PCS

User Manual



Contents

1 Safety Instructions 5
1.1 Unpacking Inspection 5
1.2 Installation Safety 5
1.3 Electrical Connection Safety 6
1.4 Operation Safety 7
1.5 Maintenance Safety 7
1.6 Disposal Safety 8
1.7 Safety Labels 8
2 Product Introduction 10
2.1 Product Overview 10
2.2 Application Scenarios 10
2.3 Circuit Block Diagram 11
2.4 Components 12
2.5 Product Dimensions 12
3 Unpacking and Storage 13
3.1 Unpacking and Inspection 13
3.2 Scope of Delivery 13
3.3 Equipment Storage 13
4 Mechanical Installation 15
4.1 Installation Requirements 15
4.1.1 Installation Environment Requirements 15
4.1.2 Installation Support Requirements 16
4.1.3 Installation Angle 16
4.1.4 Installation Space Requirements 17

4.1.5 Installation Tools Requirements 18
4.1.6 Heat Dissipation Requirements 19
4.2 Installing the PCS 20
4.2.1 Moving the PCS 20
4.2.2 Installing the PCS 20
5 Electrical Connection 25
5.1 Preparation Before Installation 25
5.1.1 Safety Check 25
5.1.2 Tool Preparation 25
5.1.3 Interfaces to Be Connected 25
5.2 Cable Selection 26
5.3 Grounding Cable Assembly Guide 27
5.4 Power Plug Assembly Guide 28
5.4.1 Power Cable Connection Procedure 28
5.4.2 Installing the Power Connector 28
5.5 Communication Plug Assembly Guide 29
5.5.1 Communication Cable Connection Procedure 29
5.5.2 Installing the Communication Connector 30
6 Commissioning 32
6.1 Commissioning Tools List 32
6.2 Safety Precautions 32
6.3 HMI Connection Instructions 32
6.4 Pre-Power-On Checks 33
6.5 Powering On the Device 33
6.6 Commissioning 33

6.7 Shutdown 35
7 Troubleshooting 36
8 System Maintenance 41
9 Appendix 42
9.1 Circuit Breaker Selection 42
9.2 Glossary 42

1 Safety Instructions

Relevant safety regulations must be observed throughout product installation, commissioning, operation, and maintenance. Improper use or incorrect operation may result in:

- Personal injury or death of the operator or third parties.
- Damage to the product or other property belonging to the operator or third parties.

To avoid the hazards above, strictly follow the safety precautions in this manual.



- The safety precautions in this manual do not cover all regulations that must be observed and are intended only as a supplement to all safety precautions. All work should be carried out in accordance with the actual on-site conditions. Weiheng Intelligent Technology Co., Ltd. disclaims any liability for any losses resulting from violation of general safe operation requirements, safety standards, or the safety precautions in this manual. Local laws, regulations, and specifications must be observed when installing, operating, and maintaining the equipment. The safety precautions in this manual are intended only as a supplement to local laws and regulations.

1.1 Unpacking Inspection

⚠WARNING

Inspect all safety markings, warning labels, and the nameplate on the product. Make sure that the safety markings, warning labels, and nameplate are clearly visible and must not be removed or covered.

NOTE

After receiving the product, check whether the appearance and structural parts of the product are damaged, and check whether the received product is consistent with the product actually ordered. If any problem is found in the above checks, do not install the product and contact Weiheng Intelligent Technology Co., Ltd. in a timely manner.

1.2 Installation Safety

⚠DANGER

Before installation, make sure that the product has no electrical connections. If drilling is required during installation, make sure to avoid the water pipes and electrical wiring inside the wall.

⚠CAUTION

Improper installation may cause personal injury! If the product supports hoisting and needs to be lifted with lifting equipment, personnel are not allowed to stay under the product. When moving the product, take the product weight into account, keep it balanced, and prevent it from tipping over or falling.

NOTE

Before operating the product, check that the tools to be used have completed periodic maintenance.

1.3 Electrical Connection Safety

⚠DANGER

Before making electrical connections, make sure that the energy storage converter is not damaged; otherwise hazards may result! Before making electrical connections, make sure that the energy storage converter and all switches connected to it are set to "OFF"; otherwise there is a risk of electric shock!

⚠DANGER

Batteries connected in series will produce hazardous voltage! When performing electrical connections, operators must wear personal protective equipment. Before touching the DC cables, use a measuring device to make sure that the cables are not energized. Follow the safety precautions listed in the battery pack and related documents.

⚠DANGER

Lethal high voltage may exist inside the product! When performing wiring operations, always use dedicated insulated tools. Pay attention to the warning labels on the product and follow their safety instructions. Follow the safety precautions listed in this manual and other relevant documents for this product.

⚠WARNING

Incorrect wiring may cause product damage, and damage caused thereby is not covered by the warranty. Electrical connections must be performed by qualified personnel. The cables used in the energy storage system must be properly sized, securely connected, and well insulated.

⚠WARNING

Before connecting the DC connector to the PCS, check the positive and negative polarity of the battery pack, and insert the DC connector into the corresponding DC terminal only after confirming that the polarity is correct. During installation and operation of the energy storage converter, make sure that neither the positive nor the negative pole of the battery pack is short-circuited to ground. Otherwise, an AC or DC short circuit of the energy storage converter may occur, causing product damage, and damage caused thereby is not covered by the warranty.

NOTE

Wiring must comply with the relevant rules of the local power grid and the relevant safety instructions of the energy storage system.

1.4 Operation Safety

⚠DANGER

- While the product is running, do not touch the product enclosure; do not plug or unplug any connectors on the energy storage converter; do not touch any wiring terminals of the energy storage converter, otherwise there is a risk of electric shock; do not remove any parts or components of the energy storage converter, otherwise there is a risk of electric shock; and do not touch hot parts of the energy storage converter (such as the heat sink), otherwise there is a risk of burns. While the product is running, if the product is equipped with a DC switch, do not operate the DC switch, otherwise equipment damage or personal injury may occur.

1.5 Maintenance Safety

⚠DANGER

Improper maintenance may cause personal injury or product damage! Before maintenance, first disconnect the AC circuit breaker on the grid side and the DC switch, and check the status of the energy storage converter. 15 minutes after the energy storage converter is powered off, use a testing device to verify that there is no voltage or current, and wear protective equipment before operating and maintaining the energy storage converter. After the product shuts down, there is still a risk of burns. Wait until the product has cooled down and wear protective gloves before operating the product.

DANGER

Touching the power grid or the contacts, terminals, and other parts inside the product that are connected to it poses a risk of electric shock. Voltage may be present on the grid side; use a voltmeter to confirm that no voltage is present before touching.

CAUTION

Place conspicuous warning signs or set up safety warning tape around the product to prevent unauthorized personnel from approaching the product and causing misoperation or accidents.

NOTE

To reduce the risk of electric shock, do not perform any maintenance operations beyond those described in this manual. If service is needed, contact Weiheng Intelligent Technology Co., Ltd. for repair; otherwise, any resulting damage will not be covered by the warranty.

1.6 Disposal Safety

WARNING

Dispose of the product in accordance with local regulations and standards to avoid property damage or personal injury.

1.7 Safety Labels

To ensure safe operation, always observe the safety labels affixed to the equipment. Do not damage or peel off the safety labels. The safety labels are described as follows:

Safety Label	Description
	Caution: risk of electric shock!
	Ear protection must be worn!
	Read the user manual carefully before operating the equipment.
	The equipment presents potential hazards during operation. Wear protective gear when operating it.
	The equipment surface is hot during operation. Do not touch it to avoid burns.

	Protective earth connection point.
	Do not dispose of the equipment as household waste. Dispose of it according to local laws and regulations, or return it to the manufacturer.
	Delayed discharge: after power-off, wait 15 minutes for the equipment to fully discharge.

2 Product Introduction

2.1 Product Overview

The main function of the energy storage converter (PCS) is to convert electric energy between an energy storage unit (such as a battery) and the AC-side grid or equipment. The PCS supports rectification and inversion. Rectification means that the PCS converts three-phase AC power into DC power and stores the electric energy in the battery. Inversion means that the PCS converts the DC power in the battery into three-phase AC power and feeds it into the grid or supplies it to loads.

Model Description

This document applies to the following PCS models:

TAA-215kW-800,TAA-210kW-800,

TAA-209kW-800,TAA-208kW-800,

TAA-203kW-800,TAA-200kW-800,

TAA-199kW-800,TAA-188kW-800,

TAA-186kW-800,TAA-185kW-800,

TAA-175kW-800,TAA-165kW-800,

TAA-150kW-800,TAA-145kW-800,

TAA-215kW-690,TAA-210kW-690,

TAA-209kW-690,TAA-208kW-690,

TAA-203kW-690,TAA-200kW-690,

TAA-199kW-690,TAA-188kW-690,

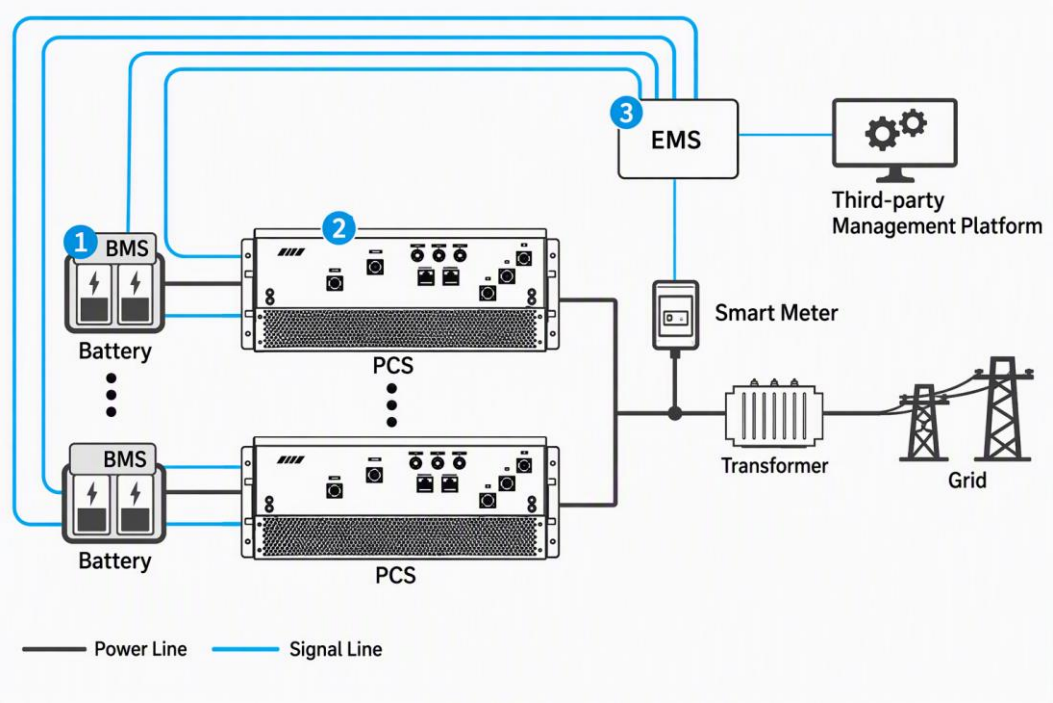
TAA-186kW-690,TAA-185kW-690,

TAA-175kW-690,TAA-165kW-690,

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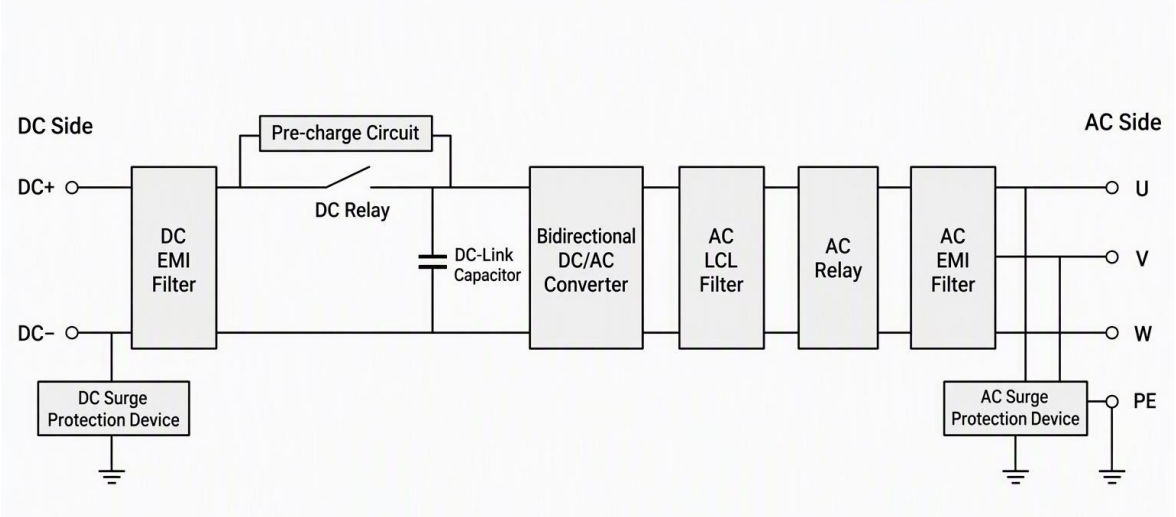
2.2 Application Scenarios

The PCS converts the DC power from the battery into three-phase AC power. It can also convert AC power into DC power acceptable to the battery to charge the battery. The PCS can operate in P/Q mode, respond to third-party EMS dispatch commands, and support various commercial and industrial grid-connected energy storage applications, such as peak-valley arbitrage, distribution area capacity expansion, and demand management. It also supports energy storage applications paired with new energy sources (such as PV), enabling functions such as smoothing new energy generation and assisting new energy grid connection.

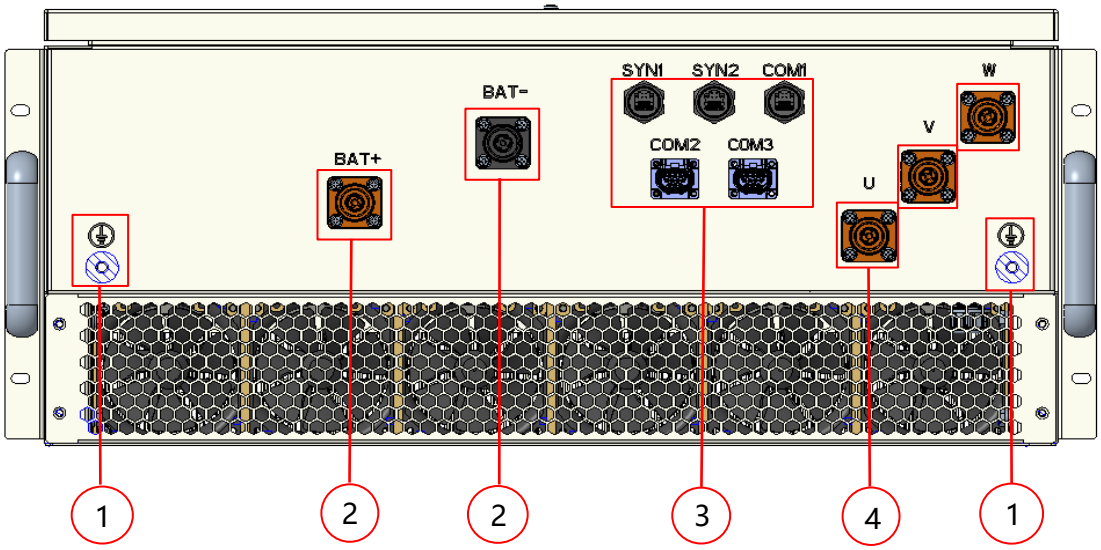


No.	Component	Description
1	Battery system	Releases and stores electric energy. The EMS communicates with the battery BMS via the CAN or 485 bus.
2	PCS	Responsible for energy conversion between the battery and the grid. Supports active and reactive power control and implements the EMS energy dispatch strategy.
3	EMS (energy management system)	Responsible for energy dispatch and monitoring of the entire system.

2.3 Circuit Block Diagram

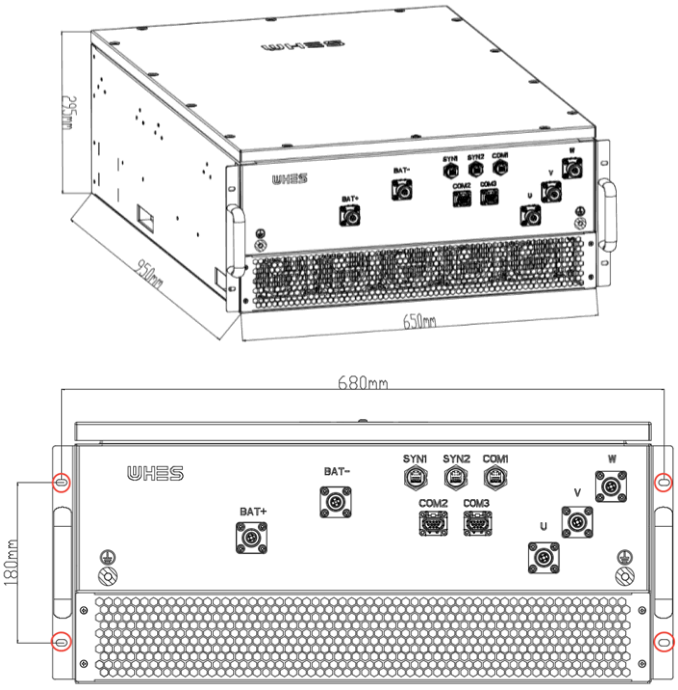


2.4 Components



No.	Name	Function
1	Enclosure grounding port	Connects the protective earth cable.
2	Battery connection port	Connects the battery power cable.
3	Communication port	External communication interface
4	AC connection port	Connects the AC cable.

2.5 Product Dimensions



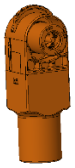
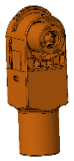
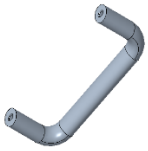
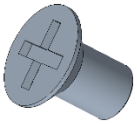
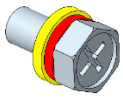
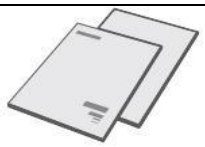
3 Unpacking and Storage

3.1 Unpacking and Inspection

The equipment has been fully tested and strictly inspected before delivery, but it may still be damaged during transportation. Perform a detailed inspection before signing for the product.

1. Check whether the outer packaging is damaged, such as deformation, holes, cracks, or other signs that may indicate damage to the equipment inside the packaging box. If any damage is found, do not open the packaging and contact your dealer.
2. Check whether the PCS model is correct. If it does not match, do not open the packaging and contact your dealer.
3. Check whether the types and quantities of the deliverables are correct and whether the appearance is damaged. If any damage is found, contact your dealer or the manufacturer.

3.2 Scope of Delivery

Component	Description	Component	Description
	Energy storage converter ×1		DC input plug (positive) ×1
	DC input plug (negative) ×1		AC output plug ×3
	Drawer-type handle ×2		Screw (M6×10) ×4
	Screw (M6×16) ×4		RJ45 communication terminal ×3
	12-pin COM communication terminal ×2		Product documentation ×1

3.3 Equipment Storage

If the PCS is not put into use immediately, store it as follows:

1. Make sure the outer packaging box is not removed and the desiccant inside the box is not

lost.

2. Make sure the storage environment is clean, with a suitable temperature and humidity range and no condensation.

3. Make sure the stacking layers, height, and orientation of the PCS comply with the label instructions on the packaging box.

4. Make sure the PCS will not tip over after stacking.

5. If the PCS has been stored for six months or longer, it must be inspected and confirmed by qualified personnel before it can be put into use again.

4 Mechanical Installation

4.1 Installation Requirements

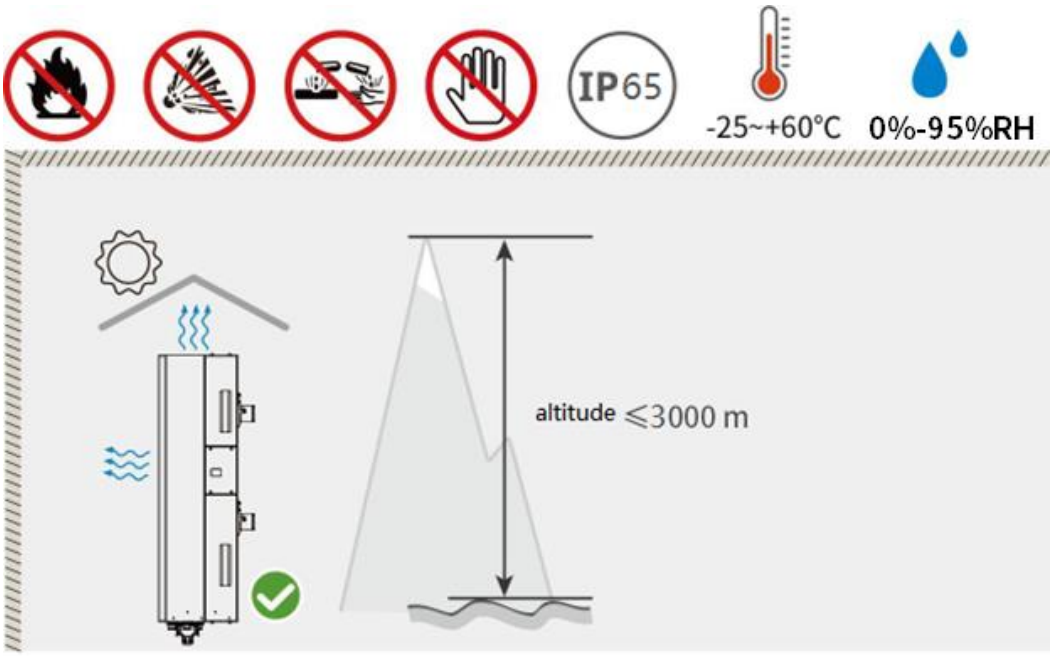
4.1.1 Installation Environment Requirements

1. Do not install the equipment in flammable, explosive, or corrosive environments.
2. Keep the equipment away from heat sources and open flames, such as fireworks, candles, heaters, or other heat-generating equipment. Exposure to heat may damage the equipment or cause a fire.
3. Install the equipment in an area free from liquids. Do not install it under locations prone to condensation, such as water pipes and air outlets, or under locations prone to water leakage, such as air conditioning vents, ventilation openings, and machine room cable exit windows, to prevent liquid from entering the equipment during maintenance and causing faults or short circuits.
4. Do not install the equipment in environments with dust, smoke, volatile gases, corrosive gases, radiation such as infrared rays, organic solvents, or excessive salt.
5. Do not install the equipment in environments with conductive metal dust or magnetically permeable dust.
6. Do not install the equipment in areas where microorganisms such as fungi and mold tend to grow.
7. The installation site must comply with local laws, regulations, and relevant standards.
8. Install the equipment out of the reach of children and avoid positions where it can be easily touched. The equipment surface may be hot during operation, which may cause burns.
9. The equipment generates noise during operation. Install it away from noise-sensitive areas, such as residential areas, schools, and hospitals, to prevent the noise from disturbing people nearby.
10. Keep the PCS away from direct sunlight, rain, snow, and similar environments. It is recommended to install the PCS in a sheltered location; set up a sunshade if necessary.
11. The installation space must meet the ventilation, heat dissipation, and operating space requirements of the equipment.
12. The protection rating of the equipment supports both indoor and outdoor installation. The ambient temperature and humidity at the installation site must be within the appropriate range.
13. Install the equipment at a height convenient for operation and maintenance, ensuring that the indicators and all labels are easy to view and the wiring terminals are easy to access.
14. Install the PCS at an altitude below the maximum operating altitude of 3000 m.

15. Keep the equipment away from strong magnetic fields to avoid electromagnetic interference. If there are radio stations or wireless communication equipment below 30 MHz near the installation site, install the equipment according to the following requirements:

Add multi-turn ferrite cores to the DC input cables or AC output cables of the PCS, or add low-pass EMI filters.

Keep the distance between the PCS and the wireless electromagnetic interference equipment greater than 30 m.

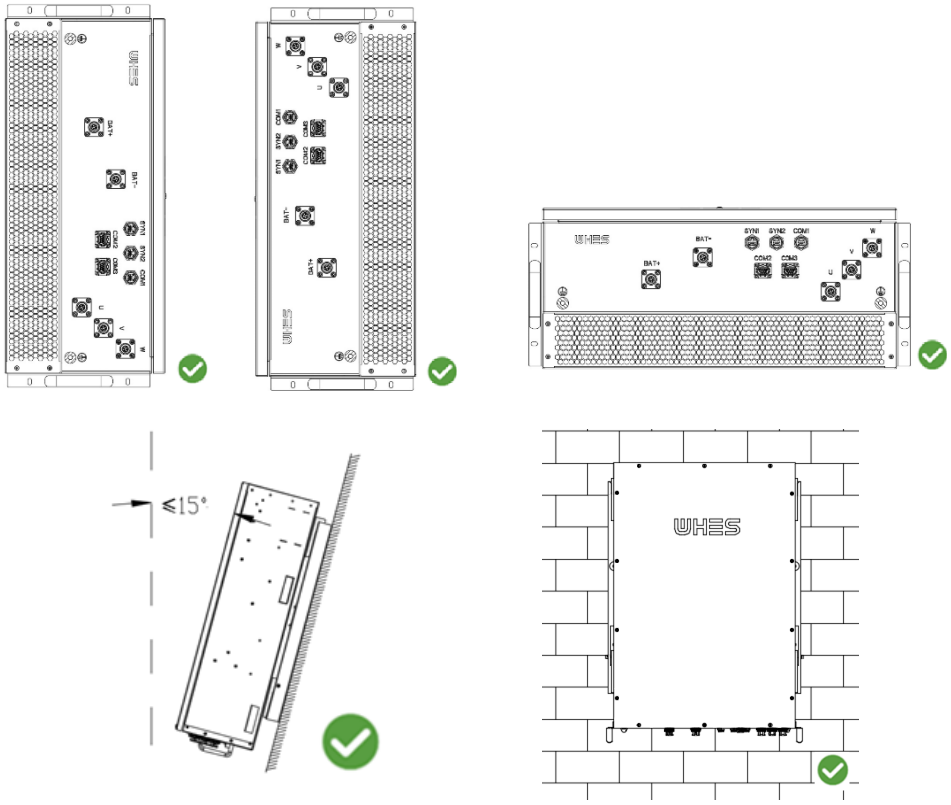


4.1.2 Installation Support Requirements

- The installation support must not be made of flammable materials and must be fire-resistant.
- Make sure the installation support is sturdy and reliable and can bear the weight of the PCS.

4.1.3 Installation Angle

- The PCS can be installed lying flat, standing on its side, or wall-mounted.



4.1.4 Installation Space Requirements

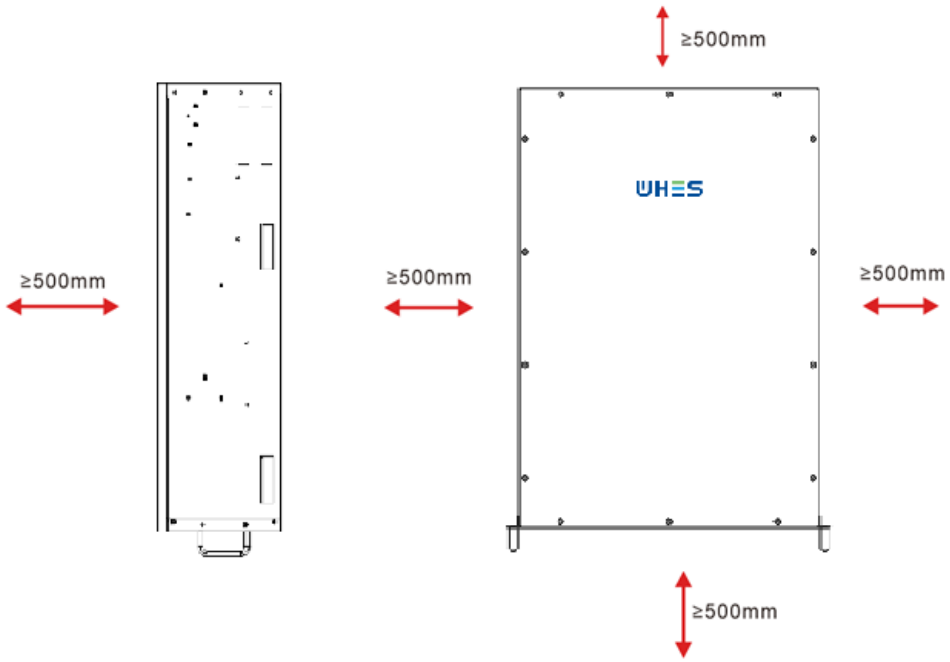
- Rack Installation

NOTE
When installing the product in an enclosed environment (such as inside a cabinet or chassis), ensure adequate ventilation and do not block the air inlets and outlets. If necessary, add cooling devices (such as cooling fans) to ensure sufficient airflow. Otherwise, the product may overheat due to poor ventilation.

For specific installation space requirements, please contact Weiheng Intelligent Technology Co., Ltd., which will determine them based on the system design.

- Wall-Mounted Installation

When wall mounting, reserve space on all sides around the equipment as shown in the figure below:



4.1.5 Installation Tools Requirements

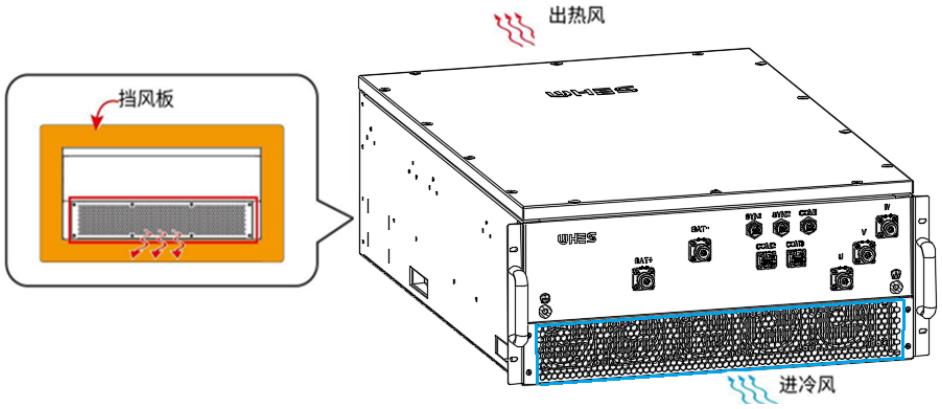
The following tools are recommended for installation. Other auxiliary tools may be used on site if necessary.

NOTE
• Before operating the equipment, carefully check that the tools to be used meet the requirements and register them. After the operation, collect all the tools as counted to prevent them from being left inside the equipment. All required tools must be fully prepared and inspected and certified by a professional organization. Tools with damage, tools that have failed inspection, or tools beyond their inspection validity period must not be used. Ensure the tools are sturdy and not overloaded.



4.1.6 Heat Dissipation Requirements

When the PCS is installed in a cabinet, install an air baffle at the air outlet to prevent the hot air from the PCS air outlet from recirculating into the cold air inlet, as shown in the figure:



4.2 Installing the PCS

4.2.1 Moving the PCS

⚠CAUTION

- During transport, transfer, installation, and other operations, comply with the laws, regulations, and relevant standards of the country and region where the equipment is located. Before installation, move the PCS to the installation site. Wear safety gloves to avoid injury. Keep the equipment balanced during handling to avoid dropping it.
- During transport, secure the PCS firmly, use appropriate packaging materials, avoid overloading, protect the goods from damage caused by jolting, and keep the handling passage clear.
- Use the correct tools and master the correct way to use them.
- To avoid personal injury or equipment damage during handling, note the following: assign personnel and tools according to the weight of the equipment, so that the equipment does not exceed the weight that can be carried by a person and injure personnel.

4.2.2 Installing the PCS

- Rack Installation

NOTE

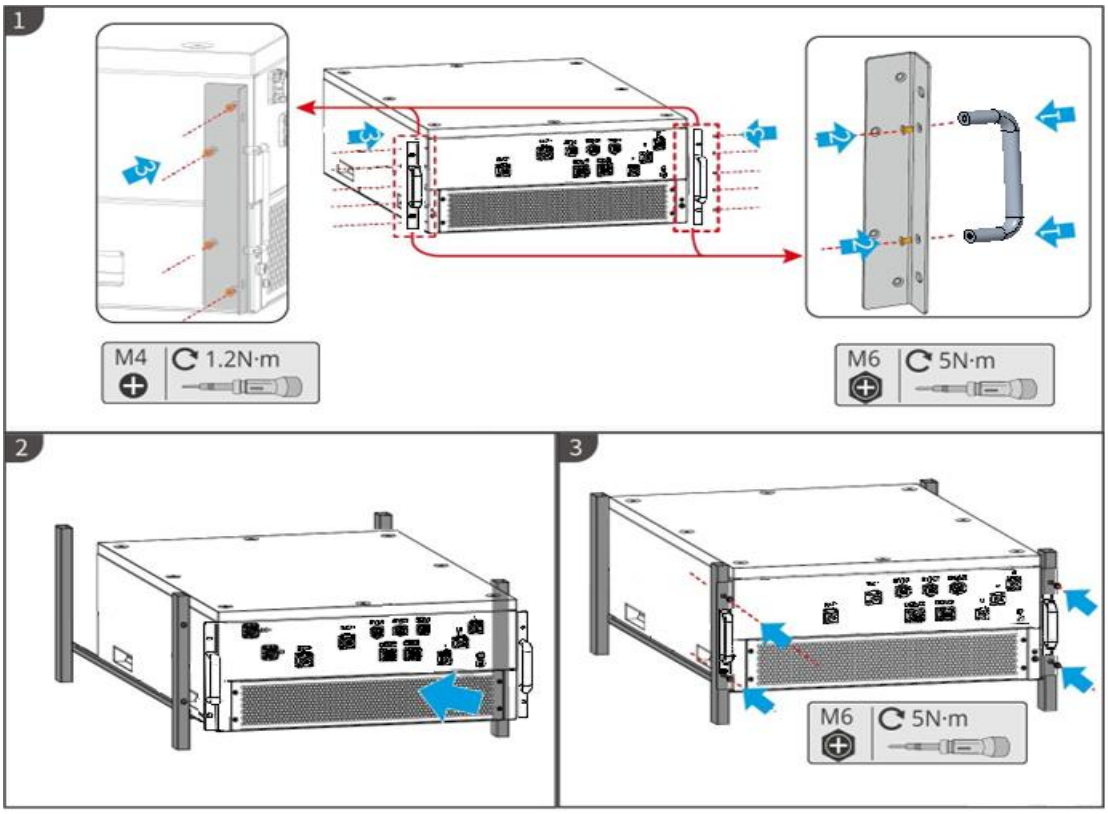
- The handles are only used for pushing the PCS in or pulling it out and must not be used to bear weight. Make sure the PCS is firmly installed to prevent it from falling and injuring personnel. It is strictly forbidden to drill holes on the equipment. Drilling holes may damage the sealing, electromagnetic shielding performance, internal components, and cables of the equipment. Metal chips generated by drilling may enter the equipment and cause short circuits on the circuit boards.

Installation Procedure

Step 1: Assemble the mounting ears and install them onto the PCS.

Step 2: Push the PCS onto the guide rails of the mounting support.

Step 3: Secure the PCS to the cabinet with screws.

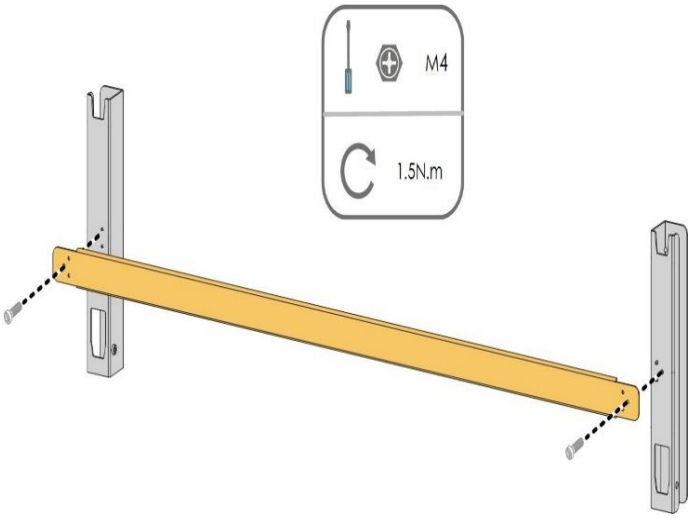


- **Wall-Mounted Installation**

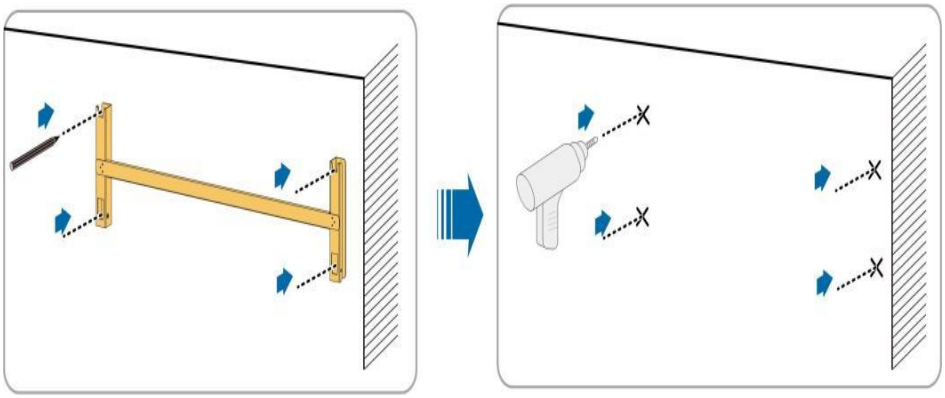
NOTE
● The handles are only used for pushing the PCS in or pulling it out and must not be used to bear weight. Make sure the PCS is firmly installed to prevent it from falling and injuring personnel. It is strictly forbidden to drill holes on the equipment. Drilling holes may damage the sealing, electromagnetic shielding performance, internal components, and cables of the equipment. Metal chips generated by drilling may enter the equipment and cause short circuits on the circuit boards.

Installation Procedure

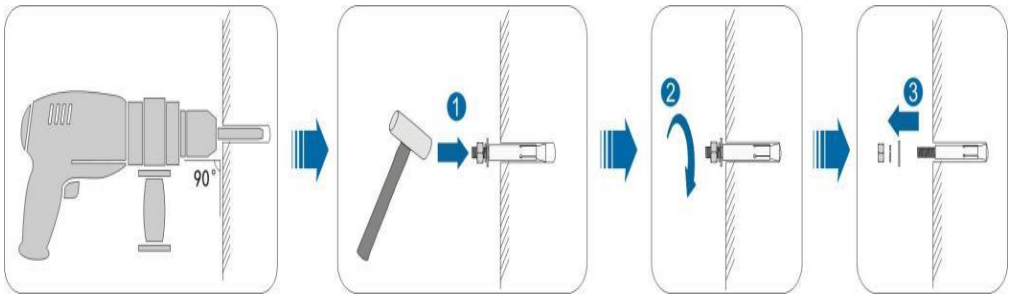
Step 1: Fasten the two mounting plate assemblies together with connecting rods.



Step 2: Place the assembled mounting plate at the installation point, use a spirit level to adjust the angle, and mark the drilling positions.



Step 3: Use an impact drill to drill holes, clean the holes, insert the expansion bolts into the holes, and tap them in with a rubber mallet. Use a wrench to tighten the nuts to secure the bolt tails. Remove the nuts, spring washers, and flat washers and set them aside for later use.



Step 4: Secure the mounting plate with the expansion bolts.

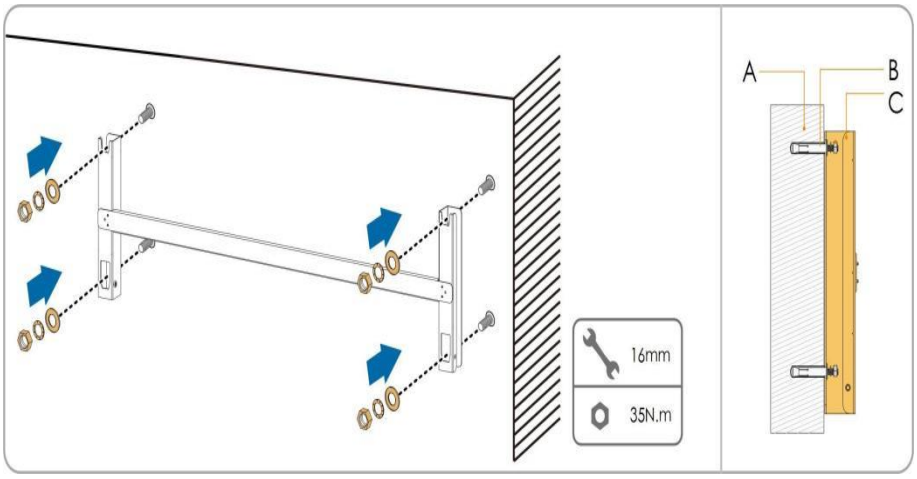
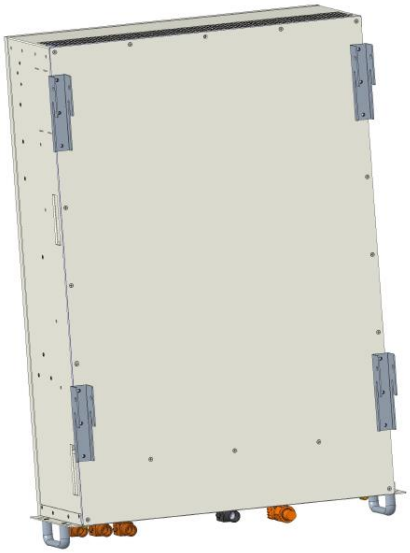


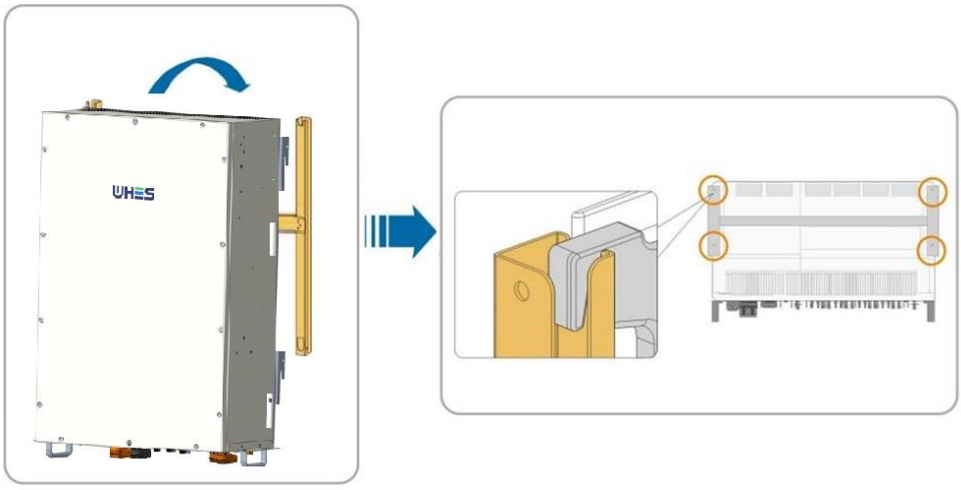
Table 4-2 Tightening Sequence

No.	Name	Description
A	Wall	-
B	Expansion Bolt	The tightening sequence is nut, spring washer, flat washer.
C	Mounting Plate	-

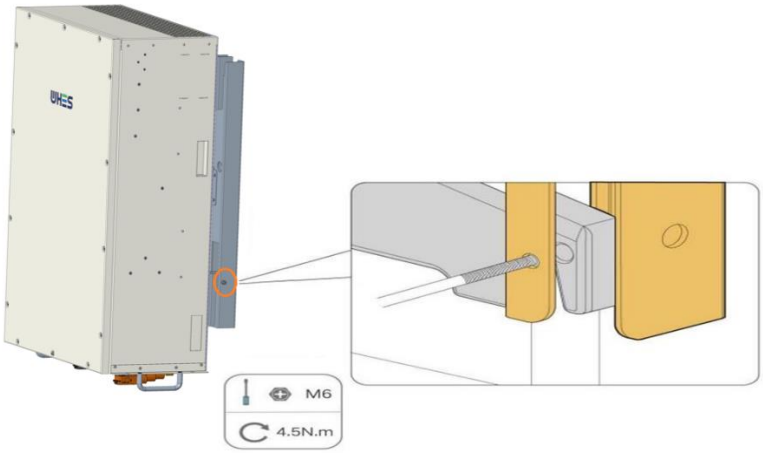
Step 5: Secure the four mounting ears to the PCS chassis with M6 screws.



Step 6: Lift the PCS onto the mounting plate and make sure the mounting ears fit well into the slots of the mounting plate.



Step 7: Secure the PCS with screws.



5 Electrical Connection

5.1 Preparation Before Installation

5.1.1 Safety Check

NOTE
• Only professional electrical installation personnel are allowed to install the equipment. Follow the user manual strictly during installation. Before connecting the electrical equipment, make sure to disconnect the DC-side and AC-side circuit breakers of the PCS (if any) to ensure that the electrical connection is performed under safe conditions. Live parts must be handled properly and isolated with insulating materials to prevent personal injury. Cable selection, erection, and routing must comply with local laws, regulations, and codes. During cable routing, coiling and twisting of cables are strictly forbidden. If a cable is found to be too short, replace the cable with a new one; making joints or solder points in the middle of a cable is strictly forbidden. All cables must be firmly connected, well insulated, and of appropriate specifications.

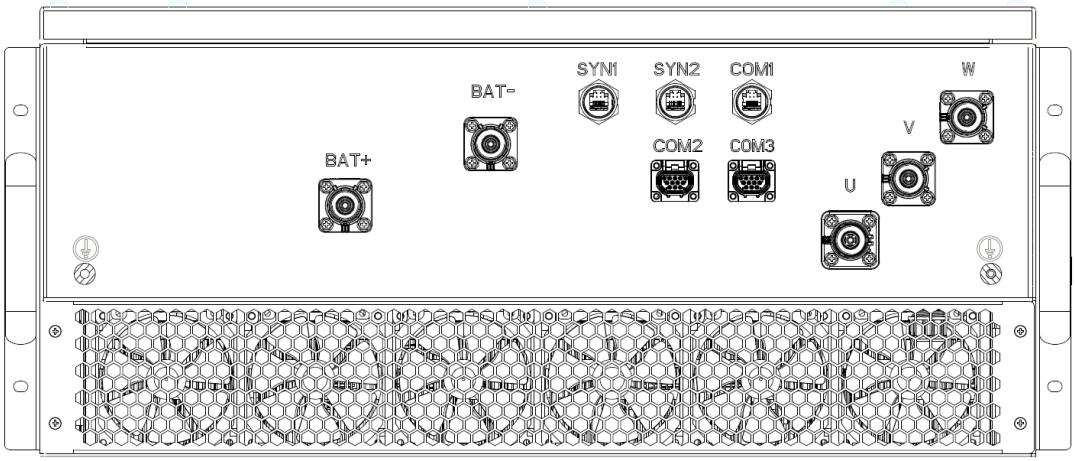
5.1.2 Tool Preparation

See Chapter 4 for the tools.

5.1.3 Interfaces to Be Connected

NOTE
• Make sure the phase sequence of the AC-side wiring complies with the phase sequence requirements of the on-site power grid, and confirm that the polarity of the DC-side wiring complies with the polarity requirements of the battery.

The plug interfaces of the complete PCS unit are shown in the figure below:



No.	Port Name	Port Label	Figure	Description
1	DC-Side Port	BAT+		DC-Side Positive Connection Port
		BAT-		DC-Side Negative Connection Port
2	AC-Side Port	U		AC-Side Phase U Connection Port
		V		AC-Side Phase V Connection Port
		W		AC-Side Phase W Connection Port
3	Parallel Port	SYN1		Multi-Unit Parallel Connection Port
		SYN2		
		COM1		Ethernet communication between EMS and PCS
4	EMS Port	COM2		485 communication between EMS and PCS; 485 communication between HMI and PCS
		COM3		CAN communication between EMS and PCS

5.2 Cable Selection

NOTE
● While the PCS is running, do not plug or unplug the DC-side and AC-side power cables; improper operation may cause electric shock. Confirm the U, V, W, BAT+, and BAT- cables and label them properly. Confirm the cable lengths, taking the bending radius into account.

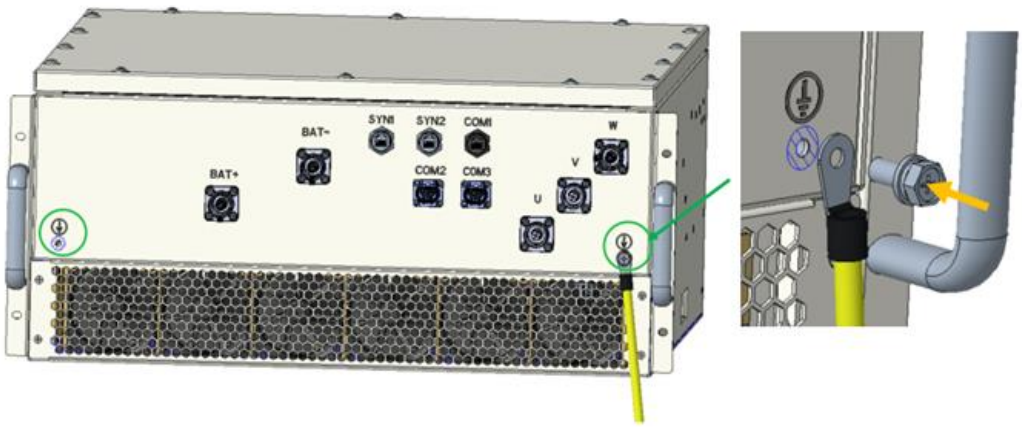
No.	Cable Name	Cable Specification	Figure
1	DC-Side Cable	1500 Vdc outdoor copper-core 70 mm² cable	
2	AC-Side Cable	Outdoor copper-core 70 mm² cable	
3	Grounding Cable	Outdoor copper-core 35 mm² cable	
4	EMS Communication Cable	Shielded twisted pair, 2*20 AWG	
5	Parallel Cable	Cat6 double-shielded network cable	

5.3 Grounding Cable Assembly Guide

NOTE

- The equipment must be permanently connected to the protective earth. Before operating the equipment, check its electrical connections to make sure the equipment is reliably grounded. Do not operate the PCS without the grounding cable installed. Do not damage the grounding conductor. To improve the corrosion resistance of the grounding terminal, it is recommended to apply silicone or paint to the outside of the grounding terminal after the grounding cable is installed.

1. Make sure the PCS is powered off.
2. Use a tool to fasten the OT terminal to the PCS panel, as shown in the figure.



The enclosure is provided with an M8 threaded grounding stud. It is recommended to use a

35 mm^2 yellow-green wire crimped with an OT terminal and an M8*12 screw; the recommended tightening torque for the M8 screw is 4.8 N·m.

5.4 Power Plug Assembly Guide

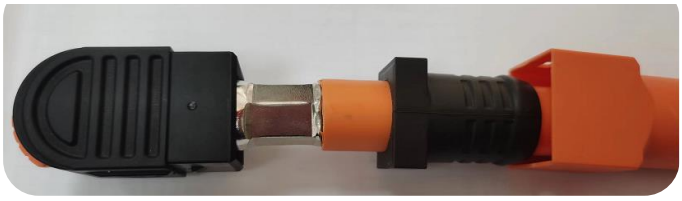
NOTE
• The BAT- plug is black, and the remaining 4 plugs (BAT+, U, V, W) are orange.

5.4.1 Power Cable Connection Procedure

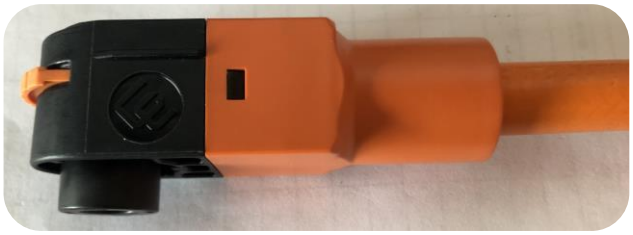
Installation Step 1: Strip approximately 14 mm to 16 mm of insulation from all cables.



Installation Step 2: Use the crimping tool to bundle the cable ends into the terminals.



Installation Step 3: Thread the cable through the backshell and the sealing insert in sequence, fit the sealing insert into the backshell, and keep its four corners flush with the backshell. Snap the backshell closed; two clicks indicate that the backshell is installed in place.



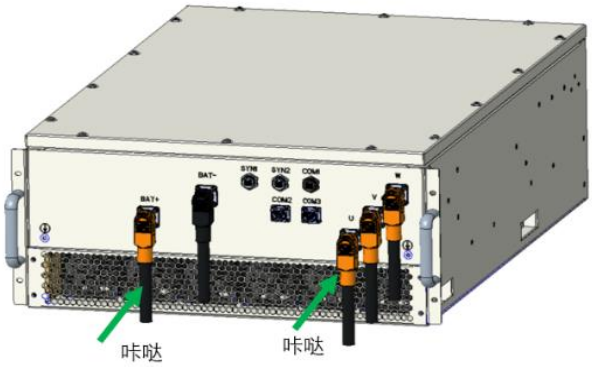
5.4.2 Installing the Power Connector

The PCS mainly uses the bottom-in, bottom-out wiring method.

1. Make sure the PCS is powered off.

2. Confirm that the installation interfaces are U, V, W, BAT+, and BAT-, and label the cables properly.

3. Connect the plug with cables to the PCS, as shown in the figure. A click indicates that the connection is successful.

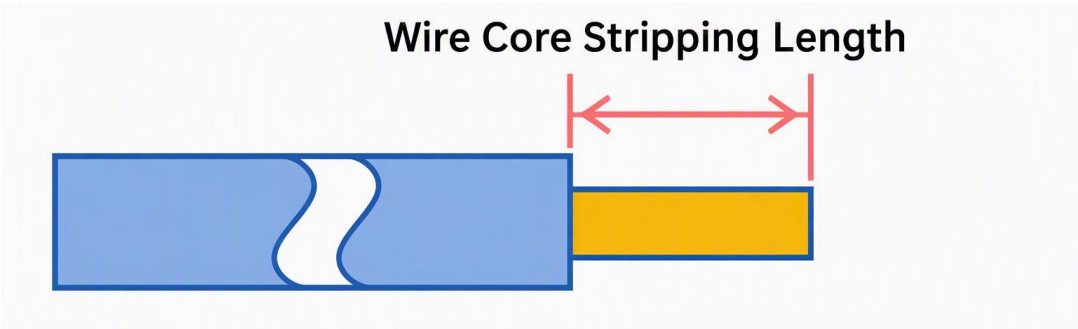


5.5 Communication Plug Assembly Guide

Front-Panel Terminal Model	Front-Panel Pin No.	Function	Description
COM2	1	EMS_485A	Connection to EMS 485A
	2	EMS_485B	Connection to EMS 485B
	3	DEBUG_485A	PCS Commissioning Port
	4	DEBUG _485B	PCS Commissioning Port
COM3	1	EMS_CANH	Connection to EMS CANH
	2	EMS_CANL	Connection to EMS CANL

5.5.1 Communication Cable Connection Procedure

Installation Step 1: Strip 4-6 mm of insulation from the conductors.



Installation Step 2: Insert the cable into the terminal and crimp it.



Installation Step 3: Route the wire harness through the corresponding holes of the sealing grommet, and push the sealing grommet until it is flush against the inner surface of the housing.



Installation Step 4: Connect the plug and the socket. Pre-insert them into position, and apply appropriate force to snap the latch between the plug and the socket into place. A "click" sound indicates that the latch is properly engaged.

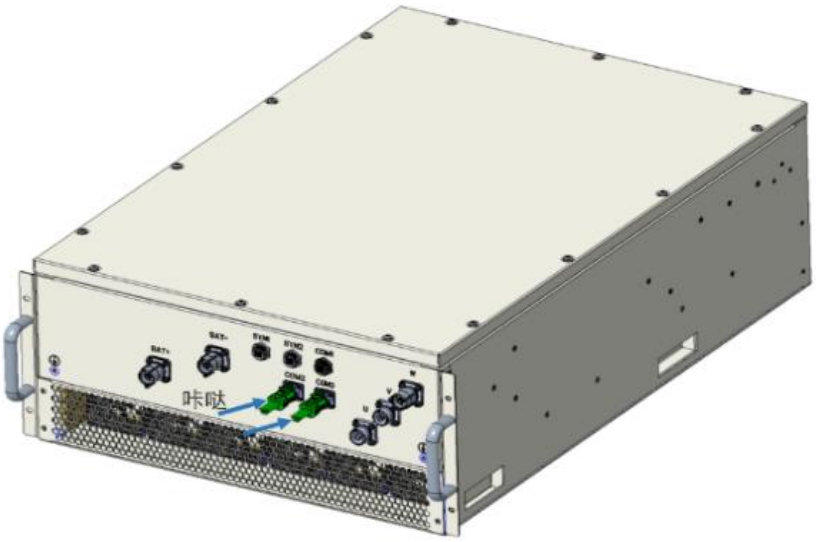


5.5.2 Installing the Communication Connector

1. Make sure the PCS is powered off.

2. Confirm that the communication interfaces to be connected are COM2 and COM3. Label the 485 communication cables and the CAN communication cables between the EMS and the PCS separately (see the table above), and label the HMI 485 communication cable (see the table above).

3. As shown in the figure, if a click is heard, it indicates that the PCS plug and socket are successfully connected.



6 Commissioning

6.1 Commissioning Tools List

No.	Name	Specification	Quantity	Remarks
1	HMI	DC80480KM070	1	Can control one complete PCS unit and view the operating data of the unit in real time.
2	HMI Commissioning Cable	-	1	Connects the HMI to the communication port of the PCS.

Note: The above are the materials required for commissioning a single PCS. To obtain the commissioning tools, or if multiple PCS units need to be commissioned in parallel, please contact the after-sales service personnel.

6.2 Safety Precautions

⚠DANGER

- Read and follow the safety precautions in this manual! Only qualified professional technicians are allowed to work on the equipment. This product is commonly used in industrial high-power applications. During operation, the product contains live parts. Therefore, improper removal of required covers, improper use, incorrect operation, or inadequate maintenance may cause serious personal injury, death, or property damage. The user is responsible for commissioning the unit and other components in compliance with the technical regulations recognized by the country and other local regulations in the place of use. Make sure the equipment is properly grounded. Cover or isolate adjacent live parts. If the protective device on a current branch trips, the fault current may already have been interrupted. To reduce the risk of fire and electric shock, inspect the conductive parts and other components of the product and replace any damaged parts. After the protective device trips, locate and eliminate the cause of the disconnection.

6.3 HMI Connection Instructions

The interface definitions for the connection between the HMI and the PCS are as follows:

HMI		PCS		
Pin No.	Name	Port No.	Pin No.	Name

1	GND	COM3	4	GND
6	VCC		3	PWR
2	RS485-A	COM2	1	RS485-A
3	RS485-B		2	RS485-B

For the location of the interfaces on the PCS panel, see Section "5.1.3 Interfaces to Be Connected".

6.4 Pre-Power-On Checks

No.	Check Item
1	The PCS is installed securely. The installation position is convenient for operation and maintenance, the installation space allows adequate ventilation and heat dissipation, and the installation environment is clean and tidy.
2	The protective ground wire, DC cables, AC cables, communication cables, etc. are connected correctly and securely.
3	The cables are tied in compliance with the routing requirements, distributed reasonably, and free of damage.
4	The voltage and frequency at the grid connection point of the PCS meet the grid connection requirements. See "Technical Data" in the Appendix.
5	The DC input voltage must be within the DC voltage range of the PCS. See "Technical Data" in the Appendix.

6.5 Powering On the Device

NOTE
The PCS must be powered on strictly following the steps below; otherwise, the equipment may be damaged or fail to work properly. Step 1: Connect the HMI to the corresponding port on the PCS panel. Step 2: Close the AC switch between the AC side of the PCS and the grid. Step 3: Close the DC switch of the battery system on the DC side of the PCS.

6.6 Commissioning

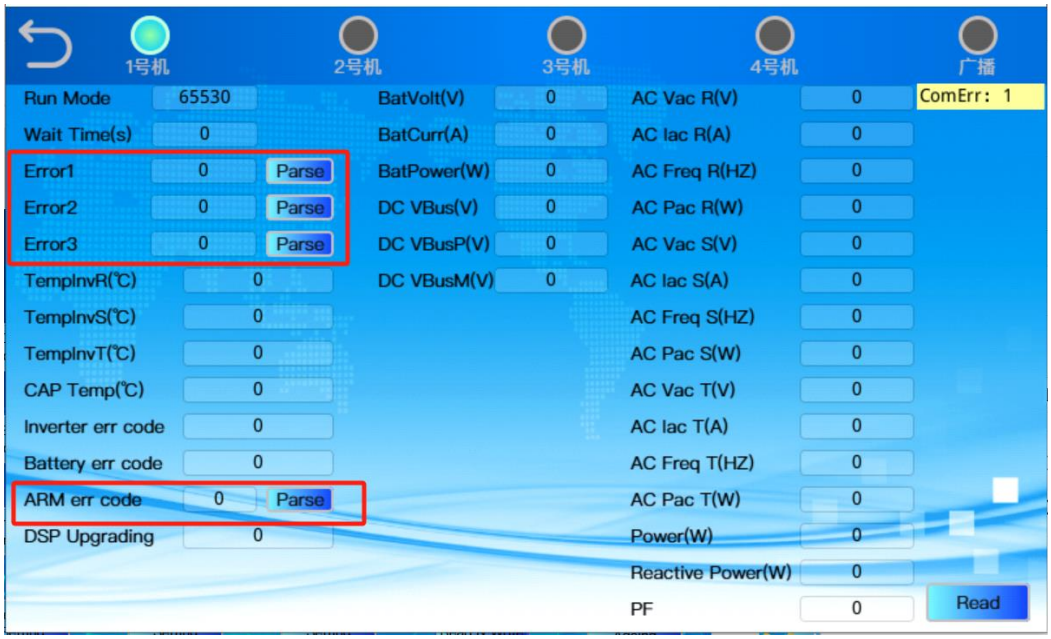
Step 1: Communication Connection

When the yellow "ComErr" indicator on the HMI home screen disappears, it indicates that communication between the HMI and the equipment is normal.



Step 2: Check the equipment status

On the home screen, click the "Inverter information" button to enter the real-time sampling data screen, where you can view the real-time sampling data and fault information of the equipment.



After confirming that all fault codes of the equipment are 0, you can start the equipment.

If a fault code is not 0, click the "Parse" button to view the corresponding fault name.

For details of the fault names and solutions, see Chapter 7 Troubleshooting.

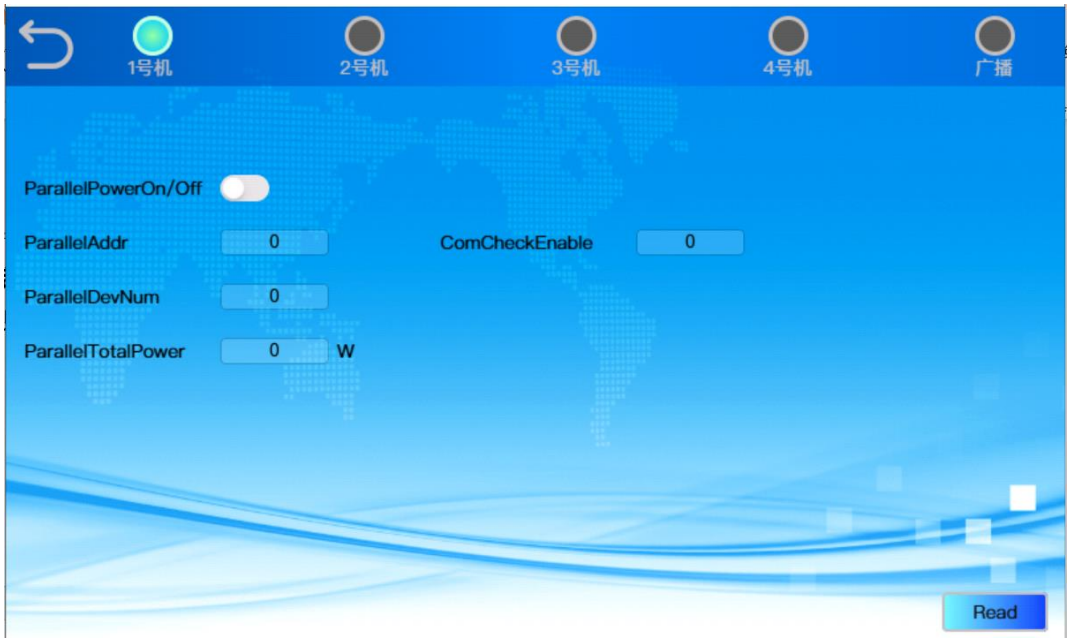
Step 3: Start the equipment

Click the back button in the upper left corner to return to the home screen, then enter the

"EMS ARM Setting" screen for machine operation control, and click the "ParallelPowerOn/Off" button to start the machine.

Step 4: Set the operating power

Click the "ParallelTotalPower" input box to set the operating power of the equipment (a positive value means discharging, and a negative value means charging).



Step 5:

Click the back button in the upper left corner to return to the home screen, then enter the "Inverter information" screen again to view the operating status and real-time power value of the machine.

6.7 Shutdown

On the HMI, click the back button in the upper left corner to return to the home screen, then enter the "EMS ARM Setting" screen and click the "ParallelPowerOn/Off" button to stop the machine.

7 Troubleshooting

Please troubleshoot faults according to the following methods. If the troubleshooting methods do not help, please contact the after-sales service center. When contacting the after-sales service center, please collect the following information to facilitate a quick resolution.

1. Software version, equipment installation time, fault occurrence time, fault occurrence frequency, etc.

2. Equipment installation environment, such as weather conditions, and system information, such as the serial number and installation environment. It is recommended to provide photos, videos, and other files to assist in problem analysis.

3. Grid conditions.

No.	Fault Name	Possible Cause	Solution
1	Battery Overvoltage	The battery voltage is too high at power-on.	1. Check whether the battery voltage is too high. If the battery voltage is within the allowable range but the fault persists, please contact your dealer or the after-sales service center. 2.
2	Battery Undervoltage	The battery voltage is too low at power-on.	1. Check whether the battery voltage is too low. If the battery voltage is within the allowable range but the fault persists, please contact your dealer or the after-sales service center. 2.
3	DC Full-Bus Software Overvoltage	1. The battery voltage is too high; the bus voltage sampling is abnormal. 2.	1. Check whether the battery voltage is within the normal range. Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center. 2.
4	DC Half-Bus Software Overvoltage	1. The battery voltage is too high; the half-bus voltage sampling is abnormal. 2.	1. Check whether the battery voltage is within the normal range. Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center. 2.

5	DC Bus Voltage Unbalance	1. The half-bus voltage is too high; the positive and negative half-bus voltages are unbalanced. 2.	1. Check whether the battery voltage is within the normal range. Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center. 2.
6	FLASH Fault	Abnormal memory chip.	Please contact your dealer or the after-sales service center.
7	EEPROM Read/Write Fault	The EEPROM driver is abnormal or the EEPROM is damaged.	Please contact your dealer or the after-sales service center.
8	ARM Communication Fault	1. Temporary abnormality caused by environmental factors; abnormality inside the chip. 2.	Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center.
9	Insulation Monitoring Fault	The insulation resistance to ground detected by the machine is lower than the normal value.	1. Check whether the main circuit is shorted to ground and whether the cable insulation is damaged. If none of the above causes is found and the fault persists, please contact your dealer or the after-sales service center. 2. 3.
10	DC Pre-Charge Relay Fault	1. Abnormality inside the relay; abnormal control circuit. 2.	Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center.
11	DC Main Relay Fault	1. Abnormality inside the relay; abnormal control circuit. 2.	Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center.
12	AC Relay Fault	1. Abnormality inside the relay; abnormal control circuit. 2.	Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center.
13	IGBT Over-Temperature Fault	1. The ambient temperature is too high; the internal fan is not working properly; the current is too high. 2. 3.	1. Check whether the air duct is blocked, whether the fan is operating normally, and whether the current is within the normal range. If none of the above causes is found and the fault persists, please contact your dealer or the after-sales service center. 2.

			3. 4.
14	Open-Loop Inverter Voltage Fault	Abnormal drive.	Please contact your dealer or the after-sales service center.
15	CPLD Communication Fault	1. Temporary abnormality caused by environmental factors; abnormality inside the chip. 2.	Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center.
16	Battery Hardware Overcurrent Fault	Impact load or short circuit on the DC side.	Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center.
17	Battery Software Overcurrent Fault	Impact load or short circuit on the DC side.	Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center.
18	AC Hardware Overcurrent Fault	Impact load or short circuit on the AC side.	Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center.
19	AC Software Overcurrent Fault	Impact load or short circuit on the AC side.	Power off the PCS following the normal shutdown procedure, wait 15 minutes, and then power it on again. If the fault persists, please contact your dealer or the after-sales service center.
20	Grid Phase Error	Abnormal grid wiring.	1. Check whether the phase sequence of the three-phase AC cables is correct. If none of the above causes is found and the fault persists, please contact your dealer or the after-sales service center. 2.
21	Grid Overfrequency	The grid frequency exceeds the overfrequency threshold.	1. If this occurs occasionally, it may be due to a short-term grid abnormality; the PCS will resume normal operation after detecting that the grid is normal, and no manual intervention is required. If it occurs frequently, check whether the grid frequency is within the allowed range: if the grid frequency is outside the allowed range, please contact the local power utility; if the grid frequency is within the allowed

			range, modify the PCS grid frequency protection threshold or disable the grid frequency protection function after obtaining approval from the local power utility. 2. ● ●
22	Grid Underfrequency	The grid frequency drops below the underfrequency threshold.	1. If this occurs occasionally, it may be due to a short-term grid abnormality; the PCS will resume normal operation after detecting that the grid is normal, and no manual intervention is required. If it occurs frequently, check whether the grid frequency is within the allowed range: if the grid frequency is outside the allowed range, please contact the local power utility; if the grid frequency is within the allowed range, modify the PCS grid frequency protection threshold or disable the grid frequency protection function after obtaining approval from the local power utility. 2. ● ●
23	Grid Overvoltage	The grid voltage exceeds the AC overvoltage threshold.	1. If this occurs occasionally, it may be due to a short-term grid abnormality; the PCS will resume normal operation after detecting that the grid is normal, and no manual intervention is required. If it occurs frequently, check whether the grid voltage is within the allowed range: if the grid voltage is outside the allowed range, please contact the local power utility; if the grid voltage is within the allowed range, modify the PCS grid voltage protection threshold or disable the grid voltage protection function after obtaining approval from the local power utility. 2. ● ●

24	Grid Undervoltage	The grid voltage drops below the AC undervoltage threshold.	1. If this occurs occasionally, it may be due to a short-term grid abnormality; the PCS will resume normal operation after detecting that the grid is normal, and no manual intervention is required. If it occurs frequently, check whether the grid voltage is within the allowed range: if the grid voltage is outside the allowed range, please contact the local power utility; if the grid voltage is within the allowed range, modify the PCS grid voltage protection threshold or disable the grid voltage protection function after obtaining approval from the local power utility. 2. ● ●
25	Grid Disconnection	1. Grid power outage, or the AC line or AC switch is open. 2.	1. Check whether the grid voltage is normal; check whether the switch is closed. If the fault persists after confirming that none of the above causes apply, please contact your dealer or the after-sales service center. 2. 3.

8 System Maintenance

DANGER

When performing operation or maintenance on the PCS, power it off first. Operating the equipment while it is energized may damage the PCS or cause electric shock.

NOTE

- If a cable is damaged, it must be replaced by qualified personnel to avoid risks. Do not clean the electrical components inside or outside the equipment with water, alcohol, oil, or other solvents.
-

Maintenance Item	Maintenance Method	Maintenance Interval
Heat sink air inlet/outlet dust removal	Check the heat sink and the air inlet/outlet for foreign objects and dust. If necessary, power off the equipment before cleaning.	Once every six months
Fan	Check the fan for abnormal noise; check the blades for cracks; check for abnormal locked rotor or derating protection. If any problem is found, please contact the after-sales service personnel of Weiheng Intelligent Technology Co., Ltd. promptly for handling.	Once every six months
Cable connections	Check whether the AC and DC cables are securely connected and free of damage; check whether the cable connectors are tightened; check whether the grounding cable is securely connected.	Once every six months

9 Appendix

9.1 Circuit Breaker Selection

The converter has no internal fuses or circuit breakers. When using it, a disconnect switch and fuses must be provided on the DC side, and a circuit breaker on the AC side. The recommended information on the DC fuse, DC disconnect switch, and AC circuit breaker is as follows:

Name	Recommended Model	Quantity (pcs)
DC Disconnect Switch	1500VDC 250A 10kA/50ms	1
DC Fuse	1500VDC350A DC250kA/4ms t270000A2s	2
AC Circuit Breaker	690VAC 400A IcU20kA	1

9.2 Glossary

Name	English Name	Abbreviation	Definition
Energy Storage Converter	PCS(Power Conversion System)	PCS	A system connected between the battery bank and the grid that stores grid energy in the battery bank or feeds energy from the battery bank back to the grid.
Battery Management System	Battery Management System	BMS	A system that monitors the battery status (voltage, current, temperature, state of charge, etc.) and provides communication interfaces and protection for the battery.
Energy Management System	Energy Management System	EMS	A computer application system based on computer, network, and communication technologies that collects, processes, monitors, and dispatches information from devices such as the battery management system, energy storage converter, and power distribution, and realizes active/reactive power regulation of the energy storage system.