

# PDU48/300DUI 智能 DCDU 插框 用户手册

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# PDU48/300DUI Intelligent DCDU Power Subrack User Manual

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# Safety Precautions

To reduce the chance of accident, please read the safety precautions very carefully before operation. The "Caution, Notice, Warning, Danger" in this book do not represent all the safety points to be observed, and are only supplement to various safety points. Therefore, the installation and operation personnel must be strictly trained and master the correct operations and all the safety points before actual operation.

When operating Vertiv products, the safety rules in the industry, the general safety points and special safety instructions specified in this book must be strictly observed.

## Electrical Safety

### I. Hazardous voltage

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Danger

Some components of the power system carry hazardous voltage in operation. Direct contact or indirect contact through moist objects with these components will result in fatal injury.

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Safety rules in the industry must be observed when installing the power system. The installation personnel must be licensed to operate high voltage and AC power.

In operation, the installation personnel are not allowed to wear conductive objects such as watches, bracelets, bangles, rings.

When water or moisture is found on the Subrack, turn off the power immediately. In moist environment, precautions must be taken to keep moisture out of the power system.

"Prohibit" warning label must be attached to the switches and buttons that are not permitted to operate during installation.

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Danger

High voltage operation may cause fire and electric shock. The connection and wiring of AC cables must be in compliance with the local rules and regulations. Only those who are licensed to operate high voltage and AC power can perform high voltage operations.

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### II. Tools

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Warning

In high voltage and AC operation, special tools must be used. No common or self-carried tools should be used.

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### III. Thunderstorm

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Danger

Never operate on high voltage, AC, iron tower or mast in the thunderstorm.

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In thunderstorms, a strong electromagnetic field will be generated in the air. Therefore the equipment should be well earthed in time to avoid damage by lightning strikes.

## IV. ESD

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### Notice

The static electricity generated by the human body will damage the static sensitive elements on PCBs, such as large-scale ICs. Before touching any plug-in board, PCB or IC chip, ESD wrist strap must be worn to prevent body static from damaging the sensitive components. The other end of the ESD wrist strap must be well earthed.

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## V. Short circuit

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### Danger

During operation, never short the positive and negative poles of the DC distribution unit of the system or the non-grounding pole and the earth. The power system is a constant voltage DC power equipment, short circuit will result in equipment burning and endanger human safety.

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Check carefully the polarity of the cable and connection terminal when performing DC live operations.

As the operation space in the DC distribution unit is very tight, please carefully select the operation space.

Never wear a watch, bracelet, bangle, ring, or other conductive objects during operation.

Insulated tools must be used.

In live operation, keep the arm muscle tense, so that when tool connection is loosened, the free movement of the human body and tool is reduced to a minimum.

## VI. Dangerous energy

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### Warning

More than 240VA system capacity, keep away from hazardous energy and avoid bridge connection.

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## Battery

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### Danger

Before any operation on battery, read carefully the safety precautions for battery transportation and the correct battery connection method.

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Non-standard operation on the battery will cause danger. In operation, precautions should be taken to prevent battery short circuit and overflow of electrolyte. The overflow of electrolyte will erode the metal objects and PCBs, thus causing equipment damage and short circuit of PCBs.

Before any operation on battery, pay attention to the following points:

Remove the watch, bracelet, bangle, ring, and other metal objects on the wrist.

Use special insulated tools.

Use eye protection device, and take preventive measures.

Wear rubber gloves and apron to guard against electrolyte overflow.

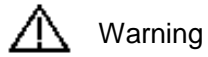
In battery transportation, the electrode of the battery should always be kept facing upward. Never put the battery upside down or slanted.

Battery installation requires reliable grounding. And battery is connected before accessing the battery protection device.

## Others

### I. Sharp object

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When moving equipment by hand, protective gloves should be worn to avoid injury by sharp object.

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### II. Cable connection

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Please verify the compliance of the cable and cable label with the actual installation prior to cable connection.

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### III. Binding the signal lines

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The signal lines should be bound separately from heavy current and high voltage lines, with binding interval of at least 150mm.

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# Chapter 1 Overview

This chapter introduces model instruction and composition, technical specification, and features of the power system. The 'Power system' in this manual refers to the PDU48/300DUI subrack power system.

## 1.1 Model Instruction and Composition

### Model instruction

There are five basic configurations for the power system: PDU48/300DUI-S1, PDU48/300DUI-S2, PDU48/300DUI-S3, PDU48/300DUI-S4 and PDU48/300DUI-S5. Take PDU48/300DUI-S1 as an example, the model instruction is shown in Figure 1-1.

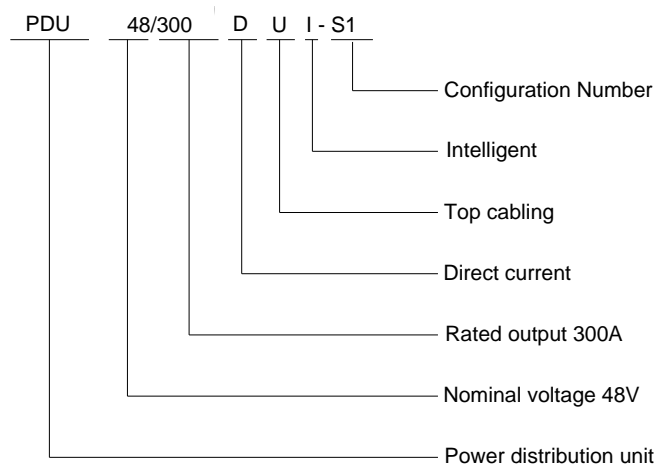


Figure 1-1 Model instruction

### Configuration

There are five basic configurations for the power subrack. The appearances of PDU48/300DUI-S1, PDU48/300DUI-S2 and PDU48/300DUI-S3 are the same. Take PDU48/300DUI-S1 power subrack as an example, the appearance of the power system is shown in Figure 1-2.

The appearances of PDU48/300DUI-S4 and PDU48/300DUI-S5 are the same, see Figure 1-3.

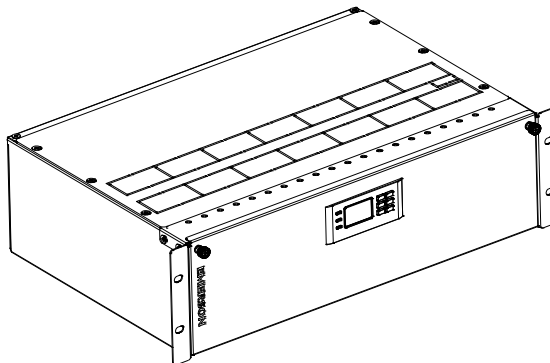


Figure 1-2 Appearance of PDU48/300DUI-S1

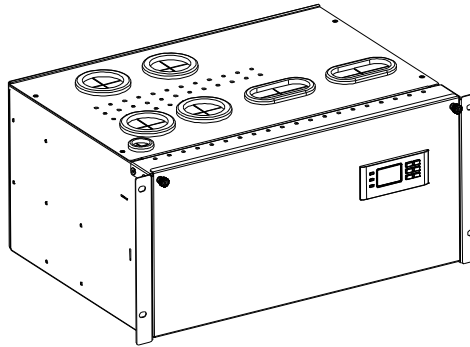


Figure 1-3 Appearance of PDU48/300DUI-S4

## 1.2 Technical Specification

The technical specifications of the power system are listed in Table 1-1.

Table 1-1 Technical specification of the power system

Parameter	Description		
Operating temperature	-5°C ~ +40°C		
Storage temperature	-40°C ~ +70°C		
Relative humidity	5%RH ~ 95%RH		
Altitude	≤ 2000m (derating is necessary above 2000m)		
Others	No conductive dust or erosive gases. No possibility of explosion		
Input voltage range	43.2Vac ~ 57.6Vac		
DC output configuration	PDU48/300DUI-S1 PDU48/300DUI-S2	LLVD: 63A×5 BLVD: 63A×2+16A×4+10A×4	
	PDU48/300DUI-S3	LLVD: 32A×12+6A×1 BLVD: 16A×4+10A×2	
	PDU48/300DUI-S4 PDU48/300DUI-S5	LLVD:160A×2 BLVD:100A×2	User1,2
		LLVD: 63A×1,32A×1 BLVD: 16A×2	User 3
Output voltage	42.3Vdc ~ 57.6Vdc, nominal voltage: 48Vdc		
Output current	BLVD current≤80A, LLVD current≤220A		
Dimensions	PDU48/300DUI-S1 PDU48/300DUI-S2 PDU48/300DUI-S3	485mm(W) × 132mm(D) × 133mm(H)	
	PDU48/300DUI-S4 PDU48/300DUI-S5	485mm(W) × 250mm(D) × 133mm(H)	
Weight	PDU48/300DUI-S1 PDU48/300DUI-S2 PDU48/300DUI-S3	About 9kg	
	PDU48/300DUI-S4 PDU48/300DUI-S5	About 13kg	
Note: PDU48/300DUI-S5 has a LLVD contactor			

## 1.3 Features

- The power consumption for each user can be calculated independently.
- The power system can be installed in a standard 19-inch rack or on a wall.
- The power system (for 3 users) supports top cabling or rear cabling, being suitable for narrow place.
- The power system is of network design. Providing multiple communication ports (such as RS232, modem, Ethernet and dry contacts), which enables flexible networking and remote monitoring.
- The power system has perfect lightning protection at DC side.
- The power system has complete fault protection and fault alarm functions. It can communicate with superior monitoring device thru RS485 port.

## Chapter 2 Installation Instruction

### 2.1 Safety Regulation

Certain components in this power system carry hazardous voltage and current. Always following the instructions below:

1. Only the adequately trained personnel with satisfactory knowledge of the power system can carry out the installation. The most recent revision of these safety rules and local safety rules in force shall be adhered to during the installation.
2. All external circuits that are below 48V and connected to the power system must comply with the requirements of SELV as defined in IEC 60950.
3. Make sure that the power (mains and battery) to the system is cut off before any operations can be carried out within the system cabinet.
4. The power cabinets shall be kept locked and placed in a locked room. The key keeper should be the one responsible for the power system.
5. The wiring of the power distribution cables should be arranged carefully so that the cables are kept away from the maintenance personnel.

### 2.2 Preparation

#### Unpacking inspection

The equipment should be unpacked and inspected after it arrives at the installation site. The inspection shall be done by representatives of both the user and Vertiv Tech Co., Ltd.

To inspect the equipment, you should open the packing case, take out the packing list and check against the packing list that the equipment is correct and complete. Make sure that the equipment is delivered intact.

#### Cables

The cable should be selected in accordance with relevant industry standards.

It is recommended to use the RVVZ cables as AC cables. The cable should reach at least +70°C temperature durability. With cable length shorter than 30 meters, the Cross-Sectional Area (CSA) calculation should be based on the current density of 3.5A/mm<sup>2</sup>. The suggested CSA value is no less than the Table 2-1.

Table 2-1 AC cable CSA selection

AC MCB rated current	Min cable CSA	Max cable CSA
300A	50mm <sup>2</sup> x2	PDU48/300DUI-S1, PDU48/300DUI-S2, PDU48/300DUI-S3
380A	50mm <sup>2</sup> x2	PDU48/300DUI-S4, PDU48/300DUI-S5

The CSA of DC cable depends on the current flowing through the cable and the allowable voltage drop. To select the load cable CSA, see Table 2-2.

Table 2-2 Selection of Load cable CSA

Load route rated current	Max. allowable current	Min. cable CSA	Max. cable length (voltage drop: 0.5V, with min. CSA)	Max. cable CSA	Max. cable length (voltage drop: 0.5V, with max. CSA)
160A	100A	35mm <sup>2</sup>	9m	50mm <sup>2</sup>	12m
100A	50A	25mm <sup>2</sup>	12m	50mm <sup>2</sup>	25m
63A	40A	16mm <sup>2</sup>	10m	25mm <sup>2</sup>	14m
32A	25A	10mm <sup>2</sup>	11m	25mm <sup>2</sup>	29m
16A	12A	6mm <sup>2</sup>	14m	25mm <sup>2</sup>	48m

Note: The specs are applicable at ambient temperature of 25°C. If the temperature is higher than this, the CSA of the cable should be increased

To prevent the air switching capacity is too large, the load doesn't work when overload. Recommended the capacity of the air switching is up to 1.5~2 times of the load peak.

The CSA of the system grounding cables should be consistent with the largest power distribution cables. The CSA value is no less than 25mm<sup>2</sup>.

For AC distribution, DC distribution interface definition, see Table 2-3.

Table 2-3 AC distribution, DC distribution interface definition

Connector name		Connector specifications	Wiring instruction
Input power distribution	Input busbar	M8 bolt, OT type wiring terminal, max. cable CSA 50mm <sup>2</sup>	Connected to the superior output interface
	Grounding busbar	One M8 bolt, OT type wiring terminal, max. cable CSA 35mm <sup>2</sup>	Connected to the grounding bar of the building
	Negative output fuse	M8 bolt, OT type wiring terminal, max. cable CSA 50mm <sup>2</sup>	Connected to the users negative load port
	Negative output MCB	H type terminal, max. cable CSA 25mm <sup>2</sup>	Connected to the users negative load port
	Positive busbar	Terminal subrack terminal: cable CSA ≤ 50mm <sup>2</sup>	Connected to the users positive load port

## 2.3 Mechanical Installation

### Note

1. The cabinet or rack that installed in the subrack must provide fireproof and electric protection casing, or install in cement or other difficult to burn, at the same time keep enough distance to other combustible material.
2. For the convenience of maintenance, users should maintain a clearance of 800mm at the front of the power system.

### Rack installation

Insert the power subrack to the rail, and use M6 screws to fasten the power subrack and the rail through the hangers, as show in Figure 2-1.

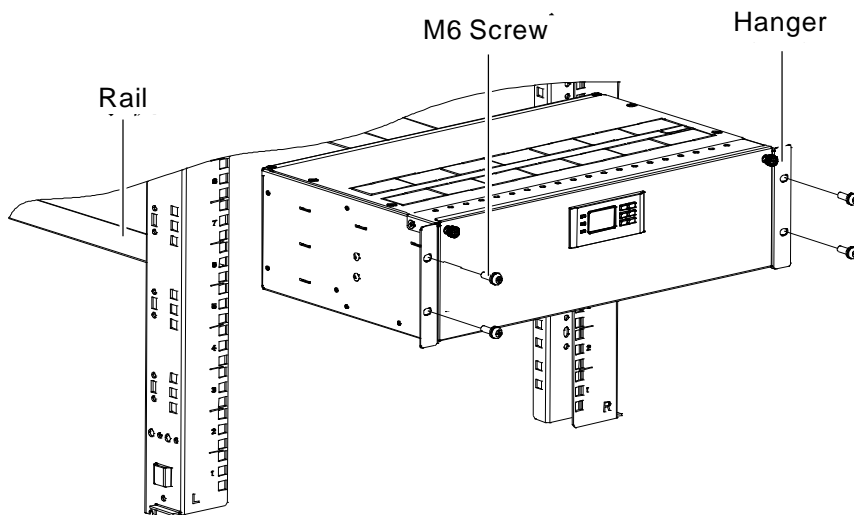


Figure 2-1 Cabinet or rack installation

### Wall-mounted installation

Two wall-mounted methods are available for the subrack: horizontal and vertical.

1. Mark the specific installation position of the power subrack.

Two fixed supports of the power subrack are used to fix the power subrack onto the wall. The installation hole dimensions is shown in Figure 2-2 (unit: mm). Mark the exact central points of the installation holes according to the positions of the installation holes on the supports with a pencil or an oil pen.

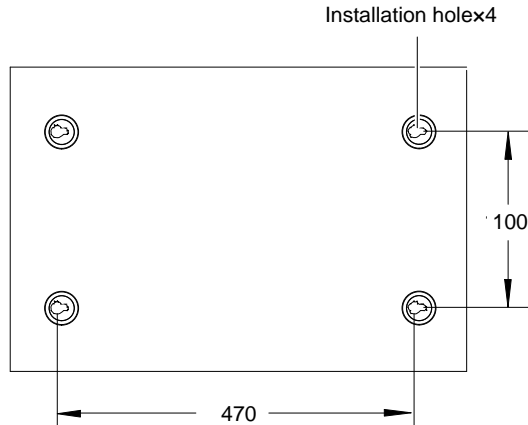


Figure 2-2 Wall-mounted installation dimension

2. Dig the installation holes.

The required expansion bolt is M6. Take the  $\phi 10.5$  aiguille to dig the installation holes at the marked points.

3. Install expansion bolts.

Clean the dust and put the expansion bolts into the installation holes. Hit the expansion bolts gently with a hammer to make the top at the same level with the wall.

4. Install the power subrack.

Two wall-mounted methods are shown in Figure 2-3 and Figure 2-4.

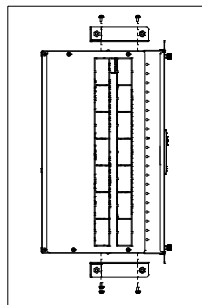


Figure 2-3 Wall-mounted installation (Method 1)

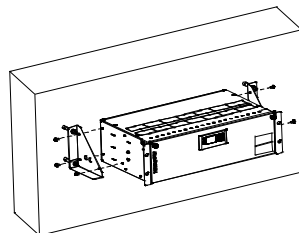



Figure 2-4 Wall-mounted installation (Method 2)

Use the nuts with plain washer and spring washer to fix the power subrack onto the wall.

## 2.4 Electrical Installation



1. Switch off all MCBs and fuses before the electrical connection.
2. Only the qualified personnel shall do the power cable connection.

 **Note**

For the space limitation of a certain installation method, user should connect the cables to the subrack first, and then install the power subrack.

## 2.4.1 Power System Cabling Method

### Cabling from the top of the power system

PDU48/300DUI-S1, PDU48/300DUI-S2 and PDU48/300DUI-S3 only support top cabling mode, see Figure 2-5. PDU48/300DUI-S4 and PDU48/300DUI-S5 support both top and rear mode. For the top cabling mode of PDU48/300DUI-S4 and PDU48/300DUI-S5, see Figure 2-6.

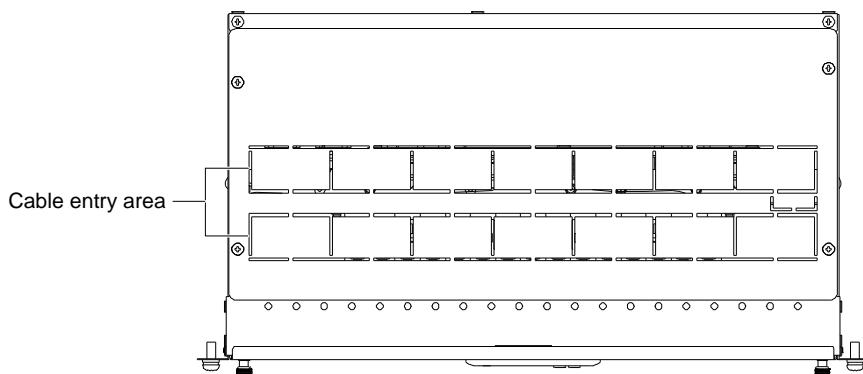


Figure 2-5 Top cabling mode of PDU48/300DUI-S1, PDU48/300DUI-S2 and PDU48/300DUI-S3

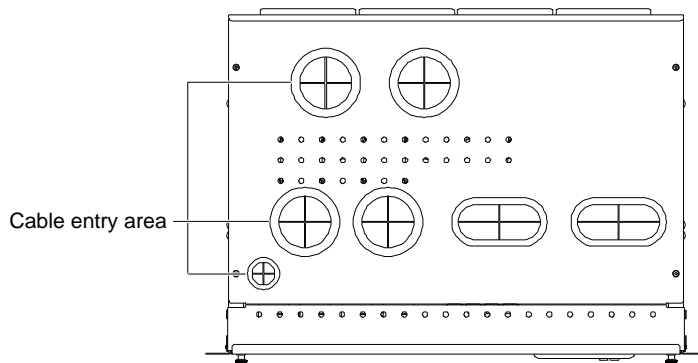


Figure 2-6 Top cabling mode of PDU48/300DUI-S4 and PDU48/300DUI-S5

### Cabling from the rear of the power system

For the rear cabling mode of PDU48/300DUI-S4 and PDU48/300DUI-S5, see Figure 2-7.

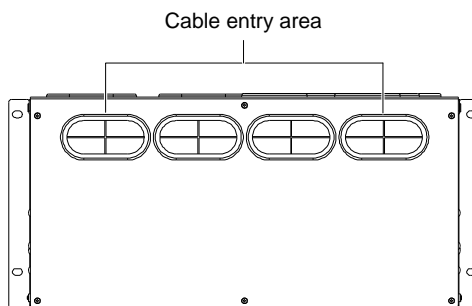


Figure 2-7 Rear cabling mode of PDU48/300DUI-S4 and PDU48/300DUI-S5

## 2.4.2 Connecting Power Cables



**Danger**

1. Switch off all MCBs and fuses before the electrical connection.

2. Only the qualified personnel shall do the power cable connection.

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The position of the connection terminals of the power system are shown in Figure 2-8, Figure 2-9, Figure 2-10. Figure 2-11 and Figure 2-12.

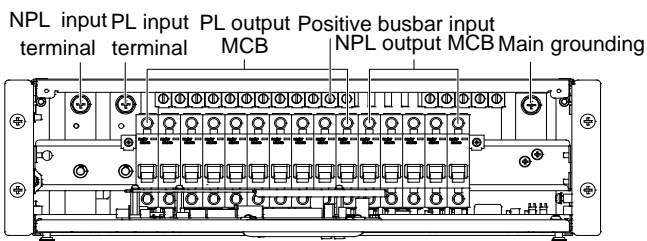


Figure 2-8 Connection terminals of PDU48/300DUI-S1

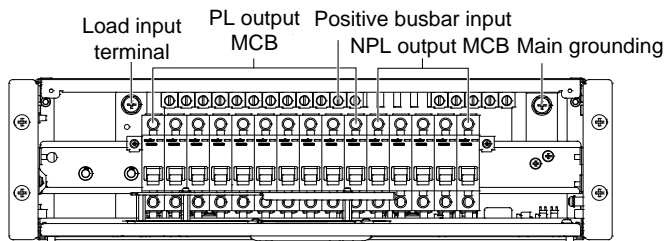


Figure 2-9 Connection terminals of PDU48/300DUI-S2

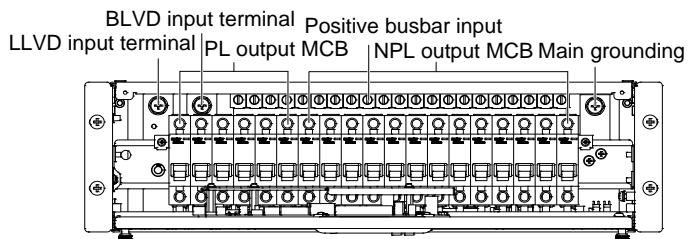


Figure 2-10 Connection terminals of PDU48/300DUI-S3

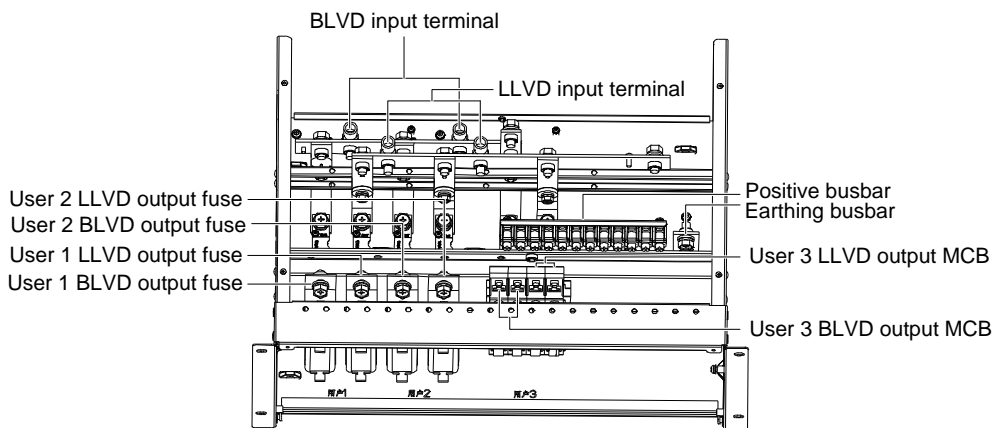


Figure 2-11 Connection terminals of PDU48/300DUI-S4

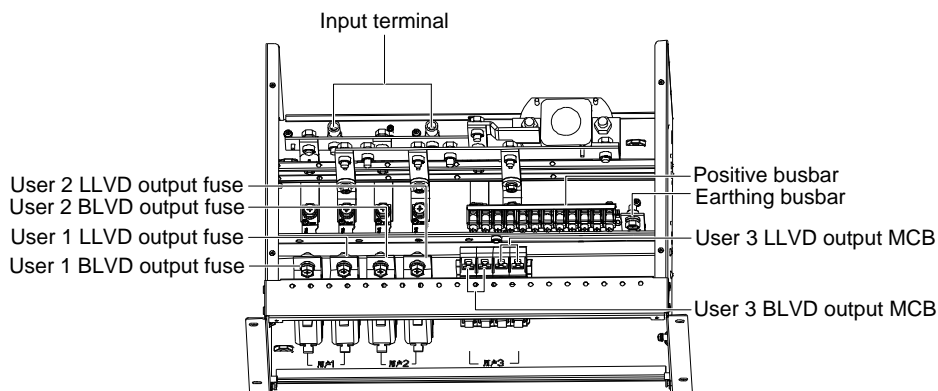


Figure 2-12 Connection terminals of PDU48/300DUI-S5

**Note**

1. Recommended tightening torque of user grounding screw is 10 N\*M.
2. In case system earthing cable lessen, please add another fixing point except for the earthing screw.

**2.4.3 Connecting Signal Cables**

The standard configuration of the system is SMDCU controller, which provides output dry contacts and communication ports. For the five configurations of the power system, the controller is installed in the front door. See the following figure:

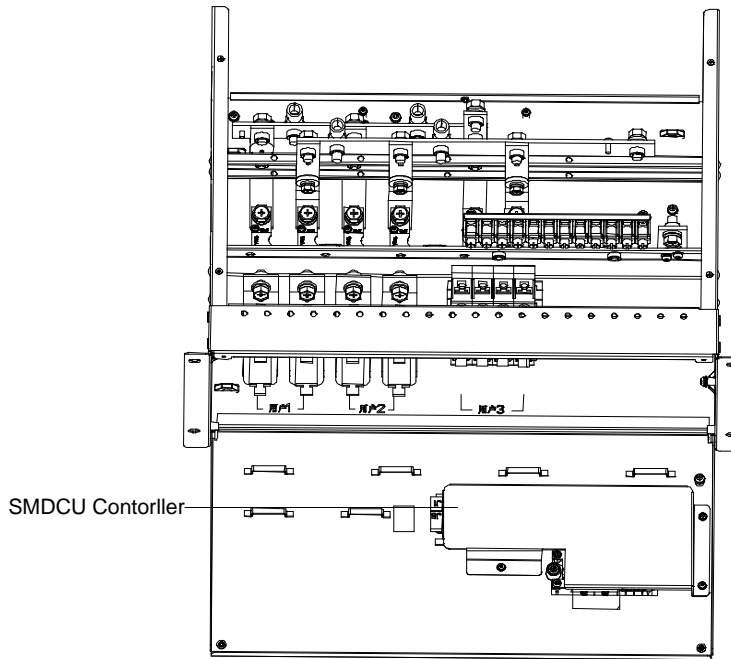


Figure 2-13 Controller position illustration

SMDCU controller provides two dry contact alarm output ports: DO1 and DO2. Digital output dry contact specification of SMDCU controller is as following:

Digital output: relay isolation, max: 30Vdc 1A, 125Vac 0.5A, 60W; Min: 10uA@10Vdc.

The dry contacts definition of M225S controller and M225S1X1 user interface board is shown in Table 2-4

Table 2-4 Dry contact definition

Type	Default alarm	Description
DO1	Major alarm	/
DO2	Observation alarm	/

In the controller normal state, the alarm contacts are always open, when system issues above alarms, related contacts will be closed. All the status changes should be verified by a multimeter. After the alarms are removed, the dry contacts (DO) should back to the open state.

**Connecting Communication Signal Cable**

The communication port of SMDCU controller is shown in Figure 2-14.

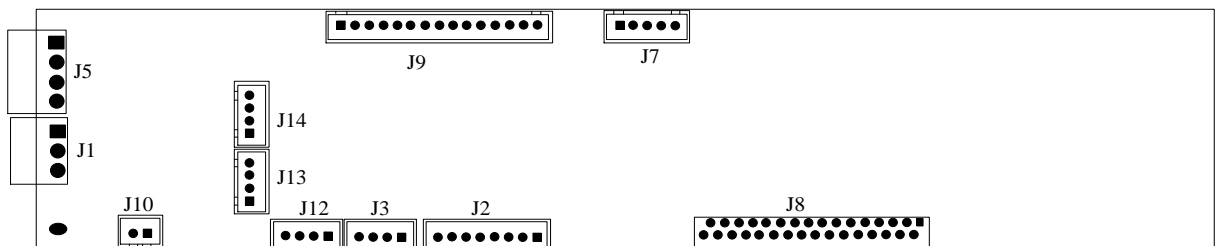


Figure 2-14 SMDCU controller communication port

The functions of the interfaces are shown in Table 2-5.

Table 2-5 Dry contacts definition

Type	Definition	Description
J1	RS485	Connected to upstream equipment
J3	Power interface on the controller board	Connected at factory
J5	Dry contact DO	Connected to signal cable: 1 and 3 are NO, 2 and 4 are COM
J8	LCD screen interface	Connected at factory
J9	Alarm and status detection	Connected at factory
J12 ~ J14	User shunt detection	Connected at factory

Note: Please connect the signal cables according to the silkscreen

## Chapter 3 Commissioning

During installation test, the corresponding safety rules should be adhered to.

### 3.1 Installation Check and Startup

Before the test, inform the chief manufacturer representative. Only trained electrical engineer can maintain and operate this equipment. In operation, the installation personnel are not allowed to wear conductive objects such as watches, bracelets, bangles and rings.

During operation, parts of this equipment carry hazardous voltage. Misoperation may result in severe or fatal injuries and property damage. Before the test, check the equipment to ensure the proper earthing. Installation check must be done before testing. Then the batteries can be charged for the first time.

Make sure that the AC input MCBs, battery MCBs and load MCBs are switched off. Make sure that all the devices are properly installed.

#### Installation check

	OK	Comments
Check all the fuse and cables. Are the models correct?	<input type="checkbox"/>	
Check the busbar connections, input and output cable connection, and connection between the power system and the system grounding	<input type="checkbox"/>	
Make sure all the cables are connected firmly to the controller module.	<input type="checkbox"/>	

#### Startup preparations

	OK	Comments
Make sure that all the MCB are switched off and all the fuses are removed.	<input type="checkbox"/>	
Measure the AC input voltage. Make sure the input voltage is within the allowable range.	<input type="checkbox"/>	U <sub>min</sub> = V
Check that communication and alarm cables are connected to the signal transfer board.	<input type="checkbox"/>	
Check with an ohmmeter that there is no short circuit between the positive & negative distribution bus bars, or between the positive & negative battery poles (Note: Pull out all modules before the check and restore them after the check).	<input type="checkbox"/>	

#### Startup

	OK	Comments
Switch on the superior power output fuse or output MCB.	<input type="checkbox"/>	
Check the system voltage and busbar polarity with a voltmeter. The voltage difference between the measured value and displayed value should be less than $\pm 0.3V$ .	<input type="checkbox"/>	

### 3.2 Basic Settings

When the system is put into service for the first time, the parameters of controller module must be set based on the actual system configuration, such as battery number, capacity, user's charge current limit and other functional requirements. Only after that can the controller module display system operation information and control the output.

	OK	Comments
Set the current limit according to the superior fuse or MCB capacity. Default priority load of PDU48/300DUI-S1/S2/S3 is 150A, default non-priority load is 150A. Default priority load of PDU48/300DUI-S4/S5 is 90A, default non-priority load is 90A. The current limit is recommended to set to 50%~70% of the output nominal capacity.	<input type="checkbox"/>	

### 3.3 Alarm Check And System Operation Status Check

#### System operation status check

There should be no alarms during normal system operation. The system operation status can be conducted through the controller module.

	OK	Comments
The controller should be able to display the DC voltage. The difference between the displayed voltage and that measured at the busbar should be less than $\pm 0.3V$	<input type="checkbox"/>	

### 3.4 Final Steps

	OK	Comments
Make sure that materials irrelevant to the equipment have been all removed.	<input type="checkbox"/>	
Rehabilitate the power equipment and close the cabinet door.	<input type="checkbox"/>	
Fill in the installation report and hand it over to the user.	<input type="checkbox"/>	
Record all the operations in the file , including operation time and operator name	<input type="checkbox"/>	

If any defect is found in this equipment, inform the personnel responsible for the contract.

If repairing is needed, please fill in the FAILURE REPORT and send the report together with the defective unit to the repairing center for fault analysis.

## Chapter 4 Use Of SMDCU Controller

This chapter introduces the operation panel indicators and functional keys of the environment controller briefly, and expounds the main screen contents, access method, system controlling, information querying and parameter setting.

### 4.1 Operation Panel

The operation panel of the SMDCU controller provides the backlit LCD, functional keys and indicators, as shown in Figure 4-1.

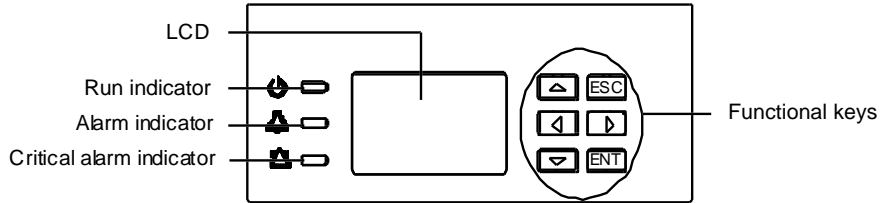


Figure 4-1 Operational panel of the SMDCU controller

The indicators on the operational panel are described in Table 4-1.

Table 4-1 Indicators description of the environment controller

Indicator	Color	Normal state	Fault state	Fault cause
Run indicator	Green	On	Off	No operation power supply
Alarm indicator	Yellow	Off	On	There are observation alarms
Critical alarm indicator	Red	Off	On	There is a major or critical alarm

The controller uses a 128 x 64 LCD unit, and a keypad with six functional keys (listed in Table 4-2). The interface is Chinese/English optional for language.

Table 4-2 Description of the SMDCU controller functional keys

Key	Name	Function
ESC	Escape	Return to the upper level menu. When an audible alarm is generated, press this key to silence it.
ENT	ENT	Enter the lower level menu or confirm the menu operation. When changing or inputting parameters, press this key to get into editing state. After any change is made, press this key to validate the change.
▲	Up	Shift among parallel menus. For a character string, these two keys can be used to change values. After the selection, press the ENT key to confirm it.
▼	Down	
◀	Left	In value setting interface, these two keys can be used to change values. These two keys can move the cursor on the LCD screen that requires character string to be input.
▶	Right	

### 4.2 Main LCD Screen

The following LCD screens will be mentioned in this chapter for many times. This section is a centralized introduction about the contents and access methods of these LCD screens.

 **Note**

The contents of the LCD screens given in this manual are just examples. For different configurations, models and system states, the actual contents of the LCD screens may be different from this manual.

#### 4.2.1 System Information Screen

After the initialization, the first system information screen will appear.

The system information screen displays the main information, you can press ▲ or ▼ repeatedly to view different system run information, as shown in Figure 4-2. If there are multiple users, then you can press ◀ or ▶ to view information of these different users.

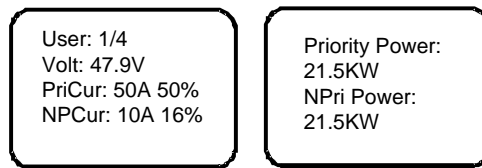


Figure 4-2 First system information screen

Press the ESC key in the system information screen to enter the product information screen, as shown in Figure 4-3.

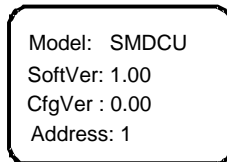


Figure 4-3 Product information screen

At the product information screen, press the ESC key to return to the system information screen.

Note: user can press ◀ or ▶ in the product information screen to adjust the LCD contrast.

#### 4.2.2 Overall Menu Structure

The overall menu structure is shown in Figure 4-4.

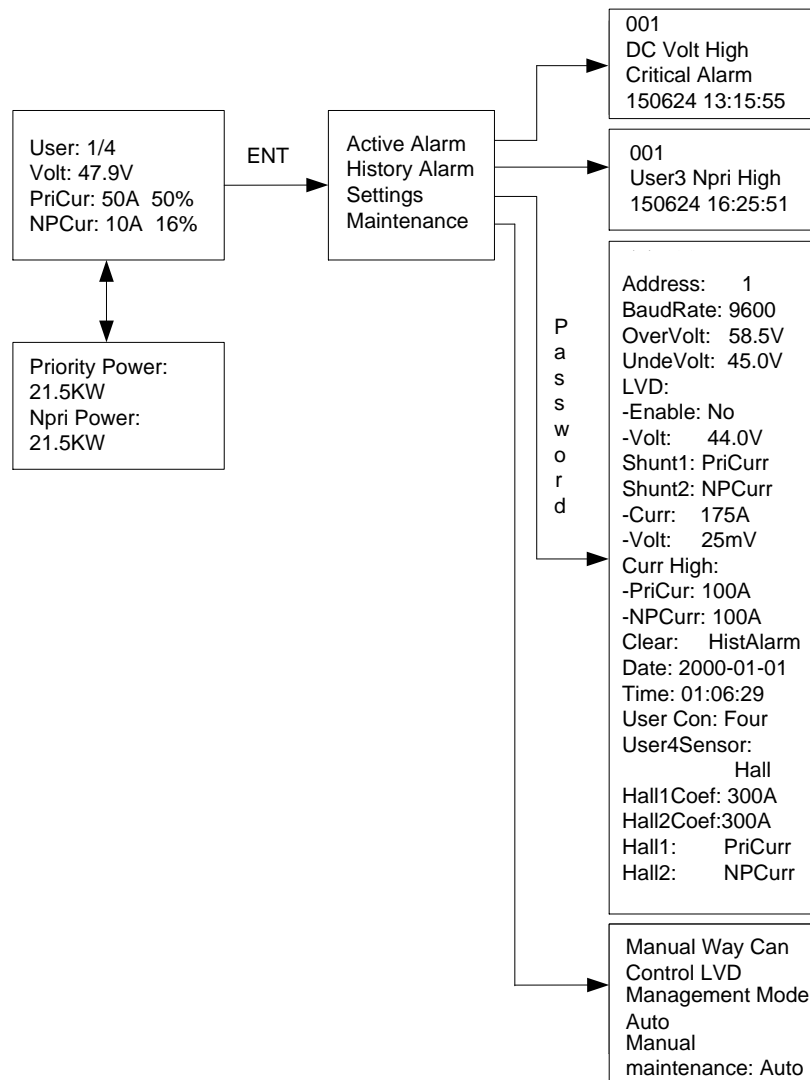


Figure 4-4 Overall menu structure

### 4.2.3 Main Menu Screen

The main menu is the highest-level menu of the SMDCU controller. At the sub-menus of this screen, you can query the settings, controls, and alarm information of the system, see Figure 4-5



Figure 4-5 MAINMENU screen

1. At any one of the system information screen, press the ENT key to enter the MAINMENU screen.
2. At any sub-menu of the MAINMENU screen, press the ESC key repeatedly to return to the higher-level menu, and ultimately return to the MAINMENU screen.
3. Select the required sub-menu through pressing ▲ or ▼. The selected sub-menu is shown by cursor, and press the ENT key to enter the corresponding sub-menu.

### 4.2.4 Active Alarm screen

Select 'Active Alarm' menu, press the ENT key to enter the active alarm screen. If there is no alarm, the system cannot access the Active Alarm screen. The earliest alarm will be displayed if there are any alarms (see Figure 4-6). Press ▼ to view next alarm or press ▲ to view the last alarm. Press the ESC key to return to the MAINMENU screen.

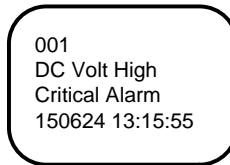


Figure 4-6 Active Alarm screen

### 4.2.5 History Alarm Screen

Select the 'history alarm' menu at the MAINMENU screen, press the ENT key to enter to the History Alarm screen (see Figure 4-14). If there is no historical alarm, the system cannot access the History Alarm screen. The earliest historical alarm will be displayed if there are any alarms. Press ▼ to view next alarm, press ▲ to view the last alarm. Press the ESC key to return to the first system information screen.

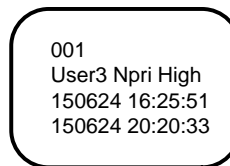


Figure 4-7 History alarm screen

### 4.2.6 Settings Screen

The settings screen is a sub-menu of the MAINMENU. It contains many sub-menus, and you can set all the system parameters there. The settings screen has password protection, only correct password allows you to enter it, as shown in Figure 4-8.

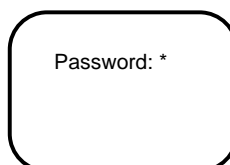


Figure 4-8 Password confirmation screen



1. When inputting the password, use the ENT key to get into editing state, press ▲ or ▼ to modify numbers, and ◀ or ▶ to move the cursor. After the input, press the ENT key to confirm.
2. If the password is correct, the next screen will appear. Otherwise, the system will prompt 'Password incorrect'.
3. During the operation, press the ESC key will return to the MAINMENU screen.
4. The SMDCU controller has one password level (default: 1).

Once you input the correct password, you never need to input the password again during the operation. If the interval for adjacent operation is more than four minutes, the system will prompt you to input the password again.

The settings screen is shown in Figure 4-9.

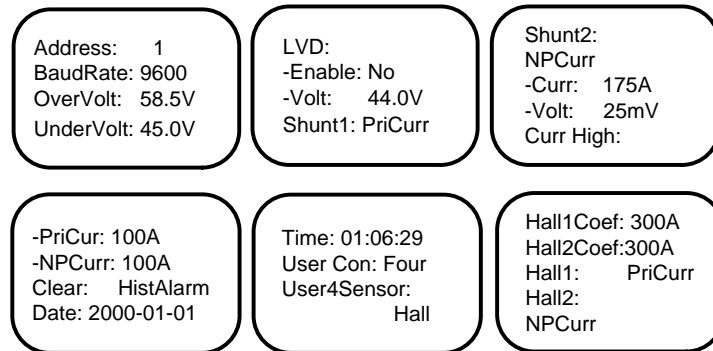


Figure 4-9 Settings screen

Press ▲ or ▼ to select the required setting parameters, press ◀ or ▶ to select the value of the parameter, and then press the ENT key to confirm. The setting description of SMDCU is listed in Table 4-3.

Table 4-3 Parameters setting list of ECCUP

No.	Parameter	Range	Default value	Value description
1	Address	1 ~ 254	1	/
2	Baud rate	2400/4800/9600/19200	9600	/
3	OverVolt	40V ~ 60V	58.5V	Overvoltage alarm will be generated when the voltage is higher then the setting value
4	UnderVolt	40V ~ 60V	45V	Undervoltage alarm will be generated when the voltage is lower then the setting value
5	LVD Enable	Yes / No	No	/
6	LVD Volt	40V ~ 50.5V	44V	/
7	Shunt 1	PriCurr/NPCurr/SumCurr	PriCurr	When the parameter has been changed, then the parameter of user 1, 2, 3 and 4 will also be changed
8	Shunt 2	PriCurr/NPCurr/SumCurr	NPCurr	
9	Shunt Curr	1 ~ 500A	175A	When the parameter has been changed, then the parameter of user 1, 2, 3 and 4 will also be changed
10	Shunt Volt	1 ~ 150mV	25mV	
11	PriCur High	1 ~ 500A	100A	When the parameter has been changed, then the parameter of user 1, 2, 3 and 4 will also be changed
12	NPCurr High	1 ~ 500A	100A	
13	Clear	History Alarm/Energy/Parameter	History Alarm	Note: when selecting the parameter, it will be restored to the default value, which may not meet the current system configuration
14	Date	Y - M - D		Set it according to actual requirement by using the Enter key
15	Time	T: M: S		Set it according to actual requirement by using the Enter key
16	User Con	Single/three/four	Single	/
17	User4 Sensor	Shunt/Hall	Shunt	/
18	Hall1 Coef	1 ~ 500A	300A	Note: The Hall sensor can be selected only when the user configuration is four users
19	Hall2 Coef	1 ~ 500A	300A	
20	Hall1	PriCurr/NPCurr/SumCurr	PriCurr	

No.	Parameter	Range	Default value	Value description
21	Hall2	PriCurr/NPCurr/SumCurr	NPCurr	

### 4.2.7 Maintenance Screen

The maintenance screen is a sub-menu of the MAINMENU. It is used to control the system manually in real time. The maintenance screen has password protection, only correct password allows you to enter it, as shown in Figure 4-10.



Figure 4-10 Password confirmation screen

1. When inputting the password, use the ENT key to get into editing state, press ▲ or ▼ to modify numbers, and ◀ or ▶ to move the cursor. After the input, press the ENT key to confirm.
2. If the password is correct, the next screen will appear. Otherwise, the system will prompt 'Password incorrect'.
3. During the operation, press the ESC key will return to the MAINMENU screen.
4. The SMDCU controller has one password level (default: 1).

Press ▲ or ▼ to select the required setting parameters, press ◀ or ▶ to select the value of the parameter, and then press the ENT key to confirm. The setting description is listed in Table 4-4.

Table 4-4 Maintenance output description

Parameter	Range	Default value	Value description
Management Mode	Auto/Manual	Auto	
Manual maintenance	Auto /Power off	Auto	Set only when the management mode is "Manual"

 **Note**

Manual maintenance can only be operated by maintenance personnel! After the operation, please set the management mode to "Auto".

## Chapter 5 Troubleshooting

This chapter describes the handling of alarms, as well as the routine maintenance of the system during system daily operation.

The maintenance personnel must have adequate knowledge about the subrack power system.

### Note

1. The maintenance must be conducted under the guidance of related safety regulations.
2. Only trained personnel with adequate knowledge about the subrack power system shall maintain the inner part of the subrack.

### 5.1 Controller Alarms And Fault Handling

The controller alarms are classified into three types: major alarm, observation alarm and no alarm.

**Major alarm:** This type of alarms have strong impacts on the system performance. Whenever these alarms are generated, users are supposed to handle them immediately. The red major alarm indicators will be on.

**Observation:** When this type of alarm is raised, the system maintains normal output for a while. If the alarm occurs during watch time, it should be handled immediately. If the alarm occurs during non- watch- time, handle it during watch time. The yellow observation alarm indicators will be on.

**No alarm:** If alarms are set as 'no alarm' by the users, when these alarms occur, the green alarm indicators will be on and the system works normally.

The handling methods of normal alarms are given in Table 5-1.

*Table 5-1 Alarm description and action to correct*

Index	Alarm	Handling method
1	DC volt high	<ol style="list-style-type: none"> <li>1. Check the DC output voltage and 'DC over-voltage' value through the controller. If the setting value is inappropriate, correct it.</li> <li>2. Check if the output voltage of a certain rectifier is high, if yes, replace it.</li> </ol>
2	DC volt low	<ol style="list-style-type: none"> <li>1. Check if the alarm is caused by mains failure, if yes, disconnect some loads to prolong the operation of the whole system.</li> <li>2. Check the DC under-voltage value set through the controller. If the set value is inappropriate, correct it.</li> <li>3. Check if any rectifier is inoperative, or has no output current. If yes, replace it.</li> <li>4. Check if the total load current exceeds the total rectifier current during float charge. If yes, disconnect some loads or add more rectifiers to make the total rectifier current bigger than 120% of the total load current with one redundant rectifier.</li> </ol>
3	Load branch fail	<p>Check if the corresponding MCB is switched off. If the MCB is open, find out the fault and remove it. Otherwise, the alarm circuit is faulty. Please contact Emerson.</p>

#### Controller fault handling

The symptoms of usual controller faults include: LCD doesn't display or display incorrectly. If there's a fault, please see the following procedures to find the reasons.

1. Loosen the three fixing bolts of the controller, and open the cover plate, as shown in Figure 5-1.

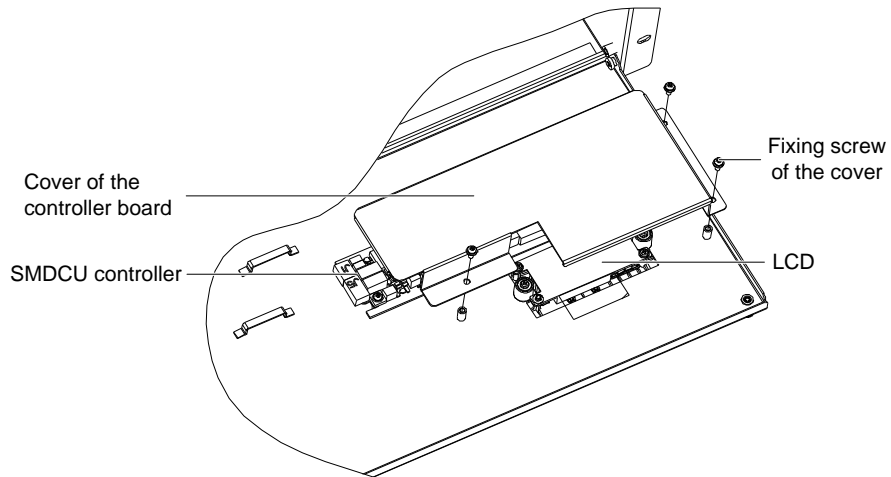


Figure 5-1 Opening the cover plate

2. If the LCD is off, you should perform the following check.

- (1) Check if the basbar voltage is normal;
- (2) Check if the terminals J3 and J8 are connected correctly.

3. If the results are normal, the PCB board might be damaged, replace it.

## Appendix 1 Technical And Engineering Data

Table 1 Parameters setting list of SMDCU

No.	Parameter	Range	Default value	Value description
1	IP address	1 ~ 254	1	/
2	Baud rate	2400/4800/9600/19200	9600	/
3	OverVoltage threshold	40V ~ 60V	58.5V	Overvoltage alarm will be generated when the voltage is higher then the setting value
4	UnderVoltage threshold	40V ~ 60V	45V	Undervoltage alarm will be generated when the voltage is lower then the setting value
5	LLVD enable	Yes / No	No	/
6	LLVD voltage	40V ~ 50.5V	44V	/
7	Shunt 1	Priority load / non-priority load / total current	Priority load	When the parameter has been changed, then the parameter of user 1, 2, 3 and 4 will also be changed
8	Shunt 2	Priority load / non-priority load / total current	Non-priority load	
9	Shunt current coefficient	1 ~ 500A	175A	When the parameter has been changed, then the parameter of user 1, 2, 3 and 4 will also be changed
10	Shunt voltage coefficient	1 ~ 150mV	25mV	
11	Priority load overcurrent threshold	1 ~ 500A	100A	When the parameter has been changed, then the parameter of user 1, 2, 3 and 4 will also be changed
12	Non-priority load overcurrent threshold	1 ~ 500A	100A	
13	Clear	History alarm / power / parameter	History alarm	Note: when selecting the parameter, it will be restored to the default value, which may not meet the current system configuration
14	Date	Y - M - D		Set it according to actual requirement by using the Enter key
15	Time	T: M: S		Set it according to actual requirement by using the Enter key
16	User configuration	Single user / three users /four users	Single user	/
17	User4 sensor type	Shunt / Hall	Shunt	/
18	Hall1 coefficient	1 ~ 500A	300A	Note: The Hall sensor can be selected only when the user configuration is four users
19	Hall2 coefficient	1 ~ 500A	300A	
20	Hall1	Priority load / non-priority load / total current	Priority load	
21	Hall2	Priority load / non-priority load / total current	Non-priority load	

## Appendix 2 Wiring Diagram

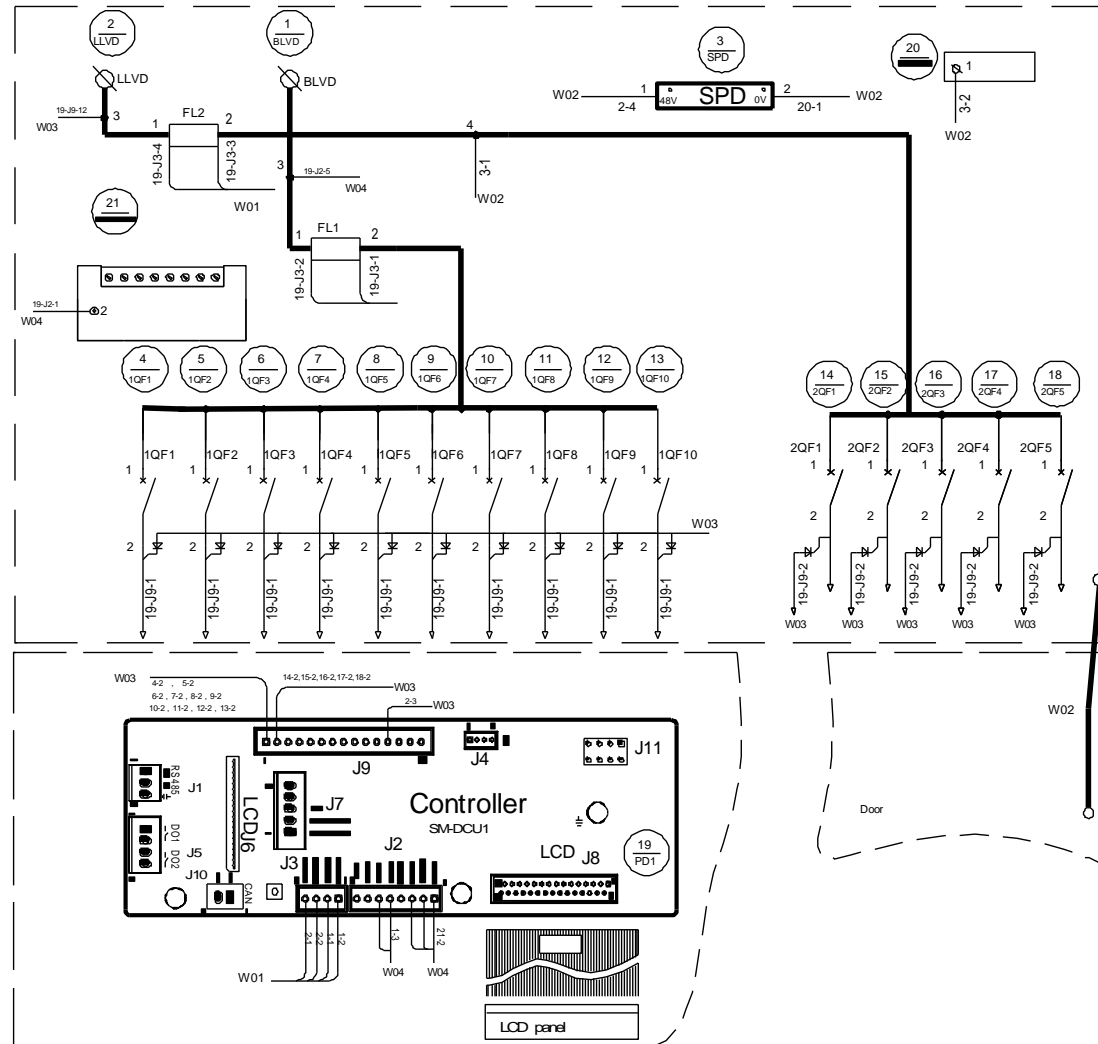


Figure 1 Wiring diagram of PDU48/300DUI-S1

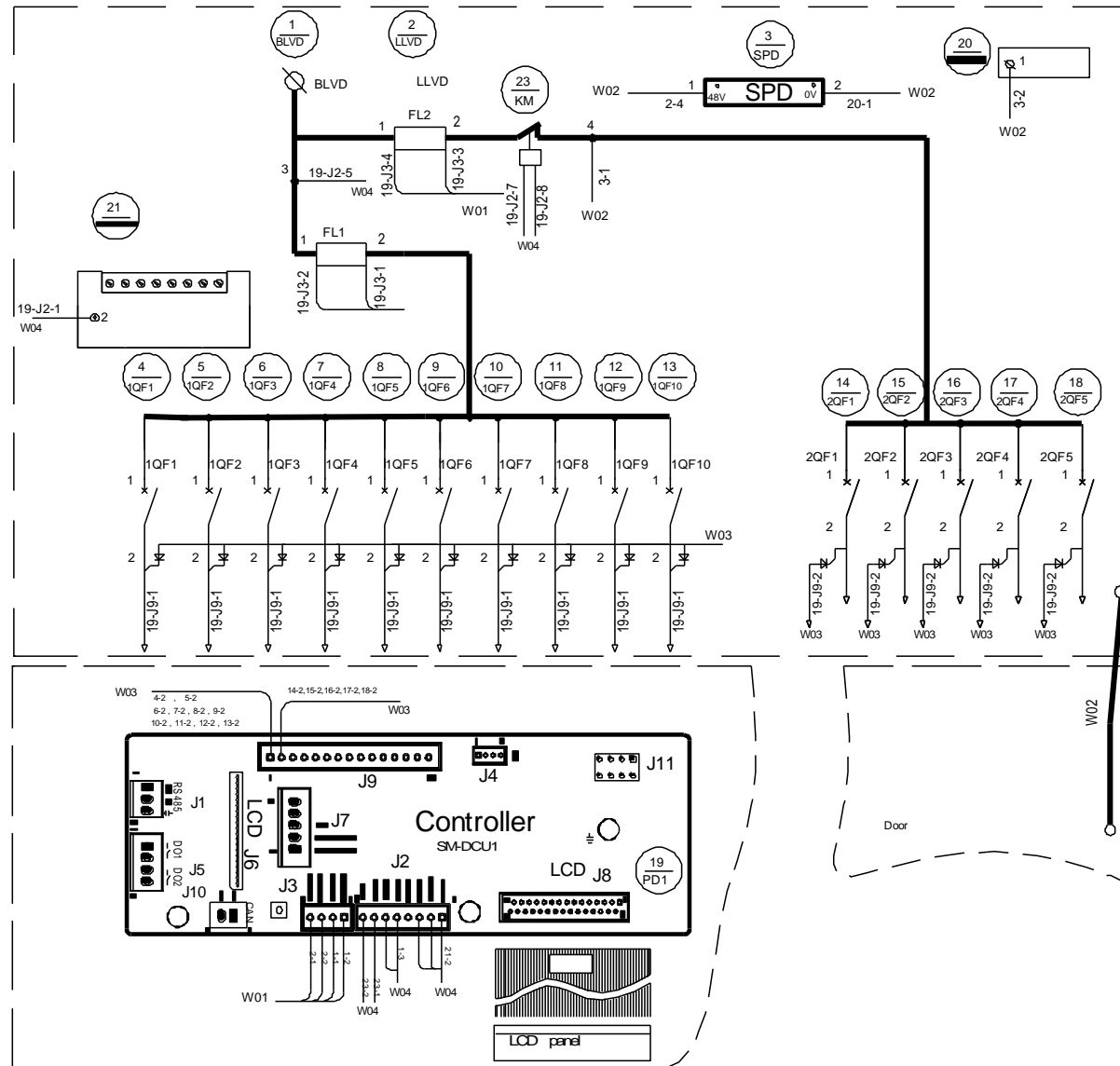


Figure 2 Wiring diagram of PDU48/300DUI-S2

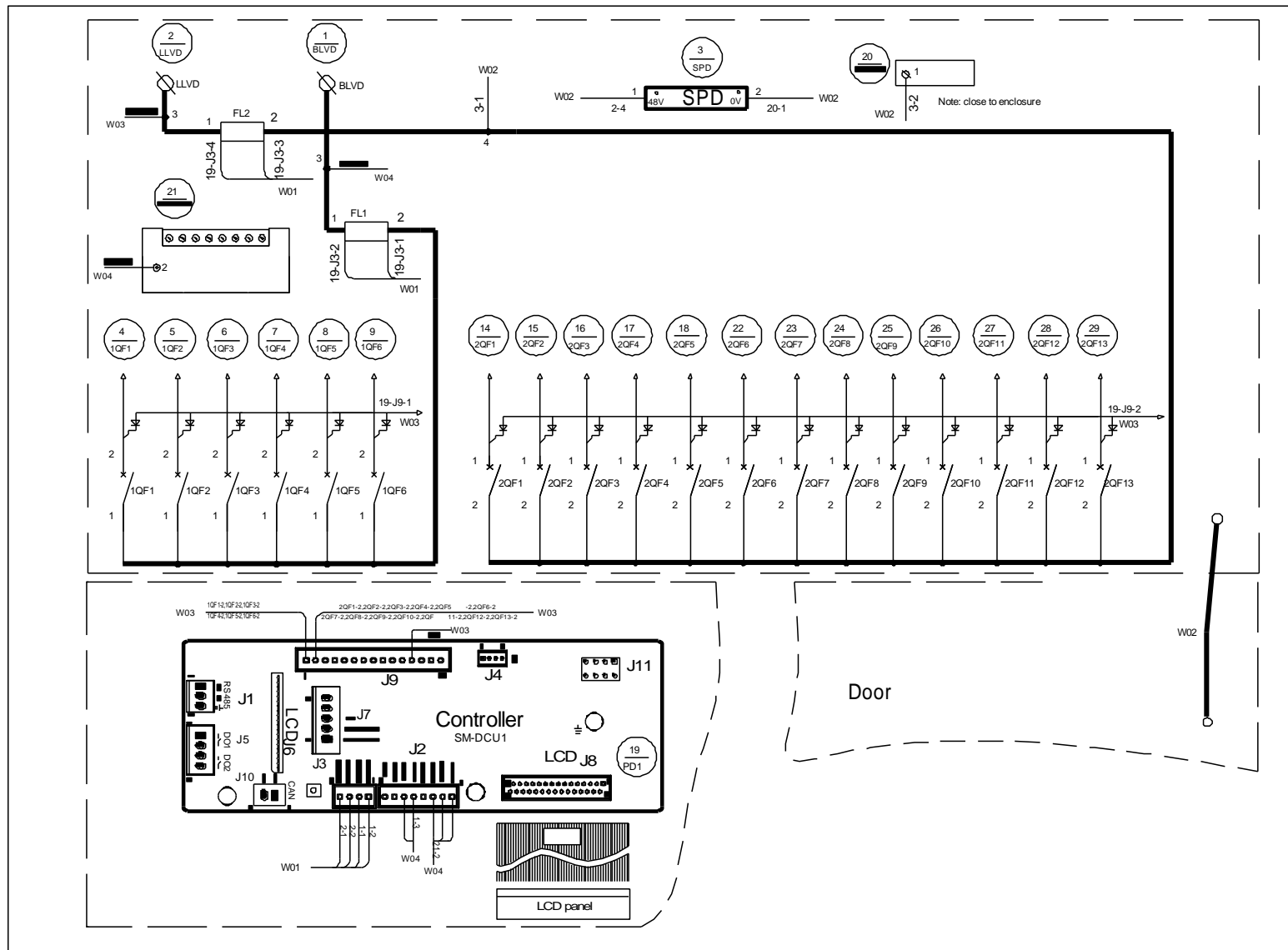


Figure 3 Wiring diagram of PDU48/300DUI-S3





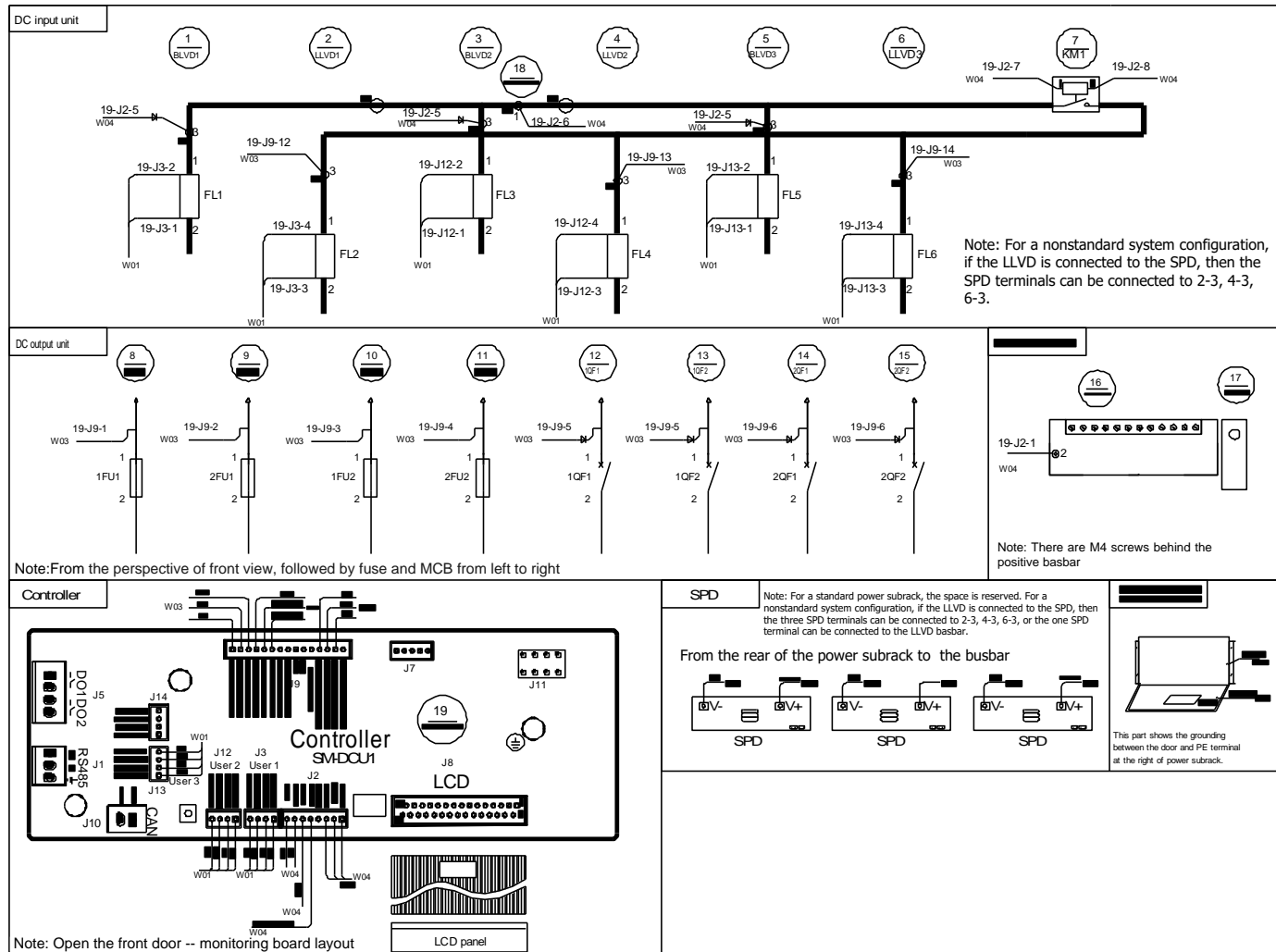


Figure 5 Wiring diagram of PDU48/300DUI-S5



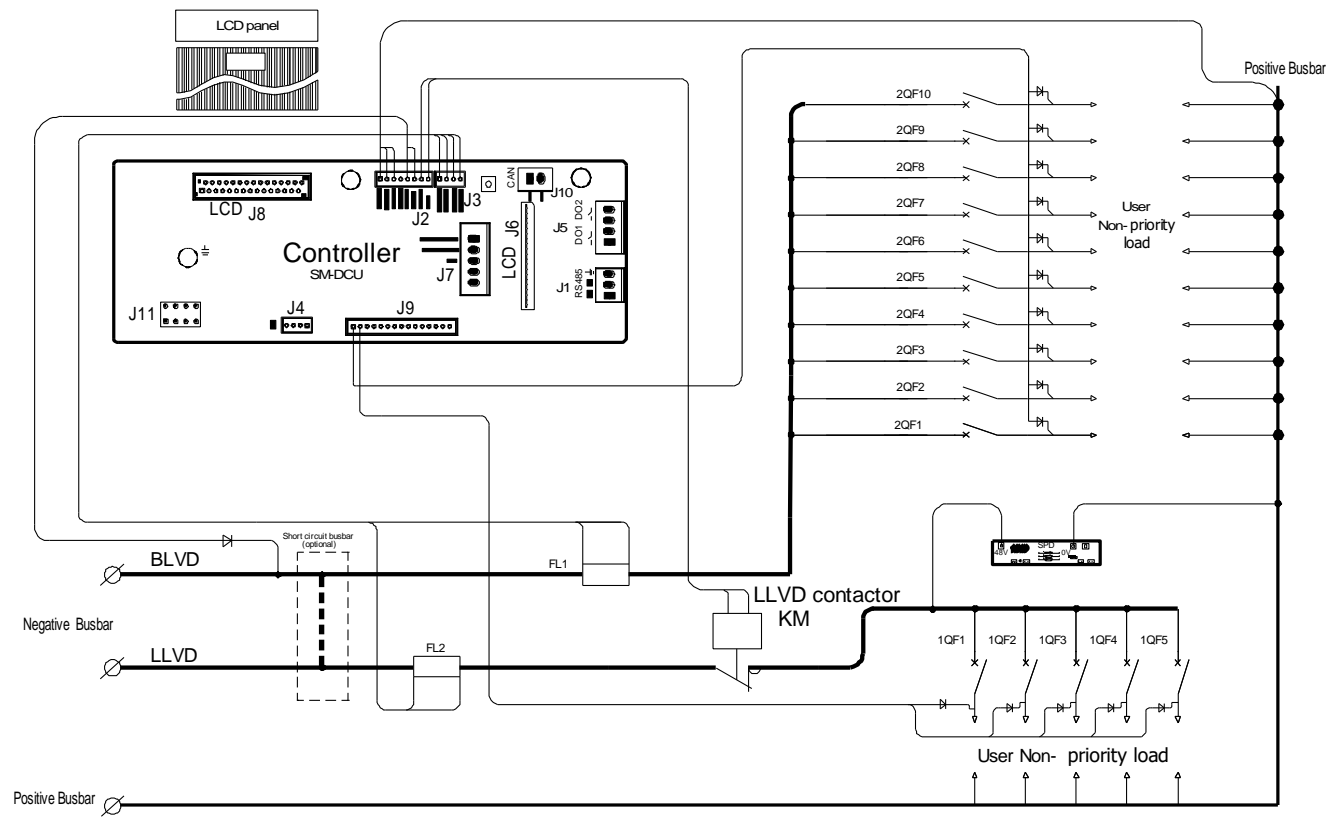


Figure 7 Schematic diagram of PDU48/300DUI-S2

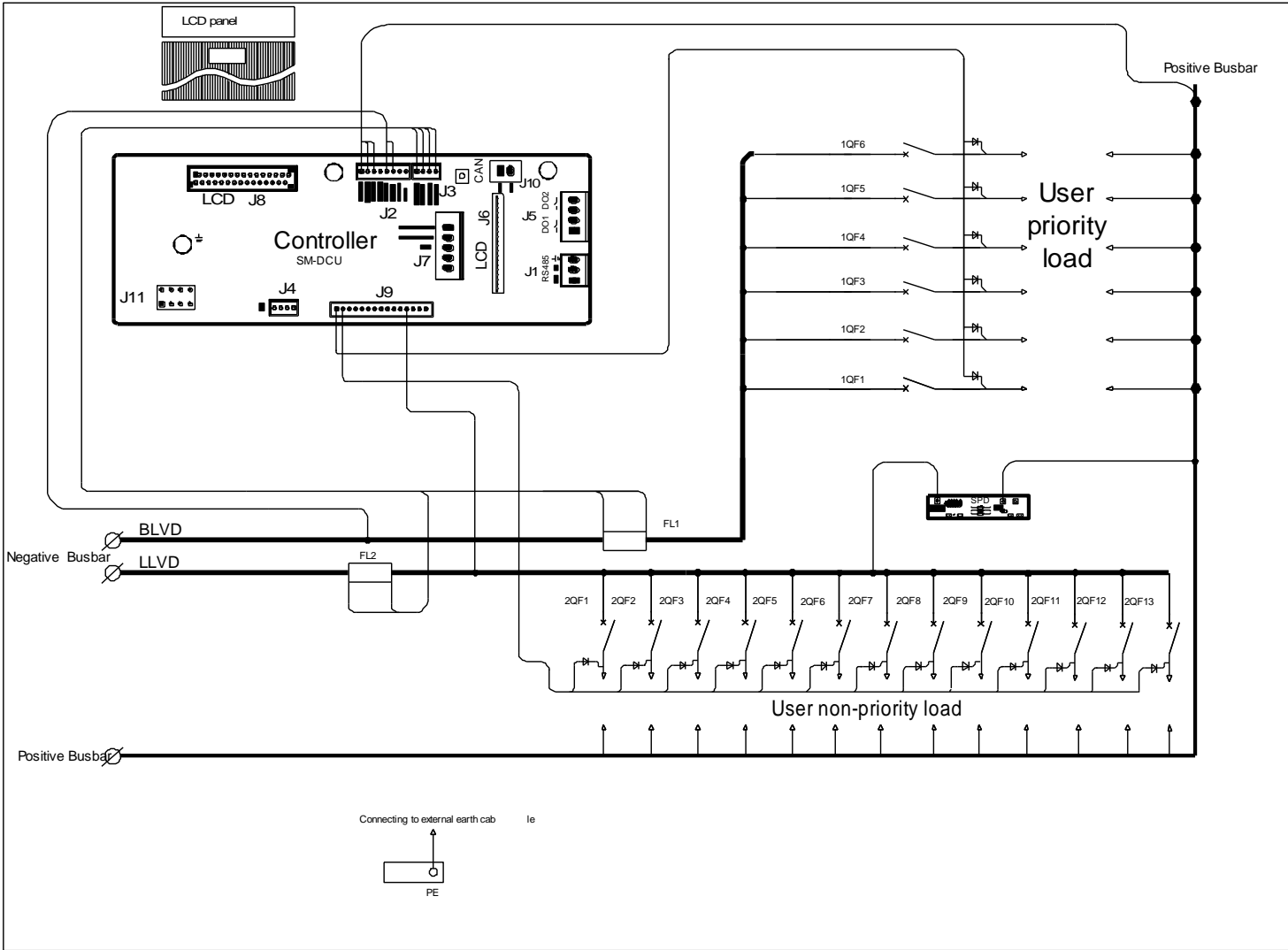


Figure 8 Schematic diagram of PDU48/300DUI-S3

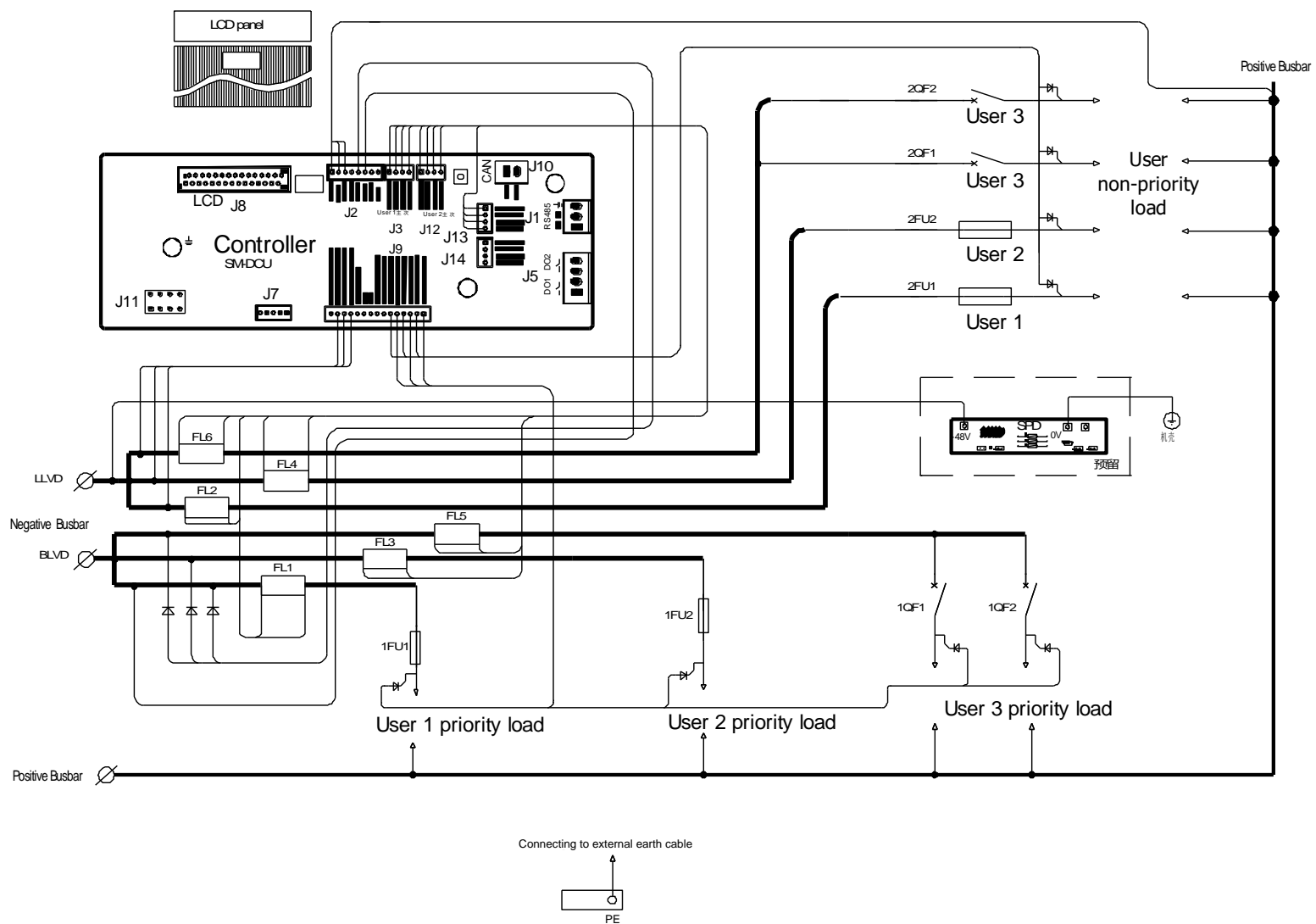
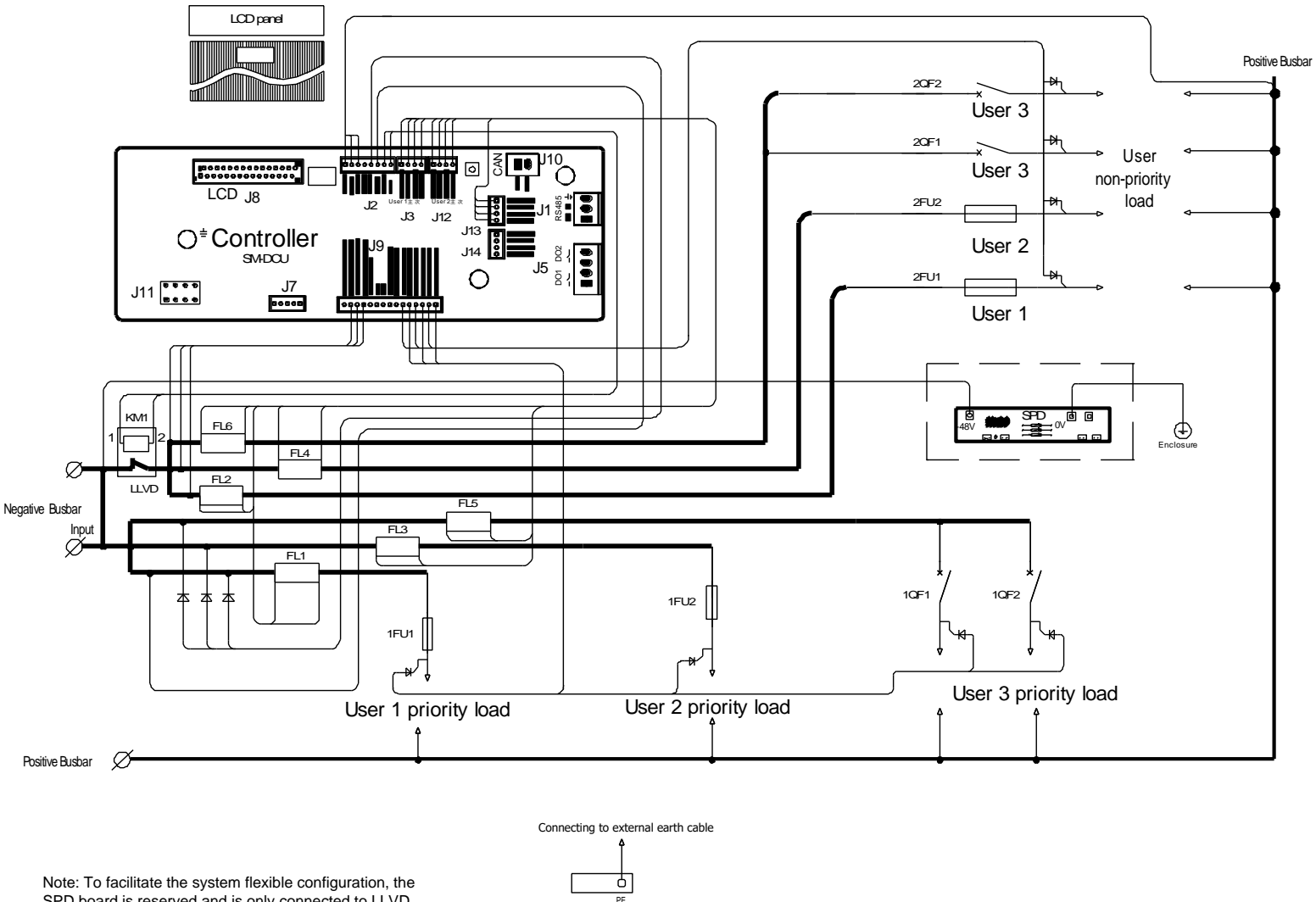


Figure 9 Schematic diagram of PDU48/300DUI-S4



Note: To facilitate the system flexible configuration, the SPD board is reserved and is only connected to LLVD.

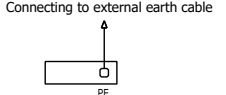


Figure 10 Schematic diagram of PDU48/300DUI-S5