Power Conversion System
Power conversion system

HG-PCS (125K/ 150K) Series

User Manual

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Foreword

summary

Thank you for choosing Higre 's Power Conversion System (hereinafter referred to as PCS)!

This document describes the PCS, including its appearance, features, operating principle, installation, electrical connections, operation, maintenance, and storage.

Please save this manual after reading it for future reference.

The images in this manual are for reference only. Please refer to the actual product for details.

Compliance standards: UL 1741, IEEE 1547

Symbol Conventions

This manual references safety symbols used to remind users to follow safety procedures. It covers matters related to installation, operation, and maintenance. The meanings of the safety symbols are as follows.

Symbolic description

Symbol	Description
	Alerts you to a high risk hazard that will, if not avoided, result in serious injury or death.

Symbol	Description
	Alerts you to a medium low risk hazard that could, if not avoided, result in moderate or minor injury.
	Alerts you to a low risk hazard that could, if not avoided, result in minor injury.
	Anti-static prompting.
	Be care electric shock prompting.
	Provides a tip that may help you solve a problem or save time.
	Provides additional information to emphasize or supplement important points in the main text.

1. Safety Instructions

This chapter primarily introduces safety precautions. Before performing any operations on the equipment, carefully read the user manual, follow the operating and installation instructions, and pay attention to all hazards, warnings, and safety information.

1.1 Security Notice

This section primarily introduces safety precautions during operation and maintenance. Please refer to the relevant safety instructions for details.



Before proceeding, please carefully read the announcements and operating instructions in this section to avoid any accidents.

The warnings in the user manual, such as "Danger," "Warning," and "Caution," do not cover all aspects of the operation. Safety bulletins are only supplementary to safety notices provided during operation.

Any equipment damage caused by violation of general safety operating requirements or design, manufacturing and use safety standards is not covered by the warranty .

1.1.1 Usage Notice



Do not touch the terminals or wires connected to the power grid, as this could result in fatal danger!



There are no operating parts inside the device. Do not attempt to open the casing yourself, as this may damage the device and could result in electric shock. Damage caused by improper operation is not covered under warranty.



Even after disconnecting the PCS's inputs and outputs, residual energy in the energy storage capacitors may still exist, potentially causing electric shock. Do not perform maintenance until all power is disconnected.

Turn off for 20 minutes.



Do not insert your fingers or tools into the rotating fan to avoid personal injury or equipment damage.



The surface temperature of the PCS may reach 75°C. Do not touch it during operation. Avoid burning the surface.



In case of fire, please use a dry powder fire extinguisher. Using a liquid fire extinguisher may result in... electric shock.



If safety requirements testing of the PCS is required, please contact the manufacturer; otherwise, the equipment may be damaged.



No liquid or other object is allowed to enter the PCS, otherwise it may damage the equipment.

1.1.2 Energy Storage Battery Protection

There is a dangerously high voltage between the positive and negative terminals of the energy storage battery! Accidental contact could result in electric shock or personal injury!



When maintaining the equipment, always ensure that the connection between the PCS and the energy storage battery is completely disconnected, and place a warning mark at the disconnection point to prevent accidental reconnection.

1.1.3 Electrostatic Discharge Protection



To prevent static electricity from damaging sensitive components (such as circuit boards), please wear an anti-static wrist strap before touching sensitive components. The other end...

The foundation is solid.

1.1.4 Grounding Requirements



High risk of leakage! The PCS must be grounded before wiring. The grounding terminal must be grounded, otherwise there is a risk of electric shock when touching the PCS.

During installation, the PCS must be grounded first. During removal, the grounding wire must be disconnected first. It was finally removed.

Do not damage the grounding conductor.

PCS must be permanently connected to protective ground.

Before operation, check the electrical connections to ensure that the PCS is reliably grounded.

1.1.5 Moisture protection



Moisture intrusion may damage the equipment!

Please check the following items to ensure that PCS is working properly.

Do not open the PCS cover when the air humidity exceeds 95%.

Do not open the PCS cover for maintenance or repair in humid weather.

1.1.6 Warning Flag Settings

To prevent accidents caused by unauthorized personnel approaching the PCS or performing improper operations, please follow these requirements when installing, maintaining, or repairing the PCS.

Place warning signs at the location of the switch to prevent accidental shutdown.

Warning signs or safety warning tapes should be set up in the work area to avoid personal injury or equipment damage.

1.1.7 Electrical Connections

Electrical connections must be made according to the instructions and circuit diagram. Refer to the schematic diagram in the user manual.



Battery configuration, grid level, grid frequency, etc., must meet technical requirements. (PCS)

Grid connection requires permission from the local power supplier and proper procedures. Operation should be performed by qualified personnel. All electrical connections must comply with the electrical standards of the country or region where the project is located.

1.1.8 Live Line Measurement



This equipment contains high voltage. Accidental contact could result in electric shock. Therefore, protective measures must be taken when performing measurements while it is in operation (e.g., wearing protective gear , insulated gloves, etc.).

The measuring device must meet the following requirements:

The measuring range and operating requirements of the measuring equipment must meet the on-site requirements;

The connection of the measuring device should be correct and conform to the standard to avoid generating electric arcs.

1.2 Operator Requirements



The operation and wiring of the PCS should be performed by qualified professional technicians. This means ensuring that electrical connections comply with relevant standards.

Professional and technical personnel must meet the following requirements:

Receive rigorous training, understand all safety notices, and master the correct operating procedures.

Completely familiar with the structure and working principle of the entire energy storage system.

Be familiar with the relevant standards of the local country and region.

1.3 Maintenance Notice



After the AC and DC connections of the PCS are disconnected, at least 20 minutes must be waited before maintenance can be performed.

After the PCS stops operating due to power failure, please pay attention to the following matters during maintenance.

Ensure that PCS does not reconnect unexpectedly.

Use a multimeter to confirm that the internal PCS is not powered.

Make the necessary grounding connection.

Cover potentially electrified areas with insulating material.

Keep escape routes clear during maintenance.

1.4 Other



All operations of PCS must comply with the relevant standards of the country or region where the project is located.



Maintenance is strictly prohibited after the PCS is powered on.

At least two people are required to be present during maintenance.

Maintenance can be performed after the PCS is powered off and fully discharged.

In addition, the following safety or emergency measures should be taken based on the actual situation.

Operators should take appropriate safety precautions as needed, such as wearing protective equipment, including earplugs and heat-resistant shoes.

PCS (Personal Communication Systems) are typically installed far from city centers, so necessary preparations are required. Emergency rescue facilities are also needed for emergency situations.

Take all necessary auxiliary measures to ensure the safety of personnel and equipment.

2 Overview

This chapter mainly introduces the appearance, structure, working principle, and communication methods of PCS, etc.

2.1 Product Introduction

The HG-PCS series power conversion system independently developed by Higre Company can be used in energy storage. The system's basic characteristics are bidirectional (rectification and inversion) and a series of special performance features. It can be used both grid-connected and off-grid. Energy storage in a smart grid can effectively regulate power resources, balance the differences in electricity consumption between day and night and between seasons, regulate power surplus and shortage, and ensure grid security. It is an important prerequisite for the application of renewable energy and an effective means of achieving intelligent management. The power conversion system (PCS) is a necessary component for realizing a smart grid. As shown in Figure 2-1, an energy storage system consists of energy storage batteries, a power conversion system (PCS), a transformer, a power grid, and loads.

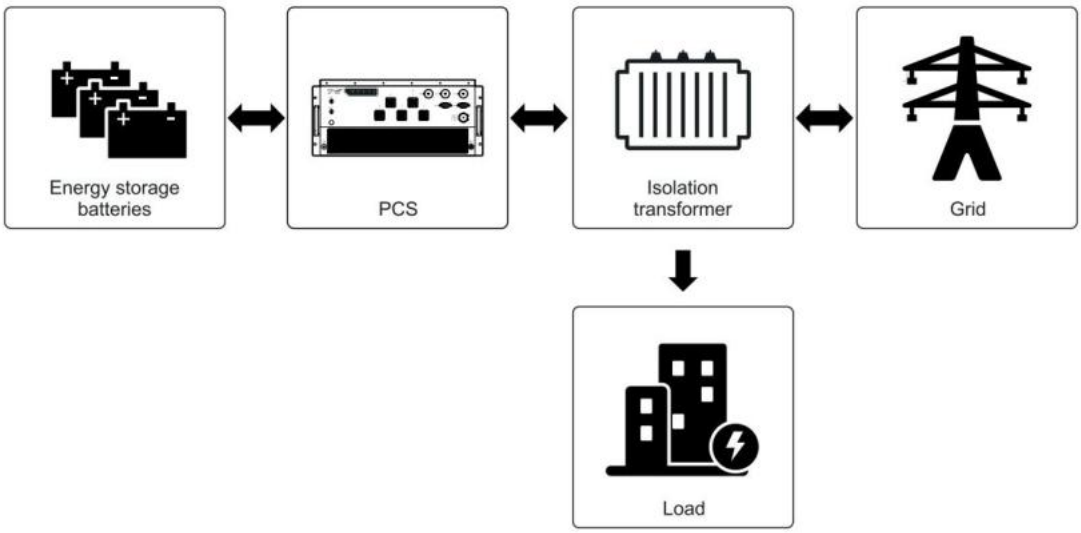


Figure 2-1 Energy storage system composition

CAUTION

PCS grid connection requires permission from the local power supply authority and must be carried out by professionals.

NOTE

The network configurations supported by PCS are shown in Figure 2-2.

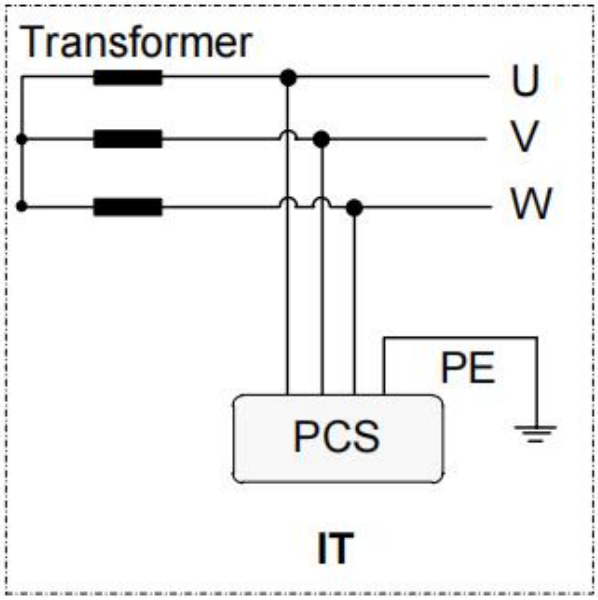


Figure 2-2 Network types supported by PCS

2.1.1 Functions

Integrated System

- Its modular design allows for easy and flexible matching and integration with battery systems.
- With built-in DC pre-charge function, users do not need to configure batteries separately.
- It has a buffer circuit, so it can be used immediately after insertion, and is safe and reliable.

High efficiency and intelligence

- Efficient three-level design .
- Advanced midpoint potential balance control technology effectively reduces ripple voltage and extends the service life of bus capacitors.
- It has fault waveform capture/remote online update functions.

Flexible and convenient

- The convenient modular design makes installation easier and reduces maintenance costs.
- Supports parallel operation of multiple PCS units via AC connection. The system configuration is flexible.
- It adopts an independently designed fan module, enabling quick installation and maintenance.
- With an IP6.5 design , it can adapt to various harsh environments.

2.2 Appearance and Structure

2.2.1 Appearance

The appearance of PCS is shown in Figure 2-4.

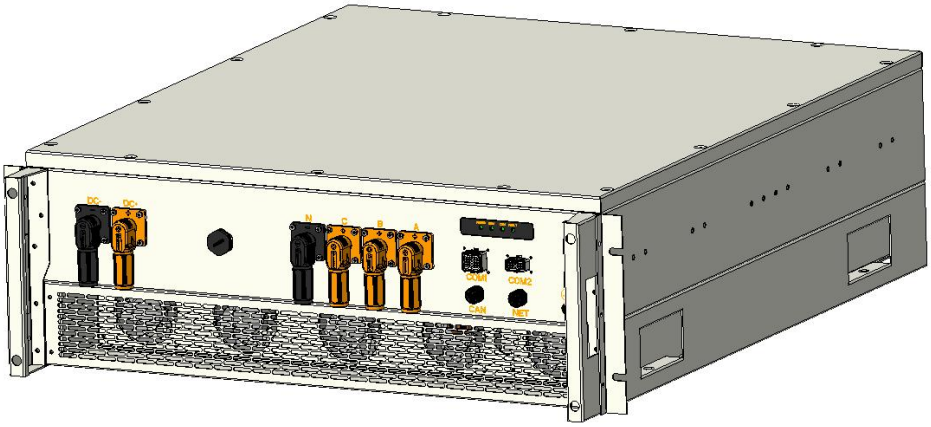


Figure 2-4 Appearance

PCS is designed with front indicator and bar indicator panels. See Tables 2-2 and 2-3 for illustrations of the front indicator and bar indicator panels.

2.2.2 Structural Layout

The structural layout of the PCS is shown in Figure 2-5. See Figure 2-5 for corresponding component diagrams. See Table 2-1.

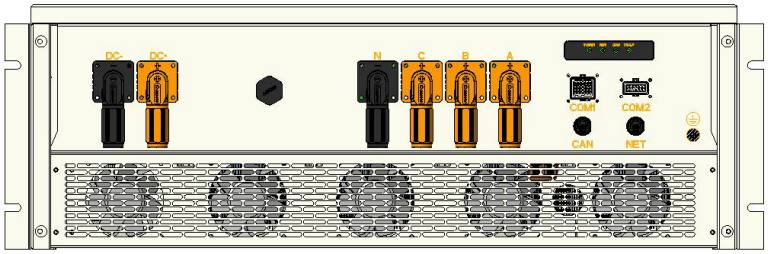


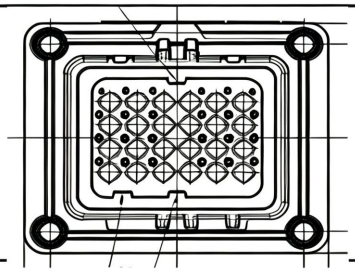
Figure 2-5 Structural Layout Diagram

Table 2-1 Panel terminal definition

logo	name	use
DC +/ DC -	DC terminals	DC side terminal
A/B/C/N	AC terminals	AC side terminal block
COM1	RS485 terminal 1	/
COM2	RS485 terminal 2	/
CAN	CAN bus	/
NET	network port	/

COM1/COM2

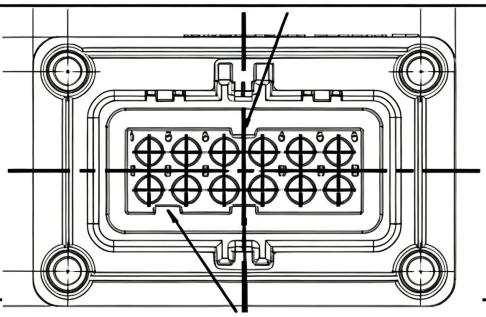
The COM1 port uses a 24- pin signal connector , as shown in Figure 2-6; the COM2 port uses a 1-2 pin signal connector , as shown in Figure 2-7.



Panel socket: ETS-05A-P24-C-GY-3902
Plug: ETP-05A-P24-C-GY-3902
Wiring terminal: 5A-TM(STAMPING)

Pin	Definition	Function
1	DI+	Active output for encoding +
2	DI-	Active output for encoding -
3	DO+	Passive output for encoding+
4	DO-	Passive output for encoding-
5	5VT	Active input 5V+
6	5VT	Active input 5V+
7	5VT	Active input 5V+
8	5VT	Active input 5V+
9	DI1	Active input 1-
10	DI2	Active input 2-
11	DI3	Active input 3-
12	DI4	Active input 4-
13	NO1	Passive output 1+
14	COM1	Passive output 1-
15	NO2	Passive output 2+
16	COM2	Passive output 2-
17	NO3	Passive output 3+
18	COM3	Passive output 3-
19	NO4	Passive output 4+
20	COM4	Passive output 4-
21	/	/
22	/	/
23	/	/
24	/	/

Figure 2-6 COM1 Port Definition

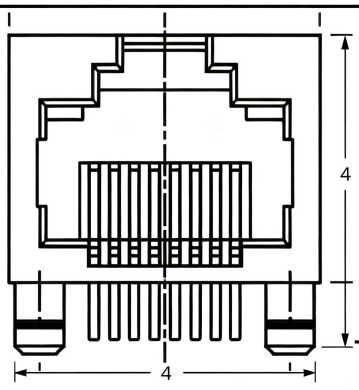


Panel terminal: ETS-05A-P12-C-GY-3902
Plug：ETP-05A-P12-C-GY-3902
Wiring terminal: 5A-TM(STAMPING)

PIN脚	Definition	Function
1	RSV_CAN_LP	Parallel CAN high
2	RSV_CAN_N	Parallel CAN low
3	Parallel_CAN low	BMS general CAN high
4	BMS_CAN_N	BMS general CAN low
5	BMS_RS485_P	BMS RS485 high
6	BMS_RS485_N	EMS RS485 high
7	EMS_RS485_P	EMS RS485 low
8	EMS_RS485_N	RVS RS485 high
9	RVS_RS485_P	RVS通讯用485低
10	RVS_RS485_N	RVS RS485 low
11	/	/
12	/	/

Figure 2-7 COM2 Port Definition

CAN port

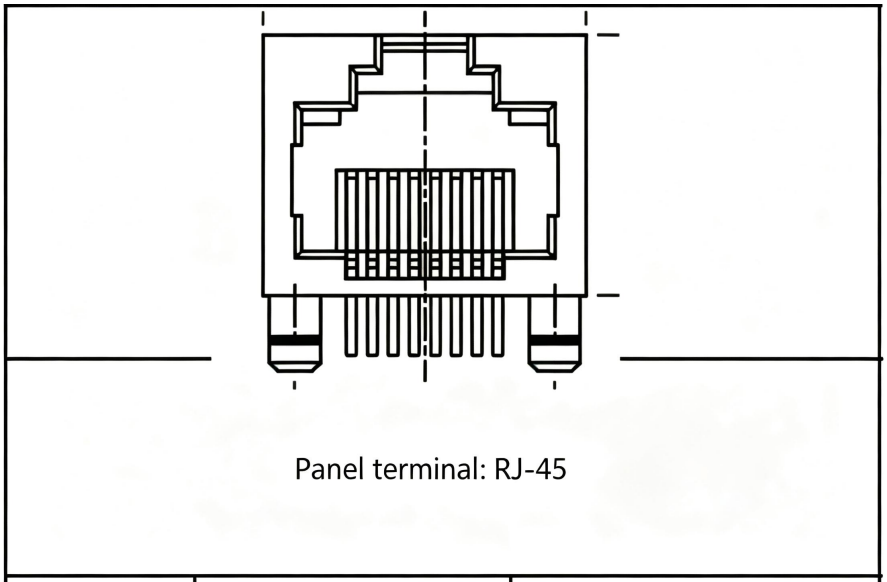


Panel terminal: RJ-45

PIN	Definition	Function
1	PCS_CAN low	PCS CAN LOW
2	PCS_CAN_P	PCS CAN high

Figure 2-8 CAN Port Definition

NET port



PIN	Definition	Function
1	TX+	Transmit +
2	TX-	Transmit -
3	RX+	Receive +
6	RX-	Receive -

Figure 2-9 NET Port Definition

bar indicator panel

The bar-shaped indicator panel has four indicator lights (as shown in Figure 2-10) that indicate the current operating status of the PCS. The descriptions of these four indicator lights are as follows.

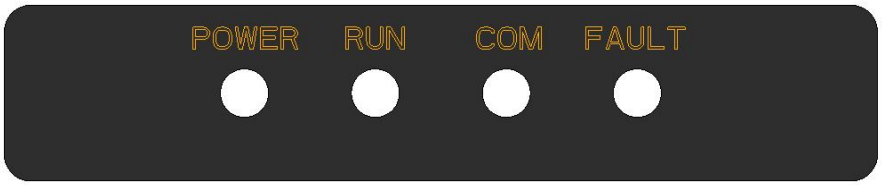


Figure 2-10 Bar indicator panel

Table 2-2 Indicator Status Diagram

mark	Color Name	name
POWER	green	Power supply status
RUN	green	Running status

COM	green	Communication status
FAULT	red	Fault status

2.2.3 Dimensions

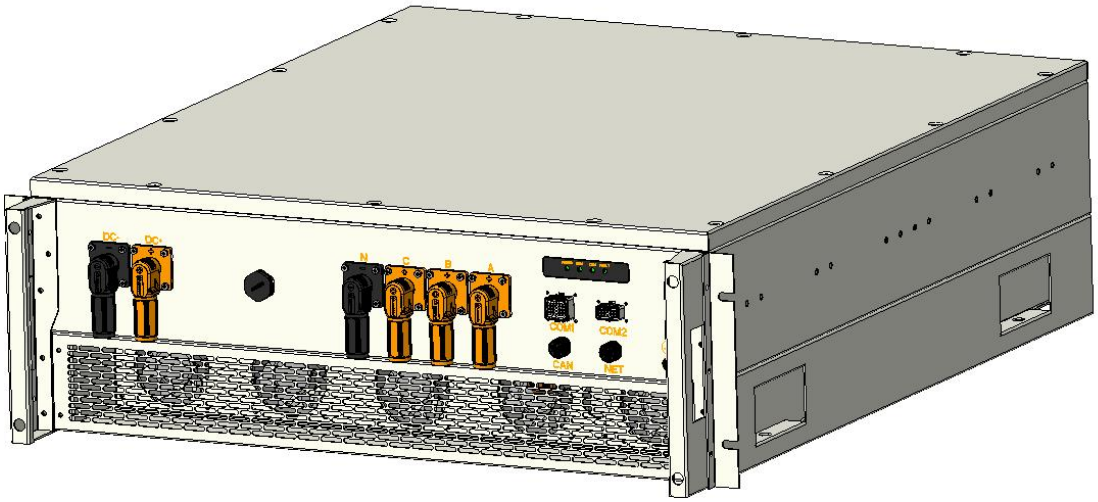


Figure 2-11 Dimensions (unit: mm)

twenty three Working principle

The external battery pack of the PCS is connected to the DC bus via an external DC switch. During charging, current flows from the grid to the battery through a three-phase rectifier. During discharging, current flows through the DC bus, then through a three-phase inverter and output filter to generate sinusoidal AC power. When off-grid, the AC output supplies power to the load; when grid-connected, the output feeds into the grid, as shown in Figure 2-12.

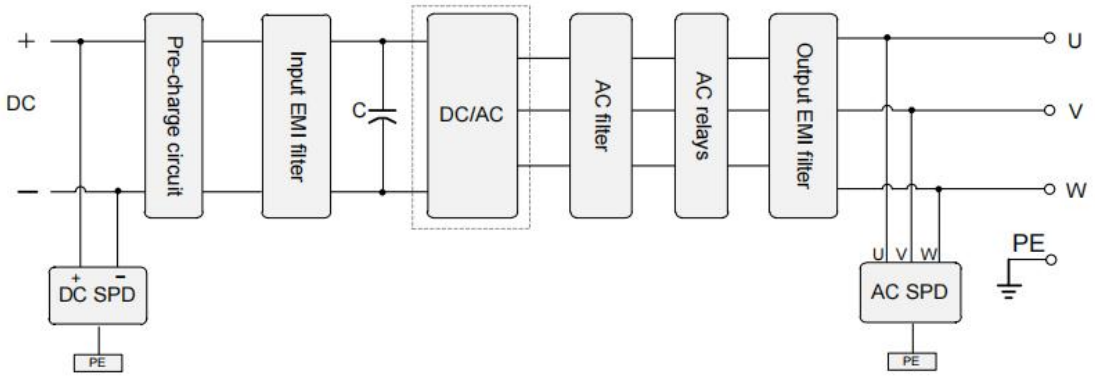


Figure 2-12 Working principle diagram

twenty four Work mode

PCS includes two operating modes: on-grid mode and off-grid mode.

Grid connection mode

In grid-connected mode, the PCS can perform charging and discharging functions.

Charging methods include constant current charging, constant power charging, and constant voltage charging.

Discharge includes constant power discharge.

In addition, in grid-connected mode, users can set charging and discharging times via a host computer.

During grid-connected operation, the PCS can automatically track the grid frequency and perform the following functions: smooth power output, peak shaving, system frequency modulation, load balancing, transient active noise reduction output emergency response, transient voltage emergency support, and improved power quality.

Offline mode

In off-grid mode, the PCS can output stable voltage and frequency. When powered by the grid, the PCS can also output stable voltage and frequency.

Even if the PCS is in a faulty state or an isolated system state, it can continue to supply power to the load to ensure normal operation.

During normal production and daily electricity use, the PCS is in an off-grid state.

2.5 communication

The PCS has multiple communication methods, including communication with the host computer via PCS data communication with the BMS , CAN, and RS485.

Users can easily obtain current operation information via Ethernet or RS485.

2.5.1 Host computer communication

Ethernet communication

Ethernet communication (with the interface shown in Figure 2-13) is mainly used for local area networks.

Network monitoring enables remote monitoring from the backend. The default IP address for PCS is 192.168.1.50, port number 502, and it uses the Modbus TCP protocol.

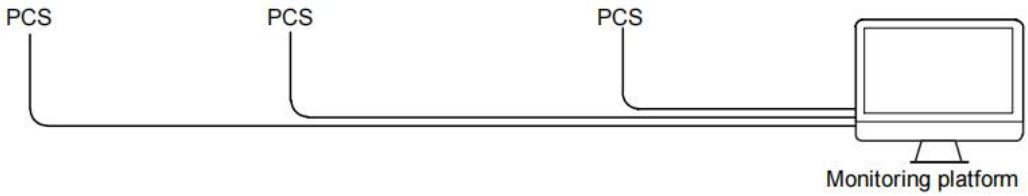


Figure 2-13 Monitoring multiple PCS via Ethernet

RS485 communication

RS485 communication is mainly used for local area network monitoring, enabling remote monitoring.

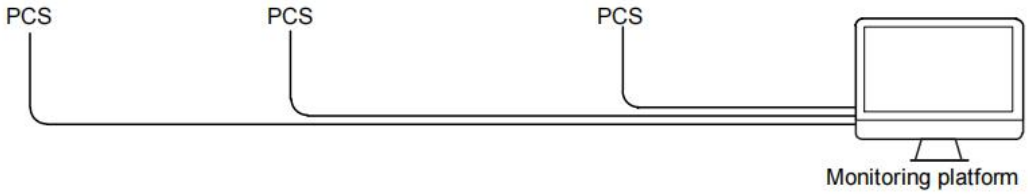


Figure 2-14 Monitoring multiple PCS via RS485

NOTE

1. RS485 interfaces A and B on each PCS should be connected to the monitoring platform separately. A and B cannot be used interchangeably.

2. If multiple PCSs communicate via RS485, please configure the communication address of each PCS via the web interface.

3. RS485 communication and input/output wiring should be separate to avoid mutual interference.

2.5.2 Communicating with the Battery Management System (BMS)

The PCS can communicate with the Battery Management System (BMS) via an RS485 interface.

Meanwhile, real-time battery status can be monitored via COM2 or CAN.

It issues fault alarms and provides protection based on battery status, thereby enhancing battery life and battery safety .

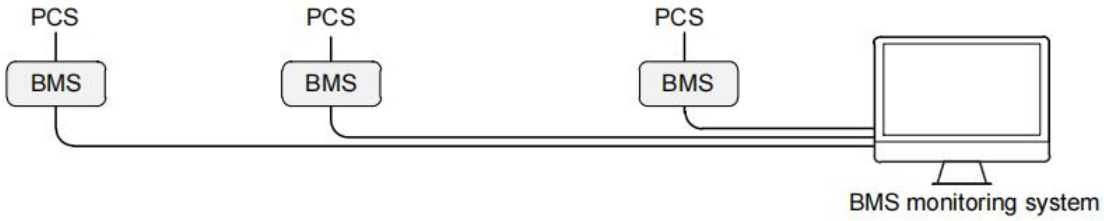


Figure 2-15 BMS communicates with multiple PCS

3. Install

This chapter mainly introduces the installation of PCS, including the installation process, installation preparation, transportation, unpacking and inspection, installation procedures, electrical connections , and checking the installation status.

3.1 Installation process

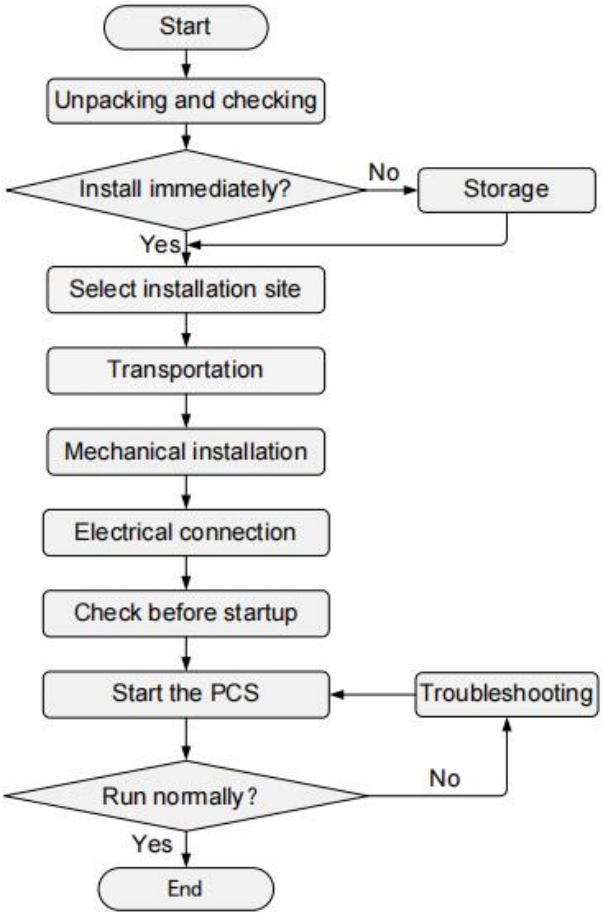


Figure3-1 Installation process

Figure 3-1 Installation process

3.2 Unpacking and Inspection

Determine the unpacking location in advance. Generally, the unpacking location should be as close as possible to the installation location.

PCS has undergone comprehensive testing and rigorous inspection before leaving the factory, but damage may still occur during transportation, so a detailed inspection is required upon arrival.

Inspect the appearance of the PCS for any shipping damage. If any shipping damage is found, report it to the carrier immediately.

Check that all accessories are complete and correct. If any discrepancies are found, take appropriate action. If you notice anything wrong, contact your dealer immediately.



After unpacking, if the computer needs to be stored for a long time, it is recommended to pack it properly. Original plastic packaging.

3.3 Selection of Installation Location

3.3.1 Installation Environment

The operating environment has a certain impact on the lifespan and reliability of PCS. Therefore, please avoid using it in the following working environments.

Do not install the PCS in environments with excessively high or low temperatures or humidity, or in environments exceeding the technical requirements. Specifications (Temperature: -30 ° C to 50 °C, Relative Humidity: 0% to 100%).

Do not install the PCS in an enclosed space, and ensure good ventilation around the PCS.

It must not contain flammable or explosive materials, nor dust, corrosive substances, or salt. Installation environment.

Choosing the optimal installation location for the PCS plays a crucial role in its safe operation, lifespan, and performance assurance. Therefore, it is recommended to choose a location that avoids direct sunlight, rain, and snow.

Because PCS operation generates noise pollution, it should be avoided to install PCS systems nearby. Residential areas should be chosen whenever possible.

3.3.2 Installation Space

CAUTION

Sufficient space should be left around the PCS to ensure good heat dissipation and easy maintenance.

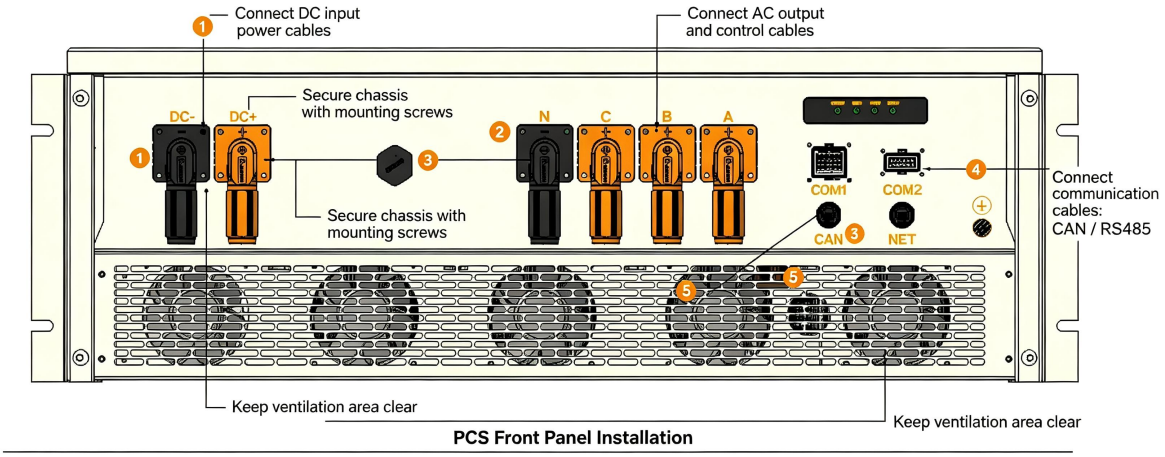


Figure 3-4 Installation space

If the PCS is installed in the energy storage system, ventilation holes need to be designed on the front of the energy storage system, and the ventilation rate should be no less than 60% of the front area.

The PCS is located on the back of the energy storage system and requires ventilation holes to dissipate heat.

If the ventilation holes on the back are louvered, the distance between the back of the PCS and the louvers should be at least 100 mm.

3.4 Transportation

Before installation, the PCS needs to be transported to the selected installation location. During transportation, the PCS can be moved using handles or lifting rings, depending on the actual situation.

The grooves on the side of the PCS (as shown in Figure 3-5) can be used for transporting the PCS.

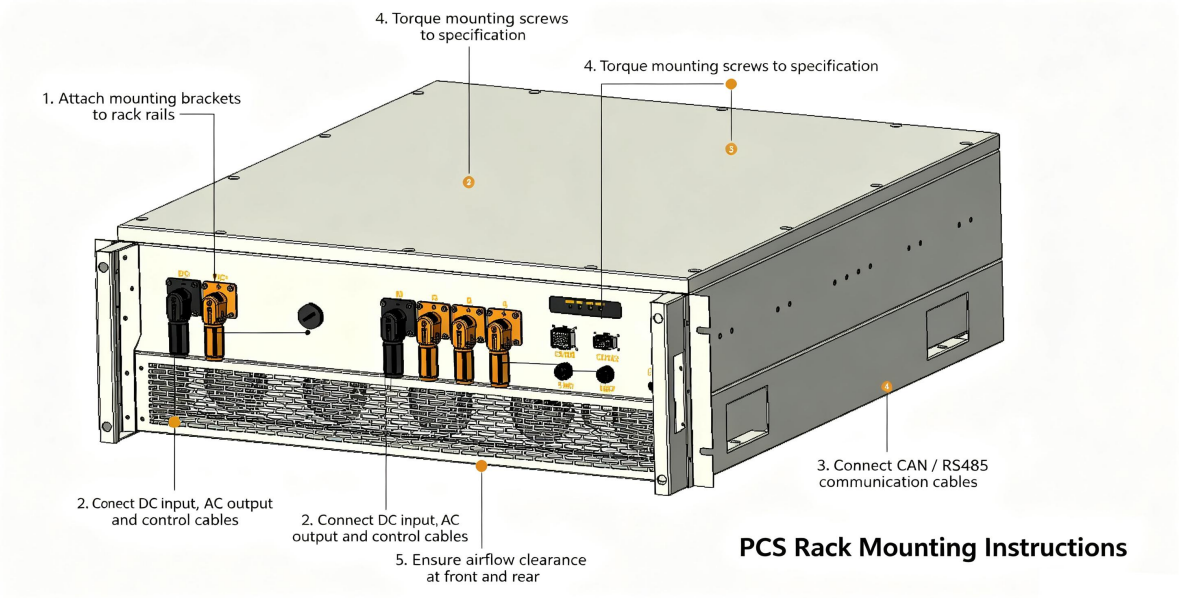
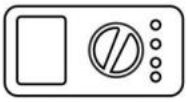
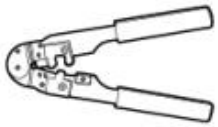
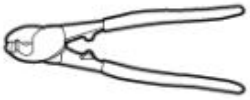
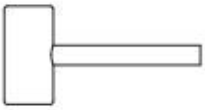
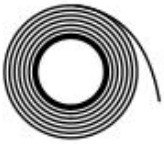
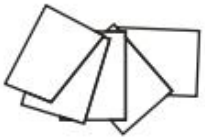
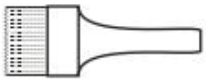
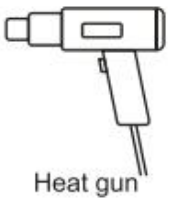
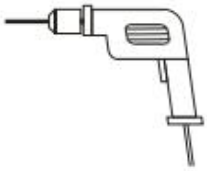
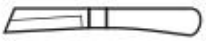


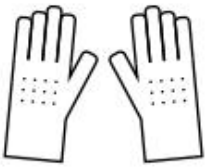
Figure 3-5 Overall Machine Overview Diagram

3.5 Installation Tools

Recommended installation tools include, but are not limited to, the following tools; if necessary, you may also use other auxiliary tools depending on the site conditions.

工具			
 Clamp meter	 Multi-meter	 Wrench	 Phillips screwdriver

Tools			
 Flat-headscrewdriver	 Socket wrench	 Adjustable wrench	 Torque wrench
 COAX crimping tool	 Diagonal pliers	 Wire stripper	 Hydraulic pliers
 Clamping plier	 Wire plier	 Rubber hammer	 Claw hammer
 Heat shrink tubing	 Insulation tape	 Cotton cloth	 Brush
 Steel tape	 Heat gun	 Electric drill	 Electrician's knife
 Label paper	 Cable tie	 Levelling instrument	

Tools			
Protection			
 Protective gloves	 ESD gloves	 Insulated gloves	 Insulated shoes
 Protective glasses	 Reflective jacket	 Safety helmet	 Dust mask

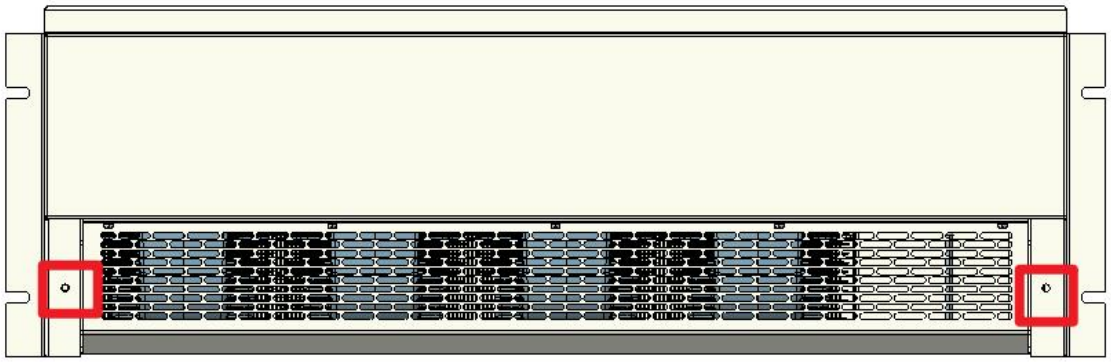
CAUTION

Installation tools must be insulated to avoid electric shock.

Multimeter range ≥1500Vdc. Wrench specification: T30.

3.6 Mechanical Installation

Install the PCS using six M6*12 flathead screws, as shown in Figure 3-6.



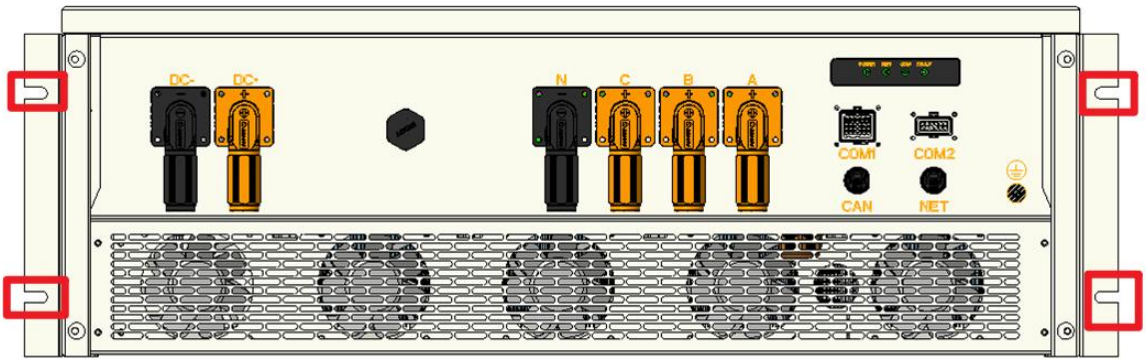


Figure 3-6 Mounting screw holes

3.7 Electrical Connections

Once the PCS is securely installed, it can be connected to the energy storage system.

Electrical connections must comply with local laws, regulations, and relevant electrical standards.

3.7.1 Security Notice

During the operation, professionals must wear protective equipment.



There may be high voltage inside the PCS.

Do not close external DC switches and external AC circuit breakers before completing the electrical connections. Contact us.

Before wiring, ensure that all cables are de-energized.



Any improper wiring operation may result in equipment damage or personal injury; therefore, wiring must be performed with caution. Operations must be carried out by qualified technicians.

The cables used in energy storage systems must be securely connected, well-insulated, and... in compliance with regulations.

CAUTION

Wiring must comply with local power grid regulations and safety procedures. Instructions for use of the energy storage battery are required. All electrical installations must conform to the electrical standards of the country or region where the project is located.

Once the local power authority grants permission, the PCS can be connected to the power grid.

3.7.2 Electrical wiring requirements

The wiring terminals are located at the bottom of the PCS (as shown in Figure 2-5). Recommended wires and terminals are shown in Table 3-1.

Table 3-1 Requirements for wires and terminals

name	type	Recommended wire gauge (square millimeters)
DC input line	1500V and above outdoor cables	Outdoor single-core cable: 70
AC output cable	690V and above outdoor multi-core single-core cable	Or outdoor single-core cable: 70
RS485/CAN communication line	Shielded twisted pair	2*0.3 mm^2
External grounding wire	Outdoor cables	The cross-sectional area of the conductor is ≥ S/2 (where S is the cross-sectional area of the AC conductor for output lines).

All cables listed in the table above use UL-certified copper wire. If using other types of wire, please replace them according to the corresponding standards. All wires selected by our company have passed national standard certification or UL certification.

If the recommended terminal model is not used, please confirm with our company. If aluminum wire is used, a copper-aluminum transition terminal should be used to avoid damage to the copper wire. The strip should not be in direct contact with the aluminum wire. The above-mentioned cable should be prepared by the user.

3.7.3 External grounding connection

The PCS is designed with two external grounding terminals. Before electrical connection, during connection, reliably connect the grounding terminals to the field grounding copper strip.

WARNING

Before connecting the AC power, energy storage battery, and communication lines, please connect the following lines first: First, connect the external grounding wire.

Use crimping pliers to strip the insulation layer of the grounding wire, crimp it into the corresponding terminal, and then connect the crimped grounding wire to the external grounding terminal of the PCS , as shown in Figure 3-7.

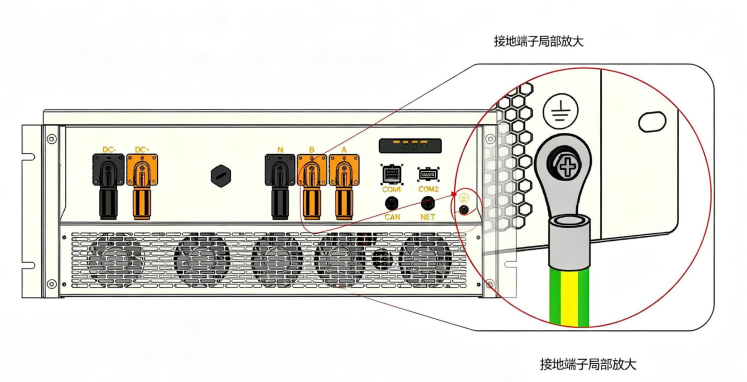


Figure 3-7 Grounding terminal position

It is recommended to use DT or OT terminals for the external grounding wire. To improve the corrosion resistance of the grounding terminal, it is recommended to apply anti-rust paint to the outside of the grounding terminal after installation.

CAUTION

The grounding method of the PCS must not be the same as the grounding method of the lightning rod of the building where the PCS is installed; the two must be separate (as shown in Figure 3-14), otherwise lightning strikes will cause damage.

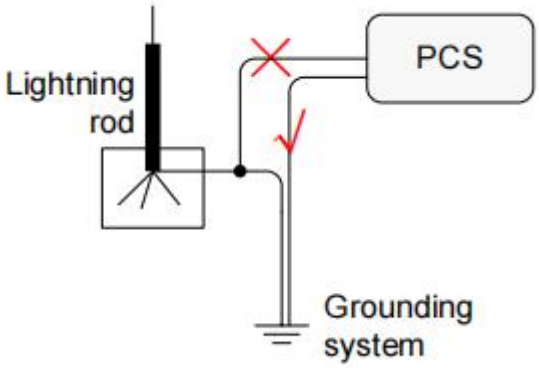


Figure 3-8 Connect to map

The grounding of the PCS should be directly connected to the grounding system, and the impedance should be less than 20mΩ.

3.7.4 AC lines

An external circuit breaker should be configured on the output side of the PCS (as shown in Figures 3-9 and 3-10). To ensure that the PCS can disconnect from the power grid normally in abnormal conditions, please select an appropriate AC circuit breaker or AC fuse.

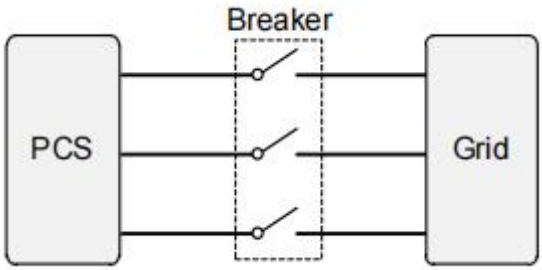


Figure 3-9 Grid connection diagram

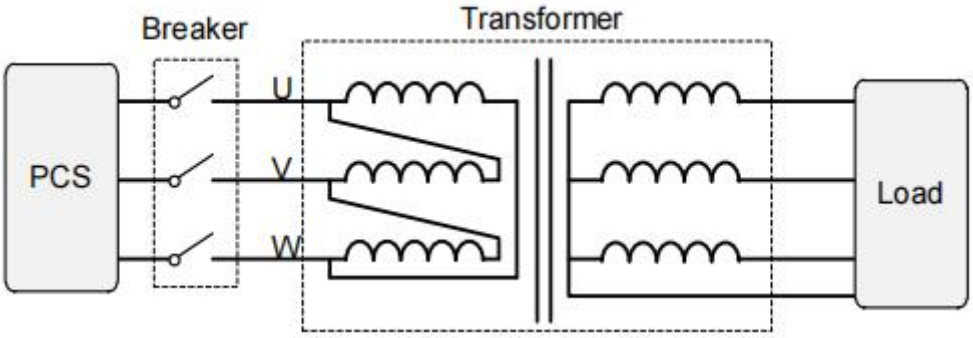


Figure 3-10 Offline connection diagram

External AC switch

An AC switch is a connection switch between the PCS and the power grid/transformer. It can safely disconnect the PCS from the power grid/transformer when necessary. To ensure operator safety, the AC switch must be turned off in the following situations.

The AC switch must be turned off during installation and wiring.

Before maintenance, please turn off the AC power switch and wait for 20 minutes. Then use a multimeter to measure the AC voltage inside the PCS. Maintenance can only be performed when the voltage is below 10V.

Wire requirements

To prevent unexpected interruptions in the PCS connection to the power grid due to excessive AC wire impedance, please select the appropriate wire specifications according to Table 3-1.

CAUTION

Before wiring, please mark the AC output cable to avoid incorrect connection.

Wiring procedure

CAUTION

Before grid connection, ensure that the grid voltage and frequency meet the requirements. For PCS requirements (see Technical Specification A for details), please contact your power company to resolve this issue.

DANGER

The internal PCS may contain dangerously high voltage! Before connecting, ensure all wires are de-energized. Do not turn off the AC circuit breaker until all electrical connections are complete.

Step 1: Set the external DC switch and external AC circuit breaker to the "off" position.

Step 2: Crim the AC cables (L1 , L2 , L3, N) onto the aviation plug, as shown in Figure 3-11 .

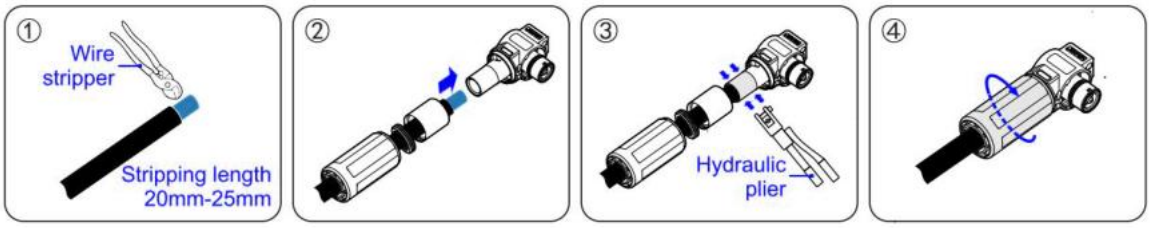


Figure 3-1 1 Crimped AC Cable

The image above only shows the crimping process; the corresponding color for AC cables should be selected according to the relevant specifications.

It is recommended to use 18-inch American wire cutters to strip the outer insulation of the cable and to use YQK-240 hydraulic crimping pliers to crimp the terminals.

Step 3 Connect the crimped AC cable to the AC port (L1 , L2 , L3, N) of the PCS .

L1 / L2 / L3 by the markings on the plug , as shown in Figure 3-12 .

A clicking sound will be heard when connecting, indicating that the aviation plug is correctly connected. If you need to disconnect the AC cable, press the button on the side of the aviation plug (as shown in Figure 3-13) to pull it out.

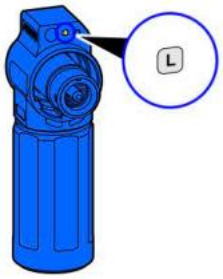


Figure 3-1 2 Aviation plug AC L1 / L2 / L3 markings

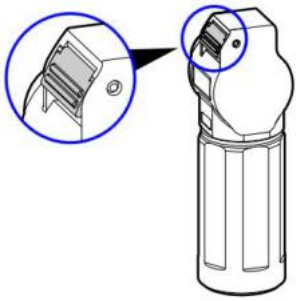


Figure 3-13 Pressing position

CAUTION

Avoid pressing on the cable insulation. Incorrect connection may damage the PCS and cause it to malfunction.

3.7.5 DC wiring

External DC switch

The DC switch is the connection switch between the PCS and the battery. It can safely disconnect the PCS from the battery when necessary. To ensure operator safety, always turn off the DC switch under the following conditions.

The external DC switch must be turned off during installation and wiring.

Before maintenance, please turn off the external DC switch and wait for 20 minutes. Then, measure the DC voltage on the PCS side with a multimeter. Maintenance can only be performed when the voltage is below 10V.

CAUTION

If the PCS is not in operation for an extended period of time, the DC switch must be turned off.

Model	DC circuit breaker
HG-PCS150K	1500 VDC / 300 A
HG-PCS1 2 0K	1500 VDC / 200 A

Table 3-3 Recommended Specifications for DC Circuit Breakers

Wiring procedure

Step 1: Check if the polarity of the energy storage battery is correct.

Step 2: Connect the positive and negative wires of the battery to the aviation plug, as shown in Figure 3-14 .

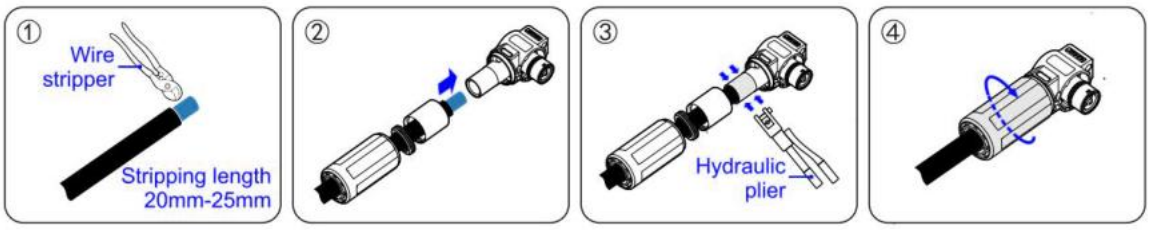


Figure 3-14 Crimped DC Cable

The image above only shows the crimping process; the corresponding color of the battery cable should be selected according to the relevant specifications.

It is recommended to use 18-inch American wire cutters to strip the outer insulation of the cable and to use YQK-240 hydraulic crimping pliers to crimp the terminals.

Step 3: Connect the crimped battery cable to the DC port (DC +, DC -) of the PCS .

DC+/DC- aviation plugs by the markings on the plug , as shown in Figure 3-15 .

A clicking sound will be heard when connecting, indicating that the aviation plug is correctly connected. To disconnect the AC cable, press the button on the side of the aviation plug (as shown in Figure 3-16) to unplug it.

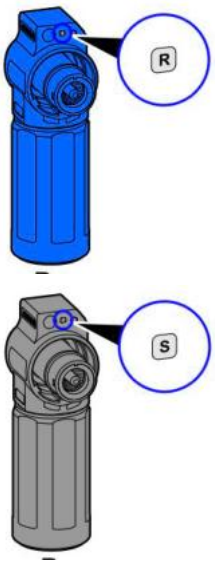


Figure 3-15 shows the location of the aviation plug DC +/ DC- .

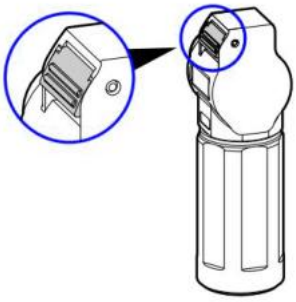


Figure 3-16 Pressing position

CAUTION

When wiring, ensure proper insulation between the positive and negative cables. A short circuit between the positive and negative terminals will cause permanent damage to the PCS. Higre Company assumes no responsibility for such damage. We will also be liable for losses caused by illegal operations.

Please connect the DC cable according to the relevant requirements of different countries.

3.7.6 COM Communication Connection

Step 1: Crim the communication cable onto the contact pins of the connector, as shown in Figure 3-17 .

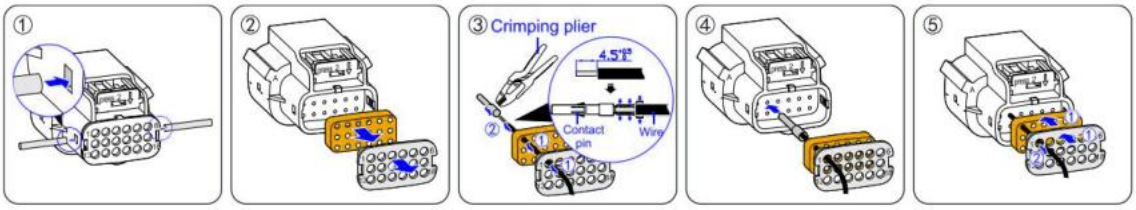


Figure 3-17 Crimp COM terminal

The diagram above only shows the crimping procedure for a single wire. Please determine the detailed connection locations and quantities based on the actual usage.

It is recommended to use electrician-grade wire strippers to remove the insulation layer and to use SN-58B type wire crimping pliers to crimp the wire.

Step 2: Connect the crimped connector to the corresponding port on the PCS (as shown in Figure 3-18) , and then press down the retaining ring (as shown in Figure 3-19) to prevent loosening.

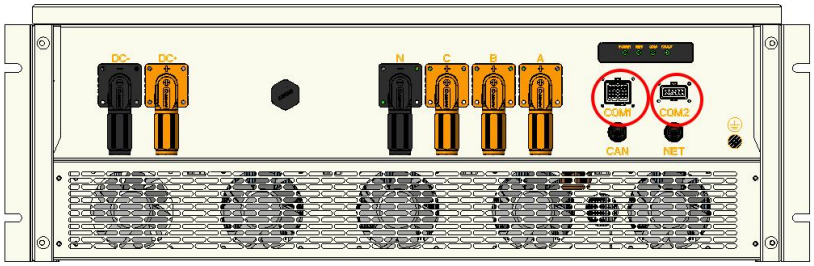


Figure 3-18 COM Connection Diagram

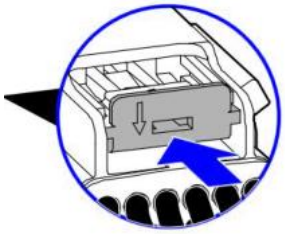


Figure 3-19 Buckle Position

Please refer to Figures 2-6 and 2-7 for the pin definitions of the COM port .

CAUTION

When connecting terminals, avoid pressing the insulation layer, as this may cause damage. Contact.

Communication lines should be kept separate from input and output cables to avoid communication interference.

Unused holes in a COM port must be plugged.

- End

3.7.7 Ethernet Communication Connection

Step 1: Loosen the external forced cable retainer of "COM," and then pass the communication cable through the external forced cable retainer. Crimp the communication cable to the corresponding terminals, as shown in Figures 3-20 and 3-21 .

CAUTION

When connecting, do not press the insulation layer of the communication cable into the terminal, otherwise it may cause poor contact.

Communication lines must be wired separately from input and output lines to avoid interference with communication.

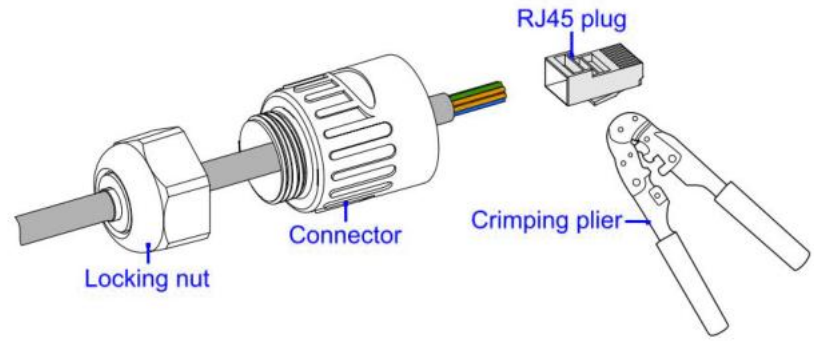


Figure 3-2 Ethernet communication cable crimping diagram

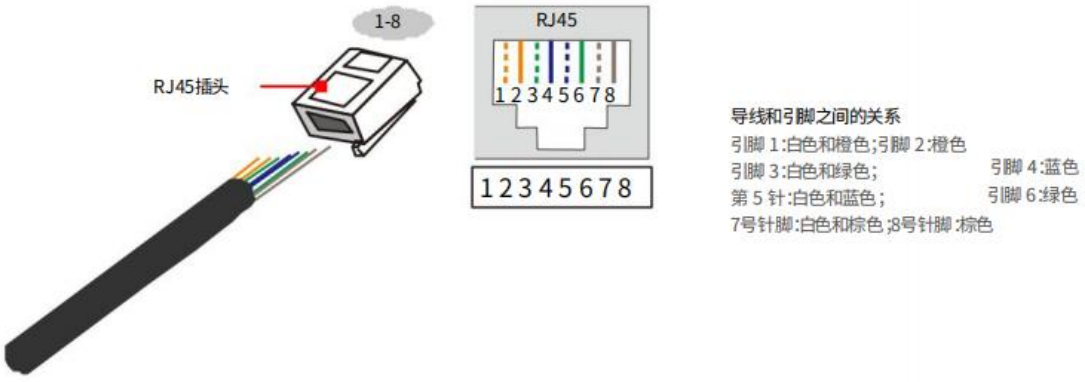


Figure 3-2 1 Ethernet communication line and pin relationship

After crimping in step 2 , insert the RJ45 plug into the clip (as shown in Figure 3-22), and then tighten the screw. RJ45 port.

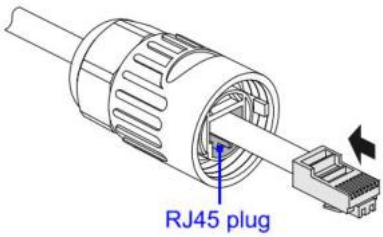


Figure 3-22 Fixed RJ45 plug

Step 3 : Connect the crimped Ethernet communication cable to the NET port of the PCS, as shown in Figure 3-23 .

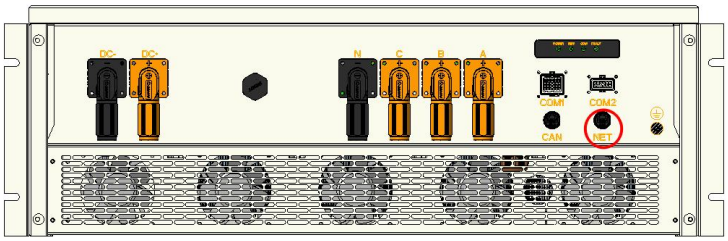


Figure 3-31 NET Port Connection Diagram

NET port on the PCS is 192.168.1.50, port number 502, and Modbus TCP protocol . For communication between multiple PCS units and the host computer, please refer to Figure 2-14 .

CAUTION

Make sure the covers of unused Ethernet ports are tightened.

3.8 Check the installation status

After installation, please check the following items:

Check that the PCS is securely installed.

Check that all screws on the PCS surface are tightened.

Check that the connections of the energy storage battery, AC output, and communication cable are correct.

4. Network Operation Diagram

This chapter mainly introduces the web operation of PCS, including communication cabling, communication settings, local settings, event logging, log management, and password changes.

4.1 Communication line connection

the PCS's NET port to the computer's network port. Establish a communication connection between the PCS and the computer.

Start the system and ensure that the PCS auxiliary power supply is working properly (if the power indicator light on the front panel or the bar indicator panel is lit, it indicates that the auxiliary power supply is working properly), wait for about 1 minute:

If the indicator light on the computer network port flashes, it means that communication has been interrupted. The PCS and computer have been assembled.

If the indicator light is not on, please check the network cable.

4.2 Communication Settings

Change the computer's network configuration. Open the Internet Protocol Version 4 (TCP/IPv4) property page, select "Use the following IP address", set the IP address to 192.168.1.50, the subnet mask to 255.255.255.0, keep other settings as default, and then click "OK" to complete the settings.

4.3 Login

Step 1: Open your browser (Google Chrome is recommended), enter the IP address 192.168.1.50 in the search box, and press Enter to access the login page.

The language can be changed in the upper right corner.

Step 2: Enter your username and password, then click the "Login" button. The page will then take you to the system information page.

The functionality status of the running information page is as follows.

Running status: Displays the current running status.

Discharge derating during PCS power-on and temperature-related discharge derating.

Discharge derating during PCS power-on and temperature-related discharge derating.

support	The PCS power supply is on and functioning correctly; there is no charging or discharging power.
stop	PCS power off and stop operating
fault	If a PCS malfunctions, click "Current Fault" to display the fault details.

Displays the total output apparent power (kVA), total output active power (kVA), and total output reactive power (kVA). Also displays the total power (kVar) and power factor of the entire energy storage system.

Unit DC Power: Displays the DC power of each unit.

Internal temperature: Displays the highest internal temperature of each unit.

Scroll down the page to see battery performance information.



This page contains many parameters related to PCS operation. All modifications are specific to PCS. Parameter settings should be performed by designated professionals. For any unclear parameters, please refer to the user manual or consult our engineers; do not change the settings arbitrarily.

4.4 Unit Operation Information

On the runtime information page, click the Unit 1 icon.

4.5 System Information

Click on "System Information" in the left-hand menu to access the System Information page.

On the system information page, you can obtain information such as model number, serial number, Unit 1 hardware version, HMI software version, Unit 1 control software version 1, Unit 1 control software version 2, etc.

4.6 Basic Settings

Click on Basic Settings in the left-hand menu to enter the Basic Settings page.

On this page, you can configure relevant functions, such as islanded operation mode, H/LVRT function, etc. These include automatic power-on start, planning curve, reactive power operation mode, system operation mode, constant current mode, constant DC voltage, power factor, switching detection rate, and power...

Slow start rate and active power, reactive power.

In addition, you can also switch between network-connected, offline, and VSG functions on this page.

4.6.1 Enable Settings

Then, click the small circle on the basic settings page, click the gray power on/off button to turn it blue, and then click the "Save" button. A confirmation window will pop up .

Clicking the "Confirm" button will display a green notification at the top of the page, indicating that the setup was successful.

On the basic settings page, click the blue "Power On/Off" button to turn it gray. Then click the "OK" button; a green notification will appear, indicating successful setup. Next, click the "Save" button; a confirmation window will pop up, indicating that you should then click the small button .

4.7 Battery Settings

Click on Battery Settings in the left-hand menu to access the battery settings page.

On this page, you can set relevant battery protection information, such as equalization charging voltage, discharge termination voltage, battery overvoltage protection, battery undervoltage alarm, battery undervoltage protection, battery undervoltage protection (heavy load), battery overvoltage hysteresis, battery undervoltage hysteresis (heavy load), and discharge termination hysteresis.

After completing the settings, click the "Save" button. A confirmation window will pop up (as shown in Figure 4-14). Click the "Confirm" button, and a green notification will appear at the top of the page, indicating that the settings are complete. Settings successful.

4.8 Profit Setting

Click on "Profit Settings" in the left-hand menu to access the planning curve page, as shown in the figure.

4.8.1 Setting the planning curve

Users can set the number of cycles, and the page will display the corresponding plan cycle settings.

For example, if the number of cycles is set to 4, clicking the page will display 4 plans in the lower right corner, which is the cycle bar.

Then, click the "Save" button in the bottom right corner, and a green notification will appear. The words "Successfully saved" will then appear at the top of the page.

4.8.2 Electricity Price Setting

Click the "Electricity Price Settings" button under Profit Settings to enter the electricity price settings page.

On this page, you can set electricity prices for peak, off-peak, and low-peak periods. Enter the number of cycles, and the corresponding cycle settings will pop up.

Then, click the "Save" button in the bottom right corner. If a green notification appears, the settings were successful.

The time periods cannot overlap or intersect. If the time periods overlap, an error message window will pop up.

4.9 Communication Settings

Click "Communication Settings" in the left-hand menu to enter the communication settings interface. On this page, users can modify the local network and Modbus communication parameters, including the 61850 communication parameters and the 104 communication parameters.

In the Modbus communication settings, enabling Modbus RTU1 will monitor via RS485, while enabling Modbus RTU2 (optional) will monitor via Ethernet. If multiple PCS communicate with the monitoring platform via RS485, a communication address for each PCS needs to be configured. The RS485 communication address is set by the RTU address of Modbus RTU1.

4.10 Local Settings

Click "Local Settings" in the left-hand menu to access the local settings page. This page includes NTP time synchronization, time synchronization period, NTP server, date settings, time settings, and time zone settings. When NTP time synchronization is set to "Off," users can set the time and adjust it accordingly. When NTP time synchronization is set to "On," users can configure the NTP server.

4.11 Event Log

Click "Event Log" in the left-hand menu to access the current fault page. Users can view the current fault, historical faults, user logs, and power scheduling logs here.

The current fault page displays the fault status of all units currently in use.

Historical faults display shows all historical faults of all units.

The user log displays the content and time of all settings executed on the web.

The power dispatch log displays the active power, reactive power, and power factor set on the web.

4.12 Energy Correction

Click "Energy Calibration" in the left-hand menu to access the energy calibration page. Users can calibrate the total charging energy and total discharging energy of the PCS.

4.13 Record Management

Click "Record Management" in the left-hand menu to access the record management page. On this page, users can export historical fault records, user logs, power dispatch logs, energy data, and fault waveform capture data. Select the items to export; the left-hand box will display:

Then click the button in the lower right corner to export the corresponding records.

4.14 Change Password

Clicking the icon in the upper right corner will display the options to log out and change password. Clicking the logout option will return you to the login page, while clicking the change password option will take you back to the login page. You will then be redirected to the password change page, where you can set your password.

Enter your original password and new password, then click the OK button. A confirmation window will pop up ; click "OK" to complete the settings.

5. Startup and Shutdown

This chapter mainly introduces how to start and stop PCS.

5.1 Pre-start checks

Before starting for the first time, please check the following items.

Ensure that the PCS is correctly installed and secured.

Ensure good ventilation around the PCS.

Ensure that no external objects or parts remain on the PCS.

Ensure that the PCS and other accessories are connected correctly.

Ensure that the wiring is connected correctly and has adequate protection.

Ensure all safety signs and warning labels are securely affixed and clearly visible.

Ensure that both the external DC switch and AC circuit breaker are in the off position.

Ensure the battery polarity is correct.

Make sure all wires are securely fastened and that the cable sheaths are undamaged.

Ensure that the gap between the connector and the wire, as well as any unconnected connectors, are properly sealed.

Ensure that the grid voltage meets the grid connection voltage requirements of the PCS.

Ensure that the input line specifications meet the current requirements of the maximum load.

Ensure that the spacing between the AC copper strips meets safety requirements.

5.2 Start PCS



Equipment damage or malfunction may result in electric shock or fire! Before operation, check the PCS for damage or other hazards. Check external equipment and circuit connections to ensure they are safe.

After confirming that PCS is working properly, start PCS by following these steps.

Step 1: Turn off the external DC switch of the PCS. After 1 minute, the indicator light on the bar indicator panel will light up.	The front panel indicator light will illuminate.
Step 2: Close the external AC circuit breaker between the PCS and the power grid. The red indicator light on the bar indicator panel will light up.	The front panel indicator lights are off.
Step 3: When both DC and AC power supplies are normal, set the operating conditions on the APP monitoring platform.	Click "Start", and PCS will prepare to launch.
Step 4: After a period of time, the PCS will be normally connected to the grid. The indicator lights on the bar display panel and	The front panel will light up or flash depending on the operating status.

5.3 Shut down PCS



When the PCS is operating normally, it is strictly forbidden to disconnect the external switches on the DC and AC sides under load, as this may damage the switches due to arcing. In severe cases, the PCS may be damaged.

Step 1: Set PCS to OFF via the host computer APP monitoring platform. The indicator lights on the indicator bar will also light up. The indicator panel will display as shown in Table 2-2.

Step 2: Close the external AC circuit breaker between PCS.

Step 3: Turn off the external DC switch on the PCS. After a while, the indicator lights on the bar indicator panel will light up. The front panel indicator lights will turn off.

- End

6. Maintenance and Troubleshooting

This chapter mainly introduces maintenance and troubleshooting.

6.1 Maintenance

For any repair services, please contact Higre Company's after-sales service center. Otherwise, Higre Company will not be liable for any losses caused by your own operation.



For personal safety, before inspection and maintenance, please disconnect the external AC switch and battery switch, and then turn off the external AC circuit breaker and DC switch on the PCS. Wait 20 minutes.

A few minutes later, use a multimeter to measure the internal DC bus voltage to ensure that the voltage is below 10V, and then you can proceed with maintenance.

6.1.1 Maintenance Details and Cycle

To ensure that the PCS is in optimal working condition, we recommend that the PCS be maintained regularly.

Table 6-1 Checklist

thing	Inspection methods	Maintenance period
Cleaning system	Check the vents for dust or debris. Clean the heat sink and vents if necessary.	Every 3 to 6 months (depending on the level of dust in the environment).
Electrical contact	Check if the wires are loose or detached. Inspect the cable for damage, especially the surfaces that come into contact with metal; if any damage is found, please inform us so that it can be repaired promptly.	Every six months or a year

thing	Inspection methods	Maintenance period
fan	Check for any unusual noises when the fan is running. Check the fan blades for cracks. Replace the fan if necessary (see 6.1.2 Maintenance Guide).	Annually (the timeframe will be shortened if there is significant sandstorm activity in the operating environment).
LED indicator light	If the LED indicator is too dirty to read, clean it with a damp cloth.	When necessary

Do not use any solvents, abrasives, or corrosive materials to clean the PCS.



Do not touch the surface during operation to avoid burns. Please turn off the computer and allow it to cool down before performing maintenance.

When the power generation value displayed on the monitoring platform is inconsistent with that of the external measuring equipment, the user can correct the power generation value on the monitoring platform according to the Higre communication protocol.

The correction formula is: Total power generation compensation value = Measurement value of measuring instrument - Total power generation value displayed on monitoring platform.

6.1.2 Maintenance Guide

Clean the air inlet and outlet.

PCS generates a significant amount of heat during operation; therefore, it employs forced air cooling. To ensure proper ventilation, the air inlets and outlets must be checked and kept clear. If necessary, the air inlets and outlets can be cleaned with a soft brush.

Fan maintenance



Before maintenance, please turn off the PCS and disconnect all power inputs. Wait at least 20 minutes for the internal capacitors to fully discharge before performing maintenance.

Fan maintenance and replacement can only be performed by a professional electrician.

The internal fan is used for cooling and heat dissipation during operation. If the fan malfunctions, it will affect the efficiency of the PCS or cause it to operate at a reduced rate. Therefore, please keep the fan clean and replace any damaged fans promptly.

6.2 Troubleshooting

The PCS is designed according to grid-connected operation standards and meets the following requirements: safety and electromagnetic compatibility. Before delivery to the customer, the PCS undergoes numerous rigorous tests to ensure reliable and optimized operation.

If a malfunction occurs, the red indicator light on the front panel and the fault indicator light on the bar indicator panel will illuminate. You can view the fault details on the host computer. In this situation, the PCS system may stop operating. Fault conditions are shown in Table 6-2.

Table 6-2 Troubleshooting Checklist

Serial Number	Fault Information	Solution
1	overvoltage of power grid	Please check the power grid . Once the power grid is restored to normal, normal operation can resume.
2	Power grid undervoltage	Please check the power grid . Once the power grid is restored to normal, normal operation can resume.
3	Over-frequency abnormality	Please check the power grid . Once the power grid is restored to normal, normal operation can resume.
4	Low frequency anomaly	Please check the power grid . Once the power grid is restored to normal, normal operation can resume.

5	Phase sequence abnormality	After confirming that the power grid is disconnected from the PCS, check whether the AC wires are in their respective positions.
6	Phase lock anomaly	Check the power grid. If the power grid has returned to normal but the phase lock-up anomaly still exists, please contact your local dealer or service center.
7	AC grounding abnormality	Turn off the PCS and wait for it to completely discharge. Check for a grounding short circuit on the AC side.
8	Abnormal insulation impedance	● Check if the insulation resistance between the positive and negative terminals of the battery pack and ground is too low; ● Check if the surrounding environment is too humid; ● Check if the internal grounding is loose ; ● If all of the above conditions are normal, please contact your local dealer or Service Center.
9	abnormal leakage current	● Check if the insulation resistance between the positive and negative terminals of the battery pack and ground is too low ; ● Check if the surrounding environment is too humid ; ● Check if the internal grounding is loose ; ● If all of the above are normal, please contact your local dealer or service center.
10	Temperature control switch malfunction	● Check if the PCS heatsink is blocked; ● Check if the PCS environment is too high or too low; ● If all of the above conditions are normal but the problem persists , please contact your local dealer or service center.
11	Internal overheating	● Check if the PCS heatsink is blocked; ● Check if the PCS environment is too high or too low; ● If all of the above conditions are normal but the problem persists, please contact your local dealer or service center.
12	Radiator overheating	● Check if the PCS heatsink is blocked; ● Check if the PCS environment is too high or too low; ● If all of the above are normal but the problem persists, please contact your local insurance agent. Distributors or service centers.
13	Power module overheating	● Check if the PCS heatsink is blocked; ● Check if the PCS environment is too high or too low; ● If all of the above conditions are normal but the problem persists, please contact your local dealer or service center.

14	Remote communication error	Check that the communication cable is properly connected or reversed. Please set the address and baud rate correctly.
15	Internal CAN communication error	If the problem persists after restarting the PCS, please contact your local dealer. Business or service center.
16	Parallel communication line abnormality	Check if the communication cable is properly connected or reversed. Please configure it correctly. Address and baud rate.
17	Overload protection	Please configure the load correctly.
18	Overload alarm	Please set the load or grid-connected power correctly.
19	Short circuit protection	Check if the AC power cord is short-circuited. If it is normal but the fault still exists, please contact your local dealer or service center.
20	Soft start error	If the problem persists after restarting the PCS, please contact your local dealer. Business or service center.
twenty one	Main contactor malfunction	If the problem persists after restarting the PCS, please contact your local dealer or service center.
twenty two	abnormal output voltage	If the problem persists after restarting the PCS, please contact your local dealer or service center.
twenty three	The output voltage does not meet the off-grid requirements.	Check and confirm that the grid-connected/off-grid mode is set correctly. If the setting is correct but the problem persists, please contact your local dealer or service center.
twenty four	Inverter software overcurrent	● Check for short circuits in the AC lines; ● Check if the software overcurrent value setting is correct; ● If all of the above are normal but the problem persists, please contact your local dealer or service center.

25	Inverter hardware overcurrent	● Check for short circuits in the AC lines; ● If the connection is normal but the problem persists, please contact your local dealer or service center.
26	Battery overvoltage	● Check if the battery voltage is normal; ● Check if the parameter settings are correct; ● If all of the above are normal but the problem persists, please contact your local dealer or service center.
27	Battery undervoltage (light load)	● Check if the battery voltage is normal; ● Check if the parameter settings are correct; ● If all of the above are normal but the problem persists, please contact your local dealer or service center.
28	Battery undervoltage (overload)	● Check if the battery voltage is normal; ● Check if the parameter settings are correct; ● If all of the above are normal but the problem persists, please contact your local dealer or service center .
29	DC bus overvoltage	Check if the battery voltage is normal. If it is normal but the problem persists, please contact your local dealer or service center.
30	DC soft start abnormality	If the problem persists after restarting the PCS, please contact your local dealer or service center.
31	DC main contactor malfunction	If the problem persists after restarting the PCS, please contact your local dealer or service center.
3 2	Battery reverse connection	Check if the DC circuit wiring is correct.
33	Battery voltage does not meet charging requirements	Check if the PCS battery settings are correct.
34	DC software overcurrent	Please check if the DC overvoltage setting is correct. If the setting is correct but the fault still exists, please contact your local dealer or service center .
35	DC hardware overcurrent	If the problem persists after restarting the PCS, please contact your local dealer or service center.

36	Busbar rapid undervoltage	If the problem persists after restarting the PCS, please contact your local dealer or service center.
37	SPD abnormality	If the problem persists, please contact your local dealer or service center.
38	Low battery alarm	● Check if the battery voltage is normal; ● Check if the parameter settings are correct; ● If all of the above conditions are normal but the problem persists, please contact your local dealer or service center.
39	Power grid voltage imbalance alarm	Check if the mains voltage is unbalanced. If the problem persists, please contact your local dealer or service center.
40	Battery Management System Charging Disabled	After the PCS is fully discharged, check the battery management system. If the fault persists, contact the battery manufacturer.
41	Battery Management System Discharge Disabled	After the PCS is fully discharged, check the battery management system. If the fault persists, contact the battery manufacturer.
42	Battery management system alarm	After the PCS is fully discharged, check the battery management system. If the fault persists, contact the battery manufacturer.
43	Battery Management System Standby	After the PCS is fully discharged, check the battery management system. If the fault persists, contact the battery manufacturer.
44	Battery Management System Error	After the PCS is fully discharged, check the battery management system. If the fault persists, contact the battery manufacturer.
45	Battery management system communication error	After the PCS is fully discharged, check the battery management system. If the fault persists, contact the battery manufacturer.

CAUTION

If the PCS displays any of the alarms listed in Table 6-2, shut down the PCS (see 5.3 Shutting Down the PCS), and restart the PCS after 5 minutes (see 5.2 Starting the PCS). If the

alarm status does not clear, please contact our local agent or service center. Before contacting us, please prepare the following materials:

1. PCS serial number.
2. PCS distributors/retailers (if any).
3. First use date.
4. Problem Description.
5. Your detailed contact information.

7. Stop operation, disassemble, and discard.

This chapter describes the methods for stopping, disassembling, and discarding PCS.

7.1 Stop running

Normally, the PCS does not need to be shut down, but it must be shut down for maintenance.



Please follow these steps to disconnect the AC and DC connections of the PCS. Continuous use may cause personal injury or equipment damage.

Step 1: Turn off the PCS. Turn the external DC switch of the PCS to the "OFF" position.

Step 2: Disconnect the external AC and DC power supply to the PCS. Ensure that the AC and DC power supplies are disconnected. The cables connected to the PCS should not be energized.

Step 3: Wait at least 20 minutes to ensure the internal capacitors are fully discharged.

Step 4: Disconnect the AC and DC cables.

Step 5: Dismantle the communication lines.

7.2 Disassembling PCS



After the PCS is connected to the grid, the battery pack must be completely disconnected and wait at least 10 minutes to ensure that the internal capacitors are fully discharged before the PCS can work normally.

It has been demolished.

Step 1: Disconnect all connections in sequence, following the reverse steps of 3.7 Electrical Connections.

Step 2: Remove the PCS following the reverse steps of mechanical installation in 3.6.

Step 3: If the PCS will be installed and used in the future, please properly pack and store the PCS (see 8.1. Packaging and Storage in 8.3).

7.3 Discard PCS

For PCS that are determined to be no longer in use, please do not treat them as general waste. Users need to dispose of PCS in accordance with relevant regulations.



The batteries, modules, and other components inside the PCS may pollute the environment. Please dispose of them in accordance with relevant regulations.

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8. Packaging, transportation, and storage

This chapter mainly introduces packaging, transportation, and storage.

8.1 Software Package

The product is packaged in a cardboard box. Please pay attention to the placement requirements when packing. One side of the cardboard box should be printed with warning icons, including keep dry, handle with care, place upwards, and stacking limits. The other side of the cardboard box should be printed with information such as the equipment model. The front of the cardboard box should be printed with the Higre company logo and the equipment name.

8.2 Transportation

Please note the warnings on the cardboard box. Avoid violent impacts during transport. In the event of equipment damage, place the equipment according to the orientation shown on the cardboard box. Do not transport the equipment with flammable, explosive, or corrosive materials. Do not store the equipment in open-air warehouses. During transit, prevent immersion in rainwater, snowmelt, or other liquids, and avoid mechanical damage.

8.3 Storage

When storing equipment, it should be placed according to the orientation shown on the cardboard box. A 20cm gap should be left between the box and the ground, and at least 50cm should be maintained between the box and walls, heat sources, and cold sources, such as windows or air vents.

The storage environment temperature should be between -30 ° C and 50 °C. If the storage or transportation equipment exceeds this range, the following regulations must be observed: Before starting, place the equipment alone and allow it to reach the operating temperature range for at least four hours. Toxic gases, flammable and explosive materials, and corrosive chemicals are strictly prohibited from being stored in the warehouse. Furthermore, the equipment should not be subjected to excessive mechanical vibration, impact, or strong magnetic fields. Under the above storage conditions, the storage period is six months. After six months, re-inspection is required.

Do not store PCS exposed to air. If storing for an extended period, check the PCS for leaks and inspect the interior for any abnormalities.

A Technical Specifications

A.1 HG-PCS125K

DC side	
Maximum voltage (V d c)	1500
Voltage operating range (V d c)	800 - 1500
Maximum DC current (A)	187.5

Communication side	
Rated voltage (Vac)	480, 4W+PE
Rated frequency (Hz)	50/60
Rated power	125kW
Maximum output current (A)	181

Power factor range	-1 ~ +1

Environment and Protection	
Protection level	IP65
Operating ambient temperature range (°C)	-30 ~ 50
Overvoltage level	III (AC) , II (DC)
Cooling method	Intelligent air cooling

A.2 HG-PCS150K

DC side	
Maximum voltage (V d c)	1500
Voltage operating range (V d c)	1000 - 1500
Maximum DC current (A)	254

Communication side	
Rated voltage (Vac)	600, 4W+PE
Rated frequency (Hz)	50/60
Rated power	150kW
Maximum output current (A)	173.2
Power factor range	-1 ~ +1

Environment and Protection

Protection level	IP65
Operating ambient temperature range (°C)	-30 ~ 50
Overvoltage level	III (AC) , II (DC)
Cooling method	Intelligent air cooling

B Quality Assurance

If the PCS malfunctions during the warranty period, Higre Company will repair or replace it with a new product free of charge.

evidence

During the warranty period, users need to present the product purchase invoice, and the trademark on the product must be clearly visible; otherwise, Higre Company has the right to refuse quality assurance.

condition

- The replaced products must be returned to Higre Company for disposal.
- Reasonable time should be allocated to Higre Company for maintaining faulty equipment.

Disclaimer

If any of the following circumstances occur, Higre Company has the right to refuse quality assurance :

- The free warranty period has expired.
- Damaged during transportation.
- Improper installation, modification, or use.
- Use in harsh environments where the user manual does not permit.
- Damage caused by the installation, maintenance, modification, or dismantling of other companies' servers.
- Damage caused by the use of non-standard or other company (excluding Higre) parts or software.
- Installation and use beyond the scope of relevant national standards.
- Damage caused by abnormal natural environment.

If the malfunction is caused by the above-mentioned circumstances and the user requires maintenance, a paid repair service may be provided after our service organization makes a decision.

To continuously improve user satisfaction, our products and user manuals are constantly being upgraded. If there are discrepancies between the user manual and the product, it may be due to different versions; please refer to the actual product. If you have any questions, please contact our company.

Software Licensing

- Higre Company's hardware or software for commercial purposes in any way .
- It is prohibited to decompile, decrypt, or destroy the original program design of the software developed by Higre Company.

C. Abbreviations and Shorthand

A

AC power

C

CE European Conformity Assessment

D

DC

I

IEC International Electrotechnical Commission

L

LED light-emitting diode

P

PE protective grounding

R

RS485 Recommended standard 485