NEW ENERGY
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Indoor and Outdoor Energy Storage Integrated System (Commercial) User manual

CONTENTS

1 Overview

1.1 Applicable Models

This document applies to the following equipment models;

- XPI-100kW215kWh

This section describes the product model definition in this user manual, as shown in Figure 1-1:

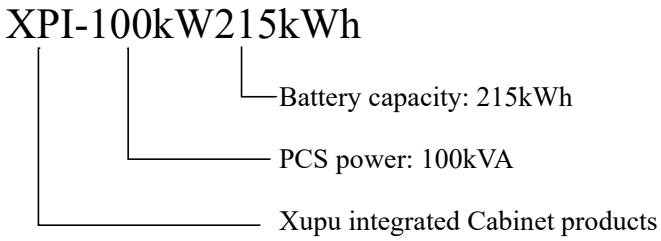


Figure 1.1 Product model definition

1.2 Target Group

Only professional worker are allowed to complete described in this document.

Professionals must have the following skills:

1) Understand how the product works and how to operate the product
2) Understand how the battery works and how to operate it
3) Be trained and understand how to deal with hazards and risks that arise during the installation and use of electrical equipment
4) Understand the installation and commissioning of electrical equipment and devices
5) Understand all applicable standard operating instructions
6) Understand and follow this manual and all safety information

1.3 Technical Terms

Names	Definition
STS	Static transfer switch
AC	AC
DC	Direct current
BESS	Battery energy storage system
ESS	Energy storage system
EMS	Energy management System
BMS	Battery management system
PCS	Bidirectional energy storage converters
SLD	Single line chart
SOH	Battery health status, expressed as a percentage
SCR	Thyristor rectifier
DOD	Depth of discharge, expressed as a percentage
EOD	Discharge cutoff
SOC	Remaining power, expressed as a percentage
UI	User interface
EPO	Emergency power outage
SPD	Surge protectors
RTU	Remote terminal equipment

2 Safety notes

2.1 Flags

Signs	Explanatory notes
 **Danger**	Indicates a dangerous situation that, if not avoided, will result in death or serious injury
 **Warning**	Indicates a dangerous situation that, if not avoided, will result in death or serious injury
 **Careful**	Indicates a dangerous situation that, if not avoided, could result in mild or moderate injury
 **Attention**	Indicates that property damage will result if not avoided
 **Explain**	Draw attention to important information, best practices and recommendations Pay attention to information used to address issues unrelated to personal injury, equipment damage, and environmental degradation.

2.2 Important safety notes

This user manual is about the installation and operation of the XPI-100kW215kWh Energy storage integrated Cabinet.

Please read this user manual carefully before installation.

The XPI-100kW215kWh Energy storage integrated cabinet must be commissioned and maintained by an engineer designated by the manufacturer or an authorized service partner. Otherwise, personal safety may be endangered and the device may fail. The resulting damage to the equipment is not covered by the warranty.

The XPI-100kW215kWh Energy Storage integrated Cabinet cannot be used in

any environment or application related to life support equipment.

This manual contains important instructions for the XPI-100kW215kWh series models, which should be followed when installing and maintaining the energy storage Converged Cabinet.

Danger

Any touching of copper bars, contacts, terminals inside the device that are connected to the power grid circuit can result in burning or fatal electric shock!
Do not touch any terminals and wires connected to the grid circuit.
Pay attention to any instructions and safety documentation regarding grid connection.

Warning

Electric shock hazards may exist inside the equipment!
Any operation related to this device must be carried out by a professional.
Pay attention to the safety precautions listed in the safety instructions and installation documentation.
Pay attention to the safety precautions listed in the operating and installation manuals and other documentation.

Warning

Large amounts of leakage current
Make sure the ground is reliable before connecting the input power.
The device must be grounded and meet local electrical codes.

Warning

When a battery is connected to the converged cabinet, the input port may have DC voltage. Pay attention to or check the battery system user manual during operation.

Warning

Do not touch live parts within 15 minutes of power failure!
The internal capacitor stores dangerous energy. Do not touch terminals, contacts, or copper bars of the device within 15 minutes after disconnecting all power supplies.

Attention

All internal maintenance and maintenance of the equipment should be carried out by trained personnel. Internal components that need to be opened using tools should not be maintained by the user.
Read this user manual before operating.

3 Product Introduction

3.1 System Introduction

XPI-100kW215kWh Energy storage integrated cabinet is an energy storage integrated cabinet system that includes ACDC bidirectional energy storage converter module, STS, DCDC, battery system, EMS, fire protection system, air conditioning system, auxiliary power supply and so on.

Two-way energy storage converter can charge and discharge the built-in battery system, STS and PCS can be combined with seamless off-grid switching, switching time ≤20ms, DCDC contain MPPT, photovoltaic can charge the battery, can also discharge in line, when the energy storage is still 10%, it will notify the start of the diesel generator, to ensure the uninterrupted operation of the load.

3.2 Appearance of the Cabinet

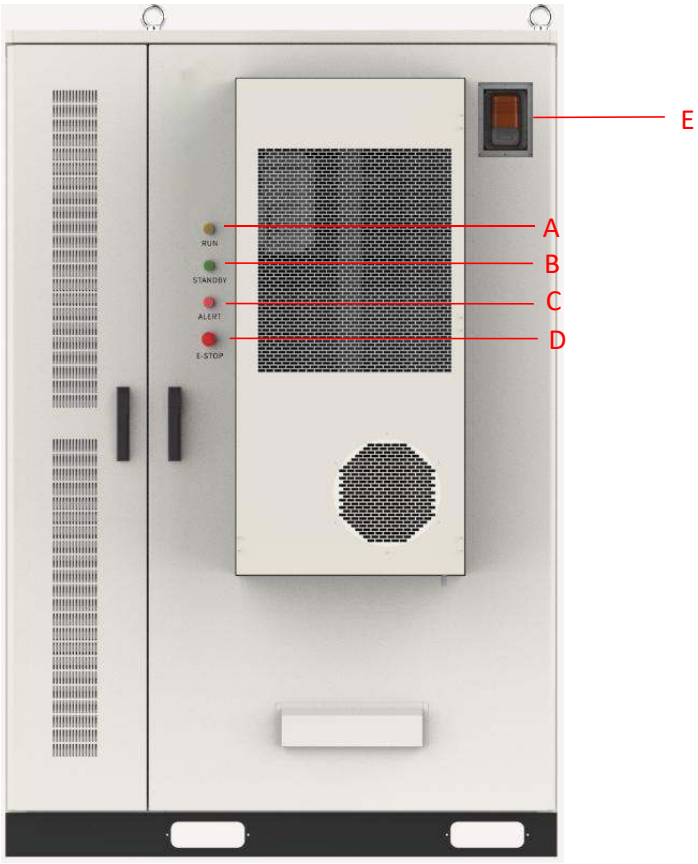


Figure 3.1 Appearance of the Cabinet

Location	Name	Instructions
A	POWER indicator	Control circuit power supply indicator
B	RUN indicator light	The Converged Cabinet is always on during normal operation
C	FAULT indicator light	The fault is always on and blinks when an alarm is generated
D	Emergency stop knob	Press it in case of emergency to immediately disconnect AC/DC power supply
E	Sound and light alarm	When the temperature is too high or smoke appears, there will be sound and light prompts

3.3 Overall dimensions and weight

The dimensions of the XPI-100kW215kWh energy storage integratedcabinet are shown in Figure 3.2. The net weight is about 3t. The specific weight is subject to the actual nominal scale.

Figure 3.2 Dimensions of the integrated cabinet(PV,Diesel, Energy storage)

3.4 System schematic diagram

The XPI-100kW215kWh energy storage integrated cabinet contains PCS, STS, DCDC, battery pack, EMS and auxiliary power distribution unit.

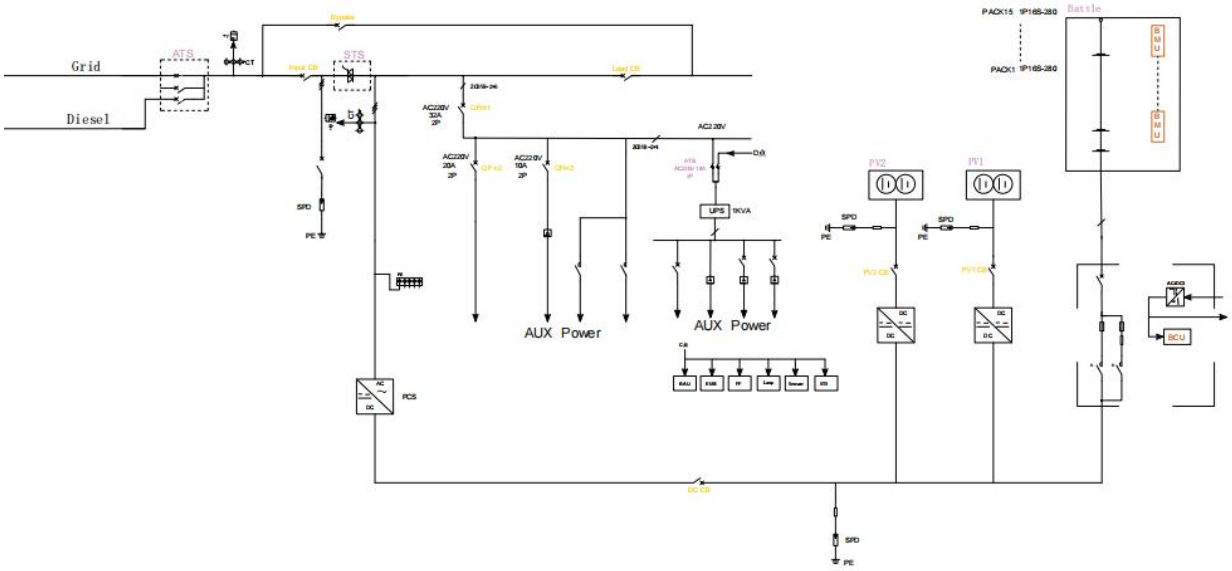


FIG. 3.3 Topology diagram of the system(PV,Diesel,ES)

3.5 Heat dissipation Design

The integrated cabinet is an IP54 outdoor machine, with the overall structure design of forward air and rear air. Outdoor air enters through the front intake window of the integrated energy storage machine, and hot air exits through the exhaust vents on the side. The exhaust air volume of the fan is 572.6m³/h.

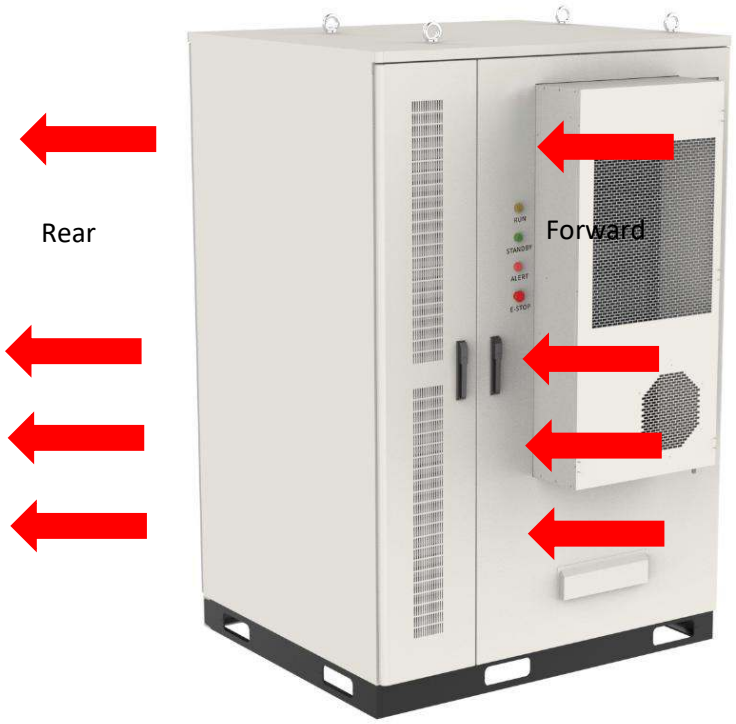


Figure 3.4 Ventilation design of the Converged Cabinet

4 Technical Specifications

Technical Specifications Sheet

Model number	**XPI-100kW215kWh**
Ac parameters	
Rated AC power	100kVA
Wiring method	Three phase three wire
Ac overload capability	100kVA
Allowed grid voltage	380/400 (-15% to 10%) Vac
Grid frequency allowed	50/60 (-2.5 to 2.5) Hz
Total current harmonic distortion rate	3% or less
Power factor	0.99 ~ 1 / - 1
Battery side parameters (adjustable)	
Cell type	LFP 280Ah
Battery System Configuration	1P240S
Rated voltage	768V
Battery voltage range	600~876V
Electricity Charge	215kWh
PV parameters	
Rated input power	100kW

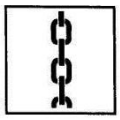
Maximum input voltage	600V
MPPT voltage range	250~600V
Maximum efficiency	≥99.5%
MPPT quantity	2 way
System parameters	
Noise	< 70dB
Level of protection	IP54
Allowable ambient temperature	- 20 ~ 60 ℃
Cooling method	Air cooling
Relative humidity allowed	0 to 95% (no condensation)
Cabinet dimensions (W x H x D)	1539*2306*1500mm
Allowable elevation	3000m (greater than 3000m derated)
Cabinet weight	3t
Maximum system efficiency	90%
Communication parameters	
External communication interface	RS 485, Ethernet, CAN
External communication protocol	Modbus TCP/RTU, CAN2.0

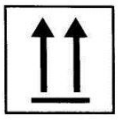
5 Store, handle, and transport

5.1 Transport and storage

To ensure that the integrated energy storage cabinet is in a better protective state during transportation, transport the storage cabinet with packaging as far as possible, and transport according to various labels on the package. Table 5-1 shows the schematic description of the packaging labels:

Table 5-1 Description of the packaging labels

ICONS	Instructions
	The center of gravity identifier indicates the center of gravity of the converged cabinet
	The lifting label indicates the position of the chain or rope when hoisting the converged Cabinet

	An upward label indicates the way to move or place the Converged storage cabinet. Do not place the cabinet upside down, sideways, or tilted.
	Place the labels lightly. Avoid violent friction or collision during transportation or placement.
	Avoid rain or moisture during transportation or storage of the labels.

Attention

Because the center of gravity is not the mechanical center of the integrated cabinet, you must always pay attention to the center of gravity mark on the packing box during transportation.

Attention

Do not tilt the converged cabinet at an Angle greater than 5°, regardless of whether the cabinet is packed. Due to its large volume and weight, excessive tilt Angle may cause injury or injury to the equipment.
In the process of moving, the equipment should be avoided by physical impact, such as sudden dropping, lifting and so on.

Attention

Do not transport the Converged Cabinet in rain or inclement weather. If it cannot be transported, take necessary protective measures.

If you do not install the Converged Cabinet on site immediately after the delivery and acceptance, store the packaged Converged cabinet in a ventilated, dry, and clean indoor environment. At the same time, attention should also be paid to the following aspects:

- To restore the package to the condition in which it was received, the desiccant inside the package must be retained.
- The storage floor is smooth and sufficient to bear the weight of the

Converged cabinet with the outer package.

- Ventilation and moisture must be ensured during storage to prevent stagnant water.
- The storage temperature must range from -40 ° C to +60 ° C, and the relative humidity must range from 0 to 100%. There is no condensation.
- Pay attention to the surrounding harsh environment, such as sudden cooling, sudden heating, collision, etc., to avoid damage to the device.
- Perform regular inspection, at least once a week. Check whether the package is in good condition to avoid insect bites. If the outer package is damaged, replace it immediately.
- If the storage time is more than half a year, the package should be opened for inspection, and the desiccant should be replaced and repacked.

Attention

The Converged cabinet is an integrated device. Do not disassemble it during transportation or storage. Equipment failure caused by modification without the authorization of Shupu Electric is not covered by the warranty.

Attention

When the equipment is transported and stored, stacking is strictly prohibited, and no other items are allowed to be stacked on the top of the equipment.

Attention

When transporting and storing the devices, ensure that the environment is free from corrosive gas, high temperature heat source, and dust, and meets fire protection requirements. It is strictly prohibited to store the equipment without packaging.

5.2 Moving

When moving an unpacked converged energy storage cabinet in a short

distance, you are advised to use a forklift to move the entire cabinet. Pay attention to the positions of the center of gravity and lifting labels on the packing box and ensure that the transport vehicle has sufficient carrying capacity. Do not lift the converged energy storage cabinet.

Moving an unpacked converged energy storage cabinet is usually used near the installation position. You are advised to use a forklift to move the converged energy storage cabinet. Before using the forklift, remove the baffle plate at the bottom of the converged energy storage cabinet.

1) Forklift movement (preferred)

A forklift is a standard method for moving the Converged energy storage cabinet. The center of gravity of the converged energy storage cabinet should be placed between the two forks of the forklift and pre-insert to ensure that the converged energy storage cabinet does not tilt after being lifted. As shown in Figure 5-1, the forks of the pallet truck must be at least 1.7m in length.

When you lift, lower, and move the Converged storage Cabinet using a forklift, ensure that the forklift moves slowly and smoothly, and place the converged storage cabinet on a solid, level ground.

Strictly follow the safety specifications of the forklift when you use the forklift to move the Converged Cabinet. Due to the large volume of the energy storage integrated cabinet, it may block the driver's line of sight, and auxiliary personnel should cooperate.

Figure 5-1 Schematic of a forklift truck

2) Pallet truck move

The use of pallet car to move the energy storage integrated cabinet is only suitable for the transport line is relatively stable. During transportation, the center of gravity of the Converged energy storage cabinet should be placed between the two forks of the forklift truck and pre-insert to ensure that the converged energy storage cabinet will not tilt after lifting. As shown in Figure 5-2, the length of the fork of a pallet truck must be at least 1.5m, the inner distance between the arms of the pallet truck must be at least 0.8m, and the outer distance between the arms of the pallet truck must be at least 1.2m, and the load-bearing capacity of the pallet truck must be greater than 3000kg.

When you lift, lower, and move the Converged energy storage Cabinet using a forklift, ensure that the forklift is slow and smooth, and place the converged energy storage cabinet on a solid and level ground.

Strictly abide by the relevant safety regulations during the entire process of using the forklift. Due to the large volume of the integrated cabinet, the line of sight of the operator may be blocked, and auxiliary personnel should cooperate.

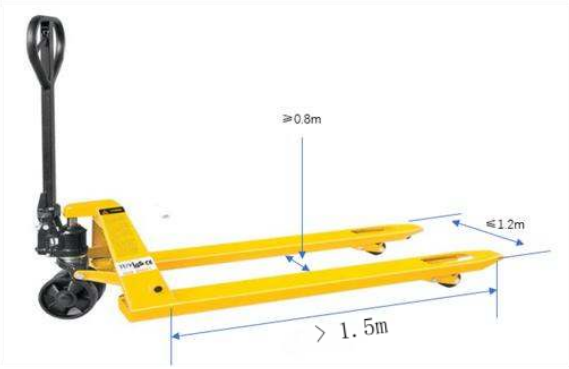


Figure 5-2 Schematic diagram of the pallet car

Attention

Before moving a pallet truck or pallet truck, remove the baffle plate at the bottom of the converged Cabinet. Otherwise, the baffle plate may be damaged.

Attention

No matter what method you choose to move the Converged cabinet, ensure that:

- Must always pay attention to its center of gravity position.
- Its volume and weight must always be taken into account.
- Operator safety must be ensured at all times.

  Take necessary auxiliary measures to ensure that the equipment is delivered to the installation site in good condition.

5.3 Unpack and Checkout

5.3.1 Unpacking coverage

After the converged cabinet is transported to the installation site, remove the transportation packing case as follows:

① Remove the top plate of the packing case.

② Remove the wooden side panels of the packing case.

③ Remove the shielding material from the packing case.

④ Remove the anchoring components that secure the converged storage Cabinet to the transportation wooden brackets.

Attention

After removing the anchoring components between the Converged storage cabinet and the wooden pallet, do not move the converged storage cabinet using the wooden pallet.

5.3.2 Inspection

Before leaving the factory, the energy storage integrated cabinet has been checked by Xupu electric staff and firmly packaged. Nevertheless, the following contents still need to be checked after the removal of the energy storage transportation packaging:

Check whether the quantity of each item in the packing list is consistent with the physical item;

Check whether the nameplate data of the product is consistent with the order contract, such as product model, rated capacity, voltage level, etc.;

Check whether the factory documents and accessories are complete;

Check whether the appearance of the converged cabinet is consistent with that described in this manual.

Check whether the converged cabinet is deformed, painted off, or loose.

Table 5-2 lists the packing list of the Converged Cabinet.

Table 5-2 Packing list

Serial Number	Name	Quantity
1	XPI-100kW215kWh outdoor integrated cabinet (including cabinet door key and related accessories)	1 set
2	XPI-100kW215kWh Series User manual	1 copy
3	Equipment wiring diagram	1 copy

4	Product certificate	1 copy
5	Inspection report	1 copy
6	Warranty Card	1 copy

Attention

Only the energy storage integrated cabinet can be installed and debuged.The inspection process, once found any problem, please contact the carrier or Xupu Electric in time.

6 Equipment Installation

6.1 Installation Requirements

6.1.1 Basic Requirements

The protection level of XPI-100kW215kWh outdoor integrated cabinet is IP54. It can be installed outdoor, but it cannot be placed in a high humidity environment for a long time. Due to the noise generated during operation, the energy storage inverter should be installed away from residential areas, and the installation position should not contain corrosive and combustible gases.

In order to ensure the safe and efficient operation of the integrated cabinet, when selecting the installation environment, be sure to comply with the following:

- The Converged cabinet must be installed on a suitable concrete support with a refractory surface, and the inlet and outlet of the converter must not be blocked.
- The installation ground is dry, flat, and free of water. The ground does not sway horizontally, and can fully bear the weight of the Converged Cabinet.
- The ambient temperature of the installation site ranges from -40 ° C to +60 ° C. The relative humidity range is: 0~100%, no condensation.
- The ground resistance of the converged cabinet is less than 4 ohms.
- The installation position should be convenient for observing the LED indicator.
- If the machine is placed directly outdoor , it is recommended to take necessary shading measures to avoid the temperature rise of the machine

due to direct sunlight, resulting in derating operation of the machine.

6.1.2 Outdoor requirements

The converter can operate within the environmental temperature of -40℃~60℃;

When the ring temperature is higher than 45℃, the machine will derate operation, when the ring temperature is lower than -20℃ cold start, it needs to heat the engine before high-power operation.

The sunlight irradiation intensity should be less than 1200W/m2. It is recommended to take necessary shading measures for converters installed outdoor .

6.1.3 Requirements for foundation supports

The cabinet must be installed on a cement foundation with flame-retardant materials or a structure supported by steel slots. Ensure that the foundation is smooth, solid, safe and reliable, and has sufficient bearing capacity. Do not install the cabinet on a depressed or inclined foundation.

During foundation construction, cable trenches should be preset according to the overall design of the power station and the positions of cables entering and exiting the cabinet bottom.

You are advised to drill holes in the foundation in advance. The holes must be the same size as those on the Converged cabinet base to securely connect the Converged Cabinet to the foundation.

As shown in Figure 6-1, the Converged Cabinet is equipped with six 14mm x 25mm locating waist holes. You are advised to use M12 x 50 bolts to secure the converter base to the foundation.

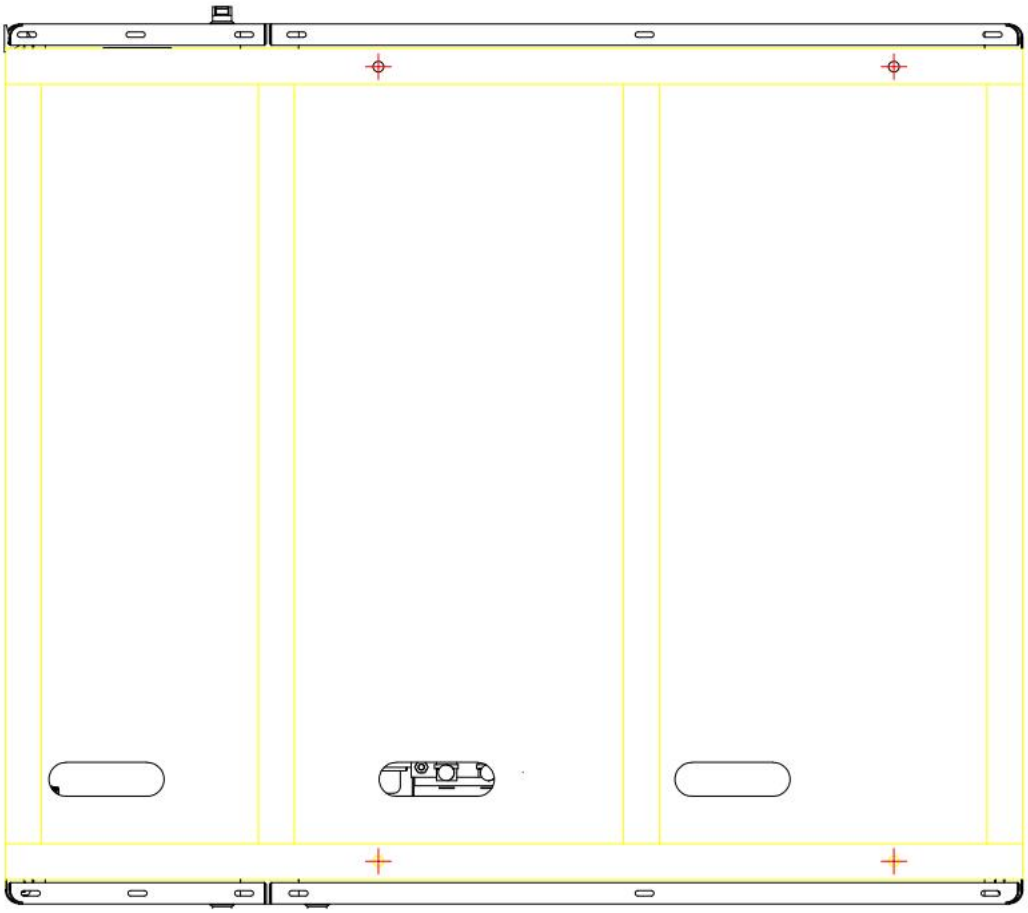


Figure 6-1 Bottom view of the XPI-100kW215kWh Converged cabinet

6.1.4 Space Requirements

As shown in Figure 6-2, when installing the converged cabinet, keep enough space between the wall and other devices to meet the requirements of the narrowest maintenance aisle, evacuation route, and ventilation. This section refers to the minimum space required for the converged cabinet to operate normally. If onsite conditions permit, you are advised to set a larger space between the

converged cabinet and other devices to ensure the reliable and efficient running of the converged cabinet.

A: ≥**1.5m**

B: ≥**1.5m**

CD: 0 in single device use

When multiple devices are combined, the space between cabinets is **11mm**, which is realized through the foot pads

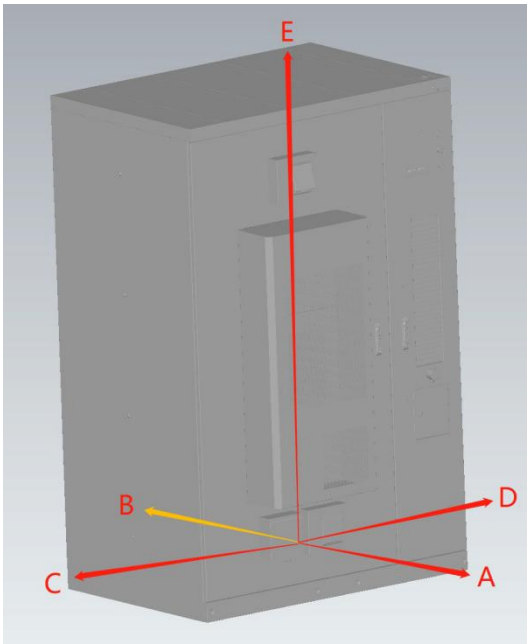


Figure 6-2 Space requirements for an XPI-100kW215kWh optical converged cabinet

6.1.5 Ventilation requirements

Converter operation will produce a lot of heat, the temperature is too high will directly affect the electrical performance of the equipment, and even damage the equipment, so when planning the converter installation environment to fully consider the ventilation and heat dissipation requirements of the equipment, to ensure the normal and efficient operation of the equipment.

To ensure reliable and efficient operation of the converged Cabinet, periodically clean the grids, air filters, and filters of the air inlet and air outlet of the storage cabinet, and periodically check whether the exhaust fans are normal.

To meet the ventilation requirements of the Converged Cabinet, the

installation environment must meet the following requirements:

1) Do not install the Converged cabinet in an environment with poor ventilation and low air flow.
2) The air inlet should have sufficient supply of fresh air.
3) The air quality must be guaranteed. If the content of suspended matter such as wind sand and dust in the air is too large, the air purity can be improved by installing filters at the air supply grid.
4) The ventilation system of the integrated cabinet must be independent of the ventilation system of other devices and do not affect each other.

If a heat dissipation air duct needs to be installed, the air duct should be designed by professionals in advance to avoid the phenomenon of flow backward when the Converged cabinet is placed. At the same time, the joints must be sealed to prevent air leakage, and the selected sealing material should withstand a temperature of at least 80 ° C. After installing the heat dissipation air duct, check the inside of the Converged cabinet to prevent screws, gaskets and other debris from falling into the cabinet during installation.

6.2 Onsite Installation

6.2.1 Cable Trough Design

The energy storage converged cabinet is connected from the bottom to the bottom. To facilitate installation and maintenance, it is recommended that cables connected to the converged cabinet be routed through the cable gutter. Concrete cable trenches should be installed under the foundation of the converged cabinet,

or rigid supports should be installed on the foundation to raise the installation surface, and cables should be laid in the overhead areas. If a cable trench is preset, anchor screws or channel steel can be used to fix the cable trench. If steel supports are used, devices can be directly installed and fixed on the supports.

The cable trench is usually designed and constructed by the construction party in accordance with relevant standards, and the weight and space occupied by the required cables are fully considered.

Figure 6-3 shows the section of a trench. You can determine the number of cable supports based on requirements. To facilitate installation and maintenance, lay DC circuits separately from AC circuits.

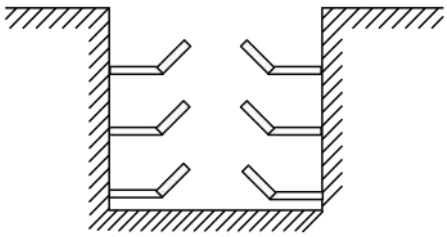


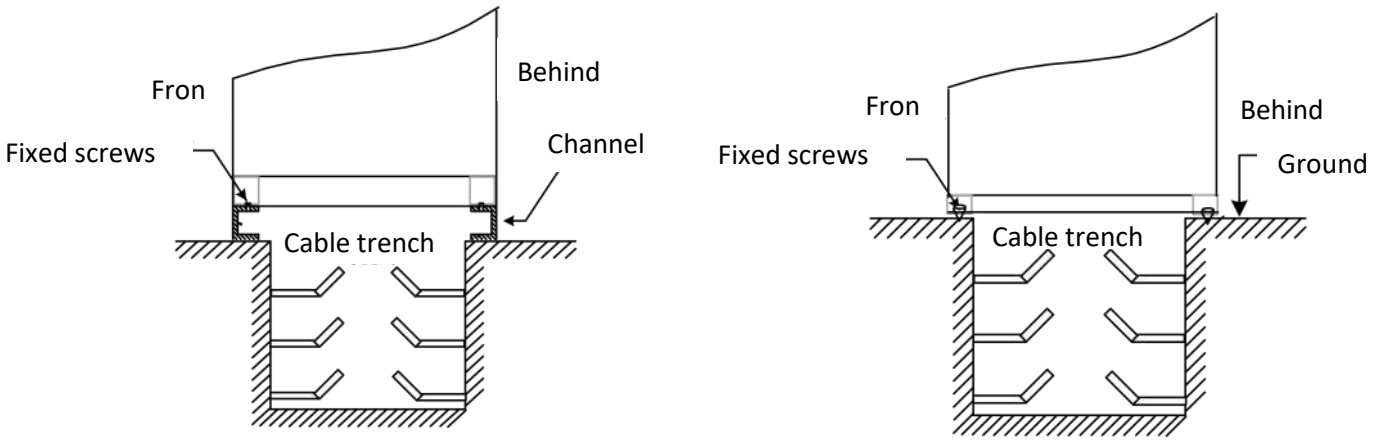
Figure 6-3 Cross-section of a trench

6.2.2 Securing the Converged Cabinet

If the Converged Cabinet is secured to the channel steel, ensure that the cable trench is laid and the channel steel holes meet the installation requirements of the converged cabinet. If the Converged cabinet is secured to a concrete floor, drill holes in the ground and secure the converged cabinet to the ground using expansion screws. Figure 6-4 shows how to secure the Converged cabinet.

To secure the Converged cabinet, perform the following steps:

1) Transport the Converged cabinet to the installation position using appropriate tools, and align the tools with the installation holes.
2) Secure the Converged cabinet to the channel steel or foundation through the waist holes in the base using M16*35 bolts.
3) Install a baffle plate for the base to secure the Converged cabinet.



a. b.

(a) Diagram of securing the Converged Cabinet to the channel steel

(b) Diagram of securing the Converged Cabinet to the ground

Figure 6-4 Securing the Converged Cabinet

6.3 Electrical Connections

6.3.1 General Safety Rules

Danger

Electric shock hazard!
Make sure the installation cables and equipment are not live before installation.
The internal capacitor of the energy storage converter is a dangerous energy storage device. Do not place inflammable and explosive materials near the energy storage converter.

Warning

All electrical connections must meet the electrical connection standards of the country/region where the project is located.

The energy storage converter can be connected to DC only after it has been approved by the local power supply company and installed by professional technicians.

Warning

Only professional electricians or personnel with professional qualifications can make electrical connection to this product.

Please strictly follow the connection label inside the device.

During the entire process of electrical connection of the energy storage converter, as well as subsequent maintenance and overhaul operations, the following safety rules must be observed:

- Disconnect the energy storage converter from all external connections and the internal power supply of the device.
- Ensure that the energy storage converter is not accidentally re-powered.
- Use a multi-meter to measure and ensure that the energy storage converter is completely powered off.
- Make necessary ground and short circuit connections.
- Use an insulating fabric to cover adjacent parts of the operating section that may be live.

6.3.2 Installing Tools

The following tools are available before installation:

- Torque wrench

- Screwdriver
- Wire strippers
- Terminal press
- Heat gun (or heat outlet fan)
- Multi meter

6.3.3 Wiring parts

Parts such as screws used to connect power cables to the Converged cabinet have been delivered in unified bags. Strictly follow the screw fastening rules to connect cables.

Attention

When connecting cables, ensure that the connectors are tight.
If the connection is not sufficient or the contact surface is oxidized, local heat accumulation may occur, which may lead to fire and combustion.

Attention

When connecting power lines, use copper cables of appropriate size, secure them with copper terminals, and then connect them to the copper bar.

6.3.4 Make preparations Before Connecting cables

1) Open the Converged Energy Storage cabinet door

Before connecting cables to the converged cabinet, open the door of the converged cabinet and some covers of the electrical room.

2) Open the cable inlet holes

The energy storage converged cabinet adopts a bottom-inlet cable and

bottom-outlet cable design. Cable inlet holes are reserved for users at the bottom of the converter, and external cables are connected from the bottom of the machine. To prevent foreign matter from entering or leaving the machine during transportation, the device to be delivered is provided with an inlet hole baffle. Remove the inlet hole baffle before connecting cables.

6.3.5 Cable Requirements

Cable selection requirements are as follows:

- The selected cable must have sufficient current carrying capacity. The current carrying capacity of the conductor depends on factors such as environmental conditions, conductor insulation material type, laying method, wire material, and cross-sectional area.
- The diameter of all cables must be selected according to the maximum current on either side of the energy storage converter, and there must be a margin.
- The cables on the same side should be of the same specification and type.
- Please choose flame-retardant cables.

Table 6-1 lists the recommended cable diameters. For the recommended cable table of the specific device model, contact our technical personnel.

Table 6-1 Recommended cable connection specifications

Cables	Wire diameter requirements	Mounting bolt specification
Grid side ABCN phase	It is recommended that 1 stick 70 mm per phase	M8*25

Ground wire	A grounding copper conductor of at least 35mm is recommended	M6*20

Attention

Do not overload the cable, and the current distributed on the 1mm² cable must not exceed 3A.

6.3.6 Cable connection Precautions

Attention

Before performing all electrical wiring, check the insulation and integrity of all connected cables.
Do not use cables that have poor insulation performance, are partially exposed, or are otherwise damaged.

Attention

Before connecting a cable, ensure that the polarity of either side of the cable is correct.
Do not pull hard on the cable during wiring to avoid damaging its insulation properties.
Ensure that there is a certain amount of bending space for all cables.
Take necessary auxiliary measures to reduce the stress on the cable.
The length of the screw should be appropriate. Too long a screw may affect the insulation performance of the device.
During installation, prevent part of the heat shrink tubing from being caught between the copper nose and the copper bar. Otherwise, poor contact may occur and even damage the device.
After each step of the wiring operation, you need to carefully check to ensure that the wiring is correct and firm.

Attention

Incorrect wiring may cause fire and burning. Please pay attention to the connection sequence of wiring components.
When connecting, make sure the connecting pieces are tight. If the connection is insufficient or the oxidation of the contact surface will cause local heat accumulation, which may lead to fire and combustion.

Attention

After all the electrical connections are completed, the wiring should be comprehensively checked, and the gap of the wire inlet should be blocked with fireproof mud after confirming that it is correct.
To prevent small animals from entering.

6.3.7 Wiring area Overview

The input and output wiring terminals of the Converged Cabinet are located on the right side of the cabinet, and the communication ports are located on the top of the module. Figure shows the wiring terminal layout. Connect cables according to the labels.

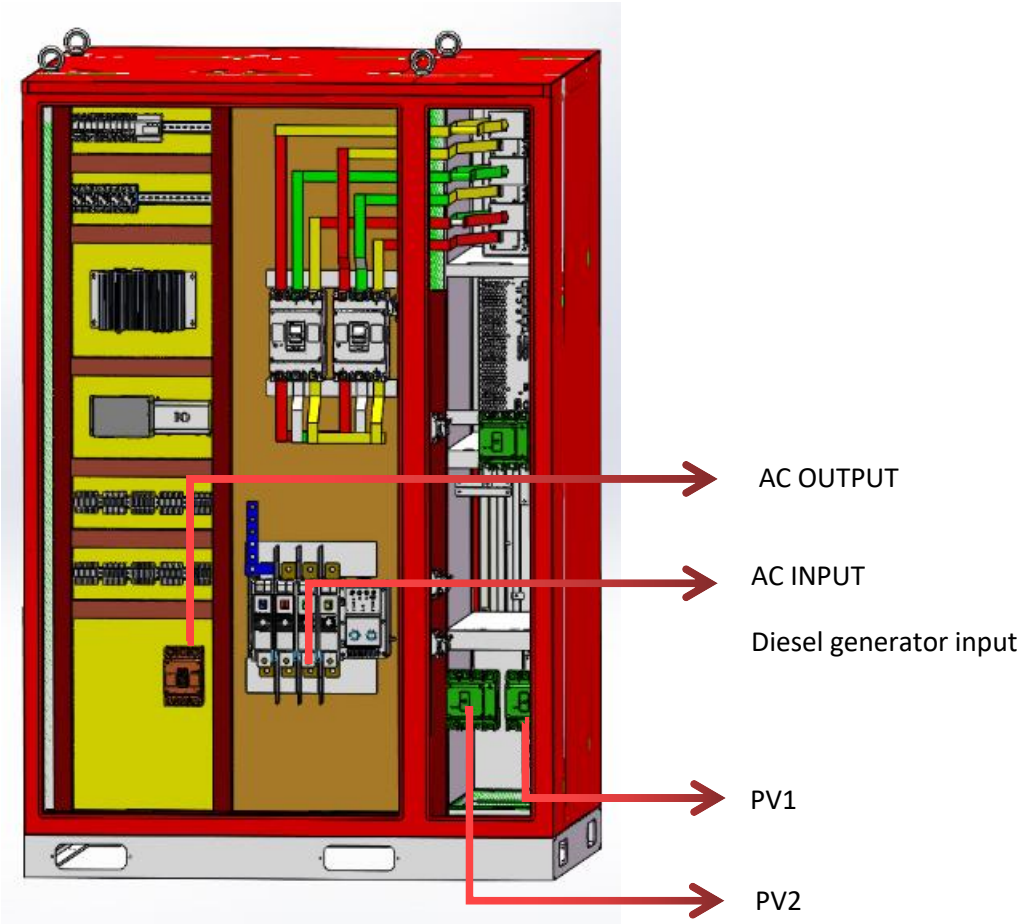


Figure 6-1 Wiring terminals (N-wire and L-wire position labels)

6.3.8 AC Test Cable connections

Before connecting AC cables, check the following:

- Measure the AC line voltage and ensure that the AC line voltage is within the normal AC voltage range of the Converged Cabinet.
- Verify the phase sequence of cables and label them.

Attention

Incorrect AC cables may cause the Converged Cabinet to fail to work or even be damaged.

Before connecting cables, ensure that the power distribution circuit breaker on the power grid side is off and the AC and DC isolation switches are off.

If the N wire is tapped on the side of the isolation transformer, the N wire is suspended and must be insulated. Do not ground the N wire.

To avoid three-phase current imbalance caused by uneven cable routing during cable transmission, you are advised to route AC cables in groups, with each group containing one three-phase cable. The distance between groups should be at least twice the diameter of a single cable. The length of each phase cable from the AC wiring side of the converged Cabinet to the winding of the isolation transformer should be similar.

Connect the AC side of the converged Cabinet to the power grid through the isolation transformer. The steps for connecting the AC side cables are as follows:

① Check that the power grid distribution switch at the rear of the AC side of the converged cabinet is off.

② Ensure that the AC and DC isolation switches of the converged cabinet are off.

③ Determine the phase sequence of the AC connection cables and mark them.

④ Select the appropriate size of bolts, use A wrench to tighten the "A" phase, "B" phase, and "C" phase cables.

6.3.9 Connecting Ground cables

Attention

The ground cable must be well grounded, otherwise:

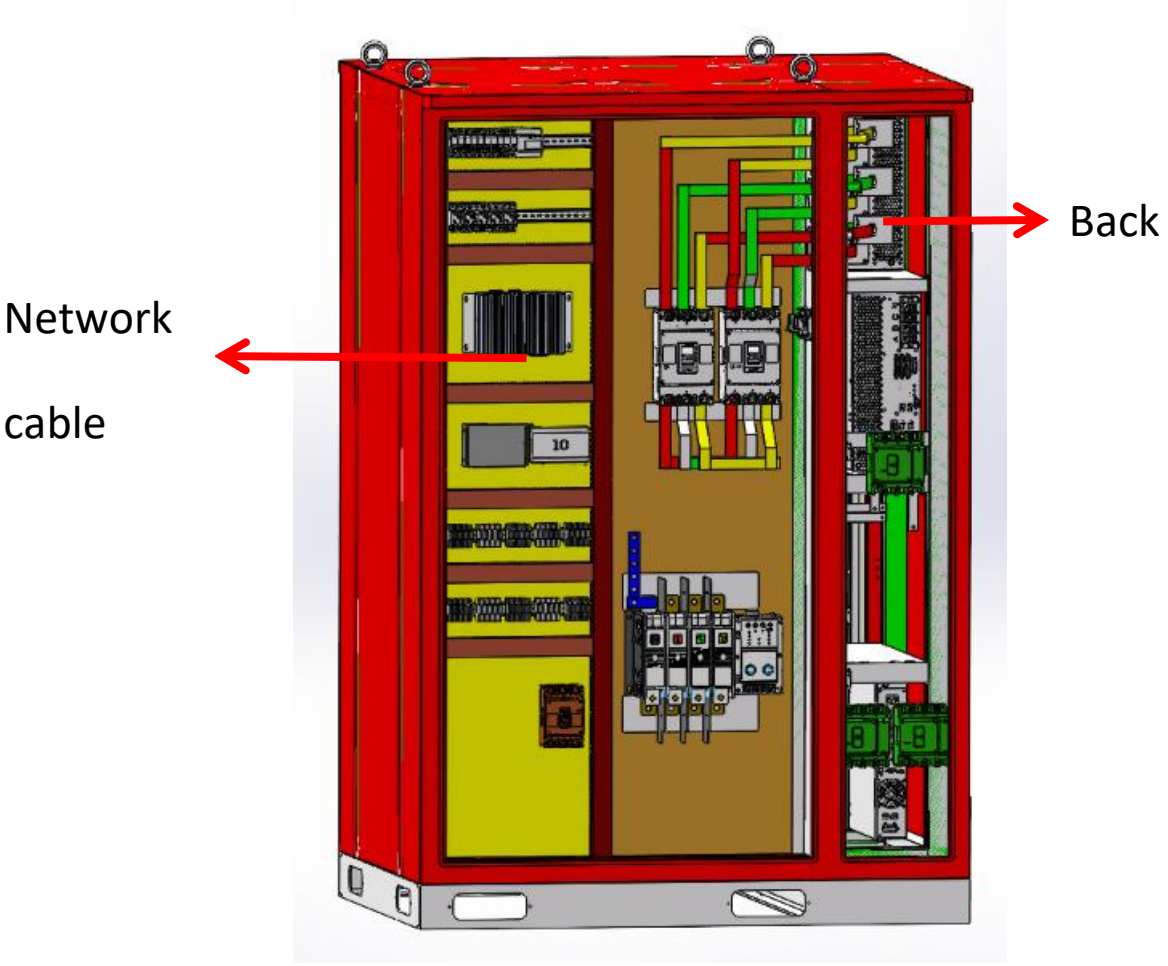
- May pose a fatal click hazard to the operator in the event of failure.
- May cause damage to equipment when struck by lightning.
- The device may not work properly.

Before delivery, the shell of the Converged cabinet and components in the cabinet that need to be grounded have been reliably connected to the ground copper bar at the bottom of the device. During grounding connection, ensure that at least 20mm^2 of the ground copper conductor area is required to connect the PE ground copper bar to the equipotential connection device at the installation site or in the equipment room, and then connect the PE ground copper bar to the ground or ground network through the equipotential connection device. The ground resistance must be no greater than 4 ohms.

After cables are connected, the gaps around the bottom of the converged cabinet should be sealed with fireproof mud. Tighten waterproof terminals of communication cables, and plug unused waterproof terminals with appropriate plugs to meet the requirements of waterproof and dust-proof.

6.3.10 Communication ports

The XPI-100kW215kWh cabinet has an EMS external communication port, which is located behind the battery compartment.



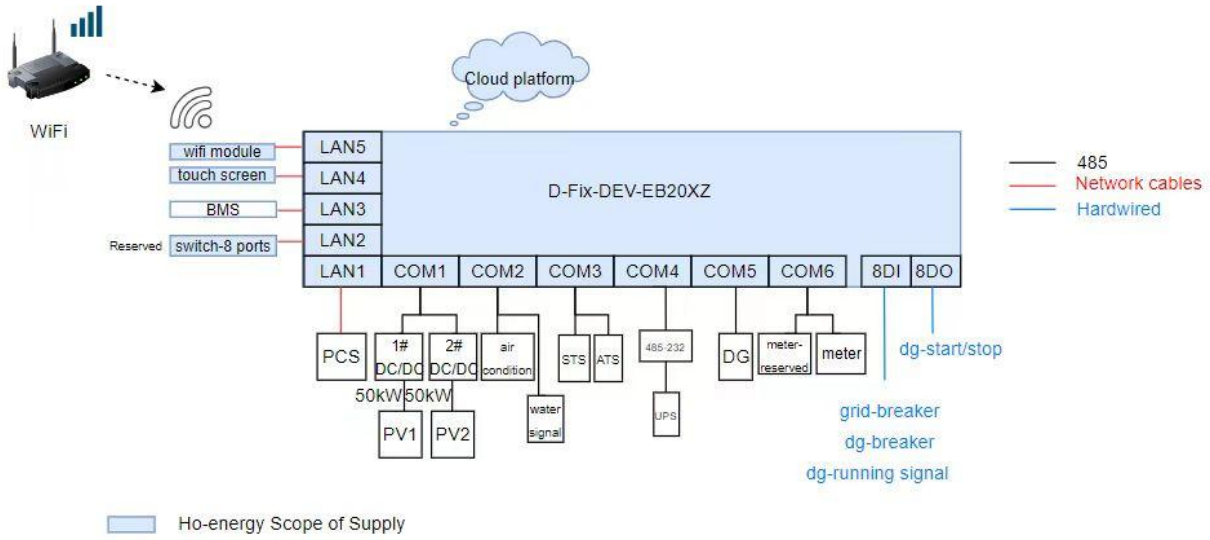


Figure 6-9 External communication ports and their locations

6.3.11 Installation Checklist

After the converged storage cabinet is fully installed, arrange at least two personnel to check the installation according to the items listed in Table 6-3. Make records during the check. If any item does not meet the requirements, rectify it immediately.

Table 6-3 Check list

Check the mechanical installation items	
1	The Converged cabinet is not deformed or damaged
2	The bottom of the Converged cabinet is fixed and the support is stable and reliable
3	There is enough space around the Converged cabinet
4	The temperature, humidity, and ventilation conditions of the environment where the Converged cabinet resides meet requirements
5	Smooth circulation of cooling air
6	Cabinet seal protection is complete and reliable
Electrical installation inspection	
7	The Converged cabinet is firmly grounded
8	Match the voltage on the grid side with that on the AC side of the Converged cabinet
9	The phase sequence of the network side connection is consistent, and the tightening torque meets the requirements
10	The DC voltage of the battery system must match the DC voltage of the Converged cabinet
11	The DC positive and negative polarity matches the positive and negative poles of the energy storage converged cabinet
12	Connect the cables correctly and keep a distance from other cables
13	Cables are marked correctly and clearly
14	The insulating shield is complete and reliable, and the hazard warning label is clear and firm
Other inspections	
15	Fasten all useless conductive parts with insulating cable ties
16	There are no tools, parts, iron filings, or other foreign objects left inside the cabinet
17	No condensation of moisture or icing on the inside of the cabinet

7 Operation and commissioning

7.1 Check before running

Before the first operation or after the completion of maintenance and overhaul, the installation of the equipment should be thoroughly checked again.

Warning

All operations during operation must be carried out by professional electrical personnel, and no individual shall operate without authorization.

7.1.1 Checking Cable Connections

- Check all connection cables for breakage or cracks to ensure that all connection cables are intact.
- Double check that all cables are connected correctly against the system wiring schematic.
- Make sure all cables are securely connected.
- Verify that the cabinet ground point is properly connected to the foundation ground point. Each ground point inside the cabinet is properly grounded.

7.1.2 Check the electrical compartment

- Make sure the main circuit AC DC isolation switches are all off.
- Make sure the emergency stop knob is released and in working order.
- Check and ensure that the energy storage converter and various electrical switches and buttons of the front and rear stages operate flexibly and meet the specifications.
- Make sure the circuit breakers QF3, QF4, QF5, QF6, QFm1, QFm2, QFm3, QFm5, QFm6, QFm7, QFm8, QFz1, QFz2, QFz3 are off

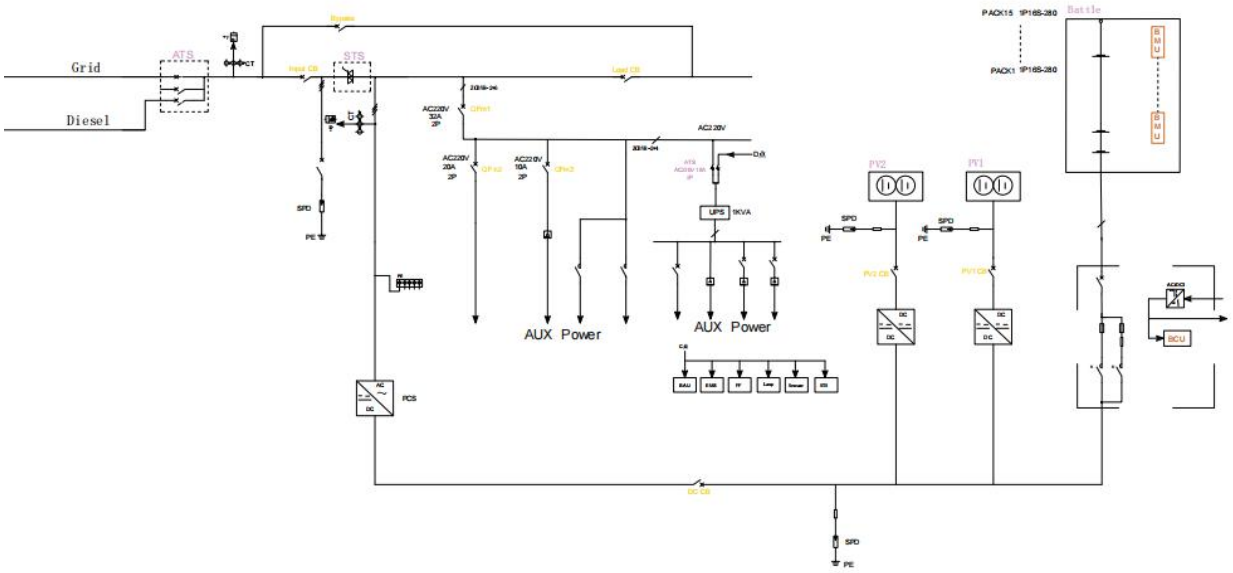


Figure 7-1 Position diagram of the isolation switch

7.1.3 Check the battery/grid side voltage

- Measure whether the open circuit voltage of each storage battery meets the requirements and record it accurately.
- Make sure the positive and negative polarity is correct.
- Measure the resistance of the cable between the battery pack junction box and the machine with an ohmmeter in the megohm range and record it precisely.

Warning

Make sure the measuring device is used correctly, otherwise there is a danger of clicking.

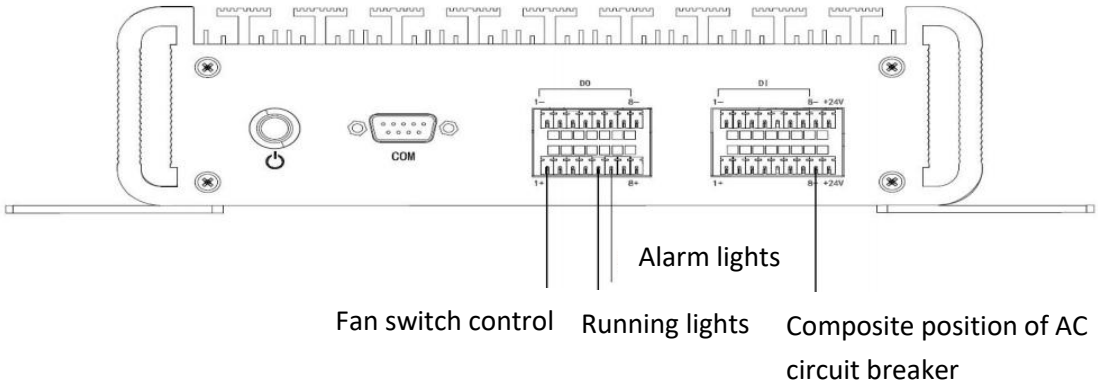
Warning

The voltage on either side shall not exceed the maximum DC voltage allowed by the energy storage inverter. Too high DC voltage may damage the device or even cause a safety accident.

- Accurately measure the voltage of the three groups of lines on the AC power grid side. The measured value should not exceed the allowable voltage range of the power grid on the AC side of the energy storage converter, and the three-phase balance should be achieved.
- Accurately measure the frequency of the AC power grid side, and the measured value should not exceed the permissible range of the grid frequency of the AC side of the energy storage converter.
- It is recommended to measure the THD(total harmonic distortion) of each phase voltage, if the distortion is serious, the energy storage inverter may not be able to operate.

7.2 System Power-on

Close the main circuit AC/DC isolation switch, close the circuit breaker QF3, QF4, QF5, QF6, QFm1, QFm2, QFm3, QFm5, QFm6, QFm7, QFm8, QFz1, QFz2, QFz3, and turn on the EMS host switch, and the LED indicator "POWER" green light is long on.



7.3 Cloud Platform interface

7.3.1 Preparing for Login

Work Environment

The working environment of the Web user interface should meet the following requirements:

Browser: IE 9/10/11, Firefox or chrome.

Minimum resolution: 1024x768

Set IP address

Correctly set the IP addresses, subnet masks, and gateways of the EMS, computers, and other connected network devices.

7.3.2 Login screen

procedure

Connect port LAN2 to the computer using a network cable to ensure that the computer and port LAN2 of the EMS belong to the same LAN. Type the website http://123.60.190.77 in the address bar of the browser and Enter the correct user name and password. Click Log in to the system and press Enter.

Specify **'user name'** and 'Password'**,** and then click 'Login'.

Access Control

The login screen is the first screen for Web access. After the user enters the password, the screen switches to the main screen to prevent excessive network access traffic.

The cloud platform provides multiple login passwords.

Username	Permissions
Clients	Can only view Web interface, read data
Maintenance Engineers	Customer Permissions + Modifiable amount of Settings

7.3.3 System Tools interface

After login, the home page will enter the energy storage Overview -- home page by default

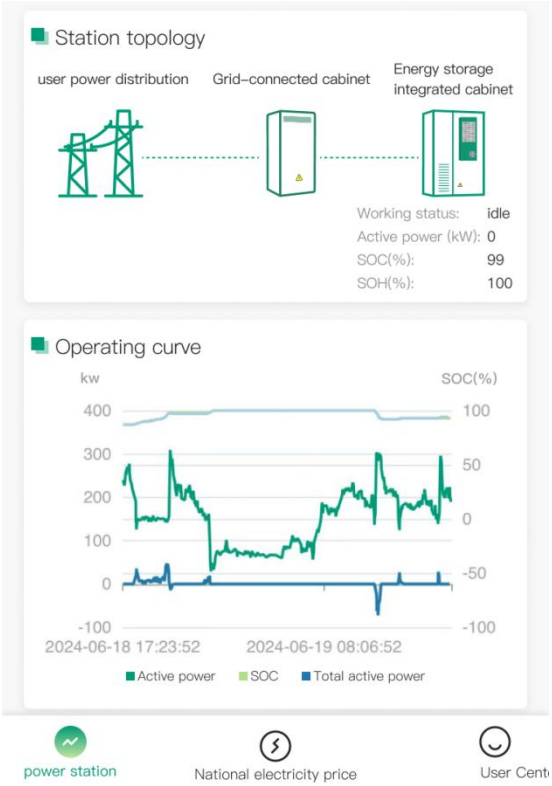
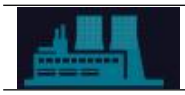


Figure 7.3.3 APP version

This page displays the overview data, device topology, cumulative charge and discharge statistics, real-time running curve, alarm information, and environmental control data of the power station.

Figure 7.3.4 Computer cloud platform

7.3.4 Device list

icon	Name
	Energy Storage converter
	Batteries
	PV
	Load
	Power grid

7.3.5 Real-time Information related screen

Click Data Monitor -- Data Display to enter the data display page. On this page, you can view the remote communication and telemetry of all devices

Real-time values of points and historical data.

Select a device, such as PCS.

Click Query to see the real-time values of all telemetry and telemetry points under the changed device, as well as the update time.

Select a point you want to view and click the View History button. The default query is for the last 24 hours of the curve, which can be customized when Interval view.

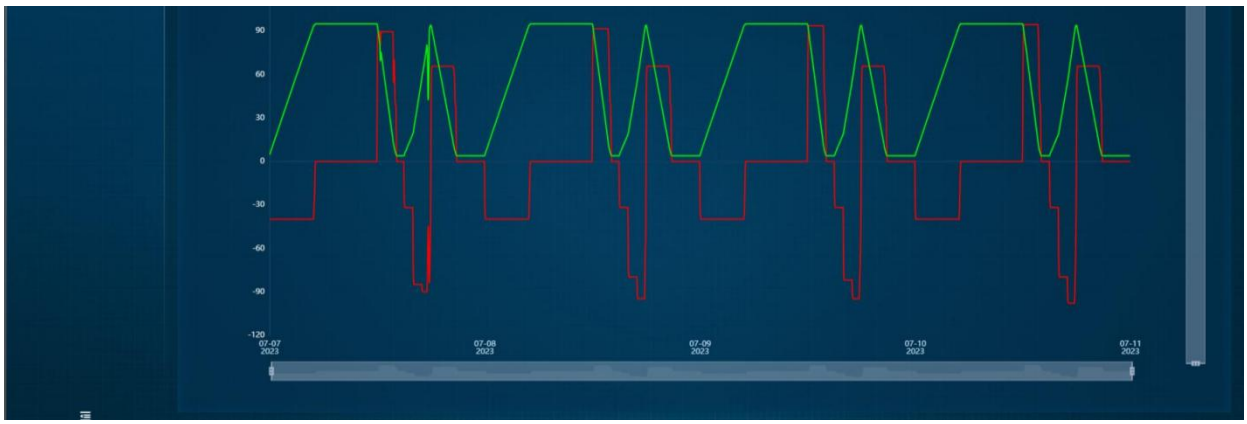
7.3.6 Data Statistics Interface

Click Data Monitor -- History Curve to enter the History curve page. Select the indicator, you can select multiple measurement points of multiple devices to view.

Select the time range, accurate to the second.

After selecting the indicator and time range, click Query. Hover over the curve to see the value for a specific moment in time. Queries when you're done, you can move on to adding other signals or removing signals without starting over.

Click the Export button to export all data that matches the curve.



Data storage: The system saves this data every 1 minute. The minimum storage time is 1 year, up to 400 data points can be recorded, and the data can

be exported in excel format monthly.

Including PCS related data, such as active power, reactive power, apparent power, power factor, charge and discharge, etc.

BMS related data, such as SOC, voltage, current, rechargeable amount, discharge capacity, state, etc.

PV related data, such as power, active power, reactive power, absorbed power, discharge power, benefit and other instrument related data.

7.3.7 Energy management interface

Click Remote Control -- Command Delivery to enter the command delivery page. This page can remote repair the controllable points under each device

Change the value and send it to the device.

Select a device and click OK.

Click Query, the page shows all the controllable points under the device, the current value, update time and other information

Select the point to be modified, enter the modified value, and click to deliver.

7.4 Energy storage converter control mode

7.4.1 Ethernet connection

1, the system requires windows system; It must run under the.net framework 3.5 framework. You can directly click Run first, if the system does not have.NET library, some windows system will pop up automatically download.net library, directly click download and install. If there is no network or no automatic pop-up

download and installation box, you need to manually download.net library; If other error boxes pop up and cannot run, please contact the manufacturer.

2, the computer IP configuration requirements

Insert the network cable into the COM1 port and connect it to the computer. Set the IP address of the computer to 192.168.4.40 according to the sequence below.

The login interface as shown in Figure 7.1 will appear.

Enter "123" in the Name input box,

In the Password field enter the initial password "2200",

Click "Log in" to enter the background operation interface of PWS1-100M, as shown in Figure 7.4.1.

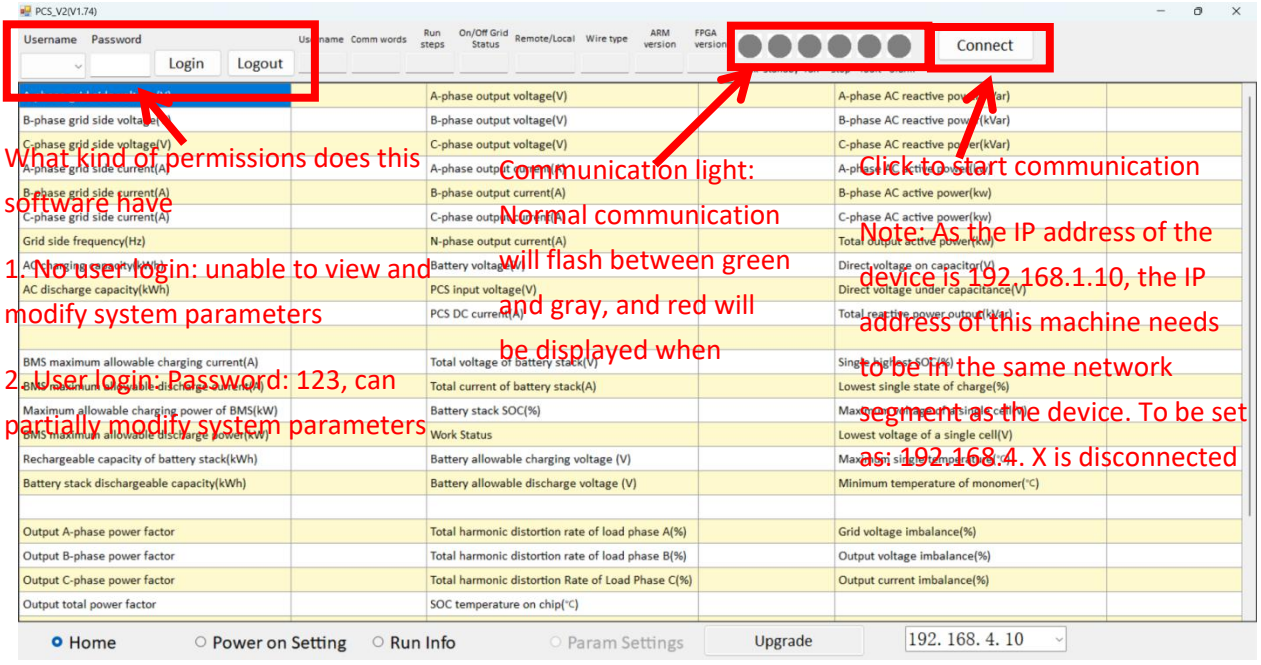


Figure 7.4.1 Login interface

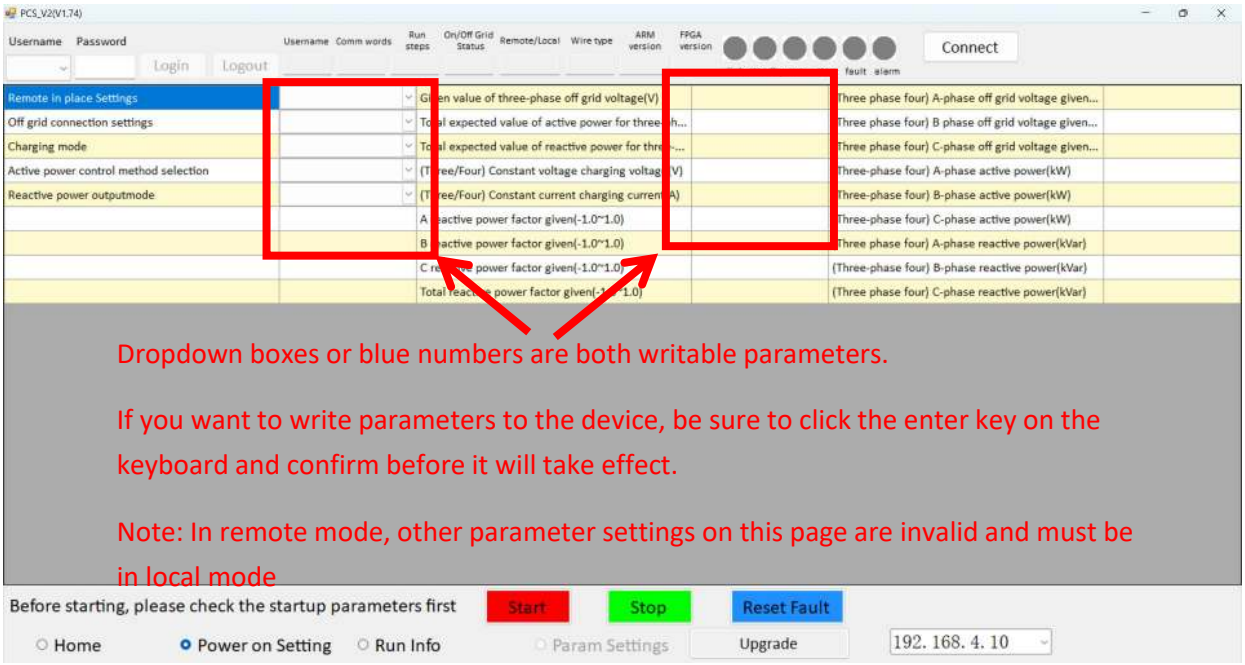


Figure 7.4.2 Example of web page background operation interface

8 Troubleshooting

8.1 Safety precautions

Warning

There may be a danger of electric shock due to high voltage
Under fault conditions, the product may have high pressure. Touching live parts of the device may result in danger or death
Serious injury from electric shock is possible.
Follow all safety information when handling the product.
Wear appropriate personal protective equipment when performing product maintenance.
If you are still unable to resolve the issue through this document, contact the manufacturer.

8.2 Export device running data

When it is time to send the logs to the manufacturer for analysis, you will need to download the device operation logs.

1. Use a password to log in to the control interface of the web page.

2. Choose "History" > "Data History" > Select the running data of the

corresponding device and the corresponding month > "Package excel" When the download is complete, you can save the record file in the browser.

8.3 common fault description

The following table shows faults caused by incorrect parameter Settings.

The user can reset the parameters according to the instructions in the appendix, and the fault can then be resolved automatically.

Attention

Classification of alarms:
Fault: Shutdown.
Warning: Alarm but not off;

Alarm removal method:
Automatic: After the alarm cause disappears, the alarm is automatically cleared.
Manual: After the alarm cause disappears, the alarm clearing command needs to be sent manually.
Power off: After the alarm disappears, the power needs to be turned off and restarted.

Alarm classification + Clear Method (abbreviated A.C. (Automatic Clear) + C.M. (Manual Clear)) :
Fault + Automatic
Fault + Manual
Fault + Power off
Warning + Auto
Warnings + Off

Table 8-1 List of common faults

Fault name	A.C.+C.M	Reason
Ac bus over voltage	**A.C.**	Ac bus voltage above the over voltage protection set
Ac bus under voltage	**A.C.**	Ac bus voltage below the over voltage protection set
Ac bus over frequency	**A.C.**	Ac bus frequency above over frequency protection set value
Ac bus under frequency	**A.C.**	Ac bus frequency below under frequency protection set
Ac Over voltage	**A.C.**	The current grid voltage is higher than the over voltage protection set point
Grid under voltage	**A.C.**	The current grid voltage is below the under voltage protection setting
Grid over frequency	**A.C.**	The current grid frequency is higher than the over frequency

		protection set value
Grid under frequency	**A.C.**	The current grid frequency is below the under frequency protection setting
Dc input over voltage	**A.C.**	The current DC voltage of the device is higher than the upper DC voltage limit
The DC input under voltage	**A.C.**	The current DC voltage of the device is lower than the lower limit of the DC voltage or the DC voltage is not connected
The DC bus is over voltage	**A.C.**	The voltage on the DC bus capacitor is too high when the module is running
Dc bus under voltage	**A.C.**	The capacitor voltage on the DC bus is too low when the module is running
Parameter mismatch	**A.C.**	1. The parameter setting of < DC parameter > is unreasonable;

8.4 Troubleshooting in detail

For detailed troubleshooting, please consult our technical personnel.

9 Maintenance

9.1 Safety during maintenance

Danger

High pressure is present in live parts of the product. Touching live electrical may result in death or severe electric shock damage.
Wear appropriate personal protective equipment for maintenance.
Do not touch any live parts.
Review all warning messages in products and documentation.
Follow all safety information provided in the battery section.
Be sure to disconnect the external power supply device from the bidirectional energy storage converter before performing any work:
- The grid voltage that the grid feeds
- Internal power supply
- DC voltage of the battery
- Additional external voltage, such as a control signal from the control room

Ensure that devices that have been disconnected cannot be automatically connected.
After turning off the device, wait at least 5 minutes before turning it back on so that the capacitor is fully discharged.
Make sure all components are completely free of voltage before operating.
Cover or isolate any adjacent live components.

Attention

Avoid product damage caused by dust intrusion and moisture penetration

The intrusion of dust or moisture can damage the product and affect its function.

Perform maintenance only when the environment is dry and dust-free.

Allow product maintenance only when the product is turned off.

Reconnect the external power supply after installing the product.

Install all baffles if the installation or commissioning process is interrupted. Close and lock the case.

Store the product in a dry area.

9.2 Maintenance plans and spare parts

9.2.1 Operating Environment Requirements

The installation environment of the device must meet the requirements of the required operating environment of the device:

Allowable ambient temperature: -20~60 ° C

Allowable relative humidity: 0~ 95% (non-condensing)

Maximum allowable height: 3,000 m

Note: PCS will derate output when the maximum height is exceeded.

For the specific derating factor, please consult our technicians.

9.2.2 Check electrical and fixed connections

After it is put into operation, perform regular inspections of the electrical and fixed component connections of the equipment. This inspection is best done every three months. A record of each inspection should be kept.

- Ground connection;
- Electrical connection with DC input;
- Electrical connections for AC inputs;

- Connections of communication cables;
- A fan;

And access the fault information recorded by the monitor.

9.2.3 Cleaning and cleaning

Dust and debris should be cleaned from the copper strips, terminals, and mesh of the equipment before it is put into operation.

After the equipment is put into operation, dust in the equipment room should be cleaned regularly. Check the ventilation and exhaust facilities in the equipment room are normal. It is recommended that you clean it every three months.

9.3 Maintenance

- Maintenance intervals should be shortened in harsh environmental conditions.
- Site location and environmental conditions will affect maintenance intervals. Pay attention to cleanliness and corrosion protection.
- More frequent maintenance may be required, depending on the conditions of the site.
- If DC distribution components are susceptible to harsh environmental conditions, shorter maintenance intervals are recommended.
- We recommend regular visual inspections to determine if maintenance is required.

Consumables and maintenance materials

Consumables and maintenance materials are usually not included in the standard equipment list;

Only professionals or persons with electrical qualifications should carry them out;

Live maintenance work;

View history;

Read error messages and warnings;

Check the fan;

No live maintenance;

View history;

Perform a visual inspection;

Clean the ventilation baffle;

Clean air ducts and ventilation ducts;

Inspect the interior;

Check the bolted connection of the power cord;

Check the label;

Check latches, doorstops, and hinges;

10 Addendum

10.1 Quality Assurance

If the product fails during the warranty period, Shenzhen Xupu Electric Co., LTD. (hereinafter referred to as the company) will repair or replace the new product free of charge.

- EVIDENCE

During the warranty period, the company requires customers to present the invoice and date of purchase of the product. At the same time, the trademark on the product should be clearly visible, otherwise the company has the right to deny the quality guarantee.

- Conditions

The defective products after replacement are disposed of by the company.

The customer shall allow reasonable time for the Company to repair the faulty products.

- Exemption of Liability

The Company has the right not to guarantee the quality under the following circumstances:

1. The whole machine and parts have exceeded the free warranty period.
2. Shipping damage.
3. Incorrect installation, modification, or use.
4. Operating in very harsh environments beyond those described in this manual.
5. Failure or damage to equipment caused by installation, repair, alteration or disassembly not by our service personnel.
6. Equipment failure or damage caused by the use of non-standard or non-Shupp components or software.
7. Any installation and use beyond the scope specified in the relevant international standards.
8. 3. Damage caused by abnormal natural environment.

Due to the above circumstances caused by product failure, customers require maintenance services, after the company's service department judgment, can stop paying maintenance services.

In order to continuously improve customer satisfaction, the company's products and user manuals are in continuous improvement and upgrading. If there is a difference between the user manual and the product in your hand, the version may be caused, please refer to the specific product. If you still have questions, please contact the company.

11 Contact

If you have technical questions about our products, please call the service hotline. Please provide the following information so that we can give you the necessary help.

- Model of the equipment
- Serial number of the device
- Specifications of the battery
- Information about the photovoltaic module
- Current alarm information about the device
- Current AC and DC information of the device
- The software version of the device

NEW ENERGY
HBOWA

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