User Manual

Intelligent Power System

DCIPS2B-S-00-B63

Safety Precautions

Before starting the operation, please read the operation instructions and precautions carefully to reduce the occurrence of accidents. The "Care, attention, warning, danger" items in the product and product manual do not represent all safety matters that should be followed, and only serve as a supplement to various operating safety precautions. Therefore, responsible for Transtector product installation, operation personnel must be strictly trained to master the correct system operation methods and a variety of safety precautions before the equipment can be operated. When carrying out the operation of the company's products and equipment, we must comply with the safety specifications of the relevant industries, and strictly comply with the relevant equipment precautions and special safety instructions provided by Transtector

Electrical safety

High Voltage

	Some parts of the power supply system operate with high voltage. Direct or indirect contact with these parts through wet objects may result in fatal danger.

When installing AC power supplies, comply with all applicable safety regulations and requirements of related industries. This power supply must be installed by qualified personnel. Do not wear loose conductive items such as necklaces, bracelets, watches or rings during installation or maintenance.

Turn off the power immediately if water or dampness is observed on or inside of the unit.

When operating in a humid environment, take measures to prevent water from condensing on or entering the device.

	The operation of high voltage lines may cause fire or electric shock accidents. The area through which AC cables are connected and routed must comply with local laws and regulations. Only personnel qualified for high voltage and AC operations are allowed to perform high voltage operations.

Tools

	Special insulated tools and personal protective equipment (PPE) must be used when performing various operations with high voltage and AC power

Lightning

	High voltage, AC, tower and mast operations are strictly prohibited during thunderstorms.

During thunderstorms, strong electromagnetic fields are generated in the atmosphere. Do not perform installation activities during thunderstorm activity, and ensure that the unit is properly grounded at time of installation to prevent damage to the equipment when operating.

Static Electricity

	Static electricity generated by the human body can damage electrostatic sensitive components on the circuit board, such as large-scale integrated circuits (ics). To prevent the static electricity of the human body from damaging the sensitive components, wear an ESD wrist strap and ground the other end of the wrist strap before touching the device or holding the board, circuit board, or IC chip.

Short-circuit

	It is strictly prohibited to short-circuit the positive and negative terminals of the DC distribution of the power system or short-circuit the non-grounded terminals to the ground during operation. The power supply device is a constant voltage DC power supply device. Short circuit may cause device overheating or personal injury.

Check the polarity of all cables and interface terminals when working with DC power energized. DC power distribution operation space is compact, so carefully inspect the operation space prior to installation.

Battery Safety

	Before carrying out battery work, you must carefully read the safety precautions of battery handling, and the accurate connection method of the battery.

Improper operation of the battery can cause danger. During operation, strict attention must be paid to preventing all batteries from short-circuiting or experiencing electrolyte overflow and loss. Electrolyte overflow poses a potential threat to the device. It will corrode metal objects and circuit boards, causing device damage and circuit boards short circuit.

Before installing and operating the battery, pay attention to the following precautions to ensure safety:

1. Remove watches, bracelets, bracelets, rings, and other objects containing metal from your wrist.
2. Use insulated tools that are intended for the purpose.
3. Use eye protection that includes side shields.
4. Use rubber gloves and wear an apron to prevent injury from electrolyte spills.

5. The batteries must always be oriented with the electrode face up during handling process, do not invert or tilt.

Power Off the Load and protect the battery

The power supply system includes an integrated protective function to maintain the health of the batteries. Under the load voltage, the power supply system is powered by the power supply, and If the battery voltage drops below 44.02vdc, power is automatically disconnected for the non-critical loads to prioritize charge for the critical loads. The battery is protected by the battery voltage dropped to the 0.2vdc when the battery voltage is reduced automatically to avoid the battery because of the discharge and affect the battery life.

The system factory is set to activate battery protection, which means that battery protection may occur when an extended outage or equipment failure is communicated. The important loads should be taken to the battery protection branch. For critical loads, it is necessary to remove the battery protection function to ensure the continuity of power.

	The advantage of enabling battery protection is that the battery can be protected when the battery voltage is low; The disadvantage is that the battery voltage drops to a certain level, which cuts off the battery, making all loads, including important and non-important loads power off. The advantage of canceling battery protection is to extend the power supply time of important loads, but the disadvantage is that the battery cannot be protected, and the unexpected power off caused by misoperation or equipment failure cannot be avoided.

Others

Object sharp corners

	Wear protective gloves to prevent sharp object cuts when handling equipment by hand.

Power cables

	Before connecting the cable, ensure that the cable label is correct.

	The signal cables must be bundled separately from the power cables at a distance of at least 150mm.

Table of Contents

Overview

This chapter describes the model description, configuration, composition and main features of the DCIPS2B-S-00-B63 intelligent power system.

1.1 Description and Configuration

Figure 1 shows the system configuration diagram for DCIPS2B-S-00-B63

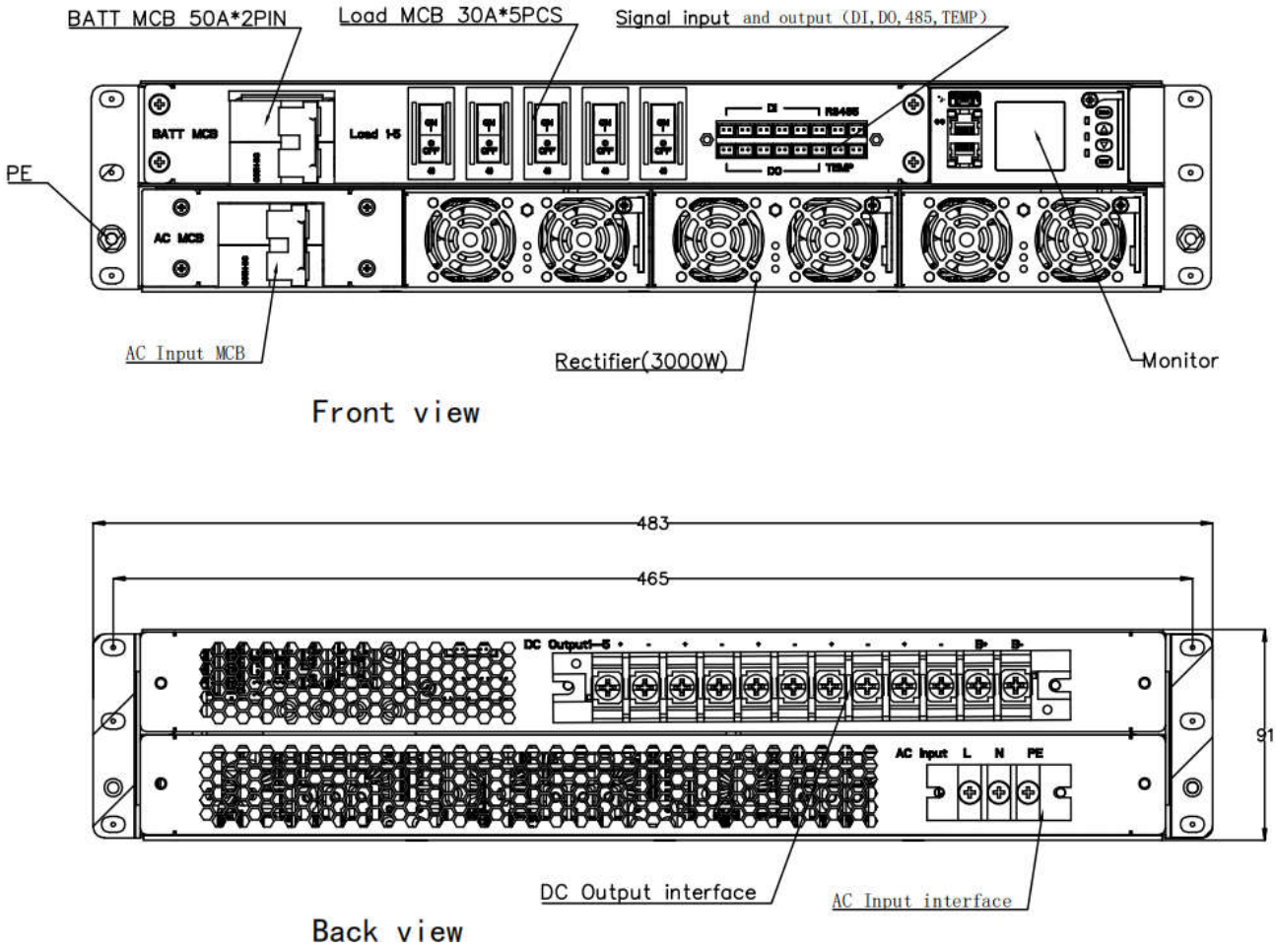


Figure 1: DCIPS2B-S-00-B63 System Configuration Diagram

1.2 Key Features

- Wide Ac input voltage working range 85Vac ~ 300Vac.
- The rectifier module adopts active power factor compensation technology, and the power factor value reaches
- Rectifier module provide high efficiency up to 96% and utilize comprehensive soft switching technology.
- The rectifier module has ultra-low radiation. With advanced electromagnetic compatibility design, the rectifier module can meet the requirements of CE, NEBS, YD/T983 and other domestic and foreign standards. The conduction and radiation of the rectifier module can meet the requirements of Class B.
- System and rectifier module certitifed to CE standards.
- High power density for rectifier modules.
- Rectifier modules are hot-swappable with replacement less than 1min.
- Rectifier module has integral output overvoltage protection and output overvoltage software protection. There are two types of software overvoltage protection: primary overvoltage locking mode and secondary overvoltage locking mode.
- Battery management functions include battery low voltage protection function, load power off function, temperature compensation, automatic voltage regulation, stepless current limiting, battery capacity calculation, online battery testing and other functions.
- 10,000 historical alarm records can be recorded and ability to record 10 groups of battery test data.
- Networking features flexible networking options including RS-485 interface, IP interface, dry contact and other communication interfaces supports remote monitoring and control.
- Integrated high capacity lightning protection.
- Complete suite of fault protection and alarming capabilities.

Installation Guide

This chapter describes how to install and connect cables to the power system. Before installation, read the safety regulations carefully, and then install and connect cables according to this chapter.

2.1 Installation Preparation

Unpack and check the goods against the packing list, and for any apparent damage.
Select power cables based on relevant specifications electrical industry specifications. RVVZ type AC cable is recommended, and cable should be rated for +70°C minimum. User Table 2-1 Determines the cross-sectional area of an AC cable.

Table 2-1: AC cable cross-sectional area

Connector name	Specifications	AC power cable cross-sectional area
Ac input terminals	60A*4P	Maximum cable cross-sectional area 32mm
Note: When the wiring distance is less than 30 meters, it is recommended to estimate the cross-sectional area of the cable according to the current density 4A/mm2 , and it is recommended not to be less than 10mm		

The cross-sectional area of a DC cable depends on the current flowing through the cable and the allowable cable voltage drop, as well as the peak load capacity. It is recommended that the peak load capacity be 1/2 to 2/3 of the capacity of the air switch and fuse.

Table 2-2: Battery cable selection

Rated current of the	Rated current of the	Rated current of the	Rated current of the	Rated current of the	Rated current of the
125A	100A	70mm^2	14m	90mm^2	18m
Note: 1. The size in the table is the cable size when the ambient temperature is 25 ° C. If the ambient temperature is too high, the cross-sectional area of the cable should be appropriately increased. 2. The battery cable should at least reach the +90℃ temperature resistance level, and it is recommended to use a double insulating layer copper core flame retardant cable					

Table 2-3: Load cable selection

Branch current	Branch current	Branch current	Branch current	Branch current	Branch current
100A	50A	6mm^2	14m	25mm^2	22m
50A	50A	6mm^2	14m	25mm^2	22m
10A	5A	6mm^2	17m	25mm^2	71m
3A	3A				
1A	1A				
Note: The size in the table is the cable size when the ambient temperature is 25℃. If the ambient temperature is too high, the cross-sectional area of the cable should be appropriately increased					

The cross-sectional area of the system ground cable must be the same as that of the largest power distribution cable, but no smaller than 35mm^2. The terminals of the ground bus bar are M6 screws.

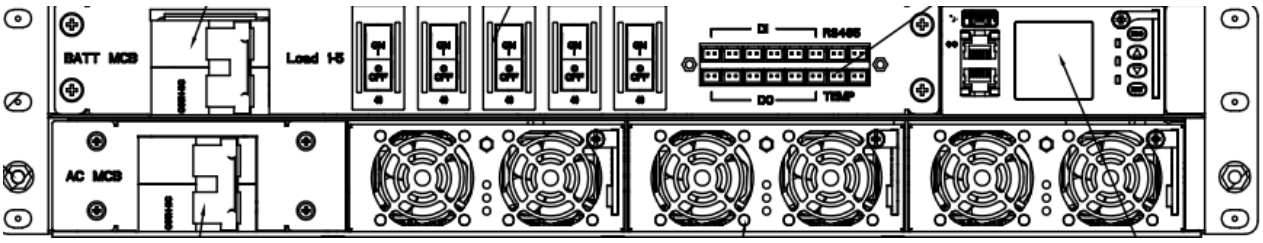
2.2 Mechanical installation

First, install the 2U power frame into a standard 19” power cabinet. The front panel has four screw positions for securing.

Next, install the modules. The system can be equipped with up to (3) rectifier modules and/or solar modules. All modules have the same dimensions and can be used interchangeably

To install a rectifier or solar module, perform the following steps:

1. Unscrew the holding screw on the handle on the module panel, pull the pull down to the lowest level, and the positioning pin will be concave into the bottom cover of the module.
2. Place the rectifier module in the position shown in Figure 2-2. Push the module inwards slowly until it does not move. Close the handle on the module panel and tighten the retaining screw for the handle.
3. Install filler panels on the spare slots. The installation is complete as shown in the image below.



2.3 Electrical Installation

Prepatory Steps

1. Place all switches, etc. in the off position before electrical connection.
2. Installation of mains cables can only be performed by qualified personnel.

Connect Ground Cable

All cables are led from the top of the cabinet. Remove the cabinet cover before wiring. Connect one end of the ground cable to the ground copper bar in the equipment room and the other end to the ground terminal. Figure 2-3 shows the position of the ground terminal.

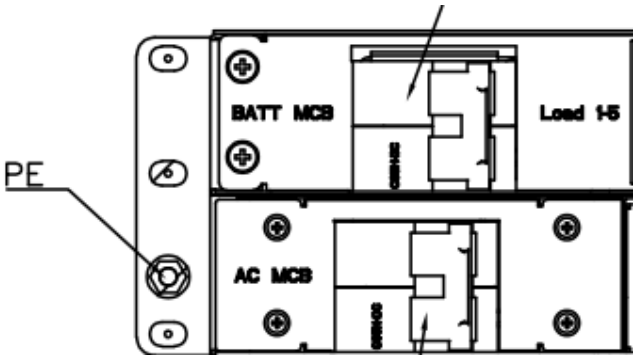


Figure2-3

Connect AC cables

Connect the AC input cable to the position of the AC input terminal shown in Figure 2-4

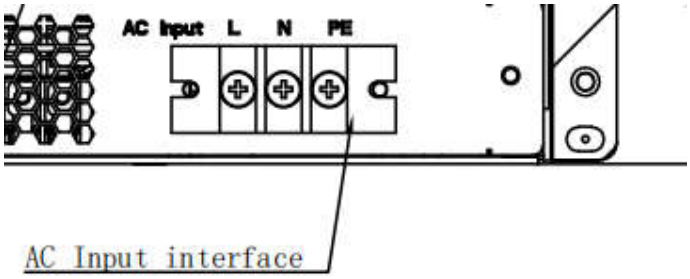


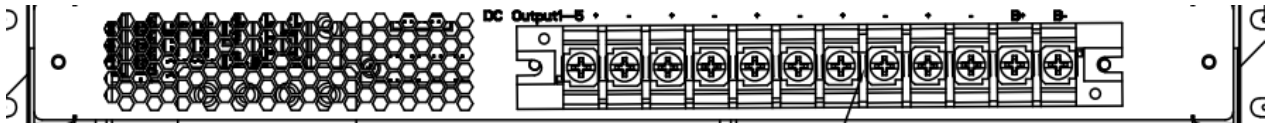
Figure2-4

Connect the load cables

Battery positive, load positive copper bar requires removal of the cover plate and front panel above the frame.

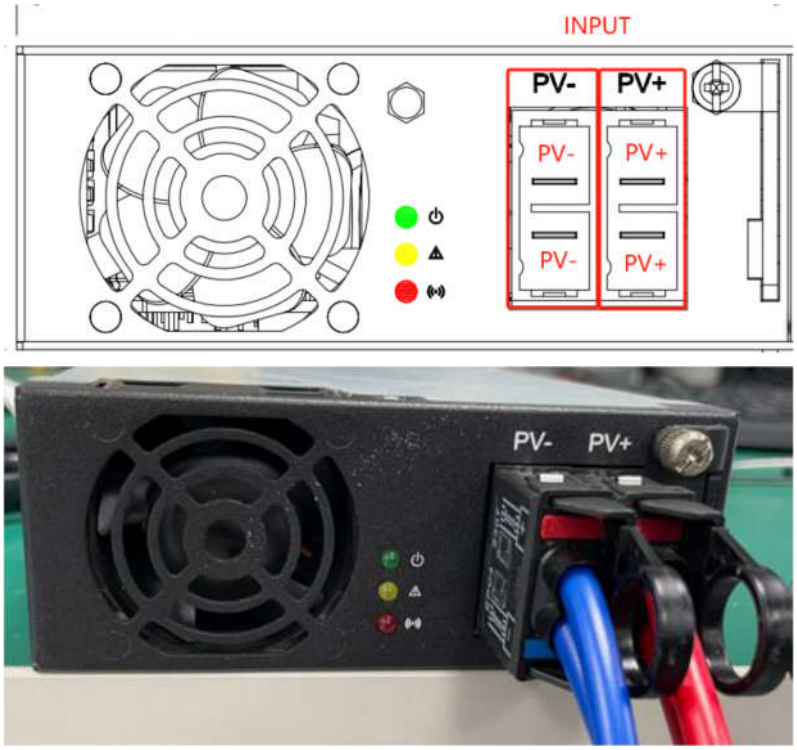
CAUTION

1. There is a danger of high current when operating the battery. When connecting battery cables, make sure all battery circuit breakers are disconnected. Before connecting the power system to the battery pack, disconnect the corresponding battery circuit breaker or the single battery connector in the battery pack. Otherwise, the power system will be charged after installation.
2. The polarity of the connection between the two ends of the battery cable must be the same, otherwise it will damage the battery and power system!

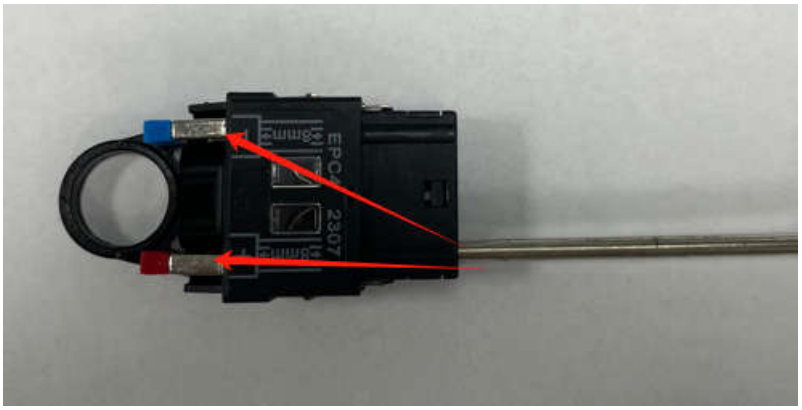


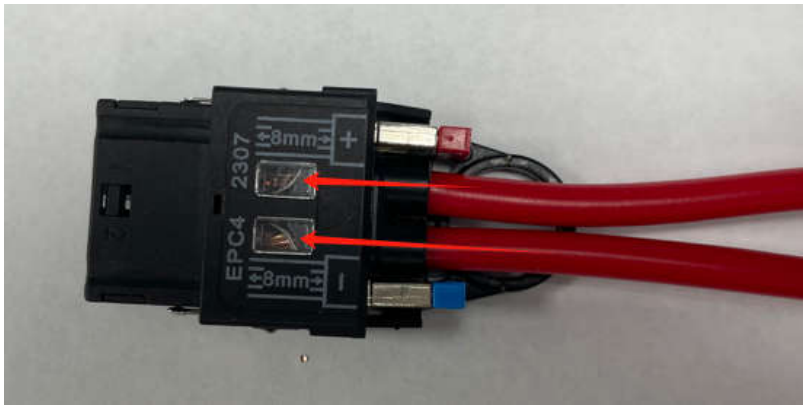
Connect PV system to solar module (if applicable)

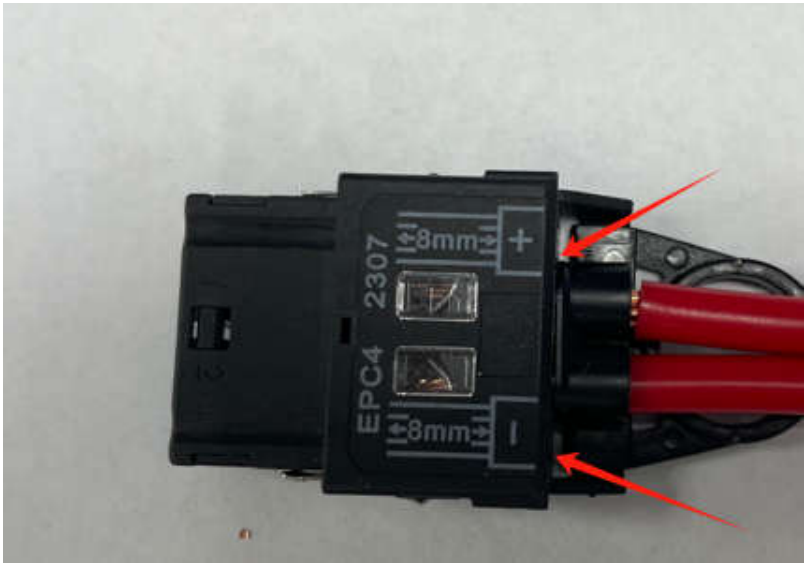
1. Connect wiring from the PV+ and PV- inputs from the solar system to the provided terminals. The recommended cable size is 4mm² (11 AWG), AC input voltage range : 70 ~ 150 Vdc



2. Select one of the terminals for the positive or negative wire connection. Use a flathead screwdriver to push out the sliders, insert the wires into the channels until they are visible through the window, and then push the sliders back into position.



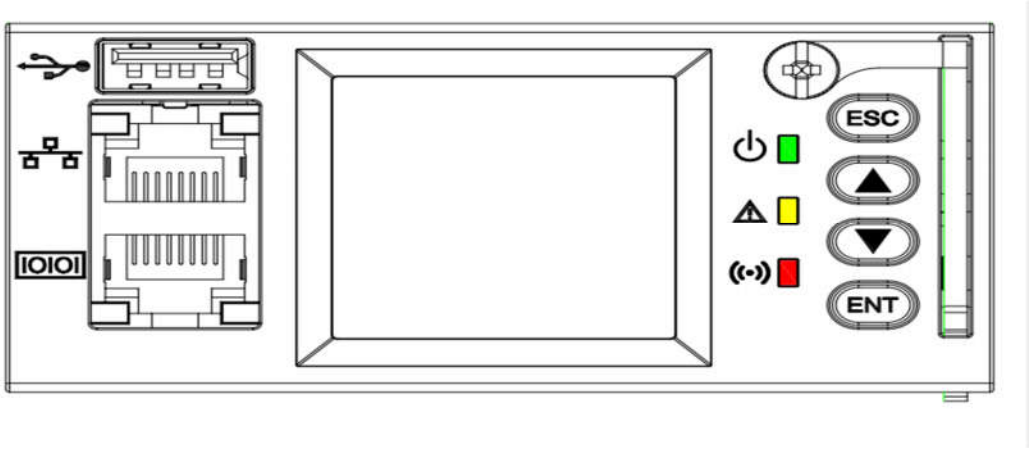




3. If the solar panel input voltage is between 70Vdc and 150Vdc, the module will operate and supply 48Vdc to the power system when it receives sunlight

2.4 Connecting signal lines

The front panel of the monitoring module DS-PMU-01 includes a display screen, four buttons and two RJ45 heads.



Monitoring Module Indicator Status

Indicator Labels	Color	Normal State	Abnormal State	Abnormal Cause
Operating Indicator Light	Green	On	Off	No working power supply
Warning Indicator Light	Yellow	Off	On	General warning
Emergency Warning Indicator Light	Red	Off	On	Serious warning in the power system

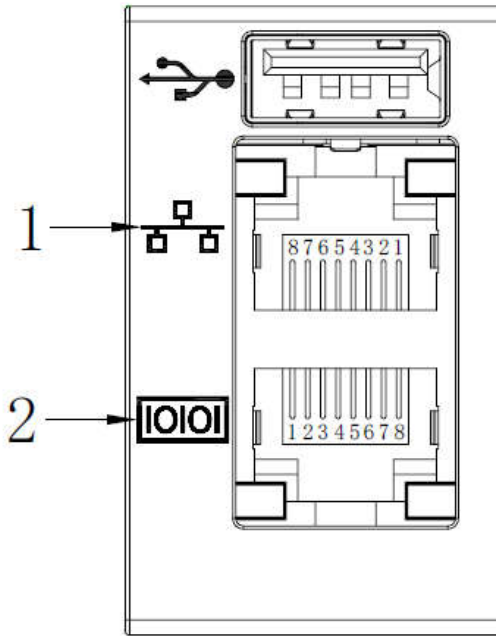
Monitoring module includes a 52×37.5 LCD display unit with 4 function operation keys, with a user interface that is simple and intuitive. The monitoring module panel is easy to disassemble and replace when needed.

Note: All parameters in the monitoring are set as follows: decimal place, one place, ten place

When setting parameters, press the "Confirm" key, the initial cursor will hover over the decimal place, then press the "back" key to set the parameters in the ones place, and then press the "back" key continuously to set the parameters in the higher place.

Monitor module operation key description table

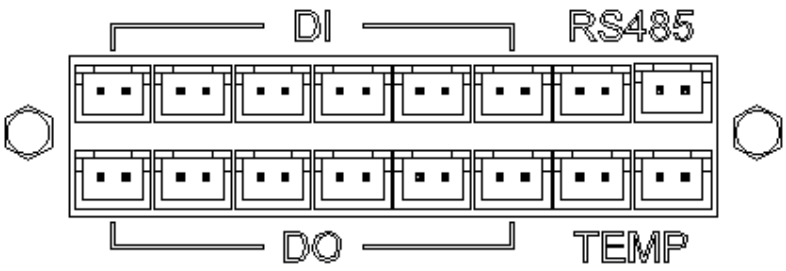
Key identification	Key name	Features
ESC	Return key	Return to the parent menu.
ENT	Confirm key	"Next Level Menu" or "Confirm" action. Press ENT to enter the editing state while modifying or entering parameters. After any setting is modified, you need to press the "ENT" key to confirm it before it takes effect
▲	Page up key	Press the up or down page key to flip through the flat menu interface of another page; When the value of the interface option is a string, press the up or down page key to change its selected value. On the first screen of the system information screen, you can press the up page flip key to enter the current alarm screen, and press the down page flip key to enter the historical alarm screen.
▼	Scroll down key	



1 Network Port								
Serial number	1	2	3	4	5	6	7	8
Definitions	TX+	TX-	RX+	/	/	RX-	/	/

2 Communication Port								
Serial number	1	2	3	4	5	6	7	8
Definitions	RS485_4B	RS485_4A	DGND	DGND	DGND	DGND	RS485_1B	RS485_1A

The signal terminals are shown below:



On the front panel there are 6 DI, 6 DO, 2 temperature sampling and 2 reserved 485 (can be configured as needed)

System Configuration

This chapter describes how to energize the power system after it is installed. Commissioning should always be performed by qualified personnel, compliant with all safety warnings and corresponding safety regulations.

3.1 Check Installation and Power On

Ensure that the AC input circuit breaker, the mains input circuit breaker of the rectifier module, and the load circuit breaker are disconnected, and that all devices are properly installed. Check the power supply system item by item according to the items listed below.

Pre-Inspection Checklist

	Verified	Remarks
• All circuit breakers and cable models of the system are correct		
• The system is grounded correctly and reliably, and the input/output cables are connected correctly and reliably		
• The number and connection of single batteries are correct, and the polarity of the battery pack is correct		
• All connections are firm and reliable		
• Communication and alarm cables are all connected to the monitoring module, and if the system is equipped with a temperature sensor, make sure the sensor is properly installed		

Start Up Preparation Checklist

	Verified	Remarks
• All circuit breakers have been disconnected		
• Measure the AC input voltage of the system to ensure that the voltage value is within the rated input range of the system		Umin= V
• Before installing the battery string, ensure that at least one short circuit copper bar connected to the battery string is not connected to prevent short circuit caused by short circuit of the positive and negative terminals		
• Install the last unconnected battery connection in all battery packs		
• Use a voltmeter to measure each battery connection and make sure the battery is polarity correct. For a lead-acid battery containing 24 cells, the voltmeter should read 2.0 to 2.1V/ cell or 48 to 51V/ cell. If the voltage reading of a single cell is lower than 2.0V, the single cell must be replaced		Umin= V
• Check with an ohmmeter to confirm that there is no short circuit between the positive and negative DC output bus or between the positive and negative battery terminals (take care to remove all modules before measurement and restore them after measurement)		

Start Up

	Verified	Remarks
• Close the AC input circuit breaker of the system and close the input circuit breaker of one rectifier module. The green LED on the rectifier module will light up and the fan will start to rotate. After a delay, the monitoring module displays an output voltage of 53.5V • Check the bus polarity and system voltage with a voltmeter. The error between the measured value and the displayed value should not exceed ±0.3V • Turn on and off each rectifier module in the power system by turning on and off the rectifier module input circuit breaker. Measure the output voltage of the rectifier module		

3.2 Set Basic Parameters

When the power system runs for the first time, the system setting of the monitoring module must be completed according to the actual configuration of the system and the number of battery packs configured by the user, the nominal capacity and the charging current limit point and other functional requirements. Then, the normal operation of the system operation information display and output control can be carried out. To change the parameter Settings, you need to go to the main menu→Parameter Settings (password: 20000) →battery parameters →basic parameters, set "Management mode" to "Manual", and then return to the sub-menus under parameter Settings to set parameters (except for special instructions).

	Verified	Remarks
• The system type has been set before the product leaves the factory. Check whether the setting is consistent with the actual system (the system type is: 48/75A/225/AUTO). • Set the monitoring module based on the actual number of battery strings connected. Default value: group 1 • Set the monitoring module based on the actual total capacity of battery strings. Default value: 100Ah • Set the monitoring module based on the battery manufacturer's requirements. The temperature compensation coefficient ranges from 0 to 500mV/℃. Default value: 72mV/ ° C. (This parameter is not available if no temperature sensor is configured.) • Set the monitoring module. Charging current limit point range: 0.1 ~ 0.25C10. Default value: 0.1C10 • Set the monitoring module based on the voltage recommended by the battery supplier. • Floating charging voltage: 42V ~ equalizing charging voltage, default: 54V; Equalized charging voltage: floating charging voltage 58V. Default value: 55V • For non-equalized batteries, the equalized charge voltage can be set to 0.1V higher than the floating charge voltage • Use a multipurpose table to measure the battery voltage and record. Go to the main menu → Control Output (Password: 200000) → Module voltage regulator sub-menu, set the output voltage of the rectifier module to the actual voltage of the battery, and insert the battery melt core. Then the output voltage of the rectifier module is set to 53.5V • Go to the Basic parameter submenu and set Management Mode to Automatic.		

3.3 Check Alarms Status

Check Alarms

Check whether each function unit can trigger alarms and whether the alarms are displayed on the cabinet monitoring module.

	Verified	Remarks
• When a rectifier module is removed, a Communication interruption alarm for Module N is generated. If the rectifier module is connected again, the alarm is cleared automatically. Check the other rectifier modules in the same way • If a battery circuit breaker is disconnected, the Battery Branch Fault alarm is generated. If the circuit breaker is connected, the alarm is cleared. Use the same method to test other battery circuit breakers • If one of the loaded DC output branches is disconnected, the Load or auxiliary load branch N alarm is generated. If the branch is connected, the alarm is cleared. Test other load branches in the same way • Turn off all battery circuit breakers and keep only one rectifier module working. Adjust the floating charge voltage of the rectifier module by using the monitoring module to make it lower than the alarm point. Then the system generates the DC Output Undervoltage alarm • If the rectifier module is working, set the battery management parameter of the monitoring module to Manual, go to the output control menu of the monitoring module, select Battery Power Off, and confirm that the battery protection contactor should be disconnected. The monitoring module displays the Battery protection alarm. Use the same method to test the load power-off function • If the varistor of the AC SPD is removed, the SPD Fault alarm is triggered. If the varistor of the AC SPD is inserted, the alarm is cleared • Note: This alarm will be generated about 3s after the preceding alarm is triggered. The method of querying alarm information in the monitoring module is specified		

3.4 Check System Run Status

Verify the system works properly and no alarm is generated. You can check whether the system is running properly by using the monitoring module.

	Verified	Remarks
• The system type is 48V, 75A, or 300AUTO		
• The AC voltage displayed on the monitoring module is correct		
• The difference between the DC voltage displayed by the monitoring module and the actual voltage should not exceed ±0.3V		
• The difference between the battery current displayed by the monitoring module and the actual value is less than 1%		
• The number of rectifier modules displayed on the monitoring module is consistent with the actual number of rectifier modules installed		
• The voltage, current, and current limiting value of any rectifier module displayed by the monitoring module are consistent with the set value and the actual value		
• For a system configured with a temperature sensor, the battery and ambient temperature displayed by the monitoring module are normal. Pinch the probe of the temperature sensor with your hand, and the temperature display value changes		

3.5 Post Installation Activities

	Verified	Remarks
• Make sure the system is clean of debris		
• Fill in and submit equipment installation report		
• Fill in the parameter table on the cabinet door		

Troubleshooting

This chapter describes the measures to be taken when a system alarm occurs and the routine maintenance of the power system. When maintaining a power supply device, the maintenance personnel must have sufficient knowledge of the power system.

4.1 Alarm Handling

The monitoring module divides alarm types into four levels: major alarm, critical alarm, minor alarm, and no alarm.

Major alarm or critical alarm: This type of alarm seriously affects the operating performance of the power supply system. Users are required to handle the alarm immediately no matter when it occurs. The monitoring module lights the alarm indicator and generates an audible alarm.

General alarm: After this type of alarm occurs, the power system can temporarily maintain the normal DC output. If it occurs during the on-duty time, it requires immediate measures to deal with it. If it does not occur during the on-duty time, it requires handling at the beginning of the on-duty time. The monitoring module only lights the alarm indicator. No alarm: If this type of alarm is set to No alarm by the user, the system can run normally without any sound and light indication when this type of alarm is generated.

Table 6-1 describes how to handle common alarms of the power supply system.

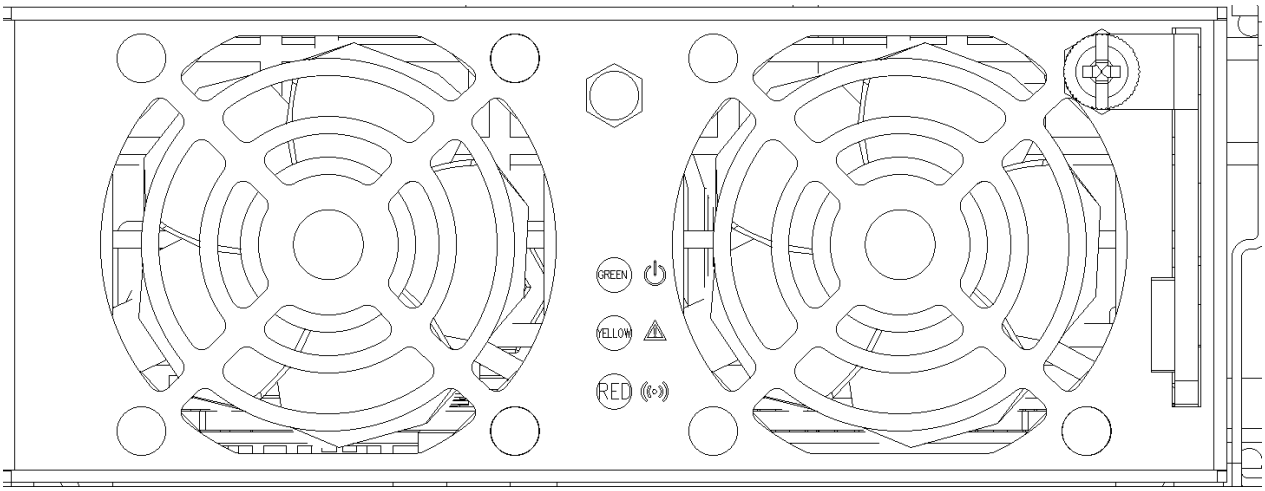
Serial Number	Alarm Name	Treatment method
1	AC outage	When the power failure time is not long, the DC power supply is borne by the battery. If the cause of the power failure is unknown or the time is too long, it is necessary to start the oil generator to generate electricity. It is recommended that you switch the power supply to the power supply system after the generator starts for at least 5 minutes to minimize the impact on the power supply during the transition process
2	AC overpressure	Whether the set value is too low, if too low should be changed. General overvoltage does not affect the system work, when the mains voltage is greater than 305V, the rectifier module will stop working. Therefore, for the long-term overvoltage power supply network, it is necessary to negotiate with the relevant power network maintenance personnel to improve the grid

Serial Number	Alarm Name	Treatment method
3	AC undervoltage	Whether the set value is too high, if too high should be changed. If the mains voltage is lower than 176V, the rectifier module will limit the power output, and if it is lower than 80V, it will stop working. Therefore, for the long-term undervoltage power supply network, it is necessary to negotiate with the relevant power network maintenance personnel to improve the grid
4	The surge Arrester is faulty	Check the SPD. If the SPD is damaged, replace it
5	DC overvoltage alarm	1. Check the DC output voltage and the DC Overvoltage Alarm set value of the monitoring module. If the set value is incorrect, change it. 2. Locate the rectifier module that causes the overvoltage alarm. Turn off AC input switches of all rectifier modules when the battery can supply power normally. Then, turn on the AC input switches of the modules one by one. If the overvoltage alarm occurs again when the AC input switch of a module is turned on, the module is overvoltage. Replace the module
6	Dc Undervoltage alarm	1. Check the DC output voltage and the DC Undervoltage Alarm setting of the monitoring module. If the setting is incorrect, change it. 2. Check whether the mains power is cut off. If the power is cut off, disconnect part of the load to extend the working time of the entire power system. 3. Check whether a rectifier module is out of operation, that is, no output current. If yes, replace the module. 4. Check the total load current. If the total load current exceeds the total output current of the rectifier module during floating charging, remove part of the load or add a rectifier module so that the total current of the rectifier module exceeds 120% of the total load current, and at least one rectifier module is redundant
7	The load branch is disconnected and the battery branch is disconnected	Check whether the branch circuit breaker is off (check the position of the circuit breaker handle). If disconnected, find the cause and troubleshoot. Otherwise, the alarm loop is faulty. Contact Emerson
8	Battery protection	1. Check whether the mains power is off, the battery voltage drops below the set value of battery protection voltage, or the discharge time reaches the set value of battery Protection time. 2. Whether to manually control battery protection
9	Module failure	At this point, the red light-emitting diode on the panel of the rectifier module lights up. Cut off the AC input of the rectifier module and restart the module after a period of time. If the alarm persists, replace the module

Serial Number	Alarm Name	Treatment method
10	Module protection	Check whether the mains voltage is higher than the AC overvoltage point (305V) or lower than the AC undervoltage point (80V) of the rectifier. Therefore, for long-term overvoltage or undervoltage power supply networks, it is necessary to negotiate with the relevant power network maintenance personnel to improve the grid
11	Module fan failure	Check whether the fan of the rectifier module is running. If the fan does not work, check whether the fan is blocked. If yes, clear the fan. If the fan is not blocked or the fault persists after cleaning, replace the fan.
12	Module communication interruption	Check whether the communication between the rectifier module and the monitoring module is normal. If yes, restart the module. If the alarm persists, replace the module
13	The battery Temperature is high	Check whether the battery overheats due to internal faults. If yes, replace the faulty battery. Check whether the battery room temperature is too high. If yes, lower the battery room temperature

4.2 Rectifier Module Faults

The common faults of the rectifier module are as follows: the green indicator (power indicator) is off, the yellow indicator (protection indicator) is on, the yellow indicator is shining, the red indicator (fault indicator) is on, and the red indicator is shining.



Troubleshooting method of rectifier module

Anomaly	Related monitoring alarms	Abnormal cause	Handling suggestion
Green light off	No alarm	No input/output voltage	Make sure there is input and output voltage
		The auxiliary power supply of the module is faulty	Replace the abnormal module with the normal module. If the abnormal

Anomaly	Related monitoring alarms	Abnormal cause		Handling suggestion
				module still does not work properly, replace the module
Green light shining	No alarm	The background monitor operates the module		
Yellow light	Module temperature is too high	The module is protected from overheating. The main reasons are:	Fan obstruction	Remove objects that impede the operation of the fan
			Air duct is not smooth: there are obstructions in the intake or outlet	Remove obstructions from the intake or outlet
			The ambient temperature is too high or a heat source is too close to the module air inlet	Reduce ambient temperature or remove heat source
	Module protection	Modular non-uniform flow		Check whether the communication between modules is normal. If the communication between modules is abnormal, check whether the communication cables are connected properly. If the communication is normal and the fault persists, replace the faulty module
		PFC output overvoltage/undervoltage protection		Replace the abnormal module with the normal module. If the abnormal module still does not work properly, replace the module
		The AC input voltage exceeds the normal range		Ensure that the AC input voltage is in the normal range
Yellow light shining	Module communicatio n interruption	Module communication interruption		Check whether the communication cable is properly connected
Red light	Module failure	Module overvoltage		Remove the module and restart it. If the overvoltage protection continues, replace the module
	Module failure	Two or more modules with the same ID exist on the same system		Contact the supplier for maintenance
	The system current is unbalanced	Module current seriously uneven flow (current imbalance > ± 5%)		Check whether the communication between modules is normal. If the communication between modules is abnormal, check whether the communication cables are connected properly. If the communication is

Anomaly	Related monitoring alarms	Abnormal cause	Handling suggestion
			normal and the fault persists, replace the faulty module
Red lamp	Module fan fault	Fan fault	Replace a new fan