
	External container emergency	Check whether the external emergency stop	Contact the manufacturer to check the cause		On-site check

Subsystem	Inspection & Maintenance Items	Method	Troubleshooting	Inspection Result	Remarks
	stop	switch of the container is working normally, snap the emergency stop switch, and stop the system	of the fault		
Container lighting	Lighting tube	Check that all the lighting tubes are working properly	Contact the manufacturer to check the cause of the fault and replace the lamp tube		On-site check
	Emergency lamp	Check that all the emergency lights are working properly	Check the cause of the damage and replace the damaged devices		On-site check
PCS Cabinet	Visual inspection	Visually inspect all components and lines in the distribution control box for damage	Check the cause of the damage and replace the damaged devices		
	PCS cabinet indicator light	Check whether the indicator on the PCS cabinet is normal	Contact the manufacturer to find the cause of the fault		On-site check
	PCS module indicator light	Check whether the indicator on the PCS module is normal	Contact the manufacturer to locate the fault cause and replace the DCDC module		On-site check
	PCS module fan	Check whether the fan of the DCDC module works properly	Contact the manufacturer to find the cause of the fault and replace the PCS module		On-site check

Subsystem	Inspection & Maintenance Items	Method	Troubleshooting	Inspection Result	Remarks
	Visual Inspection	Visually inspect all components in the PCS cabinet, especially power cables and bolts, for burning or obvious damage	Contact the manufacturer to find the cause of the fault		
	Lightning	Visually check that the SPD window is still green	Replace the surge arrester		
	circuit breaker	Check whether the circuit breaker works properly	Contact the manufacturer, troubleshoot the fault, and replace the circuit breaker		
	PCS cabinet door lock	Check that the door lock can be opened smoothly	Contact the manufacturer to find the cause of the fault		
Battery cabinet	Battery cabinet appearance	Check whether the exterior is damaged or rusted, and whether it needs to be repainted	Painting repair		
	Battery cabinet logo	Check whether the warning label on the battery cabinet is removed	Repost warning signs		
	Battery cabinet indicator light	Check whether the indicator on the battery cabinet works properly	Contact the manufacturer to find the cause of the fault		On-line inspection
	Circuit breaker	Check whether the circuit breaker works properly	Contact the manufacturer, troubleshoot the		

Subsystem	Inspection & Maintenance Items	Method	Troubleshooting	Inspection Result	Remarks
			fault, and replace the circuit breaker		
	Battery cabinet door	Check that the battery cabinet door is tightly closed	Close the battery cabinet door again		
	Battery cabinet rubber strip	Check whether the battery cabinet door adhesive tape is damaged and falls off	Fix or replace the rubber strip.		
	The battery cabinet is leaking	Check for water leakage marks in the battery cabinet	Contact the manufacturer to find the cause of the fault		
	Battery cabinet door lock	Check whether the battery cabinet door lock can be opened smoothly	Contact the manufacturer to find the cause of the fault		
	Battery cabinet door lock rod	Check whether the battery cabinet door lock rod is deformed	Replace the battery cabinet door lock rod		
	Battery power cable / bronze	Visual inspection for significant damage or burning	Contact the manufacturer to find the cause of the fault		/
	Battery module appearance	Visually inspect the battery appearance for bulging or leakage	Contact the manufacturer to replace the battery module		A gas that has a pungent odor when it leaks
	Battery pole	Visually inspect for obvious damage or burning	Contact the manufacturer to find the cause of the fault		/

Subsystem	Inspection & Maintenance Items	Method	Troubleshooting	Inspection Result	Remarks
	Air conditioner	Check whether the air conditioner is running normally	Contact the manufacturer to replace the battery module		On-line inspection
		Check whether the air conditioner drain is blocked	Dredge the air conditioning drain		/
	Fire pipe	Visually check whether the fire tube pressure gauge pointer is in the normal green area	Contact the manufacturer to re-aerate or replace the fire hose		/
	Smoke sensor	Check whether the smoke sensor indicator blinks properly	Contact the manufacturer to find the cause of the fault		The smoke indicator blinks about once every six seconds
Scene:		Fe:	Date:		

6.3.2 Regular Inspection and Maintenance (Annual)

Table 6-2 Regular inspection and maintenance (annual)

Subsystem	Inspection & Maintenance Items	Method	Troubleshooting	Inspection Result
Container	Container appearance	The container paint is damaged or rusted		
	Container grounding	Check the grounding resistance of containers		
	Container air filter	Use vacuum to clean the dust on the air filter of the container		
	Container	Use vacuum to clean the		

Subsystem	Inspection & Maintenance Items	Method	Troubleshooting	Inspection Result
	interior	dust inside the container		
Distribution control box	Dust the power distribution control box	Dust the power distribution control box by vacuuming		
PCS cabinet	Cabinet dust removal	Use a vacuum cleaner to clean the dust from the bronze plate, terminals, and mesh in the PCS cabinet		
	Power line	The smoke indicator blinks about once every six seconds		
	Power connection	Check whether the power cable connection terminal is loose and tightened. If yes, use a torque wrench to mark the torque again		
	Ground connection	Check whether the ground cables in the cabinet are securely connected and whether the fixed terminals of the ground cables are loose. If the terminals are loose, use a torque wrench to tighten the ground cables. The moment marks the moment		
Battery cabinet	Battery cabinet appearance	Paint the battery cabinet or touch up the rust		
	Dust the battery cabinet	Dust the battery cabinet with a vacuum cleaner		
	Power line	Check the power cable and connection terminal in the battery cabinet for damage or burning		
	Power connection	Check whether the power cable connection terminal is		

Subsystem	Inspection & Maintenance Items	Method	Troubleshooting	Inspection Result
		loose and tightened. If yes, use a torque wrench to mark the torque again		
	Ground connection	Check whether the ground cable in the cabinet is securely connected and whether the fixed terminal of the ground cable is loose. If yes, use a torque wrench to mark the torque again		
	Air conditioner	Check the cleaning condition of the condenser and clean the condenser with compressed air		
	Fire fighting	Clean the fire nozzle dust		
System	SOC check	Discharge the system at rated power until the system discharge protection is cut off, and stand for 30min; The system is charged at the rated power of the charging system charging protection cut-off, static 30min, record the charging data; The system discharges at the rated power until the system discharge protection cutoff and records the discharge data		
Scene:		Fe:	Date:	

6.4 System Troubleshooting

If a fault occurs, before performing any operation on the system equipment, you should immediately record the fault information displayed on the HMI interface, the operating status of the system before the system fault and the system fault phenomenon after the system fault.

If the fault still exists after primary troubleshooting with the manual, please contact the manufacturer. Also provide the following information in order to provide you with better service:

- Photographs of the fault site
- Fault information and simple description



DANGER!

Lethal high voltages may still exist within the PowerMount under fault conditions! Only qualified technicians should perform the operations described in this manual. ("Compliant" means that the operator has had prior specialized training in the troubleshooting operations of the equipment. Perform only the troubleshooting operations described in this manual. Observe all safety practices during operation.)

No.	Fault	Trigger Condition	Troubleshooting
1	BC communication interruption	Communication between the battery cabinet and PUC is faulty.	Check whether the communication cable is properly connected
2	I/O controller communication interruption	Communication between the I/O controller and PUC is faulty	Check the communication harness of the I/O controller
3	Flooding fault	The battery cabinet is flooded.	Check whether the battery cabinet door is closed properly; Check whether the battery cabinet is flooded.
4	Scram fault	The EPO outside the container or on the PCS cabinet door is triggered	Rotate the EPO button on the EPO or PCS cabinet door outside the container.
5	Battery cell voltage high	Battery cell voltage > 3.6V	Contact Dunext for solution
6	Battery cell voltage low	Battery voltage < 2.8V	Contact Dunext for solution
7	BMM communication fault	The BMM is damaged or the communication is faulty	Check the BMM communication harness
8	ACDC_Unavailable	The PCS module is not started	Check whether the PCS module is started
9	BC_Unavailable	The BC battery cabinet is not started	Check whether the battery cabinet is started
10	Door sensor failure	Cabinet door not closed	Close the door.



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