# PDU8000 Modular Precision PDC V2.0

# User Manual

| | |
|---|---|
| **Issue** | 04 |
| **Date** | 2021-04-13 |

**HUAWEI TECHNOLOGIES CO., LTD.**

### Trademarks and Permissions


and other Huawei trademarks are trademarks of Huawei Technologies Co., Ltd.
All other trademarks and trade names mentioned in this document are the property of their respective holders.

### Notice

The purchased products, services and features are stipulated by the contract made between Huawei and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

## Huawei Technologies Co., Ltd.

Address: Huawei Industrial Base
Bantian, Longgang
Shenzhen 518129
People's Republic of China

Website: https://e.huawei.com

# About This Document

## Purpose

This manual describes the precautions and methods for installing, commissioning, and maintaining the modular precision power distribution cabinet (PDC), helping users to quickly understand methods for precision PDC operation and maintenance (O&M).

This document uses a 2000 mm high PDC as an example to describe how to install the PDC and connect cables.

NOTE

The figures provided in this manual are for reference only. The actual product appearances and configurations prevail.

## Intended Audience

This document is intended for:

- Sales engineers
- Technical support engineers
- System engineers
- Hardware installation engineers
- Commissioning engineers
- Data configuration engineers
- Maintenance engineers

## Symbol Conventions

The symbols that may be found in this document are defined as follows.

| Symbol | Description |
| --- | --- |
| DANGER | Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury. |

| Symbol | Description |
| --- | --- |
| WARNING | Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury. |
| CAUTION | Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury. |
| NOTICE | Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.<br>NOTICE is used to address practices not related to personal injury. |
| NOTE | Supplements the important information in the main text.<br>NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration. |

# Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

## Issue 04 (2021-04-13)

Modified the product model description.

Upgraded the software; added the lifecycle management, access control, and twinkle functions. Deleted alarm masking.

## Issue 03 (2018-01-25)

Added the 2500 mm high cabinet.

Added functional components for fire linkage.

## Issue 02 (2017-06-28)

This issue is the first official release.

## Issue 01 (2017-05-28)

This issue is used for first office application (FOA).

# Contents



# 1 User Manual Usage

This chapter describes the notes for using the precision modular PDC user manual.

- Before using this document, get familiar with the actual configuration and application scenario of the modular precision PDC.
- Before using this document, make available the documents delivered with each component.
- User interfaces displayed in this document correspond to the monitor display module (MDU) version V100R002C46SPC914 and are for reference only.
- Put on necessary protective equipment such as the safety helmet and gloves before entering the site.
- Before performing an operation, ensure that the prerequisites are met. Otherwise, the expected result may not be achieved. More seriously, equipment damage and personal injury may occur.
- Before using this document, read through and keep in mind the safety precautions and the cautions and notes for operations.
- Configuration parameters are essential to the reliable running of a system. Improper modifications of parameters easily cause abnormal running status, or even damage to the system.
- You are not allowed to modify configuration parameters without permission when using the modular precision PDC. If a modification is necessary, contact Huawei technical support. Huawei shall not be responsible for any loss caused by unauthorized configuration modification.
- Operations marked as optional in the chapters, sections, or procedures can be performed depending on the actual configuration and requirements of the modular precision PDC.

# 2 Safety Precautions

## 2.1 General Safety Precautions

### General Safety Principles

To ensure safety of humans and the equipment, pay attention to the safety symbols on the equipment and all the safety instructions in this document.

The "Note", "CAUTION", "WARNING", and "DANGER" statements in this document do not represent all the safety instructions. They are only supplemental to the safety instructions.

### Local Safety Regulations

When operating Huawei equipment, you must follow the local laws and regulations. The safety instructions in this document are only supplemental to the local laws and regulations.

### Personnel Requirements

Personnel who plan to install, operate, and maintain Huawei equipment must be thoroughly trained, understand all necessary safety precautions, and master correct operation methods.

- Only trained and qualified personnel are allowed to install, operate, and maintain the equipment.
- Only personnel certified or authorized by Huawei are allowed to replace or change the equipment or components (including software).
- Any fault or error that might cause safety problems must be reported immediately to a supervisor.

### Grounding Requirements

Equipment to be grounded must meet the following requirements:

- When installing the device, always make the ground connection first.

- When removing the device, disconnect the ground cable at the end.
- Do not damage the ground conductor.
- Do not operate the device in the absence of a properly installed ground conductor.
- The device (or system) must be connected permanently to the protection ground before operation. Before operating the device, check its electrical connection to ensure that it is securely grounded.

### Human Safety

- Do not operate the device or cables during thunderstorms.
- In the case of a thunderstorm, disconnect the AC power supply, and do not use fixed terminals or touch the terminals or antenna connectors.
- Before operating the device, put on electrostatic discharge (ESD) clothes, ESD gloves, and an ESD wrist strap. Do not wear conductive articles such as jewelry or watches when you operate the device.
- In the case of a fire, immediately leave the building or the equipment room, and turn on the fire alarm bell or make an emergency call. Never enter a building or equipment zone that is on fire.

### Equipment Safety

- The device must be fixed securely on the floor or to other immovable objects such as walls or mounting racks before operation.
- Do not block the ventilation vents while the device is operating.
- Tighten the screws using tools when installing panels.
- After the installation, remove packing materials from the equipment area.

## 2.2 Electrical Safety

### High Voltage

- The high voltage power supply provides power for the device operation. Direct or indirect contact (especially with a damp object) with the high voltage power supply may result in serious injury.
- Non-standard and improper high voltage operations may result in fire and electric shock.

### High Electrical Leakage

**⚠ CAUTION**

Ground the device before powering it on. Otherwise, personal injury or device damage may be caused by high electrical leakage.

If a "high electricity leakage" tag is attached on the power terminal of a device, you must ground the protective ground terminal on the device enclosure before connecting the AC power supply; otherwise, electric shock as a result of electricity leakage may occur.

### Power Cable

**DANGER**

Do not install or remove power cables when the device is on. Transient contact between the core of the power cable and the conductor may generate electric arcs or sparks, which may cause fire or injury to human eyes.

- Before installing or removing a power cable, turn off the power switch.
- Before connecting a power cable, verify that the label on the power cable is correct.

### Fuse

**CAUTION**

To ensure that the system runs safely, if a fuse is to be replaced, the new fuse must be of the same type and specifications as the old one.

## 2.3 Environmental Safety

**DANGER**

Do not place or operate a device in a flammable, explosive, or smoky environment.

Operating any electronic device in a flammable environment can be fatal.

## 2.4 Mechanical Safety

### Moving Sharp Objects

**CAUTION**

Wear protective gloves when moving sharp objects.

### Moving Heavy Objects

Wear protective gloves to protect hands when moving heavy objects.

- Be careful to prevent injury when moving heavy objects.
- It is recommended that tools such as a pallet truck be used to transport the heavy PDC.

# 2.5 Laying Out Cables

## Binding Signal Cables

**NOTICE**

Signal cables must be bound separately from strong-current cables and high-voltage cables.

## Laying Out Power Cables

When the temperature is very low, violent impact or vibration may damage the power cable sheathing. To ensure safety, comply with the following requirements:

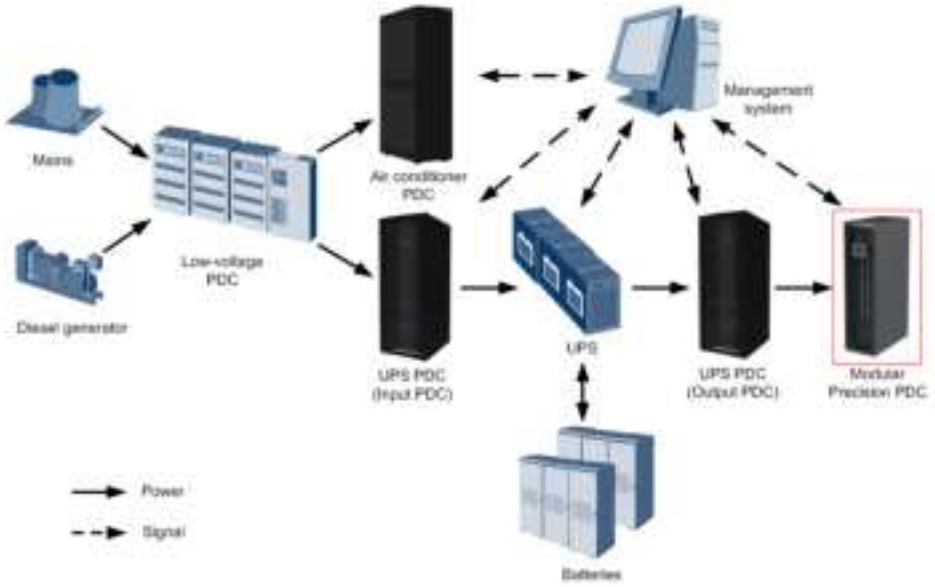
- Power cables should be laid out or installed only when the temperature is higher than 0°C.
- Store power cables for at least 24 hours at room temperature before laying out them if they were previously stored at sub-0°C.
- Handle power cables with caution, especially at a low temperature. Do not drop the power cables directly from the vehicle.

# 3 Overview

## 3.1 Positioning

The modular precision PDC is mainly used for power distribution and electric parameter measurement. It provides precision electricity management for critical loads in building or container data centers.

**Figure 3-1** Positioning of the modular precision PDC




## 3.2 Product Model

NOTE

The models of the rack and input module form the corresponding product model. For example, if the rack model is PDU8000-ACV4-SCA-1 and the input module is a dual-input 630 A switch, the product model is PDU8000-0630ACV4-SCA171.

**Figure 3-2** Product model


| No. | Meaning |
| --- | --- |
| 1 | Data center power distribution product |
| 2 | • 0160: The power distribution capacity is 160 A.<br>• 0250: The power distribution capacity is 250 A.<br>• 0400: The power distribution capacity is 400 A.<br>• 0630: The power distribution capacity is 630 A. |
| 3 | AC: alternating current |
| 4 | V4: The rated output voltage is 208 V, 380 V, 400 V, or 415 V. |
| 5 | • SCA: precision PDC (applicable to IT equipment)<br>• CCA: integrated PDC (applicable to power equipment) |
| 6 | 171: serial code |

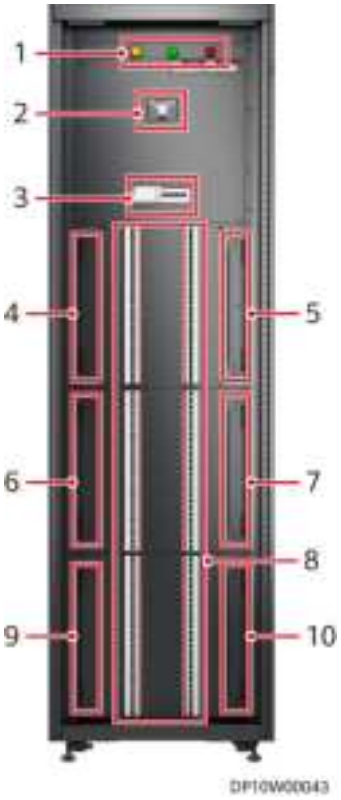
# 3.3 Appearance

The PDU8000 modular precision PDC is equipped with a smart precision monitoring system. It provides comprehensive functions for power distribution, electrical parameter measurement, and alarm reporting.

## 3.3.1 Appearance of the Modular Precision PDC with a Single Input

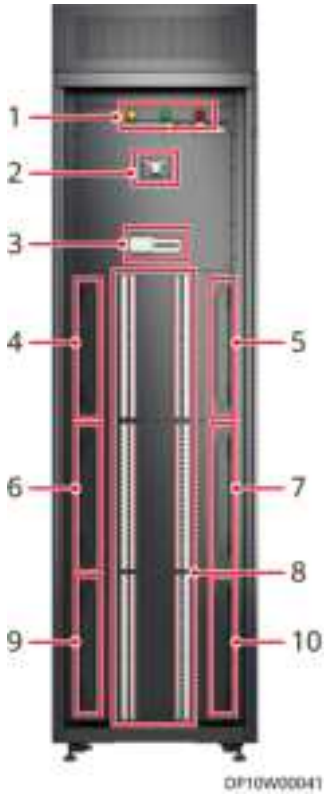
This section uses the full configuration with three output modules as an example.

**Figure 3-3** Appearance (2000 mm high)



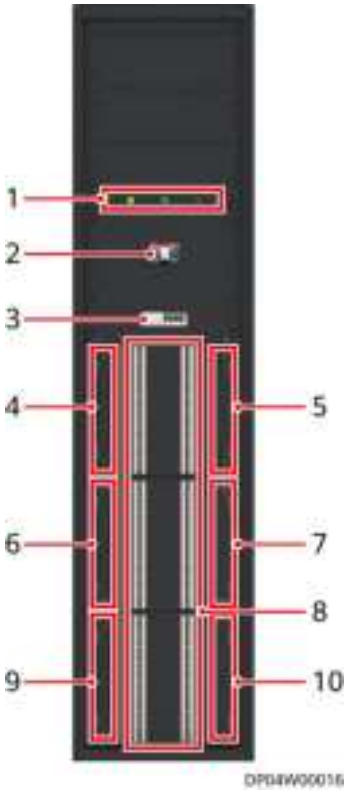

(1) Indicators
(2) MCCB input circuit breaker
(3) SPD and SPD circuit breaker
(4) Monitoring board 1
(5) Monitoring board 4
(6) Monitoring board 2
(7) Monitoring board 5
(8) MCB output circuit breaker
(9) Monitoring board 3
(10) Monitoring board 6

**Figure 3-4** Appearance (2200 mm high)




(1) Indicators
(2) MCCB input circuit breaker
(3) SPD and SPD circuit breaker
(4) Monitoring board 1
(5) Monitoring board 4
(6) Monitoring board 2
(7) Monitoring board 5
(8) MCB output circuit breaker
(9) Monitoring board 3
(10) Monitoring board 6

**Figure 3-5** Appearance (2500 mm high)

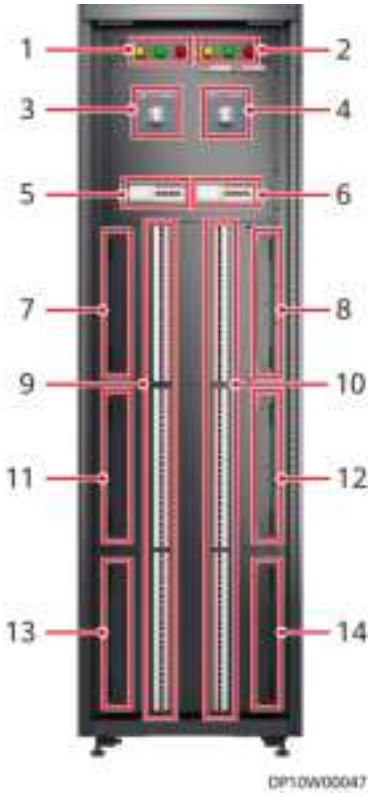



(1) Indicators
(2) MCCB input circuit breaker
(3) SPD and SPD circuit breaker
(4) Monitoring board 1
(5) Monitoring board 4
(6) Monitoring board 2
(7) Monitoring board 5
(8) MCB output circuit breaker
(9) Monitoring board 3
(10) Monitoring board 6

## 3.3.2 Appearance of the Modular Precision PDC with Dual Inputs

This section uses the full configuration with three output modules as an example.

**Figure 3-6** Appearance (2000 mm high)




(1) Indicators of route I

(2) Indicators of route II

(3) Input circuit breaker of route I

(4) Input circuit breaker of route II

(5) SPD and SPD circuit breaker of route I

(6) SPD and SPD circuit breaker of route II

(7) Monitoring board 1

(8) Monitoring board 4

(9) Output circuit breaker of route I

(10) Output circuit breaker of route II

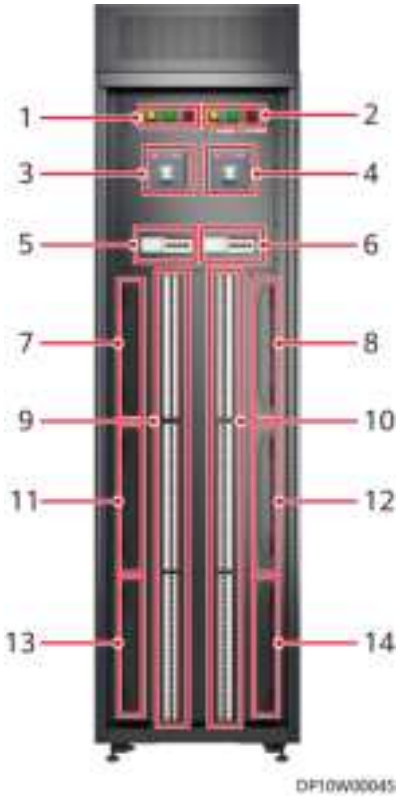
(11) Monitoring board 2

(12) Monitoring board 5

(13) Monitoring board 3

(14) Monitoring board 6

**Figure 3-7** Appearance (2200 mm high)




(1) Indicators of route I

(2) Indicators of route II

(3) Input circuit breaker of route I

(4) Input circuit breaker of route II

(5) SPD and SPD circuit breaker of route I

(6) SPD and SPD circuit breaker of route II

(7) Monitoring board 1

(8) Monitoring board 4

(9) Output circuit breaker of route I

(10) Output circuit breaker of route II

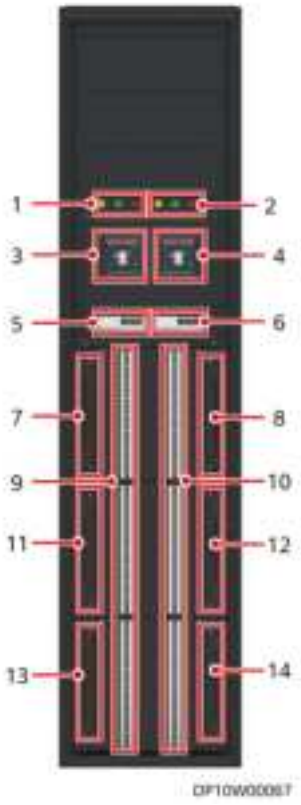
(11) Monitoring board 2

(12) Monitoring board 5

(13) Monitoring board 3

(14) Monitoring board 6

**Figure 3-8** Appearance (2500 mm high)




(1) Indicators of route I

(2) Indicators of route II

(3) Input circuit breaker of route I

(4) Input circuit breaker of route II

(5) SPD and SPD circuit breaker of route I

(6) SPD and SPD circuit breaker of route II

(7) Monitoring board 1

(8) Monitoring board 4

(9) Output circuit breaker of route I

(10) Output circuit breaker of route II

(11) Monitoring board 2

(12) Monitoring board 5

(13) Monitoring board 3

(14) Monitoring board 6

# 3.4 Features

**Table 3-1** Features

| Feature | Description |
| --- | --- |
| High efficiency and low cost | Highly integrated, normalized designs for structures and components, and flexible configuration |

| Feature | Description |
| --- | --- |
| | Cost-saving and flexible to deliver and deploy thanks to a compact design |
| | Compatible with cabinets of low to high power density |
| | (Optional) Hot-swap branch switches, making maintenance and capacity expansion convenient |
| Safe and reliable | Certified by CCC, CE, and TL |
| | Proper connection between main metal components in the power cabinet; resistance less than 0.1 ohm |
| | Hot-swap monitoring board; strong- and weak-current separation |
| Intelligent monitoring | Strong networking capability for teleindication, telemetry, telecontrol, and teleadjusting |
| | Real-time monitoring and alarm reporting |
| | (Optional) Temperature monitoring |
| Capacity expansion | (Optional) Capacity expansion for hot-swap circuit breakers with power-on |
| Fire linkage | (Optional) The non-fire extinguishing power supply is cut off by using 24 V DC before extinguishant is released. |

# 3.5 Technical Specifications

**Table 3-2** Technical specifications

| Item | Specifications |
| --- | --- |
| H x W x D (mm) | 2000 x 600 x 1100, 2000 x 600 x 1200, 2200 x 600 x 1200, 2500 x 600 x 1200 |
| Weight (kg) | < 450 |
| Rated operating voltage (V) | 208/380/400/415 (line voltage) |
| Rated insulation voltage (V) | 500 |
| Rated frequency (Hz) | 50/60 |
| Rated operating current (A) | 630/400/250/160 |

| Item | Specifications |
| --- | --- |
| Enclosure protection level | IP20 |
| Output circuit breakers | Single- or three-phase 16 A/20 A/32 A/40 A/63 A; maximum: 144 single-phase routes or 48 three-phase routes |
| Surge protection | Class C SPD in standard configuration |
| Cabling | • 400 A/250 A/160 A input scenario: Cables can be routed in and out from the top or bottom.<br>• 630 A input scenario: Cables can be routed in from the top and out from the top or bottom. |
| Environmental friendliness | RoHS, REACH |
| Overvoltage level | II |
| Operating temperature | –5°C to +40°C |
| Relative humidity | 5%–95%, non-condensing |
| Altitude | ≤ 2000 m (If the altitude exceeds 2000 m, the device is derated according to GB/T3859.2-93.) |

**Table 3-3** Safety and EMC

| Item | Specifications | |
| --- | --- | --- |
| Safety | CCC, CE, TL | N/A |
| EMC | Conducted emission (CE) | EN55022 CLASS A |
| | Radiated emission (RE) | EN55022 CLASS A |
| | Voltage fluctuation and flicker | EN61000-3-3<br>EN61000-3-11 |
| | Harmonic current | EN61000-3-2<br>EN61000-3-12 |
| | Conducted susceptibility (CS) | IEC61000-4-6 |
| | Radiated susceptibility (RS) | IEC61000-4-3 |
| | Electrostatic discharge (ESD) | IEC61000-4-2 |

| Item | Specifications | |
|---|---|---|
| | Electrical fast transient (EFT) | IEC61000-4-4 |
| | Surge | IEC61000-4-5 |
| | Voltage dip and short interruption | IEC61000-4-11 2004 |

# 3.6 Modules

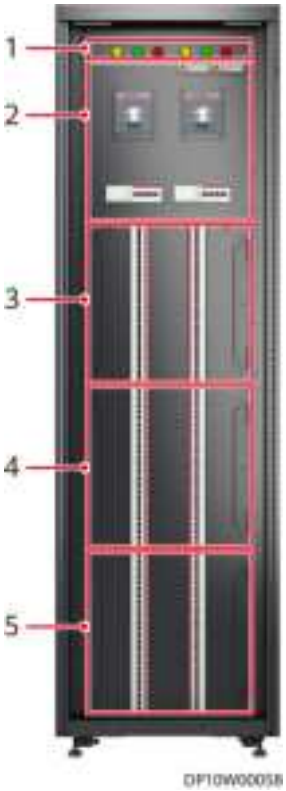
A modular precision PDC mainly consists of the structural module, power distribution module, monitoring module, and accessories.

## 3.6.1 Configuration Description

A modular precision PDC consists of the cabinet, power distribution subracks, MCCBs, MCBs, cables, wiring terminals, fuse suite, indicators, and transformers. Determine the specifications and quantity of MCCBs and MCBs to be configured based on the requirement.

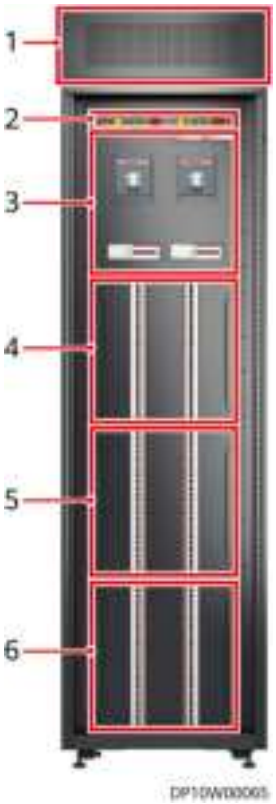
- Number of inputs: single or dual inputs
- Input capacity: 630 A/400 A/250 A/160 A
- Number and capacity of output MCBs: determined based on customer requirements

**Figure 3-9** Cabinet configuration (2000 mm high)



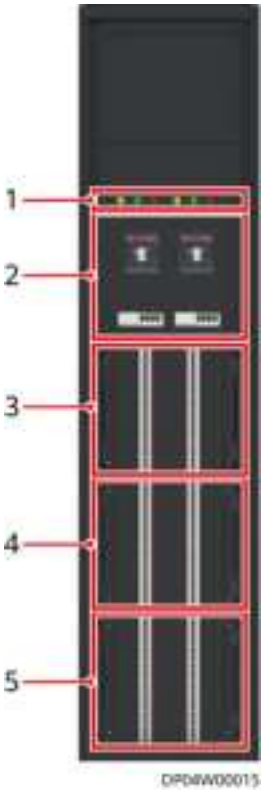
(1) Indicator module (1 U high)
(2) Input module (10 U high)
(3) Output module 1 (10 U high)
(4) Output module 2 (10 U high)
(5) Output module 3 (10 U high)

**Figure 3-10** Cabinet configuration (2200 mm high)




(1) Top frame (5 U high)
(2) Indicator module (1 U high)
(3) Input module (10 U high)
(4) Output module 1 (10 U high)
(5) Output module 2 (10 U high)
(6) Output module 3 (10 U high)

**Figure 3-11** Cabinet configuration (2500 mm high)




(1) Indicator module (1 U high)
(2) Input module (10 U high)
(3) Output module 1 (10 U high)
(4) Output module 2 (10 U high)
(5) Output module 3 (10 U high)

## 3.6.2 Power Distribution Module

The power distribution module is used for receiving and distributing power, and consists of the MCCB input module, MCB output module, and a power distribution bus.

MCCB input modules are classified into single-route and dual-route ones.

**Figure 3-12** Single-route MCCB input module

**Figure 3-13** Dual-route MCCB input module

**Figure 3-14** MCB output module

**Table 3-4** Module function description

| Module | Function |
| --- | --- |
| MCCB input module | Provides overload and short-circuit protection. |
| | Collects currents. |
| | Provides level C surge protection. |
| MCB output module | Distributes power, and provides overload and short-circuit protection. |

## 3.6.3 Monitoring Module

The monitoring module is used to display and monitor electrical parameters. It consists of the Monitor Display Unit (MDU), monitoring board, and signal cables. There are two types of MDUs. Their BOM numbers are 02310PQR and 02312PCE.

**Figure 3-15** MDU (02312PCE)

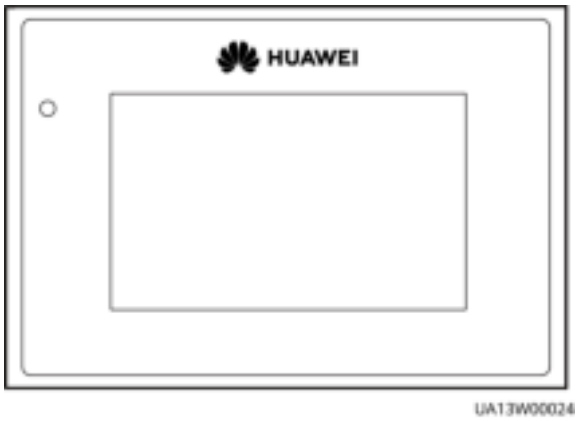



**Figure 3-16** MDU (02310PQR)

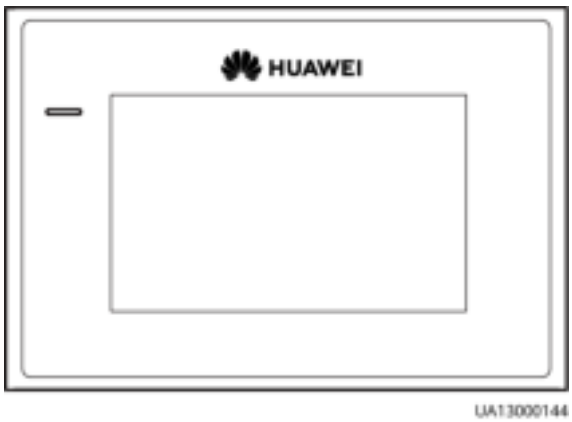


**Figure 3-17** Monitoring board


**Table 3-5** Module function description

| Module | Function |
| --- | --- |
| MDU | Provides menus for setting PDC parameters and viewing the PDC operating status and alarms. |
| | Upgrading software |
| | (Optional) Detects temperatures. |
| Monitoring board | Collects parameters such as circuit breaker status, and voltages and currents of the main route and branches. |
| | Calculates the main route electric energy, frequency, voltage, current, active power, and reactive power based on the collected parameters. |

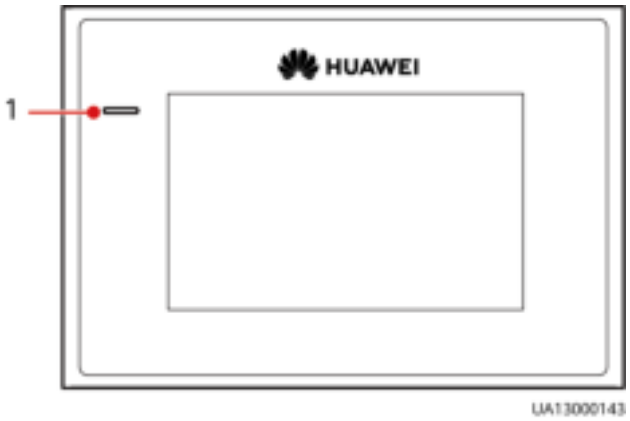
# 3.7 Components

## 3.7.1 MDU

There are two types of MDUs. Their BOM numbers are 02310PQR and 02312PCE.

**Figure 3-18** Front view of an MDU (02312PCE)


**Figure 3-19** Front view of an MDU (02310PQR)




(1) Status and alarm indicator

**Table 3-6** Indicator status

| Indicator Status | Description |
| --- | --- |
| Red | A critical alarm has been generated, and the buzzer buzzes. |
| Yellow | A major alarm has been generated, and the buzzer buzzes at an interval of 0.5s. |
| Green | A warning has been generated, or the system is running properly. |
| Off | The MDU powers off. |
| Twinkle | The indicator blinks at super short intervals for 0.5s (blinking at 10 Hz, on for 0.05s and then off for 0.05s) and then turns off for 0.5s. The cycle lasts for 10s.<br>Used to locate device. |

**Figure 3-20** Rear view of an MDU (02312PCE)

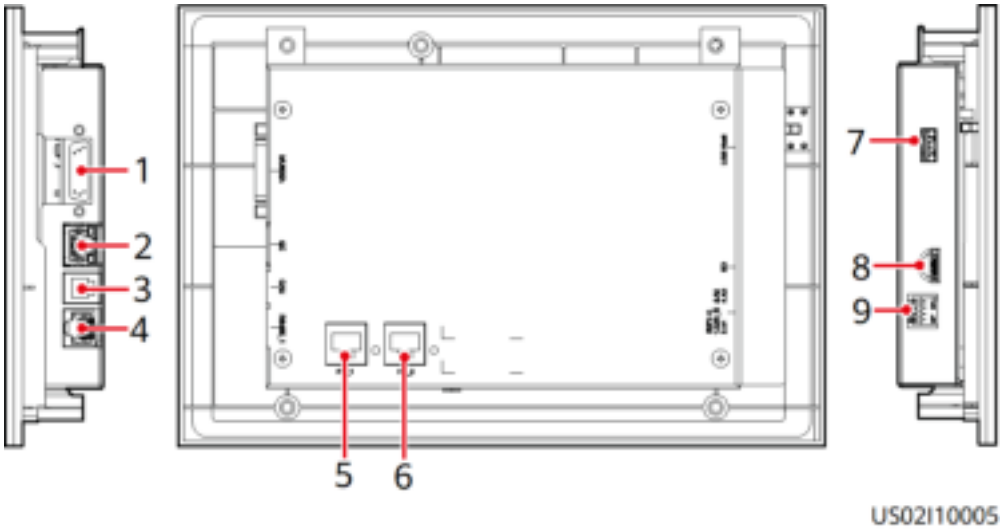



**Table 3-7** Ports at the rear of the MDU (02312PCE)

| No. | Port | Function | Remarks |
| --- | --- | --- | --- |
| 1 | MUS05A | N/A | N/A |
| 2 | GE | Network port connecting to the management system when the PDC uses Modbus TCP | N/A |
| 3 | CAN | Used for connecting to the CAN bus | N/A |
| 4 | RS485_1 | Northbound serial port connecting to the management system when the PDC uses Modbus | The cable connected to the port uses the RJ45 unshielded connectors with the following pins:<br>• PIN 1: Connects to the positive terminal of the transmit end on the MDU<br>• PIN 2: Connects to the negative terminal of the transmit end on the MDU<br>• PIN 4: Connects to the positive terminal of the receive end on the MDU<br>• PIN 5: Connects to the negative terminal of the receive end on the MDU |
| 5 | FE1 | Reserved | N/A |
| 6 | FE2 | Reserved | N/A |

| No. | Port | Function | Remarks |
| --- | --- | --- | --- |
| 7 | USB Host | Insert the USB flash drive, import and export the configuration file, export run logs, and upgrade software. | N/A |
| 8 | SD | Used for connecting to the SD card | N/A |
| 9 | SW1–4 | DIP switch | N/A |

**Figure 3-21** Rear view of an MDU (02310PQR)

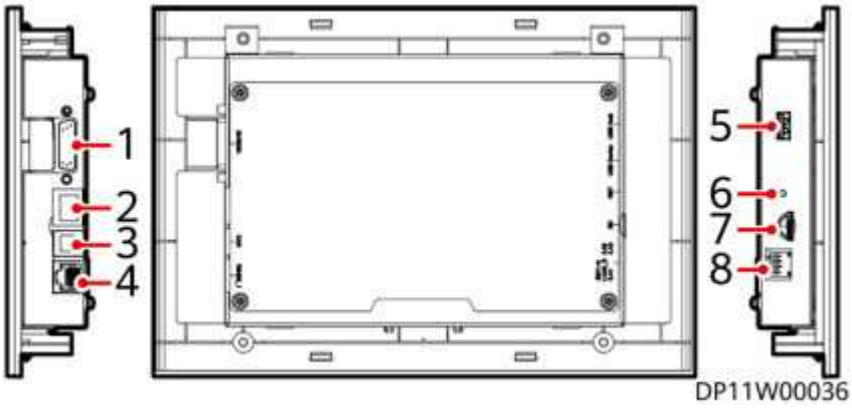



**Table 3-8** Ports at the rear of the MDU (02310PQR)

| No. | Port | Function |
| --- | --- | --- |
| 1 | MUS05A | N/A |
| 2 | FE | Network port that connects to the management system when SNMP or Modbus-TCP is used |
| 3 | CAN | Internal communications and power supply port for the MDU LCD |
| 4 | RS485_1 | Northbound port that connects to the management system when Modbus-RTU is used |
| 5 | USB Host | Insert the USB flash drive, import and export the configuration file, export run logs, and upgrade software. |
| 6 | RST | MDU reset button |
| 7 | SD | Installing an SD card |

| No. | Port | Function |
| --- | --- | --- |
| 8 | SW1-4 | DIP switch: By setting DIP switch toggles in different combinations, you can perform operations such clearing historical alarms, clearing logs, and restoring factory settings |

NOTE

The user name is **admin** (preset password: **000001**)

**Table 3-9** MDU functions and specifications

| Item | Remarks |
| --- | --- |
| Function | Displays analog values and switch status for the main route and branches, and generates alarms for key parameters. |
| | Provides the communication function. |
| Specifications | 12 V power input |
| | 7-inch TFT LCD display module |
| | Board ambient temperature: -20°C to +70°C |
| | Operating humidity: 5%-95%RH |

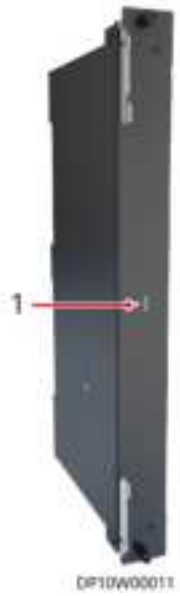
## 3.7.2 Monitoring Board

There are Three types of monitoring boards with the same appearance.

The monitoring board with the BOM number 02311GDJ or 02311GDJ-002 can convert AC into 12 V DC, and can be installed in all output modules of a cabinet.

The monitoring board with the BOM number 02311GDJ-001 can be installed only in output modules except output module 1.

**Figure 3-22** Appearance of a monitoring board




(1) Indicator

**Table 3-10** Indicator description

| Indicator Status | Description |
| --- | --- |
| Blinking green slowly | The operation is normal. |
| Blinking green fast | The communication fails. The MDU generates a monitoring board communication failure alarm. |
| Blinking red | Power supply to the monitoring board is faulty or there is a surge current impact alarm. |
| Off | The monitoring board is not working. |

**Table 3-11** Functions and specifications of the monitoring board

| Item | Remarks |
| --- | --- |
| Function | Measures parameters such as the voltages and currents of the mains and branch circuits. |
| | Provides the communication function. |
| Specifications | Operating temperature: –10°C to +55°C |
| | Operating humidity: 5%–95%RH |

## 3.7.3 MCCB

**Figure 3-23** MCCB exterior

**Table 3-12** MCCB functions and specifications

| Item | Remarks |
| --- | --- |
| Function | Connects and disconnects the circuit under normal working status. |
| | Provides overload and short-circuit protection. |
| | Provides the I1 knob for setting the thermal tripping value. |
| Specifications | Rated insulation voltage: 800 V AC |
| | Rated frequency: 50 Hz/60 Hz |
| | Operating temperature: -5°C to +40°C |

## 3.7.4 MCB

MCBs are classified into 1-pole, 2-pole, and 3-pole MCBs.

**Figure 3-24** Appearance of a 1P MCB


**Figure 3-25** Appearance of a 2P MCB


**Figure 3-26** Appearance of a 3P MCB

**Table 3-13** MCB functions and specifications

| Item | SP200 | S201/S202/S203/S204 |
| --- | --- | --- |
| Functions | Connects and disconnects the circuit under normal working status. Provides overload and short-circuit protection | |

| Item | SP200 | S201/S202/S203/S204 |
| --- | --- | --- |
| | Connects and disconnects the circuit under normal working status. Provides overload and short-circuit protection | |
| Specifications | Rated voltage:<br>• 1P: 230 V AC/240 V AC<br>• 3P: 400 V AC/415 V AC | Rated voltage:<br>• IEC 1P: 250 V AC<br>• IEC 2P: 208 V AC<br>• IEC 3P: 440 V AC |
| | Rated insulation voltage: 1 kV AC | Rated insulation voltage: 440 V AC |
| | Rated frequency: 50 Hz/60 Hz | |
| | Operating temperature: –40°C to +70°C | Operating temperature: –25°C to +55°C |
| | Rated limiting short-circuit breaking capacity: 10 kA | Rated limiting short-circuit breaking capacity: 6 kA |
| | Rated surge voltage tolerance (1.2/50): 4 kV | |
| | Pyromagnetic tripping:<br>• B: 3.2 In ≤ Im ≤ 4.8 In<br>• C: 6.4 In ≤ Im ≤ 9.6 In<br>• D: 9.6 In ≤ Im ≤ 14.4 In | Pyromagnetic tripping:<br>• B: 3 In ≤ Im ≤ 5 In<br>• C: 5 In ≤ Im ≤ 10 In<br>• D: 10 In ≤ Im ≤ 20 In<br>• K: 10 In ≤ Im ≤ 14 In<br>• Z: 2 In ≤ Im ≤ 3 In |

## 3.7.5 SPD

**Figure 3-27** SPD appearance

**Table 3-14** SPD functional parameters

| Item | Description |
| --- | --- |
| Function | Provides lightening and transient voltage surge protection. |
| Specifications | Operating temperature: -40°C to +70°C |
| | Operating humidity: 5%-95%RH |
| | Nominal discharge current In (8/20 μs) = 20 kA |
| | Maximum discharge current Imax (8/20 μs) = 40 kA |
| | Voltage protection level Up (20 kA, 8/20 μs) ≤ 1.8 kV (L-N)/≤ 1.0 kV (N-PE) |

# 4 Acceptance Guide

## Packing List

The packing materials of a modular precision PDC include:

- Wooden pallet
- Moisture-proof plastic bag
- Corner protector
- Carton
- Cushion foam

## Unpacking and Accepting Goods

**NOTICE**

- If any damage is found, report it to the carrier immediately.
- After the equipment is delivered to the installation site, representatives from the customer and Huawei unpack and inspect the equipment together.
- Move the cabinet with caution to avoid bumping or toppling. To avoid damaging the equipment, exercise caution when removing the packing materials.

**Step 1** Check whether the tiltwatch indicator on the carton has turned red. If yes, record the information and contact the equipment carrier and the local Huawei office immediately.

**Step 2** Visually inspect the equipment appearance to check whether the equipment is paint-peeling, misshapen, scratched, or soaked. If yes, record the information and contact the equipment carrier and the local Huawei office immediately.

**Step 3** Check against the delivery list that the equipment and fittings are correct and complete. If some fittings are missing or do not comply with the models in the delivery list, record the information and contact the local Huawei office immediately.

**----End**

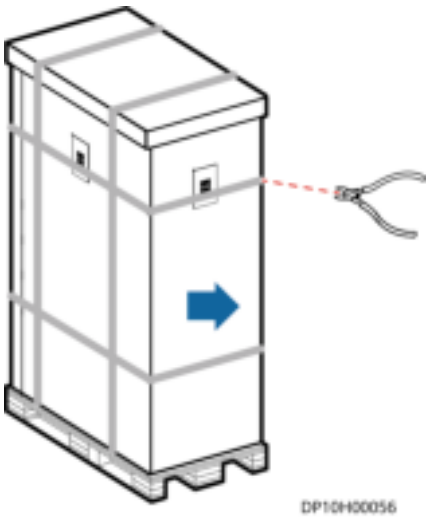
  

## Unpacking

**Step 1** Move the PDC to the specified installation position using a forklift.

**Step 2** Cut off and remove the binding straps.

**Figure 4-1** Removing the binding straps




**Step 3** Remove the packing materials and foam.

**Step 4** Remove the plastic bag, take out the fitting box, and put it away.

**----End**

# 5 Installation Guide

## 5.1 Site Requirements

The PDC site requirements are as follows:

- Far away from dust, smoke, harmful gas, and corrosive, flammable, or explosive objects.
- Free of interference from strong electromagnetic fields.
- Cabling space should be planned for the site, and cable ladders and cable trays should be designed for the PDC installation position.
- The error of the installation platform levelness must be less than 10 mm.
- Meets the PDC input rating requirements (see the Schematic Diagram delivered with the product for details).
- Temperature: -5°C to +40°C
- Relative humidity: 5%-95% RH, non-condensing
- Altitude: < 2000 m (derated when the altitude exceeds 2000 m). For the derating details, contact Huawei technical support.

NOTE

Huawei will not be liable for any consequences caused if the installation environment does not meet the requirements.

## 5.2 Installation Preparations

Before installation, unpack and check the product, make available all required technical documents, tools, and materials, check the installation environment, and train onsite installation personnel.

## 5.2.1 Obtaining Technical Documents

**Table 5-1** Technical documents

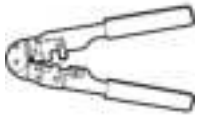
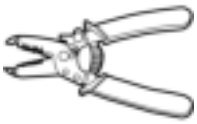
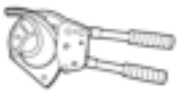
| Technical Document | Function | Obtaining Method |
| --- | --- | --- |
| *Schematic diagram* | Shows the circuit breaker control relationship in the PDC. | Delivered with the product. |
| *Wiring Diagram* | Describes the connection positions of input power cables, output power cables, and monitoring cables for the PDC. | Download this document from the website. |
| *PDU8000 Modbus Protocol for External Systems* | Used to access a third-party network management system. | Download this document from the website. |

## 5.2.2 Obtaining Tools and Materials

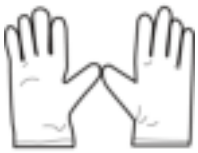
The construction team needs to prepare the tools, meters, and basic materials required for hardware installation.

**Table 5-2** Tools and materials

| Category | Tools and Materials | | |
| --- | --- | --- | --- |
| Tightening tools | M5/M6/M8 Phillips screwdriver  | Flat-head screwdriver (2-5 mm)  | Adjustable wrench  |
| | Torque wrench  | Socket wrench set  | - |

| Category | Tools and Materials | | |
|---|---|---|---|
| Pliers | Needle-nose pliers  | Diagonal pliers  | RJ45 crimping tool  |
| | Crimping tool  | Wire stripper  | Electric hydraulic pliers  |
| | Cable cutter  | - | - |
| Power tools | Hammer drill  | Heat gun  | Vacuum cleaner  |
| Instruments | Multimeter  | Electroprobe  | Network cable tester  |
| Auxiliary tools | Right angle  | Measuring tape (5 m)  | Level  |

| Category | Tools and Materials | | |
|---|---|---|---|
| | Claw hammer  | Scissors  | Box cutter  |
| | Hacksaw  | Step ladder (2 m)  | Hammer drill bits(Φ16)  |
| | Rubber mallet  | Pallet truck  | - |
| Accessories/ Consumables | cable tie  | Polyvinyl chloride (PVC) insulation tape  | Marker  |
| | ESD gloves  | Protective gloves  | Safety helmet  |
| | Safety goggles  | ESD wrist strap  | Insulated gloves  |

| Category | Tools and Materials | | |
|---|---|---|---|
| | Protective shoes  | Firestop putty  | - |

NOTE

- This table may not list some tools required at specific sites. Site installation personnel and technical support personnel should prepare tools based on site requirements.
- Prepare firestop putty for sealing cable holes after cable connection. Huawei does not provide the firestop putty. The customer needs to purchase it.

## 5.2.3 Checking Personnel Requirements

Construction personnel must have basic knowledge of safe operation, be trained to master correct operation methods, and have the appropriate job qualifications.

The owner should pay attention to the following items when organizing the construction personnel to carry out construction work:

- Construction personnel have been trained and qualified by Huawei to master methods for system installation and commissioning, and have obtained work permits before they begin to install and commission equipment.
- The number of construction personnel depends on the project progress and the installation environment.
- Construction personnel have read through the safety precautions and related product documents before they begin work.

# 5.3 Installing the PDC

### Prerequisites

- The installation environment has been checked with expected results.
- The site has been closed off, and notices have been posted.
- The PDC has been unpacked and inspected, and no problems were found.
- You have obtained the tools and meters required for the installation.
- Installation personnel must be qualified and certified. Power distribution equipment operators must hold a primary electrician certificate or higher.

### Context

- A modular precision PDC can be installed on a concrete floor or an ESD floor.
- A modular precision PDC can be deployed separately or combined with another cabinet.

NOTE

As the onsite conditions may vary, the following steps are for reference only. Onsite installation personnel and technical engineers can decide whether to perform the steps based on the actual situation.

# 5.3.1 Moving the PDC

## Context

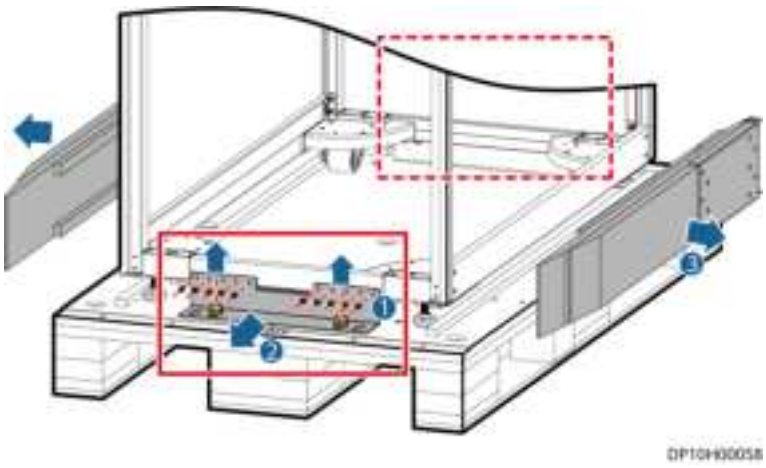
NOTICE

The PDC weighs about 400 kg. Take protective measures during movement to prevent toppling and bumping.

## Procedure

**Step 1** Remove the two L-shaped brackets between the front and rear door sills of the PDC and the pallet, as shown by (1) and (2) in **Figure 5-1**.

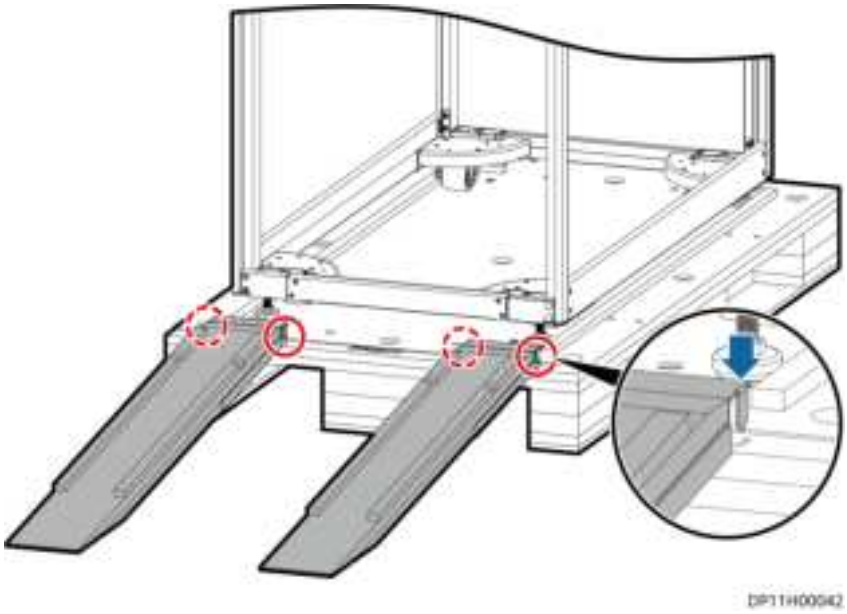
**Figure 5-1** Removing L-shaped brackets



**Step 2** Use diagonal pliers to cut off the binding straps securing the unloading ramps, and take out the unloading ramps on both sides, as shown by (3) in **Figure 5-1**.

**Step 3** Clip the unloading ramps to the wooden pallet.

**Figure 5-2** Installing the unloading ramps



**Step 4** Adjust the PDC leveling feet using a wrench to ensure that all castors touch the ground.

**Step 5** Arrange four persons to push the PDC off the wooden pallet to the ground with caution.

**----End**

## 5.3.2 Installing the PDC on a Concrete Floor

### Procedure

**Step 1** Mark the positions for installing expansion bolts based on the marking-off template.

NOTE

Each PDC is delivered with one marking-off template of the corresponding size.

**Figure 5-3** Marking-off template (PDC dimensions: 2200 mm x 600 mm x 1100 mm/2000 mm x 600 mm x 1100 mm)

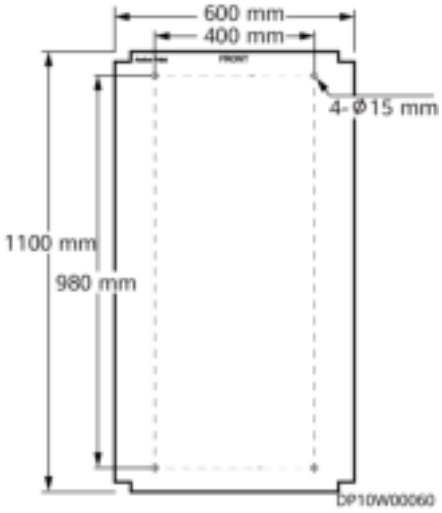
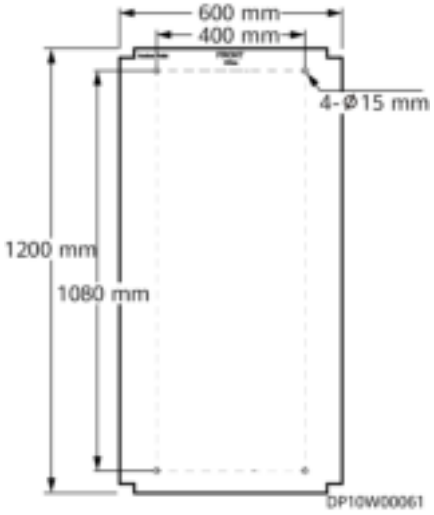



**Figure 5-4** Marking-off template (PDC dimensions: 2000 mm x 600 mm x 1200 mm)




**Step 2** Drill holes in the marked positions using a hammer drill.

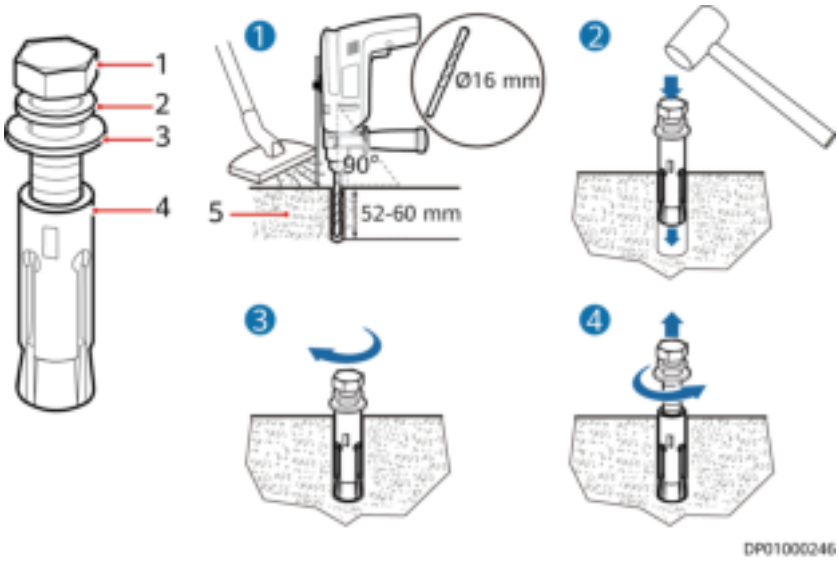
**Step 3** Slightly tighten expansion bolts to prevent the expansion sleeves from fluttering.

**Step 4** Knock the expansion bolts vertically into mounting holes until the flat washers are flush with the floor.

**Step 5** Remove the bolt, flat washer, and spring washer.

**Figure 5-5** Installing expansion sleeves



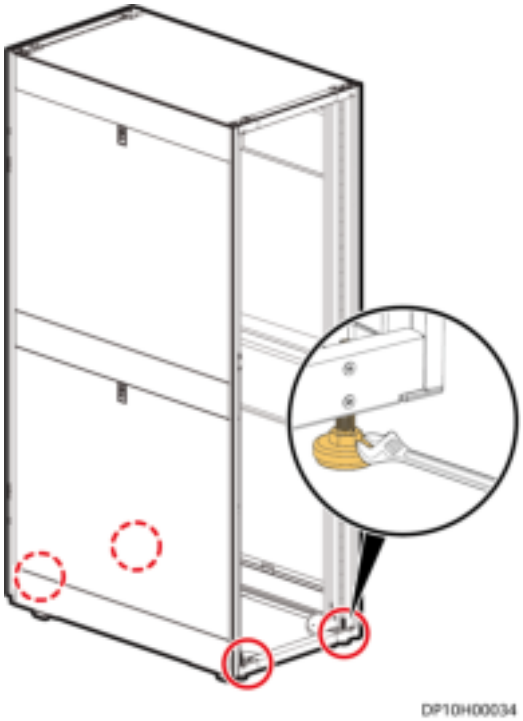

(1) M12 bolt (2) Spring washer (3) Flat washer

(4) Expansion sleeve (5) Concrete floor

**Step 6** Align the PDC mounting holes with the expansion bolt holes.

**Step 7** Adjust the anchor bolts of the PDC using an adjustable wrench until the leveling feet touch the floor.

**Figure 5-6** Leveling the feet



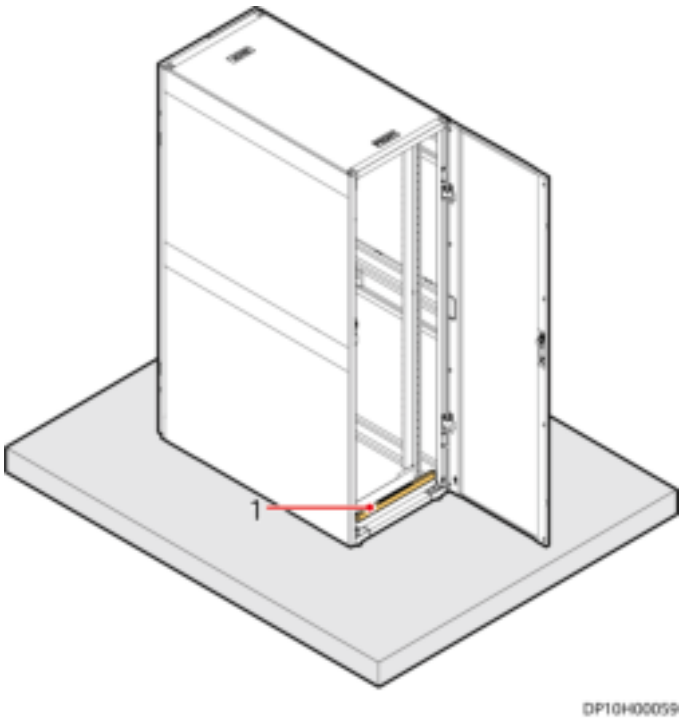

  

NOTE

- Wrench a leveling foot clockwise to elevate a cabinet foot, or wrench a leveling foot anticlockwise to lower it. The cabinet feet can be adjusted within a range of 0-8 mm.
- To prevent cabinet tilting, adjust all the feet at the four corners instead of one foot.
- Do not remove leveling feet, because this work brings you only a great deal of reworking.

**Step 8** Level the PDC using a level and an adjustable wrench.

**Figure 5-7** Leveling the PDC



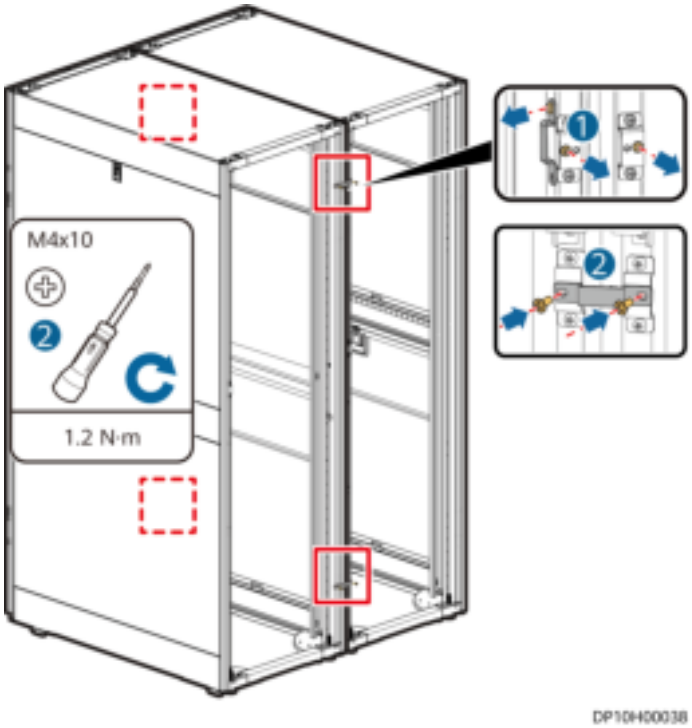

(1) Level

**Step 9** Partially tighten the expansion bolt.

**Step 10** (Optional) Combine cabinets. Remove the cabinet connecting plates from the rack, and then secure the connecting plates in the connection positions on the door using screws.

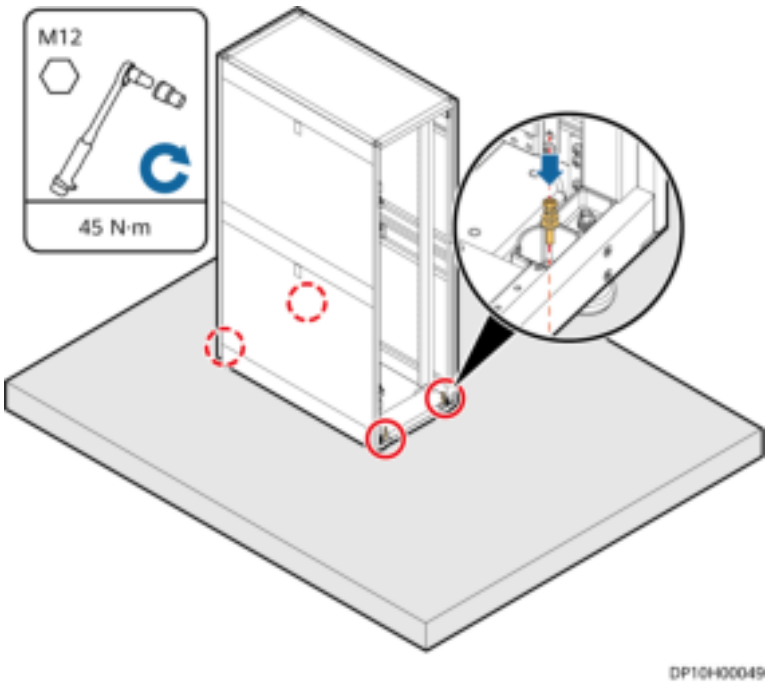
  

**Figure 5-8** Combining PDCs




**Step 11** Use a socket wrench to tighten the bolts in diagonal order.

**Figure 5-9** Tighten the PDC bolts




**----End**

# 5.3.3 Installing the PDC on an ESD Floor

## Context

A support is required when the PDC is installed on an ESD floor. The support height depends on the height between the ground and the ESD floor.

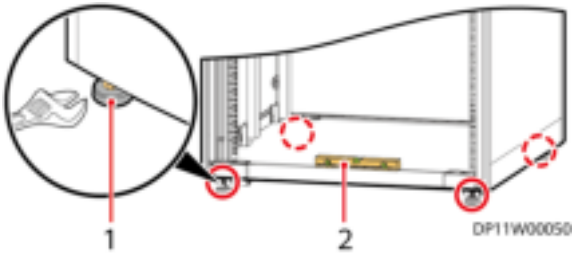
## Procedure

**Step 1** Lower the leveling feet of the PDC using an adjustable wrench until all castors are off the ground and the cabinet is level.

**Step 2** Lift the PDC onto the support and align the mounting holes in the PDC with those in the support.

**Step 3** Level the PDC by adjusting the leveling feet.

**Figure 5-10** Leveling PDC

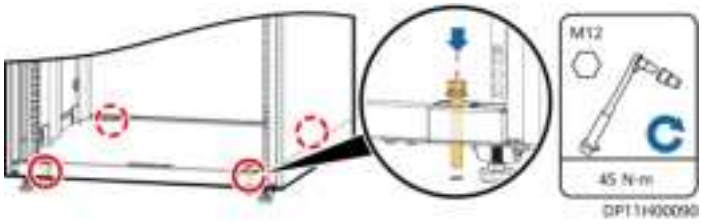



(1) Leveling foot (2) Level

**Step 4** Insert four M12 bolts into the mounting holes in the PDC and support, and partially tighten the bolts.

- Scenario 1

**Figure 5-11** Securing the cabinet



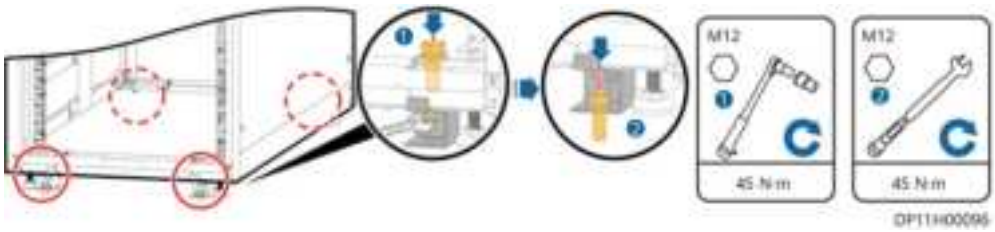

- Scenario 2

NOTE

(Optional) When the PDC installation environment is 5# channel steel and that the PDC cannot be secured using the mounting holes, secure the PDC using the mechanical part shown in the following figure.

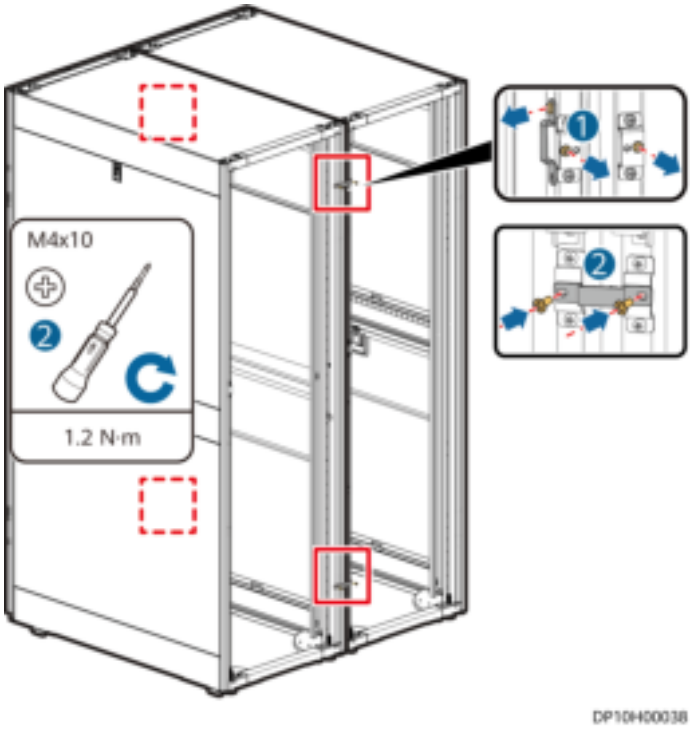
  

**Figure 5-12** Securing the cabinet (using mechanical parts)




**Step 5** (Optional) Combine cabinets. Remove the cabinet connecting plates from the rack, and then secure the connecting plates in the connection positions on the door using screws.

**Figure 5-13** Combining PDCs




**Step 6** Use a socket wrench to tighten the bolts in diagonal order.

**----End**

# 5.4 Installing Cables

# 5.4.1 Cable Routing Rules

## Binding Cables

**Table 5-3** Cable binding rules

| No. | Cable Binding Rule |
| --- | --- |
| 1 | Power cables and signal cables are bound separately with a distance above 150 mm. |
| 2 | Both ends of a cable are labeled. Labels are clean and correct, and provide concise and understandable description. |
| 3 | Cable ties are neatly cut without sharp burs, evenly distributed, bound to a proper strength, and fastened towards the same direction if possible, as shown in **Figure 5-14** and **Figure 5-15**. |
| 4 | Each output power cable bundle can contain 5-10 cables. If too many cables are bound together, the cables may overheat due to poor heat dissipation. |
| 5 | Extra cables are coiled neatly and easy to find. |
| 6 | Cables on the surface of a large cable bundle are neatly organized without unnecessary crossover. |
| 7 | Cables are arranged in distinct layers and crossovers are avoided if possible when cables in different colors are bound together, as shown in **Figure 5-16**. Cables are arranged by thickness when arrangement by thickness conflicts with arrangement by color. |
| 8 | Cables are reliably bound along the route, and the binding interval meets the requirements in **Table 5-4**. |
| 9 | Cables are away from sharp components such as copper bars and terminals to avoid scratching. |

**Figure 5-14** Cable ties without sharp burs

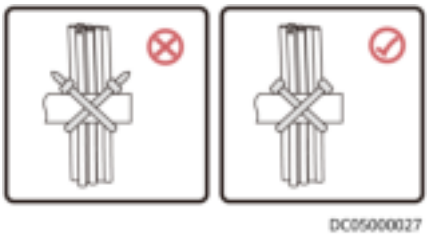



**Figure 5-15** Cable ties in the same direction

**Figure 5-16** Binding cables in different colors

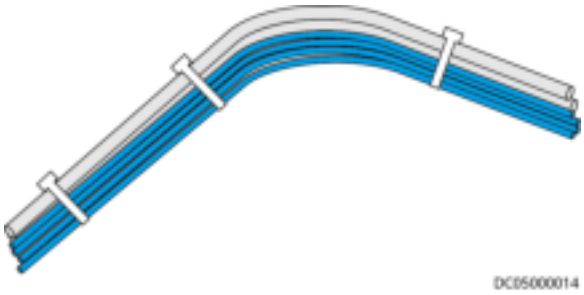



**Table 5-4** Cable bundle binding interval

| Cable Bundle Diameter (mm) | Binding Interval (mm) |
| --- | --- |
| < 10 | 150 |
| 10-30 | 200 |
| > 30 | 300 |

## Cable Bending

**Table 5-5** Cable bending rules

| No. | Cable Bending Rule |
| --- | --- |
| 1 | Cables are not overly bent as over bending may damage the cable cores. |
| 2 | Unless otherwise stipulated, the bending radius should be 10 times greater than the cable diameter if the installation space is sufficient. |
| 3 | Cables are not tied where they bend, as shown in **Figure 5-17**. |
| 4 | Cables must be a little longer than the exact cable route length to facilitate plug and unplug, as shown in **Figure 5-18**. |
| 5 | Cables should be neatly and loosely arranged to eliminate abnormal stress on certain cables, as shown in **Figure 5-19**. |

**Figure 5-17** Not tied at bends

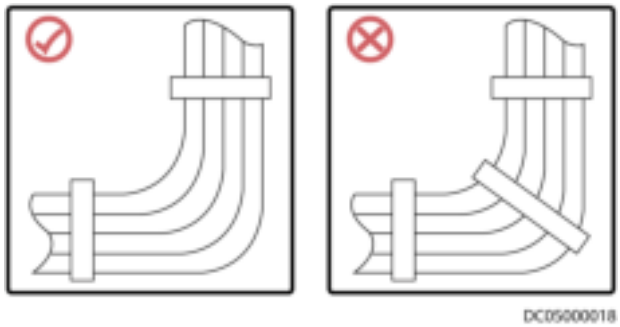


**Figure 5-18** Extra length for easy plug and unplug

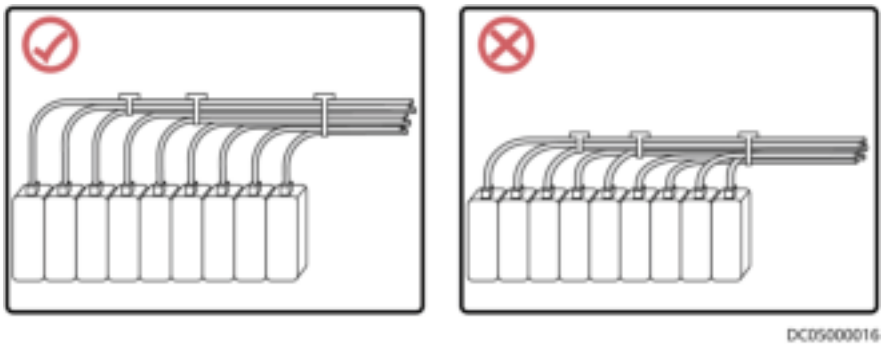
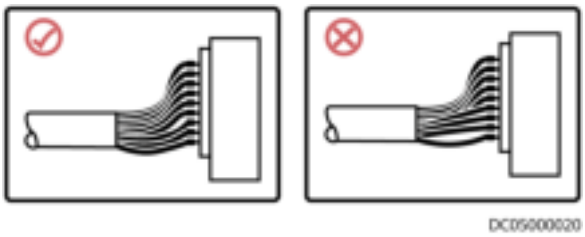


**Figure 5-19** Stroking cables



## Cable Layout

**Table 5-6** Cable layout rules

| No. | Cable Layout Rule |
| --- | --- |
| 1 | The armoring layers of armored cables are grounded. |
| 2 | The PDC ground cable is secured to the equipment room ground bar. The resistance between the PDC ground cable and the equipment room ground bar is less than 0.1 ohm. |
| 3 | Cables are securely connected in the correct phase sequence. |
| 4 | Cables are neatly arranged, and cable insulation layers are intact. |
| 5 | Different types of cables are bound separately. |
| 6 | Connection ports and cabling methods facilitate maintenance, cable routing, and capacity expansion. |
| 7 | Cable connectors prepared onsite must be normal, secure, reliable, and neat. |
| 8 | Power cables, ground cables, and various signal cables are securely connected. Adapters are securely plugged or screwed. |
| 9 | The N and PE cables are bound separately from the L1/L2/L3 or L cables for each circuit breaker. Cables are converged at the beam and bound in groups by cable ties. |

## 5.4.2 Power Cable Specifications

YJV 5-core cables are recommended. When the ambient temperature is 40°C, the conductor working temperature cannot exceed 90°C.

For the installation torque for power connection of involved electrical parts, see the specifications of the electrical parts. If the torque is not specified, see the torque requirements listed in the following table.

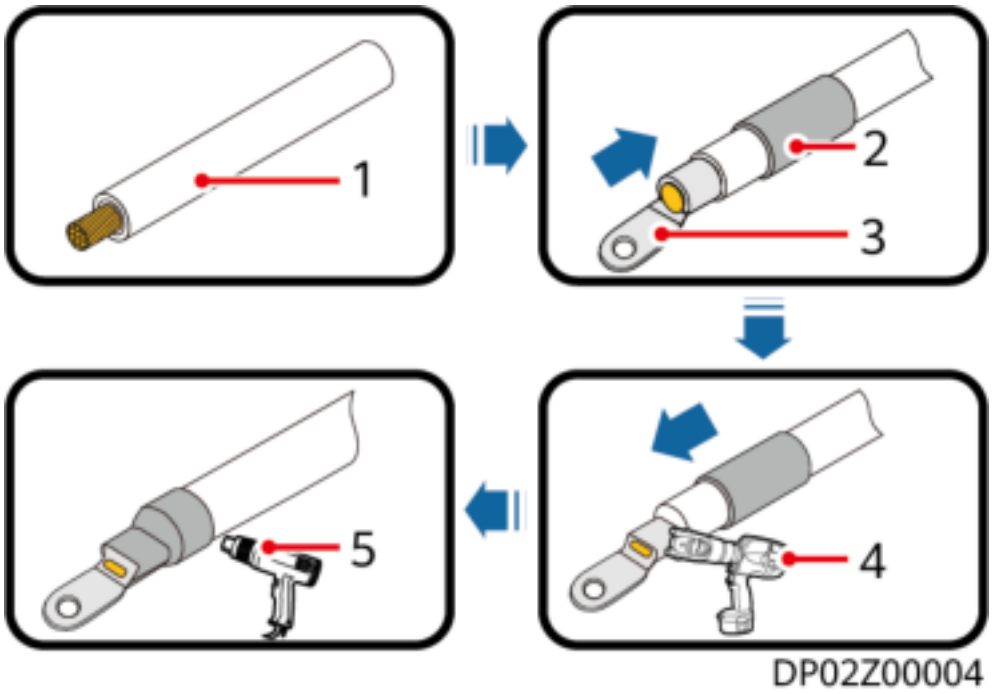
**Table 5-7** Power cable specifications

| Wiring Terminal | Rated Current (A) | Recommended Cross-Sectional Area ($mm^2$) | Terminal/Bolt Specifications | Recommended Torque (N·m) |
|---|---|---|---|---|
| Power input (L/N) | 160 | 50 | DT-M10 | 27 |
| | 250 | 95 | DT-M12 | 47 |
| | 400 | 185 | DT-M16 | 120 |
| | 630 | 2 x 185 | DT-M16 | 120 |
| Power input (PE) | 160 | 25 | DT-M10 | 27 |
| | 250 | 50 | DT-M10 | 27 |
| | 400 | 95 | DT-M12 | 47 |
| | 630 | 2 x 95 | DT-M12 | 47 |
| AC output (L) | < 10 | 2.5 | Cord end terminal (crimping screw specification: M4) | 1.2 |
| | 10 ≤ I ≤ 40 | 6 | Cord end terminal (crimping screw specification: M4) | 1.2 |
| | 40 < I ≤ 63 | 10 | Cord end terminal (crimping screw specification: M4) | 1.2 |
| AC output (N/PE) | < 10 | 2.5 | OT-M6 | 4.5 |
| | 10 ≤ I ≤ 40 | 6 | OT-M6 | 4.5 |

| Wiring Terminal | Rated Current (A) | Recommended Cross-Sectional Area ($mm^2$) | Terminal/Bolt Specifications | Recommended Torque (N·m) |
|---|---|---|---|---|
| | 40 < I ≤ 63 | 10 | OT-M6 | 4.5 |

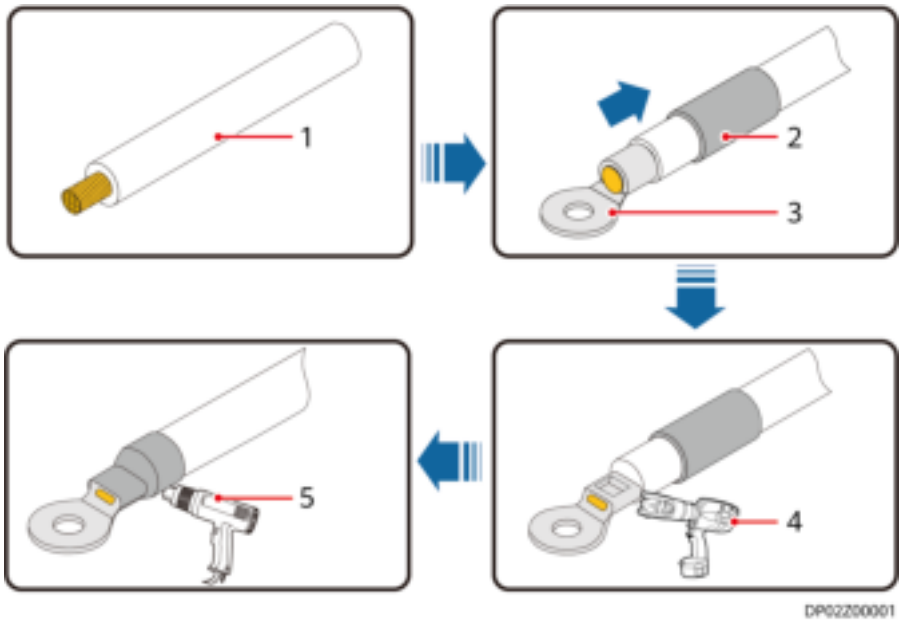
## 5.4.3 Preparing Terminals

**Figure 5-20** Preparing a DT terminal



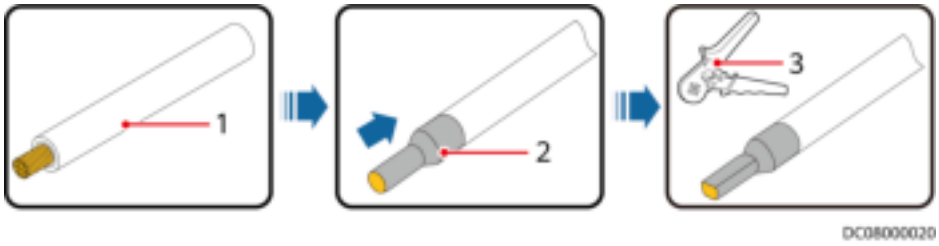

(1) Cable (2) Heat shrink tubing (3) DT terminal (4) Electric hydraulic pliers (5) Heat gun

**Figure 5-21** Preparing an OT terminal




(1) Cable (2) Heat shrink tubing (3) OT terminal (4) Electric hydraulic pliers (5) Heat gun

**Figure 5-22** Preparing a cord end terminal




(1) Cable (2) Cord end terminal (3) Crimping tool

There are two types of RJ45 connectors, including 568A and 568B, as shown in **Figure 5-23** and **Figure 5-24**. Using 568A as an example: The RJ45 connector can be connected in the 4-wire or 2-wire methods, as shown in **Figure 5-25** and **Figure 5-26**.

**Figure 5-23** 568A RJ45 connector

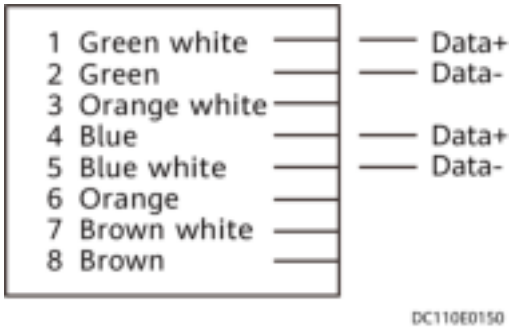



**Figure 5-24** 568B RJ45 connector

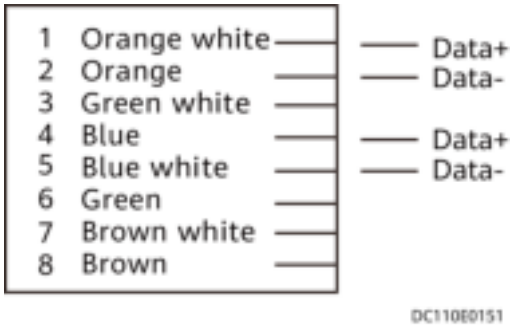



**Figure 5-25** 4-wire

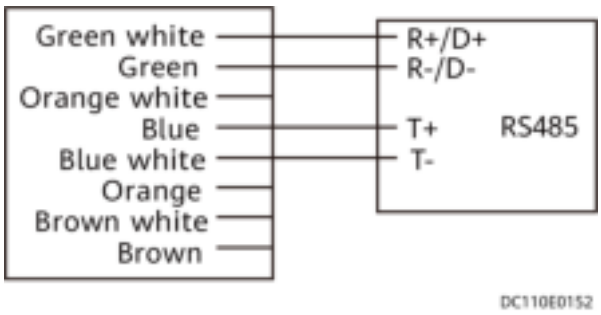
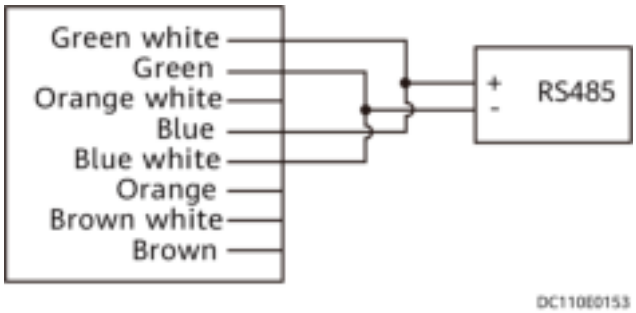



**Figure 5-26** 2-wire

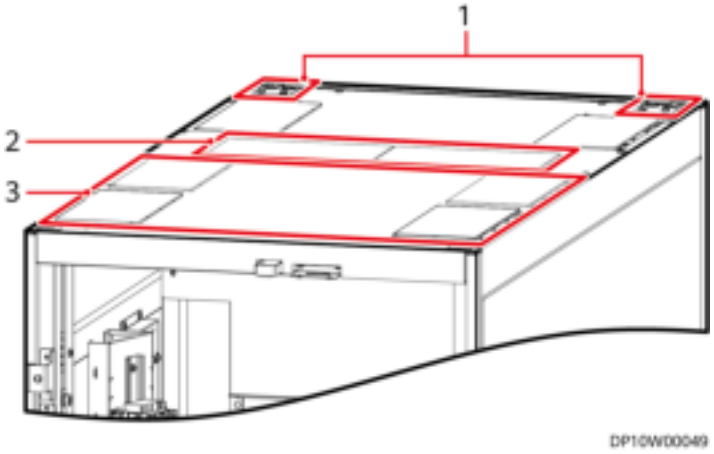


# 5.4.4 Connecting Cables

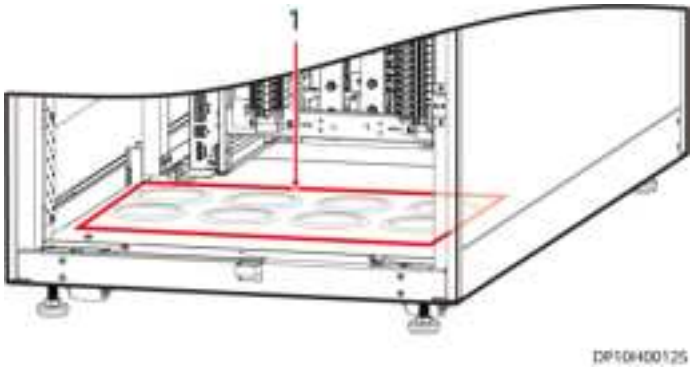
## Cable Holes

**Figure 5-27** Cable holes at the top




(1) Monitoring cable hole
(2) Power cable inlet hole
(3) Power cable outlet hole

**Figure 5-28** Cable holes at the bottom




(1) Cable holes at the bottom

## Precautions

- Ensure that all circuit breakers, including upstream output circuit breakers, are switched off before connecting cables.
- OT terminals and DT terminals must be coated with a heat shrink tubing.

NOTE

- This document uses the dual-input top cable routing and single-input bottom cable routing as examples. Cable connections for other scenarios are similar.
- Remove the rodent-proof mesh at the top or bottom based on the cable routing scenario.

## Connection Method

CAUTION

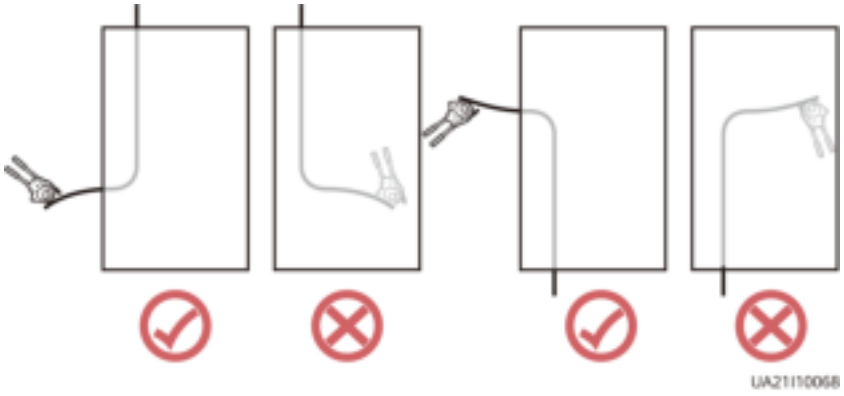
- Keep away from cabinets when preparing cables to prevent cable scraps from entering the cabinets. Cable scraps may cause ignition during power-on and result in personal injury and device damage.
- After installing cables, clean the cabinet top, bottom, copper bar wiring positions, and other positions. Ensure that there is no dust or scraps inside and around cabinets.
- Prepare terminals onsite. The length of the copper wire should be the same as that of the part of the terminal that covers the conductor.

**Step 1** Route a cable into the cabinet and bind it to a nearby beam.

**Step 2** Pull the cable to the copper bar to which the cable is to be connected, determine the cable length, and mark the cable at the position where the cable is to be cut.

**Step 3** Pull the marked cable out of the cabinet, cut the cable from the marked position, strip the cable, and crimp a terminal.

**Figure 5-29** Preparing a cable terminal outside the cabinet



NOTE

Choose an appropriate cabling route based on the actual situation. The figure is for reference only.

**Step 4** Connect the cable with a crimped terminal to the corresponding copper bar.

**Step 5** Clean foreign matter inside the cabinet.

**----End**

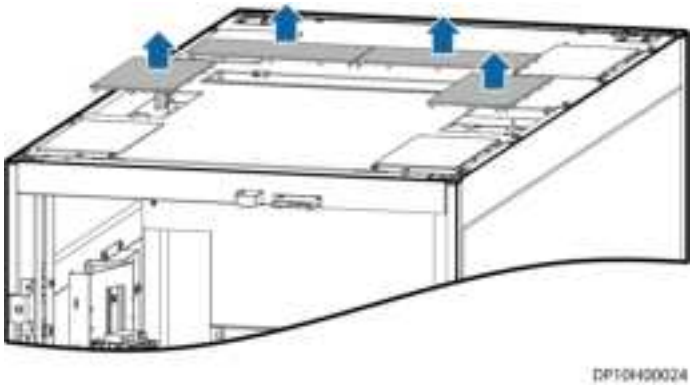
### 5.4.4.1 Top Cable Routing

The following procedure applies to a dual-input PDC.

## Procedure

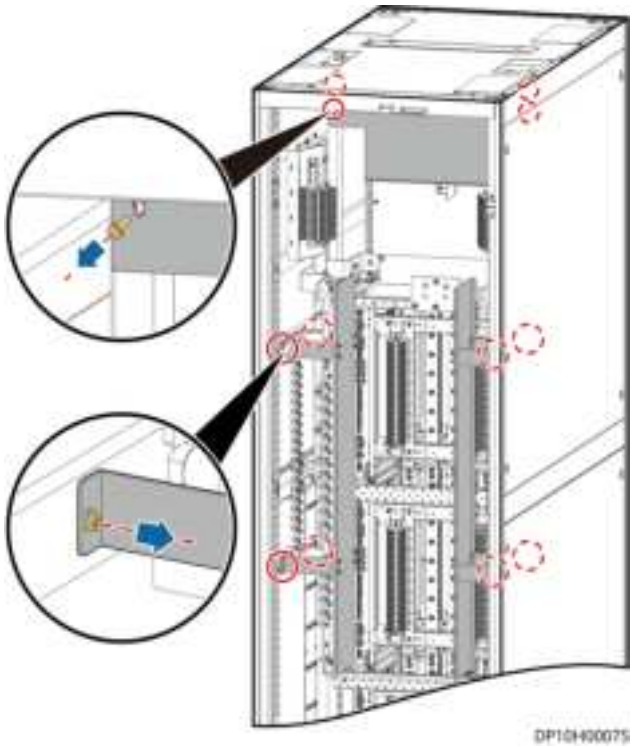
**Step 1** Remove the rodent-proof meshes at the top and put them aside.

**Figure 5-30** Removing rodent-proof meshes at the top



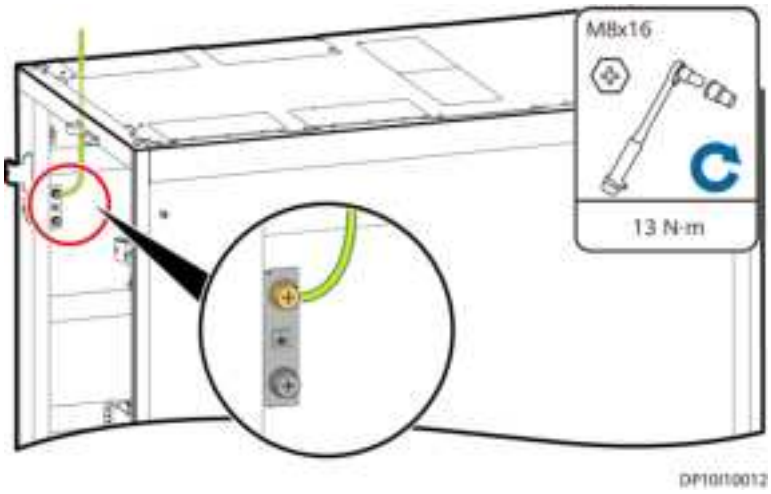
**Step 2** Remove the transparent covers of the N bar and input copper bar, and put the covers aside.

**Figure 5-31** Removing the transparent covers of the N bar and input copper bar



**Step 3** Connect the equipotential ground cables for the cabinet.

**Figure 5-32** Connecting the equipotential ground cables for the cabinet

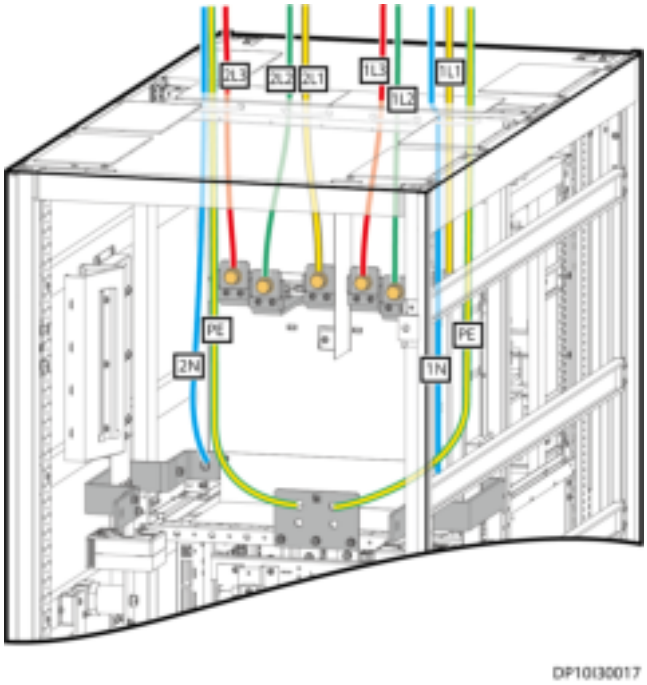



**Step 4** Connect the input power cables.

**NOTICE**

- In single-input scenarios, connect the input N cable to 1N.
- When connecting the input power cables, verify that the screw assemblies face the same direction, and that the nuts face the cabinet rear door.
- Connect the three-phase cables, N cable, and PE cable in sequence.

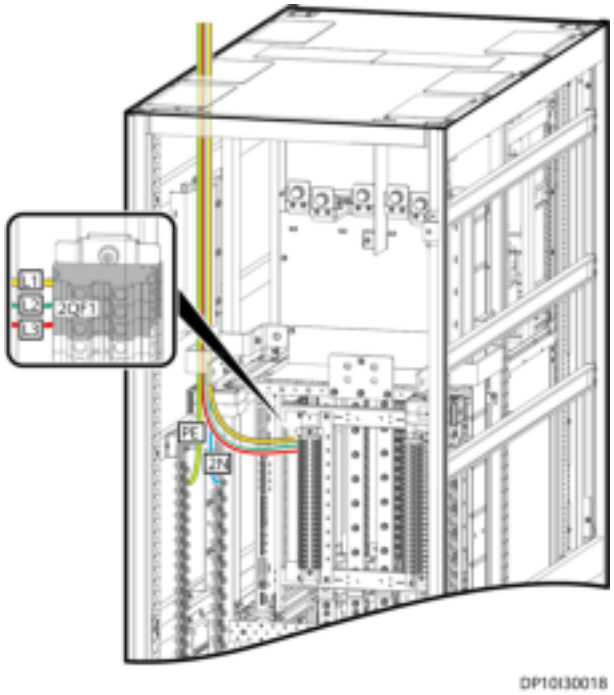
**Figure 5-33** Connecting input power cables




**Step 5** Connect the output power cables.

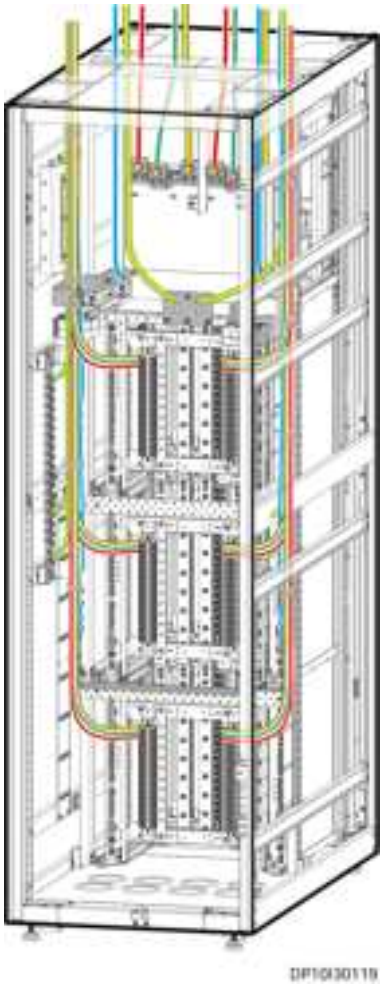
**Figure 5-34** Connecting output power cables




**Step 6** The following figure shows the overall effect after cable connection.

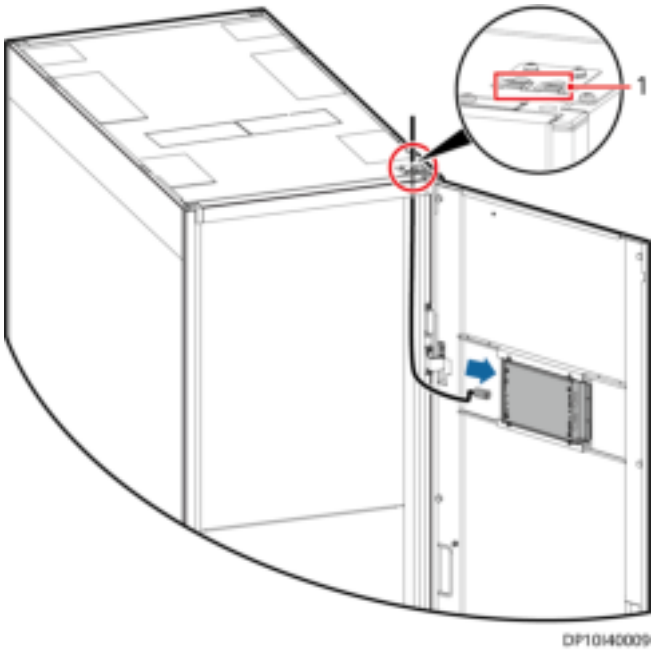
**Figure 5-35** Overall cable connection effect



**Step 7** Connect the PDC monitoring cable to the RS485_1 or FE port on the MDU side.

**Figure 5-36** Connecting the monitoring cable




(1) Monitoring cable outlet

**Step 8** (Optional) Connect the fire linkage cables.

The customer can select a cable connection method based on the actual requirement:

- Scenario 1: single-input or dual-input PDC; one pair of fire extinguishing input cables control all loads to power off.
  - Single-input PDC: Connect the positive and negative terminals of the fire control cable to the 24VDC(+) and 24VDC(-) wiring terminals at the rear right of the cabinet respectively.
  - Dual-input PDC: Connect the positive and negative terminals of the fire control cable to the 24VDC(+) and 24VDC(-) wiring terminals at the rear left or rear right of the cabinet respectively.
- Scenario 2: dual-input PDC; either of the two pairs of fire extinguishing input cables can control all loads to power off.
  - Separate the two routes of fire control cables and connect them to the fire extinguishing signal wiring terminals on both sides at the cabinet rear. Connect the positive and negative terminals of each pair of control cable to the 24VDC(+) and 24VDC(-) wiring terminals at the rear left and rear right of the cabinet respectively.

NOTE

1. 24 V DC cables routed into the PDC should be shielded cables.
2. Ensure that the polarities of 24 V DC cables routed into the PDC are correct.

**Figure 5-37** Connecting the fire linkage cables (scenario 1)

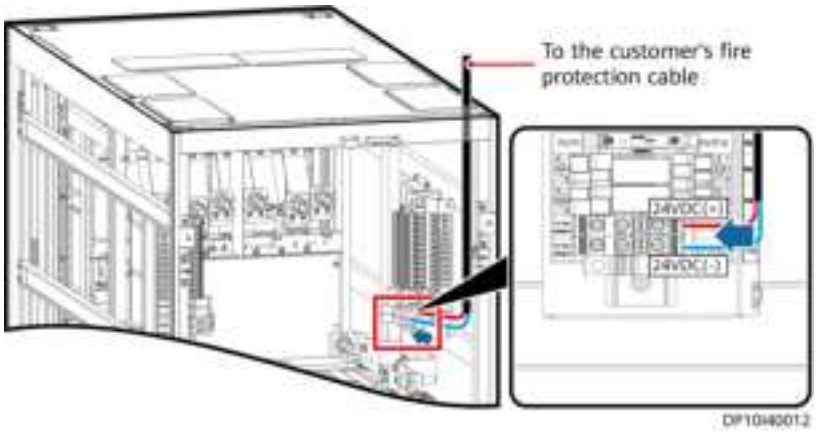
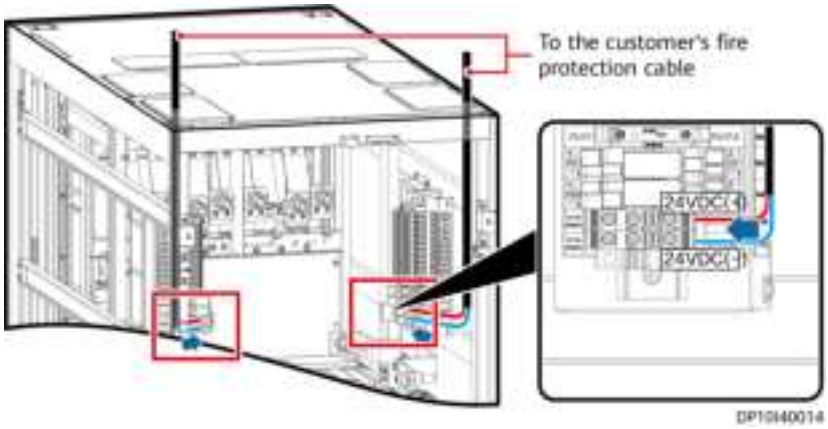
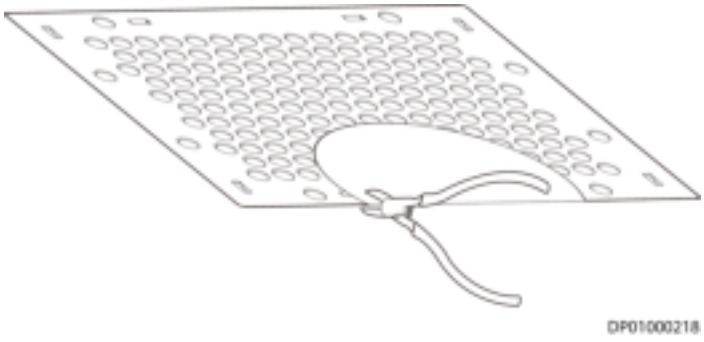



**Figure 5-38** Connecting the fire linkage cables (scenario 2)




**Step 9** Cut cable inlet and outlet holes in the rodent-proof meshes based on the number and size of cables to be routed.

**Figure 5-39** Cutting holes in the rodent-proof meshes



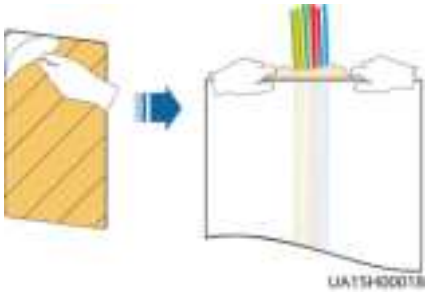

**Step 10** Reinstall the rodent-proof meshes.

**Step 11** Reinstall the transparent covers of the input copper bar and N bar.

**Step 12** Seal the gap between cables and the cabinet using flake sealing putty. (Remove the paper protective film from the sealing putty and use the aluminum foil film together with the sealing putty.)

**Figure 5-40** Fill the holes with flake sealing putty



**----End**

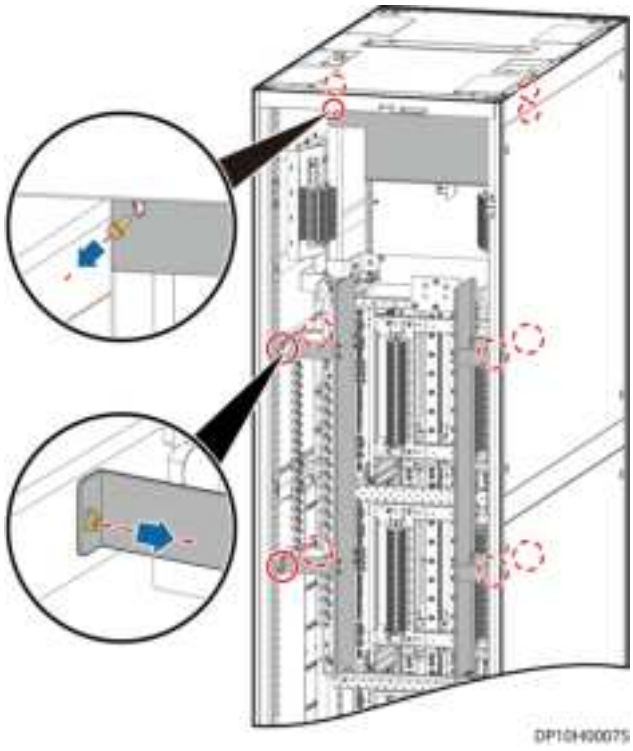
## 5.4.4.2 Bottom Cable Routing

The following procedure applies to a single-input PDC.

## Procedure

**Step 1** Remove the transparent covers of the N bar and input copper bar, and put the covers aside.

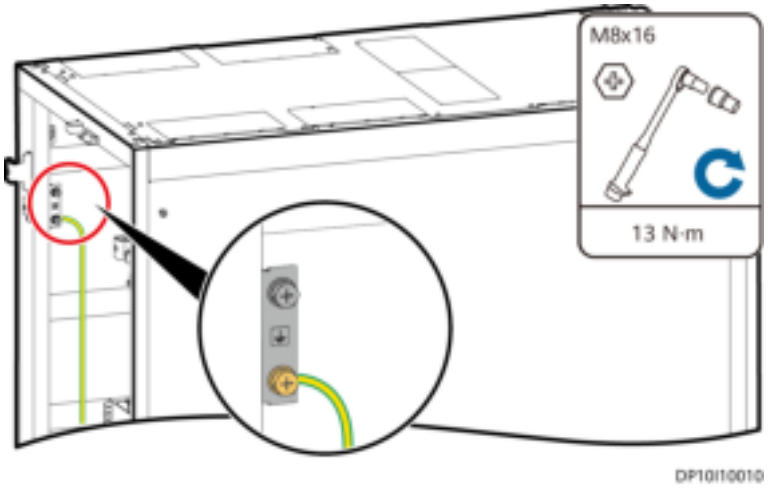
**Figure 5-41** Removing the transparent covers of the N bar and input copper bar



**Step 2** Connect the equipotential ground cables for the cabinet.

**Figure 5-42** Connecting the equipotential ground cables for the cabinet



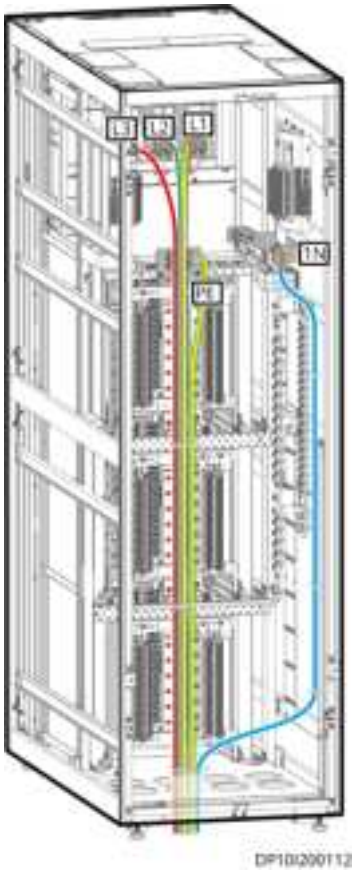

**Step 3** Connect the input power cables.

**NOTICE**

- In single-input scenarios, connect the input N cable to 1N.
- When connecting the input power cables, verify that the screw assemblies face the same direction, and that the nuts face the cabinet rear door.
- Connect the three-phase cables, N cable, and PE cable in sequence.

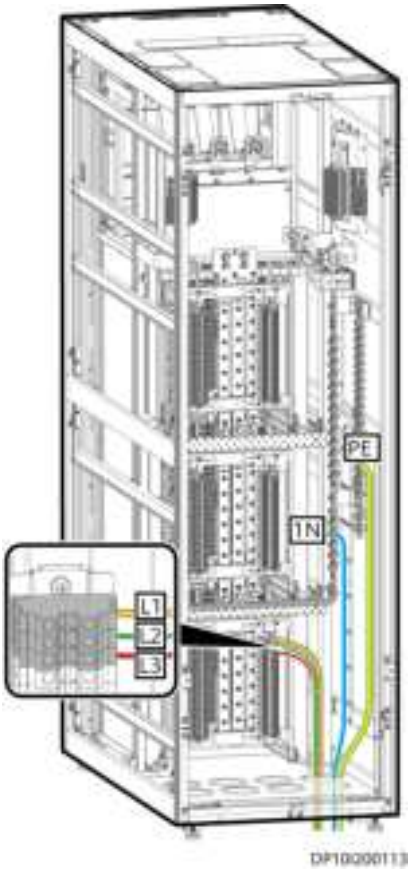
**Figure 5-43** Connecting input power cables




**Step 4** Connect the output power cables.

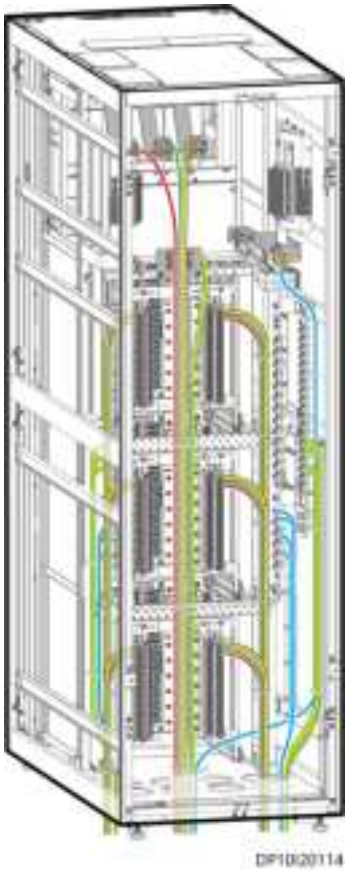
**Figure 5-44** Connecting output power cables




**Step 5** The following figure shows the overall effect after cable connection.

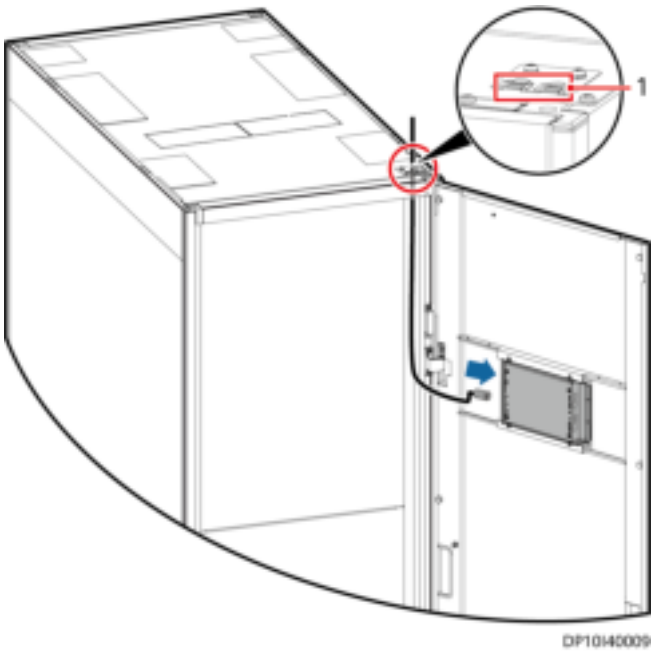
  

**Figure 5-45** Overall cable connection effect



**Step 6** Connect the PDC monitoring cable to the RS485_1 or FE port on the MDU side.

**Figure 5-46** Connecting the monitoring cable



(1) Monitoring cable outlet

**Step 7** (Optional) Connect the fire linkage cables.

The customer can select a cable connection method based on the actual requirement:

- Scenario 1: single-input or dual-input PDC; one pair of fire extinguishing input cables control all loads to power off.
  - Single-input PDC: Connect the positive and negative terminals of the fire control cable to the 24VDC(+) and 24VDC(-) wiring terminals at the rear right of the cabinet respectively.
  - Dual-input PDC: Connect the positive and negative terminals of the fire control cable to the 24VDC(+) and 24VDC(-) wiring terminals at the rear left or rear right of the cabinet respectively.
- Scenario 2: dual-input PDC; either of the two pairs of fire extinguishing input cables can control all loads to power off.
  - Separate the two routes of fire control cables and connect them to the fire extinguishing signal wiring terminals on both sides at the cabinet rear. Connect the positive and negative terminals of each pair of control cable to the 24VDC(+) and 24VDC(-) wiring terminals at the rear left and rear right of the cabinet respectively.

NOTE

1. 24 V DC cables routed into the PDC should be shielded cables.
2. Ensure that the polarities of 24 V DC cables routed into the PDC are correct.

**Figure 5-47** Connecting the fire linkage cables (scenario 1)

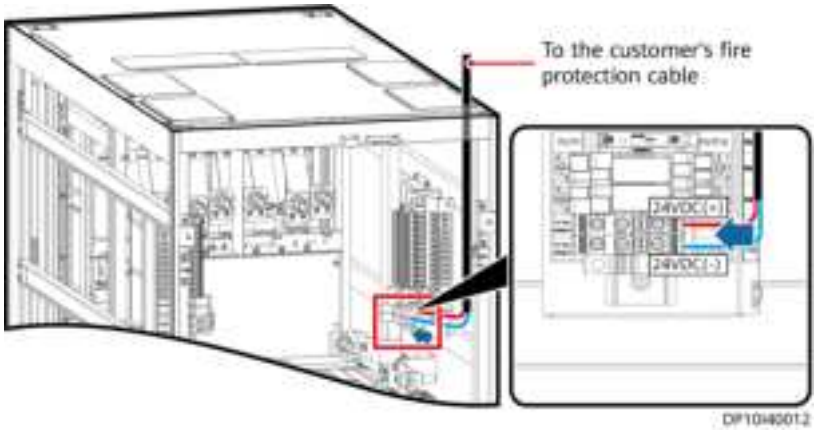
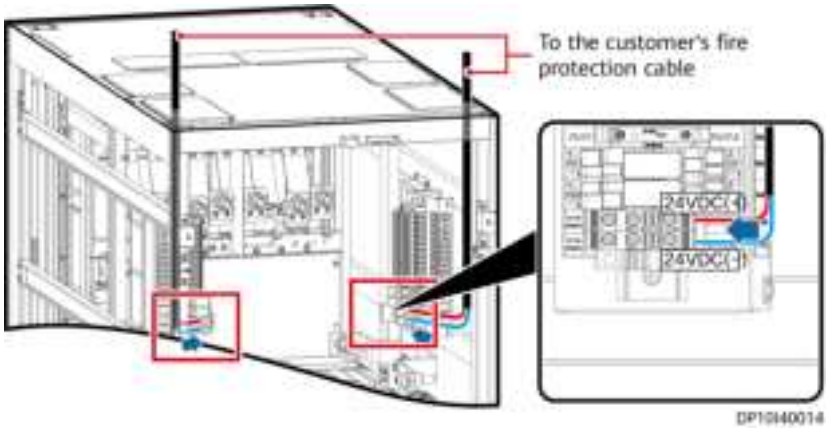


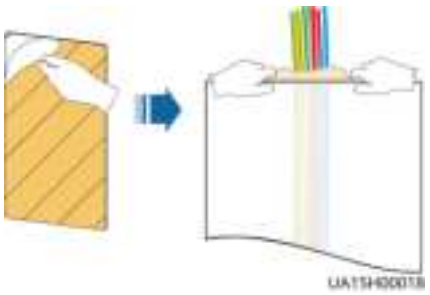
**Figure 5-48** Connecting the fire linkage cables (scenario 2)




**Step 8** Reinstall the transparent covers of the input copper bar and N bar.

**Step 9** Seal the gap between cables and the cabinet using flake sealing putty. (Remove the paper protective film from the sealing putty and use the aluminum foil film together with the sealing putty.)

**Figure 5-49** Fill the holes with flake sealing putty



**----End**

# 6 Commissioning Guide

## 6.1 Check Before Power-on Commissioning

**Table 6-1** Hardware installation checklist

| No. | Check Item | Result |
| --- | --- | --- |
| 1 | The cabinet is clean, without redundant screws, copper wires, or other debris. | □Yes □No |
| 2 | The paint on the cabinet exterior is intact. | □Yes □No |
| 3 | The cabinet door and lock work properly. | □Yes □No |
| 4 | All labels are correct, clear, and complete. | □Yes □No |
| 5 | The surrounding area of the cabinet contains no waste tape, cable ties, paper, or packing materials. | □Yes □No |

**Table 6-2** Electrical connection checklist

| No. | Check Item | Result |
| --- | --- | --- |
| 1 | All cables are connected properly. | □Yes □No |
| 2 | The ground cable is connected properly. | □Yes □No |
| 3 | The excessive sections of ground cables and power cables are cut off. | □Yes □No |
| 4 | Phase cables are connected properly. | □Yes □No |
| 5 | All circuit breakers are OFF. | □Yes □No |

**Table 6-3** Cable installation checklist

| No. | Check Item | Result |
| --- | --- | --- |
| 1 | All bolts are tightened, especially the bolts used for electrical connection. Flat washers and spring washers are installed properly. | □Yes □No |
| 2 | Cable installation meets the cable routing requirements. | □Yes □No |
| 3 | Cables are routed in the way convenient for future maintenance and expansion. | □Yes □No |
| 4 | There are no unnecessary adhesive tape or cable ties on the cables. | □Yes □No |
| 5 | Exposed parts near the wiring terminals and lugs are wrapped in PVC insulation tape or heat shrinking tubing. | □Yes □No |
| 6 | The cable routing for power cables and monitoring cables meets the requirements for routing power cables and signal cables and complies with the cable routing plan. | □Yes □No |

# 6.2 Power-On Commissioning

## Context

NOTICE

- The power-on commissioning process requires at least two qualified electricians, one responsible for operations and the other for monitoring.
- Cautions and warnings must be properly placed onsite.
- Users are categorized as admin and operator. Admin users have more rights than operator users.
- Powering off the PDC disconnects the power supply to the downstream devices. Exercise caution with this operation when the PDC is supplying power to a working system.

## Procedure

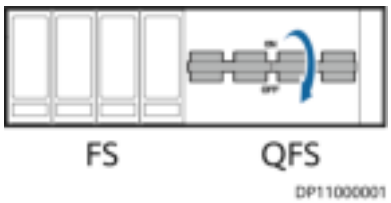
**Step 1** Check cable connections and the mechanical performance.

1. Check that cables are connected correctly outside the cabinet. Check that all bolts are secured for inlet and outlet cables and tighten a bolt if it is loose.
2. Check that ground cables are properly connected.

**Step 2** Check the insulation only after the upstream and downstream circuit breakers in the PDC are switched off.

1. Switch off the upstream circuit breaker QFS for the SPD in the input module of the PDC, and switch on other circuit breakers.

   **Figure 6-1** Switching off the SPD circuit breaker

2. Check that the insulation resistance between the live wires, between the live wire and the PE, and between the live line and the neutral wire is no less than 0.5 megohm using a multimeter.
3. After checking, turn off all the circuit breakers.

**Step 3** Switch on the SPD circuit breaker.

**NOTICE**

If the indicator of an SPD module is green, the SPD module is running properly. If an indicator is red, the corresponding SPD module has failed and must be promptly replaced.

**Figure 6-2** Switching on the SPD circuit breaker


**Step 4** Switch on the input power circuit breaker to power on the PDC. If the power indicator on the front panel of the PDC lights up, the PDC is powered on properly.

**NOTE**

The input power circuit breaker refers to the output circuit breaker that controls power supply from the upstream power distribution equipment to the PDC.

**Step 5** After the MDU screen starts, perform operations.

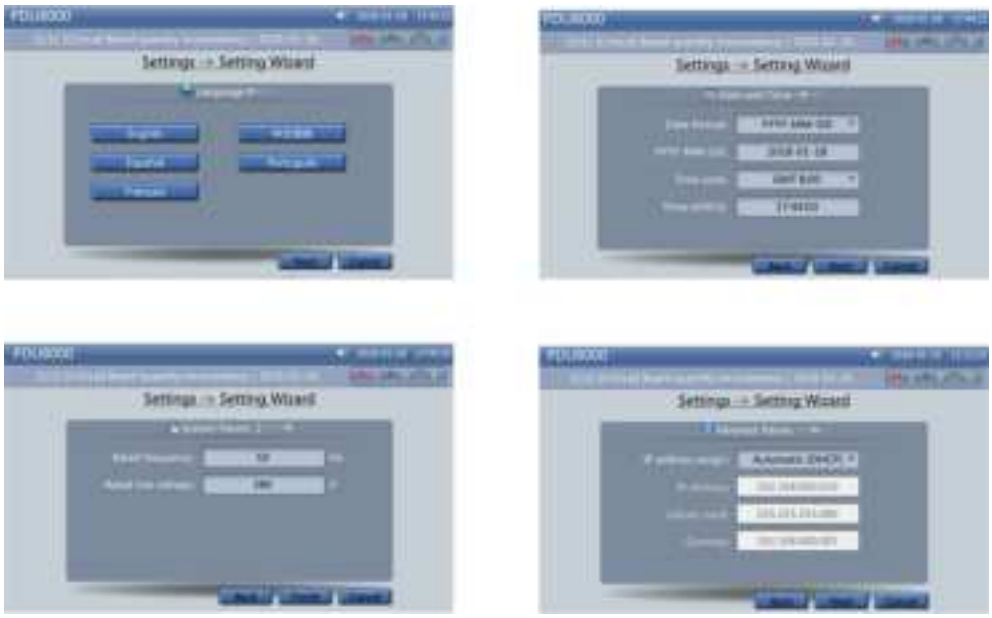
- If this is the initial startup, set the language, time, date, network parameters, and system parameters by using the **Setting Wizard**.

- If this is not the initial startup and these parameters have been set before, the system uses the existing settings by default.

NOTE

The user name is admin (preset password: **000001**).

**Figure 6-3** Setting Wizard



NOTE

The figures are for reference only. The actual parameter values prevail.

**Step 6** After the quick settings are complete, if the monitoring page displays alarms, clear the alarms.

NOTE

For system security purposes, change the preset password upon first login.

**Step 7** Turn on the input switches on the front panel of the PDC.

**Step 8** Switch on the output circuit breakers except reserved circuit breakers in the PDC in sequence to power on the corresponding devices and check whether the monitoring parameters on the MDU screen are correct.

**Step 9** (Optional) Power off the PDC.

1. Turn off the output switches in the PDC.
2. Turn off the input switches in the PDC.
3. Switch off the upstream power circuit breaker of the PDC.

**----End**

# 7 MDU Commissioning Guide

## 7.1 UI Appearance

After the MDU is powered on, the main screen is displayed. The main screen consists of a status bar, an alarm bar, a menu bar, and an information area.

**Figure 7-1** Home screen


**Table 7-1** Function Description

| No. | Area | Function Description |
| --- | --- | --- |
| 1 | Status bar | The status bar displays the product model, Universal Serial Bus (USB) flash drive, buzzer status, and current date and time. |

| No. | Area | Function Description |
| --- | --- | --- |
| 2 | Alarm bar | The alarm bar displays active alarms in a scrolling manner and the numbers of active critical alarms, major alarms, and warnings. You can click  to enter the **Active Alarm** screen. |
| 3 | Menu bar | The menu bar displays **Common Functions**, **System Info.**, and **Operating Status**. |
| 4 | Information area | Table 7-2 lists the functions of common buttons in the information window. |

**Table 7-2** Functions of common buttons in the information window

| Button | Function Description |
| --- | --- |
|  | Returns to the upper-level menu. |
|  | Goes to the previous screen. |
|  | Goes to the next screen. |
|  | Returns to the main menu screen. |
|  | Logs out. |

# 7.2 Menu Hierarchy

NOTE

This section uses a cabinet with dual three-phase inputs as an example. For other cabinets, the actual menu hierarchy prevails.

**Figure 7-2** Menu hierarchy


# 7.3 Common Functions

**Figure 7-3** Common Functions

## 7.3.1 Historical Alarm

On the **Common Functions** screen, tap **Historical Alarm** to access the screen.

**Figure 7-4** Historical Alarm


## 7.3.2 Branch Output 1/2

On the **Common Functions** screen, tap **Branch Output 1** to view the detailed parameters of each circuit breaker of **Branch Output 1**.

For the information about the **Branch Output 2** screen, refer to **Branch Output 1**.

**Figure 7-5** Branch Output 1 (1)

**Figure 7-6** Branch Output 1 (2)


# 7.4 System Information

On this screen, you can query the operating status, alarm status, and software version of the system. You can also set and maintain model information for the system.

**Figure 7-7** System Info.


## 7.4.1 Running

On the **System Info.** screen, tap **Running** to access the screen.

**Figure 7-8** Running (1)


**Figure 7-9** Running (2)


**Figure 7-10** Running (3)

### 7.4.1.1 Main Input 1/2

On the **Running** screen, tap **Main Input 1** to access the screen.

NOTE

For the information about the **Main Input 2** screen, refer to **Main Input 1**.

**Figure 7-11** Main Input 1 (1)


**Figure 7-12** Main Input 1 (2)

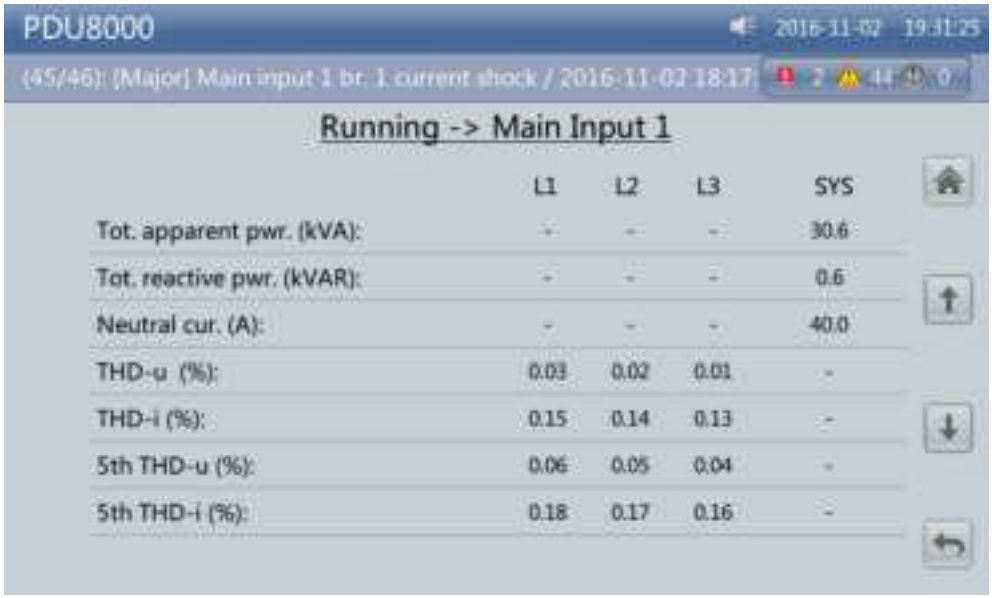


**Figure 7-13** Main Input 1 (3)

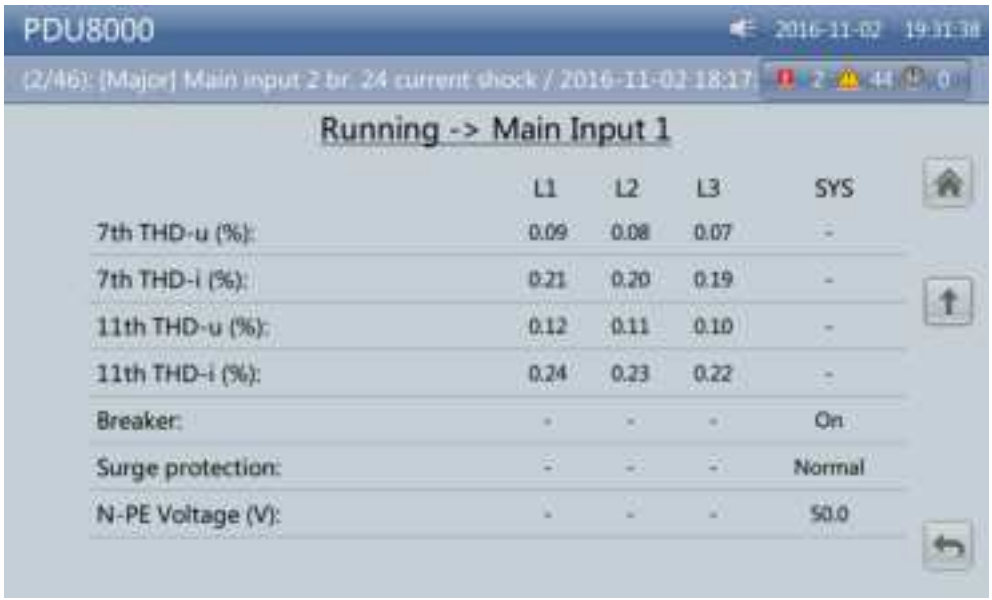
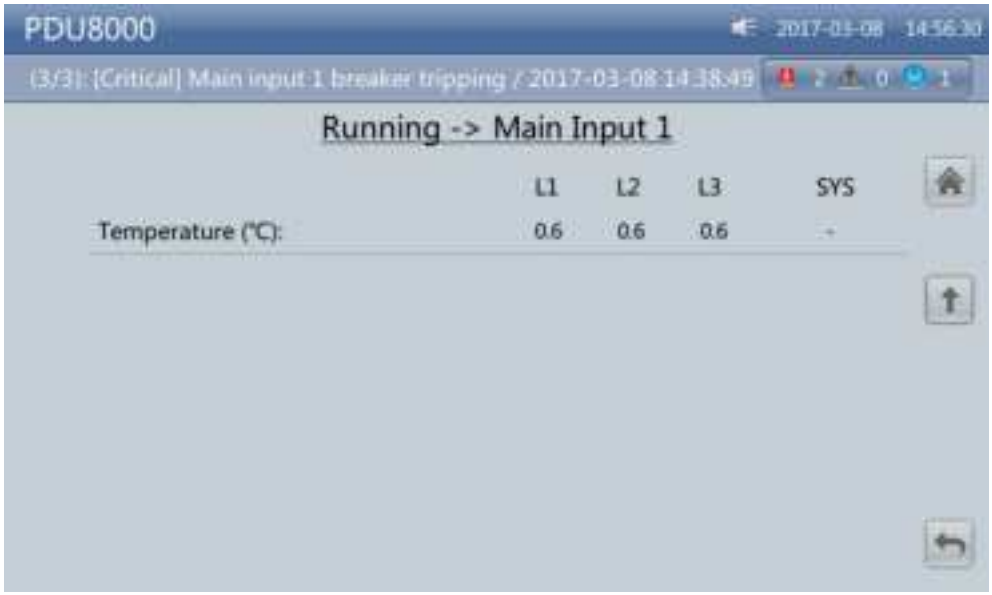



**Figure 7-14** Main Input 1 (4)




- **Power factor**

Indicates the ratio of the input active power to input apparent power.

- **Phase voltage (V)/Phase current (A)/Frequency (Hz)**

Indicates the mains input phase voltage, mains input phase current, and mains input frequency.

- **Load ratio (%)**

Indicates the load ratio of each phase, that is, ratio of actual power to rated power.

- **Total Active Power (kW)**

Indicates the sum of active power of all phases of the mains input.

- **Tot. energy (kWh)**

Indicates the sum of electricity energy of all phases of the mains input.

- **Tot. apparent pwr. (kVA)**

Indicates the sum of apparent power of all phases of the mains input.

- **Tot. reactive pwr. (kVAR)**

Indicates the sum of reactive power of all phases of the mains input.

- **Temp (°C)**

Indicates the mains temperature.

### 7.4.1.2 Branch Output 1/2

On the **Running** screen, tap **Branch Output 1** to view the detailed parameters of **Branch Output 1**.

NOTE

For the information about the **Branch Output 2** screen, refer to **Branch Output 1**.

**Figure 7-15** Branch Output 1 (1)

**Figure 7-16** Branch Output 1 (2)


## 7.4.1.3 Input 1/2 Curve

On the **Running** screen, tap **Input 1 Curve** to view the load ratio of the main input.

NOTE

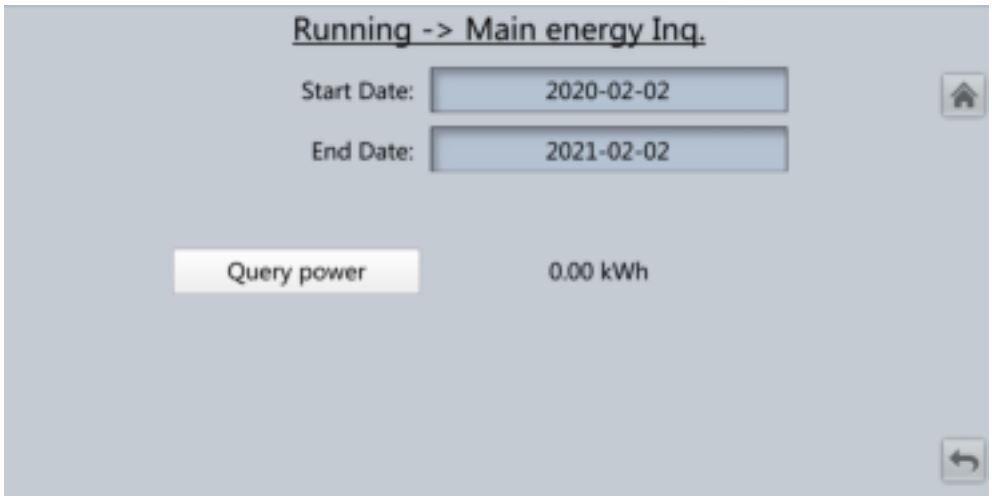
For the information about the **Input 2 Curve** screen, refer to **Input 1 Curve**.

**Figure 7-17** Input 1 Curve


## 7.4.1.4 Query Energy Yield

On the **Running** screen, tap **Query Energy Yield** to enter the screen. Then you can query the total energy yield in a time period after setting the start and end time.

**Figure 7-18** Main energy Inq.



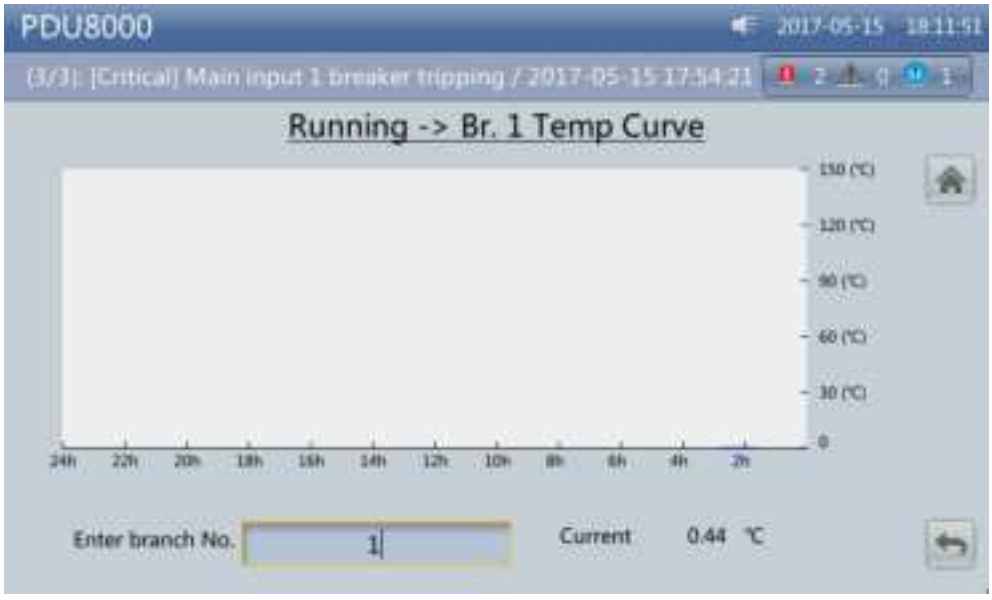

### 7.4.1.5 Branch 1/2 Temperature Curve

On the **Running** screen, tap **Br.1 Temp Curve** to access the screen.

NOTE

For the information about the **Br.2 Temp Curve** screen, refer to **Br.1 Temp Curve**.

**Figure 7-19** Br.1 Temp Curve



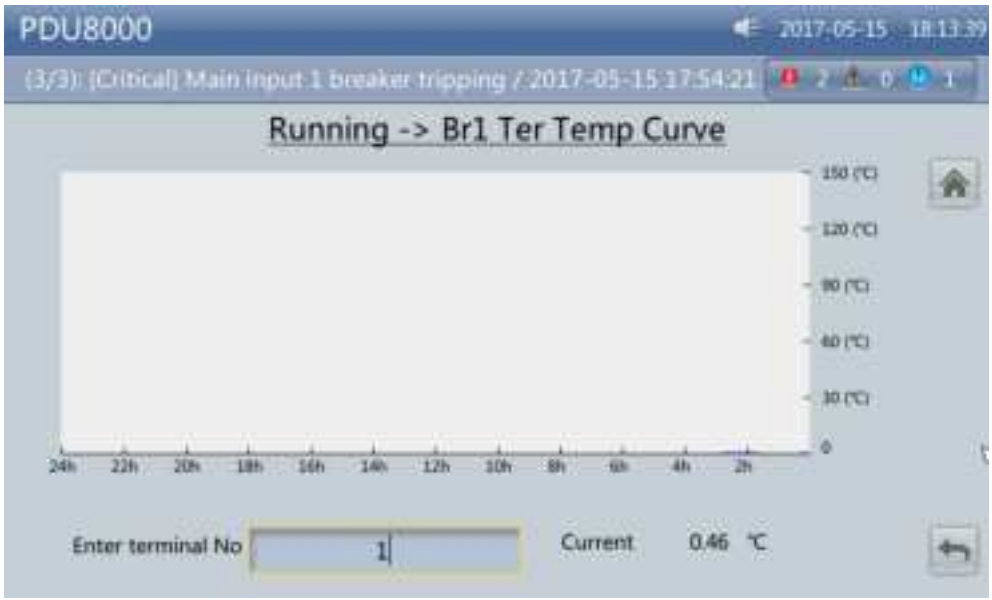

### 7.4.1.6 Branch 1/2 Terminal Temperature Curve

On the **Running** screen, tap **Br1 Ter Temp Curve** to access the screen.

NOTE

For the information about the **Br2 Ter Temp Curve** screen, refer to **Br1 Ter Temp Curve**.

**Figure 7-20** Br1 Ter Temp Curve



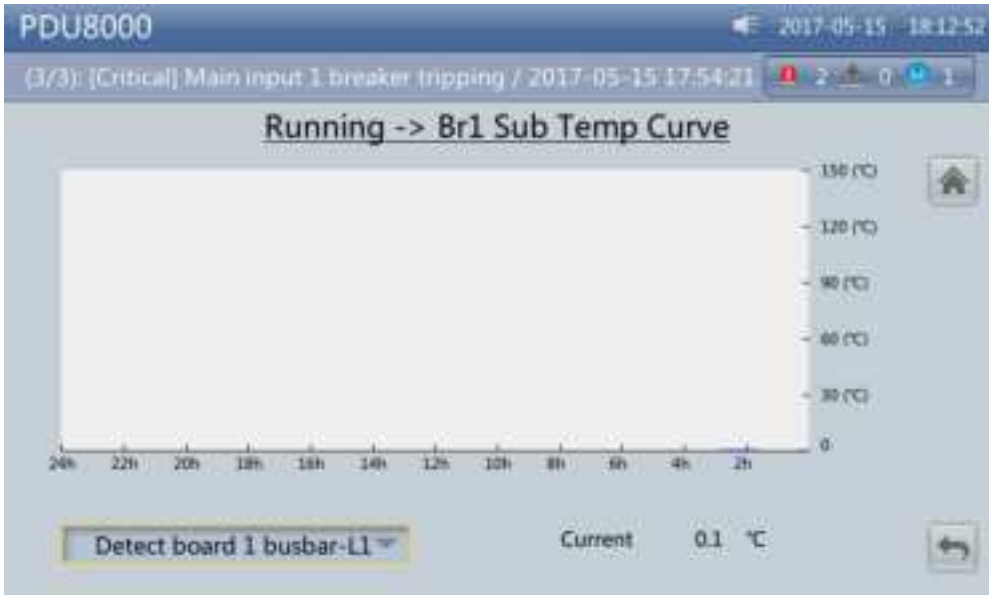

### 7.4.1.7 Branch 1/2 Subrack Temperature Curve

On the **Running** screen, tap **Br1 Sub Temp Curve** to access the screen.

NOTE

For the information about the **Br2 Sub Temp Curve** screen, refer to **Br1 Sub Temp Curve**.

**Figure 7-21** Br1 Sub Temp Curve




## 7.4.2 Alarms

On the **System Info.** screen, tap **Alarms** to access the screen.

**Figure 7-22** Alarms


### 7.4.2.1 Active Alarm

On the **Alarms** screen, tap **Active Alarm** to access the screen.

**Figure 7-23** Active Alarm


### 7.4.2.2 Historical Alarm

On the **Alarms** screen, tap **Historical Alarm** to access the screen.

**Figure 7-24** Historical Alarm


## 7.4.2.3 Buzzer Off

Two buzzer control items are available, that is, **Buzzer On** and **Buzzer Off**. If the buzzer of the system is muted, **Buzzer On** is displayed on the operation screen. If the buzzer of the system is enabled, **Buzzer Off** is displayed on the operation screen.

On the **Alarms** screen, tap **Buzzer Off**, and tap **OK** on the displayed screen.

**Figure 7-25** Buzzer Off

NOTE

- **Buzzer On** and **Buzzer Off** can be set in the same way.
- If you enable the buzzer, the buzzer buzzes when a critical alarm, minor alarm, or warning is generated. If you mute the buzzer, the buzzer does not buzz no matter what alarms are generated.

### 7.4.2.4 Twinkle

When the PDC communicates with the northbound NMS, the function determines the position of the UPS in the NMS layout diagram.

## 7.4.3 Settings

On the **System Info.** screen, tap **Settings** to access the screen. If you have not logged in, the system displays the login dialog box. Enter the initial user name and password and tap  to log in to the system and access the **Settings** screen.

NOTICE

- The default user name is **operator**, and the initial password is **000001**.
- If you enter incorrect passwords for three consecutive times, your account will be locked for 5 minutes.
- If you do not operate the screen for 3 minutes, the **System Info.** screen is displayed, and the system performs a forcible logout.

**Figure 7-26** Settings 1

**Figure 7-27** Settings 2


### 7.4.3.1 Common Settings

On the **Settings** screen, tap **Common** to access the screen.

**Figure 7-28** Common 1

**Figure 7-29** Common 2


## 7.4.3.2 Communication Settings

On the **Settings** screen, tap **Communication** to access the screen.

**Figure 7-30** Communication (1)

**Figure 7-31** Communication (2)


- **IP address assign**
  - If the MDU is directly connected to a computer, the IP address can only be allocated manually. The IP addresses of the MDU and computer must be in the same network segment, and must be different.
  - If the MDU is connected to a computer through a LAN switch or router with the DHCP function, the IP address can be allocated manually or automatically.
    - Manual: The IP addresses of the MDU and computer must be in the same network segment, and must be different.
    - Automatic: The MDU automatically queries available IP addresses in the connected network. Ensure that the MDU and PC are on the same network segment.

NOTE

You can set IP address allocation to **Manual** or **Automatic**. If the MDU restarts, IP address allocation automatically changes to **Automatic**. The IP address is bound as the IP address set last time, allowing you to log in for the second time.

- **IP address**

Set an IP address for the Ethernet. The value ranges from 0.0.0.0 to 255.255.255.255. The default value is **192.168.0.10**.

NOTICE

Ensure that the IP address is unique on the network segment. Otherwise, the LCD cannot work properly.

- **Subnet mask**

Set a subnet mask for the Ethernet. The value ranges from 0.0.0.0 to 255.255.255.255. The default value is **255.255.255.0**.

- **Gateway**

Set an Ethernet gateway. The value ranges from 0.0.0.0 to 255.255.255.255. The default value is **192.168.0.1**.

- **Serial port baud rate**

Set the serial port communications rate. The value options include 4800, 9600, and 19200. The default value is **9600**.

- **Serial port address**

Set the serial port communications address. The value ranges from 0 to 254. The default value is **1**.

- **SSL**

Indicates whether Modbus-TCP supports encryption transmission. The default value is **Enable**.

- **ModbusTCPcertification**

Sets the secondary authentication for NMS access. The default value is **Disable**.

- **SNMP Configuration**

Set SNMP related parameters.

### 7.4.3.3 System Parameter Settings

On the **Settings** screen, tap **System Param.** to access the screen.

**Figure 7-32** System Param. 1

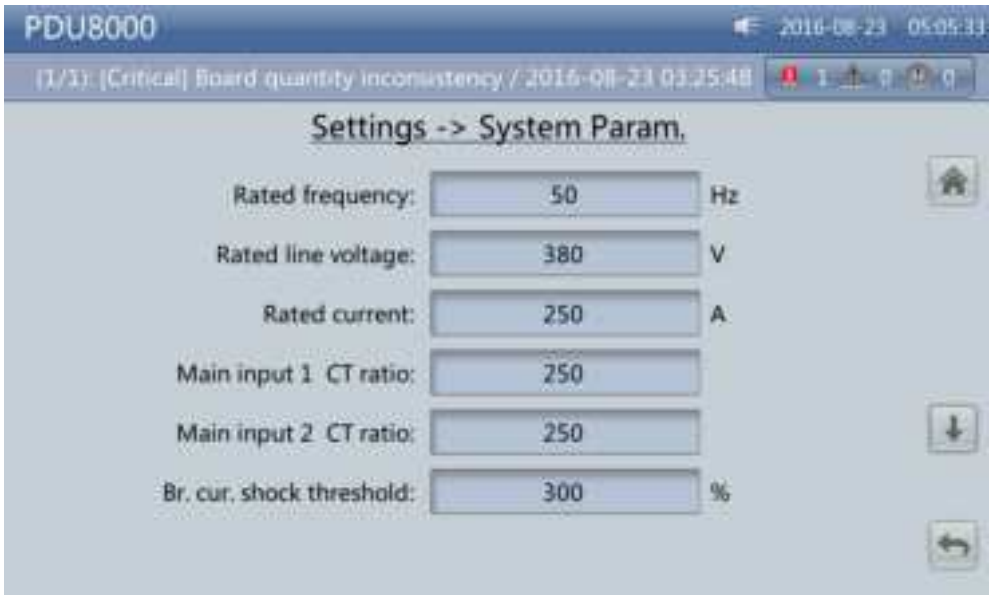
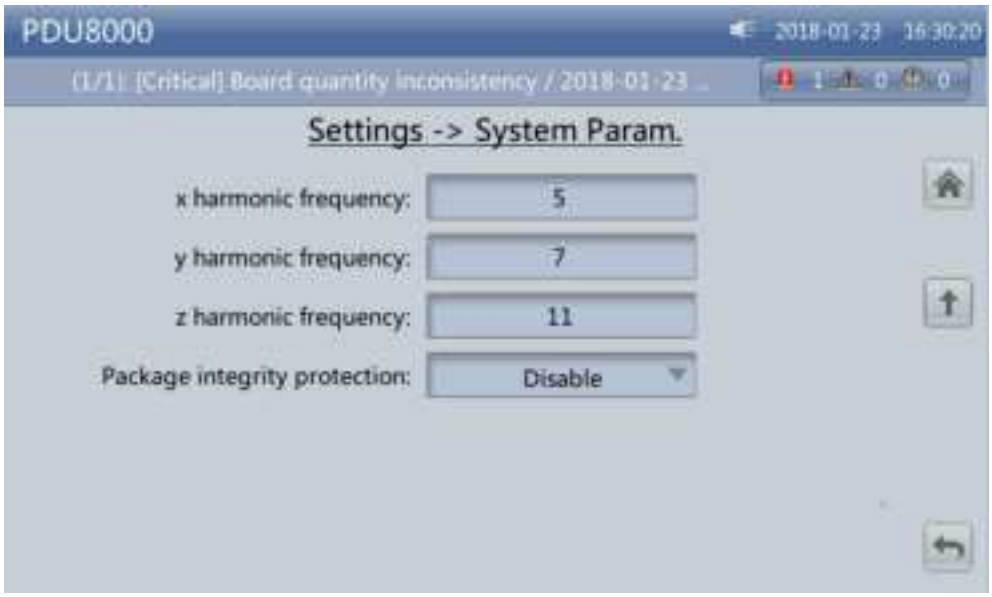


**Figure 7-33** System Param. 2




- **Rated frequency (Hz)**

Specifies the rated frequency of the PDU8000. The value ranges from **45** to **65**.

- **Rated line voltage (V)**

Specifies the rated voltage of the PDU8000. The value ranges from **100** to **480**.

- **Rated current (A)**

Specifies the rated current of the PDU8000. The value is 160, 250, 400, and 650.

- **Main input 1 CT ratio**

The value ranges from **50** to **800**.

- **Main input 2 CT ratio**

The value ranges from **50** to **800**.

- **Br. cur. shock threshold (%)**

The value ranges from **150** to **500**.

- **x harmonic frequency**

The value ranges from **2** to **63**.

- **y harmonic frequency**

The value ranges from **2** to **63**.

- **z harmonic frequency**

The value ranges from **2** to **63**.

- **Package integrity protection**

Can be set to **Disable** or **Enable**.

## 7.4.3.4 Branch Parameter Settings

On the **Settings** screen, tap **Branch Param.** to access the screen.

Tap **Set Branch 1 Alias** or **Set Branch 2 Alias** to set circuit breaker alias.

Tap **Set Rated Current** to set circuit breaker parameters.

**Figure 7-34** Branch Param.


- **Rated Current (A)**

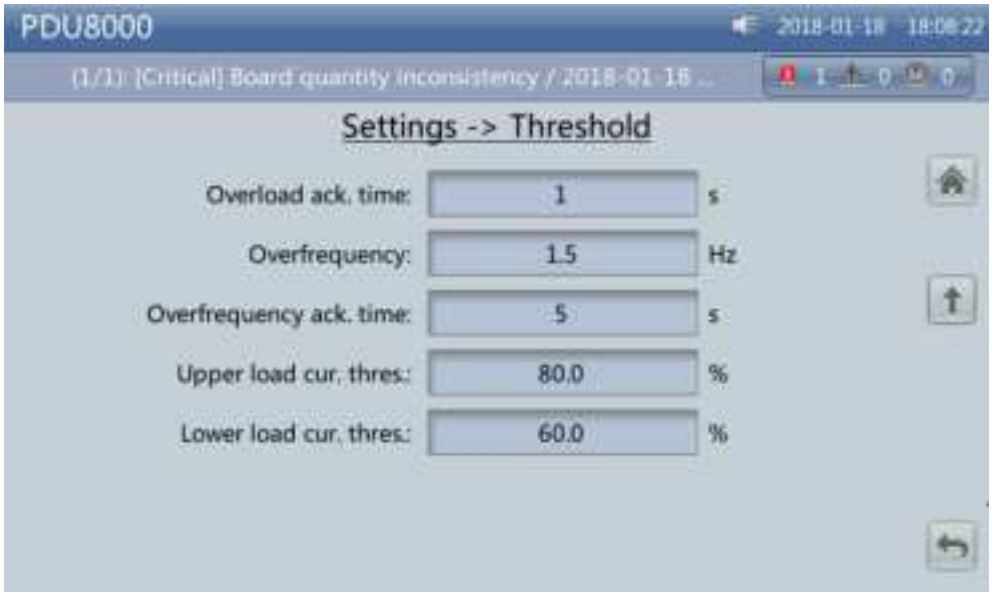
Specifies the rated current of each branch. The value is 10, 16, 25, 32, 40, 50, and 63.

## 7.4.3.5 Threshold Settings

On the **Settings** screen, tap **Threshold** to access the screen.

**Figure 7-35** Threshold (1)


**Figure 7-36** Threshold (2)




- **Open phase voltage (V)**

The value ranges from **0** to **60**.

- **System overvoltage (%)**

Specifies the upper alarm threshold in relative to the rated voltage. The value ranges from **105** to **125**.

- **Overvoltage ack.time (s)**

Specifies the duration for confirming an overvoltage alarm. The value ranges from **1** to **10**.

- **System undervoltage (%)**

Specifies the lower alarm threshold in relative to the rated voltage. The value ranges from **75** to **95**.

- **Undervoltage ack.time (s)**

Specifies the duration for confirming an undervoltage alarm. The value ranges from **1** to **10**.

- **Overload (%)**

Specifies the overload alarm threshold in relative to the rated load. The value ranges from **100** to **120**.

- **Overload ack.time (s)**

Specifies the duration for confirming an overload alarm. The value ranges from **1** to **10**.

- **Overfrequency (Hz)**

Specifies the overfrequency alarm threshold in relative to the rated frequency. The value ranges from **1** to **10**.

- **Overfrequency ack.time (s)**

Specifies the duration for confirming an overfrequency alarm. The value ranges from **1** to **10**.

- **Upper load cur. thre. (%)**

Specifies the upper alarm threshold in relative to the rated current. The value ranges from **80** to **100**.

- **Lower Load cur. thre. (%)**

Specifies the lower alarm threshold in relative to the rated current. The value ranges from **30** to **80**.

## 7.4.3.6 Setting Wizard

On the **Settings** screen, tap **Setting Wizard** to access the screen.

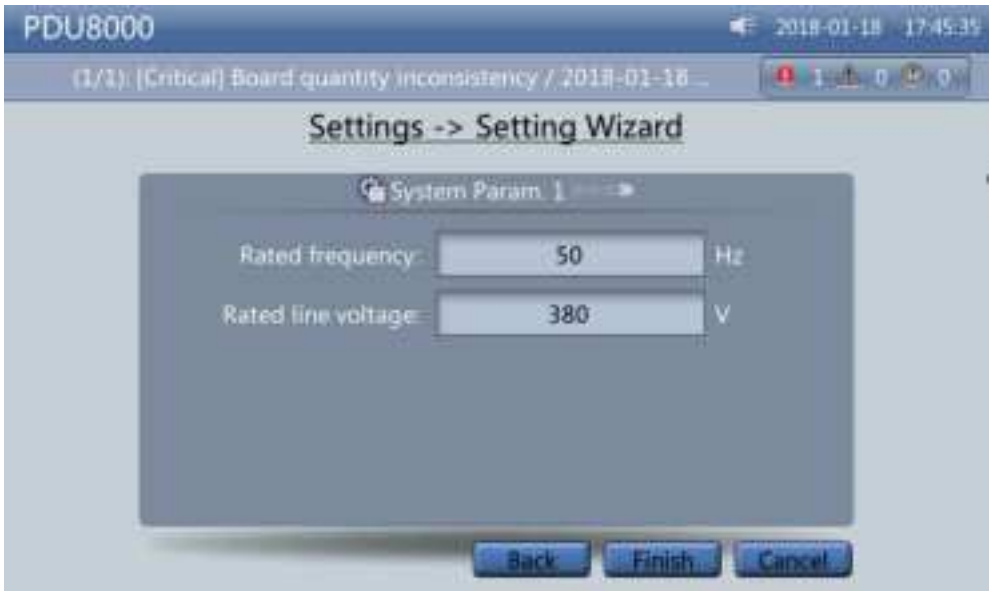
**Figure 7-37** Setting Wizard (1)


**Figure 7-38** Setting Wizard (2)

**Figure 7-39** Setting Wizard (3)


**Figure 7-40** Setting Wizard (4)




## 7.4.3.7 Access Control

On the **Settings** screen, tap **Access Control** to access the screen.

**Figure 7-41** Access Control


**Table 7-3** Access Control

| Item | Description | Default Value | Value Range |
| --- | --- | --- | --- |
| SSH | Refers to a secure encrypted transmission protocol used to access the UPS with a terminal tool.<br>**Disable**: The SSH port is disabled and cannot be accessed.<br>**Enable**: The SSH port is enabled and can be accessed. | Enable | Disable, Enable |
| ModbusTCP | Refers to an Ethernet-based Modbus protocol used to connect to the NetEco.<br>**Disable**: The Modbus TCP services are unavailable.<br>**Enable**: All functions are available. | Enable | Disable, Enable |
| SNMP | Refers to the Simple Network Management Protocol used to connect to the NetEco.<br>**Disable**: The SNMP services are unavailable.<br>**Enable**: All functions are available. | Enable | Disable, Enable |

| Item | Description | Default Value | Value Range |
| --- | --- | --- | --- |
| ModbusRTU | Refers to a Modbus protocol based on the RS485 bus, which is used to connect to the NetEco.<br>**Disable**: The Modbus RTU services are unavailable.<br>**Enable**: All functions are available. | Enable | Disable, Enable |

## 7.4.4 Maintenance

On the **System Info.** screen, tap **Maint.** to access the screen.

**Figure 7-42** Maint. (1)


**Figure 7-43** Maint. (2)

**Figure 7-44** Maint. (3)


## 7.4.4.1 Upgrading Software

### Prerequisites

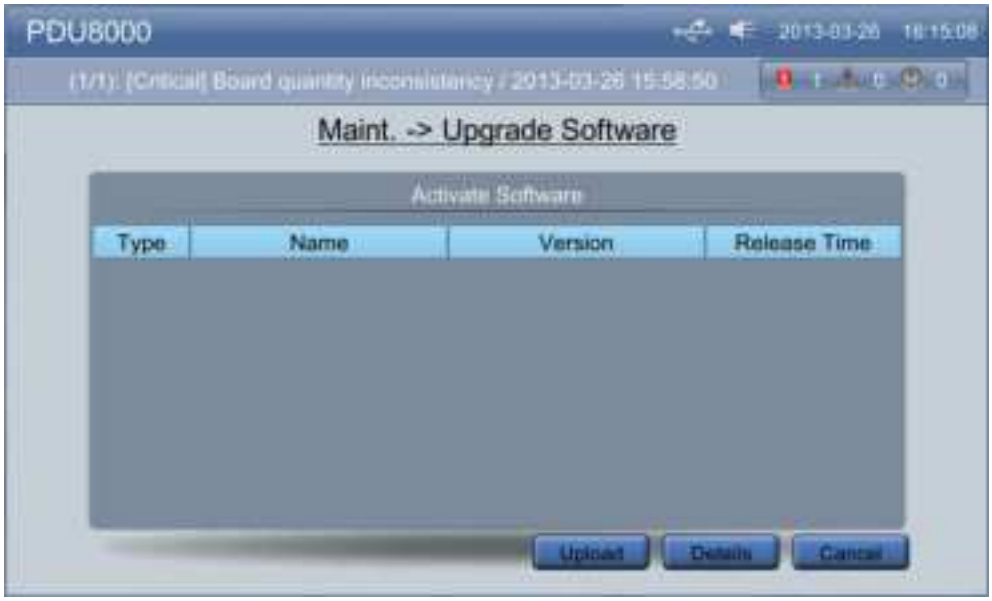
To upgrade the software, perform the following steps:

### Procedure

**Step 1** Connect a USB flash drive to the USB Host port. The message **A new USB device is found** is displayed.

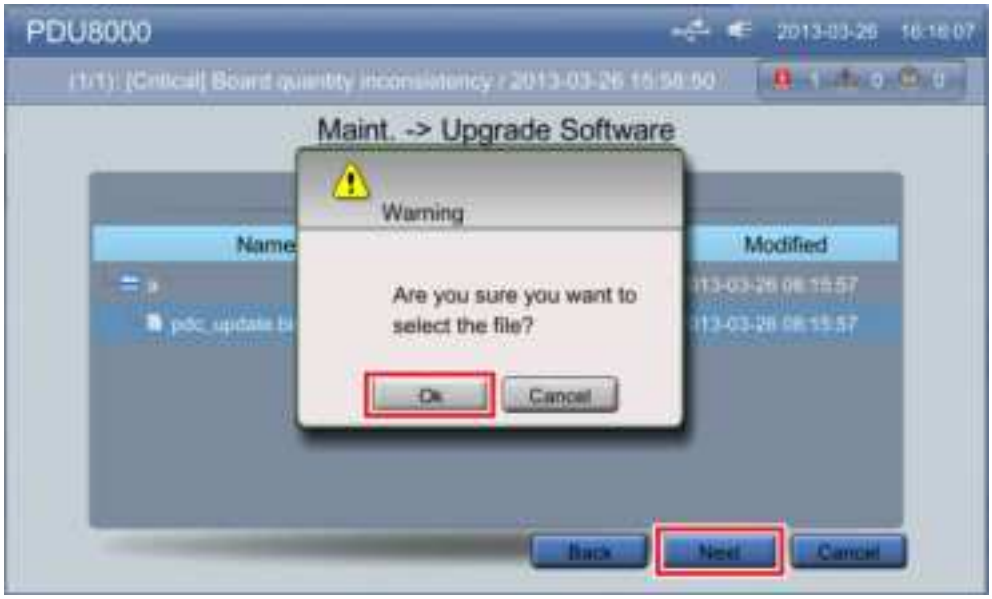
**Step 2** Log in to the **Maint.** screen as user admin, and tap **Upgrade Software** to access the screen.

**Figure 7-45** Upgrade Software (1)




**Step 3** Tap **Upload** on the displayed screen, select the upgrade software package, and tap **Next**.

**Figure 7-46** Upgrade Software (2)




NOTE

Tap the folder to view its subfolders.

**Step 4** On the displayed screen, wait until the software package is automatically copied and parsed.

**Figure 7-47** Upgrade Software (3)

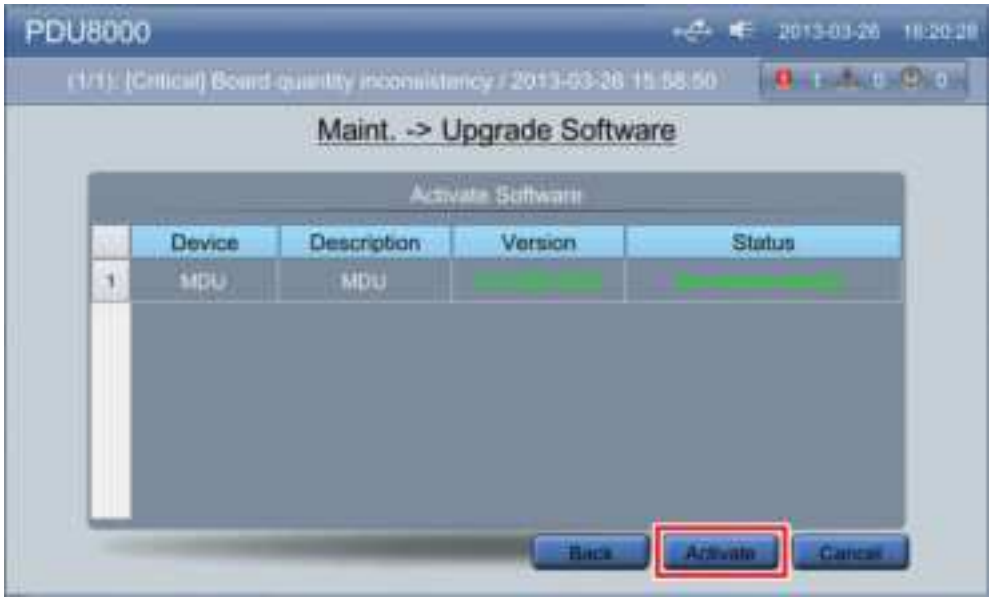

**Step 5** After the software package is copied and parsed, the software activation screen is displayed again. Select the software package and tap **Details** to activate the software package.

**Figure 7-48** Upgrade Software (4)


**Step 6** Tap **Activate** to activate the software. After the software is activated, the MDU restarts to complete the upgrade.

**Figure 7-49** Upgrade Software (5)



NOTE

- The MDU is not restarted if the software for the monitoring board is activated and is restarted if the software for the MDU is activated.
- If the PDC is powered off when the software for the monitoring board is being upgraded, the information about the monitoring board is not displayed after the MDU is restarted. In this case, tap **Upgrade Software** to continue the upgrading process. If the PDC is powered off when the software for the MDU is being upgraded, perform the upgrading again after the MDU is restarted.
- After the software is upgraded, the MDU parameters remain unchanged and do not need to be reset.

**----End**

## 7.4.4.2 Loading Configurations

### Context

The **Load Config.** function enables you to set system parameters.

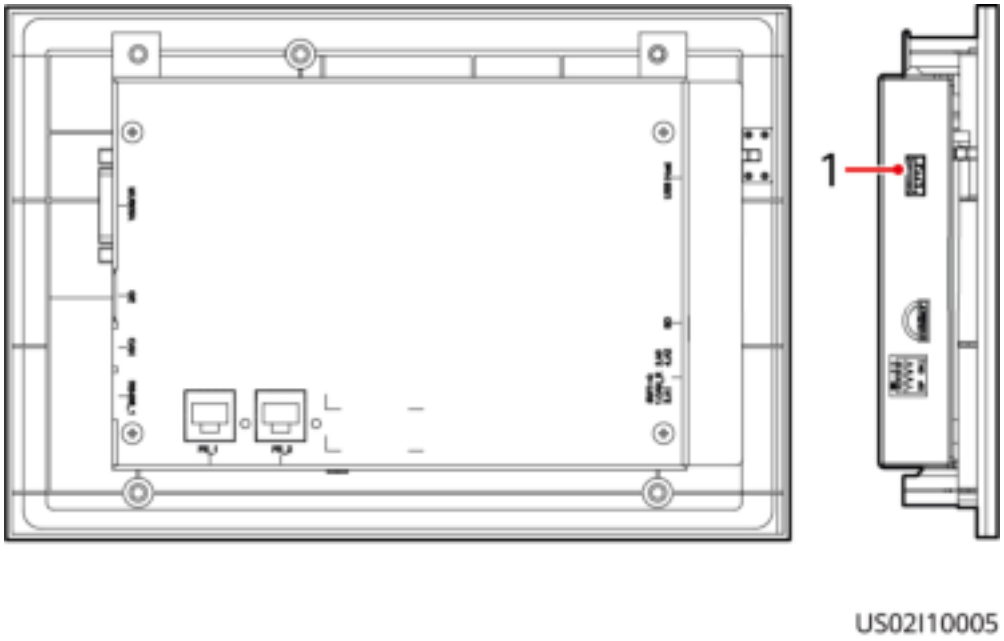
NOTICE

Note that the function may change the original model configuration parameter values. Exercise caution when using this function.

### Procedure

**Step 1** Connect a USB flash drive to the **USB Host** port.

**Figure 7-50** Inserting the USB flash drive

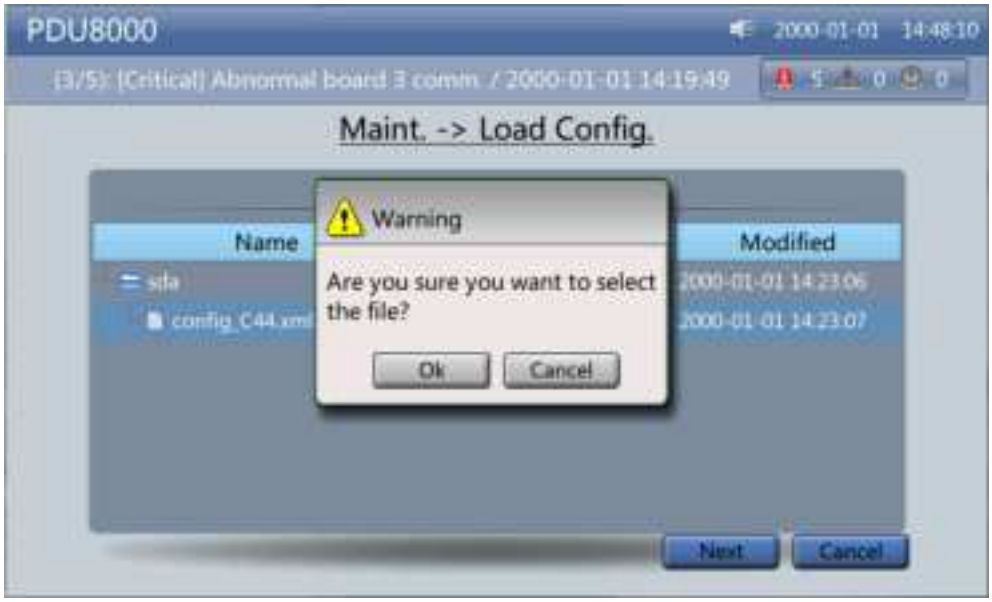


(1)USB Host port

**Step 2** On the **Maint.** screen, tap **Load Config.** to access the screen.

**Step 3** Select the file to be loaded and tap **Next**.

**Figure 7-51** Loading configurations




**NOTICE**

After the parameters are configured, the MDU restarts to complete the **Load Config.** operation.

**----End**

## 7.4.4.3 Downloading Configurations

## Procedure

**Step 1** Insert the USB flash drive.

**Step 2** On the **Maint.** screen, tap **Download Config.** to access the screen.

**Step 3** Select the storage path and tap **Next**.

**Figure 7-52** Downloading configurations


**----End**

## 7.4.4.4 Downloading Logs

## Procedure

**Step 1** Insert the USB flash drive.

**Step 2** On the **Maint.** screen, tap **Download Logs** to access the screen.

**Step 3** Select the storage path and tap **Next**.

**Figure 7-53** Downloading logs


**----End**

### 7.4.4.5 Exporting Alarms

## Procedure

**Step 1** Insert the USB flash drive.

**Step 2** On the **Maint.** screen, tap **Export Alarms** to access the screen.

**Step 3** Select the storage path and tap **Next**.

**Figure 7-54** Exporting alarms


**----End**

### 7.4.4.6 Exporting E-labels

## Procedure

**Step 1** Insert the USB flash drive.

**Step 2** On the **Maint.** screen, tap **Export E-labels** to access the screen.

**Step 3** Select the storage path and tap **Next**.

**Figure 7-55** Exporting E-labels


**----End**

## 7.4.4.7 Uploading Modbus Configurations

## Procedure

**Step 1** Insert the USB flash drive.

**Step 2** On the **Maint.** screen, tap **Upload MD Config** to access the screen.

**Step 3** Select the file to be loaded, and tap **Next**.

**Figure 7-56** Uploading Modbus configurations


**----End**

### 7.4.4.8 Extending Modbus Configurations

## Procedure

**Step 1** Insert the USB flash drive.

**Step 2** On the **Maint.** screen, tap **Extend MD Config** to access the screen.

**Step 3** Select the storage path and tap **Next**.

**Figure 7-57** Extending Modbus configurations


**----End**

### 7.4.4.9 Fault Report

## Procedure

**Step 1** Insert the USB flash drive.

**Step 2** On the **Maint.** screen, tap **Fault Report** to access the screen.

**Step 3** Select the storage path and tap **Next**.

**Figure 7-58** Fault Report


**----End**

## 7.4.4.10 Uploading the CA Certificate and Certificate File

The CA certificate and certificate file loading is used for encrypted communication. Users can perform the operation as required.

## Procedure

**Step 1** Insert the USB flash drive.

**Step 2** On the **Maint.** screen, tap **Upload CA Cert** to access the screen.

**Step 3** Select the file to be loaded and tap **Next**.

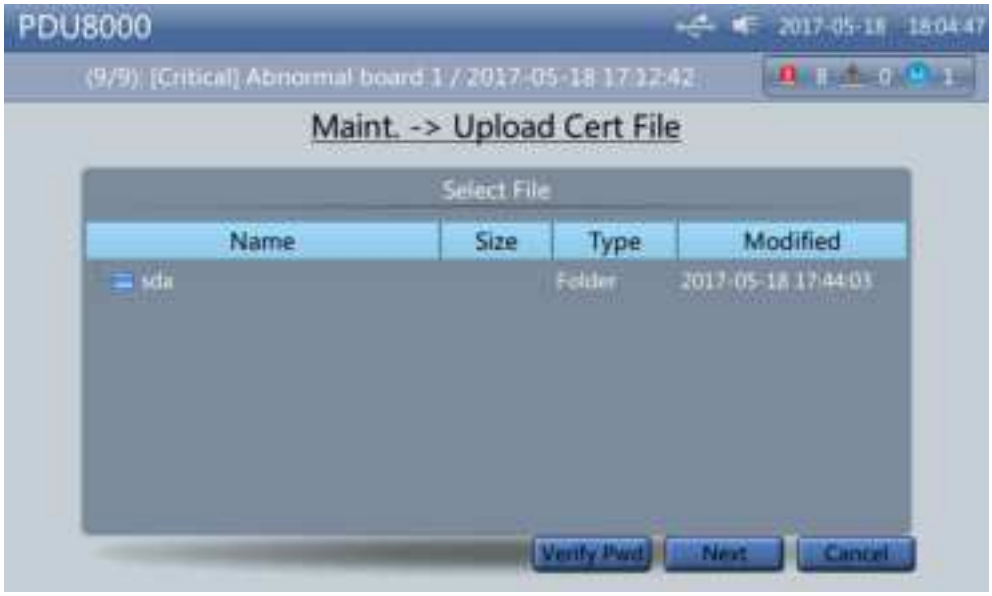
**Figure 7-59** Uploading the CA certificate

**Step 4** On the **Maint.** screen, tap **Upload Cert File** to access the screen.

**Step 5** Select the file to be loaded and tap **Verify Pwd**.

**Figure 7-60** Uploading the certificate file (1)




**Step 6** Enter the **Verify Pwd** and **Confirm Password** and tap  .

**Figure 7-61** Uploading the certificate file (2)


**Step 7** Perform the next step as prompted.

**----End**

### 7.4.4.11 Lifecycle Management

On **Lifecycle Management**, you can view monitor information such as **First Power-on**, **Arrival Date**, and **Service Life**.

**Figure 7-62** Lifecycle Management


## 7.4.5 About

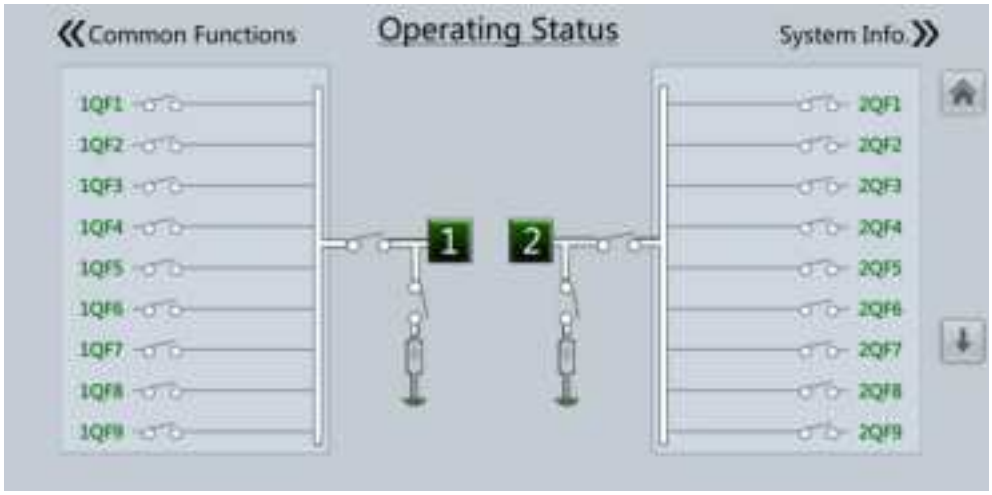
On the **System Info.** screen, tap **About** to access the screen. To view the detailed version information, tap **Version Details**.

**Figure 7-63** About


# 7.5 Operating Status

On the main screen, tap **Operating Status** to access the screen and query the circuit breaker status of the mains and branches.

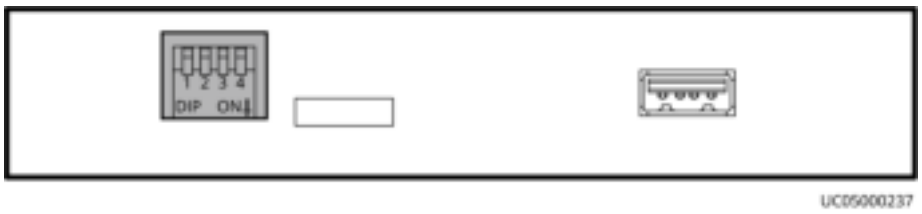
**Figure 7-64** Operating Status




# 7.6 DIP Switches

The DIP switches are located at the back of the MDU.

**Figure 7-65** DIP switches




The following lists the functions of the DIP switches: DIP2 to DIP4: Work together with specified buttons to clear historical records and logs and restore factory settings.

NOTE

To clear historical records and logs, you must log in as the **admin** user.

**Table 7-4** Functions of the DIP switches

| Function | Status | DIP2 | DIP3 | DIP4 | Button Operation | Action |
|---|---|---|---|---|---|---|
| Clear historical alarms. |  | ON | OFF | OFF | Press and hold **Active Alarm** for about 10s. | Clear historical alarms. |

| Function | Status | DIP2 | DIP3 | DIP4 | Button Operation | Action |
| --- | --- | --- | --- | --- | --- | --- |
| Clear logs. |  | OFF | ON | ON | Press and hold **Buzzer Off** for about 10s. | Clear operation logs (APP/ LUI). The MDU automaticall y restarts during the process. |
| Restore factory settings. |  | ON | ON | OFF | Press and hold **Buzzer Off** for about 10s. | The MDU automaticall y restarts after factory settings are restored. |

# 8 Maintenance Guide

## 8.1 Routine Maintenance

Routine maintenance is performed on a regular basis when the equipment is running properly to find out and eliminate defects or potential risks in a timely manner.

**Table 8-1** Routine maintenance for the PDC

| Maintenance Item | Maintenance Interval | Operation Guide | Expected Result | Exception Handling |
|---|---|---|---|---|
| Three phase power indicators | Monthly | Check the luminance of the indicators. | The three phase power indicators are steady on. | Replace the indicator that generates no or dim light. |
| Surge protection module | Monthly | Check the status of the surge protection module indicator and circuit breaker. | • The surge protection module indicator is green.<br>• The circuit breaker is switched on. | • If the indicator of an SPD module is red, replace the SPD module.<br>• If the circuit breaker is switched off, switch it on. |

| Maintenance Item | Maintenance Interval | Operation Guide | Expected Result | Exception Handling |
|---|---|---|---|---|
| Liquid crystal display (LCD) screen on the PDC | Monthly | Touch the LCD screen with your finger. | The user interface is displaying information normally. | Check whether the power cable is properly connected or replace the MDU. |
| Connections of input power cables and output power cables | Monthly | Visual observation | • The cables are not damaged.<br>• The terminals are intact and secure and free from spark signs and rust. | Take measures depending on the severity. |
| Signs of rodent movements in the PDC | Monthly | Visual observation | There is no sign of rodent movements in the PDC. | If there is a sign of rodent movements, ask a professional for advice. |
| PDC component appearance | Quarterly | Visual observation | The exterior is intact. | Take measures depending on the severity. |
| Operating temperature and humidity of the PDC | Quarterly | Measure the temperature and humidity using a point thermometer. | • Operating temperature: -10°C to +55°C<br>• Humidity: 5%-95% RH | Check whether the air conditioner and dehumidifier in the equipment room function properly. |

| Maintenance Item | Maintenance Interval | Operation Guide | Expected Result | Exception Handling |
|---|---|---|---|---|
| PDC interior | Yearly | Check whether dust has accumulated on the PDC mounting panels. | The white paper that you use to wipe the mount panel is clean. | If the white paper becomes dirty, clean the PDC interior. |
| Oxidation of metal components in the PDC | Yearly | Visual observation | No metal component rusts. | • If any metal component suffers from severe oxidation, remove the rust or replace the component in a timely manner.<br>• If the component is painted, repaint it after removing the rust. |

# 8.2 Alarm Reference

| Alarm Name | Alarm Severity | Impact | Possible Cause | Solutions |
|---|---|---|---|---|
| Abnormal board comm. | Critical | The communication between the MDU and monitoring board is interrupted. | The monitoring board is disconnected. | Check whether the CAN cable is in loose contact. If yes, connect it securely. |
| Configuring board ... | Warning | The MDU is configuring the monitoring board. | The MDU is configuring the monitoring board. | N/A |

| Alarm Name | Alarm Severity | Impact | Possible Cause | Solutions |
|---|---|---|---|---|
| Failed to configure board | Critical | Failed to configure the monitoring board. | The MDU version does not match the monitoring board. | Use the latest upgrade package to activate the board. |
| Board quantity inconsistency | Critical | The actual number of monitoring boards is different from the configured number. | • Monitoring board fault.<br>• The cable has become loose. | • Check whether the run indicator of the monitoring board is normal. If no, replace the monitoring board.<br>• Check whether the CAN cable is securely connected. |
| Abnormal board power supply | Major | The voltage of a power input to the monitoring board is less than 9.5 V. | N/A | Replace the monitoring board. |
| Main input open phase | Critical | A phase of the input power has no voltage or has a voltage lower than the threshold (0–60 V). | The input power supply is faulty. | Check the input power. |
| Main input outage | Critical | The input power has three open phases. | The input power supply is faulty. | Check the input power. |

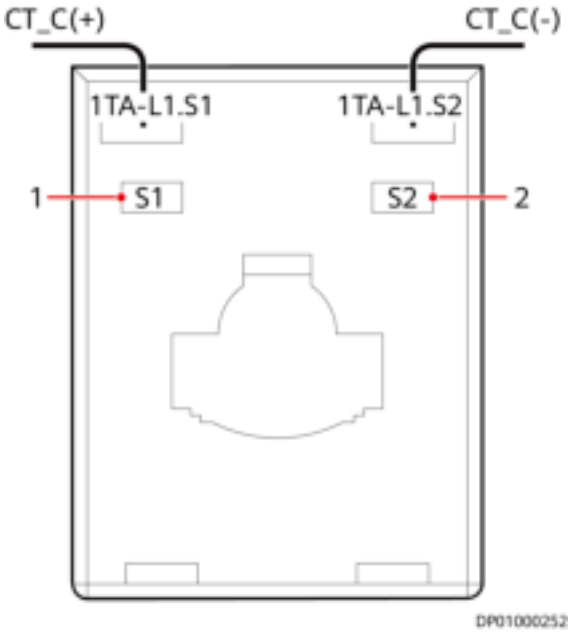
| Alarm Name | Alarm Severity | Impact | Possible Cause | Solutions |
|---|---|---|---|---|
| Main input CT reverse connect | Major | The common polarity terminal and common terminal on a phase current transformer of a mains phase are reversely connected. | N/A | Switch cables connected to the common polarity terminal and common terminal. **Figure 8-1** uses dual-input as an example to show the cable connection for the common polarity terminal and common terminal of the current transformer for route I phase L1. |
| Main input breaker tripping | Critical | The mains switch has tripped. | The back-end is short-circuited or experiences overcurrent. | Check whether the back-end current is short-circuited or experiences overcurrent. |
| Main input overvoltage | Critical | Input overvoltage: Input voltage V > 1.2 x Rated voltage (Multiple: 1.05–1.25; confirmation time: 2–10s). | The input power supply is faulty. | Check the input power. |
| Main input undervoltage | Critical | Input undervoltage: Input voltage V < 0.85 x Rated voltage (Multiple: 0.75–0.95; confirmation time: 2–10s). | The input power supply is faulty. | Check the input power. |
| Main input overfrequency | Major | The input frequency is 1.5 Hz higher than the configured frequency. The frequency setting range is 50–60 Hz. | The input power supply is faulty. | Check the input power. |

| Alarm Name | Alarm Severity | Impact | Possible Cause | Solutions |
|---|---|---|---|---|
| Main input underfrequency | Major | The input frequency is 1.5 Hz lower than the configured frequency. The frequency setting range is 50–60 Hz. | The input power supply is faulty. | Check the input power. |
| Main input overload | Critical | A phase input current of a route exceeds 1 time of the rated current (multiple: 1–1.2; confirmation time: 1–10s). | The system is overloaded. | Check all output load power. |
| Max. main input cur. exceed | Warning | A phase input current of a route exceeds 0.8 time of the rated current (multiple: 0.8–1). | The system is overloaded. | Check all output load power. |
| Min. main input cur. exceed | Warning | A phase input current of a route is lower than 0.6 time of the rated current (multiple: 0.6–0.8). | N/A | N/A |
| Main input surge protection abnormal | Major | Any dry contact on the SPD connecting to the mains input is disconnected. | The SPD circuit breaker is switched off, or an SPD module is damaged. | Switch on the SPD circuit breaker, or replace the SPD module. |
| Main input breaker off | Warning | A mains switch has changed from ON to OFF. | N/A | N/A |

| Alarm Name | Alarm Severity | Impact | Possible Cause | Solutions |
| --- | --- | --- | --- | --- |
| Br. circuit breaker off | Critical | A branch switch has changed from ON to OFF. | A branch switch is off. | If you do not to display a **Br. circuit breaker off**, you set **Br. circuit breaker off** to **Custom**, and set the branch to **Disable**.<br>MDU path: **System Info.** > **Setting** > **System Param.** |
| Branch abnormal | Warning | A branch switch is on, but no current is detected. | No loading | If you do not to display a **Branch abnormal**, you set **Branch abnormal** to **Custom**, and set the branch to **Disable**.<br>MDU path: **System Info.** > **Setting** > **System Param.** |
| Branch overload | Critical | The current of a branch exceeds 1 time of the rated current (multiple: 1–1.2; confirmation time: 1–10s). | The branch is overloaded. | Check the load power of the branch. |
| Max. br. cur. exceed | Major | The current of a branch exceeds 0.8 time of the rated current (multiple: 0.8–1). | The branch is overloaded. | Check the load power of the branch. |
| Min. br. cur. exceed | Warning | The current of a branch exceeds 0.6 time of the rated current (multiple: 0.6–0.8; confirmation time: 1–10s). | N/A | N/A |

| Alarm Name | Alarm Severity | Impact | Possible Cause | Solutions |
| --- | --- | --- | --- | --- |
| Main input br. current shock | Major | A surge current three times greater than the rated current is detected in a branch (multiple: 1.5–5). | The insulation of the branch is abnormal. | Check the cable insulation of the output branch. |

**Figure 8-1** Common polarity terminal and common terminal of the transformer




(1) Common polarity terminal (2) Common terminal

# 8.3 Troubleshooting

| Symptom | Possible Cause | Solution |
| --- | --- | --- |
| The LCD fails to display branch currents. | • The monitoring board communications cable or the secondary cable to the corresponding branch current transformer is not properly connected.<br>• The current monitoring board or current transformer is faulty. | 1. Replace the monitoring board.<br>2. Contact Huawei technical support. |
| The LCD fails to display the circuit breaker status. | • The communications cable of the Boolean value collection module or the corresponding branch Boolean value signal cable is not properly connected.<br>• The Boolean value collection module or auxiliary switch contact is faulty. | 1. Replace the monitoring board.<br>2. Contact Huawei technical support. |
| The LCD is black or blinks. | • The input CAN cable is disconnected.<br>• The LCD is faulty. | • Secure the input CAN cable.<br>• Replace the MDU. |
| The indicators of the monitoring board do not light up. | • Cables are not properly connected.<br>• The monitoring board is faulty. | 1. Replace the monitoring board.<br>2. Contact Huawei technical support. |

# 8.4 Parts Replacement

This document describes only the replacement method for certain components. If a faulty component to be replaced is not covered in this document, contact Huawei technical support.

## 8.4.1 Replacing an SPD Module

### Prerequisites

**DANGER**

Do not replace an SPD module during a thunderstorm.

- Tools: electrical tester pen, key to the PDC cabinet door, Phillips screwdriver, flat-head screwdriver
- Materials: new SPD module

## Procedure

**Step 1** Remove the protective panel of the SPD.

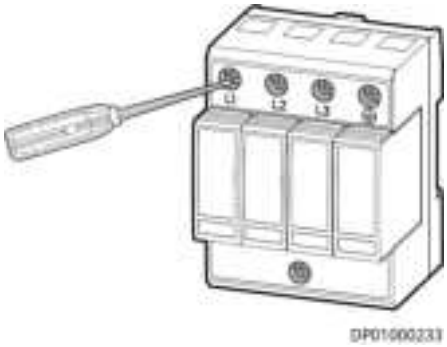
**NOTICE**

Take appropriate insulation measures to avoid electric shocks when removing the panel.

**Step 2** Switch off the SPD circuit breaker.

**Step 3** Detect the L1, L2, L3, and N voltages to the PE using an electrical tester pen, and verify that the faulty SPD has no voltage before replacing the faulty SPD. **Figure 8-2** shows how to detect the voltages.

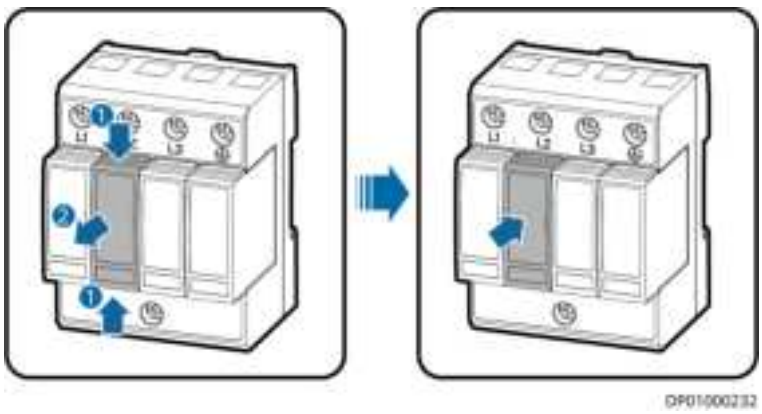
**Figure 8-2** Detecting the voltages




**Step 4** Use a flat-head screwdriver to lever the faulty SPD out.

**Step 5** Install a new SPD module.

**Figure 8-3** Replacing an SPD Module



NOTE

If there is a faulty surge protection module, it is recommended that all surge protection modules be replaced.

**Step 6** Switch on the SPD circuit breaker.

**Step 7** Reinstall the protective panel.

**----End**

## 8.4.2 Replacing an Indicator

### Prerequisites

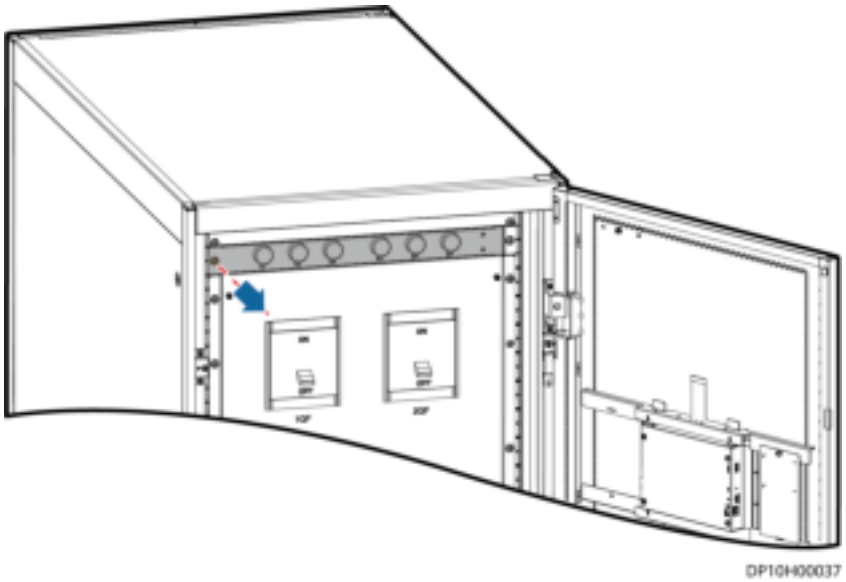
- Tools: electrical tester pen, Phillips screwdriver, key to the PDC cabinet door, multimeter, step ladder, and a pair of insulating gloves
- Materials: spare functional indicator with the same model

### Procedure

**Step 1** Open the PDC rear door, push out the fuse terminal block, and remove the fuse of the indicator to open the circuit. For details about the fuse position and how to remove it, see **8.4.5 Replacing a Fuse**.

**Step 2** Open the PDC front door, and open the indicator protection panel.

**Figure 8-4** Opening the indicator protection panel




**Step 3** Loosen the screw at the back of the indicator using a Phillips screwdriver, and remove the cables, as shown in **Figure 8-5**.

NOTE

When removing cables, label the cables with corresponding terminal ports for later connection.

**Figure 8-5** Replacing an Indicator

**Step 4** Remove the retaining ring from the indicator and remove the indicator from the mounting hole.

**Step 5** Put a new indicator into the mounting hole, secure the retaining ring, and connect the cables.

**Step 6** Reinstall the fuse to reconnect the circuit.

**Step 7** Verify that the indicator lights up properly.

**Step 8** Reinstall the protective panel.

**Step 9** Install the fuse terminal block to its original position.

**----End**

## 8.4.3 Replacing a Common MCB

### Prerequisites

**DANGER**

Before replacement, ensure that the input and output switches are OFF, and that the upstream and downstream switches are also OFF.

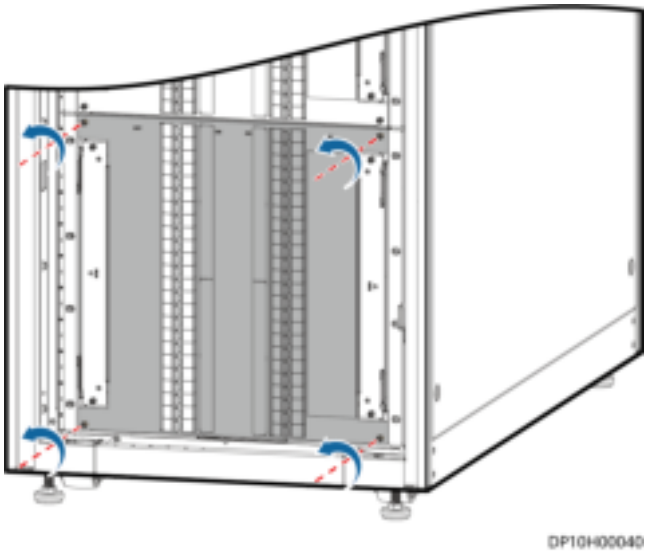
- Tools: Phillips screwdriver, flat-head screwdriver, and key to the PDC cabinet door.
- Materials: MCB of the appropriate model

### Procedure

**Step 1** Open the front door of the PDC, turn off the input and output switches in the PDC, and turn off the upstream and downstream switches.

**Step 2** Remove the screws from the PDC panel, set the screws aside, and remove the panel.

**Figure 8-6** Removing the panel

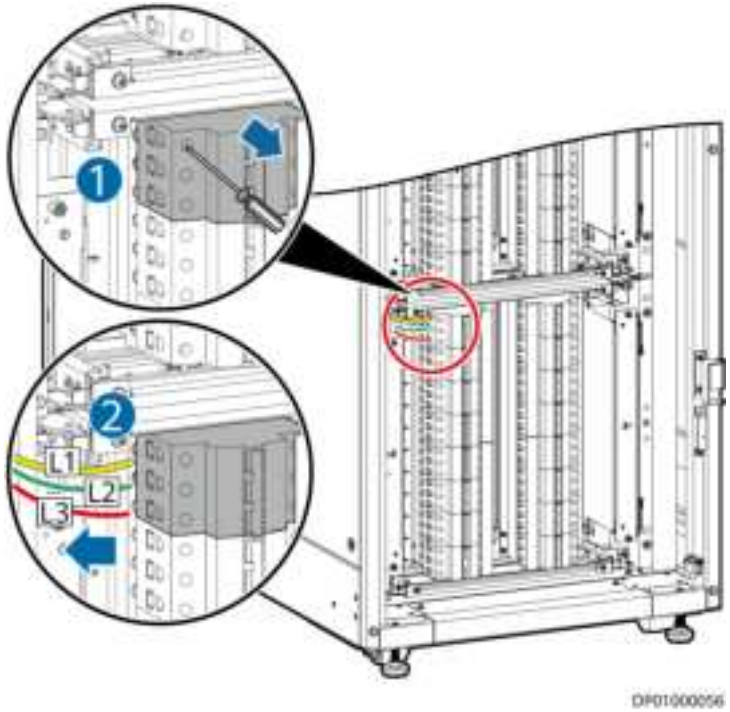


**Step 3** Remove cables connected to the left and right sides of the MCB, as shown in **Figure 8-7**.

NOTE

When removing cables, label the cables with corresponding terminal ports for later connection.

**Figure 8-7** Removing cables




**Step 4** Push the black clip of the MCB outwards. Then remove the MCB along the inner side of the PDC, as shown in **Figure 8-8**.

NOTE

Mark the MCB to ensure correct reinstallation.

**Figure 8-8** Pushing the black clip

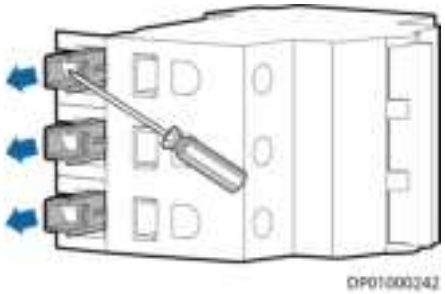
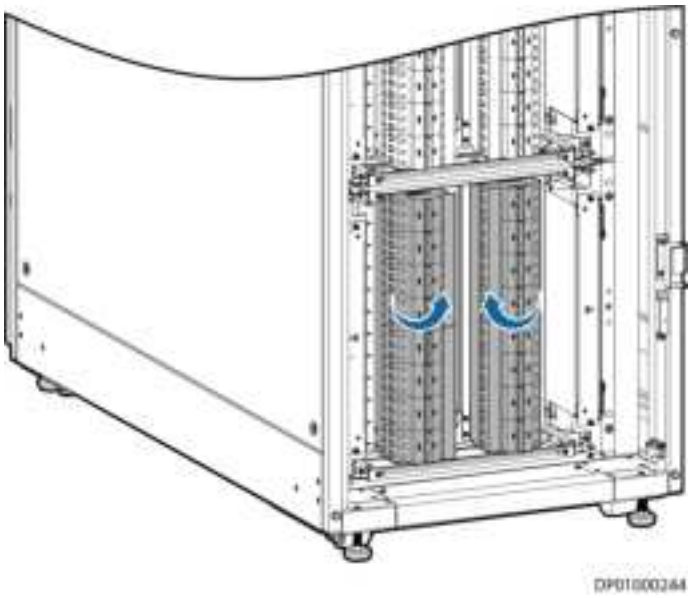


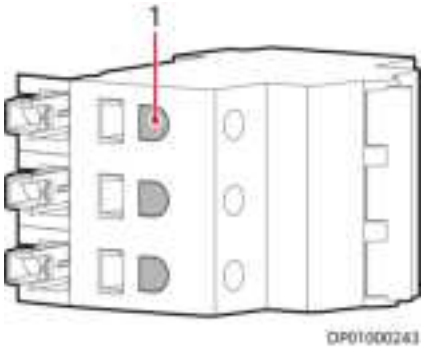
**Figure 8-9** Removing the MCB



**Step 5** Install a new MCB.

**Step 6** Connect cables. The recommended cable hole for the MCB is shown by (1) in **Figure 8-10**.

**Figure 8-10** Mounting holes



(1) mounting holes

**Step 7** Reinstall the panel on the PDC.

**----End**

# 8.4.4 Replacing a Hot-Swap MCB

## Prerequisites

- Tools: MCB extracting kit, Phillips screwdriver, key to the PDC door
- Materials: new MCB

**NOTE**

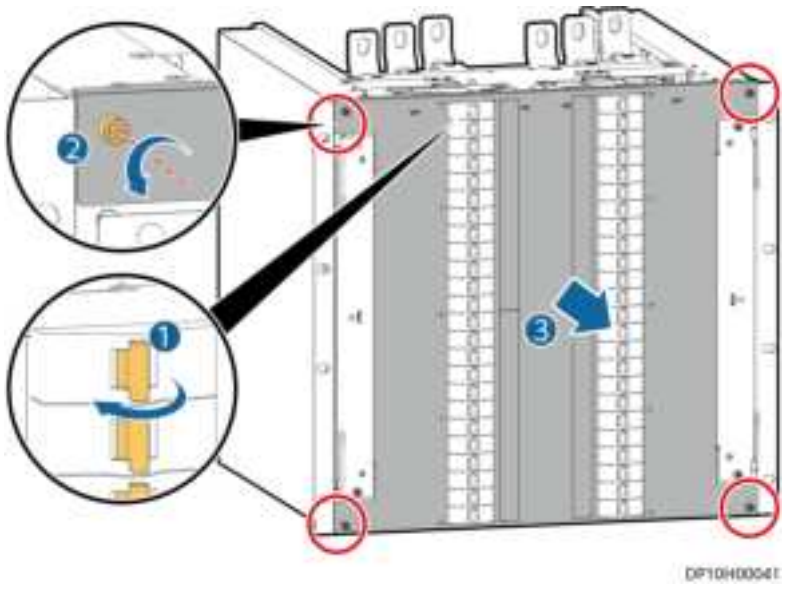
Obtain the MCB extracting kit from the file box on the PDC front door.

## Procedure

**Step 1** Open the cabinet front door, and switch the MCBs to be installed to OFF.

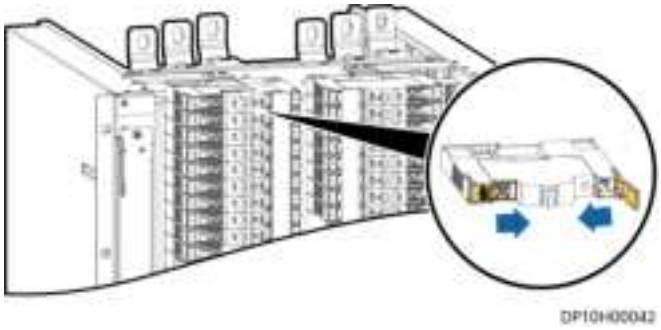
**Step 2** Remove the front panel of the output module.

**Figure 8-11** Removing the front panel




**Step 3** Push open the handles on both sides of the MCB.

**Figure 8-12** Pushing open the handles

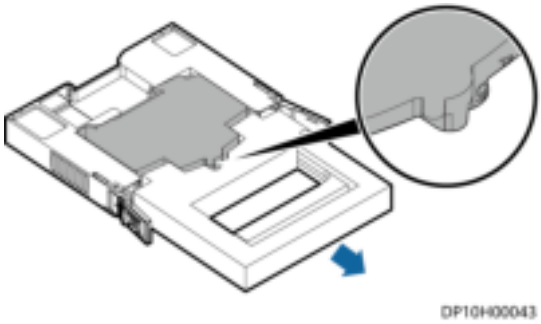



**Step 4** Remove the MCB using the MCB extracting kit.

**NOTICE**

Install and remove MCBs using the MCB extracting kit. Do not install or remove MCBs barehanded.

**Figure 8-13** Removing the MCB

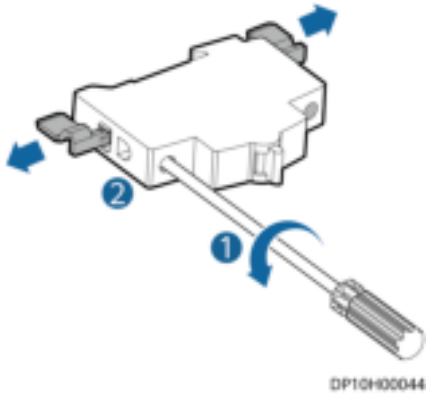



**Step 5** Remove the copper bars on both ends of the old MCB, and install the copper bars on a new MCB.

**NOTICE**

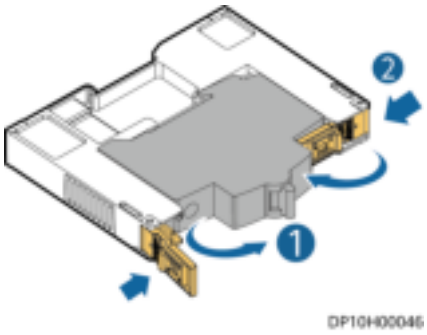
Verify that the new MCB is switched to OFF before the installation.

**Figure 8-14** Removing copper bars on both ends of an MCB



**Step 6** Install the new MCB using the MCB extracting kit, and close the handles on both sides of the hot-swap base.

**Figure 8-15** Installing an MCB




**Step 7** Reinstall the front panel.

**----End**

## 8.4.5 Replacing a Fuse

### Prerequisites

**CAUTION**

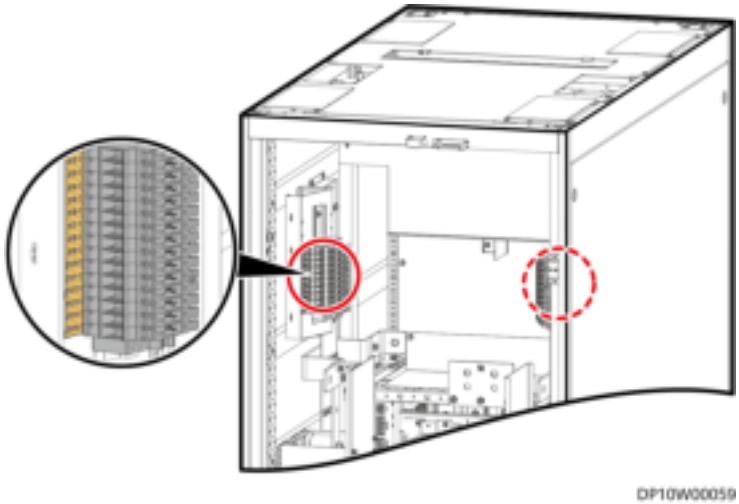
When replacing a fuse, you must wear insulated gloves, and must not touch the input copper bar.

- Tools: insulated gloves, key to the PDC door
- Material: new fuse which is intact and has the same model

### Context

Fuses are located in the rear of the PDC, which uses dual-input as an example.

**Figure 8-16** Fuse location



NOTE

The figures are for reference only. The actual product appearance prevails.

**Table 8-2** Fuse description for the single-input scenario

| Fuse No. | Function |
| --- | --- |
| 1FU1 | Fuse for the yellow power indicator of input 1 |
| 1FU2 | Fuse for the green power indicator of input 1 |
| 1FU3 | Fuse for the red power indicator of input 1 |
| 1FU4 | Fuse for phase L1 of the 220 V AC auxiliary source on the power board to the right of the first output subrack (cabinet rear view) |
| 1FU5 | Fuse for phase L2 of the 220 V AC auxiliary source on the power board to the right of the first output subrack (cabinet rear view) |
| 1FU6 | Fuse for phase L3 of the 220 V AC auxiliary source on the power board to the right of the first output subrack (cabinet rear view) |
| 1FU7 | Voltage sampling fuse of phase L3 on the power board to the right of the first output subrack (cabinet rear view)/Voltage sampling fuse of phase L1 on the power board to the left of the first output subrack (cabinet rear view) |
| 1FU8 | Voltage sampling fuse of phase L2 on the power board to the right of the first output subrack (cabinet rear view)/Voltage sampling fuse of phase L2 on the power board to the left of the first output subrack (cabinet rear view) |
| 1FU9 | Voltage sampling fuse of phase L1 on the power board to the right of the first output subrack (cabinet rear view)/Voltage sampling fuse of phase L3 on the power board to the left of the first output subrack (cabinet rear view) |
| 1FU10 | Voltage sampling fuse of phase L3 on the power board to the right of the second output subrack (cabinet rear view)/Voltage sampling fuse of phase L1 on the power board to the left of the second output subrack (cabinet rear view) |
| 1FU11 | Voltage sampling fuse of phase L2 on the power board to the right of the second output subrack (cabinet rear view)/Voltage sampling fuse of phase L2 on the power board to the left of the second output subrack (cabinet rear view) |
| 1FU12 | Voltage sampling fuse of phase L1 on the power board to the right of the second output subrack (cabinet rear view)/Voltage sampling fuse of phase L3 on the power board to the left of the second output subrack (cabinet rear view) |
| 1FU13 | Voltage sampling fuse of phase L3 on the power board to the right of the third output subrack (cabinet rear view)/Voltage sampling fuse of phase L1 on the power board to the left of the third output subrack (cabinet rear view) |

| Fuse No. | Function |
| --- | --- |
| 1FU14 | Voltage sampling fuse of phase L2 on the power board to the right of the third output subrack (cabinet rear view)/Voltage sampling fuse of phase L2 on the power board to the left of the third output subrack (cabinet rear view) |
| 1FU15 | Voltage sampling fuse of phase L1 on the power board to the right of the third output subrack (cabinet rear view)/Voltage sampling fuse of phase L3 on the power board to the left of the third output subrack (cabinet rear view) |
| 2FU1 | Fuse for phase L1 of the 220 V AC auxiliary source on the power board to the left of the first output subrack (cabinet rear view) |
| 2FU2 | Fuse for phase L2 of the 220 V AC auxiliary source on the power board to the left of the first output subrack (cabinet rear view) |
| 2FU3 | Fuse for phase L3 of the 220 V AC auxiliary source on the power board to the left of the first output subrack (cabinet rear view) |

**Table 8-3** Fuse description for the dual-input scenario

| Fuse No. | Function |
| --- | --- |
| 1FU1/2FU1 | Fuse for the yellow power indicator of input 1/Fuse for the yellow power indicator of input 2 |
| 1FU2/2FU2 | Fuse for the green power indicator of input 1/Fuse for the green power indicator of input 2 |
| 1FU3/2FU3 | Fuse for the red power indicator of input 1/Fuse for the red power indicator of input 2 |
| 1FU4/2FU4 | Fuse for phase L1 of the 220 V AC auxiliary source on the power board to the right of the first output subrack (cabinet rear view)/Fuse for phase L1 of the 220 V AC auxiliary source on the power board to the left of the first output subrack (cabinet rear view) |
| 1FU5/2FU5 | Fuse for phase L2 of the 220 V AC auxiliary source on the power board to the right of the first output subrack (cabinet rear view)/Fuse for phase L2 of the 220 V AC auxiliary source on the power board to the left of the first output subrack (cabinet rear view) |
| 1FU6/2FU6 | Fuse for phase L3 of the 220 V AC auxiliary source on the power board to the right of the first output subrack (cabinet rear view)/Fuse for phase L3 of the 220 V AC auxiliary source on the power board to the left of the first output subrack (cabinet rear view) |

| Fuse No. | Function |
| --- | --- |
| 1FU7/2FU7 | Voltage sampling fuse of phase L3 on the power board to the right of the first output subrack (cabinet rear view)/Voltage sampling fuse of phase L1 on the power board to the left of the first output subrack (cabinet rear view) |
| 1FU8/2FU8 | Voltage sampling fuse of phase L2 on the power board to the right of the first output subrack (cabinet rear view)/Voltage sampling fuse of phase L2 on the power board to the left of the first output subrack (cabinet rear view) |
| 1FU9/2FU9 | Voltage sampling fuse of phase L1 on the power board to the right of the first output subrack (cabinet rear view)/Voltage sampling fuse of phase L3 on the power board to the left of the first output subrack (cabinet rear view) |
| 1FU10/2FU10 | Voltage sampling fuse of phase L3 on the power board to the right of the second output subrack (cabinet rear view)/Voltage sampling fuse of phase L1 on the power board to the left of the second output subrack (cabinet rear view) |
| 1FU11/2FU11 | Voltage sampling fuse of phase L2 on the power board to the right of the second output subrack (cabinet rear view)/Voltage sampling fuse of phase L2 on the power board to the left of the second output subrack (cabinet rear view) |
| 1FU12/2FU12 | Voltage sampling fuse of phase L1 on the power board to the right of the second output subrack (cabinet rear view)/Voltage sampling fuse of phase L3 on the power board to the left of the second output subrack (cabinet rear view) |
| 1FU13/2FU13 | Voltage sampling fuse of phase L3 on the power board to the right of the third output subrack (cabinet rear view)/Voltage sampling fuse of phase L1 on the power board to the left of the third output subrack (cabinet rear view) |
| 1FU14/2FU14 | Voltage sampling fuse of phase L2 on the power board to the right of the third output subrack (cabinet rear view)/Voltage sampling fuse of phase L2 on the power board to the left of the third output subrack (cabinet rear view) |
| 1FU15/2FU15 | Voltage sampling fuse of phase L1 on the power board to the right of the third output subrack (cabinet rear view)/Voltage sampling fuse of phase L3 on the power board to the left of the third output subrack (cabinet rear view) |

**NOTE**

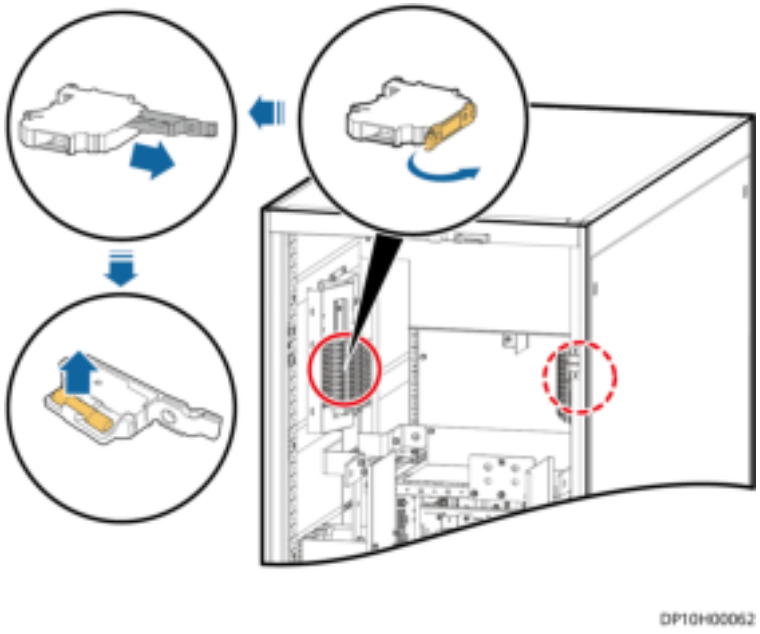
- The preceding tables use a fully configured PDC as an example. The actual cabinet configurations prevail.
- *FU*-1 indicates the fuse input end, and *FU*-2 indicates the fuse output end.

### Procedure

**Step 1** Push the fuse handle up outwards.

**Step 2** Remove the faulty fuse.

**Figure 8-17** Removing a fuse



**Step 3** Install a new fuse, and reinstall the handle.

**----End**

## 8.4.6 Replacing a monitoring board

### Prerequisites

- Tool: Phillips screwdriver
- Materials: new monitoring board

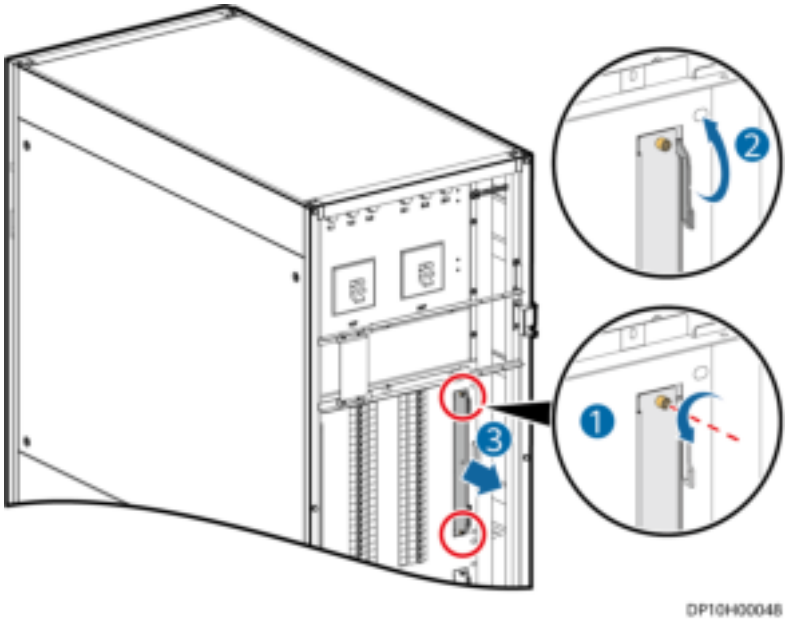
### Procedure

**Step 1** Loosen the two bolts on the monitoring board, as shown by (1) in **Figure 8-18**.

**Step 2** Open the two crowbars on the monitoring board, as shown by (2) in **Figure 8-18**.

**Step 3** Gently pull out the monitoring board, as shown by (3) in **Figure 8-18**.

**Figure 8-18** Replacing a monitoring board




NOTE

- The monitoring board with the BOM number 02311GDJ or 02311GDJ-002 can convert AC into 12 V DC, and can be installed in all output modules of a cabinet.
- The monitoring board with the BOM number 02311GDJ-001 can be installed only in output modules except output module 1.

**Step 4** Install a new monitoring board.

**Step 5** Close the two crowbars and tighten the two bolts on the monitoring board in turn.

**----End**

## 8.4.7 Replacing an MDU

### Prerequisites

- Tools: Phillips screwdriver and key to the PDC cabinet door
- Materials: new intact MDU

NOTE

The MDU can be replaced online without disconnecting the power supply.

### Procedure

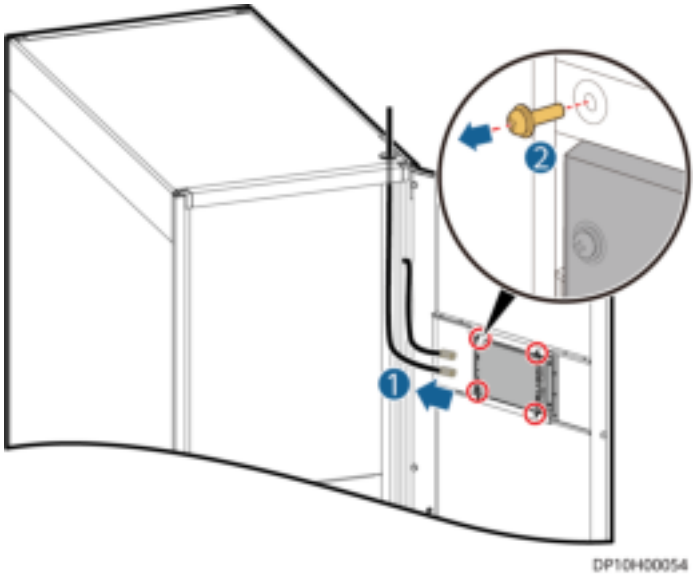
**Step 1** Remove the communications cables from the MDU, as shown in **Figure 8-19**.

NOTE

When removing cables, label the cables with corresponding terminal ports for later connection.

**Step 2** Remove the four screws fixing the MDU and put them aside, as shown in **Figure 8-19**.

**Figure 8-19** Removing the MDU




**Step 3** Hold the MDU front panel by one hand, and push out the MDU from the fastener on the front panel by the other hand.

**Step 4** Install the new MDU in the bracket, and secure it using screws.

**Step 5** Connect the communications cables to the MDU.

**Step 6** After the MDU is replaced, the new MDU automatically checks whether its configurations are consistent with the rack configuration during startup. If an inconsistency is found, the MDU displays a synchronization dialog box, as shown in **Figure 8-20**.

1. Click **OK** to synchronize the configurations. The MDU restarts.
2. If you click **Cancel** (not recommended), the configurations will not be synchronized, and the MDU displays the same dialog box after the next startup.

**Figure 8-20** Synchronization dialog box


**----End**

# 8.5 Capacity Expansion Settings

## Prerequisites

The PDC is configured with output modules that have hot-swap bases.

**DANGER**

- Install MCBs using the MCB extracting kit. Do not install MCBs barehanded.
- Before installing an MCB, verify that it is switched to OFF.
- Obtain the MCB extracting kit from the file box on the PDC front door.

## Capacity Expansion Principles

The capacity expansion principles vary slightly for single- and dual-input scenarios.

- In the single-input scenario, install MCBs for output modules from top down and from left to right. Install MCBs fully for one output module before installing MCBs for the next output module.
- In the dual-input scenario, install MCBs for added output modules from top down. Verify that the MCBs on the left and right sides are the same in number and capacity.

**NOTICE**

- 1P and 3P MCBs can be mixed up for capacity expansion, but must be installed contiguously without jumping any slot.
- 2P MCBs cannot be used for capacity expansion. The MCB capacity cannot exceed 63 A.

## Preparations

Tools: MCB extracting kit, Phillips screwdriver

Materials: MCB, MCB copper bar

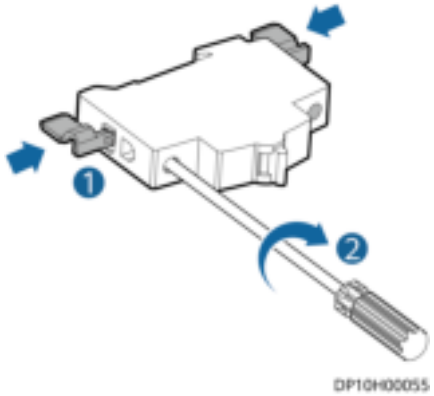
Skill requirement: power distribution engineer

## Procedure

**Step 1** Remove the front panel of the output module to be expanded.

**Step 2** Switch the MCBs to be installed to OFF, and install MCB copper bars at both ends.

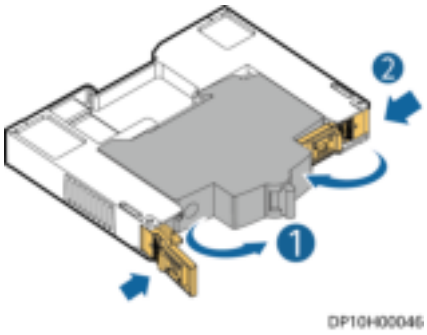
**Figure 8-21** Installing MCB copper bars




**Step 3** Open the handles on both sides of the hot-swap base.

**Step 4** Snap an MCB into the hot-swap base using the MCB extracting kit, and close the handles on both sides.

**Figure 8-22** Installing an MCB




**Step 5** Install all other MCBs in the same way according to the capacity expansion principles.

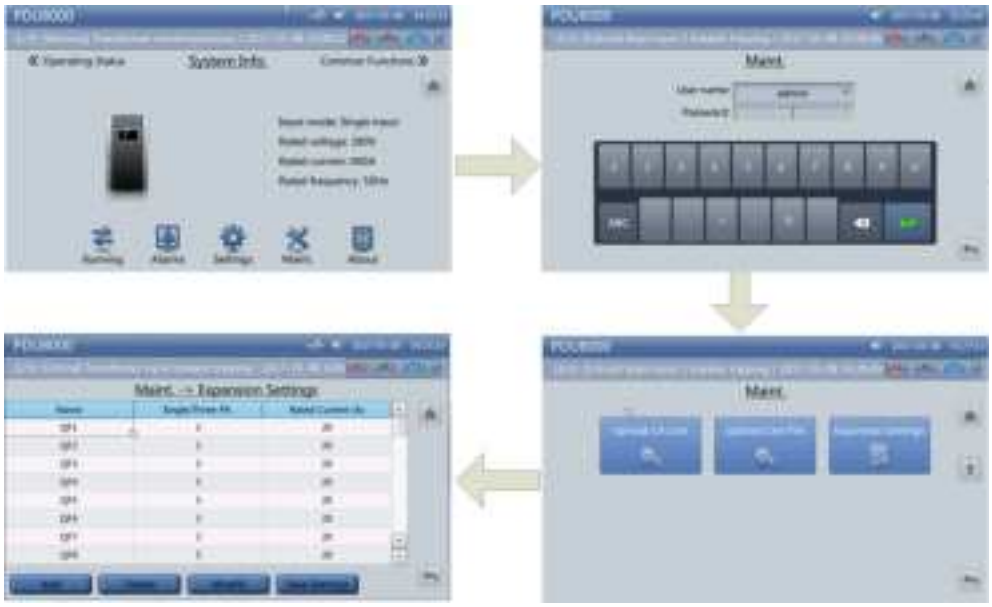
NOTE

- The number of MCBs to be installed vary depending on site requirements.
- Each reserved label code corresponds to one 1P MCB. A 3P MCB takes up three label codes.

**Step 6** Reinstall the front panel.

**Step 7** Tap **Maint.** on the **System Info.** screen to enter the **Expansion Settings** screen.

**Figure 8-23** Capacity expansion settings



NOTE

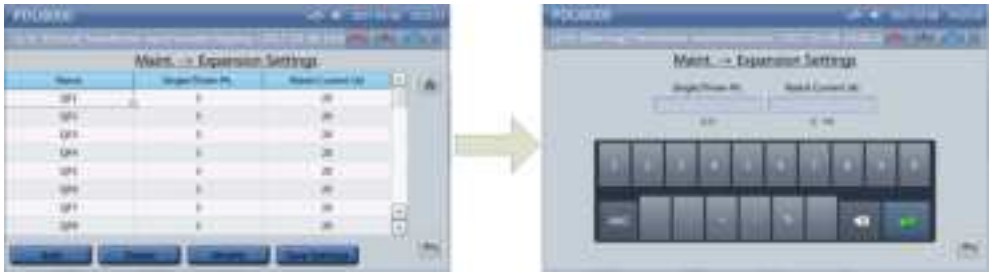
Second method for setting capacity expansion: Turn on the MCB. The dialog box for setting capacity expansion is displayed on the MDU. If you do not want to set capacity expansion, cancel the displayed dialog box for setting capacity expansion for three consecutive times to cancel capacity expansion settings.

**Step 8** Tap **Add** to set the MCB quantity, phases, and capacity.

**Figure 8-24** Adding an MCB

**Step 9** (Optional) If an MCB is incorrectly set, tap the MCB and then tap **Modify** to correct the phases and capacity.

**Figure 8-25** Modifying MCB settings



**Step 10** (Optional) If more MCBs are added than necessary, tap the extra MCB and then tap **Delete**.

**Figure 8-26** Deleting an MCB


**Step 11** After verifying that all added MCBs are correctly set, tap **Save Settings**.

**Step 12** The MDU automatically restarts, and the capacity expansion setting is complete.

**----End**

# 8.6 Changing Alias

## Procedure

**Step 1** On the main screen, tap **Operating Status** to access the screen and query the circuit breaker status of the mains and branches.

**Step 2** Tap screen and change alias.

**Figure 8-27** Changing alias

**----End**

# A PDC Silk Screen Description

The silk screen content is in the format of route number + symbol + switch sequence number. In the single-input scenario, the route number is omitted by default.

**Table A-1** Symbols

| Symbol | Name |
| --- | --- |
| QF | Circuit breaker |
| FU | Fuse |
| QFS | SPD circuit breaker |
| FS | SPD |

The silk screen content is in the format of route number + symbol + switch sequence number. In the single-input scenario, the route number is omitted by default. Symbols in the conceptual diagram are described as follows:

NOTE

- QF: input switch when there is a single input.
- QF1: first switch when there is a single input.
- 1QF: input circuit breaker for route I when there are two inputs.
- 2QF: input circuit breaker for route II when there are two inputs.
- 1QF1: first switch of route I when there are two inputs.
- 2QF1: first switch of route II when there are two inputs.

# B PDC Label Description

**Table B-1** Label description

| Picture | Description | Picture | Description |
| --- | --- | --- | --- |
|  | Located on the bottom or top panel to indicate the cabinet front |  | Located on the bottom or top panel to indicate the cabinet rear |
|  | Internal equipotential connection label |  | General ground point |
|  | Copper bar or cable of phase L1 |  | Copper bar or cable of phase L2 |
|  | Copper bar or cable of phase L3 |  | Phase L1 input of copper bar I |
|  | Phase L2 input of copper bar I |  | Phase L3 input of copper bar I |
|  | Phase L1 input of copper bar II |  | Phase L2 input of copper bar II |

| Picture | Description | Picture | Description |
| --- | --- | --- | --- |
|  | Phase L3 input of copper bar II |  | Phase N input of copper bar I |
|  | Phase N input of copper bar II |  | N bar when there is only one input |

# C Acronyms and Abbreviations

| | |
|---|---|
| **A** | |
| **AC** | alternating current |
| **APP** | Application |
| **ATS** | AC transfer switch |
| **B** | |
| **BSP** | bottom support program |
| **C** | |
| **CAN** | control area network |
| **CCC** | China Compulsory Certification |
| **CE** | conformite europende |
| **CT** | current transformer |
| **CU** | Control Union |
| **D** | |
| **DES** | Data Encryption Standard |
| **DHCP** | Dynamic Host Configuration Protocol |
| **DIP** | dual inline-pin package |
| **F** | |
| **FE** | fast Ethernet |
| **I** | |
| **IP** | Internet Protocol |
| **ID** | identity |

| | |
|---|---|
| **IT** | Internet technology |
| **L** | |
| **LCD** | liquid crystal display |
| **LUI** | LCD user interface |
| **M** | |
| **MD5** | message digest algorithm 5 |
| **MCB** | miniature circuit breaker |
| **MCCB** | molded case circuit breaker |
| **MDU** | monitor display unit |
| **O** | |
| **ODM** | original design & manufacture |
| **P** | |
| **PE** | protective earthing |
| **R** | |
| **RS485** | Recommend Standard 485 |
| **S** | |
| **SNMP** | Simple Network Management Protocol |
| **SN** | serial number |
| **U** | |
| **USB** | Universal Serial Bus |
| **UPS** | uninterruptible power system |