



UPS5000-E-(600 kVA-800 kVA)

User Manual

Issue 02
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About This Document

Purpose

This document describes the UPS5000-E-(600 kVA-800 kVA) in terms of its features, performance, working principles, appearance as well as instructions for installation, and operation and maintenance (O&M).





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 an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may 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.

Symbol	Description
	NOTICE is used to address practices not related to personal injury.
 NOTE	<p>Calls attention to important information, best practices and tips.</p> <p>NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.</p>

Change History

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

Issue 02 (2016-01-20)

Updated the maximum voltage and current which the monitoring interface card can support, optimized the dual bus scenario, and updated the routine maintenance.

Issue 01 (2015-06-25)

This is the first release.

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1 Safety Precautions

1.1 General Safety

This section describes the safety precautions that you must take before installing, maintaining, and operating the UPS.



NOTICE

To minimize the risk of personal injury and damage to equipment, read and follow all the precautions in this document before performing any operation. The "DANGER", "WARNING", "CAUTION", and "NOTICE" statements in this document do not represent all the safety instructions. They are only supplements to the safety instructions. Only trained and qualified personnel are allowed to install, operate, and maintain Huawei equipment, and they must understand basic safety precautions to avoid hazards.

Follow the precautions and special safety instructions provided by Huawei when operating Huawei products. Huawei will not be liable for any consequences that are caused by the violation of the general safety regulations and equipment design, production, and usage safety standards.

Declaration

Huawei does not take responsibilities for the following situations:

- Operation under severe environments which are not specified in this document.
- Installation or use in environments which are not specified in related international standards.
- Unauthorized product changes and software code modification.
- Operations not complying with the operation instructions and safety precautions in this document.
- Damage caused by abnormal natural environments.
- Damage caused by using batteries provided by Huawei for non-Huawei UPSs.
- Damage caused by using batteries not provided by Huawei.

Power Grid Requirements

A standard UPS can connect to a three-phase, five-wire (L1, L2, L3, N, PE) TT, TN-C, TN-S, and TN-C-S AC power distribution system (IEC60364-1).

Local Laws and Regulations

When operating the equipment, you must comply with local laws and regulations. The safety instructions in this document are only supplements to local safety regulations.

Personal Requirements



DANGER

Only engineers certified by the manufacturer or its agents are allowed to perform UPS commissioning and maintenance. Otherwise, human injury or equipment damage may occur, and the resulting UPS faults are beyond warranty scope.

Personnel who plan to install or maintain Huawei equipment must receive a thorough training, understand all necessary safety precautions, and master the correct operation methods.

- Only trained and qualified personnel are allowed to install, operate, and maintain the equipment.
- Only trained and qualified personnel are allowed to remove safety facilities and inspect the equipment.
- Only personnel certified or authorized by Huawei are allowed to replace or change the devices or components (including software).
- Operation personnel must report faults or errors that might cause serious safety issues to related owners.
- This product should be installed and used by following the specification requirements (see the chapters related to installation and technical specifications) specified in this manual. Otherwise, the product may be damaged, and the resulting product exceptions or component damage are beyond the warranty scope.

Grounding Requirements

Devices to be grounded (excluding the energy storage unit) must meet the following requirements:

- When installing a device, install the ground cable first. When removing a device, remove the ground cable at the very end.
- Do not damage the ground conductor.
- Do not operate devices if the ground conductor is not installed.
- The devices must be grounded permanently. Before operating a device, check the electrical connection of the device to ensure that it is securely grounded.

Personal Safety

- Do not operate the product or handle cables during thunderstorms.

- To avoid electric shocks, do not connect safety extra-low voltage (SELV) circuits to telecommunication network voltage (TNV) circuits.
- Before operating a device, wear electrostatic discharge (ESD) clothes, ESD gloves, and an ESD wrist strap. Remove any conductors such as jewelry or watches before the operation to avoid electric shocks or burns.
- In the case of fire, leave the building or the equipment room immediately, and turn on the fire alarm bell or make an emergency call. Never enter the building on fire in any case.
- If the cabinet provides an ESD jack, wear an ESD wrist strap and insert the ground terminal of the ESD wrist strap into the jack.
- Keep all switches OFF during device installation.
- Power on the UPS only after authorized engineers arrive at the site.
- If you use a C2 UPS in residential areas, take installation restriction or additional measures to prevent radio frequency interferences.
- If you use the UPS for life-supporting medical apparatus and facilities such as lifts where adequate care has to be taken to ensure personal safety, discuss with the manufacturer in advance about the applicability, settings, management, and maintenance of the UPS, which require special considerations during design.

Device Safety

- Before operation, ensure that the device is firmly anchored to the floor or other solid objects, such as a wall or an installation rack.
- Do not block ventilation vents while the system is operating.
- Before powering on the device, ensure that all the screws inside it are securely tightened and will not fall off during operation.
- After the installation, remove packing materials from the equipment area.
- Replace warning labels that have worn out.
- A UPS can be used to serve resistive-capacitive loads, resistive loads, and micro-inductive loads. It is recommended that a UPS not be used for pure capacitive loads, pure inductive loads, and half-wave rectification loads. It does not apply to energy feedback loads.
- Without prior consent from the manufacturer, do not alter the UPS internal structure or installation procedure.
- Never use water to clean electrical components inside or outside the UPS.

1.2 Electrical Safety

High Voltage



DANGER

- The high voltage power supply provides power for the device operation. Direct or indirect contact (through damp objects) with the high voltage power sources may result in fatal injury.
 - Non-standard and incorrect high voltage operations may result in fire and electric shocks.
-
- The personnel who install the AC facility must be qualified to perform high voltage and AC operations.
 - When selecting, connecting, and routing power cables, follow local laws and regulations.
 - When installing the AC power supply facility, follow local laws and regulations.
 - Before connecting cables to the UPS, ensure that the input power and mains power distribution switches and output power distribution switch are turned off.
 - Use dedicated tools during high voltage and AC operations. Do not use ordinary tools.
 - When the operation is performed in a damp environment, ensure that the device is dry. When water is found in the rack or the rack is damp, switch off the power supply immediately.

High Leakage Current



DANGER

- Ground a device before powering it on. Otherwise, personal injury or device damage may occur.
 - If a "high leakage current" tag is attached to the panel of the device, you must ground the protective ground terminal on the device enclosure before connecting the AC power supply, thereby preventing electric shocks.
 - The UPS can generate high leakage currents. A circuit breaker that has the leakage current protection function is not recommended.
-

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 hurt human eyes.

-
- Before moving or reconnecting the UPS, disconnect the mains and batteries, turn off the output power distribution switch, and wait more than 5 minutes after the UPS completely powers off. Otherwise, electric shocks may occur.
 - Before installing or removing the power cable, turn off the power switch.
 - Before connecting a power cable, check that its label is correct.

Fuse



NOTICE

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.

Backfeed Protection Dry Contact

The UPS can be configured with a backfeed protection dry contact to work with an external automatic circuit breaker, preventing the voltage from flowing back to input terminals over static bypass circuits. If the device installation and maintenance personnel do not need to use backfeed protection, paste labels on the external bypass input circuit breakers, informing that the circuit is connected to the UPS. Disconnect the device from the UPS before performing operations on the circuit.

Electrostatic Discharge



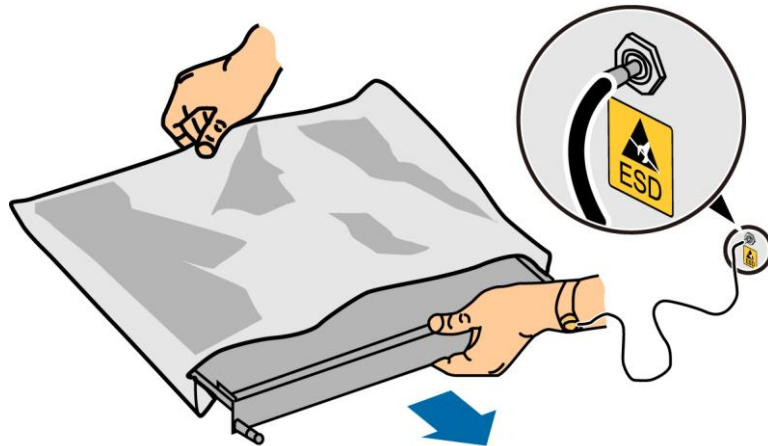
NOTICE

The static electricity generated by human bodies may damage the electrostatic-sensitive components on boards, for example, the large-scale integrated (LSI) circuits.

- Human body movement, friction between human bodies and clothes, friction between shoes and floors, or handling of plastic articles causes static electromagnetic fields on human bodies. These static electromagnetic fields cannot be eliminated until the static is discharged.
- To prevent electrostatic-sensitive components from being damaged by the static on human bodies, you must wear a pair of ESD gloves or a well-grounded ESD wrist strap when touching the device or handling boards or application-specific integrated circuits (ASICs).

[Figure 1-1](#) shows how to wear an ESD wrist strap.

Figure 1-1 Wearing an ESD wrist strap



DC15000001

1.3 Operating Environment

DANGER

Do not expose the equipment to flammable or explosive gas or smoke. Never perform any operation in such an environment.

Any operation on any electrical device in an environment that has flammable air can cause extreme danger. Strictly obey the operating environmental requirements specified in related use manuals when using or storing the device.

Keep the UPS away from the following environments:

- Places where the temperature and humidity are beyond the range of 0–40 °C and 0%–95% RH respectively.
- Places in direct sunlight or near heat sources.
- Places subject to vibrations or shocks.
- Dusty places, or places exposed to corrosive substances or salts.
- Marine environments or outdoor land environments (with simple shielding measures) near pollution sources. If a site is near a pollution source, it is at most:
 - 3.7 km away from saline water areas such as the ocean and salinas.
 - 3 km away from serious pollution sources, such as metallurgic plants, coal mines, and thermal power plants.
 - 2 km away from secondary pollution sources, such as chemical, rubber, and galvanization industries.
 - 1 km away from light pollution sources, such as packing houses, tanneries, and boiler rooms.

1.4 Battery Safety

This section describes precautions for operating batteries.



DANGER

Before operating batteries, carefully read the safety precautions for battery handling and connection.



NOTICE

- To ensure battery safety and efficient battery management, use the batteries delivered with the UPS. Huawei shall not be responsible for battery damage caused by using non-Huawei batteries for Huawei UPSs.
- Handle lead-acid batteries according to local regulations.
- Incorrect handling of batteries causes hazards. When operating batteries, avoid battery short circuits and electrolyte overflow or leakage.
- Electrolyte overflow may damage the device. It will corrode metal parts and circuit boards, and ultimately damage the circuit boards.
- Short circuits caused by incorrect operations may cause serious injuries due to high power of batteries.
- Do not reversely connect positive and negative battery terminals.
- Use batteries of the specified type. Otherwise, the batteries may be damaged.
- Check battery connections periodically to ensure that all screws are securely tightened.
- Install or store batteries in clean, cool, and dry environments.
- Do not decompose, transform, or damage batteries. Otherwise, battery short circuit, electrolyte leakage, and even personal injury may occur.

Technical Specifications

Table 1-1 Battery specifications

Battery Type	Minimum/Maximum Number of Batteries	Cell Float Voltage	Cell Equalized Voltage	Cell Minimum Voltage
Sealing lead-acid battery	Thirty to forty-six 12 V batteries	2.23–2.27 V/cell	2.3–2.4 V/cell	1.6–1.9 V/cell
Open lead-acid battery	Thirty to forty-six 12 V batteries	2.23–2.27 V/cell	2.3–2.4 V/cell	1.6–1.9 V/cell



NOTE

A cell indicates a 2 V cell, each 12 V battery consists of six cells.

Preventative Measures

When installing and maintaining batteries, pay attention to the following points:

- Use dedicated insulated tools.
- Take measures to protect your eyes, such as using eye protection devices.
- Avoid skin contact with electrolyte overflow. Wear rubber gloves and protective clothing.
- When handling a battery, ensure that its electrodes always point upward. Do not tilt or overturn batteries.
- Switch off the power supply during installation and maintenance.

Short Circuit



DANGER

Battery short circuits may cause personal injury. The high transient current generated by a short circuit may release a surge of power and cause a fire.

To avoid battery short circuits, do not maintain batteries in use.

Harmful Gas



DANGER

Do not use unsealed lead-acid batteries. Lead-acid batteries emit flammable gas. Therefore, place and secure lead-acid batteries horizontally to prevent fire or corrosion.

Store lead-acid batteries in a place with good ventilation, and take fire safety precautions.

Battery Temperature



DANGER

High temperature may result in battery distortion, damage, and electrolyte overflow.

- Install or store batteries far away from fire sources and heating devices such as transformers. Never burn batteries.

- When the battery temperature exceeds 60 °C, check the battery for electrolyte overflow. If electrolyte overflows, handle the leakage immediately.

Electrolyte Leakage



DANGER

In the case of electrolyte leakage, counteract and absorb the leaking electrolyte immediately.

When moving or handling a battery whose electrolyte leaks, note that the leaking electrolyte may hurt human bodies. When you find the electrolyte leaks, use the following substances to counteract and absorb the leaking electrolyte:

- Sodium bicarbonate (baking soda): NaHCO_3
- Sodium carbonate (soda): Na_2CO_3

When using substances to counteract and absorb electrolytes, strictly follow the guidelines provided by the battery manufacturer.

If your body comes in contact with battery electrolyte, wash with clean water immediately and seek medical advice if the situation is serious.

1.5 Mechanical Safety

Moving Sharp Objects



CAUTION

Wear protective gloves when moving sharp objects.

Moving Heavy Objects



DANGER

- Perform operations by strictly following the symbols of instructions on the device.
- Be cautious to avoid injury when moving heavy objects.

When moving or lifting a device, hold the handle or bottom of the device.

Handling Fans

Do not insert your fingers or boards into the operating fans until the fans are switched off and stop running.

1.6 Laying Out Cables

Binding Signal Cables



NOTICE

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

Laying Out Cables

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

- Cables can be laid or installed only when the temperature is higher than 0 °C (32 °F).
- Before laying out cables that have been stored in a temperature lower than 0 °C (32 °F), move the cables to an environment of the ambient temperature and store them at the ambient temperature for at least 24 hours.
- Handle cables with caution, especially at a low temperature. Do not drop the cables directly from the vehicle.
- As the insulation layer of a cable may age or be damaged at high temperatures, ensure a sufficient distance between cables and the DC busbars, shunts, and fuses. Cables prepared by the customer should be flame resistant. Cables must not be routed behind the air exhaust vent of the cabinet. The air exhaust vent should not be blocked by any foreign matter.

Before connecting a cable, ensure that the cable and cable label to be used meet the actual installation requirements.

2 Overview

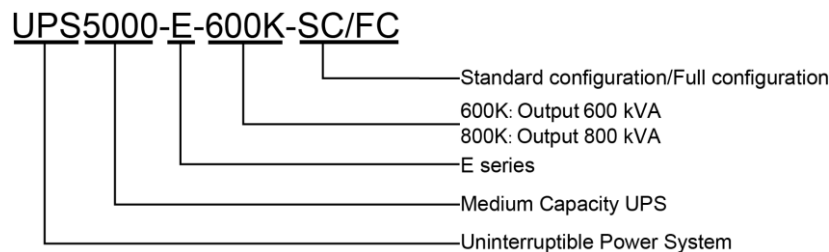
2.1 Model Description

This document describes the following UPS models:

- UPS5000-E-600K-SC
- UPS5000-E-600K-FC
- UPS5000-E-800K-SC
- UPS5000-E-800K-FC

Figure 2-1 shows a UPS model number.

Figure 2-1 UPS model number



NOTE

- The UPS5000-E-600K-SC/FC uses 40 kVA power modules. It can expand up to 600 kVA and is compatible downwards to 40 kVA. This document describes the 600 kVA UPS.
- The UPS5000-E-800K-SC/FC uses 40 kVA power modules. It can expand up to 800 kVA and is compatible downwards to 40 kVA. This document describes the 800 kVA UPS.

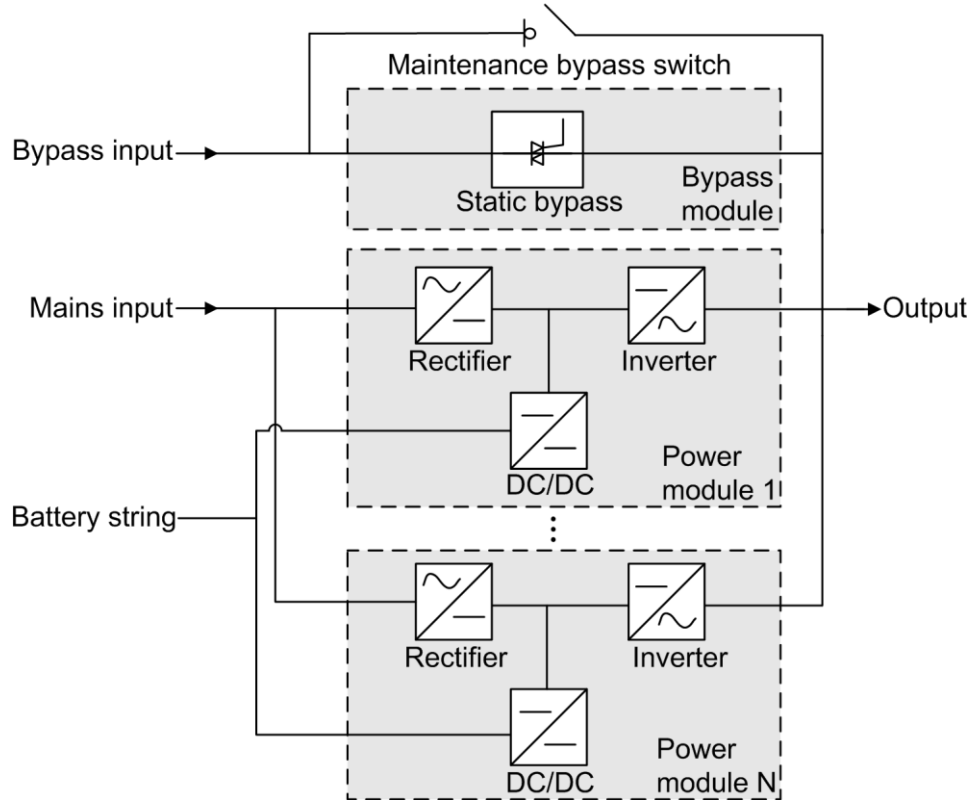
2.2 Working Principle

2.2.1 Conceptual Diagram

The UPS5000-E is an online UPS with a modular design that facilitates maintenance and capacity expansion. All the modules are under digital signal processing (DSP) intelligent control. A power module consists of a rectifier and an inverter. The power module converts

inputs into pure, high-quality sine wave outputs by using high-frequency switching. Figure 2-2 shows the UPS conceptual diagram.

Figure 2-2 UPS conceptual diagram



2.2.2 Working Modes



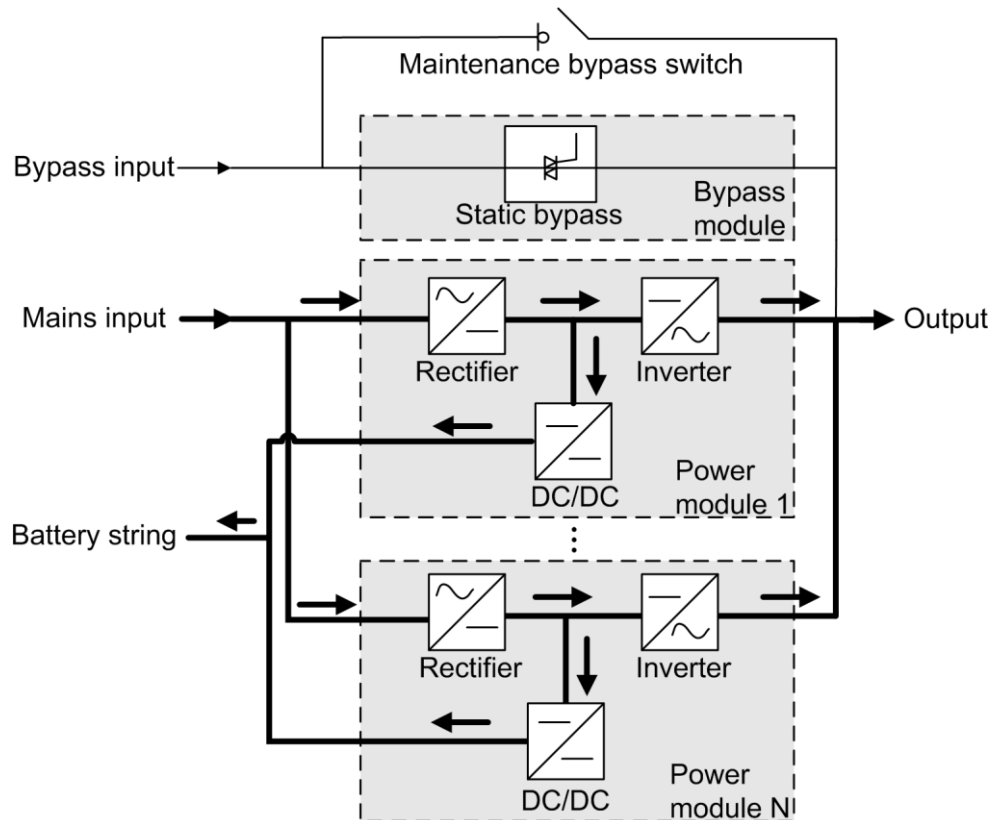
NOTE

- → indicates an input mode.
- → indicates the energy flow direction.

2.2.2.1 Normal Mode

In normal mode, the rectifier converts AC power into DC power. Then the inverter converts DC power into high-precision AC outputs. The conversions protect loads from interference such as input harmonics, glitches, and voltage transients. Figure 2-3 shows the conceptual diagram of the UPS working in normal mode.

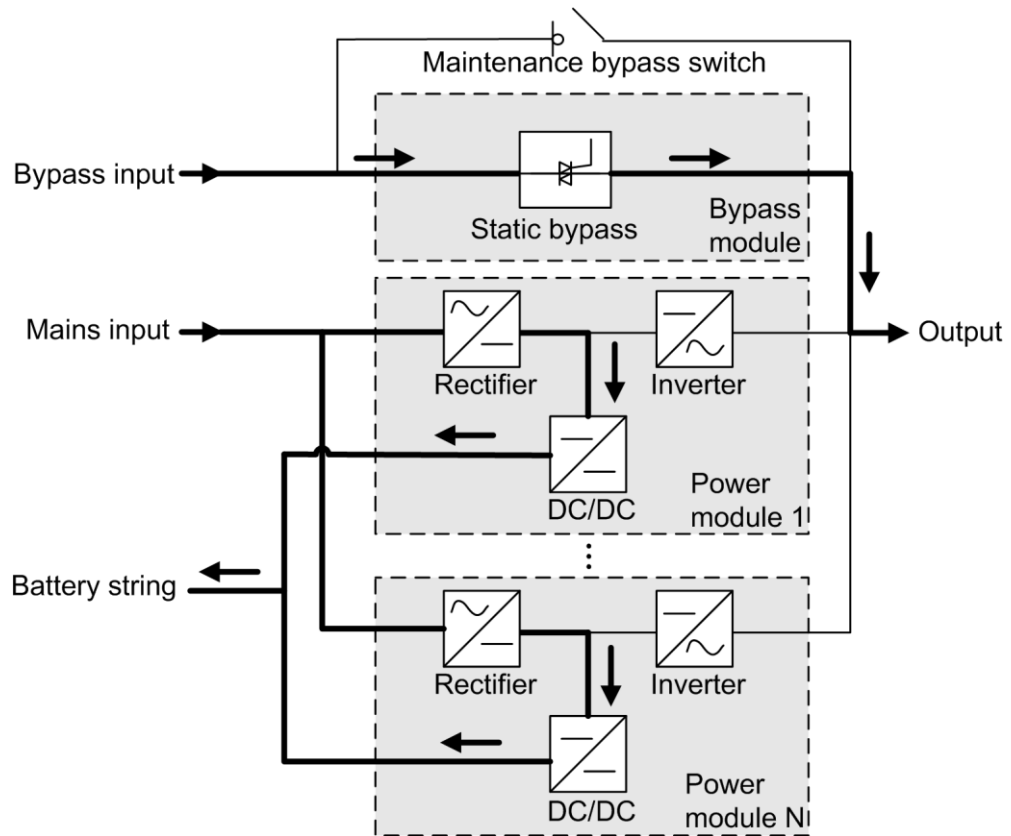
Figure 2-3 UPS conceptual diagram in normal mode



2.2.2.2 Bypass Mode

The UPS automatically transfers to bypass mode upon detecting power module overtemperature, overload, or other faults that may cause the inverter to shut down. The bypass power supply is not protected by the UPS and therefore tends to be affected by mains outage, and abnormal AC voltage or frequency. [Figure 2-4](#) shows the conceptual diagram of the UPS working in bypass mode.

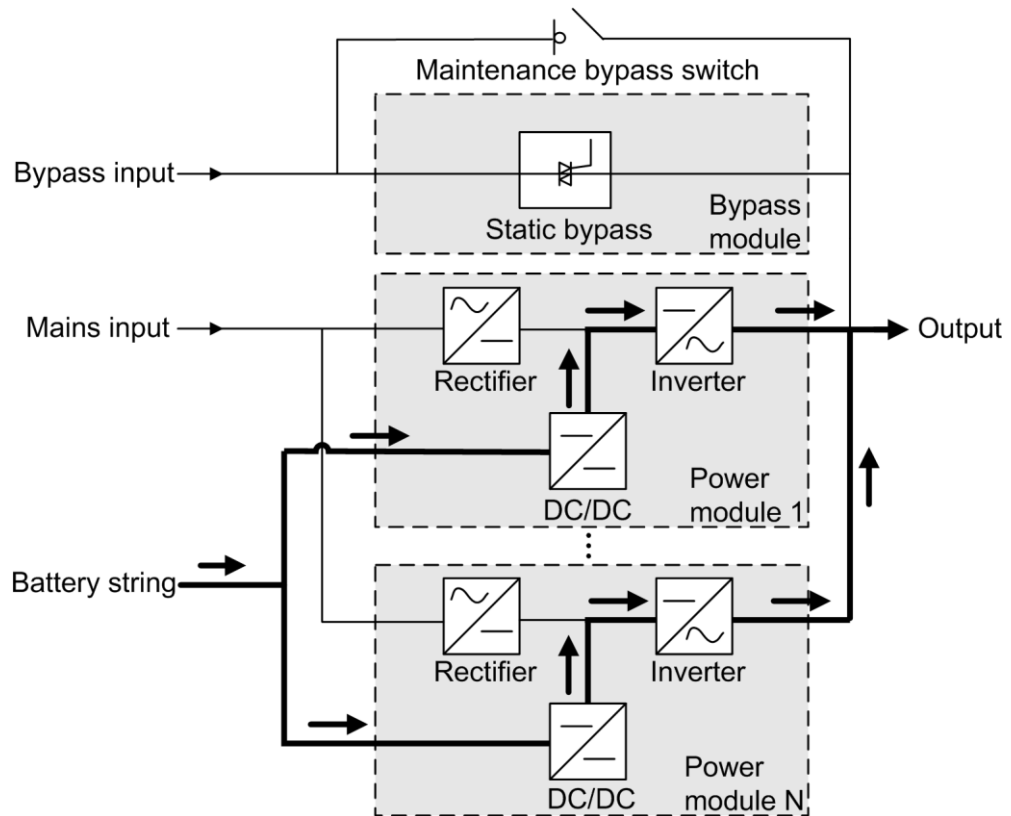
Figure 2-4 UPS conceptual diagram in bypass mode



2.2.2.3 Battery Mode

If the AC input voltage is abnormal, the UPS transfers to battery mode. The power module obtains power from batteries, and then the inverter converts the power into AC outputs. [Figure 2-5](#) shows the conceptual diagram of the UPS working in battery mode.

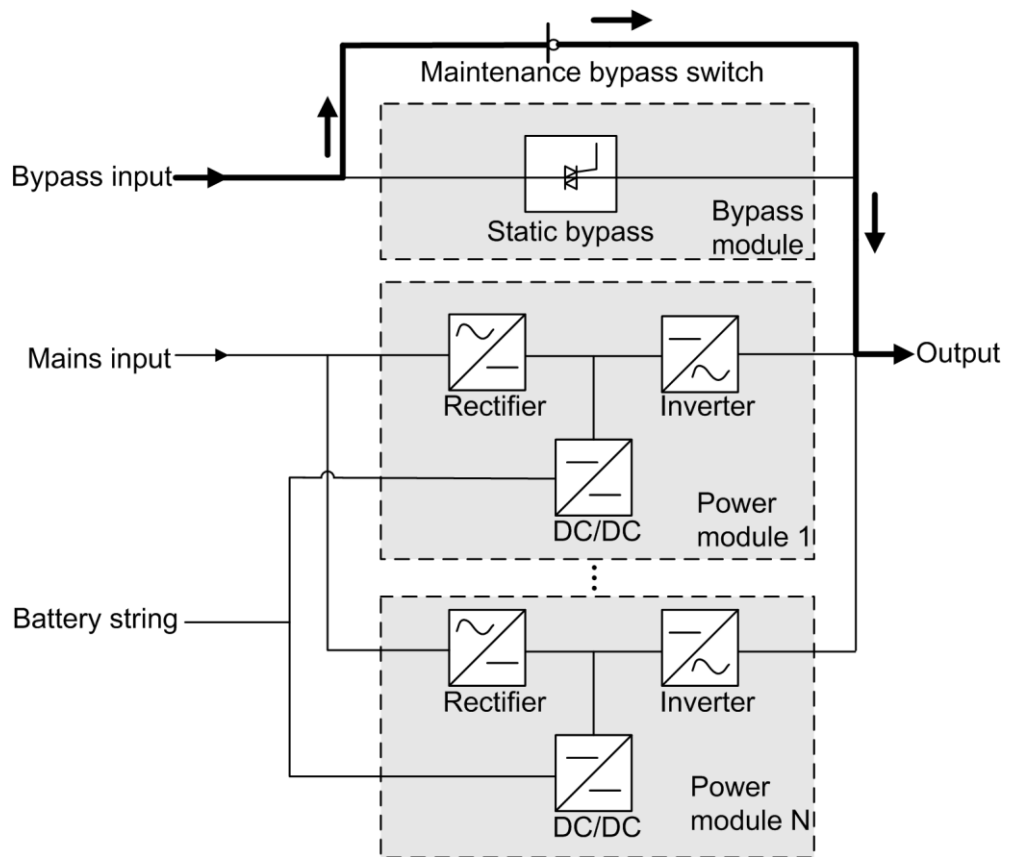
Figure 2-5 UPS conceptual diagram in battery mode



2.2.2.4 Maintenance Bypass Mode

In maintenance bypass mode, the current flows through maintenance bypass circuits, instead of the power module or bypass module. You can perform maintenance on the UPS in this mode. [Figure 2-6](#) shows the conceptual diagram of the UPS working in maintenance bypass mode.

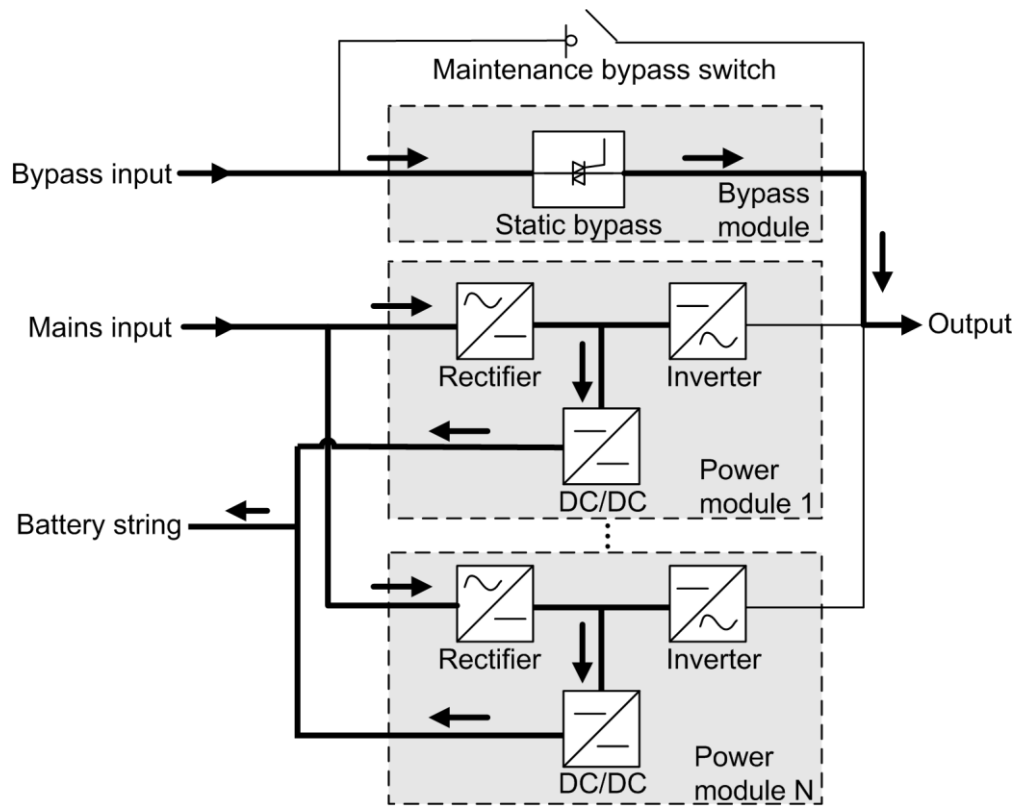
Figure 2-6 UPS conceptual diagram in maintenance bypass mode



2.2.2.5 ECO Mode

The energy control operation (ECO) mode is an energy-saving mode that can be configured on the liquid crystal display (LCD) or web user interface (WebUI). In ECO mode, when the bypass input voltage is within the ECO voltage range, the static bypass switch turns on, and the bypass supplies power (manual startup is required to ensure that the inverter is in standby state and the power flow has reached the inverter). When the bypass input voltage is out of the ECO voltage range, the UPS transfers from bypass mode to normal mode. In bypass mode or normal mode, the rectifier keeps working and charging the batteries using a charger. The ECO mode provides a higher efficiency. [Figure 2-7](#) shows the conceptual diagram of the UPS working in ECO mode.

Figure 2-7 UPS conceptual diagram in ECO mode

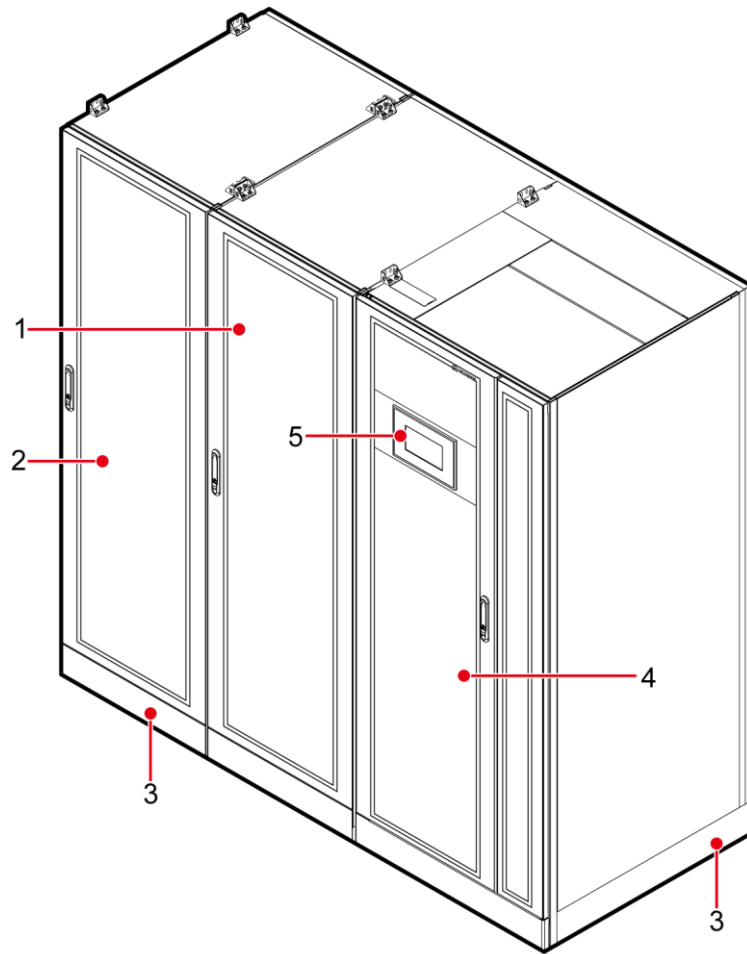


2.3 Overview

2.3.1 Appearance

Figure 2-8 and Figure 2-9 show the UPS.

Figure 2-8 600 kVA UPS



UA15000001

(1) Power cabinet 1

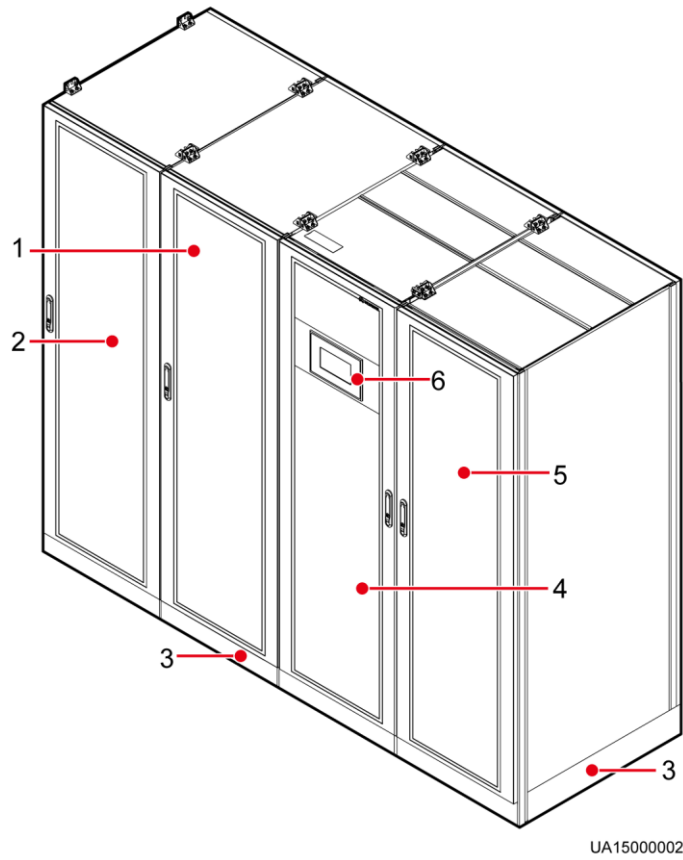
(2) Power cabinet 2

(3) Anchor baffle plates

(4) Bypass cabinet

(5) Monitor display unit (MDU)

Figure 2-9 800 kVA UPS

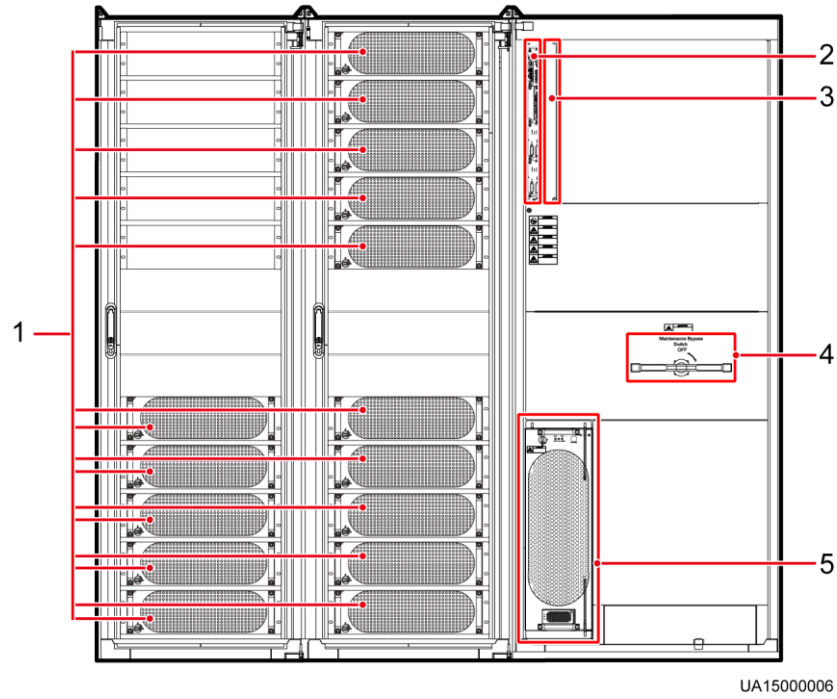


- | | | |
|----------------------|----------------------|--------------------------------|
| (1) Power cabinet 1 | (2) Power cabinet 2 | (3) Anchor baffle plates |
| (4) Bypass cabinet 1 | (5) Bypass cabinet 2 | (6) Monitor display unit (MDU) |

2.3.2 Product Structure

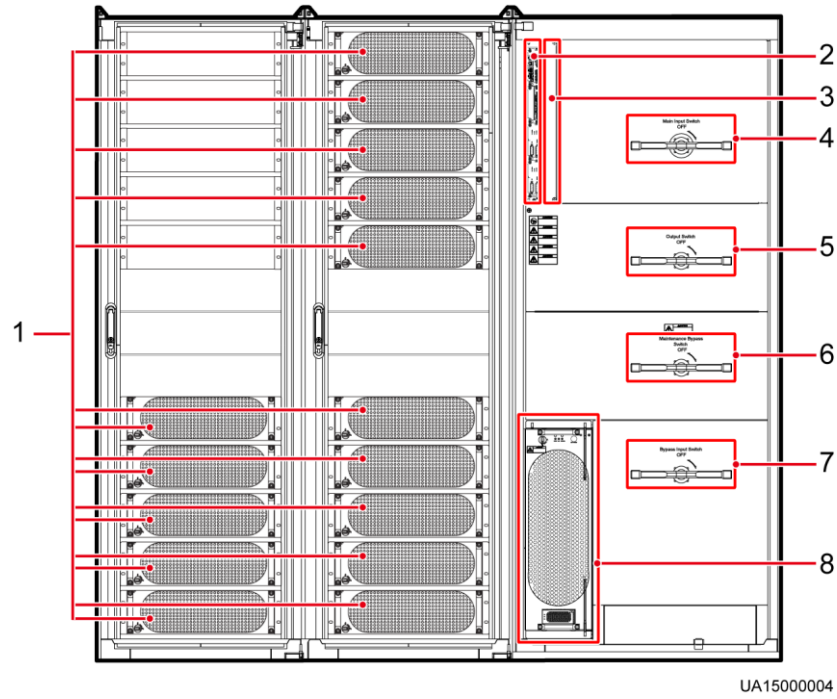
Figure 2-10, Figure 2-11, Figure 2-12 and Figure 2-13 show the product structures. Figures are UPSs with the front doors open.

Figure 2-10 Product structure (UPS5000-E-600 kVA in standard configuration)



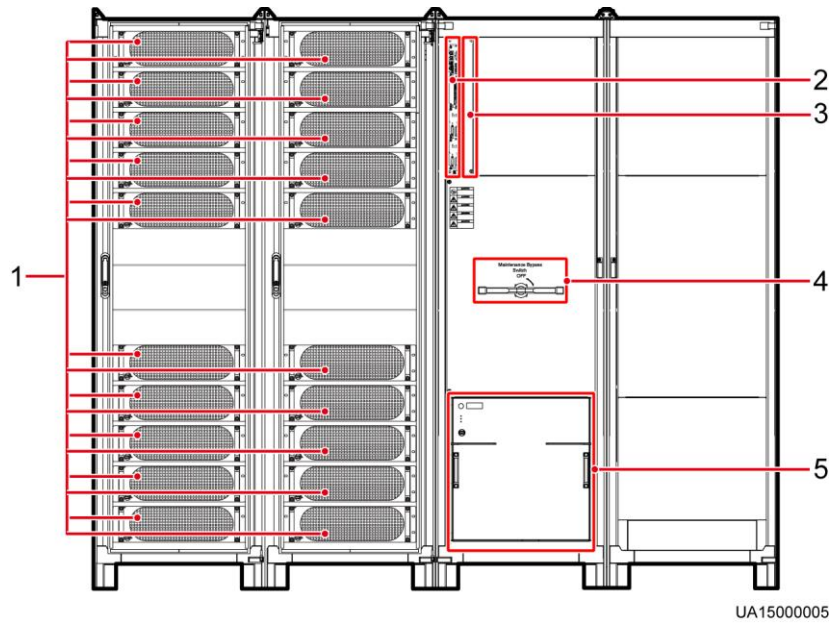
- | | | |
|-------------------------------|--------------------|--|
| (1) Power modules | (2) Control module | (3) Optional card slot (behind the filler panel) |
| (4) Maintenance bypass switch | (5) Bypass module | |

Figure 2-11 Product structure (UPS5000-E-600 kVA in full configuration)



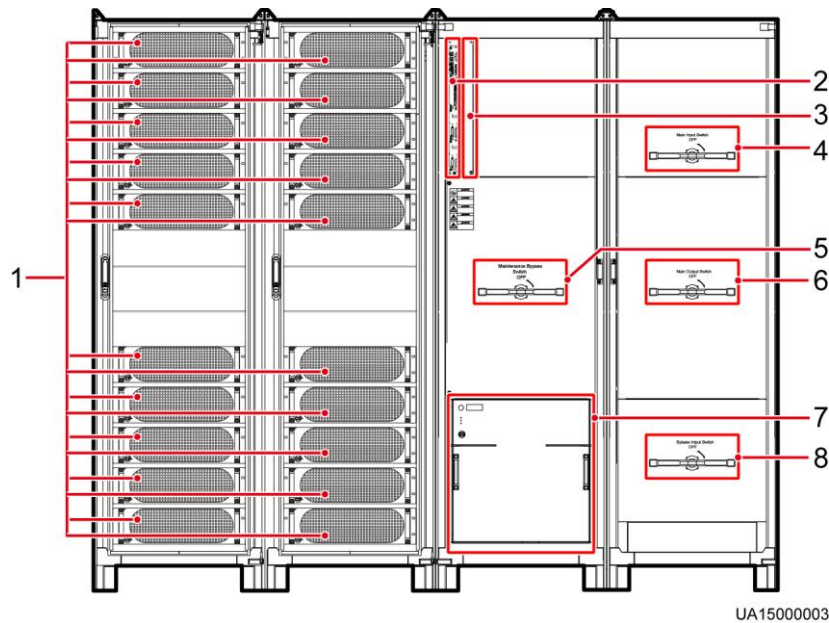
- | | | |
|-------------------------|--------------------|--|
| (1) Power modules | (2) Control module | (3) Optional card slot (behind the filler panel) |
| (4) Mains input switch | (5) Output switch | (6) Maintenance bypass switch |
| (7) Bypass input switch | (8) Bypass module | |

Figure 2-12 Product structure (UPS5000-E-800 kVA in standard configuration)



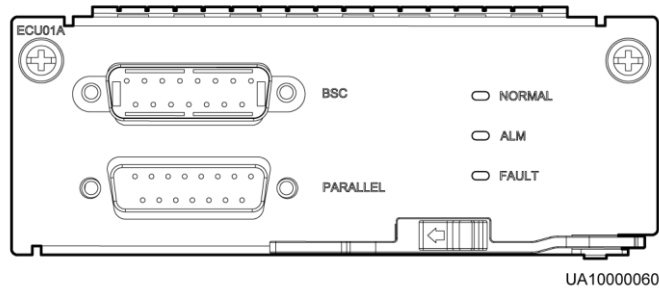
- | | | |
|-------------------------------|--------------------|--|
| (1) Power modules | (2) Control module | (3) Optional card slot (behind the filler panel) |
| (4) Maintenance bypass switch | (5) Bypass module | |

Figure 2-13 Product structure (UPS5000-E-800 kVA in full configuration)



- | | | |
|-------------------|------------------------|--|
| (1) Power modules | (2) Control module | (3) Optional card slot (behind the filler panel) |
| (4) Mains input | (5) Maintenance bypass | (6) Output switch |

Figure 2-15 ECM



In a parallel system, the PARALLEL ports on ECMs are interconnected using parallel cables. For a single UPS, the parallel cable is not needed. A hot swappable BSC is used in a dual-bus system to process the communication information of two UPS systems. [Table 2-1](#) describes the functions of the ECM.

Table 2-1 Ports on the ECM

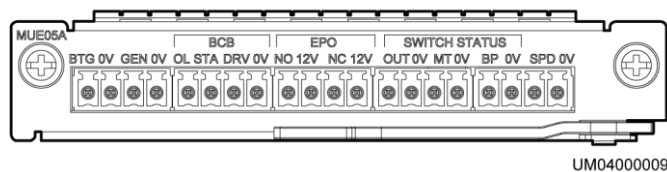
Silk Screen	Description
PARALLEL	This port transmits parallel signals. To connect UPSs in parallel, use a parallel cable to connect the parallel ports on the ECMs of the UPSs. <i>N</i> UPSs require <i>N</i> parallel cables so that at least two parallel cables are connected to each UPS, which improves reliability.
BSC	The BSC port is used in a dual-bus system to synchronize output frequencies and phases between UPS systems, ensuring that two buses can switch with each other.

2.4.3 Dry Contact Card

The dry contact card allows the UPS to monitor and manage the battery system (including the external battery switch), provide alarm signals for external devices, and implement remote emergency power-off (EPO).

[Figure 2-16](#) shows control signal ports on the dry contact card.

Figure 2-16 Dry contact card



[Table 2-2](#) describes the ports on the dry contact card.

Table 2-2 Ports on the dry contact card

Silk Screen	Description	Status	Initial Status
BTG	Port for detecting battery grounding faults	<ul style="list-style-type: none"> Connected: battery grounding fault Disconnected: no battery grounding fault 	Disconnected
0V	Port for secondary side ground		
GEN	Port for detecting diesel generator (D.G.) mode	<ul style="list-style-type: none"> Connected: D.G. mode Disconnected: non-D.G. mode 	Disconnected
0V	Port for secondary side ground		
BCB_OL	Port for detecting the BCB box	<ul style="list-style-type: none"> Grounded: BCB box connected Disconnected: BCB box not connected 	Grounded
BCB_STA	Port for monitoring the battery switch	<ul style="list-style-type: none"> Connected: battery switch ON Disconnected: battery switch OFF 	Disconnected
BCB_DRV	Port for controlling the trip of the battery switch in the BCB box	<ul style="list-style-type: none"> 0 V: battery switch not tripped 12 V: battery switch tripped 	0 V
BCB_0V	Port for secondary side ground		
EPO_NO	Emergency power-off (EPO) port	If the normally open (NO) port is connected to the EPO_12V port, EPO is triggered.	Disconnected
EPO_12V	+12 V		
EPO_NC	EPO port	If the normally closed (NC) port is disconnected from the EPO_12V port, EPO is triggered.	Connected
EPO_12V	+12 V		
SWITCH STATUS_OUT	Port for monitoring the UPS output circuit breaker	<ul style="list-style-type: none"> Connected: circuit breaker ON Disconnected: circuit breaker OFF 	Connected
SWITCH STATUS_0V	Port for secondary side ground		
SWITCH STATUS_MT	Port for monitoring the maintenance circuit breaker	<ul style="list-style-type: none"> Disconnected: circuit breaker ON Connected: circuit breaker OFF 	Disconnected
SWITCH STATUS_0V	Port for secondary side ground		

Silk Screen	Description	Status	Initial Status
SWITCH STATUS_BP	Port for monitoring the bypass input circuit breaker	<ul style="list-style-type: none"> • Connected: circuit breaker ON • Disconnected: circuit breaker OFF 	Connected
SWITCH STATUS_0V	Port for secondary side ground		
SPD	Port for monitoring the input AC surge protective device (SPD)	<ul style="list-style-type: none"> • Connected: SPD enabled • Disconnected: SPD disabled 	Connected
0V	Port for secondary side ground		



NOTE

- NO is short for normally open, and NC is short for normally closed.
- Set the EPO port to NO or NC as required.

2.4.4 (Optional) Backfeed Protection Card

Energy backfeed may be dangerous for the UPS, loads, and maintenance personnel. When backfeed occurs, the backfeed protection card triggers alarm signals or quickly disconnects the backfeed loop. The backfeed protection card uses relay contact signals. The signal ports support any power signals with a voltage of no more than 240 V AC and a current of less than 4 A. For details, see the *UPS Backfeed Protection Card User Manual*.

2.4.5 (Optional) Dry Contact Extended Card

The dry contact extended card provides five signal output ports and five signal input ports. For details, see the *UPS Dry Contact Extended Card User Manual*.

2.4.6 Monitoring Interface Card

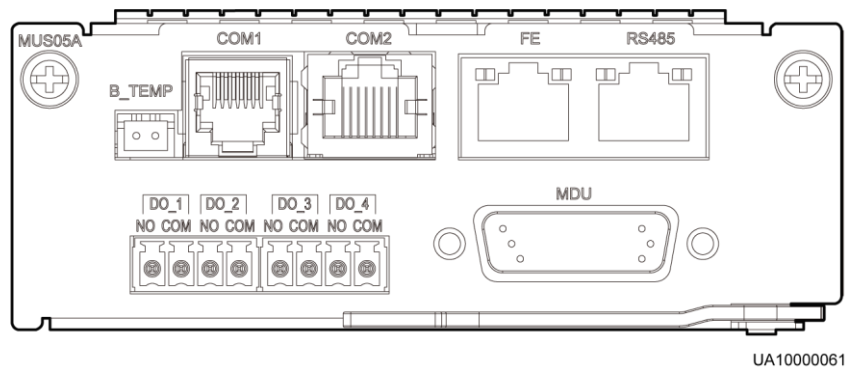
The monitoring interface card provides external ports as well as monitoring and control functions for the MDU. The ports include the ambient temperature and humidity sensor port, battery monitoring unit (BMU) port, FE port, battery temperature monitoring port, and network management port. The MDU monitors the UPS, allows users to set parameters, delivers commands, reports information, and displays the UPS key information and parameters on the LCD.

 **NOTICE**

- The FE port resembles the RS485 port. Therefore, follow the silk screen when you connect communications cables. If you mistake the RS485 port as the FE port during cable connection, the WebUI cannot be connected and MDU communication fails. If you mistake the FE port as the RS485 port during cable connection, RS485 communication fails.
- If MDU communication fails, the "Comm. failure" message is displayed on the LCD, screen switching is disabled, the buzzer buzzes, and the fault indicator is red. After you rectify the fault, the LCD recovers, and the alarm is cleared.
- Dry contact signals take effect after you set them. Set unused dry contact signals to the unused state on the LCD.
- In a parallel system, ensure that used dry contacts properly connect to each UPS.

Figure 2-17 shows the signal ports on the monitoring interface card.

Figure 2-17 Monitoring interface card



UA10000061

Table 2-3 describes the ports on the monitoring interface card.

Table 2-3 Ports on the monitoring interface card

Port	Silk Screen	Description
DO_1	NO	DO indicates critical alarms, minor alarms, bypass mode, battery mode, low battery voltage, or D.G. control. DO_1 indicates any of the six meanings (except for D.G. control); by default, it indicates critical alarms. The maximum voltage is 14.4 V DC, and the maximum current is 0.5 A.
	COM	
DO_2	NO	DO indicates critical alarms, minor alarms, bypass mode, battery mode, low battery voltage, or D.G. control. DO_2 indicates any of the six meanings (except for D.G. control); by default, it indicates minor alarms. The maximum voltage is 14.4 V DC, and the maximum current is 0.5 A.
	COM	

Port	Silk Screen	Description
DO_3	NO	DO indicates critical alarms, minor alarms, bypass mode, battery mode, low battery voltage, or D.G. control. DO_3 indicates any of the six meanings (except for D.G. control); by default, it indicates bypass mode. The maximum voltage is 14.4 V DC, and the maximum current is 0.5 A.
	COM	
DO_4	NO	DO indicates critical alarms, minor alarms, bypass mode, battery mode, low battery voltage, or D.G. control. DO_4 indicates any of the six meanings (except for D.G. control); by default, it indicates battery mode. The maximum voltage is 14.4 V DC, and the maximum current is 0.5 A. When the UPS works in intelligent power mode, DO_4 indicates D.G. control, which cannot be changed.
	COM	
DB26	MDU	Provides FE, RS485, I2C, and CAN signals.
Battery temperature sensor port	B_TEMP	Connects to an indoor battery temperature sensor.
Southbound communications port 1	COM1	Connects to an ambient temperature and humidity sensor over two wires.
Southbound communications port 2	COM2	Connects to a southbound device, such as a BMU.
Network port	FE	Connects to the network port on a PC.
Northbound communications port	RS485	Connects to a northbound network management device or a third-party network management device over two wires.

 **NOTE**

- Signal cables must be double-insulated twisted cables. If the cable length is 25–50 m, the cross-sectional area must be 0.5–1.5 mm².
- RS485 cables and FE cables must be shielded cables.

2.5 Typical Configurations

Table 2-4 describes typical UPS configurations.

Table 2-4 Typical configurations

Configuration	Application Scenario
Single UPS	A single UPS5000-E is applicable to scenarios with light loads. Its

Configuration	Application Scenario
	power will be redundant when loads are light as it adopts modular design.
N+X parallel system, where N is the number of requisite UPSs connected in parallel, and X is the number of redundant UPSs	An N+X parallel system supplies power to important loads in small- and medium-sized equipment rooms. It features high reliability and powerful transient overload capacity. $1 \leq N+X \leq 4$ ($1 \leq N \leq 4$, $0 \leq X \leq 3$) For example, in a 3+1 parallel system, three UPSs are requisite and one UPS is redundant.
Dual-bus system	The dual-bus system is suitable for scenarios where high availability requirements are posed for power supply. The dual-bus system supplies power to important loads in large- and medium-sized equipment rooms and data centers. In addition to advantages of common parallel systems, the dual-bus system also provides outstanding availability and eliminates bottleneck failures, but the configuration of the dual-bus system is complex.

 **NOTE**

A 1+1 parallel system is a typical configuration. You can set the number of requisite UPSs and redundant ones on the LCD and WebUI.

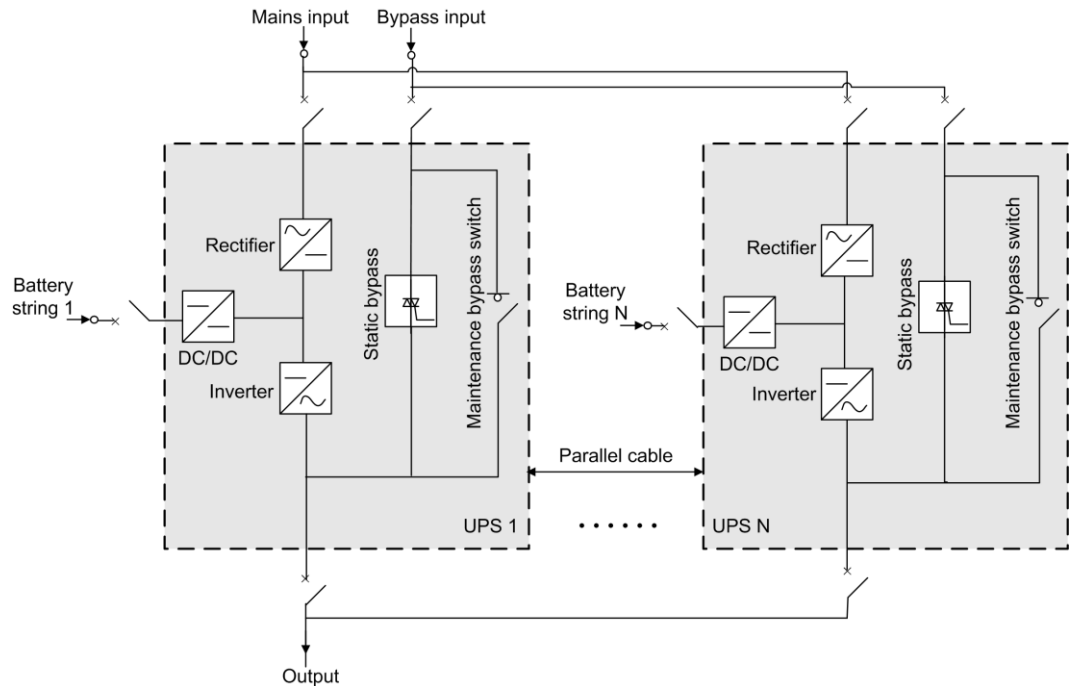
2.5.1 Single UPS

The UPS5000-E uses a modular design. It uses multiple power modules connected in parallel to deliver a high loading capacity. If a single power module is faulty, the other power modules continue working. When the load power is small, the UPS provides redundant capacity, which ensures high reliability. [Figure 2-2](#) shows the conceptual diagram of a single UPS.

2.5.2 N+X Parallel System

In an N+X parallel system, mains input, bypass input, and AC output terminals between cabinets are connected in parallel. Energy control modules (ECMs) on each UPS are connected over parallel cables. The parallel connections synchronize the UPS outputs to supply power to loads. If one UPS fails, the other UPSs continue supplying power to loads. [Figure 2-18](#) shows the conceptual diagram of an N+X parallel system.

Figure 2-18 Conceptual diagram of an N+X parallel system



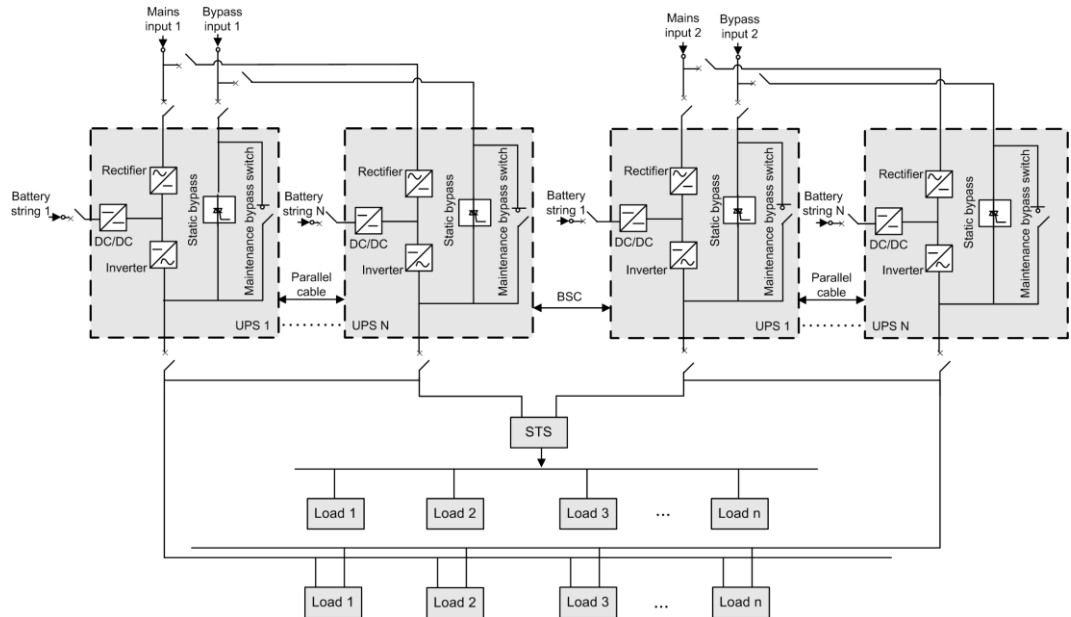
NOTE

Conceptual diagrams in section Typical Configurations are used as examples when no battery string is shared.

2.5.3 Dual-Bus System

A dual-bus system consists of two independent UPS systems. Each of these UPS systems in turn consists of one or more UPSs connected in parallel. The dual-bus system is highly reliable and is suitable for loads with multiple input terminals. You can install a static transfer switch (STS) to start the bus synchronization controller (BSC), while the STS is optional, and the BSC is a standard configuration. Of the two UPS systems, one is a master system, and the other is a slave system. The UPS systems work in normal mode or bypass mode. [Figure 2-19](#) shows the conceptual diagram of a dual-bus system.

Figure 2-19 Conceptual diagram of a dual-bus system



2.6 Optional Components

Component	Model	Function
Battery circuit breaker (BCB) box	600 kVA <ul style="list-style-type: none"> PDU8000-0400DC V8-BXA001 PDU8000-0630DC V8-BXA001 PDU8000-0800DC V8-BXA001 	Controls the connection between battery strings and the UPS, and supports overload, short-circuit protection, and remote trip control.
	800 kVA <ul style="list-style-type: none"> PDU8000-0630DC V8-BXA001 PDU8000-0800DC V8-BXA001 	
Battery bus bar (BBB) box	600 kVA <ul style="list-style-type: none"> PDU8000-1250DC V8-BGA001 PDU8000-2000DC V8-BGA001 	Converges the energy of multiple battery strings.
	800 kVA <ul style="list-style-type: none"> PDU8000-2000DCV8-BGA001 	
Antiseismic kit	N/A	Reinforces the cabinet so that the cabinet meets the requirements of 9 degree seismic fortification intensity.
Air filter	N/A	Prevents the UPS from dust and

Component	Model	Function
		ensure normal operations.
IP21 component	N/A	Prevents water from dropping into the cabinet, protecting the cabinet to IP21.
ECM extended subrack	N/A	Install this subrack when the UPS is equipped with a backfeed protection card and dry contact extended card.
Dry contact extended card	N/A	Provides extended monitoring ports: five routes of relay output ports and five routes of input ports.
Backfeed protection card	N/A	Detects mains and bypass backfeed and provides protection.
Battery monitor unit (BMU)	N/A	Monitors battery voltages and temperatures and battery string charge/discharge currents, and communicates with the UPS over Modbus.
Battery grounding failure detector	N/A	Detects current leakage and generates alarms. When equipped with a remote trip switch, the detector protects devices and prevents fire disasters. Detects battery grounding failures and sends alarm signals when the ground leakage current exceeds the specified value.
Ambient temperature and humidity sensor	N/A	Collects ambient temperatures and humidity.
Parallel cable	10 m or 15 m	Connects UPSs in parallel.
BSC cable	15 m or 60 m	Transmits bus synchronization signals in a dual-bus system.

 **NOTE**

- If an IP21 component is installed, cables cannot be routed from the top of the cabinet.
- The ECM extended subrack does not support onsite installation. If you require this optional component, inform Huawei when you purchase the UPS. Huawei installs it before delivery.

3 Installation

3.1 Installation Preparations

3.1.1 Site

3.1.1.1 UPS Weight and Size

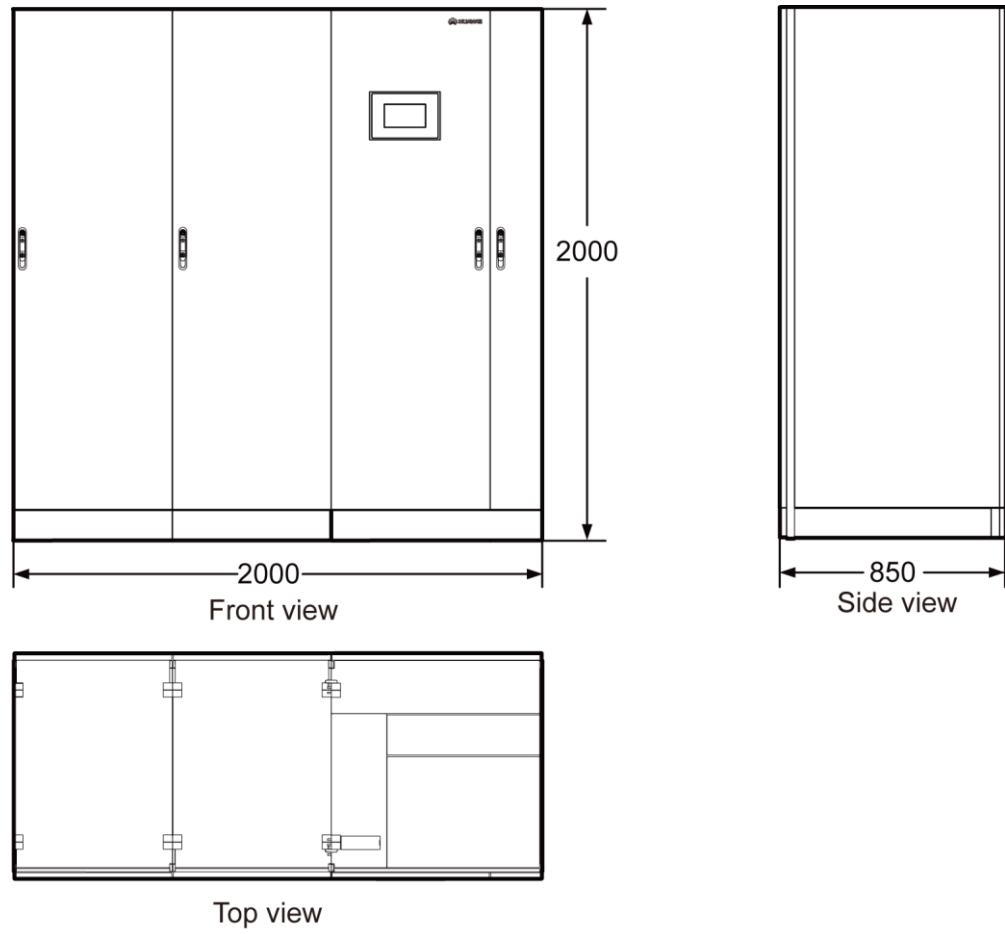
Ensure that the ground or installation support can bear the weight of the UPS, batteries, and battery racks. The weight of batteries and battery racks depends on site requirements. [Table 3-1](#) lists UPS weight.

Table 3-1 UPS weight

Model	Capacity	Weight
UPS5000-E	600 kVA	1350 kg
	800 kVA	1670 kg

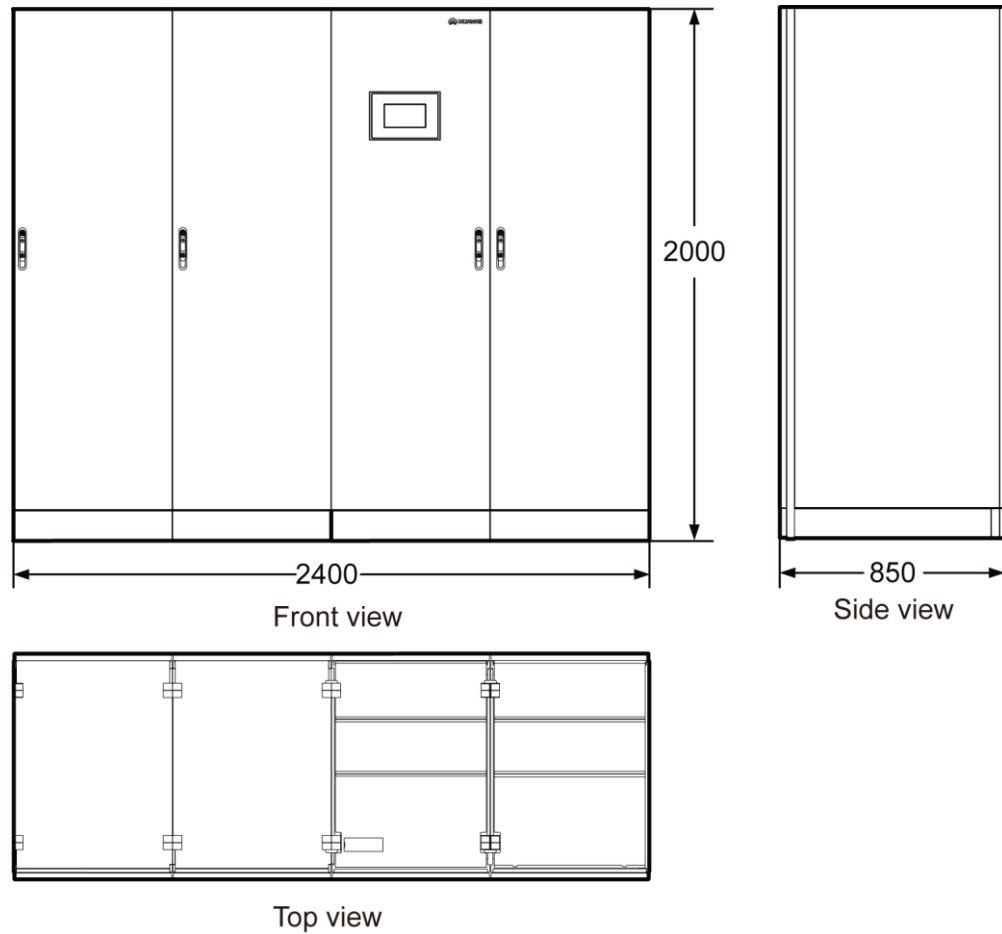
[Figure 3-1](#) and [Figure 3-2](#) show the installation dimensions.

Figure 3-1 600 kVA UPS installation dimensions (unit: mm)



UA150E0011

Figure 3-2 800 kVA UPS installation dimensions (unit: mm)



UA150E0010

3.1.1.2 Installation Environment

- Do not install the UPS in high temperature, low temperature, or damp areas. For details about environmental specifications, see chapter 8 [Technical Specifications](#).
- Install the UPS far away from water sources, heat sources, and flammable or explosive materials. Keep the UPS away from direct sunlight, dust, volatile gases, corrosive materials, and salty air.
- Do not install the UPS in environments with conductive metal scraps in the air.
- The optimal operating temperatures for valve regulated lead acid (VRLA) batteries are 20–30 °C. Operating temperatures higher than 30 °C shorten the battery lifespan, and operating temperatures lower than 20 °C reduce the battery backup time.

3.1.1.3 Installation Clearances

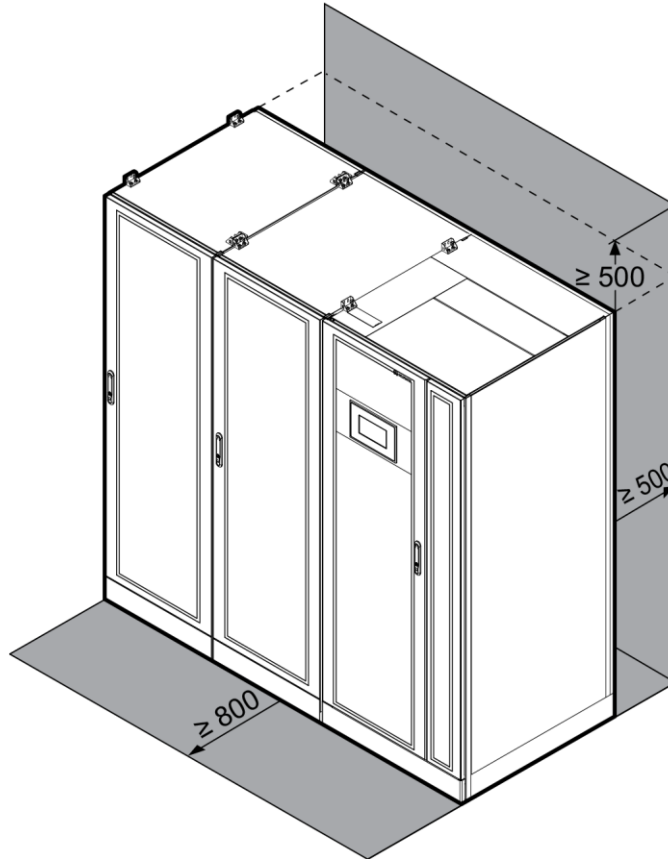
Reserve sufficient clearances around the cabinet to facilitate operations and ventilation:

- Reserve a clearance of at least 800 mm from the front of the cabinet.
- Reserve a clearance of at least 500 mm from the top of the cabinet.

- Reserve a clearance of at least 500 mm at the rear of the cabinet. If you need to perform operations at the rear, keep a clearance of at least 800 mm.

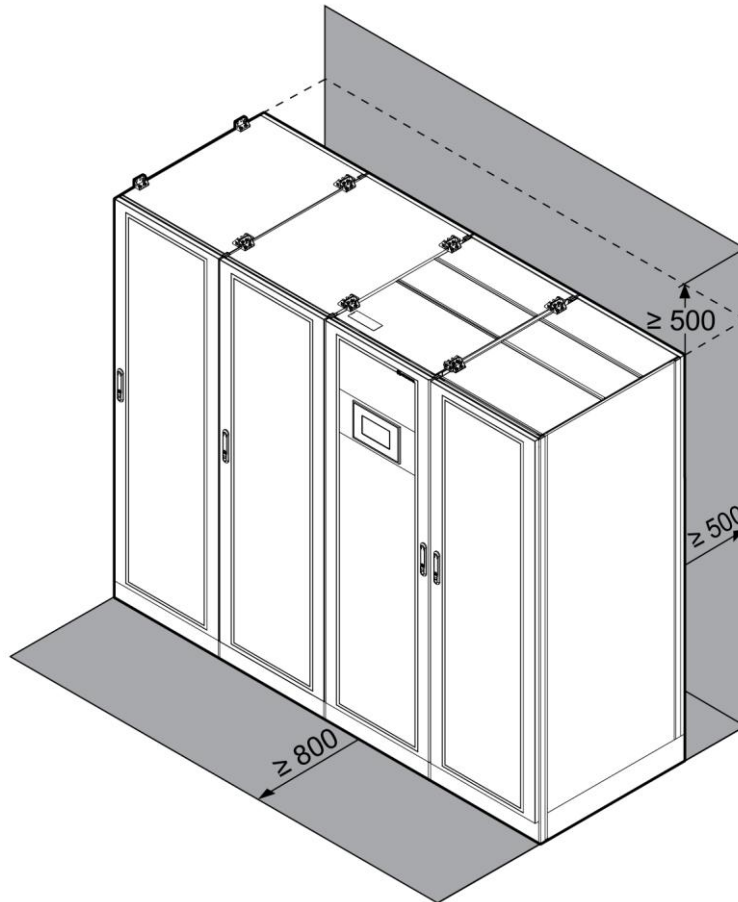
Figure 3-3 and Figure 3-4 show installation clearances.

Figure 3-3 600 kVA UPS installation clearances (unit: mm)



UA15000015

Figure 3-4 800 kVA UPS installation clearances (unit: mm)



UA15000014

3.1.2 Tools


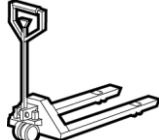

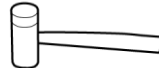


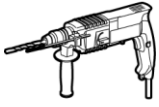
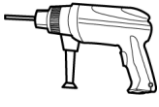
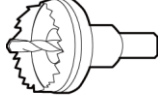

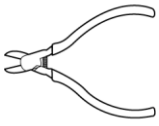
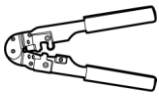
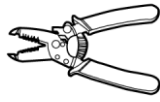
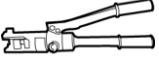
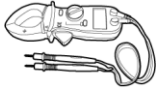




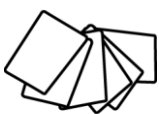
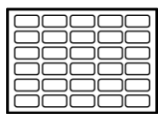

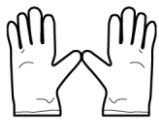



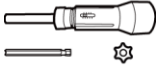



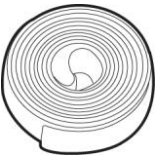
NOTICE




Insulate installation tools to prevent electric shocks.

You need to prepare the tools and meters required for installation.

Table 3-2 Tools and meters

Tools and Meters			
Pallet truck 	Manual pallet truck 	Ladder 	Rubber mallet 

Tools and Meters			
<p>Hammer drill and drill bit $\Phi 16$</p> 	<p>Hand-held electric drill</p> 	<p>Alloy hole saw</p> 	<p>Heat gun</p> 
<p>Diagonal pliers</p> 	<p>Crimping tools</p> 	<p>Wire stripper</p> 	<p>Hydraulic pliers</p> 
<p>Clamp meter</p> 	<p>Multimeter</p> 	<p>Cable tie</p> 	<p>Level</p> 
<p>Polyvinyl chloride (PVC) insulation tape</p> 	<p>Cotton cloth</p> 	<p>Label</p> 	<p>Electrician's knife</p> 
<p>Electrostatic discharge (ESD) gloves</p> 	<p>Protective gloves</p> 	<p>Insulated gloves</p> 	<p>Insulation protective shoes</p> 
<p>Torque screwdriver</p> 	<p>Insulated adjustable wrench</p> 	<p>Inner hexagon spanner</p> 	<p>Brush</p> 
<p>Flat-head screwdriver (2-5 mm)</p>	<p>Phillips screwdriver (M3/M4/M5/M6/M8)</p>	<p>Insulated torque wrench (M6/M8/M12/M16)</p>	<p>Heat shrink tubing</p> 

Tools and Meters			
			



NOTE

Table 3-2 lists only the common tools for installation and cable connection. For more dedicated tools required, see the corresponding component manuals. Prepare tools based on site requirements.

3.1.3 Power Cables



NOTICE

- The UPS can generate large leakage currents. A circuit breaker that provides leakage current protection is not recommended.
- If multiple UPSs are to be connected in parallel, input and output power cables for each UPS should have the same length and specifications.

Table 3-3 lists the recommended cross-sectional areas for power cables.

Table 3-3 Recommended cross-sectional areas for power cables

Item			600 kVA	800 kVA
Mains input connector	Mains input current (A)		1055	1407
	Recommended cross-sectional area (mm ²)	L1	2 x (4 x 240)	3 x (4 x 240)
		L2		
		L3		
		N		
Bypass input connector	Bypass input current (A)		912	1216
	Recommended cross-sectional area (mm ²)	L1	2 x (4 x 240)	3 x (4 x 185)
		L2		
		L3		
		N		
Output connector	Output current (A)		912	1216
	Recommended cross-sectional area (mm ²)	U	2 x (4 x 240)	3 x (4 x 185)
		V		
		W		

Item			600 kVA	800 kVA
		N (If the voltage is non-linear, increase the cross-sectional area of the neutral wire.)		
Battery input connector	Nominal discharge current (480 V current; forty 12 V batteries) (A)		1302	1736
	Maximum discharge current (end of discharge current of forty 12 V batteries, namely, 1.67 V/cell discharge current of 192 2 V cells) (A)		1559	2079
	Recommended cross-sectional area (mm ²)	+ N -	3 x (3 x 240)	4 x (3 x 240)
Ground cable	Recommended cross-sectional area (mm ²)	PE	240	240



NOTE

When selecting, connecting, and routing power cables, follow local safety regulations and rules.

If external conditions such as cable layout or ambient temperatures change, perform verification in accordance with the IEC-60364-5-52 or local regulations.

The currents listed in [Table 3-3](#) are measured at a rated voltage of 380 V. If the rated voltage is 400 V, multiply the currents by 0.95. If the rated voltage is 415 V, multiply the currents by 0.92.

If primary loads are non-linear loads, increase the cross-sectional areas of neutral wires 1.5–1.7 times.

When the mains input and bypass input share a power source, configure both types of input power cables as mains input power cables. The cables listed in [Table 3-3](#) are used only when the following requirements are met:

- Routing mode: Routing the cables over the cable ladder or bracket in a single layer (IEC60364-5-52 middle F).
- The ambient temperature is 30 °C.
- The AC voltage loss is less than 3%, and the DC voltage loss is less than 1%.
- 90 °C copper flexible cable.
- The length of the AC power cables of a 600 kVA or 800 kVA UPS is no longer than 30 m and DC power cables no longer than 50 m.



NOTICE

When you connect power cables, comply with the tightening torque listed in [Table 3-4](#) to ensure secure connections and prevent safety risks.

Table 3-4 Power cable connector requirements

Connector	Connection Mode	Bolt Type	Bolt Hole Diameter	Torque
Mains input connector	Crimped DT terminals	M16	18 mm	120 N m
Bypass input connector	Crimped DT terminals	M16	18 mm	120 N m
Battery input connector	Crimped DT terminals	M16	18 mm	120 N m
Output connector	Crimped DT terminals	M16	18 mm	120 N m
Grounding connector	Crimped DT terminals	M12	-	47 N m

Table 3-5 Upstream input circuit breaker configurations

Upstream Input Circuit Breaker	600 kVA	800 kVA
Upstream mains input switch	1250 A/3P	1600 A/3P
Upstream bypass input switch	1000 A/3P	1250 A/3P

Table 3-6 Recommended input front-end and output back-end circuit breakers

UPS Capacity	Component	Specifications	Manufacturer
600 kVA	Mains input circuit breaker	E1N1250 R1250 PR121/P-LIS 3P	ABB (recommended when the short-circuit current of the circuit breaker is located is less than 50 kA.)
	Bypass input circuit breaker	E1N1000 R1000 PR121/P-LIS 3P	
	Output branch circuit breaker	E1N1000 R1000 PR121/P-LIS 3P	
800 kVA	Mains input circuit breaker	E1N1600 R1600 PR121/P-LIS 3P	
	Bypass input circuit breaker	E1N1250 R1250 PR121/P-LIS 3P	
	Output branch	E1N1250 R1250	

UPS Capacity	Component	Specifications	Manufacturer
	circuit breaker	PR121/P-LIS 3P	



NOTE

- The input upstream circuit breakers recommended in [Table 3-5](#) are for reference only.
- If multiple loads are connected, specifications for branch circuit breakers must not exceed the recommended specifications.
- The circuit breaker selection principle is to protect loads and cables, and the cascading principle is to realize specific protection.

3.1.4 Unpacking and Checking

Context



NOTICE

- Only trained personnel are allowed to move the UPS. Use a pallet truck to transport the UPS box secured to a wooden support to the installation position.
- To prevent the UPS from falling over, secure it to an electric pallet truck using ropes before moving it.
- To prevent shocks or falls, move the UPS gently. After placing the UPS in the installation position, unpack it and take care to prevent scratches. Keep the UPS steady during unpacking.
- If the UPS installation environment is in poor condition and the UPS will be stored for a long time after it is unpacked, wrap the UPS with the original plastic coat to prevent dust.



NOTE

The power cabinet and bypass cabinet are separately delivered. Therefore, perform the following operations for both the power cabinet and bypass cabinet.

Procedure

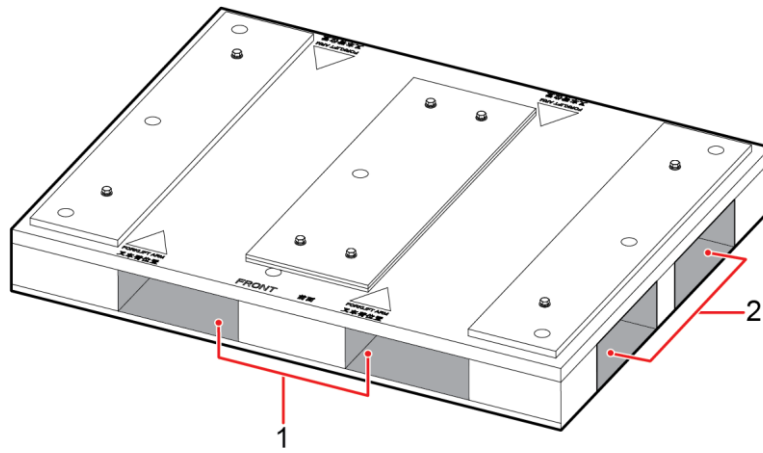
- Step 1** Visually inspect the UPS appearance for shipping damage. If any damage is found, report it to the carrier immediately.
- Step 2** Use a pallet truck to move the power cabinet and bypass cabinet near the installation position.



NOTICE

To prevent the UPS from falling over during transportation, the pallet is specially designed. If an electric pallet truck is used, insert the forks into the front of the pallet; if a manual pallet truck is used, insert the forks into the left or right side of the pallet, as shown in [Figure 3-5](#).

Figure 3-5 Pallet



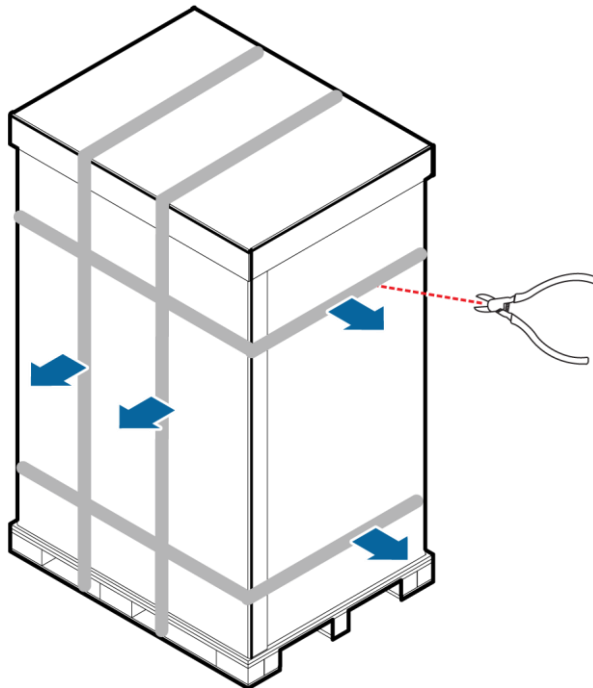
UA15000136

(1) Place for inserting the forks of an electric pallet truck

(2) Place for inserting the forks of a manual pallet truck

Step 3 Cut off and remove the binding tapes, as shown in [Figure 3-6](#).

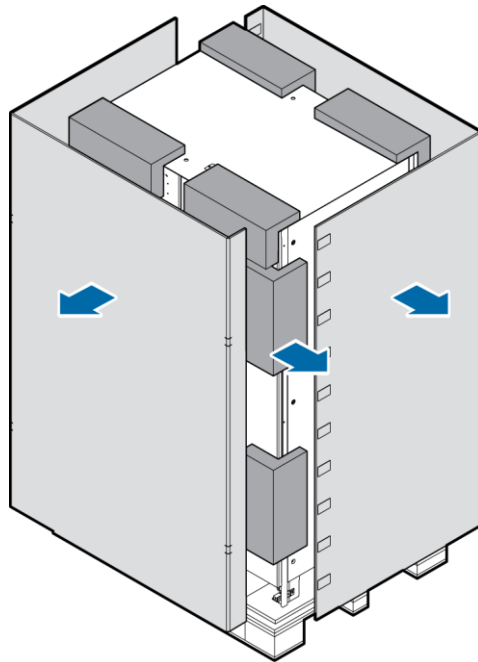
Figure 3-6 Removing binding tapes



UA13000015

Step 4 Remove the packing materials and foam, as shown in [Figure 3-7](#).

Figure 3-7 Removing the packing materials and foam



UA13000016

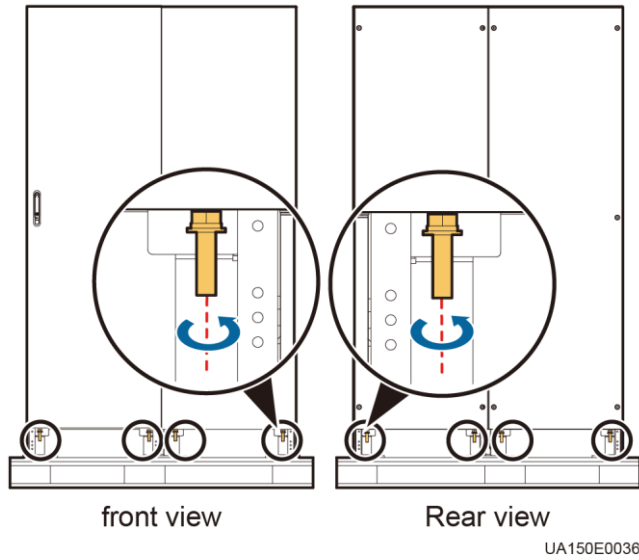
Step 5 Remove the plastic bag and take out the fitting box. Store them for future use.

Step 6 Check that the UPS is intact.

1. Visually inspect the UPS appearance for shipping damage. If it is damaged, notify the carrier immediately.
2. Check that the fittings comply with the packing list. [Table 3-7](#) and [Table 3-8](#) list the fittings. If some fittings are missing or do not comply with the packing list, record the information and contact your local Huawei office immediately.

Step 7 Remove the screws that secure the cabinet and pallet, as shown in [Figure 3-8](#) (using the power cabinet as an example).

Figure 3-8 Removing screws from the cabinet and pallet



----End

3.2 Single UPS Installation

Context

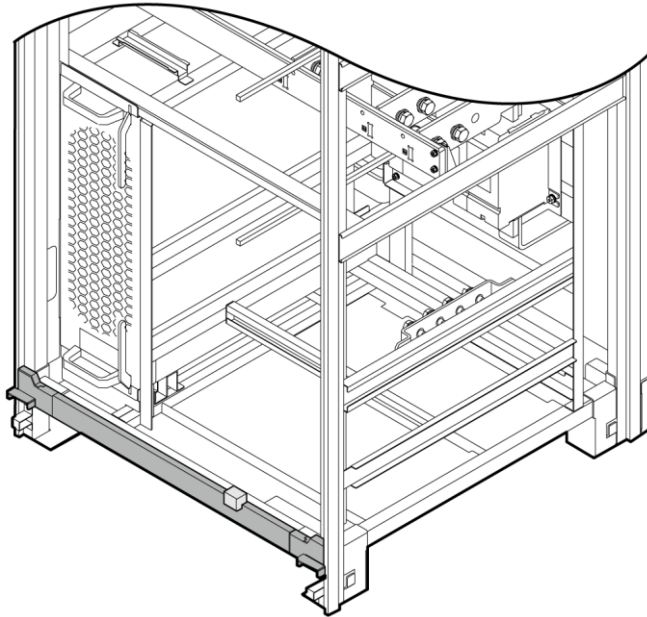
UPSs in standard configuration and full configuration have the same installation procedures and cable connection modes. This section uses UPSs in full configuration as an example.



NOTICE

When you install the UPS and connect cables, do not step on the front door baffle plate and the door support at the bottom of the cabinet to prevent paint flake-off and deformation, as shown in [Figure 3-9](#). Otherwise, the front door will not be properly closed.

Figure 3-9 Front door baffle plate



UA15000103

3.2.1 Installing the UPS

3.2.1.1 Installing the UPS on the Ground

Determining the UPS Installation Position



NOTICE

- Ensure that the installation ground is flat.
- The marking-off template is delivered with the UPS and is placed at the top of the UPS.

Step 1 Determine the cabinet installation position on the ground according to cabinet mounting holes (ground installation) on the marking-off template. [Figure 3-10](#) and [Figure 3-11](#) show the marking-off template. [Figure 3-12](#) and [Figure 3-13](#) show the hole dimensions.

Figure 3-10 600 kVA UPS marking-off template

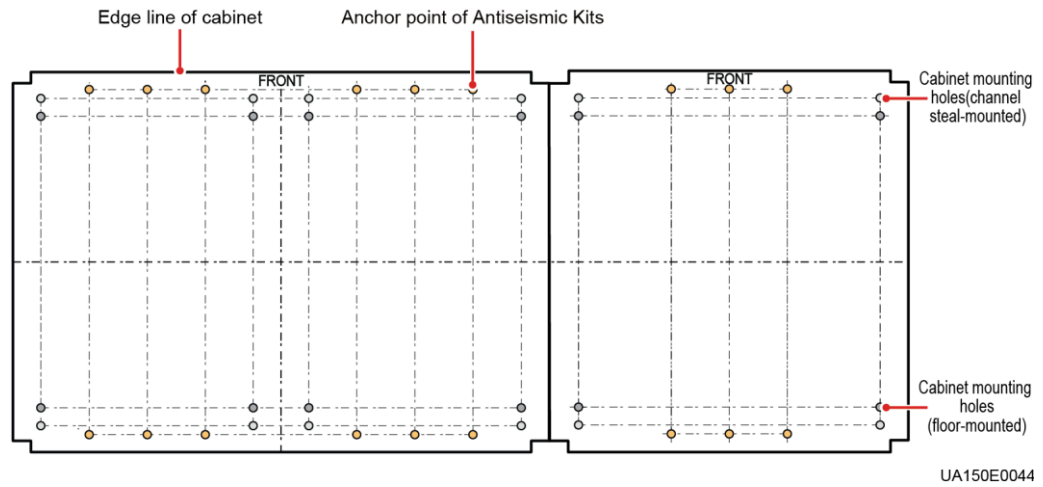


Figure 3-11 800 kVA UPS marking-off template

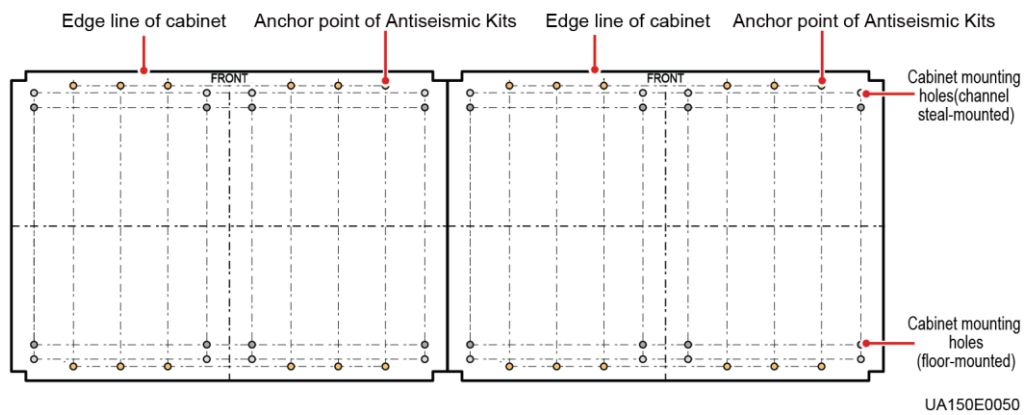


Figure 3-12 Mounting hole dimensions for the 600 kVA UPS (unit: mm)

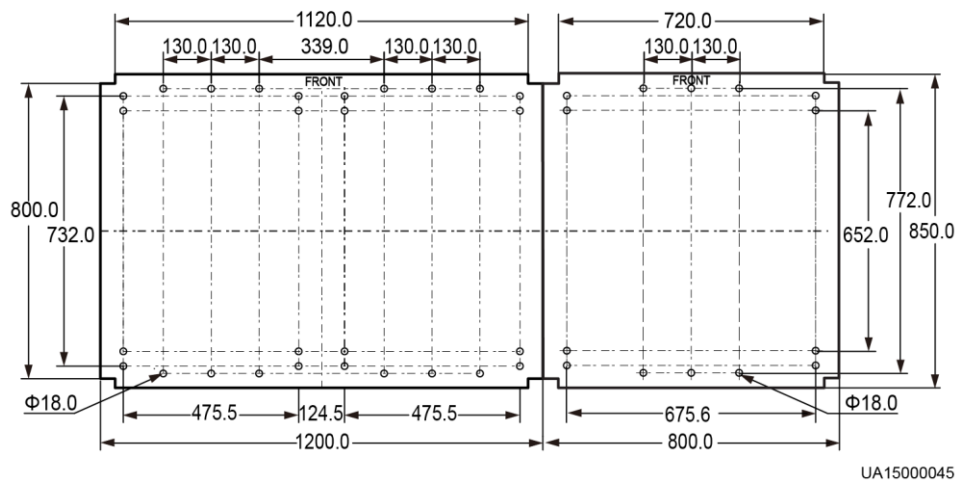
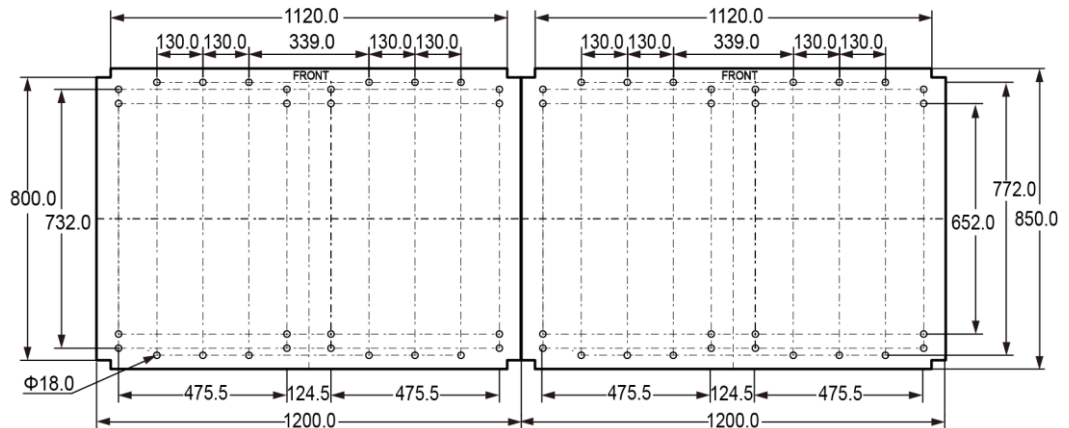


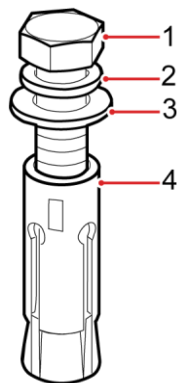
Figure 3-13 Mounting hole dimensions for the 800 kVA UPS (unit: mm)



UA15000051

Step 2 Use a hammer drill to drill holes for installing expansion bolts, and install expansion sleeves in the holes. [Figure 3-14](#) shows expansion bolt composition. [Figure 3-15](#) shows how to install an expansion bolt.

Figure 3-14 Expansion bolt composition



UA10000072

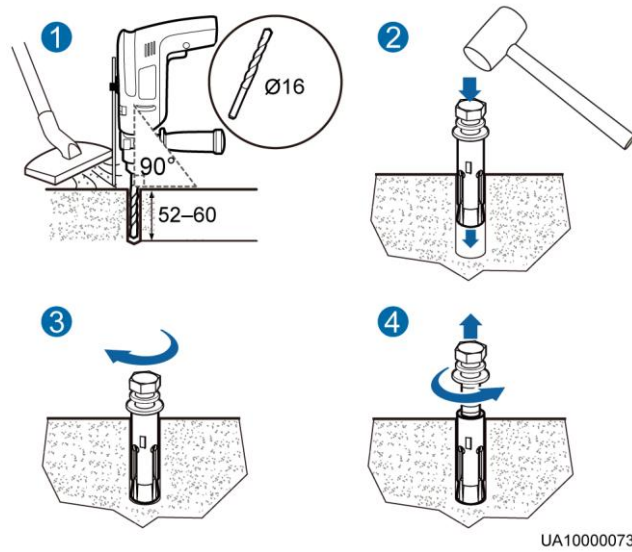
- (1) M12 bolt (2) Spring washer (3) Flat washer (4) Expansion sleeve



NOTICE

Knock the expansion bolt into the hole until the expansion sleeve completely fits into the hole. The expansion sleeve must be completely buried under the ground to facilitate subsequent installation.

Figure 3-15 Installing an expansion bolt (unit: mm)



1. Drill holes in the ground by using a hammer drill. The hole depth is 52 mm to 60 mm.
2. Partially tighten the expansion bolt and vertically insert it into the hole. Knock the expansion bolt using a rubber mallet until the expansion sleeve is fully inserted into the hole.
3. Partially tighten the expansion bolt.
4. Remove the bolt, spring washer, and flat washer.

----End

Combining the Power Cabinet and Bypass Cabinet

The power cabinet and bypass cabinet are separately delivered. Before installing the UPS, combine the power cabinet and bypass cabinet. Before combining the cabinets, check that fittings are complete. [Table 3-7](#) and [Table 3-8](#) list the fittings.

Table 3-7 600 kVA UPS fittings

Mounting Fittings	Number of Fittings	Screw Specifications	Number of Bolts (PCS)	Torque (N•m)	Remarks
Bottom connecting plate	2	M12x25	8	26	<ul style="list-style-type: none"> • The fittings are delivered with the UPS and are visible when you open the front door of the bypass cabinet. • The 10 soft connecting copper bars are numbered 48 to 54, 56, 58,
Top connecting plate	2	M6x20	8	3	
Soft connecting copper bar	10	M12x45	40	47	

Mounting Fittings	Number of Fittings	Screw Specifications	Number of Bolts (PCS)	Torque (N•m)	Remarks
Grommet strip	N/A	N/A	N/A	N/A	and 60. <ul style="list-style-type: none"> If you choose to route cables by drilling holes at the top of the cabinet, paste grommet strip to the hole edge to protect cables.
Middle connecting plate	2	M6x20	4	3	Installed on the cabinet before delivery.

Table 3-8 800 kVA UPS fittings

Mounting Fittings	Number of Fittings	Screw Specifications	Number of Bolts (PCS)	Torque (N•m)	Remarks
Bottom connecting plate	2	M12x25	8	26	<ul style="list-style-type: none"> The fittings are delivered with the UPS and are visible when you remove the packing material from the bypass cabinet. The two soft connecting copper bars are numbered 52. (Optional) Eight L-shaped connecting copper bars, seven of which are numbered 50 and one is numbered 51. If you choose to route cables by drilling holes at the top of the cabinet, paste grommet strip to the hole edge to protect cables.
Top connecting plate	2	M6x30	8	3	
Soft connecting copper bar	2	M12x45	10	47	
(Optional) L-shaped connecting copper bar	8	M12x45	16	47	
Grommet strip	N/A	N/A	N/A	N/A	

Mounting Fittings	Number of Fittings	Screw Specifications	Number of Bolts (PCS)	Torque (N•m)	Remarks
Middle connecting plate	2	M6x30	4	3	Installed on the cabinet before delivery.

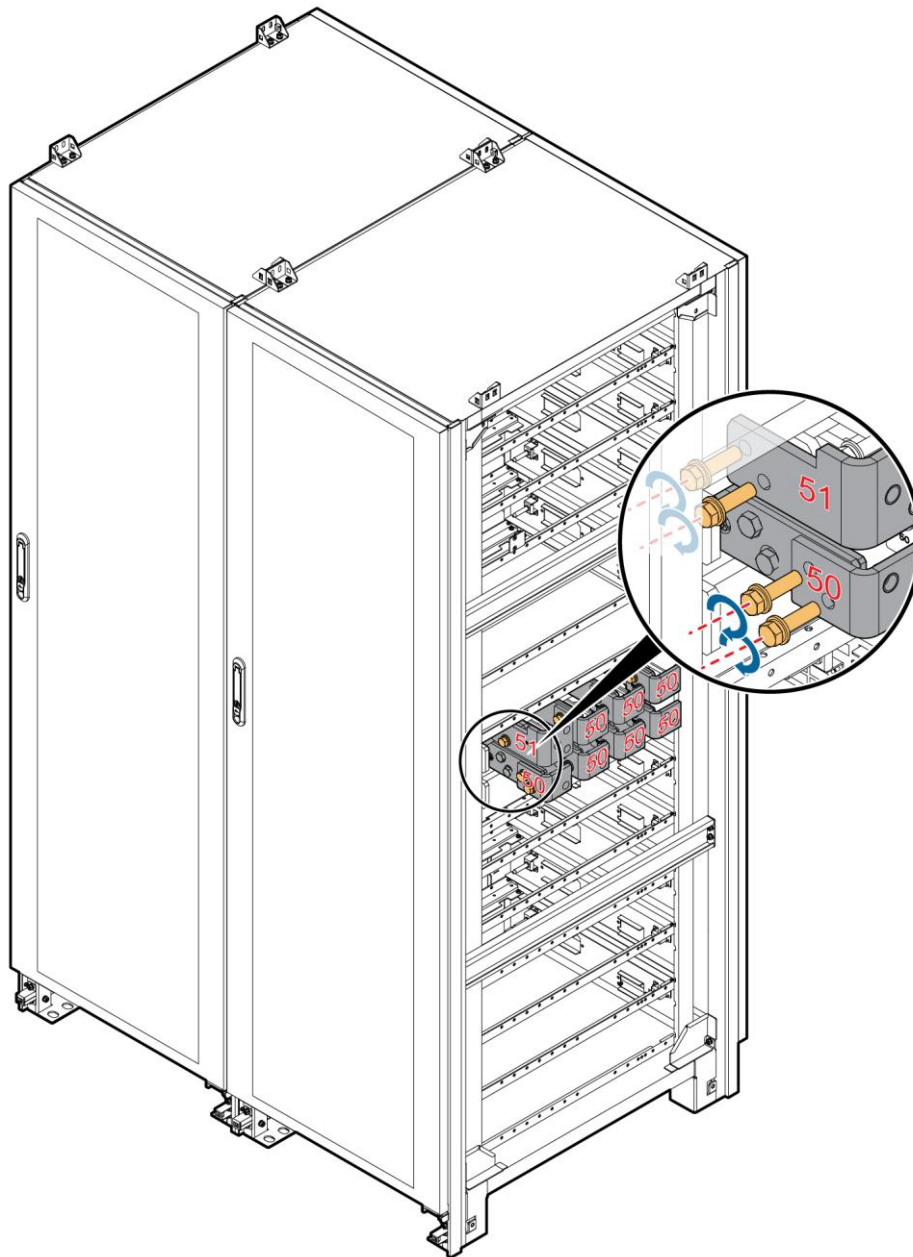
Step 1 (Optional) Obtain eight L-shaped connecting copper bars from the fittings package, and install them in the 800 kVA power cabinet from inside to outside, as shown in [Figure 3-16](#).



NOTE

If the eight L-shaped connecting copper bars have already been installed, skip this step.

Figure 3-16 Installing eight L-shaped connecting copper bars (800 kVA UPS)



UA15000125

Step 2 Use a pallet truck to move the cabinet to the cabinet to the expansion bolt holes on the ground. The power cabinet is on the left, and the bypass cabinet is on the right, as shown in [Figure 2-8](#) and [Figure 2-9](#).

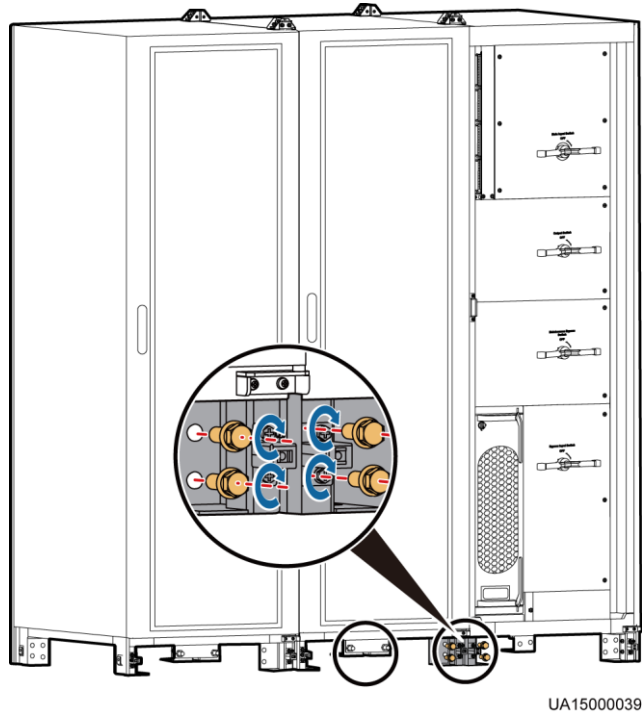


NOTE

When you align the power cabinet with the bypass cabinet, adjust the position of the bypass cabinet by using a pallet truck so that the front doors of the two cabinets are aligned with each other.

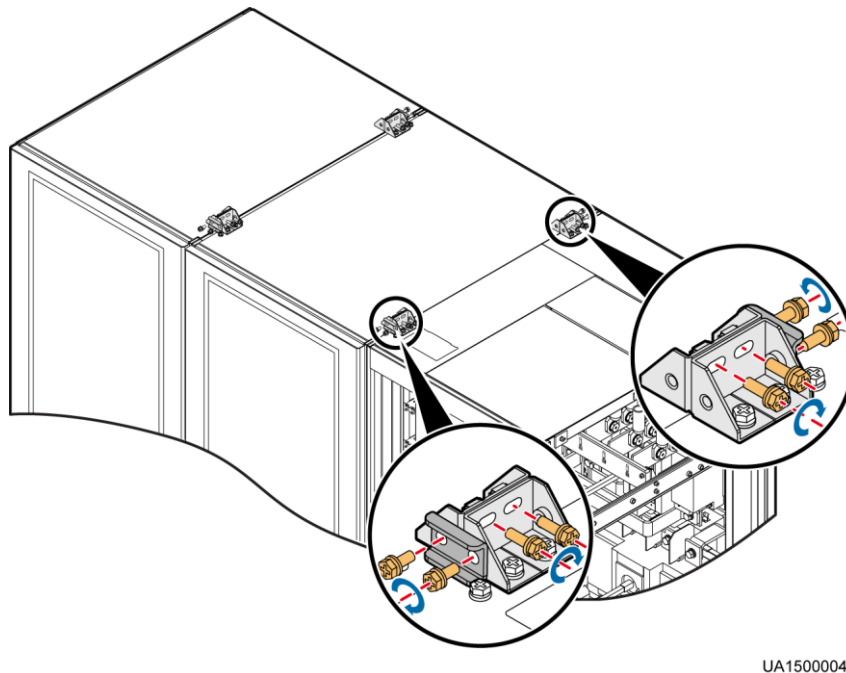
Step 3 Install the two bottom connecting plates on power cabinet 1 and its adjacent bypass cabinet. The method is the same for the 600 kVA UPS and 800 kVA UPS. [Figure 3-17](#) uses the 600 kVA UPS as an example.

Figure 3-17 Installing bottom connecting plates



Step 4 Install the two top connecting plates on power cabinet 1 and its adjacent bypass cabinet. The method is the same for the 600 kVA UPS and 800 kVA UPS. [Figure 3-18](#) uses the 600 kVA UPS as an example.

Figure 3-18 Installing top connecting plates



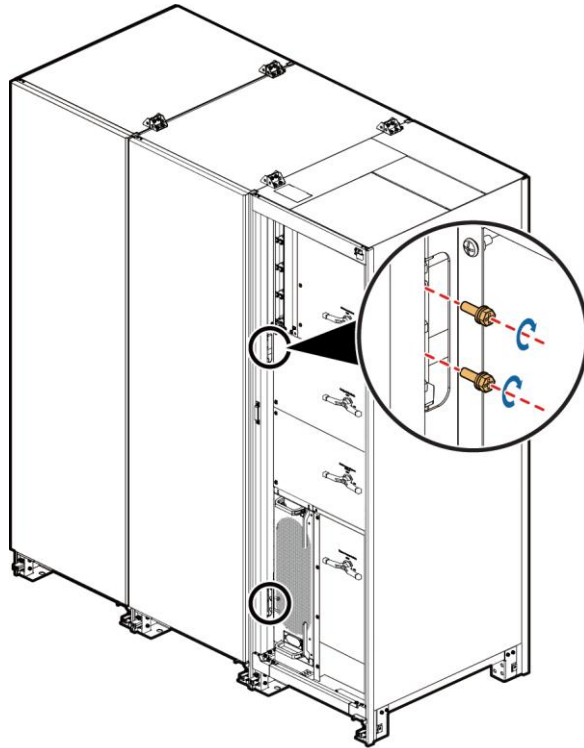
Step 5 Open the front door of the bypass cabinet, and install the two middle connecting plates on power cabinet 1 and its adjacent bypass cabinet. Secure the 600 kVA UPS by using M6x20 screws, and secure the 800 kVA UPS by using M6x30 screws. The method is the same for the 600 kVA UPS and 800 kVA UPS. [Figure 3-19](#) uses the 600 kVA UPS as an example.



NOTE

After the power cabinet is aligned with the bypass cabinet, secure the connecting plate between the two cabinets by using M6 screws to minimize the gap in between.

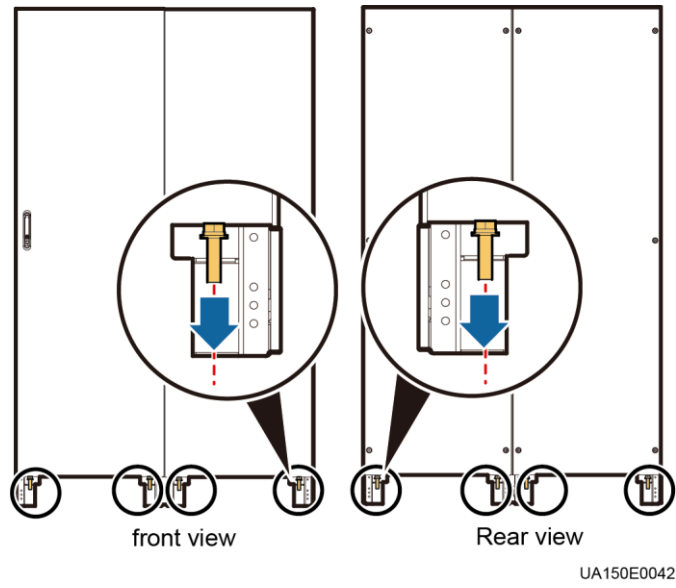
Figure 3-19 Installing connecting plates



UA1500041

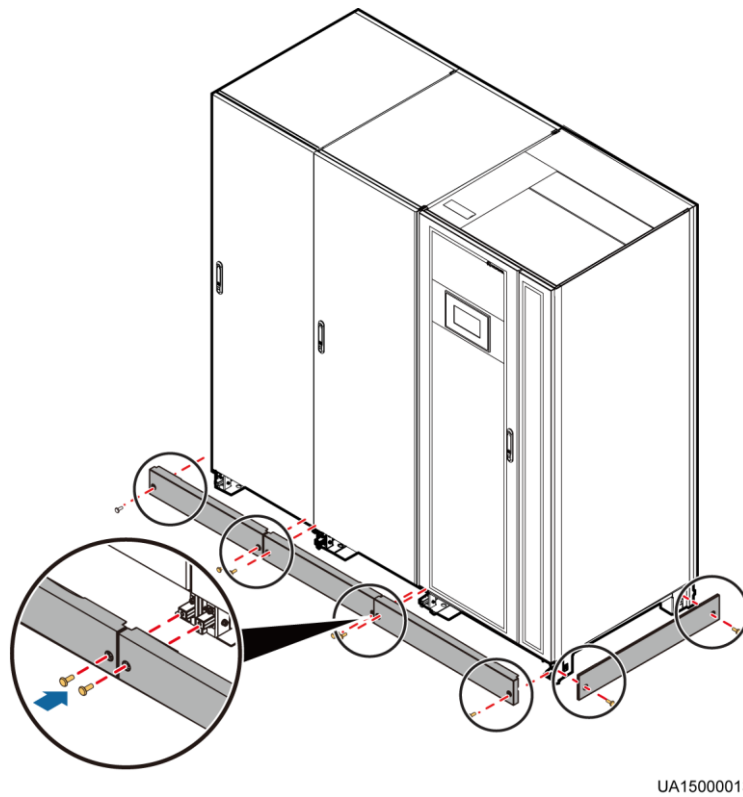
Step 6 Use M12x60 expansion bolts to secure the cabinet to the expansion bolt holes on the ground and tighten the expansion bolts, as shown in [Figure 3-20](#) (using a power cabinet as an example).

Figure 3-20 Tightening expansion bolts



Step 7 Install the front, rear, left, and right anchor baffle plates, as shown in [Figure 3-21](#) (using the 600 kVA UPS as an example).

Figure 3-21 Installing front, rear, left, and right anchor baffle plates

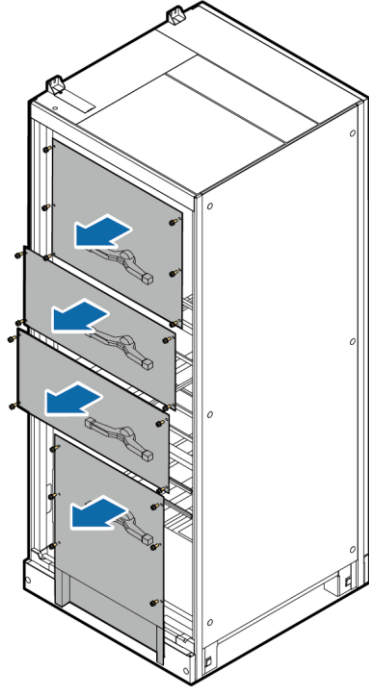


Step 8 Remove the power distribution covers, as shown in [Figure 3-22](#) and [Figure 3-23](#).

 **NOTE**

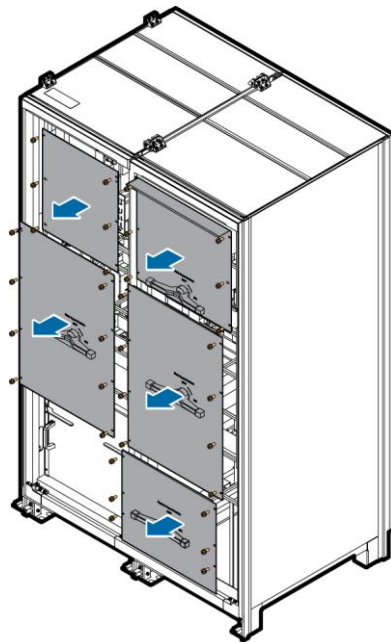
The power distribution covers can be removed from the bypass cabinet only when all switches are OFF.

Figure 3-22 Removing power distribution covers from the 600 kVA UPS



UA15000023

Figure 3-23 Removing power distribution covers from the 800 kVA UPS

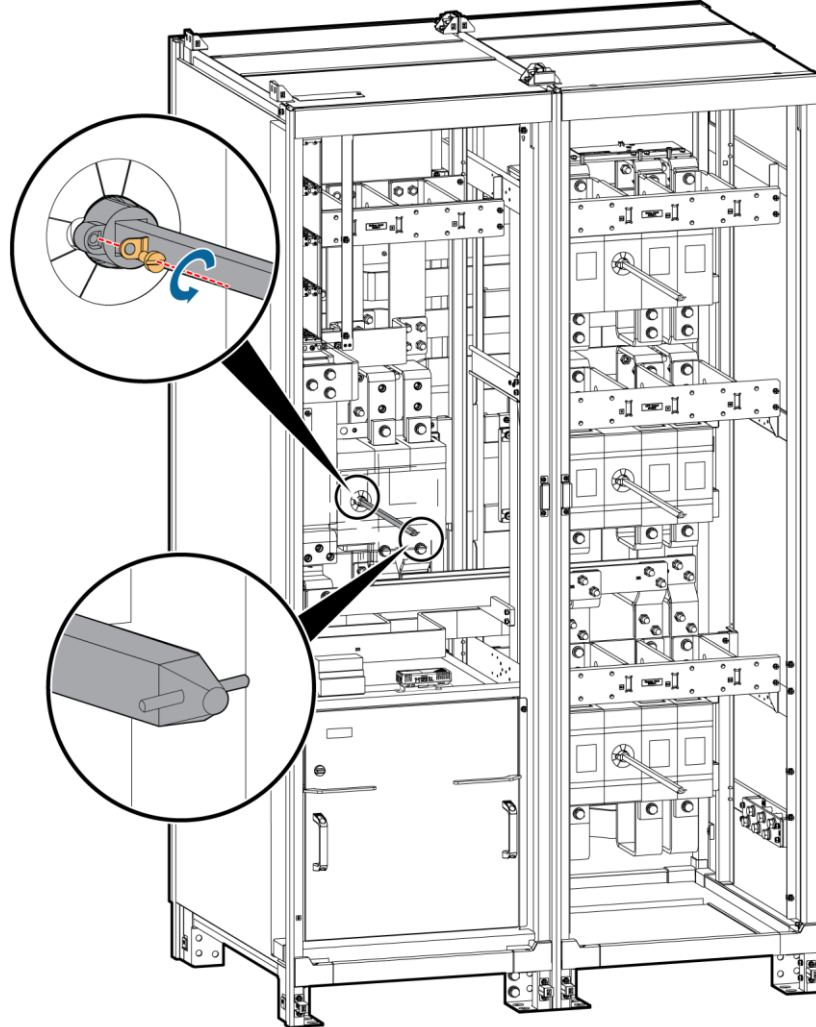


UA15000031

Step 9 Remove rear panels from power cabinet 1 and its adjacent bypass cabinet.

Step 10 Remove the switch extension pole.

Figure 3-24 Removing the switch extension pole (800 kVA)

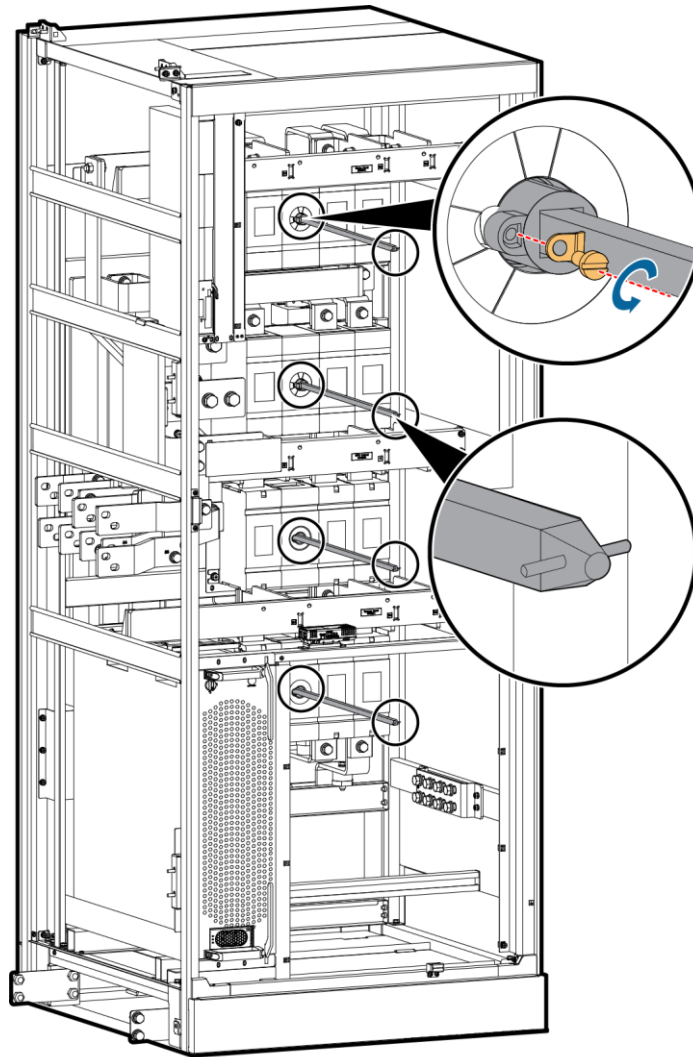


UA15000127

 **NOTE**

- For an 800 kVA model, the switch extension pole in the left bypass cabinet must be removed to facilitate cabinet combination. The switch extension pole in the right bypass cabinet can be removed or reserved, which has no impact.
- For a 600 kVA model, removing the switch extension poles or not does not affect cabinet combination or cable connection.

Figure 3-25 Removing the switch extension poles (600 kVA)



UA15000211



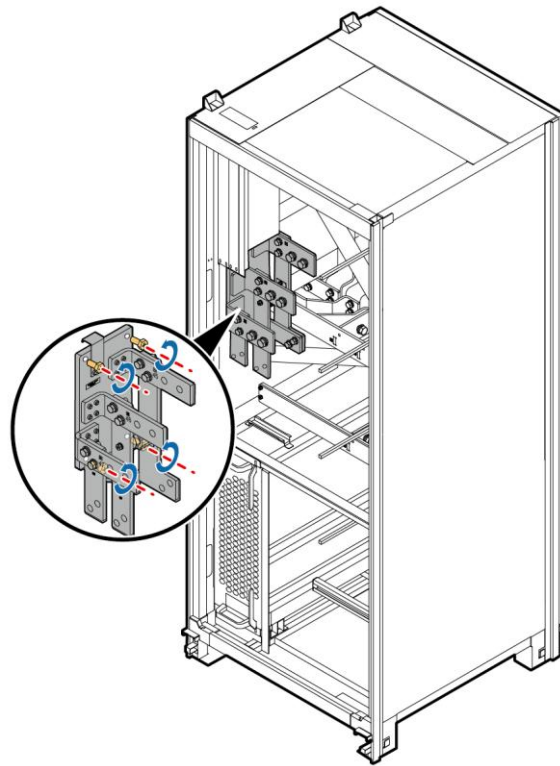
NOTICE

- The removed screws, washers, and switch extension poles should be kept in good condition and reinstalled after cables are connected.
- Keep the dowel leveled, as shown in [Figure 3-24](#) and [Figure 3-25](#). Insert the switch extension pole until it is fully inserted, place the spacer, and tighten the slotted screw.

Step 11 Install soft connecting copper bars between power cabinet 1 and its adjacent bypass cabinet. The following describes the methods for the 600 kVA UPS and 800 kVA UPS separately.

- 600kVA UPS
 - a. Remove the battery copper bar assembly, as shown in [Figure 3-26](#).

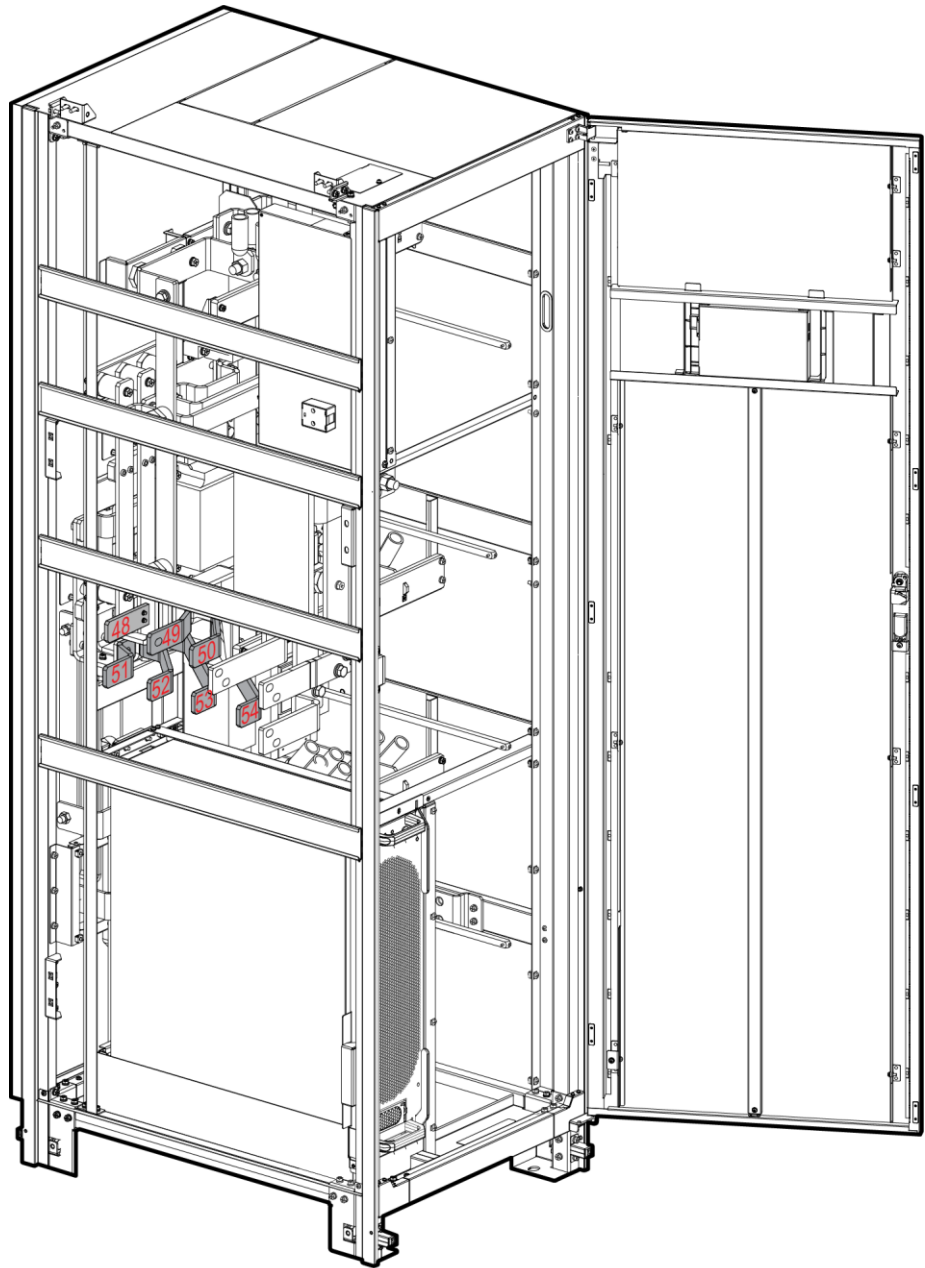
Figure 3-26 Removing a battery copper bar assembly



UA15000123

- b. Install soft copper bars numbered from 48 to 54 from inside outwards. [Figure 3-27](#) shows the soft copper bars.

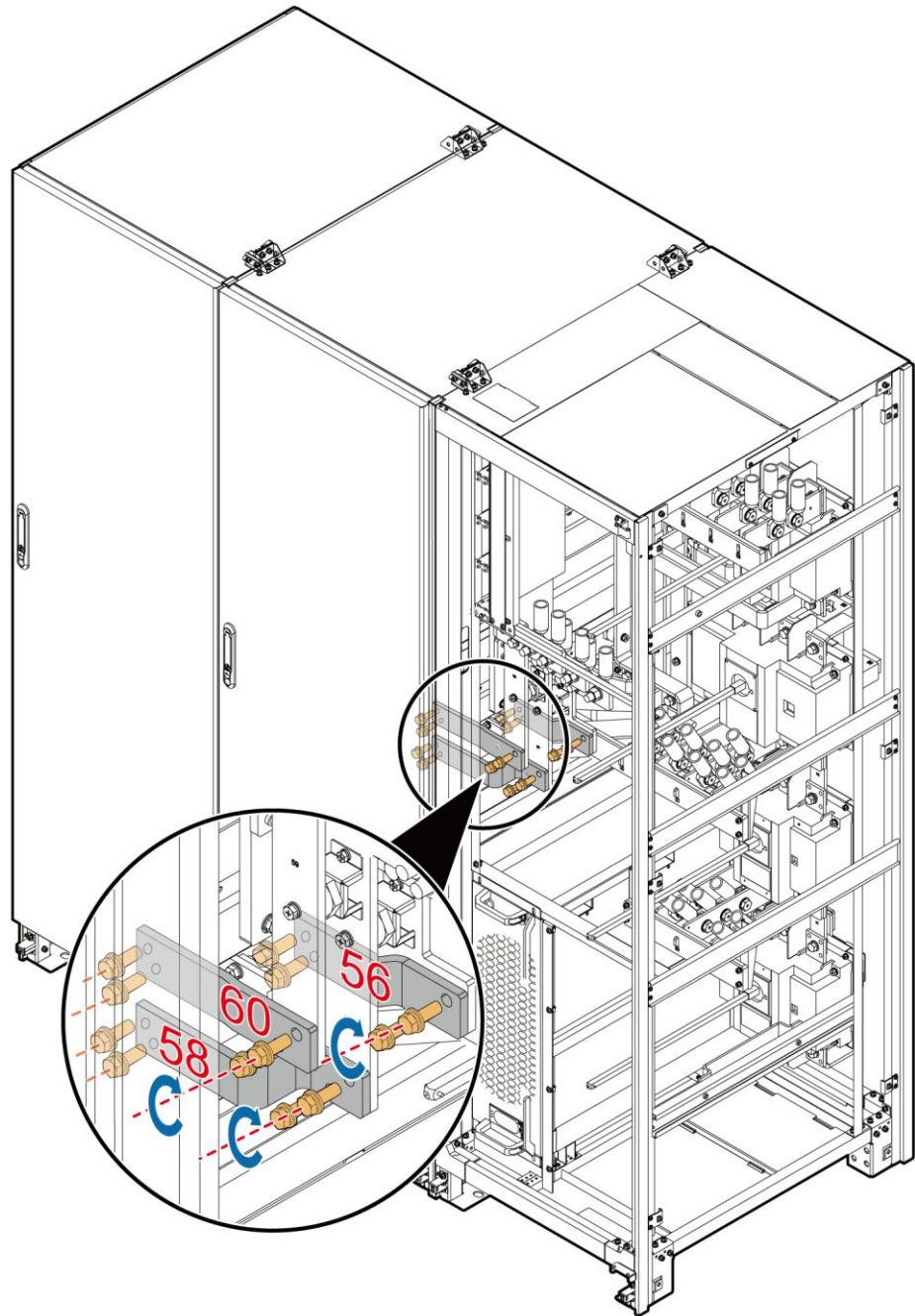
Figure 3-27 Installing soft copper bars numbered from 48 to 54



UA15000037

- c. Reinstall the battery copper bar assembly.
- d. Remove the filler panel from the power cabinet, and install soft copper bars named 56, 58, and 60, as shown in [Figure 3-28](#).

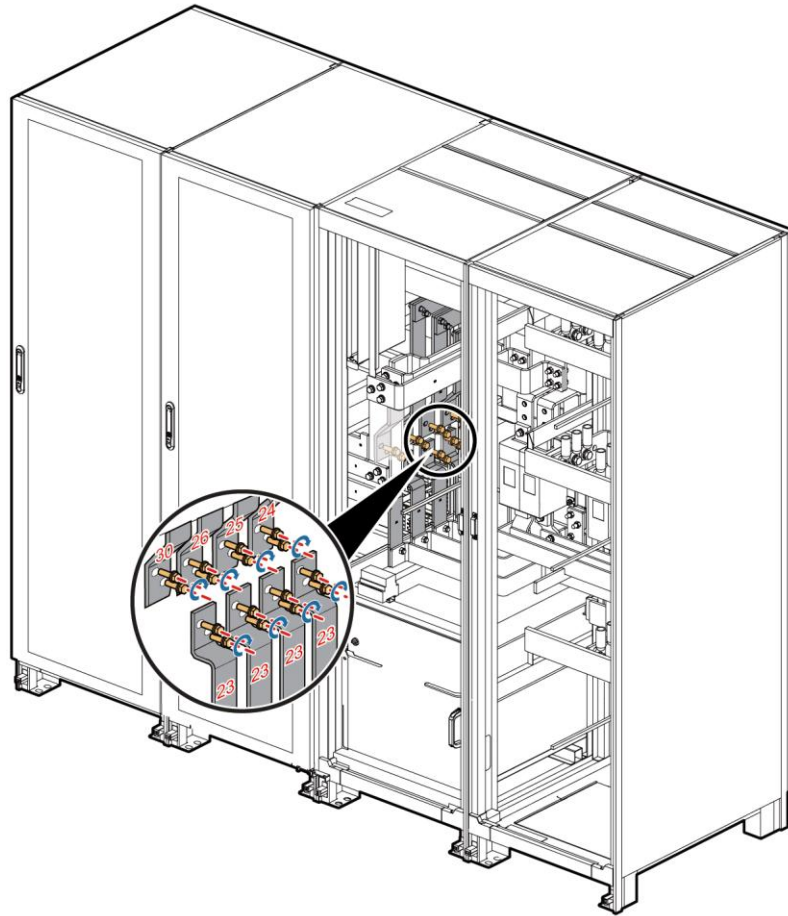
Figure 3-28 Installing soft copper bars numbered 56, 58, and 60



UA15000038

- 800kVA UPS
 - a. Cut off the binding tapes between soft copper bar holes numbered 23, 24, 25, 26 and 30.
 - b. Secure the soft copper bars numbered 23, 24, 25, 26 and 30 by using M12x45 screws, as shown in [Figure 3-29](#).

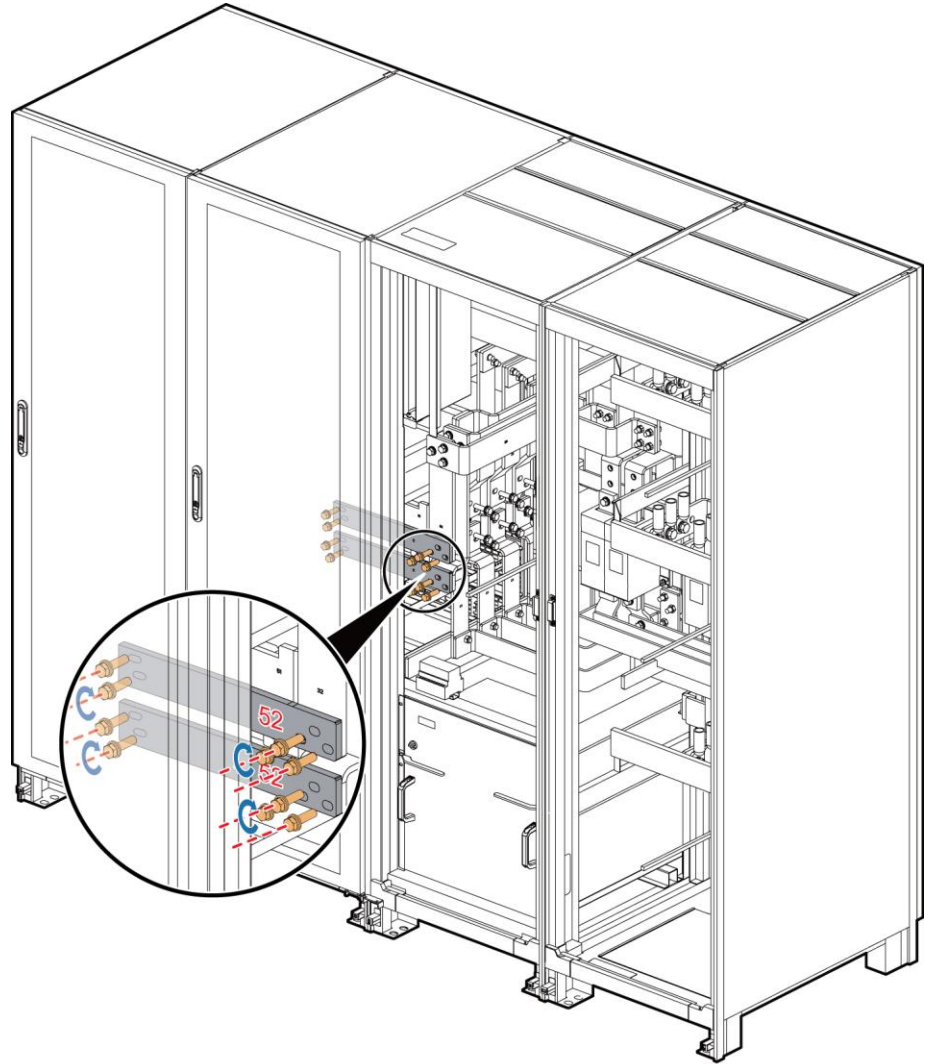
Figure 3-29 Securing soft copper bars numbered



UA15000083

- c. Remove the filler panel from the power cabinet and take out the two soft copper bars numbered 52 from the fitting bag. Secure them separately to power cabinet 1 and its adjacent bypass cabinet, as shown in [Figure 3-30](#).

Figure 3-30 Installing soft copper bars numbered 52



UA15000025

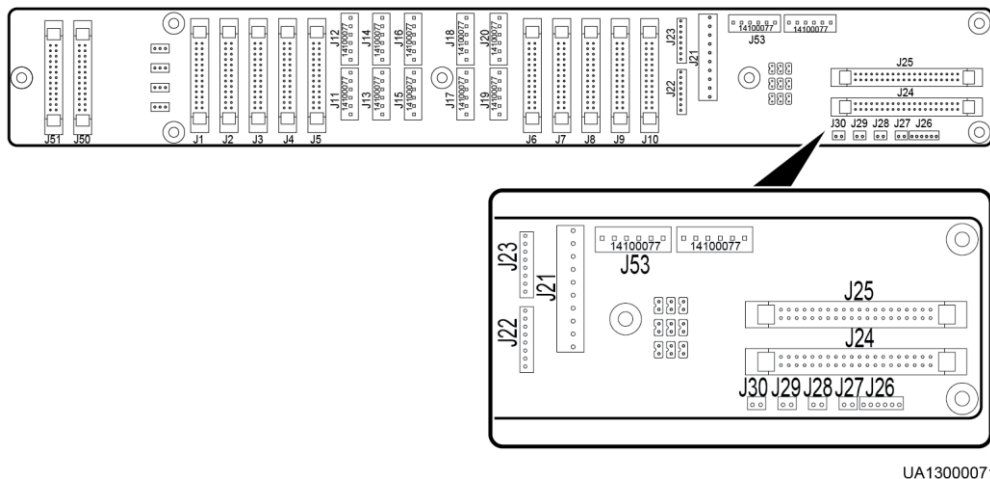
- Step 12** Insert the cable terminal on the bypass cabinet into the corresponding port on the system signal interface board in power cabinet 1. The system signal interface board is located at the rear of power cabinet 1, which can be seen if the rear panel is removed.

 **NOTICE**

- Cut the cable ties binding the cables to be connected in the bypass cabinet. When connecting the cables of the bypass cabinet to power cabinet 1, route the cables from the internal side of the column to the system signal interface board of power cabinet 1 so that the rear panels can be reinstalled on the bypass cabinet and power cabinet 1.
- After the cables have been connected, bind the cables to the column of the bypass cabinet and the binding holes on the system signal interface board. Verify that the cables are correctly connected and reinstall the rear panels.

The silk screens on the system signal interface board in power cabinet 1 are shown in [Figure 3-31](#). The mapping between the cables in the bypass cabinet and the ports on the system signal interface board is listed in [Table 3-9](#). [Figure 3-32](#) and [Figure 3-33](#) show cable connections for combined cabinets.

Figure 3-31 Silk screens on the system signal interface board in power cabinet 1



UA13000071

Table 3-9 Mapping between the cables in the bypass cabinet and the ports on the system signal interface board in power cabinet 1

Bypass Cabinet Cable Name	Bypass Cabinet Cable No.	Silk Screen on the System Signal Interface Board in the Power Cabinet or Cable No.	Quantity
Bypass module DL37 cable	W301_J21	J21	1
	W303_J24	J24	1
ECM 8-pin cable	W305_J22	J22	1
ECM monitoring bus	W307_J25	J25	1

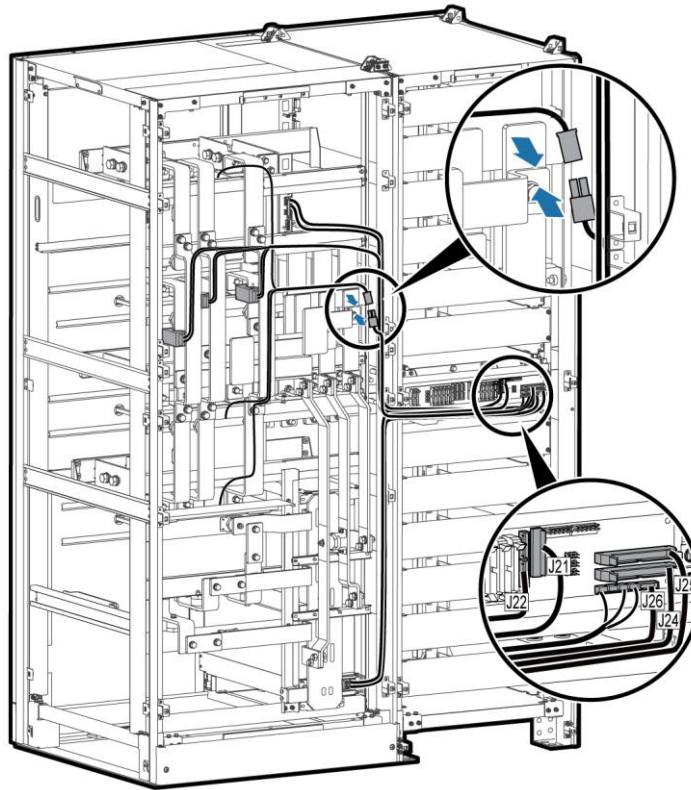
Bypass Cabinet Cable Name	Bypass Cabinet Cable No.	Silk Screen on the System Signal Interface Board in the Power Cabinet or Cable No.	Quantity
CT cable	W309_J26	J26	1
Switch cable	<ul style="list-style-type: none"> • In full configuration: <ul style="list-style-type: none"> – 600 kVA: 04091624-06 – 800 kVA: 04091625-06 • In standard configuration: SW1310 	04091626-23	1



NOTE

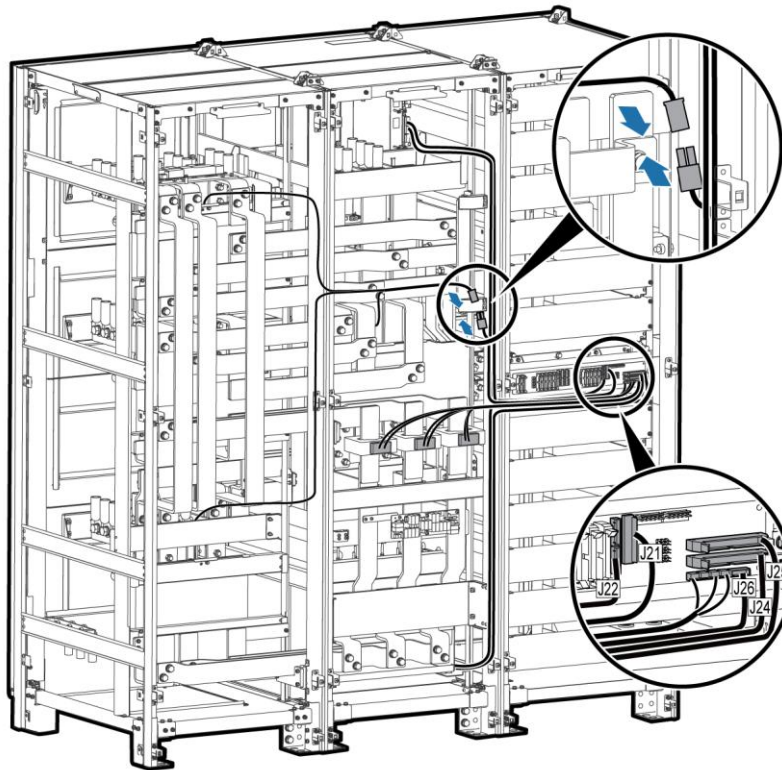
A standard model has only one switch cable (maintenance bypass switch). A full configuration model has three bypass switches (main input switch, maintenance bypass switch, and bypass input switch). The following figures use a full configuration model as an example to describe how to combine cabinets and connect cables.

Figure 3-32 Cable connection for combined cabinets (600 kVA)



UA15000147

Figure 3-33 Cable connection for combined cabinets (800 kVA)



UA15000148

----End

3.2.1.2 Installing the UPS on Channel Steels

Determining the UPS Installation Position

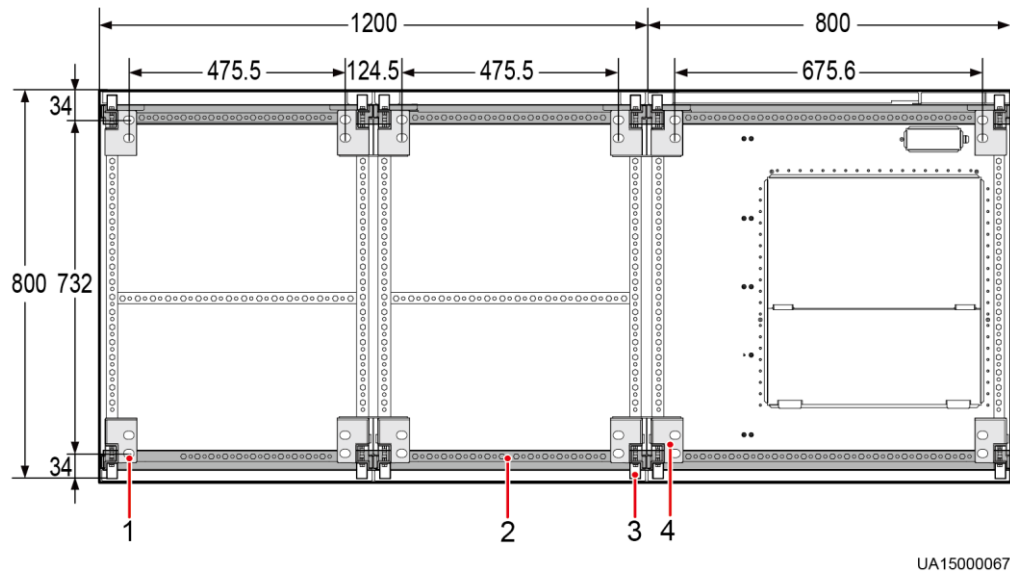


NOTICE

- Channel steels and expansion bolts for securing the channel steels should be purchased by the customer. The recommended channel steel width is 50 mm or more.
- Ensure that the spacing between external sides of a channel steel is 800 mm. Secure channel steels to the ground by using expansion bolts.
- Keep the channel steel surface flat.

Step 1 Determine the cabinet installation position on channel steels according to cabinet mounting holes (channel steel installation) on the marking-off template. [Figure 3-10](#) and [Figure 3-11](#) show the marking-off template. [Figure 3-34](#) and [Figure 3-35](#) show the dimensions of cabinet base mounting holes.

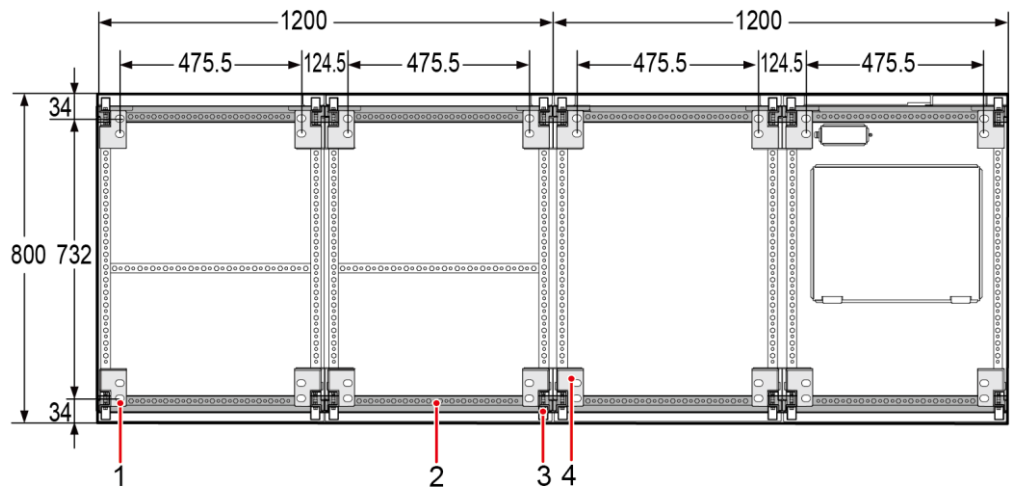
Figure 3-34 Dimensions of cabinet base mounting holes for the 600 kVA UPS (unit: mm)



UA15000067

- (1) Channel steel mounting hole (2) Channel steel (3) Column (4) Base

Figure 3-35 Dimensions of cabinet base mounting holes for the 800 kVA UPS (unit: mm)



UA15000066

- (1) Channel steel mounting hole (2) Channel steel (3) Column (4) Base



NOTICE

- It is recommended that the external sides of front and rear channel steels be aligned with the column. The channel steel spacing is 800 mm. The recommended channel steel width is 50 mm or more.
 - Cabinet mounting holes must be aligned with channel steel mounting holes, and secure the cabinet to channel steels with bolts.
-

Step 2 Drill cabinet mounting holes in channel steels by using a hammer drill.

----End

Combining the Power Cabinet and Bypass Cabinet

Step 1 The method of combining the power cabinet and bypass cabinet is the same as the method of combining them on the ground. For details, see [Combining the Power Cabinet and Bypass Cabinet](#) in [3.2.1.1 Installing the UPS on the Ground](#).

----End

Securing the UPS

Step 1 Use M12x45 comment bolts to secure the cabinet to the mounting holes in the channel steel and tighten the bolts.

Step 2 Install the front, rear, left, and right anchor baffle plates, as shown in [Figure 3-21](#).

----End

3.2.2 Installing Batteries

Context



NOTICE

- Before installing batteries, read through the battery safety precautions, obtain the delivered battery installation guide, and install batteries as instructed.
 - Place the batteries in a correct way to prevent vibrations and shocks.
 - Install the batteries from the lower layer to the upper layer to prevent falling over due to imbalance.
-

Procedure

Step 1 Install a battery rack and batteries.

For details, see the battery installation guide delivered along with batteries.



NOTICE

After you install the BCB box, adjust the disconnection protection threshold of the end-of-discharge (EOD) based on backup time to avoid overcurrent disconnection. The default values are as follows:

1. If backup time < 1 h, EOD is 1.67 V/cell.
 2. If $1 \text{ h} \leq \text{backup time} < 3 \text{ h}$, EOD is 1.75 V/cell.
 3. If backup time $\geq 3 \text{ h}$, EOD is 1.80 V/cell.
-

Step 2 (Optional) Install a BCB box.

For details, see the *PDU8000-(0125, 0250, 0400, 0630, 0800) DCV8-BXA001 BCB Box User Manual* delivered with the BCB Box.

Step 3 (Optional) Install a BBB box.

For details, see the *PDU8000-(0630, 1250, 2000) DCV8-BGA001 BBB Box User Manual* delivered with the BBB Box.

----End

3.2.3 Routing Cables

3.2.3.1 Top Cable Routing

Context



NOTICE

- Top cable routing is recommended. Bottom cable routing is applicable only when a cable tray or support is used.
 - If an IP21 component is installed, cables cannot be routed from the top of the cabinet.
 - If you choose to route cables through holes, remove the power cable tray cover, spare power cable tray cover and battery cable tray cover and drill holes. After you drill holes, paste grommet strip to the hole edge to protect cables. Reinstall the covers on the cabinet.
 - After routing cables, use firestop putty to fill in the gap between the cables and the cabinet.
-

Procedure

Step 1 Open the front door of the bypass cabinet, and remove power distribution covers from the bypass cabinet, as shown in [Figure 3-22](#) and [Figure 3-23](#).

Step 2 Route power cables.



NOTICE

- Connect cables from top to bottom in this sequence: mains input power cables, output power cables, bypass input power cables, and battery input cables.
- When you connect each phase wire, tighten screws from inside to outside to secure wires.

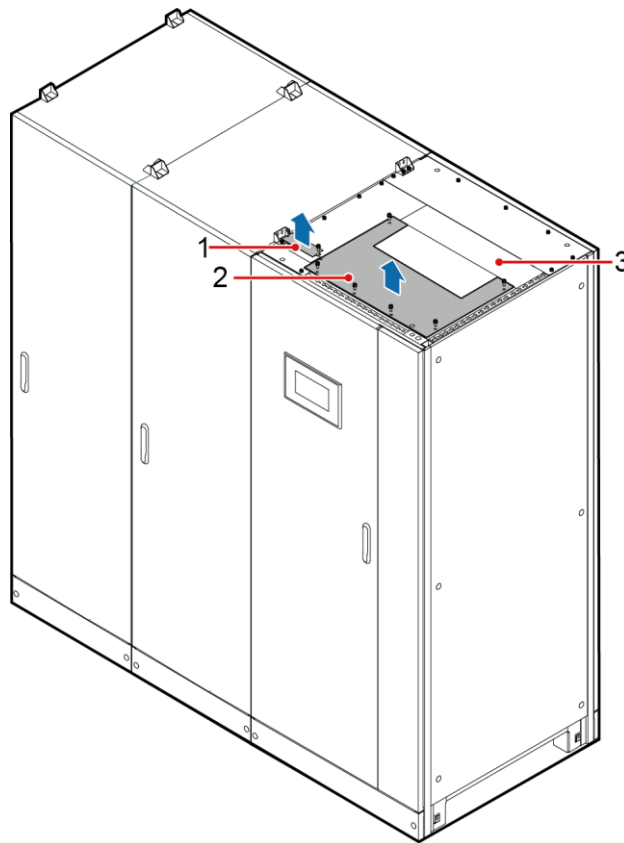
1. Remove the power cable tray cover, battery cable tray cover and signal cable tray cover from the top of the cabinet. Use a hole saw to drill holes in the power cable tray cover, attach grommet strips around the holes to protect cables, and reinstall the power cable tray cover on the cabinet, as shown in [Figure 3-36](#) and [Figure 3-37](#).



NOTE

The hole size and quantity are for reference only.

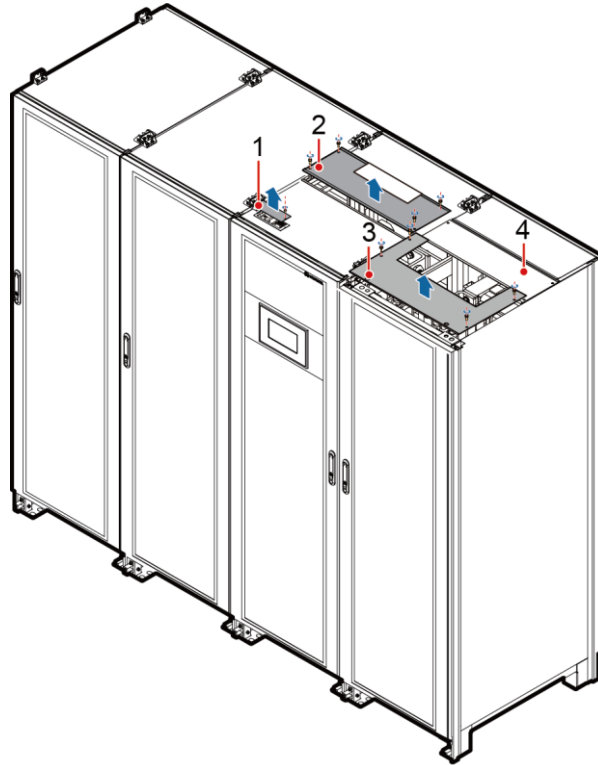
Figure 3-36 Removing cable tray covers from the top of the 600 kVA UPS



UA15000018

- (1) Signal cable tray cover (2) Power cable tray cover (3) Spare power cable tray cover

Figure 3-37 Removing cable tray covers from the top of the 800 kVA UPS

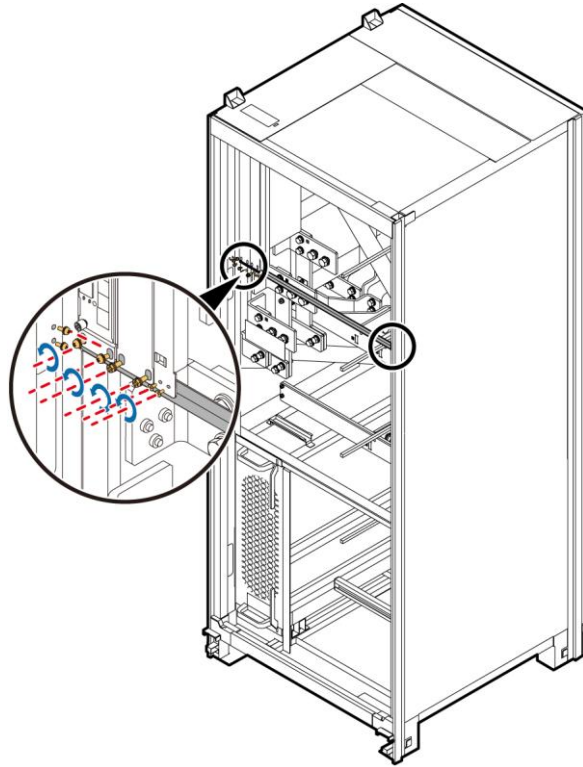


UA15000029

- | | |
|-----------------------------|----------------------------------|
| (1) Signal cable tray cover | (2) Battery cable tray cover |
| (3) Power cable tray cover | (4) Spare power cable tray cover |

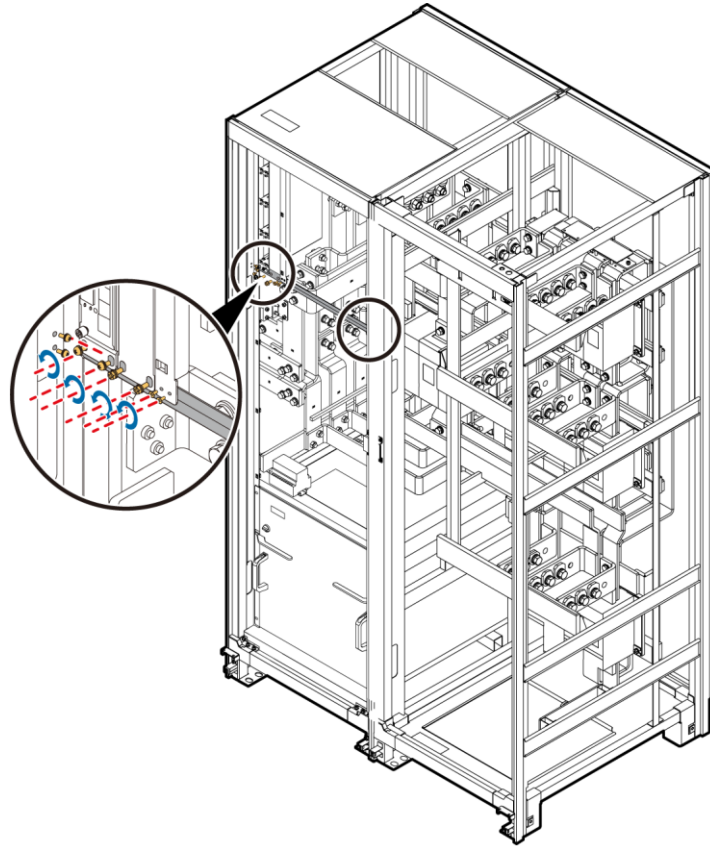
2. (Optional) Remove the 10 screws that secure the beam, as shown in [Figure 3-38](#) and [Figure 3-39](#).

Figure 3-38 Removing the beam from the 600 kVA UPS



UA15000019

Figure 3-39 Removing the beam from the 800 kVA UPS



UA1500030

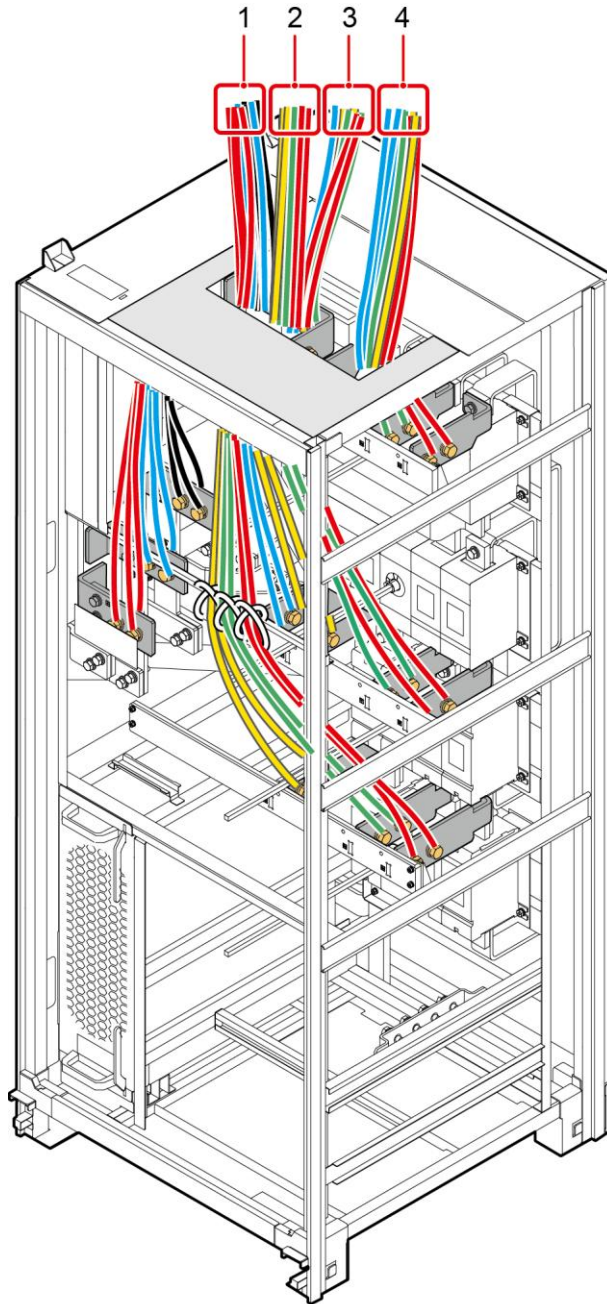


NOTE

Store the removed screws and beam. Reinstall them after connecting cables.

3. [Figure 3-40](#) and [Figure 3-41](#) show the power cables routed from the top of the cabinet.

Figure 3-40 Routing power cables from the top of the cabinet and binding position (covers removed of 600 kVA UPS)



UA15000021

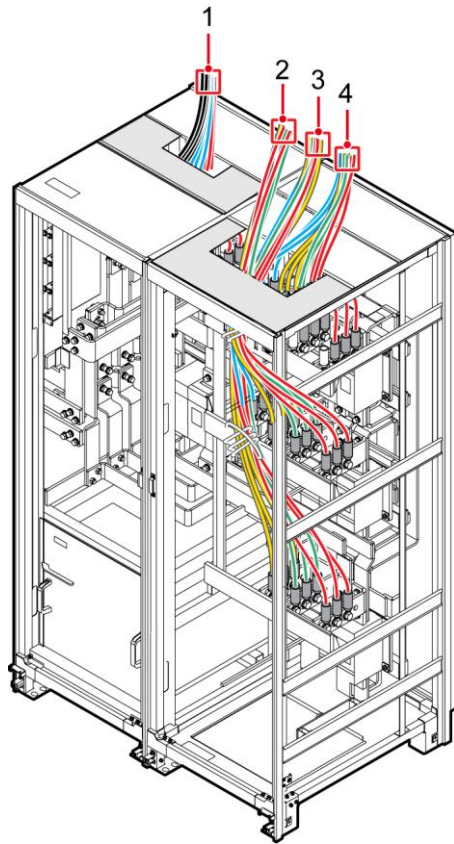
(1) Battery cables

(2) Bypass input power cables

(3) Output power cables

(4) Mains input power cables

Figure 3-41 Routing power cables from the top of the cabinet and binding position (covers removed of the 800 kVA UPS)



UA15000016

(1) Battery cables

(2) Bypass input power cables

(3) Output power cables

(4) Mains input power cables

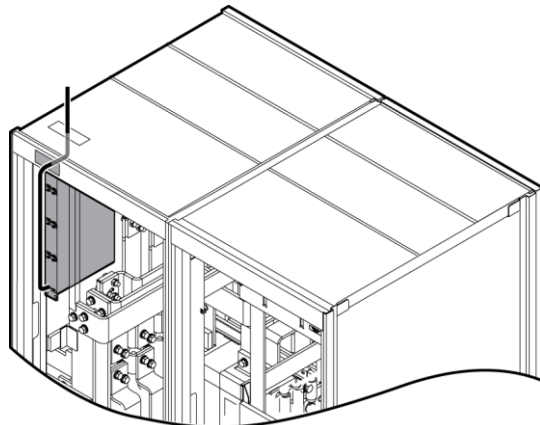


NOTICE

Bind signal cables and power cables separately.

Step 3 Route signal cables. Bind signal cables to the cabinet in the shortest route. [Figure 3-42](#) shows the signal cables routed from the top of the cabinet.

Figure 3-42 Routing signal cables from the top of the cabinet



UA15000028



NOTE

The number and colors of signal cables in [Figure 3-42](#) are for reference only.

----End

3.2.3.2 Bottom Cable Routing

Prerequisites



NOTICE

- If you choose to route cables from the bottom of the cabinet, ensure sufficient space at the bottom of the cabinet.
- If you choose to route cables through holes, remove power cable tray covers and drill holes. After you drill holes, paste grommet strip to the hole edge to protect cables. Reinstall the covers on the cabinet.
- After routing cables, use firestop putty to fill in the gap between the cables and the cabinet.

Procedure

Step 1 Open the front door of the bypass cabinet, and remove power distribution covers from the bypass cabinet, as shown in [Figure 3-22](#) and [Figure 3-23](#).

Step 2 Route power cables.



NOTICE

- Connect cables from bottom to top in this sequence: bypass input power cables, output power cables, mains input power cables, and battery input cables.
- When you connect each phase wire, tighten screws from inside to outside to secure wires.

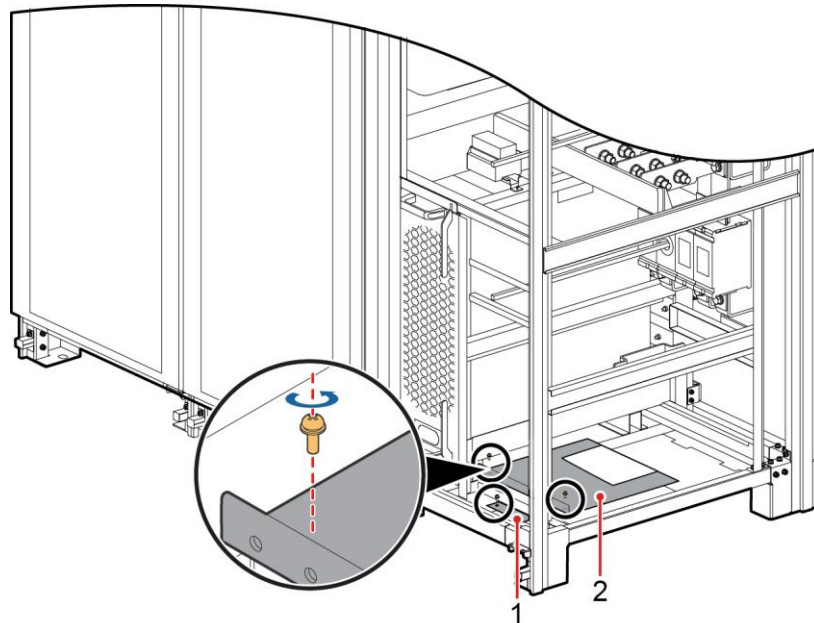
1. Remove the power cable tray cover and signal cable tray cover from the bottom of the cabinet. Use a hole saw to drill holes in the power cable tray cover, attach grommet strips around the holes to protect cables, and reinstall the power cable tray cover on the cabinet, as shown in [Figure 3-43](#) and [Figure 3-44](#).



NOTE

The hole size and quantity are for reference only.

Figure 3-43 Removing cable tray covers from the bottom of the 600 kVA UPS

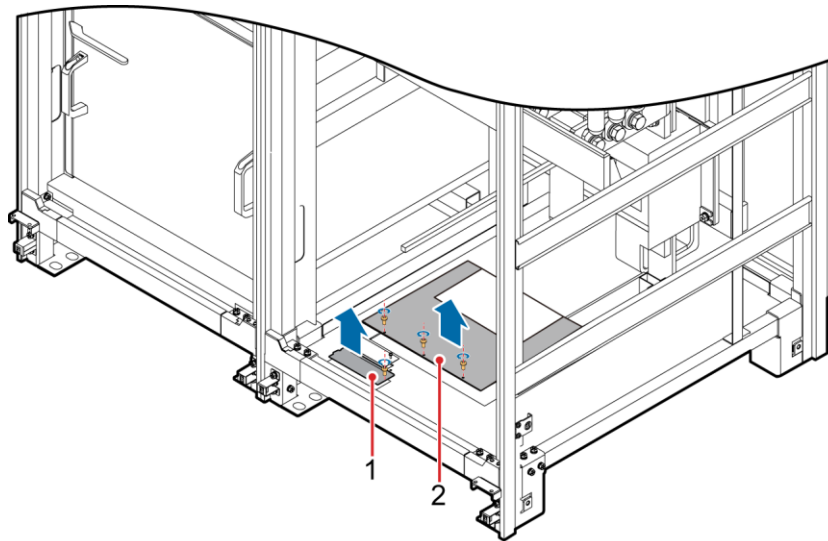


(1) Signal cable tray cover

(2) Power cable tray cover

UA15000065

Figure 3-44 Removing cable tray covers from the bottom of the 800 kVA UPS



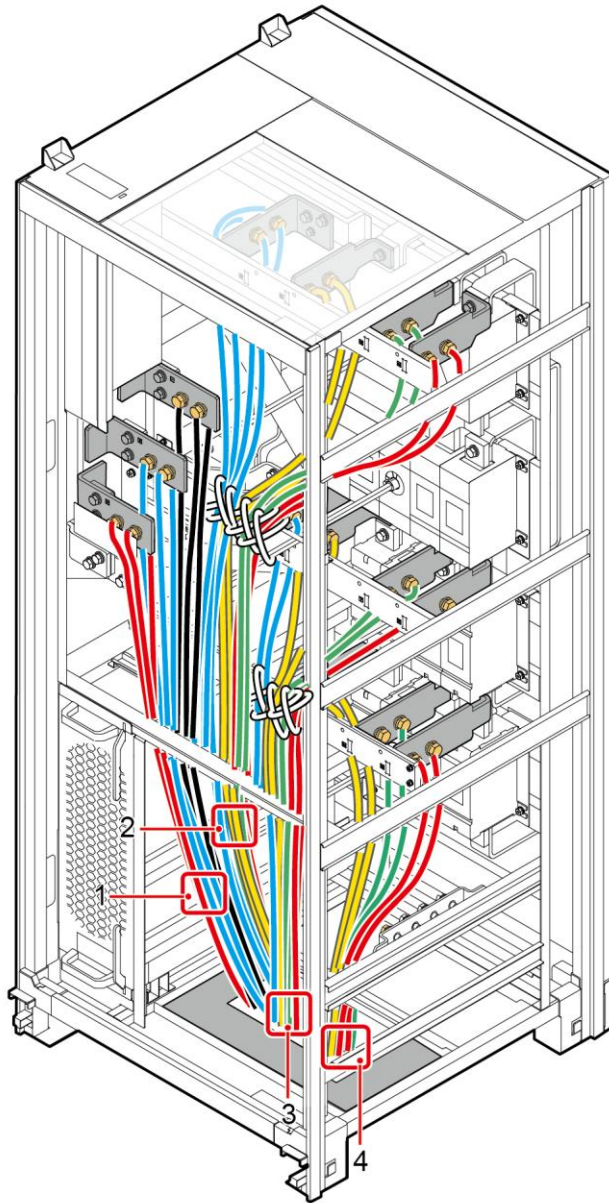
UA15000034

(1) Signal cable tray cover

(2) Power cable tray cover

2. [Figure 3-45](#) and [Figure 3-46](#) show the power cables routed from the bottom of the cabinet.

Figure 3-45 Routing power cables from the bottom of the cabinet and binding position (600 kVA UPS)



UA15000022

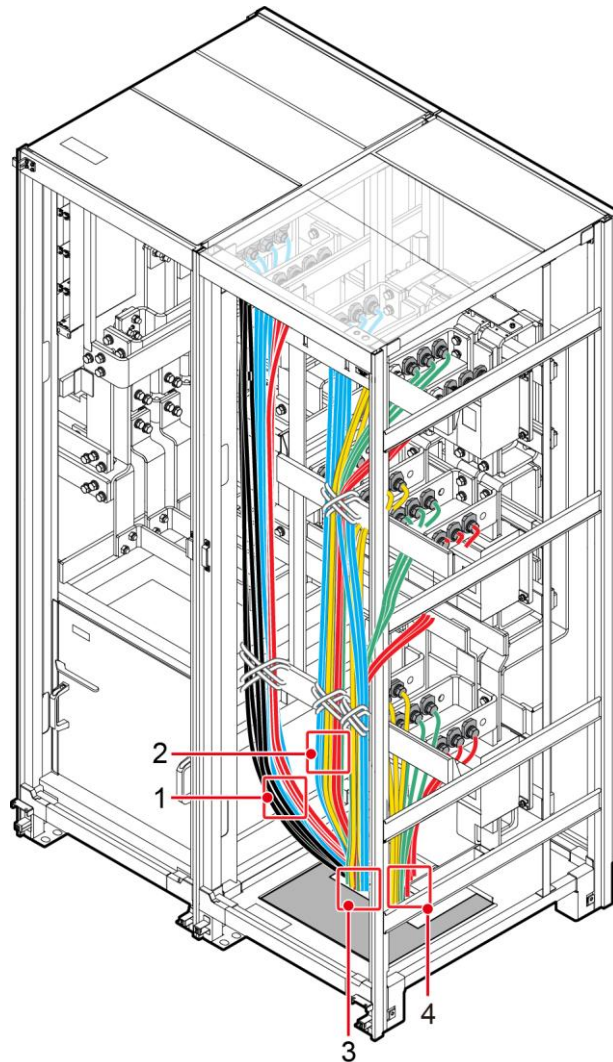
(1) Battery cables

(2) Mains input power cables

(3) Output power cables

(4) Bypass input power cables

Figure 3-46 Routing power cables from the bottom of the cabinet and binding position (800 kVA UPS)



UA15000017

(1) Battery cables

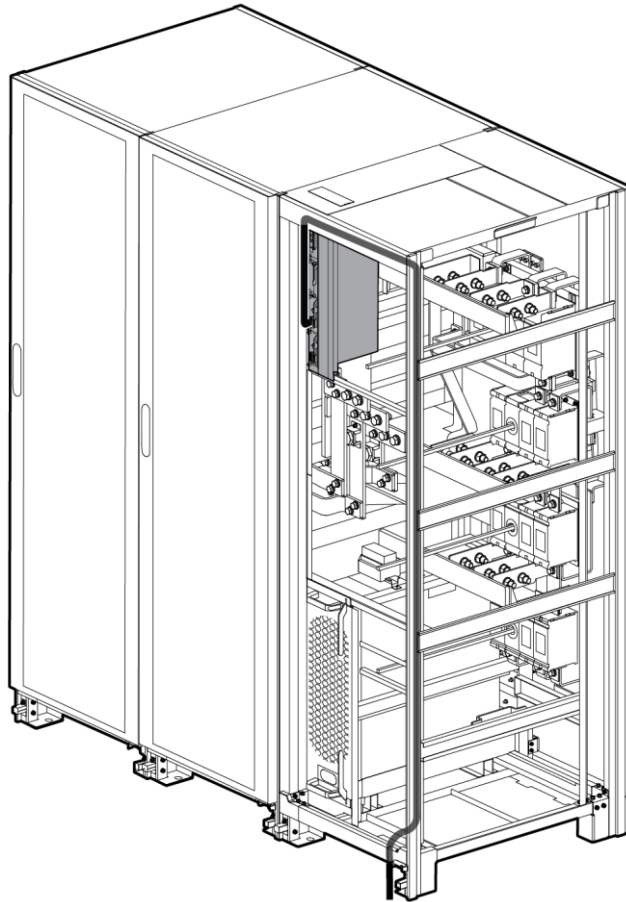
(2) Mains input power cables

(3) Output power cables

(4) Bypass input power cables

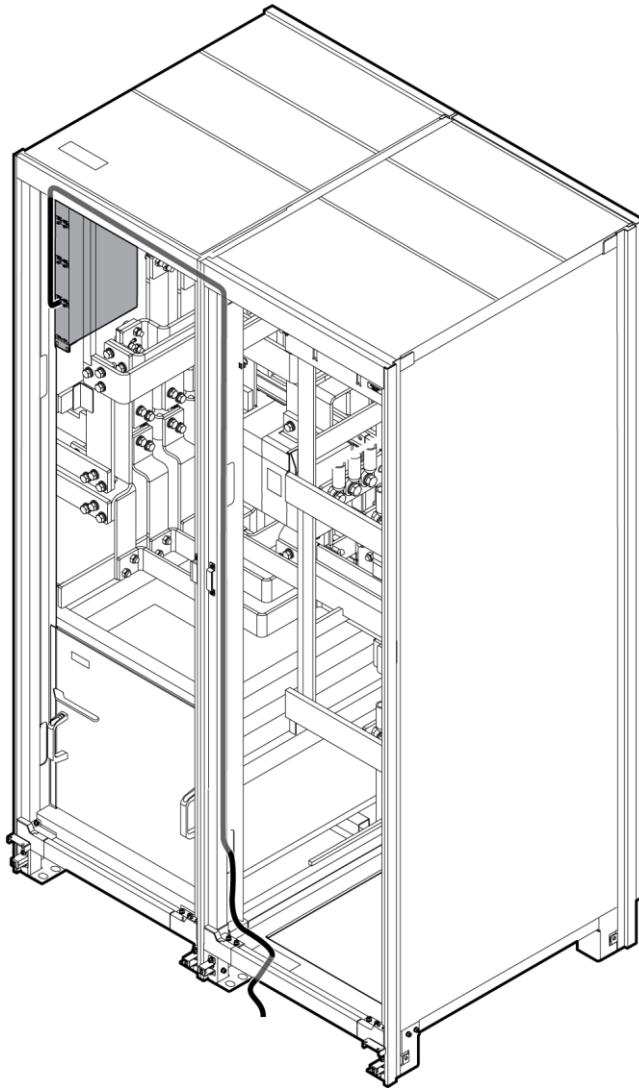
Step 3 Lay out signal cables. Bind signal cables to the cabinet in the shortest route. [Figure 3-47](#) and [Figure 3-48](#) show the signal cables routed from the bottom of the cabinet.

Figure 3-47 Routing signal cables from the bottom of the 600 kVA UPS



UA15000059

Figure 3-48 Routing signal cables from the bottom of the 800 kVA UPS



UA15000027



NOTE

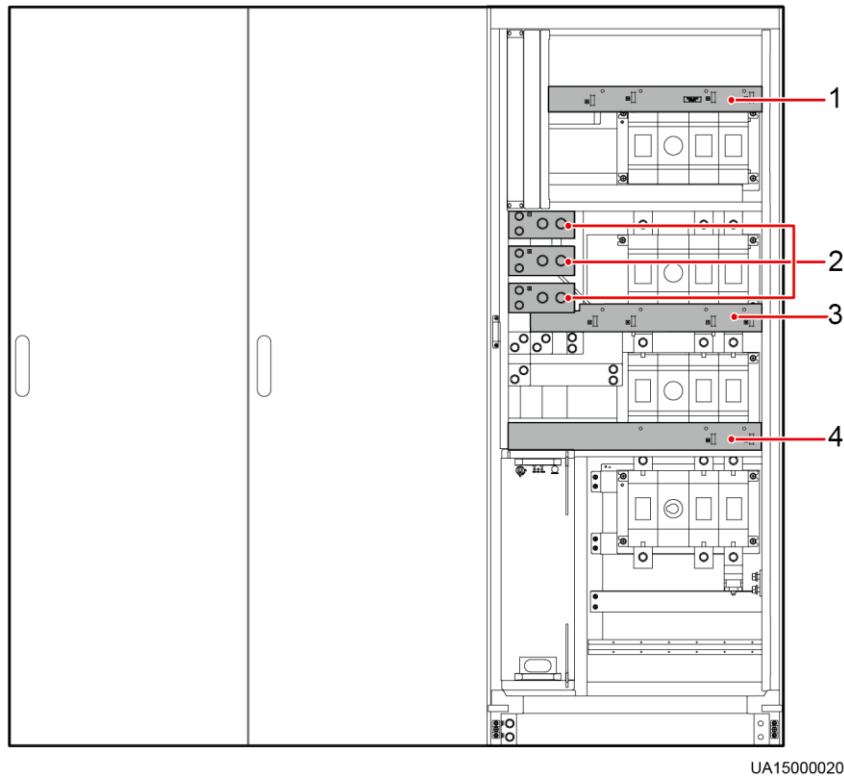
The number and colors of signal cables in [Figure 3-47](#) and [Figure 3-48](#) are for reference only.

----End

3.2.4 Connecting Ground Cables

[Figure 3-49](#) and [Figure 3-50](#) show the UPS wiring terminals.

Figure 3-49 600 kVA UPS PDU



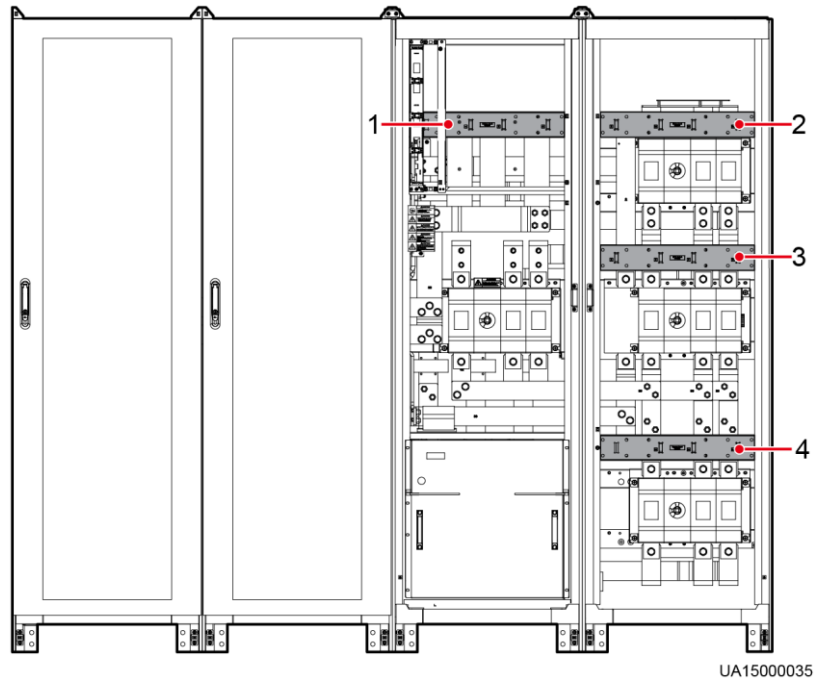
(1) Mains input
wiring terminals

(2) Battery input
wiring terminals

(3) Output wiring
terminals

(4) Bypass input
wiring terminals

Figure 3-50 800 kVA UPS PDU



(1) Battery input
wiring terminals

(2) Mains input
wiring terminals

(3) Output wiring
terminals

(4) Bypass input
wiring terminals



CAUTION

If you do not ground the UPS as required, electromagnetic interference, electric shocks, or fire disasters may occur.

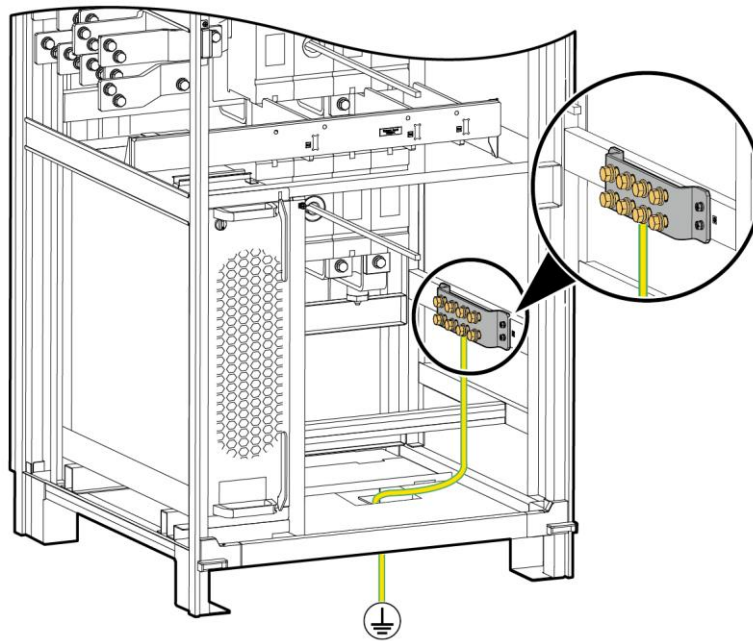


NOTICE

- Before cable connections, ensure that all UPS input switches are OFF. Paste warning labels to prevent operation on the switches.
- Connect input power cables to the UPS and then to customer equipment.
- The figure is for reference only. For details about the recommended cross-sectional area and number of ground cables, refer to [Table 3-3](#) and site requirements.
- In the case of top cable routing, the ground cable is routed from the top. [Figure 3-51](#) and [Figure 3-52](#) show how to route a ground cable from the bottom.

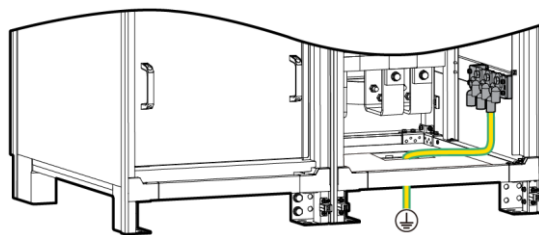
Connect the ground cable to the UPS, as shown in [Figure 3-51](#) and [Figure 3-52](#).

Figure 3-51 Connecting a ground cable to the 600 kVA UPS



UA15000048

Figure 3-52 Connecting a ground cable to the 800 kVA UPS



UA15000033

3.2.5 Connecting AC Input Power Cables

3.2.5.1 Single Mains

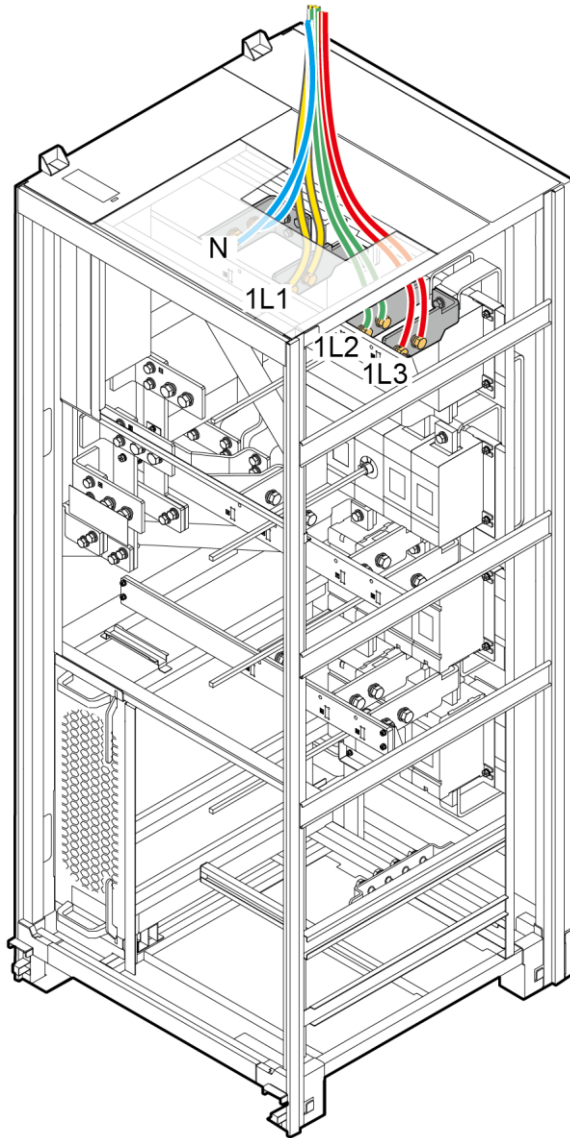


NOTICE

- This figure is for reference only. For details about recommended cable specifications and numbers, see [Table 3-3](#). Select and install cables based on site requirements.
- After connecting cables, check that a certain clearance is reserved between the internal switch (if any) extension pole and power cables to avoid friction.

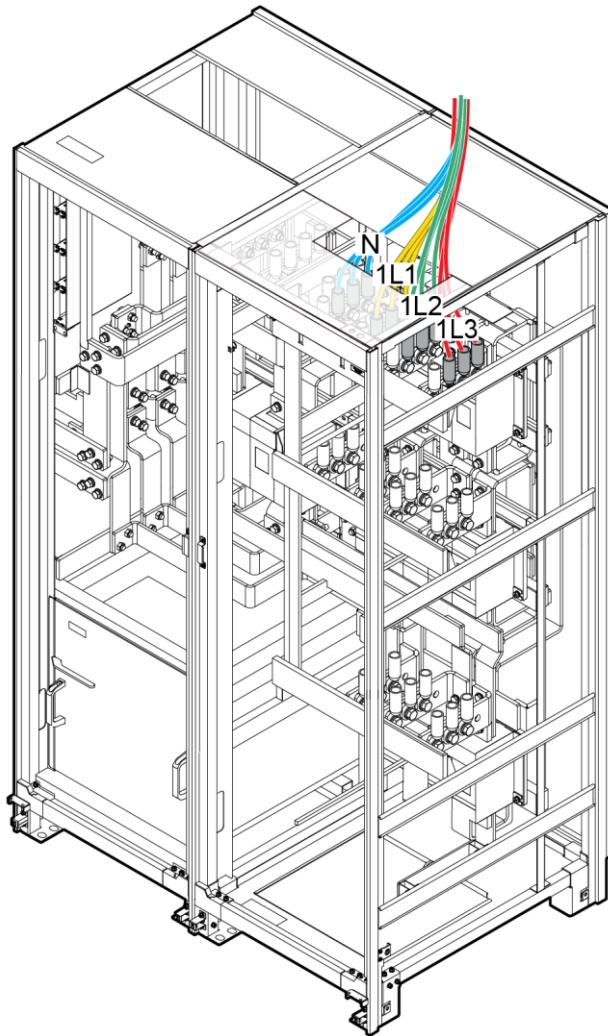
Connecting AC input power cables to mains input power distribution terminals 1L1, 1L2, 1L3, and N respectively, as shown in [Figure 3-53](#) and [Figure 3-54](#).

Figure 3-53 AC input power cables connection (600 kVA)



UA1500072

Figure 3-54 AC input power cables connection (800 kVA)



UA15000068

3.2.5.2 Dual Mains

Procedure

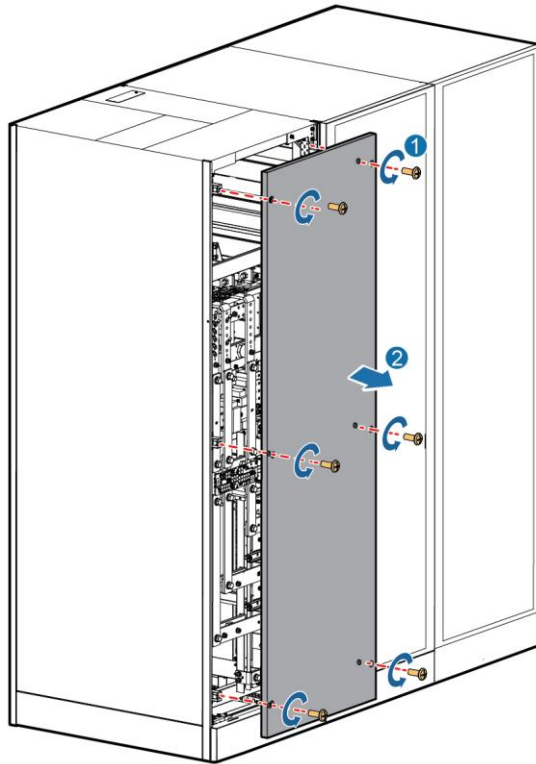
Step 1 Remove the rear cover of the bypass cabinet, as shown in [Figure 3-55](#).



NOTE

It is recommended that you remove the side panel from the bypass cabinet before connecting cables.

Figure 3-55 Removing the rear cover



UA15000088

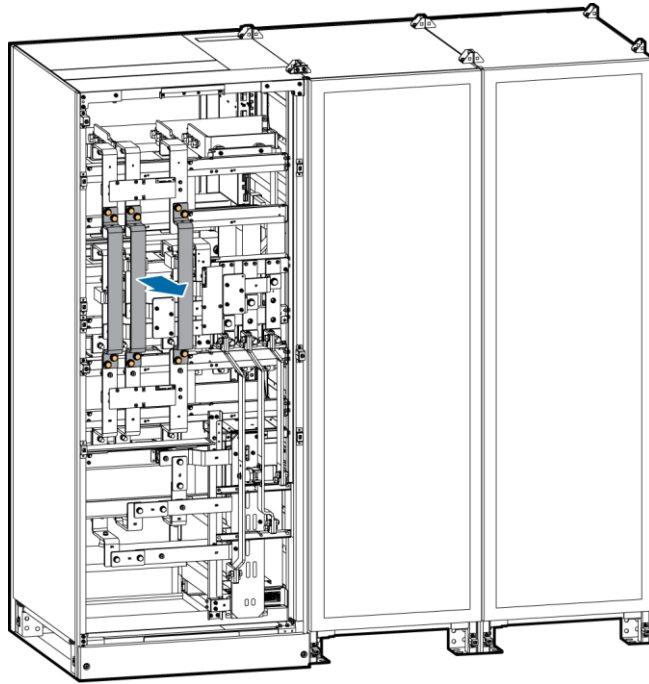
Step 2 Remove the connecting copper bars between mains and bypass input terminals, as shown in [Figure 3-56](#) and [Figure 3-57](#).



NOTE

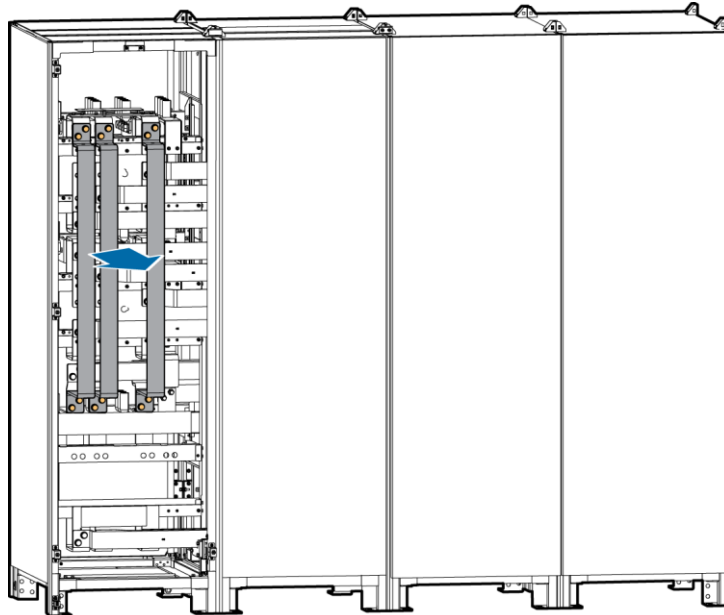
Properly keep the removed copper bars and bolts.

Figure 3-56 Removing copper bars from the 600 kVA UPS



UA15000087

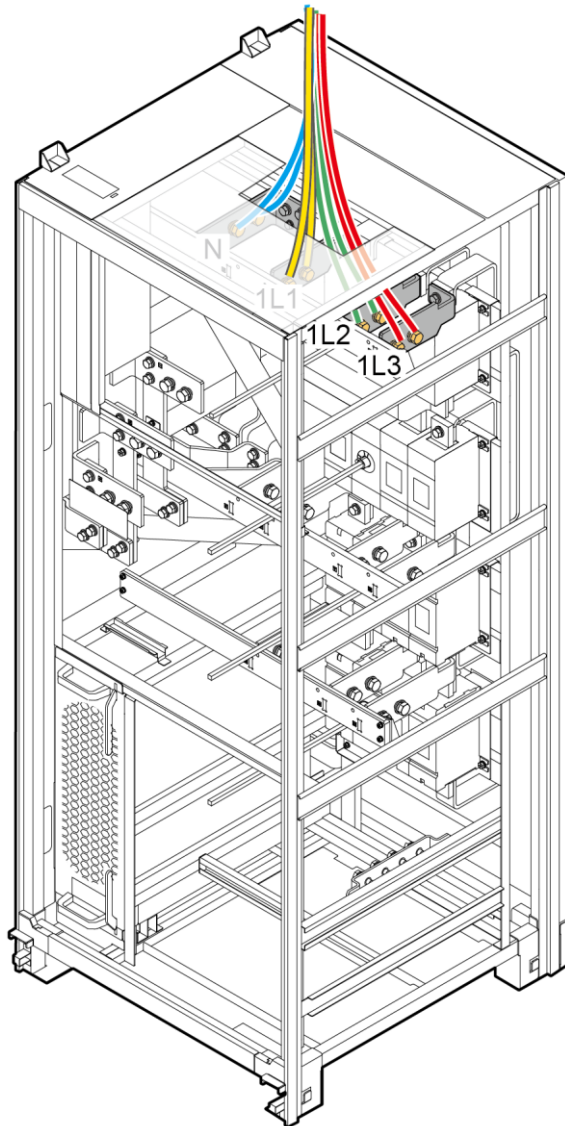
Figure 3-57 Removing copper bars from the 800 kVA UPS



UA15000056

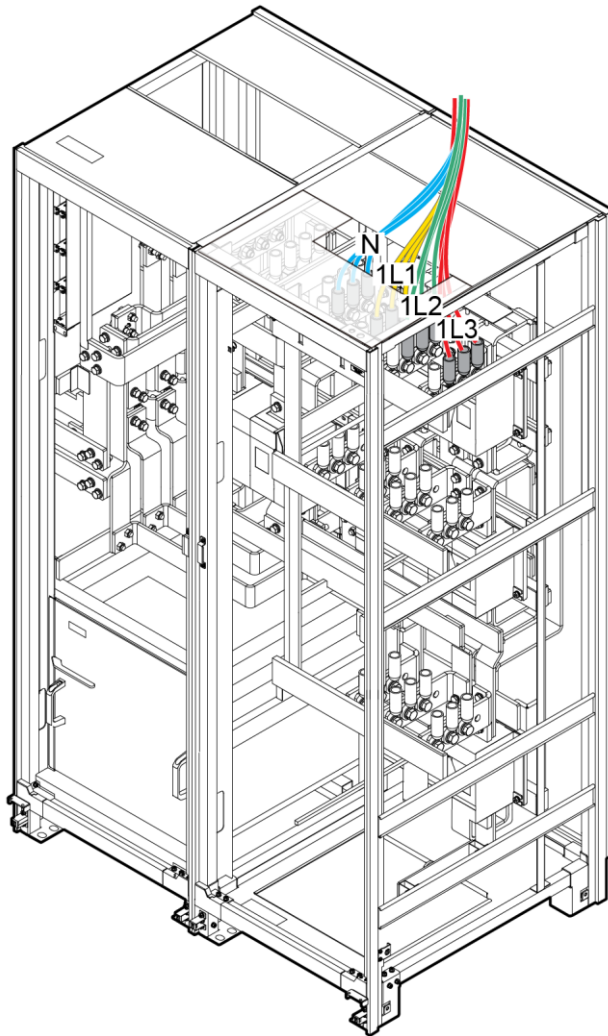
Step 3 Connect mains input power cables to mains input terminals 1L1, 1L2, and 1L3 respectively. Connect the neutral wires of mains input power cables to input N wiring terminals, as shown in [Figure 3-58](#) and [Figure 3-59](#).

Figure 3-58 Connecting mains input power cables to the 600 kVA UPS



UA15000060

Figure 3-59 Connecting mains input power cables to the 800 kVA UPS



UA15000068

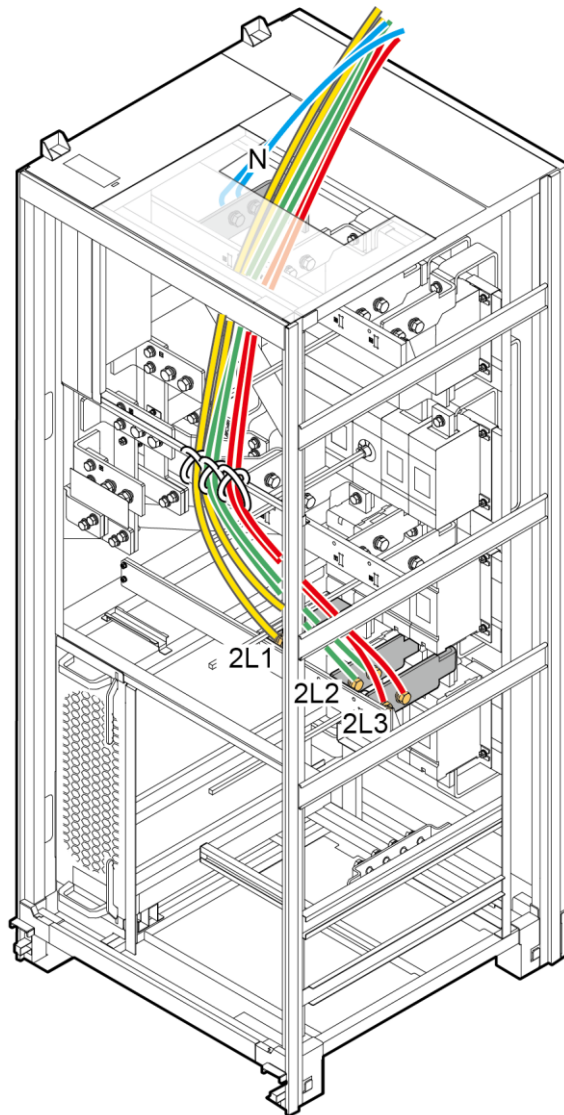
Step 4 Connect bypass input power cables to bypass input terminals 2L1, 2L2, 2L3. Connect the neutral wires of bypass input power cables to input N wiring terminals, as shown in [Figure 3-60](#) and [Figure 3-61](#).



NOTICE

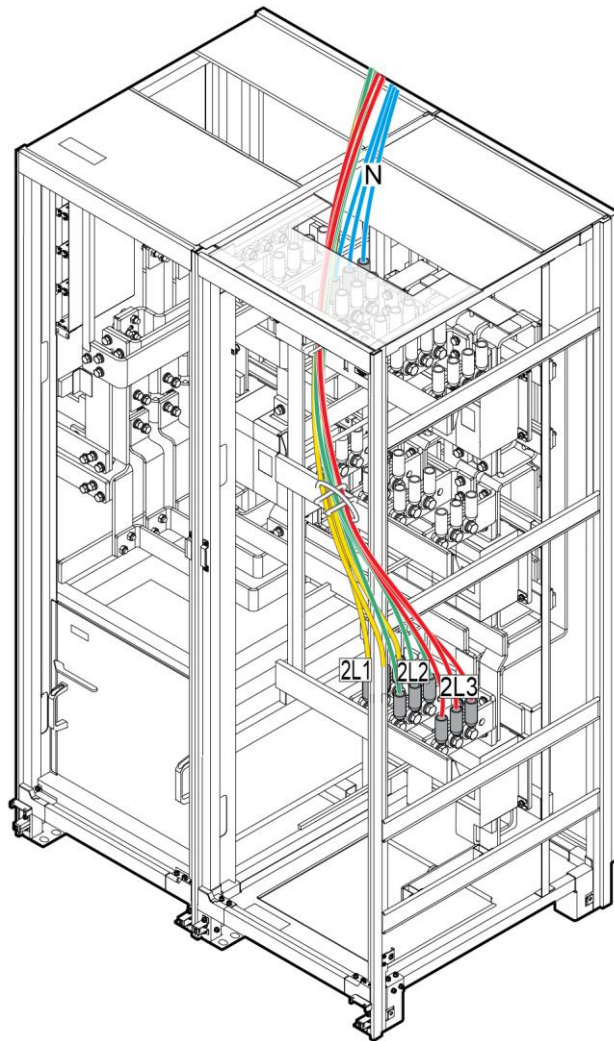
- If the mains input and bypass input use different power sources, connect four N wires to the 600 kVA UPS and six N wires to the 800 kVA UPS.
- After connecting cables, check that a certain clearance is reserved between the internal switch (if any) extension pole and power cables to avoid friction.

Figure 3-60 Connecting AC input power cables to the 600 kVA UPS



UA15000145

Figure 3-61 Connecting AC input power cables to the 800 kVA UPS



UA15000146

Step 5 Reinstall the rear cover in the cabinet.

----End

3.2.6 Connecting AC Output Power Cables



CAUTION

After you connect output power cables, if loads are not ready to be powered, insulate the end of the system output power cable.

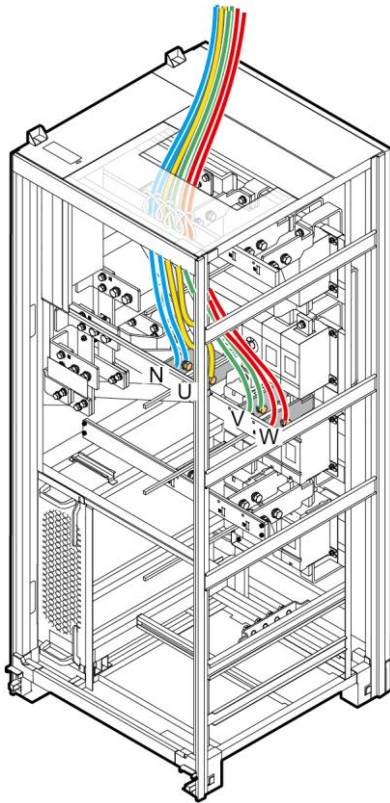


NOTICE

- The figure is for reference only. For details about the recommended cross-sectional area and number of AC output power cables, refer to [Table 3-3](#) and site requirements.
- After connecting cables, check that a certain clearance is reserved between the internal switch (if any) extension pole and power cables to avoid friction.

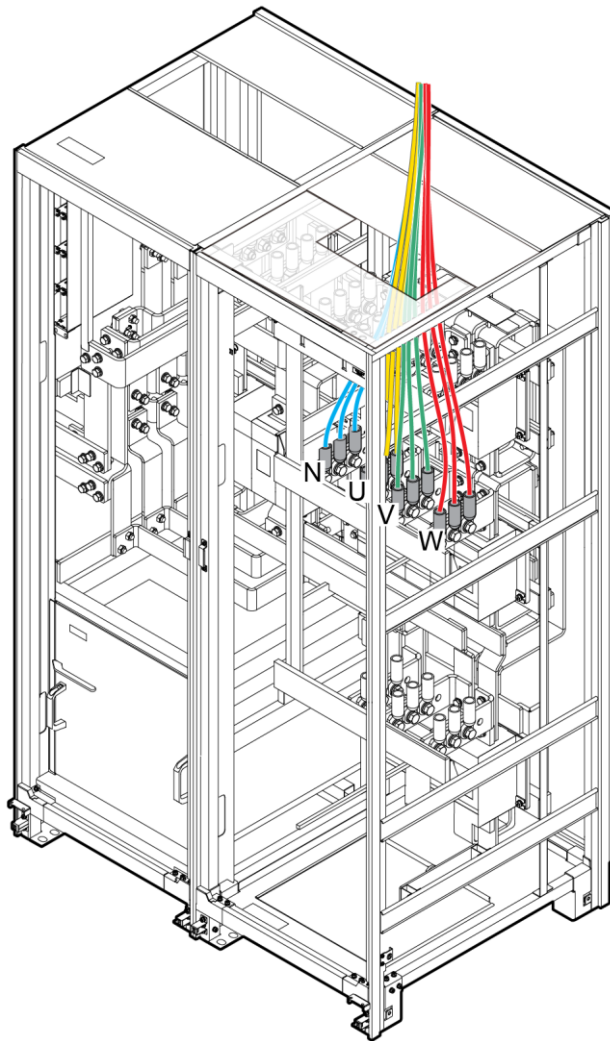
Connect the output power cables to output wiring terminals N, U, V, and W, as shown in [Figure 3-62](#) and [Figure 3-63](#).

Figure 3-62 Connecting AC output power cables to the 600 kVA UPS



UA15000061

Figure 3-63 Connecting AC output power cables to the 800 kVA UPS



UA15000070

3.2.7 Connecting Battery Cables



DANGER

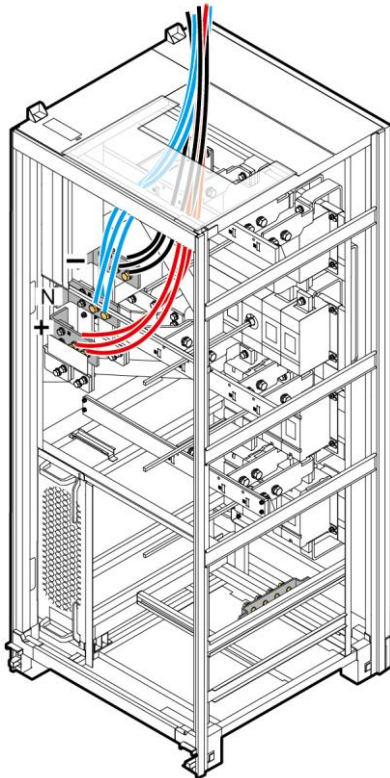
- The battery voltage may result in serious injury. Observe safety precautions when connecting cables.
- Ensure that cables are correctly connected between battery strings and the battery switch, and between the battery switch and the UPS. Avoid inverse connections.

 **NOTICE**

The figure is for reference only. For details about the recommended cross-sectional area and number of battery cables, refer to [Table 3-3](#) and site requirements.

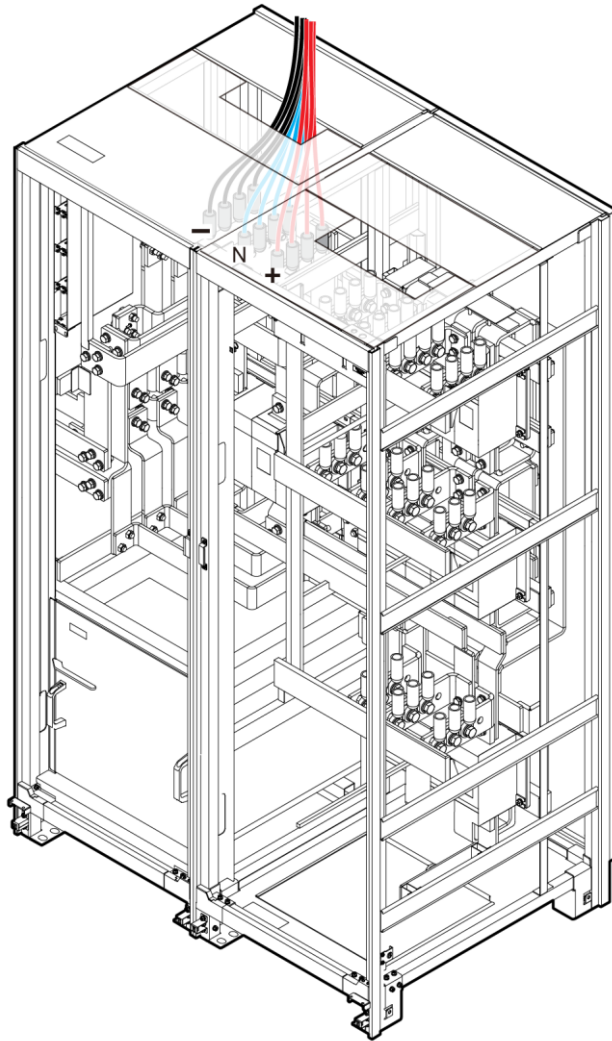
Connect battery cables to battery wiring terminals -, N, and +, as shown in [Figure 3-64](#) and [Figure 3-65](#).

Figure 3-64 Connecting battery cables to the 600 kVA UPS



UA15000062

Figure 3-65 Connecting battery cables to the 800 kVA UPS

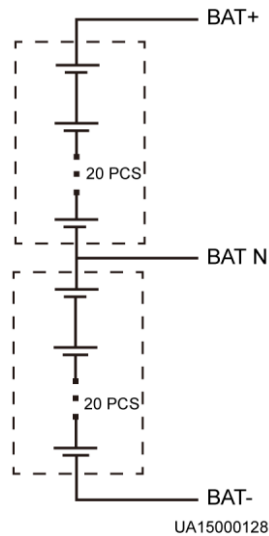


UA15000071

Route a neutral wire from the middle of the positive and negative battery strings.

Take a battery string consisting of 40 batteries as an example. [Figure 3-66](#) shows a neutral wire routed from the middle of positive and negative battery strings, each consisting of 20 batteries.

Figure 3-66 Neutral wire



 **NOTE**

After you connect cables, reinstall the beam and switch extension poles (if removed), power distribution covers, and bypass cabinet side panel on the cabinet.

3.2.8 Remote EPO



NOTICE

- Huawei does not provide the EPO switch or cable. Prepare them by yourself. The recommended cable is 22 AWG.
- Equip the EPO switch with a protective cover to prevent misoperations, and cover the cable with protective tubing.
- Triggering EPO will shut down the rectifier, inverter, charger, and static bypass, but does not disconnect the UPS mains input. To power off the UPS completely, turn off the front-end input switch when you trigger EPO.

Connect the prepared EPO switch to UPS dry contacts. [Figure 3-67](#) and [Figure 3-68](#) show the cable connections for an NC EPO switch and an NO EPO switch.

Figure 3-67 Cable connection for an NC EPO switch

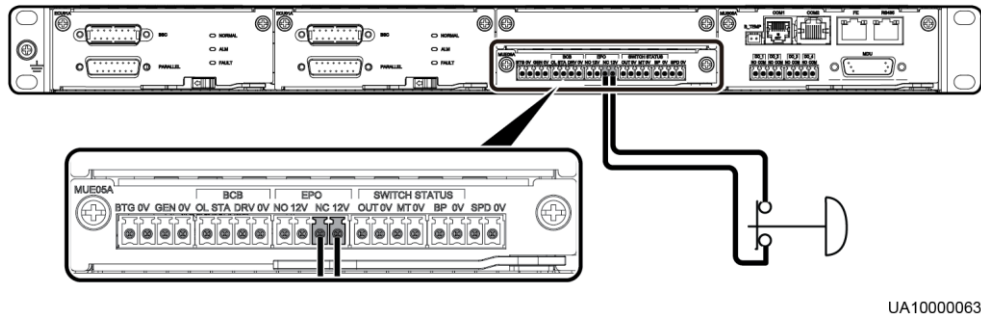
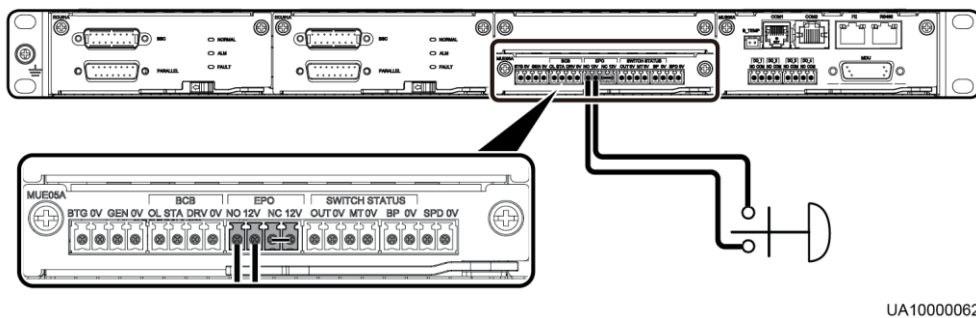


Figure 3-68 Cable connection for an NO EPO switch



NOTE

- When the EPO switch is in the NC state, remove the jumper between EPO_NC and EPO_12V before connection. When you turn off the EPO switch, EPO is triggered.
- When the EPO switch is in the NO state, ensure that the jumper is connected between EPO_NC and EPO_12V. When you turn on the EPO switch, EPO is triggered.

3.2.9 Connecting Communications Cables

Procedure

- Step 1** Connect the external network management device to the RS485 port. [Figure 3-69](#) and [Table 3-10](#) describe the RS485 pin definitions.

Figure 3-69 RS485 pins

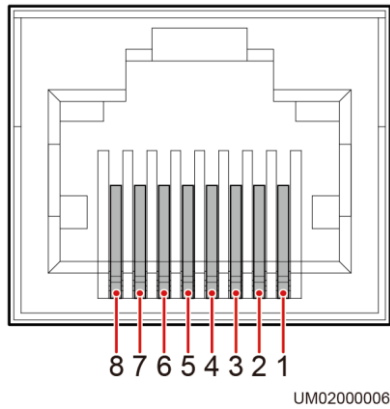


Table 3-10 Pin definition

Pin	Description
1	RS485_T+
2	RS485_T-
3	N/A
4	RS485_R+
5	RS485_R-
6	GND
7	N/A
8	N/A

 **NOTE**

If cables are prepared onsite, follow the three methods below:

- Connect pin 1 and pin 2. Pin 1 connects to RS485+ and pin 2 connects to RS485-.
- Connect pin 4 and pin 5. Pin 4 connects to RS485+ and pin 5 connects to RS485-.
- Connect pins 1, 2, 4, and 5. Twist cables to pin 1 and pin 4 into one cable and then connect it to RS485+. Twist cables to pin 2 and pin 5 into one cable and then connect it to RS485-.

Step 2 Connect the network port on a PC to the FE port.

----End

3.3 Parallel System Installation

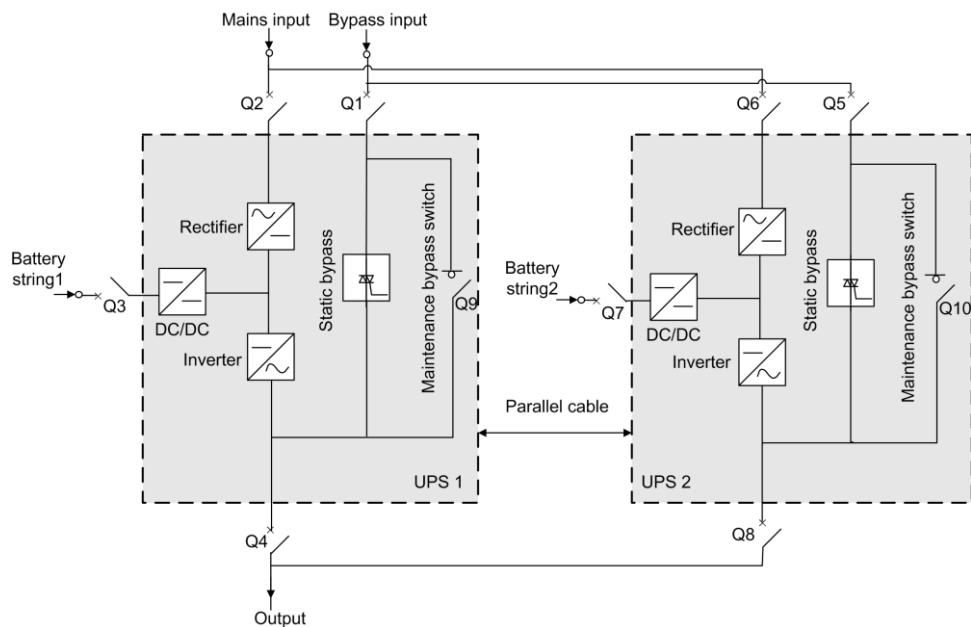
3.3.1 Connecting Power Cables

Procedure

- Step 1** Ground each single UPS. For details, see section [3.2.4 Connecting Ground Cables](#).
- Step 2** Connect power cables for each UPS. For details, see section [3.2.5 Connecting AC Input Power Cables](#) and [3.2.6 Connecting AC Output Power Cables](#).
- Step 3** Connect battery power cables of each UPS. For details, see section [3.2.7 Connecting Battery Cables](#).
- Step 4** Choose a parallel mode and connect cables to the parallel system based on site requirements.

[Figure 3-70](#), [Figure 3-71](#), and [Figure 3-72](#) show the typical conceptual diagram and cable connections for a 1+1 parallel system.

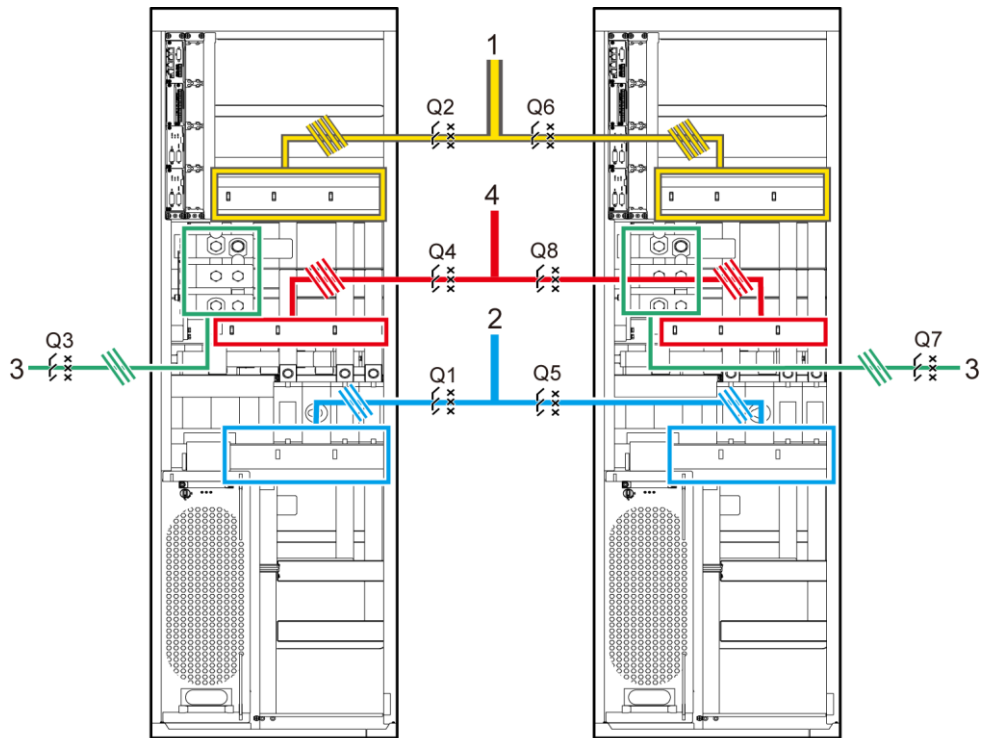
Figure 3-70 Conceptual diagram of a 1+1 parallel system



 **NOTICE**

- To clearly and simply show cable connections, this document uses "the number of oblique lines" to indicate the number of power cables of the same type.
- Connect power cables according to port silk screen.

Figure 3-71 Connecting cables to a 1+1 parallel system (600 kVA)



UA13000035

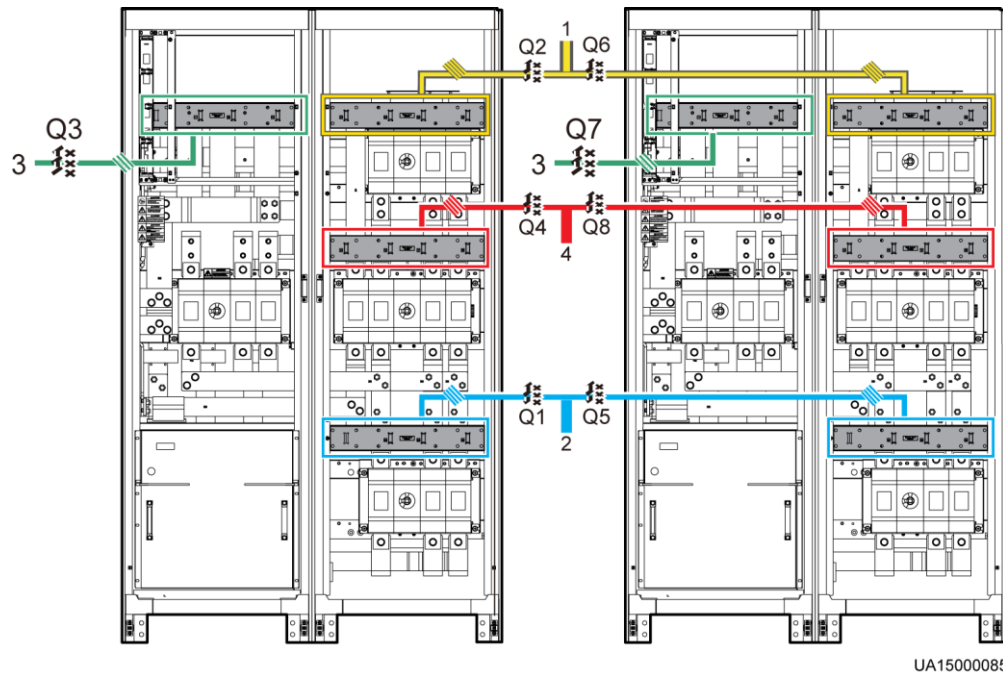
(1) Mains input power cables

(2) Bypass input power cables

(3) Battery cables

(4) Output power cables

Figure 3-72 Connecting cables to a 1+1 parallel system (800 kVA)



- | | | | |
|------------------------------|-------------------------------|--------------------|-------------------------|
| (1) Mains input power cables | (2) Bypass input power cables | (3) Battery cables | (4) Output power cables |
|------------------------------|-------------------------------|--------------------|-------------------------|

Figure 3-73, Figure 3-74, and Figure 3-75 show the conceptual diagram and cable connections for a bus system consisting of two UPS systems respectively.

 **NOTICE**

The length and specifications of power cables on each UPS must be the same to achieve current equalization in bypass mode. The power cables include bypass input power cables and UPS output power cables.

Figure 3-73 Conceptual diagram of a dual-bus system

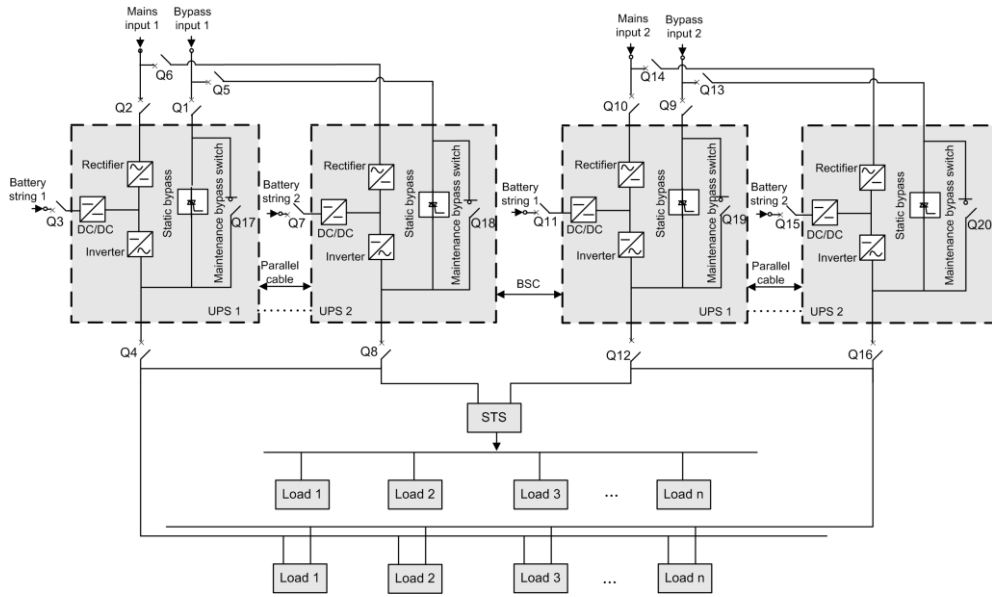
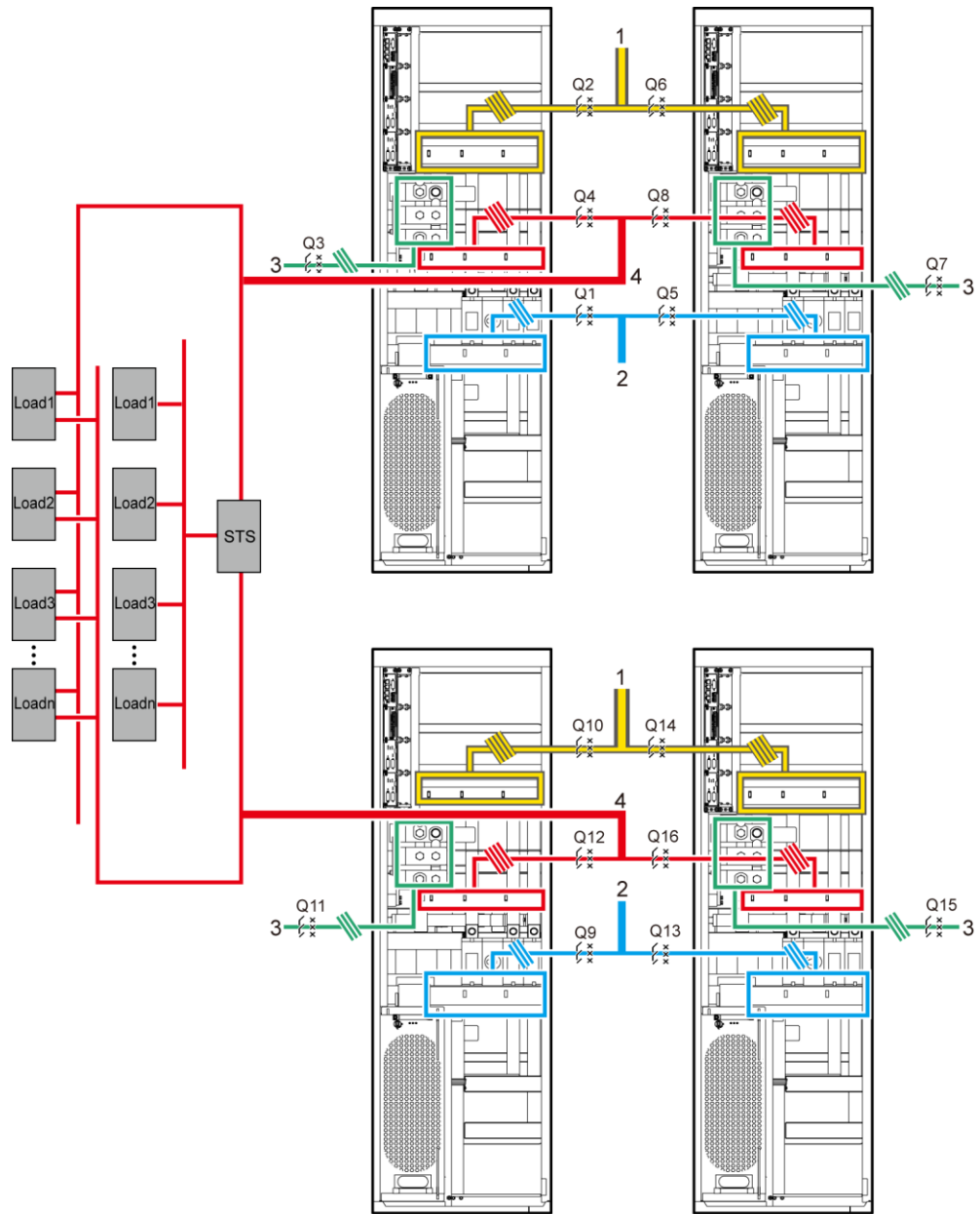


Figure 3-74 Connecting cables to a dual-bus system (600 kVA)



UA13000036

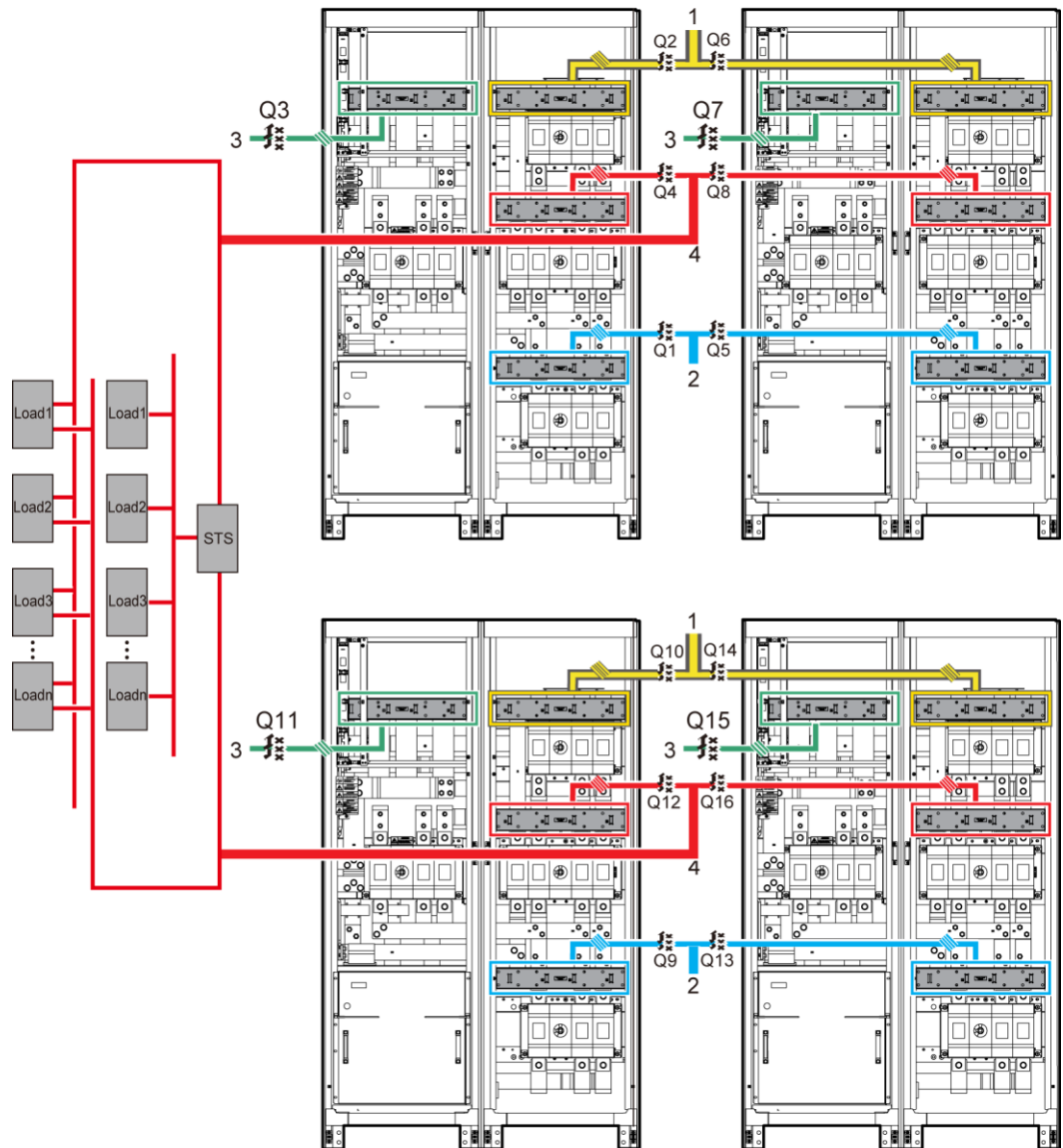
(1) Mains input power cables

(2) Bypass input power cables

(3) Battery cables

(4) Output power cables

Figure 3-75 Connecting cables to a dual-bus system (800 kVA)



UA15000082

(1) Mains input power cables

(2) Bypass input power cables

(3) Battery cables

(4) Output power cables

----End

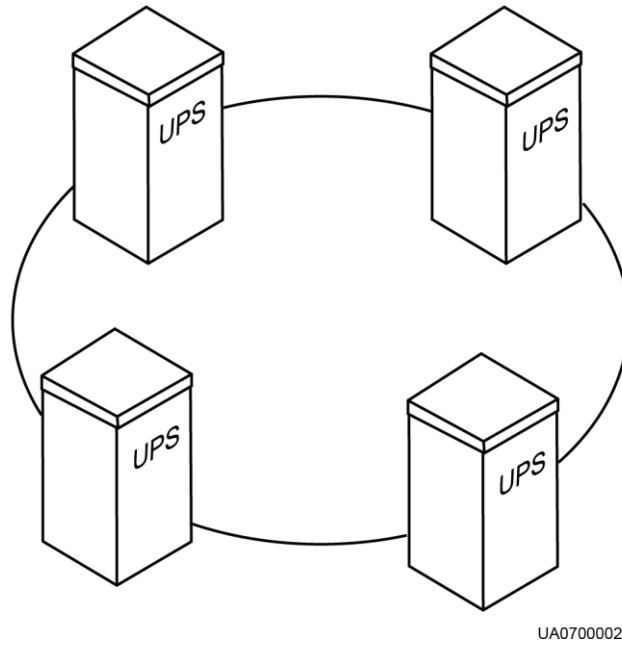
3.3.2 Connecting Signal Cables

Connecting Signal Cables to a Parallel System

Connect the parallel ports on the UPSs over parallel cables to create a loop.

- [Figure 3-76](#) and [Figure 3-77](#) show the wiring principle for an N+X parallel system.

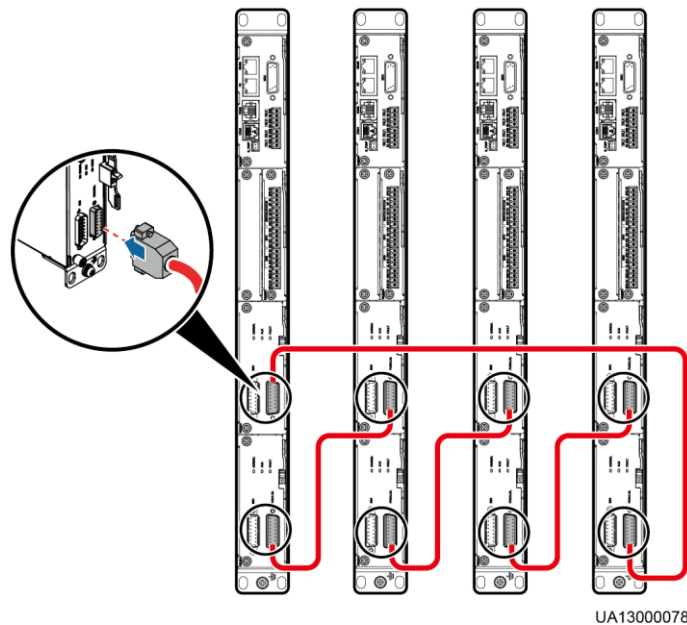
Figure 3-76 N+X parallel system topology



NOTICE

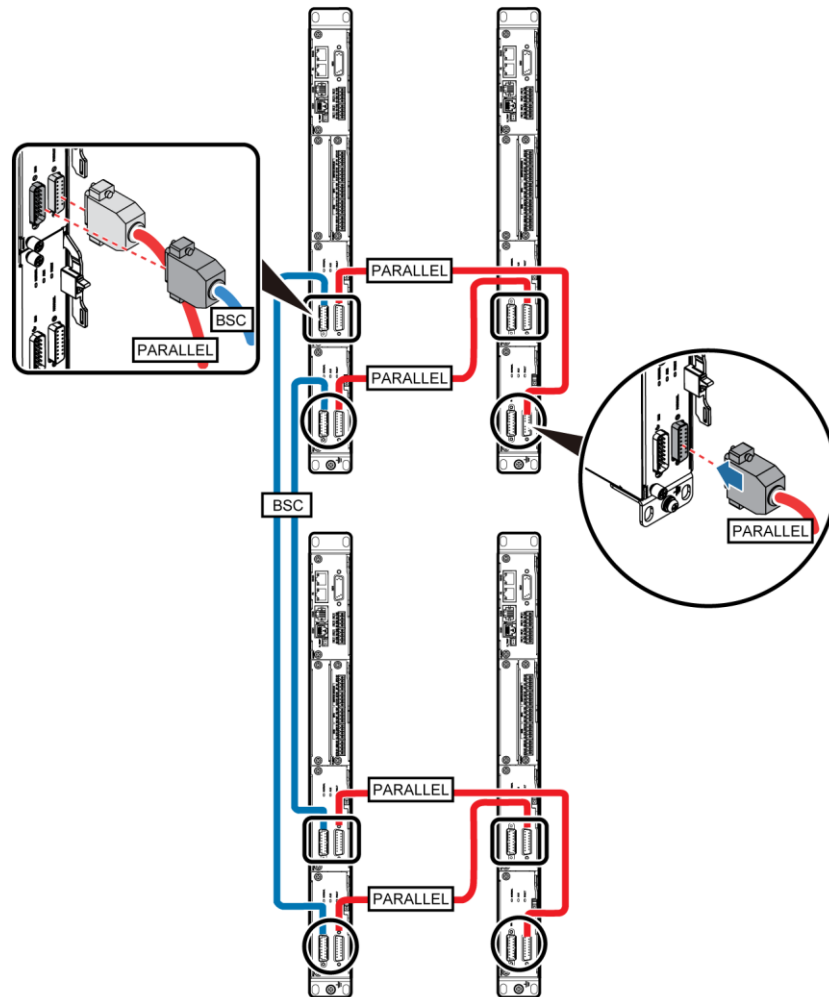
Figure 3-77 shows only the CM, which stands for the UPS.

Figure 3-77 Signal cable connections of N+X parallel system



- In a dual-bus parallel system, BSC cables are added for the master and slave systems. [Figure 3-78](#) shows cable connections in a dual-bus system consisting of two master systems in parallel.

Figure 3-78 Connecting signal cables to a dual-bus system



UA13000034

Connecting Other Signal Cables

Connect signal cables to each UPS in the parallel system by referring to [2.4 Control Module](#).

3.4 Installing Optional Components

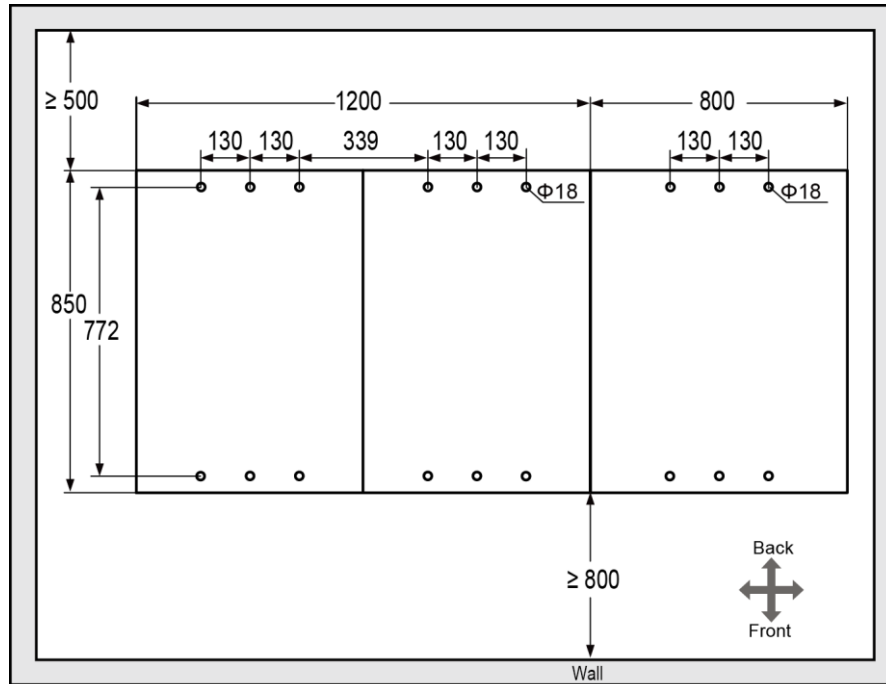
3.4.1 Installing Antiseismic Kits

 **NOTICE**

Install antiseismic kits only when the cabinet is floor-mounted.

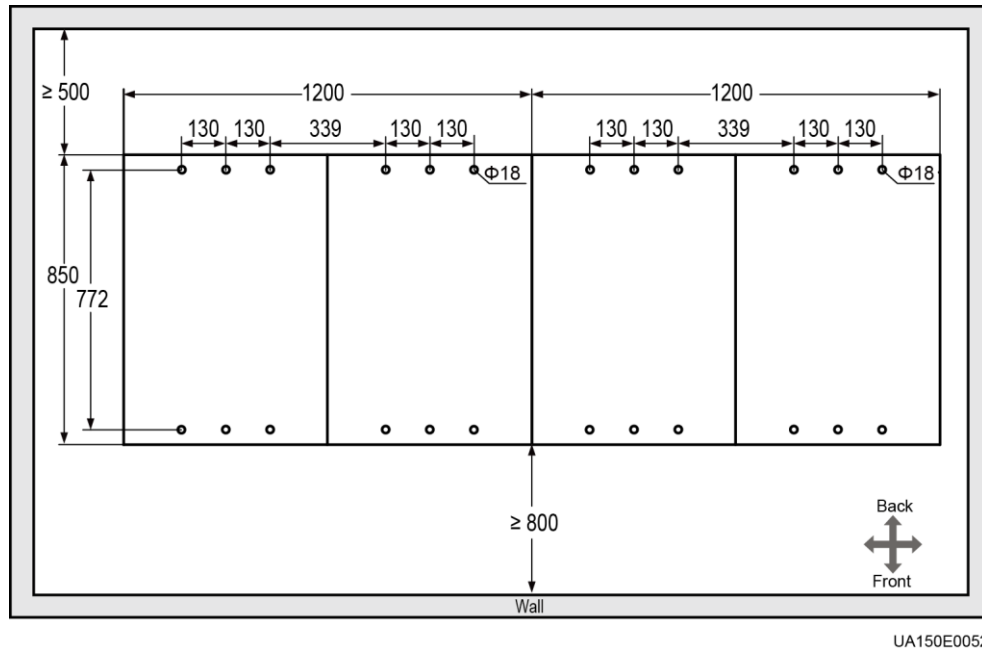
- Step 1** Mark mounting holes on the ground according to the marking-off template, as shown in [Figure 3-10](#) and [Figure 3-11](#). [Figure 3-79](#) and [Figure 3-80](#) show the dimensions of antiseismic kit mounting holes.

Figure 3-79 Dimensions of antiseismic kit mounting holes for the 600 kVA UPS (unit: mm)



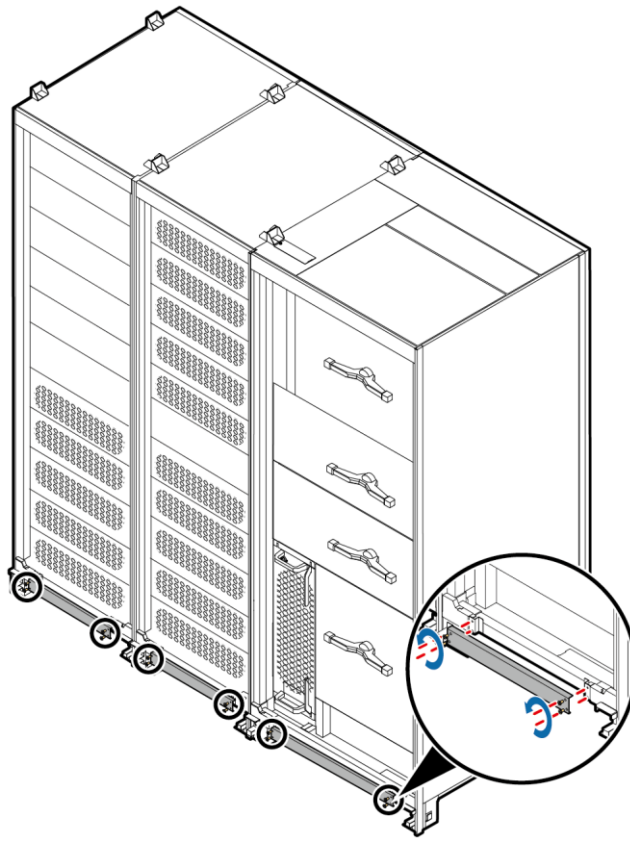
UA150E0046

Figure 3-80 Dimensions of antiseismic kit mounting holes for the 800 kVA UPS (unit: mm)



- Step 2** Drill holes for installing expansion bolts, and install expansion sleeve by referring to section [3.2.1.1 Installing the UPS on the Ground](#).
- Step 3** Open the front door, and remove support baffle plates on the front of the cabinet, as shown in [Figure 3-81](#). Remove the rear covers.

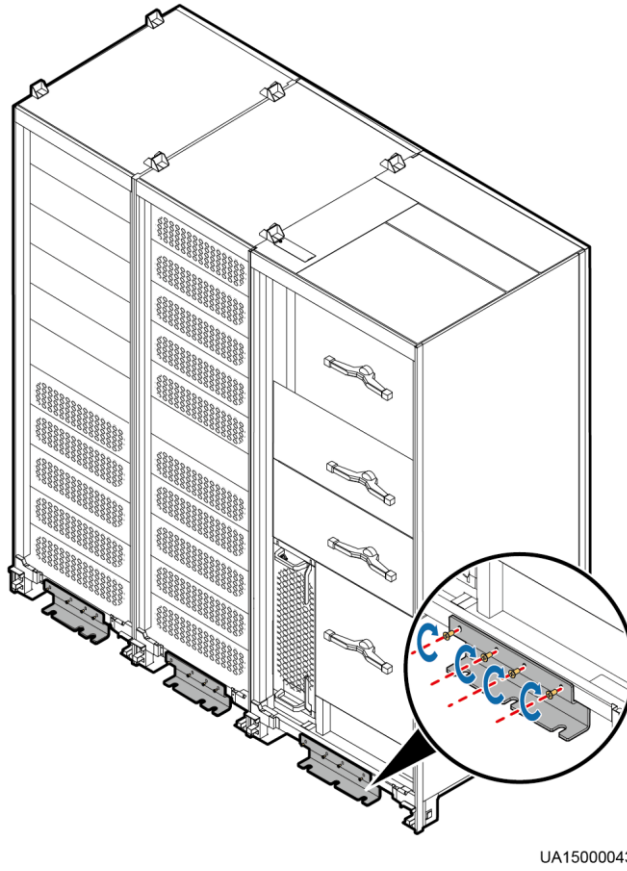
Figure 3-81 Removing support baffle plates



UA15000053

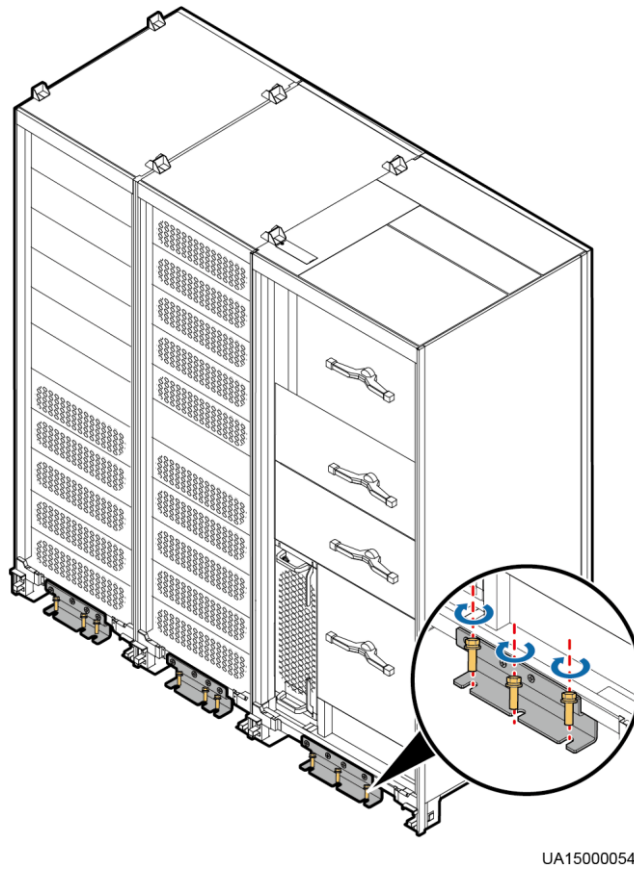
Step 4 Use M6 screws to secure the antiseismic kits to the front and rear of the cabinet to a torque of 3 N m. Using the front of the cabinet as an example, the procedure is shown in [Figure 3-82](#).

Figure 3-82 Securing the antiseismic kits to the cabinet



- Step 5** Adjust the cabinet to ensure that the expansion bolts holes align with the beneath half holes.
- Step 6** Use M12x60 expansion bolts to firmly lock the front and rear antiseismic kits to the ground. Using the front of the cabinet as an example, the procedure is shown in [Figure 3-83](#).

Figure 3-83 Locking the antiseismic kits to the ground



Step 7 Reinstall the support baffle plates and rear covers in the cabinet.

Step 8 Install the front and rear anchor baffle plates and left and right anchor baffle plates, as shown in [Figure 3-21](#).

----End

3.4.2 Installing an IP21 Component

Context



NOTICE

If the IP21 component is installed, you cannot route cables at the top of the cabinet.

Procedure

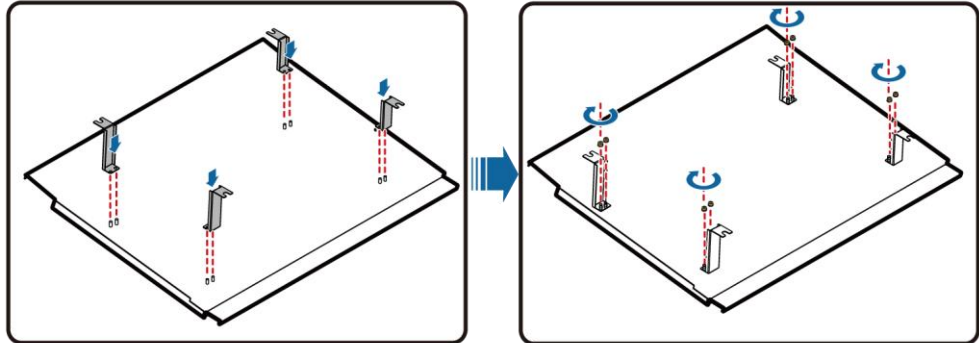
Step 1 Install leveling feet at the bottom of the IP21 component, with two long feet on the front and two short feet at the rear, as shown in [Figure 3-84](#).



NOTE

Refer to the "front" and "back" silk screens on the surface of the IP21 component.

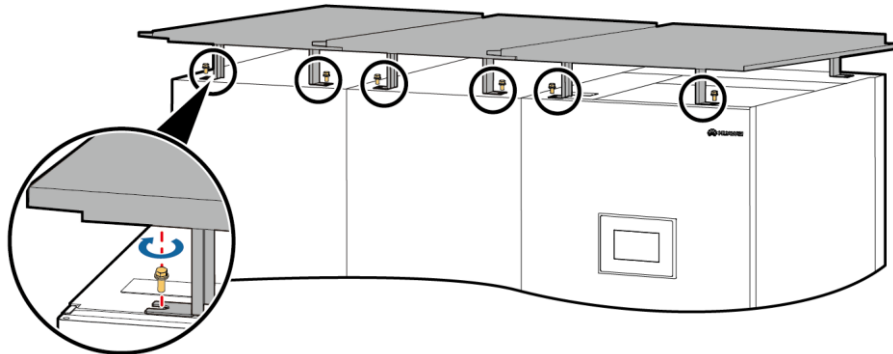
Figure 3-84 Installing leveling feet



UA13000020

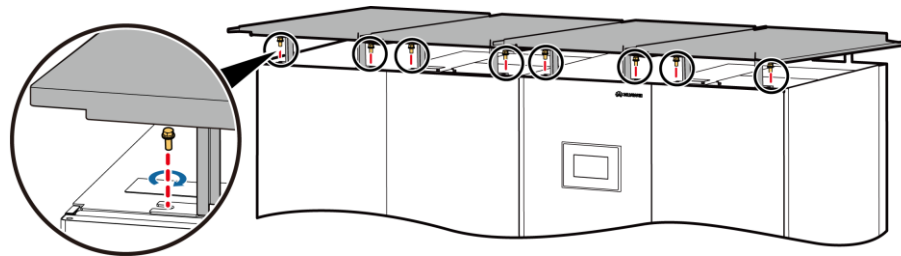
Step 2 Install the IP21 component at the top of the UPS cabinet by using M12 screws, as shown in [Figure 3-85](#) and [Figure 3-86](#).

Figure 3-85 Installing an IP21 component (600 kVA)



UA15000089

Figure 3-86 Installing an IP21 component (800 kVA)



UA15000086

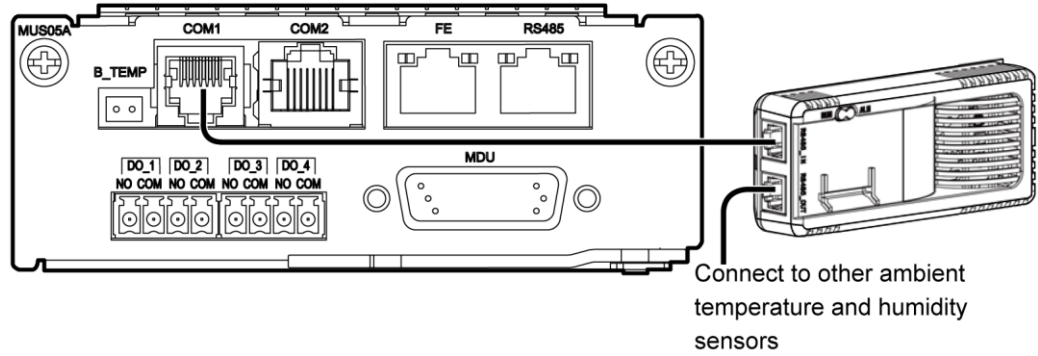
----End

3.4.3 Installing an Ambient Temperature and Humidity Sensor

See the *UPS Ambient Temperature and Humidity Sensor User Manual*.

[Figure 3-87](#) shows the position of an ambient temperature and humidity sensor in the UPS.

Figure 3-87 Connecting a UPS to an ambient temperature and humidity sensor



UB060E0003

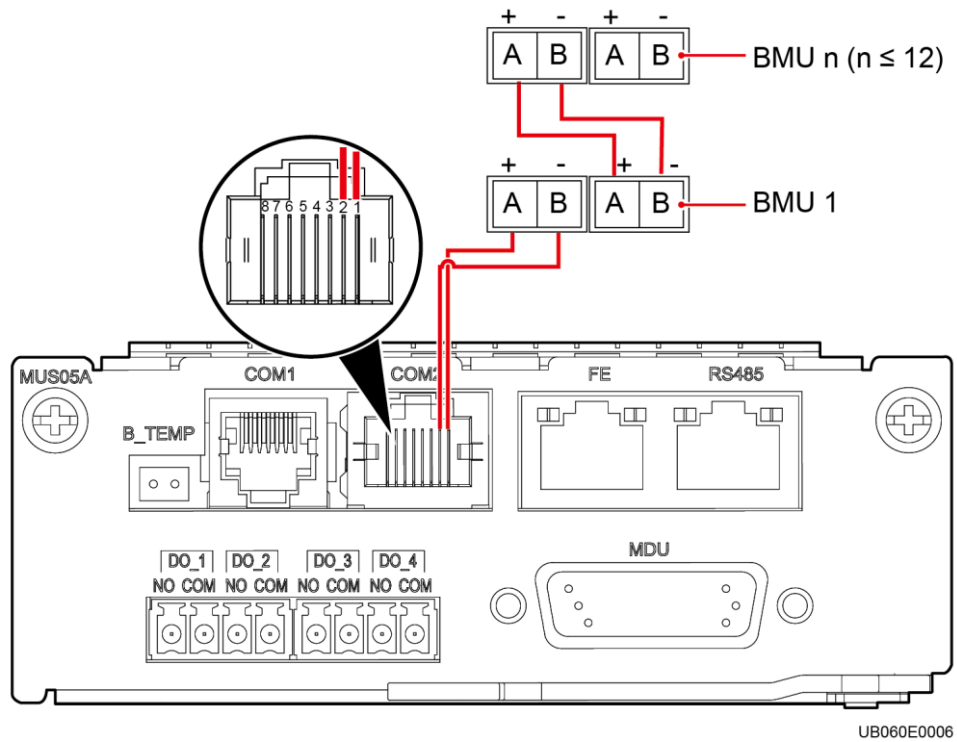
3.4.4 Installing a BMU

Procedure

Step 1 Install a BMU.

For details, see the *UPS Battery Monitor Unit User Manual*. [Figure 3-88](#) shows the BMU position in the UPS.

Figure 3-88 Connecting a BMU to the UPS



----End

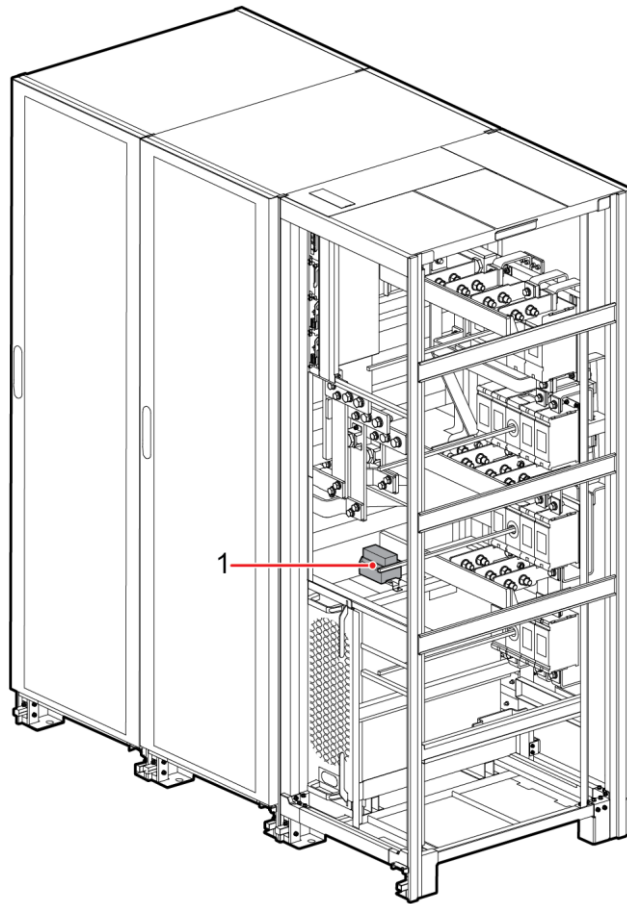
3.4.5 Installing a Battery Grounding Failure Detector

Procedure

Step 1 Install a battery grounding failure detector.

For details, see the *UPS Battery Grounding Failure Detector User Manual*. [Figure 3-89](#) and [Figure 3-90](#) show the positions of battery grounding failure detectors in the UPSs.

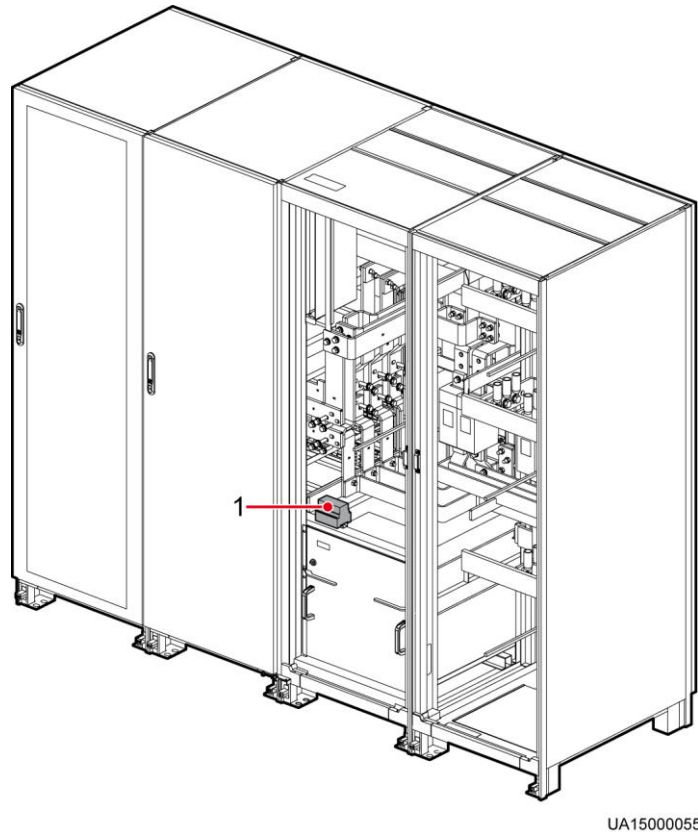
Figure 3-89 Position of a battery grounding failure detector in the 600 kVA UPS



UA15000064

(1) Battery grounding failure detector

Figure 3-90 Position of a battery grounding failure detector in the 800 kVA UPS



(1) Battery grounding failure detector

----End

3.5 Installation Verification

Table 3-11 lists check items.



NOTICE

Check items 10 and 11 listed in Table 3-11 carefully. If the check results of these two items do not meet the acceptance criteria, the UPS may be damaged.

Table 3-11 Installation checklist

No.	Item	Acceptance Criteria
01	Consistency between system configurations and delivery configurations	The system configurations, including models and the number of modules, comply with the contract.

No.	Item	Acceptance Criteria
02	Cable layout	Cables are routed properly and meet engineering requirements.
03	Secure cable connections	Input and output power cables and battery cables are securely connected and spring washers are flattened, preventing falling off and safety accidents. Ensure that there is no disconnection or potential risk.
04	Marks for tightened screws	Tightened screws are marked.
05	Serial port connection (security protection mechanism supported)	Signal cables are connected properly and securely.
06	Cable labels	Both ends of each cable are labeled. Labels are easy to understand.
07	Ground cable connections	The ground cable is securely connected to the equipment room ground bar. Measure the resistance between the UPS ground cable and the equipment room ground bar, which must be less than 1 ohm.
08	Distances between cable ties	Distances (recommended: 30 cm) between cable ties are the same, and no burr exists.
09	Cable connections	Cables are properly connected according to wiring diagrams.
10	Live wire and neutral wire connections	Input and output live wires and neutral wires are correctly connected. Mains input terminals 1L1, 1L2, 1L3, and N, bypass input terminals 2L1, 2L2, 2L3, and N, and output terminals U, V, W, and N are properly connected.
11	Input and output live wire phase sequences	In single UPS mode, mains and bypass input and output live wires are connected in a correct sequence. In a parallel system, mains and bypass input and output live wires are connected in the same sequence for each UPS.
12	Battery cable connections	Check that the voltages on the positive and negative battery terminals and battery N are correct using a multimeter.
13	Operating environment	Clean the conductive dust and other sundries inside and outside the cabinet.
14	Copper busbar short circuit	Check that copper busbars are open-circuited using a multimeter or an insulation resistance tester.



NOTE

After routing cables and checking cable connections, use firestop putty to fill in the gap between the cables and the cabinets, and reinstall the covers for the cabinets.

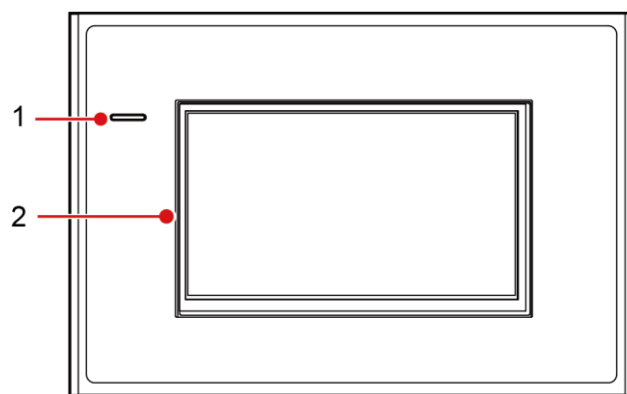
4 User Interface

4.1 LCD Interface

4.1.1 LCD

The MDU is located on the front door of the cabinet. The MDU allows you to control the UPS operation, set parameters, and view running status and alarms. The MDU provides a status indicator and an LCD touchscreen, as shown in [Figure 4-1](#).

Figure 4-1 MDU



UA13000043

(1) Status indicator

(2) LCD touchscreen



NOTE

Touch the LCD screen firmly because it is an industrial resistive touchscreen. It is recommended that you use your fingernails for accurate selection and quick response, as shown in [Figure 4-2](#).

Figure 4-2 Touching the LCD

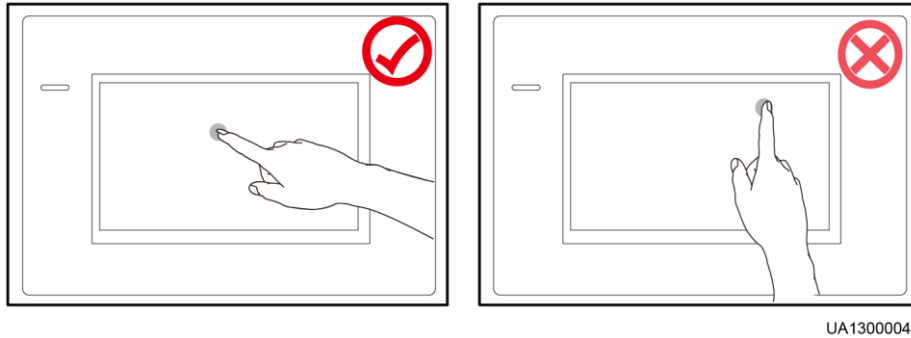


Table 4-1 describes the status indicator.

Table 4-1 Status indicator

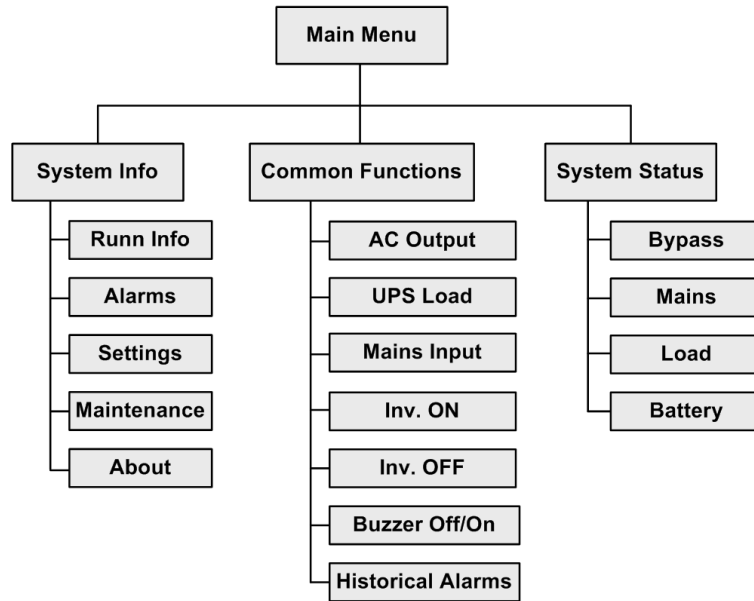
Status	Color	Meaning
On	Red	A critical alarm has been generated, and the buzzer sounds continuously.
	Yellow	A minor alarm has been generated, and the buzzer buzzes at 2 Hz.
	Green	The UPS is running properly.
Off	N/A	The MDU is powered off.

4.1.2 LCD Menu

4.1.2.1 Menu Hierarchy

Figure 4-3 shows the LCD menu hierarchy.

Figure 4-3 Menu Hierarchy



4.1.2.2 Initial Startup



NOTICE

User interfaces displayed in this document use the 600 kVA UPS as an example and correspond to the monitoring software version V100R001C10SPC009 and are for reference only.

The **Settings Wizard** screen is displayed when you start the UPS for the first time or when you restart the UPS after restoring factory settings, as shown in [Figure 4-4](#). You can set **Language**, **Time**, **Network Param.**, and **System Param.** on the **Settings Wizard** screen.

Figure 4-4 Settings Wizard



4.1.2.3 Main Menu

The LCD screen is divided into three parts: **status bar**, **alarm bar** and **information area**. [Figure 4-5](#) shows the default main screen. [Table 4-2](#) describes functions of all domains on the screen.

Figure 4-5 Main Menu screen

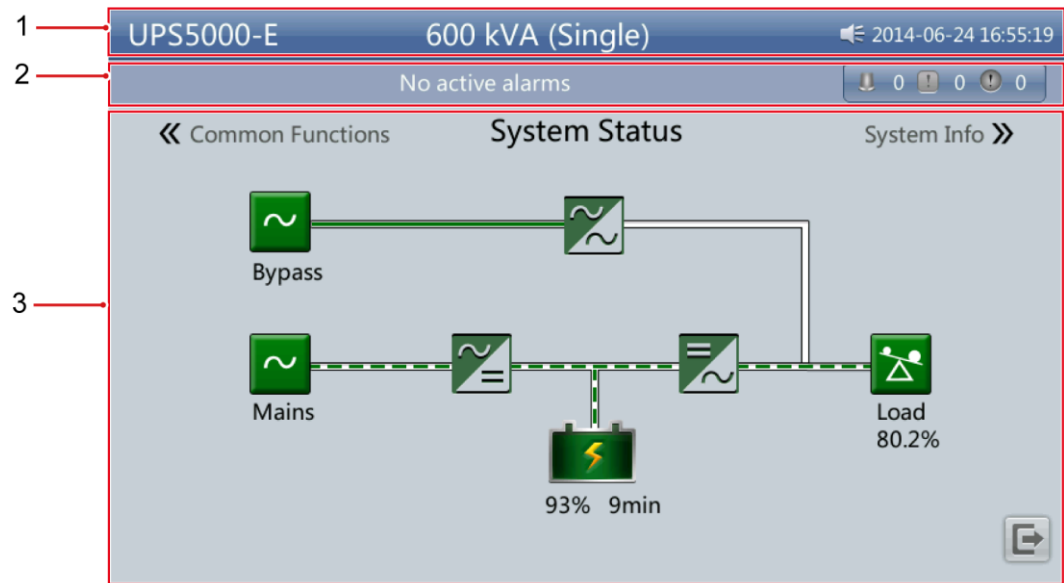







Table 4-2 Main screen description

Number	Area	Function
1	Status bar	Displays the UPS model, capacity, configuration, current date and time, Universal Serial Bus (USB) flash drive status, and buzzer status.
2	Alarm bar	Displays active alarms in a scrolling list and the number of active alarms based on severity. Tap the alarm icon area to open the active alarm page.
3	Information area	Displays the power flow as well as the key information such as load and battery information. Tap the Bypass , Mains , Battery , and Load icons to view details.

Table 4-3 describes the functions of common buttons.

Table 4-3 Functions of common buttons

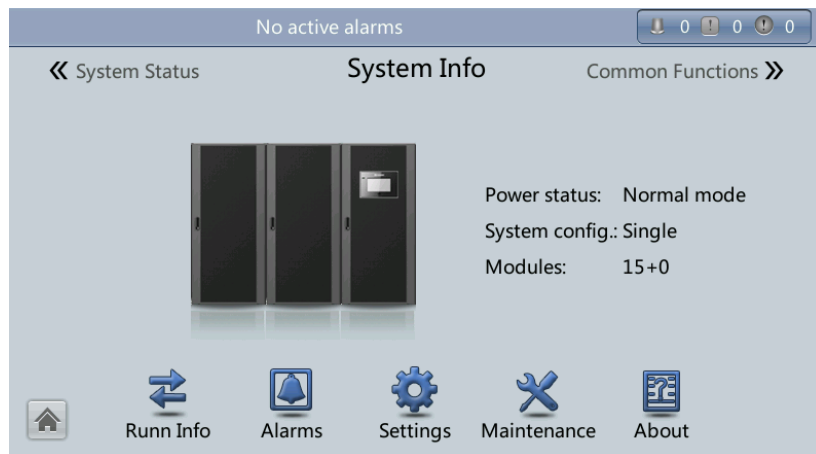
Button	Function
	Returns to the main screen.
	Goes to the lower part of a page.
	Goes to the upper part of a page.

Button	Function
	Returns to the upper-level menu.
	Logs out.

4.1.3 System Info Screen

On the main screen, tap **System Info**. The **System Info** screen is displayed, as shown in [Figure 4-6](#).

Figure 4-6 System Info screen



 **NOTE**

For details about the menus on the **System Info** screen, see [appendix A.1 Menus on the LCD](#).

4.1.3.1 Cabinet Data Screen


On the **System Info** screen, tap the UPS picture. On the **Cabinet Data** screen, select a module to view its running data.  points to a selected module, as shown in [Figure 4-7](#) and [Figure 4-8](#).

Figure 4-7 Cabinet 1 Data screen

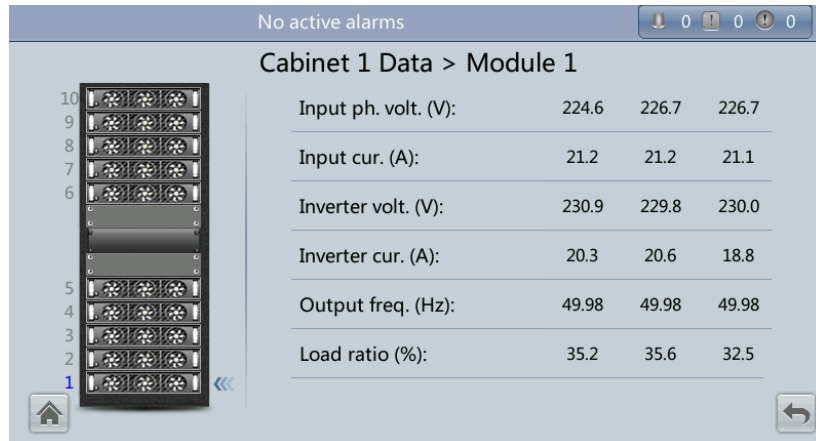
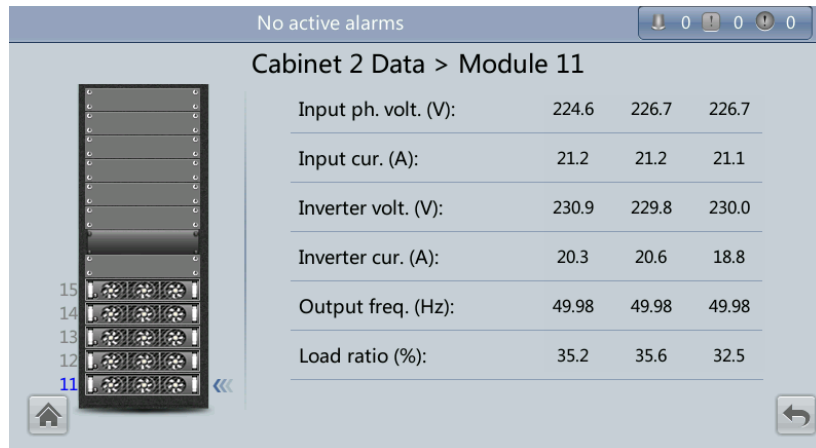


Figure 4-8 Cabinet 2 Data screen



4.1.3.2 Runn Info Screen


On the **System Info** screen, tap  to access the **Runn Info** screen. On this screen, you can query **AC Output**, **UPS Load**, **Mains Input**, and **Bypass Input**. See [Figure 4-9](#) and [Figure 4-10](#).

Figure 4-9 Runn Info screen 1

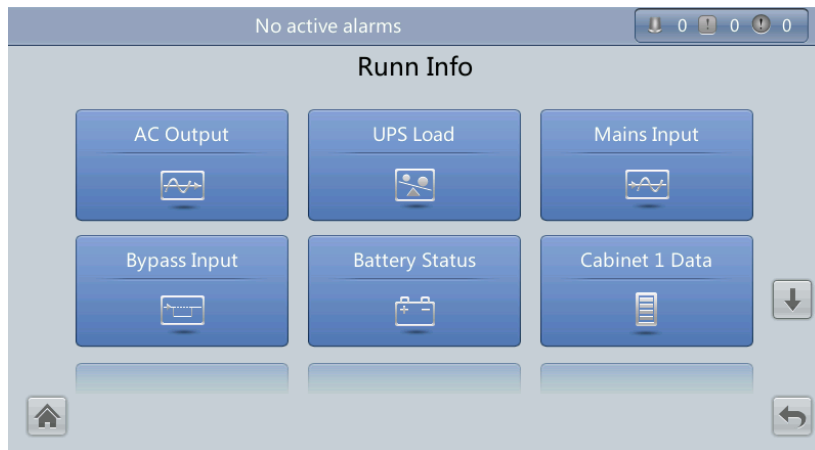
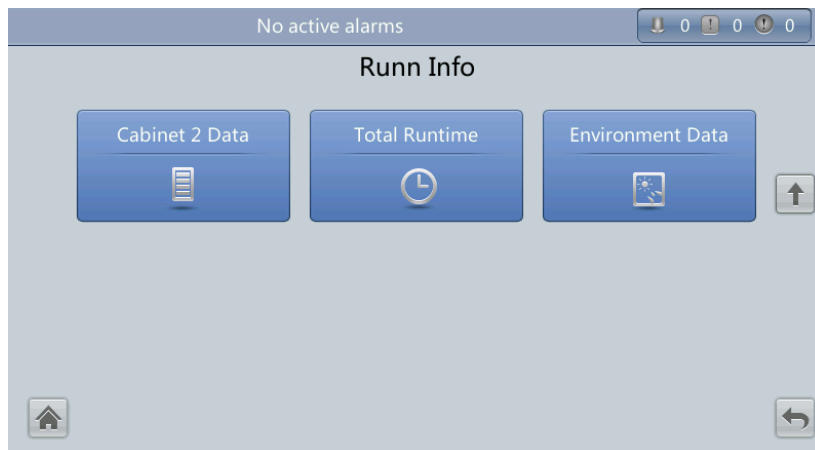


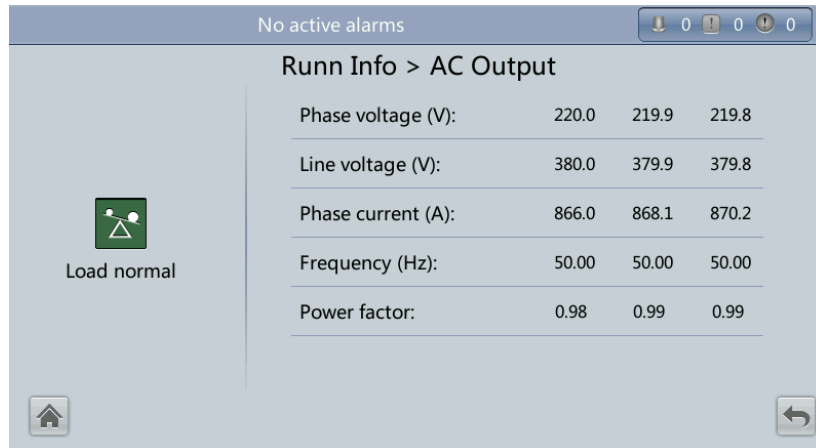
Figure 4-10 Runn Info screen 2



AC Output

Figure 4-11 shows the **AC Output** screen.

Figure 4-11 AC Output screen

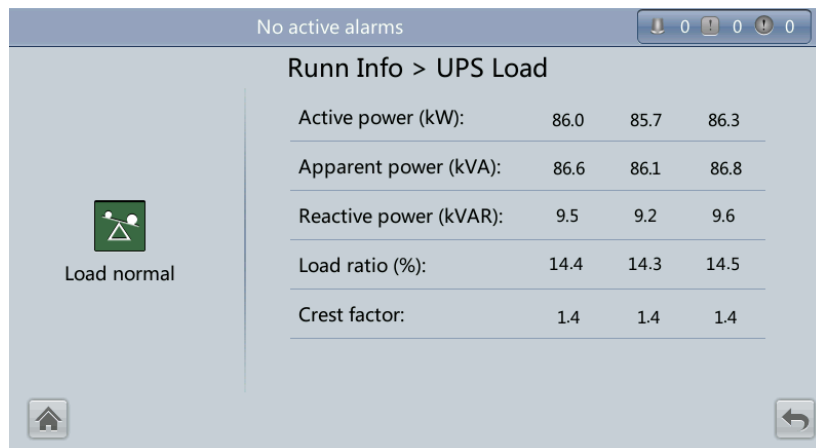


- **Phase voltage (V)/Line voltage (V)/Phase current (A)/Frequency (Hz)**
AC output phase voltage/AC output line voltage/AC output phase current/AC output frequency.
- **Power factor**
Proportion of output active power to output apparent power.

UPS Load

Figure 4-12 shows the **UPS Load** screen.

Figure 4-12 UPS Load screen



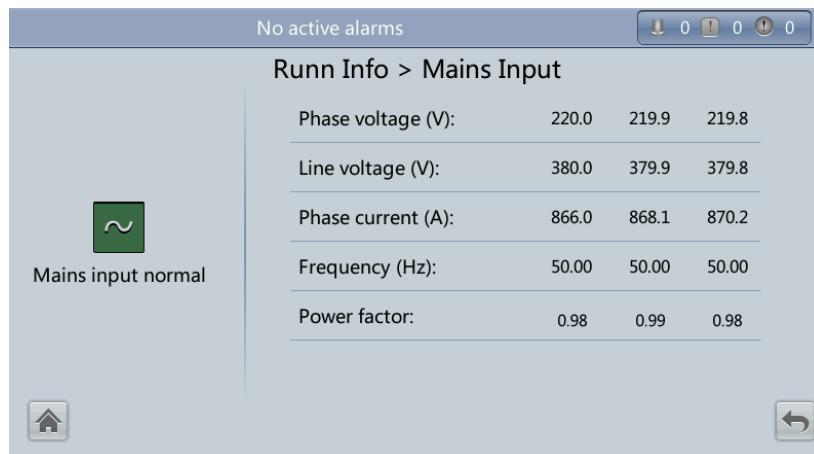
- **Active power (kW)**
Output active power of each phase on the UPS.
- **Apparent power (kVA)**
Output apparent power of each phase on the UPS.
- **Reactive power (kVAR)**
Output reactive power of each phase on the UPS.

- **Load ratio (%)**
Load ratio of each phase on the UPS, that is, proportion of actual power to rated power.
- **Crest factor**
Proportion of the peak value of load current to the valid value.

Mains Input

Figure 4-13 shows the **Mains Input** screen.

Figure 4-13 Mains Input screen

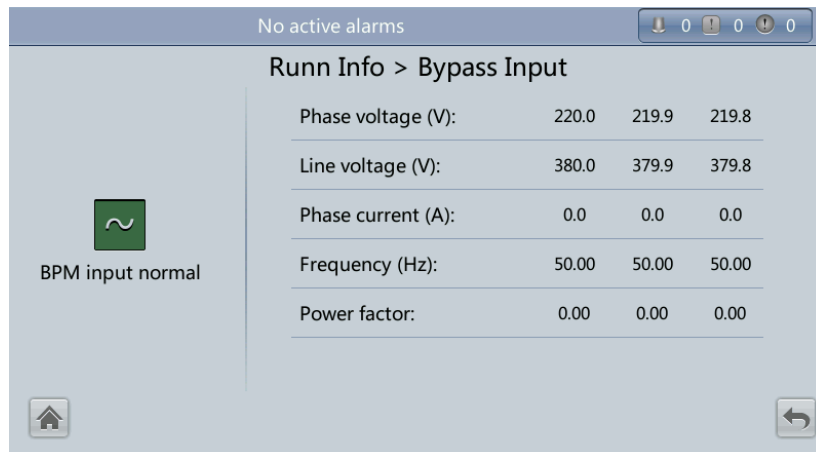


- **Phase voltage (V)/Line voltage (V)/Phase current (A)/Frequency (Hz)**
Mains input phase voltage/Mains input line voltage/Mains input phase current/Mains input frequency.
- **Power factor**
Proportion of the mains input active power to the mains input apparent power.

Bypass Input

Figure 4-14 shows the **Bypass Input** screen.

Figure 4-14 Bypass Input screen

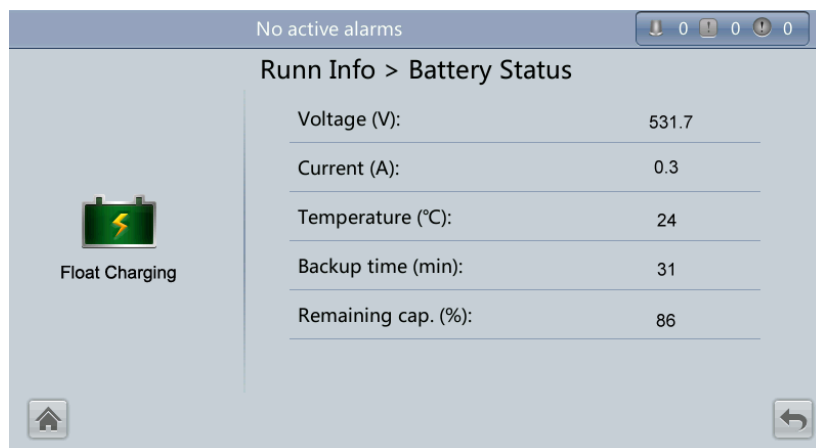


- **Phase voltage (V)/Line voltage (V)/Phase current (A)/Frequency (Hz)**
Bypass input phase voltage/Bypass input line voltage/Bypass input phase current/Bypass input frequency.
- **Power factor**
Proportion of the bypass input active power to the bypass input apparent power.

Battery Status

Figure 4-15 shows the **Battery Status** screen.

Figure 4-15 Battery Status screen



- **Battery Status**
The value can be **Not connected**, **Not chg. or dis.**, **Hibernating**, **Float charging**, **Equalized charging**, or **discharging**.
- **Voltage (V)**
Voltage of the battery string.
- **Current (A)**

Current of the battery string. The current is + when batteries are being charged and - when discharged.

- **Temperature (°C)**
Battery operating temperature (A battery sensor is required. If this sensor is not installed, **NA** is displayed).
- **Backup time (min)**
Battery backup time estimated at the current load.
- **Remaining cap. (%)**
Remaining battery capacity.

Total Runtime

Figure 4-16 shows the **Total Runtime** screen.

Figure 4-16 Total Runtime screen



- **Bypass runtime (h)**
Time for which the UPS runs in bypass mode.
- **Inv. runtime (h)**
Time for which the UPS runs in inverter mode.



NOTE

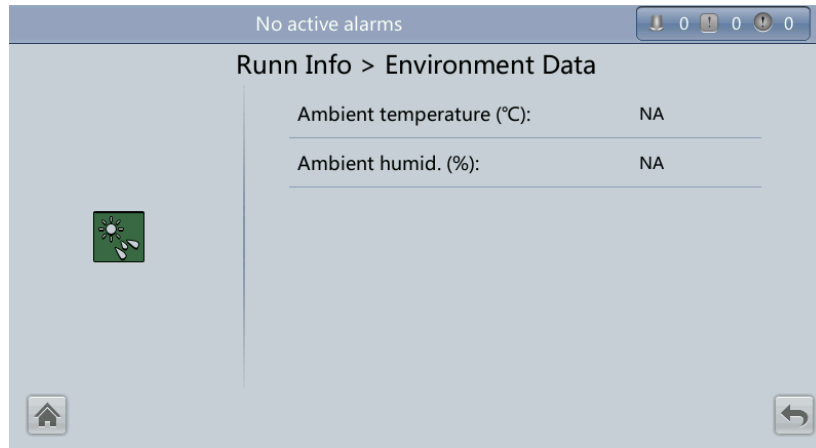
The value takes an integer. For example,

- If the value is less than 1, the value takes 0.
- If the value is greater than 1 and less than 2, the value takes 1.

Environment Data

Figure 4-17 shows the **Environment Data** screen.

Figure 4-17 Environment Data screen



- **Ambient temperature (°C)**
Temperature measured by the ambient temperature and humidity sensor (Install the sensor. If the sensor is not installed, **NA** is displayed).
- **Ambient humid. (%)**
Humidity measured by the ambient temperature and humidity sensor (Install the sensor. If the sensor is not installed, **NA** is displayed).

4.1.3.3 Alarms Screen


On the **System Info** screen, tap  to enter the **Alarms** screen. On the **Alarms** screen, you can view **Active Alarms** and **Historical Alarms**, **Buzzer Off**, and **Clear Faults**, as shown in [Figure 4-18](#).

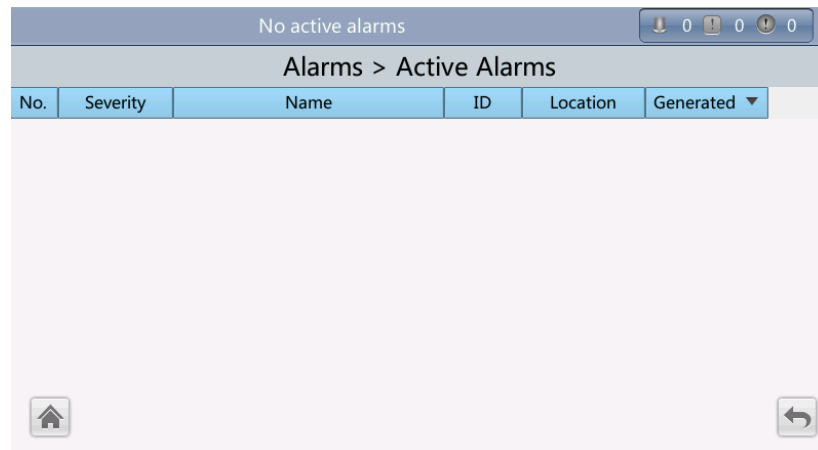
Figure 4-18 Alarms screen



Active Alarms

[Figure 4-19](#) shows the **Active Alarms** screen. The active alarm information, including the **Severity**, **Name**, **ID**, **Location**, and **Generated**, is displayed on this screen.

Figure 4-19 Active Alarms screen



Historical Alarms

Figure 4-20 shows the **Historical Alarms** screen. The historical alarm information, including the **Severity**, **Name**, **ID**, **Location**, **Generated** and **Cleared**, is displayed on this screen.

Figure 4-20 Historical Alarms screen

The screenshot shows a mobile application interface for 'Alarms > Historical Alarms'. At the top, it says 'No active alarms' with three status icons (down arrow, warning, up arrow) and the number '0' next to each. Below this is a header 'Alarms > Historical Alarms'. A table with the following columns is shown: 'No.', 'Severity', 'Name', 'ID', 'Location', 'Generated', and 'Cleared'. The table contains seven rows of data. At the bottom left is a home icon and at the bottom right is a back arrow icon.

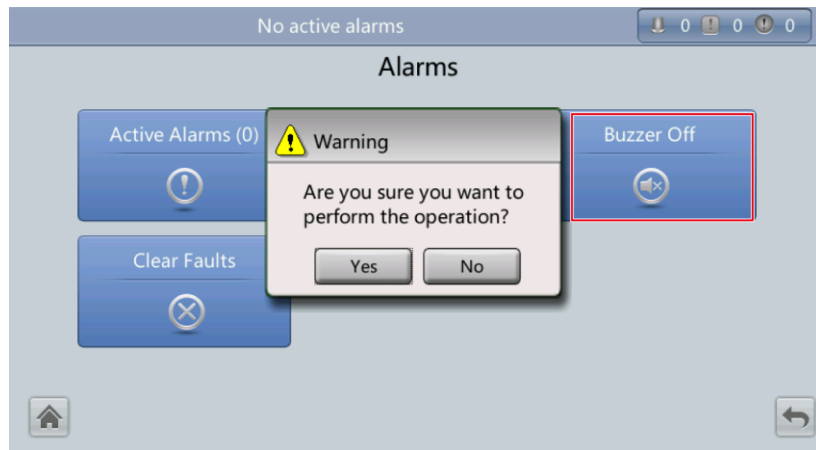
No.	Severity	Name	ID	Location	Generated	Cleared
1	Warning	Manual start failure	0402-01	UPS system	2014-06-24 16:48:27	2014-06-24 16:48:27
2	Warning	Manual start failure	0402-01	UPS system	2014-06-24 16:48:08	2014-06-24 16:48:08
3	Warning	Manual start failure	0402-01	UPS system	2014-06-24 16:47:56	2014-06-24 16:47:56
4	Warning	Manual start failure	0402-01	UPS system	2014-06-24 15:23:54	2014-06-24 15:23:54
5	Warning	Manual shutdown	0403-01	UPS system	2014-06-24 15:23:06	2014-06-24 15:23:06
6	Warning	Manual shutdown	0403-01	UPS system	2014-06-24 15:22:34	2014-06-24 15:22:34
7	Minor	Module quantity mismatch	0114-01	UPS system	2014-06-24 12:55:15	2014-06-24 13:51:03

Buzzer Off

Two buzzer menus are available, that is, **Buzzer On** and **Buzzer Off**. If the buzzer is muted, **Buzzer On** is displayed on the operation screen. If the buzzer is enabled, **Buzzer Off** is displayed on the operation screen. Figure 4-21 shows the **Buzzer Off** screen.

If you enable the buzzer, the buzzer buzzes when a critical alarm, a minor alarm, or a certain warning is generated. If you mute the buzzer, it never buzzes.

Figure 4-21 Buzzer Off screen



Clear Faults


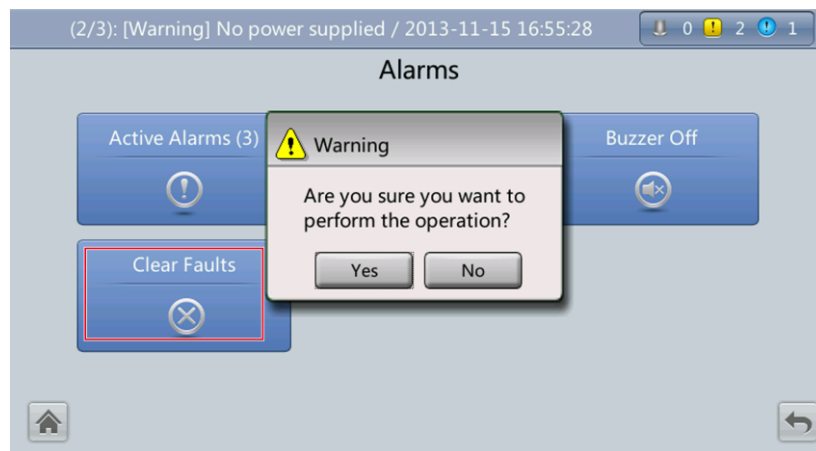
Figure 4-22 shows the **Clear Faults** menu. Tap **Clear Faults**. If you have not logged in, a login screen is displayed. Enter a user name and password, and tap .

Figure 4-22 Clear Faults screen



NOTE

- Table 4-4 lists the default user names and preset passwords and describes the permission of the default users.
- If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.

4.1.3.4 Settings Screen


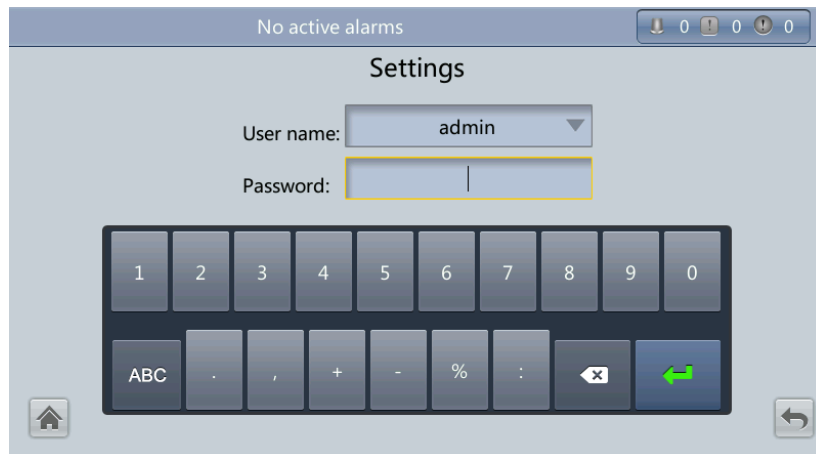

On the **System Info** screen, click . If you have not logged in, a login screen is displayed, as shown in Figure 4-23.

Figure 4-23 Login screen



On the login screen, enter a preset user name and password, and click  to log in. The **Settings** screen is displayed, as shown in [Figure 4-24](#) and [Figure 4-25](#).

 **NOTE**

- [Table 4-4](#) lists the default user names and preset passwords and describes the permission of the default users.
- If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.

Figure 4-24 Settings screen 1

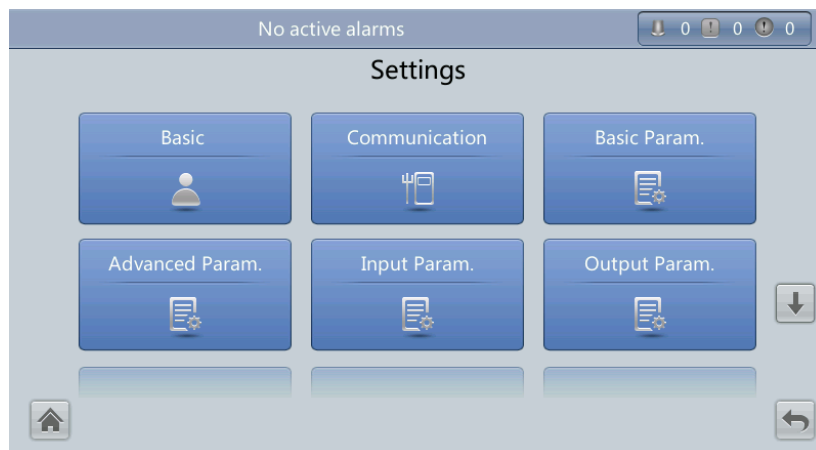
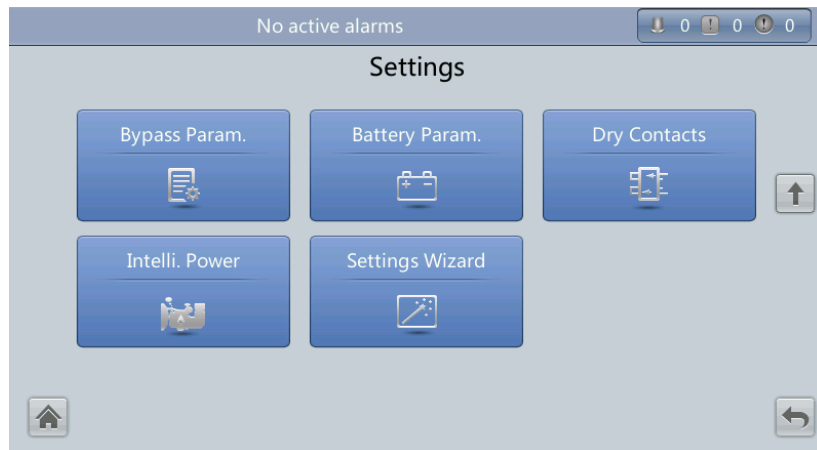


Figure 4-25 Settings screen 2



Basic Settings



NOTICE

Set the date and time correctly. Incorrect time display in running and alarm information would lead to analysis errors during maintenance or repair.

Set basic parameters, as shown in [Figure 4-26](#) and [Figure 4-27](#).

Figure 4-26 Basic screen 1

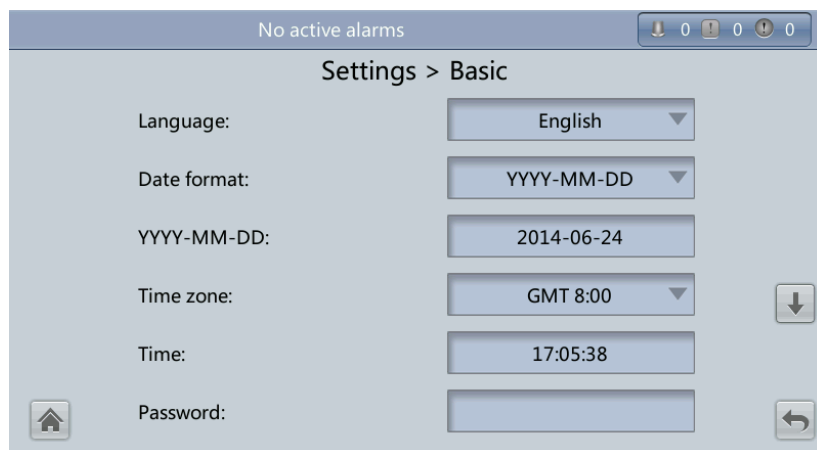
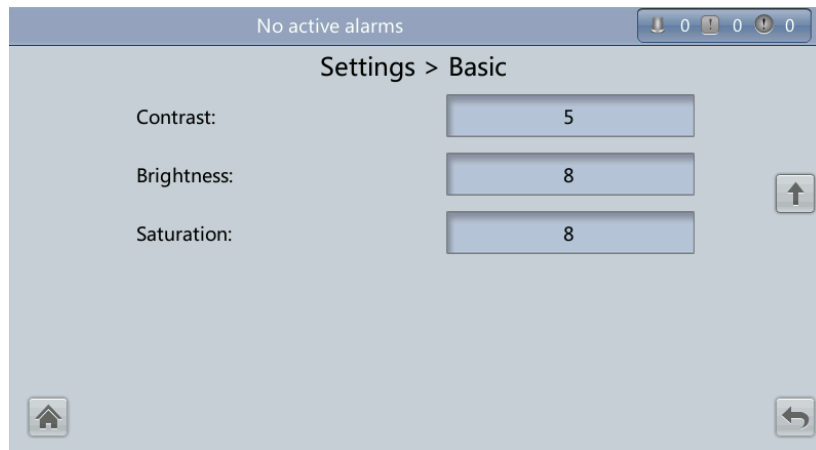


Figure 4-27 Basic screen 2



- **Language**
Twelve languages, including English, Chinese, and Italian, are supported. The default language is English.
- **Password**
The preset password is 000001. You can change the password.

Communications Settings

Set communications parameters, as shown in [Figure 4-28](#), [Figure 4-29](#), and [Figure 4-30](#).

Figure 4-28 Communication screen 1

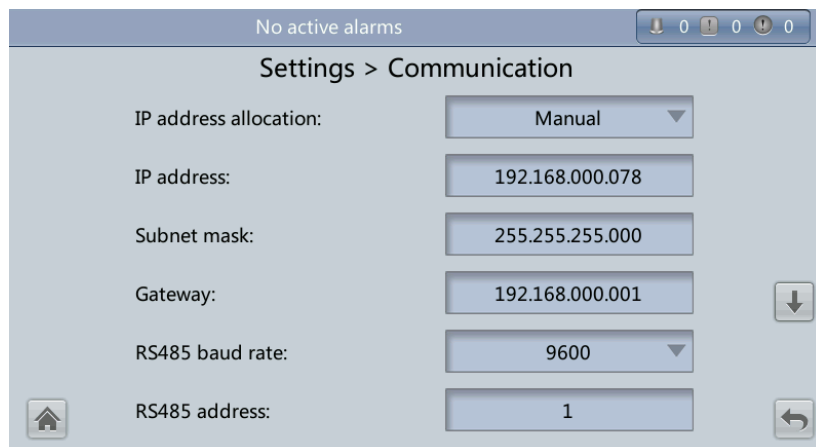


Figure 4-29 Communication screen 2

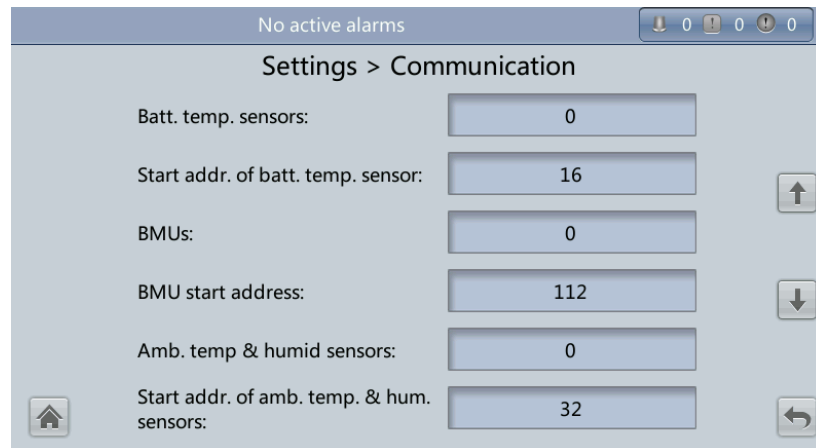
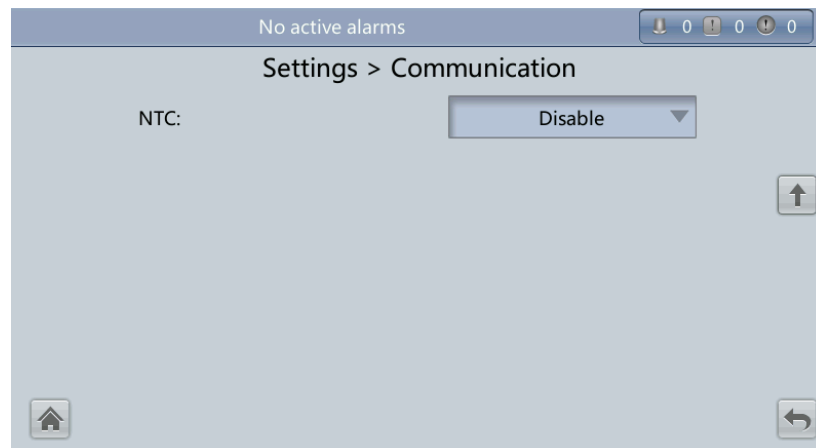


Figure 4-30 Communication screen 3



- **IP address allocation**

- 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 an LAN switch or router with the DHCP function, the IP address can be allocated manually or automatically.
 - **Manual:** Check that their IP addresses are two different values on the same network segment.
 - **Automatic:** The MDU automatically searches for 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**. After you restart the device, **IP address allocation** changes back to **Manual**. **IP address** is the IP address that you have previously set.

- **IP address**

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



NOTICE

Ensure that the UPS IP address is unique on the network segment. Otherwise, the WebUI display function may be abnormal.

- **Subnet mask**
Set an Ethernet subnet mask that ranges from 0.0.0.0 to 255.255.255.255. The default value is **255.255.255.0**.
- **Gateway**
Set an Ethernet gateway that ranges from 0.0.0.0 to 255.255.255.255. The default value is **192.168.0.1**.
- **RS485 baud rate/RS485 address**
Set an address that ranges from 1 to 254 for this port. **Baud rate** depends on the network management conditions.
- **Batt. temp. sensors**
A maximum of four battery temperature sensors can be cascaded.
- **Start addr. of batt. temp. sensor**
Set this parameter by using the DIP switch on the battery temperature sensor. The address range is 16–28. Ensure that the address that you set on the LCD is the same as that set for the DIP switch. Otherwise, communication fails.
- **BMUs**
BMUs can be cascaded. A maximum of 12 BMUs can be cascaded.
- **BMU start address**
Set the BMU start address through the DIP switch on the BMU to 112. Ensure that the address that you set on the LCD is the same as that set for the DIP switch. Otherwise, communication cannot be implemented.
- **Amb. temp & humid sensors/Start addr. of amb. temp. & hum. sensors**
The ambient temperature and humidity sensor looks the same as the battery temperature sensor. The difference is that the former has a DIP switch address range of 32 to 44. Therefore, you can use the sensor as an ambient temperature and humidity sensor or a battery temperature sensor by setting the DIP switch address.
- **NTC**
The short-distance battery temperature sensor monitors the ambient temperature near batteries. It ensures that batteries work reliably and securely. The default status is **Disable**. If a short-distance battery temperature sensor is configured, set **NTC** to **Enable**.

Basic Parameter Settings

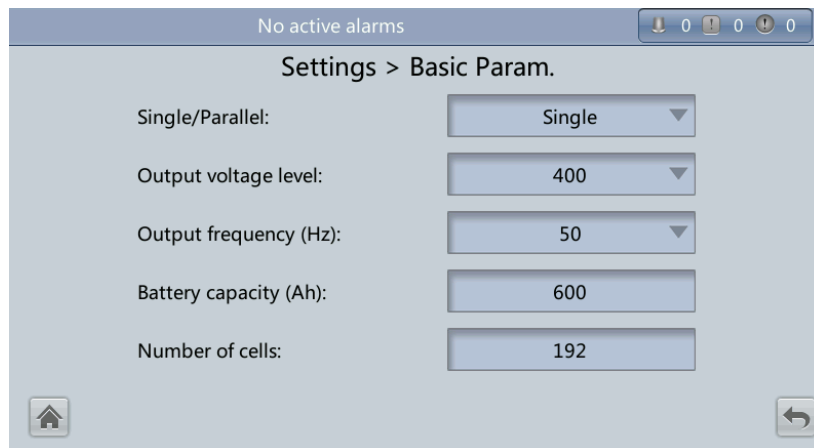


NOTICE

- **Single/Parallel, Output voltage level, and Output frequency** must be the same as the actual values. Otherwise, an alarm may be generated, or other serious faults may occur.
- **Battery capacity and Number of cells** must be the same as the actual values. Otherwise, batteries may be damaged, or other serious faults may occur.

Set basic system and battery parameters, as shown in [Figure 4-31](#).

Figure 4-31 Basic Param. screen



- **Single/Parallel**
Set the UPS running mode. The value can be **Single** (default) or **Parallel**.
- **Output voltage level**
Set the system output voltage level. The value can be 380 V, 400 V (default), or 415 V. If **Output voltage level** is 380 V or 400 V, the default upper limit of bypass voltage is 15% and the default lower limit of bypass voltage is 20%. If **Output voltage level** is 415 V, the default upper limit of bypass voltage is 10% and the default lower limit of bypass voltage is 20%. The parameter is configurable after the inverter shuts down.
- **Output frequency (Hz)**
Set the system output frequency level. The value can be 50 Hz (default) or 60 Hz.
- **Battery capacity (Ah)**
Set the battery string capacity. The value range is 5 to 3000 Ah. The default value is 600 Ah for the UPS5000-E-600 kVA, 800 Ah for the UPS5000-E-800 kVA.
- **Number of cells**
Set the number of cells. Each 12 V battery consists of six cells. The value range is 180–276, 192 by default.



NOTE

- A cell consists of electrodes and electrolytes, which is the basic unit for the battery. Each cell has a nominal voltage of 2 V. A battery is a module consisting of single or multiple cells in a shell. Each battery has a nominal voltage of 2 V or 12 V. The number of cells must be a multiple of 12 (for example, 180 and 192).
- Cell float voltage, **Cell equalized volt**, **Float volt. temp. comp. coef.**, and **EOD voltage threshold** are set for cells.

Advanced Parameter Settings



NOTICE

Set **System capacity** and **Power module capacity** according to specifications. Incorrect settings may cause an overload alarm, which affects normal UPS running.

Set advanced parameters, such as **System capacity**, and **Power module capacity**, as shown in [Figure 4-32](#), [Figure 4-33](#), [Figure 4-34](#), and [Figure 4-35](#).

Figure 4-32 Advanced Param. screen 1

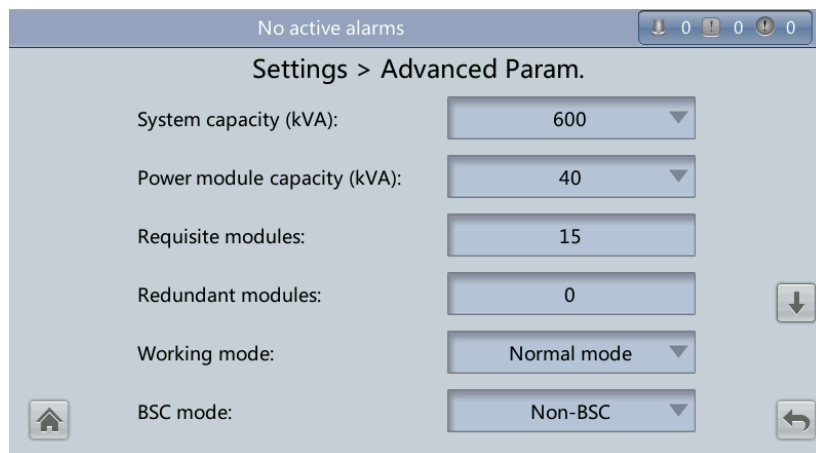


Figure 4-33 Advanced Param. screen 2

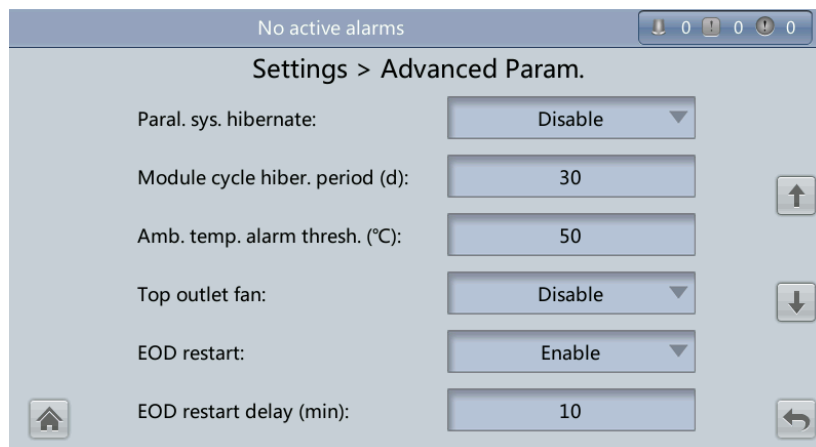


Figure 4-34 Advanced Param. screen 3

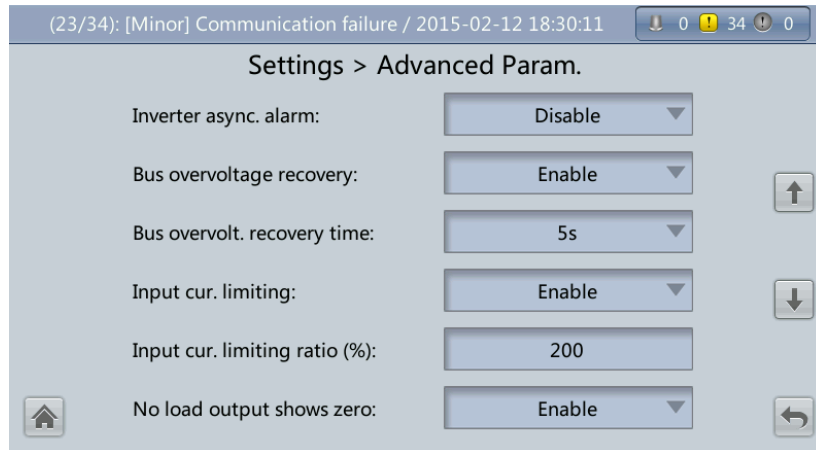


Figure 4-35 Advanced Param. screen 4



- **System capacity (kVA)**
Rated system capacity, equals to capacity of each power module multiplied by the number of requisite power modules. The **Module quantity mismatch** alarm will be generated if the setting is incorrect.
- **Power module capacity (kVA)**
Rated power module capacity.
- **Requisite modules**
Match the system capacity.
- **Redundant modules**
Set in accordance with loading capacity and redundant requirements.
- **Working mode**
The value can be **Normal mode** (default), **Converter mode**, **Self-load mode**, or **ECO**.
- **BSC mode**
 - The value can be **Non-BSC mode** (default) or **BSC mode**. The latter is set when the system is a dual-bus system.

- A dual-bus system consists of one master and one slave BSC system, which are specified by the customer. A BSC system cannot be the master and slave at the same time. Specify master and slave systems during deployment. To change the setting, you must follow the guidance of maintenance engineers. Set the master and slave BSC systems to master and slave BSC modes respectively.
- Ensure that the BSC signal cable between the master and slave BSC systems is properly connected and that BSC-related hardware is properly installed.
- **Paral. sys. hibernate**

When the customer load is light, set parallel hibernation to alternate modules in hibernation, which can prolong their service life as well as improving the system efficiency.
- **Module cycle hiber. period (d)**

1 to 100 days can be set. The default value is **30 days**.
- **Amb. temp. alarm thresh. (°C)**

An alarm is generated when the ambient temperature reaches the preset value.
- **Top outlet fan**

If a top outlet fan is configured, check the fan running status after enabling this parameter.
- **EOD restart**

The UPS transfers to battery mode when the mains becomes abnormal. When batteries reach the EOD threshold and the bypass is disabled and **EOD restart** is enabled, the UPS will restart as soon as the mains resumes.

If **EOD restart** is disabled, clear the alarm manually or enable the function to restart the UPS.
- **EOD restart delay (min)**

If **EOD restart** is set to **Enable**, the UPS starts working after **EOD restart delay** when the mains recovers from an EOD power failure. The value range is 1–1440 min, and the default value is **10 min**.
- **Inverter async. alarm**

Specifies whether the **Inverter async.** alarm is displayed when the inverter does not track the bypass input. The normal power supply is not affected no matter whether you set the parameter to **Enable** or **Disable**.
- **Bus overvoltage recovery**

Specifies whether to automatically clear the alarm and restart the power module when the rectifier or inverter shuts down due to a bus overvoltage alarm. If **Bus overvoltage recovery** is set to **Enable**, the bus overvoltage alarm is automatically cleared, and the rectifier and inverter automatically start when the bus voltage recovers (less than 420 V) within **Bus overvolt. recovery time**. When **Bus overvoltage recovery** is set to **Disable**, the bus overvoltage alarm cannot be automatically cleared, and the rectifier and inverter cannot automatically start. The default value is **Enable**.
- **Bus overvolt. recovery time**

If **Bus overvoltage recovery** is set to **Enable**, the bus overvoltage alarm is automatically cleared, and the rectifier and inverter automatically start when the bus voltage recovers (less than 420 V) within **Bus overvolt. recovery time**. The default value is **5s**.
- **Input cur. limiting**

Enable or disable input current limiting for the UPS to protect the D.G.
- **Input cur. limiting ratio (%)**

Limit the input current to protect the D.G. The value can be 50%–200%, 200% by default.

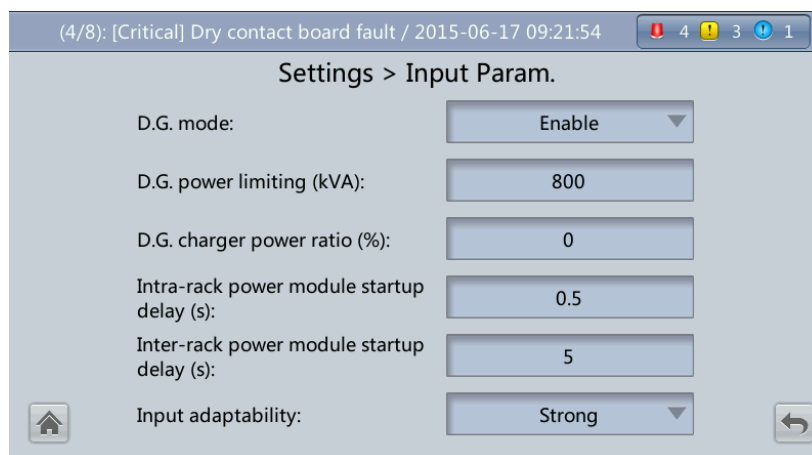
- **No-load output shows zero**

If this parameter is set to **Enable**, the output current and load ratio will be displayed as 0 in the case of zero load. If this parameter is set to **Disable**, the output current and load ratio will not be displayed as 0 in the case of zero load.

Input Parameter Settings

Set input parameters, as shown in [Figure 4-36](#).

Figure 4-36 Input Param. screen



NOTE

It is recommended that you retain the default input parameter settings.

- **D.G. mode**

Enable or disable D.G. mode. Set this parameter when a D.G connects to the input PDC. Select **Enable** when a D.G. is detected over dry contacts.

- **D.G. power limiting (kVA) and D.G. charger power ratio (%)**

Control the input current and current limiting value to address instantaneous load impact and to enhance the work with the D.G. The **D.G. power limiting** value range is 0–5000 kVA, and the default value is 800 kVA for the UPS5000-E-600 kVA and 1000 kVA for the UPS5000-E-800 kVA. The **D.G. charger power ratio** value range is 0%–100%, and the default value is 0%.

- **Intra-rack power module start delay (s) and Inter-rack power module start delay (s)**

The two parameters enable the UPS to control the interval that each rack (or module) transfers from battery mode to normal mode, which reduces the impact on the generator or power grid. In the case of battery undervoltage, the system automatically shortens the delay for transferring to normal mode to 1/8 of the normal delay to accelerate the transfer and prevent battery overdischarge. **Intra-rack power module start delay (s)** can be set to a value ranging from 0.5 to 120. The preset value of **Intra-rack power module start delay (s)** depends on the preset number of power modules. The preset value is 2.0, 1.0, and 0.5 for 1–5, 6–10, and 10–20 power modules respectively. **Inter-rack power module start delay (s)** can be set to a value ranging from 2 to 120. The preset value of **Inter-rack power module start delay (s)** is 5.0. The start delay of a module in a rack

varies depending on the rack number and module number. 1# module in rack 1 does not have a start delay.

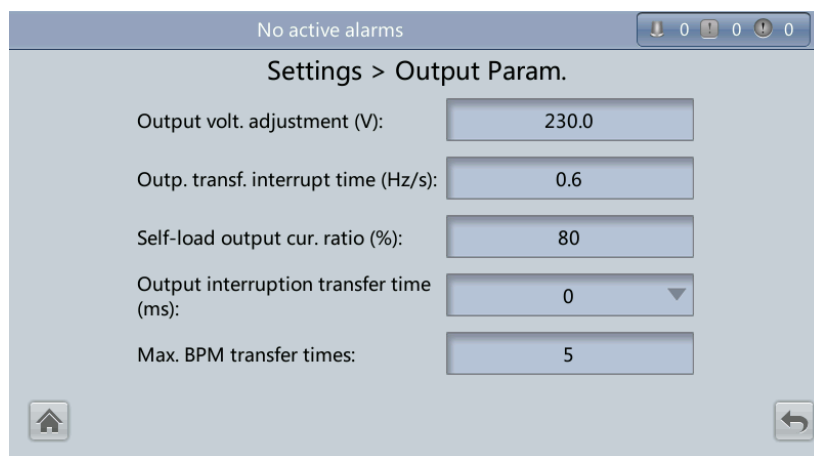
- **Input adaptability**

The value of **Input adaptability** can be **Strong** (default) or **Weak**. Strong input adaptability applies to the D.G. or input sources whose input current has high frequency oscillation. In this mode, the total distortion of the input current waveform (THDi) is poor, but the system is stable. Weak input adaptability is suitable for mains and AC input sources.

Output Parameter Settings

Set output parameters, as shown in [Figure 4-37](#).

Figure 4-37 Output Param. screen



- **Output volt. adjustment (V)**

The output voltage can be slightly adjusted based on the onsite power distribution condition to ensure a minimum difference between the output voltage and the bypass voltage. This facilitates uninterruptible transfer from normal mode to bypass mode. The voltage adjustment range is $\pm 5\%$. The default value is 220.0 when the voltage is 380 V, 230.0 when 400 V, 240.0 when 415 V.

- **Outp. transf. interrupt time (Hz/s)**

- The value range is 0.1–2.0 Hz/s, and the default value is 0.6 Hz/s.
- This parameter can be adjusted based on site requirements. If **Output freq. track rate (Hz/s)** is slow, the inverter frequency is different from the bypass frequency when the bypass frequency changes. If output is overloaded or the inverter is faulty, an interruption (less than 20 ms) occurs when the UPS transfers from normal mode to bypass mode. If **Output freq. track rate (Hz/s)** is fast, the inverter frequency is unstable.

- **Self-load output cur. ratio (%)**

Set the percentage of the output current to the rated output current when the UPS is in self-load mode. The value can be 20%–100%, 80% by default.

- **Output interruption transfer time (ms)**

The default value is 0 ms. The transfer from inverter mode to bypass mode takes 1 to 2 ms, and the transfer from bypass mode to inverter mode takes 0 to 20 ms.

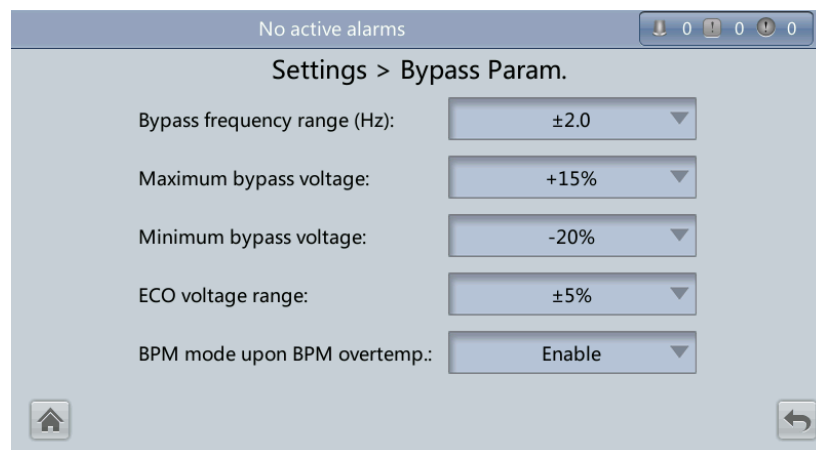
- **Max. BPM transfer times**

Cross currents occur during the transfer between bypass mode and normal mode, which impacts the system. This parameter specifies the number of transfers between bypass mode and normal mode within 1 hour, which ensures system security. The value can be 1 to 10, 5 by default.

Bypass Parameter Settings

Set bypass parameters, such as the bypass voltage and frequency range, as shown in [Figure 4-38](#).

Figure 4-38 Bypass Param. screen



- **Bypass frequency range (Hz)**

When the difference between the bypass input frequency and the rated frequency is greater than this value, the system determines that the bypass frequency is abnormal and that the bypass is unavailable.

The bypass frequency range must be greater than the ECO frequency range. The value range is ± 0.5 Hz to ± 6 Hz, and the default value is ± 2 Hz.

- **Maximum bypass voltage**

Upper threshold for the bypass voltage. When the difference between the bypass voltage and the rated voltage exceeds this value, the system determines that the bypass voltage is abnormal and that the bypass is unavailable.

 **NOTE**

- When the voltage level is 380 V, the value range is 10%, 15% (default), 20%, and 25%.
- When the voltage level is 400 V, the value range is 10%, 15% (default), and 20%.
- When the voltage level is 415 V, the value range is 10% (default) and 15%.

- **Minimum bypass voltage**

Lower threshold for the bypass voltage. When the difference between the bypass voltage and the rated voltage exceeds this value, the system determines that the bypass voltage is abnormal and that the bypass is unavailable. The value can be -10% , -15% , -20% (default), -30% , -40% , -50% , or -60% .

- **ECO voltage range**

In ECO mode, when the difference between the bypass voltage and the rated voltage is greater than this value, the system determines that the ECO voltage is abnormal and

transfers to normal mode. The values can be $\pm 5\%$ (default), $\pm 6\%$, $\pm 7\%$, $\pm 8\%$, $\pm 9\%$, or $\pm 10\%$.

- **BPM mode upon BPM overtemp.**

This parameter specifies whether to start bypass mode if overtemperature occurs.

Battery Parameter Settings



NOTICE

Battery parameter settings have great impact on battery maintenance, battery lifespan, and UPS discharge time. When you set battery parameters, note the following:

- **Battery string sharing** is unavailable when **Single/Parallel** is **Single**.
- **Battery string sharing** affects the actual charge current and the estimated discharge time. An incorrect setting will cause a high or low charge current, which tends to damage batteries. An incorrect estimated discharge time may lead to a data backup fault.
- Retain default settings for **Chg. cur. limiting coef.** and **Cell float voltage**. Only professional maintenance personnel are allowed to change the settings.
- When you set parameters, ensure the following: **Chg. cur. limiting coef.** > **Transfer-to-equalized charging cur. Coef**; **Dis. cur. 0.1C EOD** > **Dis. cur. 0.3C EOD** > **Dis. cur. 0.5C EOD** > **Dis. cur. 1.0C EOD**.
- **Battery type** must meet the actual situation. Currently, only **VRLA batt.** is supported.
- **Chg. volt. over range point** and **Dis. volt. over range point** are used to check whether the batteries in each battery string have the same charge voltage and discharge voltage. When a value exceeds the specified range, an alarm is generated. The calculation formula is $(\text{Charge/Discharge voltage} - \text{Average voltage}) / \text{Average voltage} \times 100\%$. The charge/discharge voltage and average voltage are obtained from the BMU. If the BMU is not configured, you do not need to set these two parameters.

Set battery parameters, as shown in [Figure 4-39](#) to [Figure 4-43](#).

Figure 4-39 Battery Param. screen 1

No active alarms		Settings > Battery Param.	
Installation time:	2014-01-01		
Maintenance period (d):	0		
Battery type:	VRLA batt.		
Chg. cur. limiting coef. (C10):	0.10		↓
Cell float voltage (V/cell):	2.25		
Cell equalized volt. (V/cell):	2.35		↶

Figure 4-40 Battery Param. screen 2

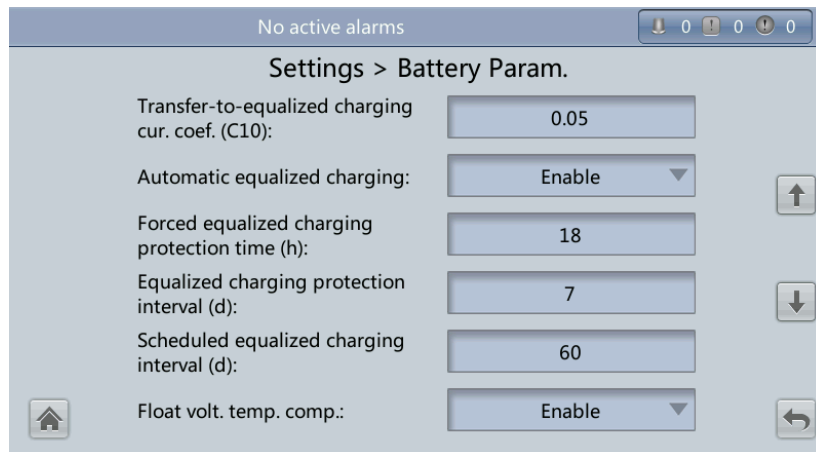


Figure 4-41 Battery Param. screen 3

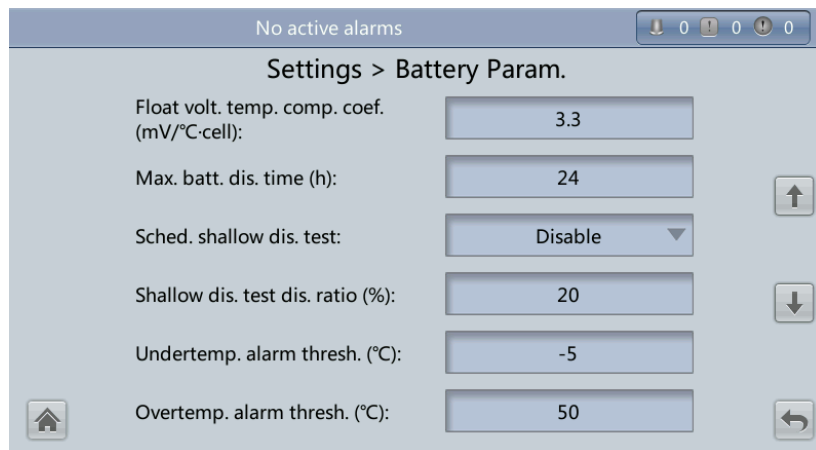


Figure 4-42 Battery Param. screen 4

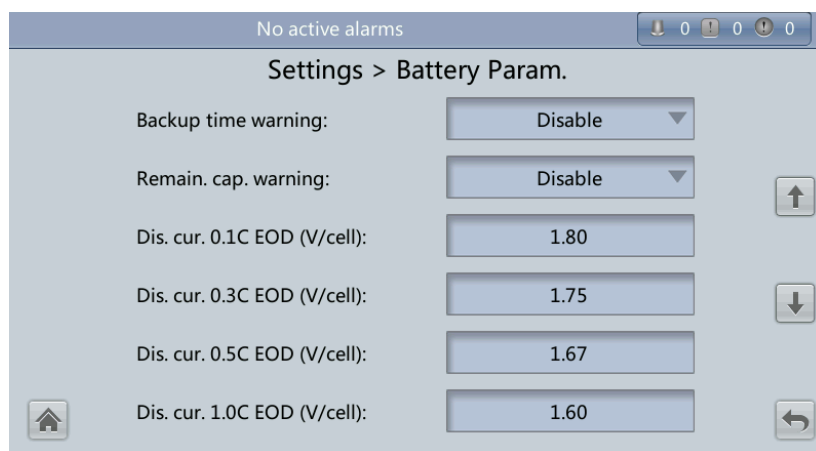
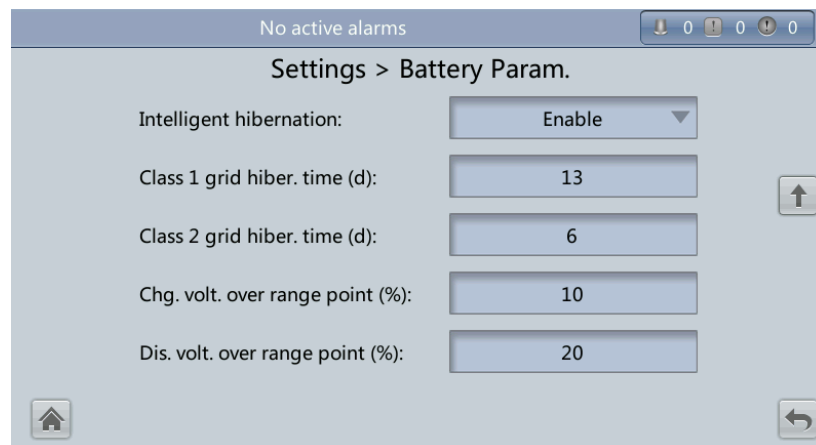


Figure 4-43 Battery Param. screen 5



- **Installation time**
A battery maintenance reminder is displayed when the maintenance time (counted from the installation time) comes.
- **Maintenance period (d)**
Interval for reminding users of battery maintenance.
- **Battery type**
Set the battery type based on actual conditions. Currently, only lead-acid batteries are supported.
- **Chg. cur. limiting coef. (C10)**
Charging current limit, which is a multiple of the battery capacity. The value can be 0.05–0.15, 0.1 by default.
- **Cell float voltage (V/cell)**
Set the float voltage. The value can be 2.23–2.27 V/cell, 2.25 V/cell by default. The value is configurable in any mode.
- **Cell equalized volt. (V/cell)**
Set the battery equalized voltage. The value can be 2.30–2.40 V/cell, 2.35 V/cell by default. The value is configurable in any mode.
- **Transfer-to-equalized charging cur. coef. (C10)**
The battery enters equalized charge state when the battery current exceeds this parameter value. The value range is 0.02–0.08, and the default value is 0.05.
- **Automatic equalized charging**
When the value is **Enable**, the UPS automatically changes the battery management status to equalized charging based on the charge current and float charge time.
- **Forced equalized charging protection time (h)**
When batteries are continuously under float charging or hibernation, you can enable forced equalized charging. When the forced equalized charging time reaches the value of this parameter, float charging starts.
- **Equalized charging protection interval (d) and Scheduled equalized charging interval (d)**
After batteries transfer from equalized charging to float charging, if the batteries do not discharge, equalized charging starts only after the float charging time reaches **Equalized**

charging protection interval. After equalized charging is complete, scheduled equalized charging starts when the non-equalized charging time exceeds **Scheduled equalized charging interval.**

- **Float volt. temp. comp.**
Option to correct the float voltage based on the battery temperature when a battery temperature sensor is connected. The value is configurable in any mode.
- **Float volt. temp. comp. coef. (mV/ °C cell)**
Correction coefficient during float voltage temperature compensation.
- **Max. batt. dis. time (h)**
Set the maximum discharge time. When the discharge time reaches the value, the UPS powers off. The value can be 16–48 hours, 24 hours by default.
- **Sched. shallow dis. test**
When certain conditions are met, the charger shuts down, and batteries supply power to loads. The system records the battery discharge data as the reference for battery capacity and lifespan.
- **Shallow dis. test dis. ratio (%)**
Set the proportion of the discharge capacity to the total discharge capacity. The value can be 10%–50%, 20% by default. The value is configurable in any mode.
- **Undertemp. alarm thresh. (°C) and Overtemp. alarm thresh. (°C)**
Battery temperatures can be monitored in a timely manner. If a battery overtemperature alarm is detected, the charging current limit decreases to 0.03 CA. Battery charging stops if a battery overtemperature protection alarm (when the temperature reaches the high temperature threshold plus 3 °C) is generated.
- **Backup time warning and Remain. cap. warning**
When the first two parameters are set to **Enable**, an alarm is generated when the backup time or remaining capacity is less than the alarm threshold.
- **Dis. cur. 0.1C EOD (V/cell), Dis. cur. 0.3C EOD (V/cell), Dis. cur. 0.5C EOD (V/cell), and Dis. cur. 1.0C EOD (V/cell)**
By default, **0.1C EOD (V/cell)** is set to **1.80**, **0.3C EOD (V/cell)** to **1.75**, **0.5C EOD (V/cell)** to **1.67**, and **1.0C EOD (V/cell)** to **1.60**. These values are calculated in real time based on the discharge currents.
- **Intelligent hibernation**
If this parameter is set to **Enable**, the intelligent battery hibernation function is enabled.
- **Class 1 grid hiber. time (d) and Class 2 grid hiber. time (d)**
Set the hibernation time based on the power grid type. In hibernation mode, batteries are not charged or discharged, which extends the battery lifespan. The **Class 1 grid hiber. time** value range is 0–30 days, and the default value is 13 days. The **Class 2 grid hiber. time** value range is 0–15 days, and the default value is 6 days. The value 0 indicates no hibernation.
- **Chg. volt. over range point (%) and Dis. volt. over range point (%)**
The parameters check whether the batteries in each battery string have the same charge voltage and discharge voltage. When a value exceeds the specified range, an alarm is generated.
The calculation formula is: (Charge/Discharge voltage – Average voltage)/Average voltage x 100%.

Dry Contact Settings



NOTICE

- Set the dry contacts that you need to use. Otherwise, the UPS may not run properly.
- When you disable a dry contact card, its dry contact signals are disabled.
- After you enable a dry contact card, its dry contact signals can be displayed on the LCD.
- Disable all the dry contacts for a dry contact card that is not connected and all the dry contacts that are not used to prevent false alarms.
- () encloses a unit, and [] encloses silk screen.

Specify dry contact settings on the following cards:

- Dry contact card (MUE05A): provides dry contact signals for the battery grounding failure detector, D.G., BCB box, and PDCs.
- Backfeed protection board (MUE06A): provides backfeed protection signals. You need only to enable or disable this board.
- Monitoring interface card (MUS05A): provides four routes of configurable output dry contact signals.
- Dry contact extended card (MUE07A): provides two routes of input signals and one route of output signals.

Set the dry contact parameters, as shown in [Figure 4-44](#) to [Figure 4-50](#).

Figure 4-44 Dry Contacts screen 1

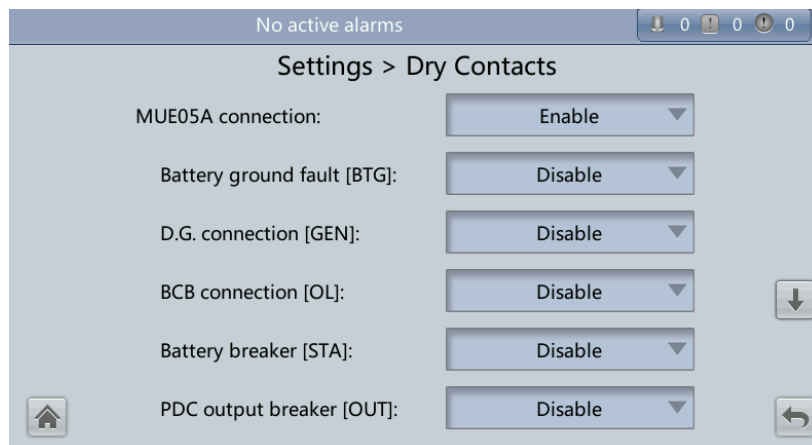


Figure 4-45 Contacts screen 2

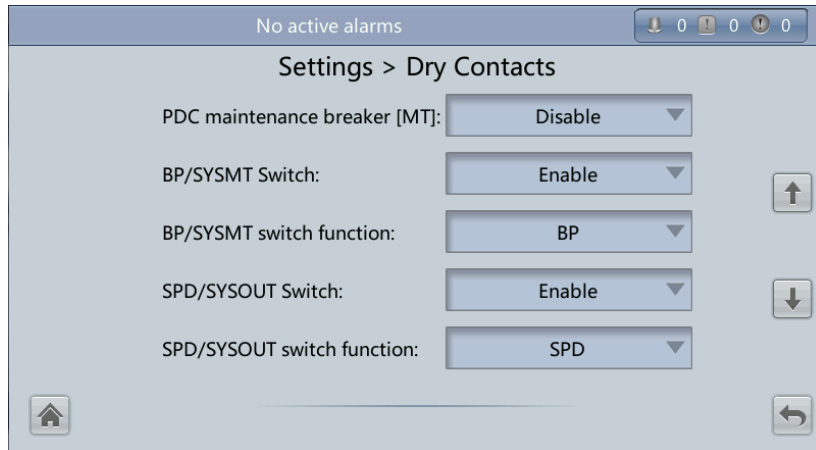


Figure 4-46 Dry Contacts screen 3

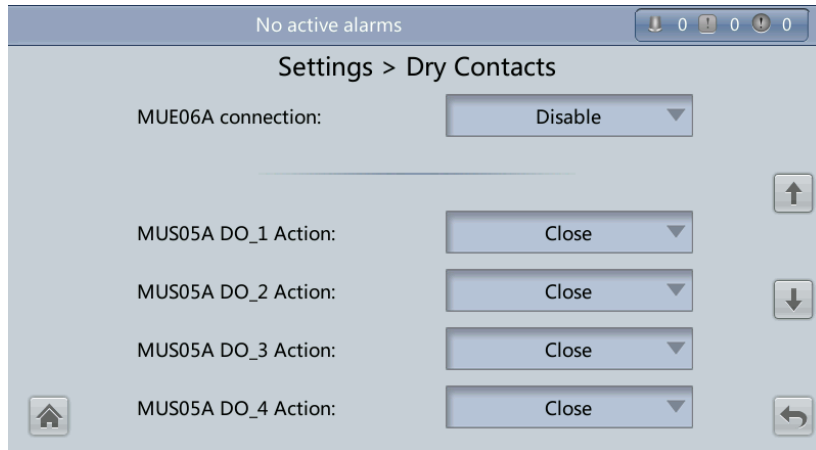


Figure 4-47 Dry Contacts screen 4

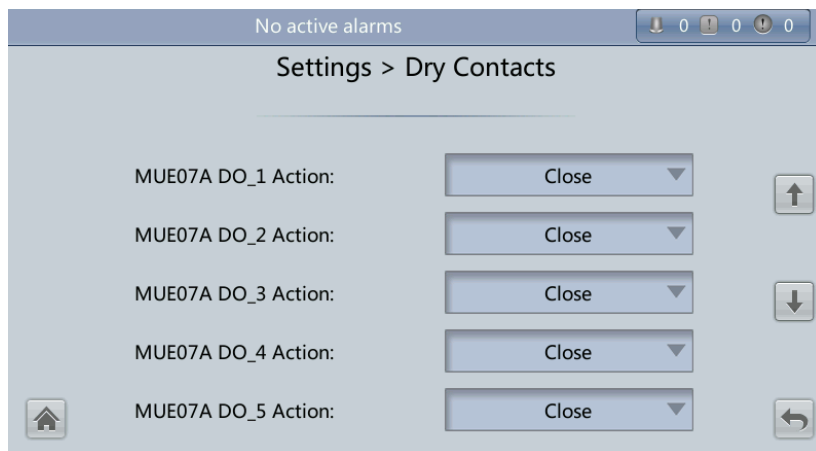


Figure 4-48 Dry Contacts screen 5

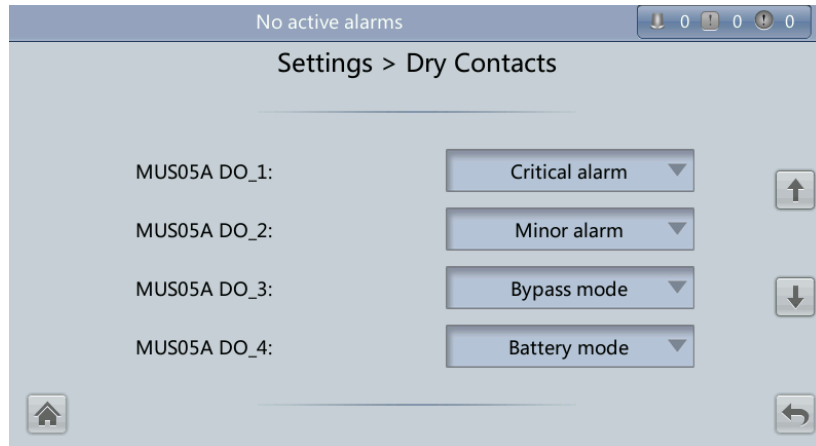


Figure 4-49 Dry Contacts screen 6



Figure 4-50 Dry Contacts screen 7



- **MUE05A connection**
MUE05A connection status. Independent input signals can be enabled only when this parameter is set to **Enable**.
- **Batter ground fault [BTG]**
Enable or disable the battery grounding failure detection.
- **D.G. connection [GEN]**
Enable or disable D.G. connection detection.
- **BCB connection [OL]**
Enable or disable BCB connection detection.
- **Batter breaker [STA]**
Enable or disable battery circuit breaker monitoring.
- **PDC output breaker [OUT]**
Enable or disable PDC output circuit breaker monitoring.
- **PDC maintenance breaker [MT]**
Enable or disable PDC maintenance circuit breaker monitoring.
- **BP/SYSMT Switch**
If the BP/SYSMT switch is set to **Enable**, the port has dry contact signal access. How a user uses the port depends on the status of the BP/SYSMT switch.
- **BP/SYSMT switch function**
If the BP/SYSMT switch is set to **Enable**, this parameter is displayed on the screen. A user can set this parameter to determine whether the port is used to detect the status of the PDU bypass input switch or system maintenance switch.
- **SPD/SYSOUT Switch**
If the SPD/SYSOUT switch is set to **Enable**, the port has dry contact signal access. How a user uses the port depends on the status of the SPD/SYSOUT switch.
- **SPD/SYSOUT switch function**
If the SPD/SYSOUT switch is set to **Enable**, this parameter is displayed on the screen. A user can set this parameter to determine whether the port is used to detect the status of the PDU input surge protector or system output switch.
- **MUE06A connection**
If this parameter is enabled, the mains and bypass backfeed protection is enabled.
- **MUS05A DO_1 Action**
Control the status of the DO_1 dry contact on the MUS05A dry contact card.
- **MUS05A DO_2 Action**
Control the status of the DO_2 dry contact on the MUS05A dry contact card.
- **MUS05A DO_3 Action**
Control the status of the DO_3 dry contact on the MUS05A dry contact card.
- **MUS05A DO_4 Action**
Control the status of the DO_4 dry contact on the MUS05A dry contact card.
- **MUE07A DO_1 Action**
Control the status of the DO_1 dry contact on the MUE07 extended dry contact card.
- **MUE07A DO_2 Action**
Control the status of the DO_2 dry contact on the MUE07 extended dry contact card.

- **MUE07A DO_3 Action**
Control the status of the DO_3 dry contact on the MUE07 extended dry contact card.
- **MUE07A DO_4 Action**
Control the status of the DO_4 dry contact on the MUE07 extended dry contact card.
- **MUE07A DO_5 Action**
Control the status of the DO_5 dry contact on the MUE07 extended dry contact card.
- **MUS05A DO_1**
Corresponds to signal of the output dry contact DO_1 on the MUS05A.
- **MUS05A DO_2**
Corresponds to signal of the output dry contact DO_2 on the MUS05A.
- **MUS05A DO_3**
Corresponds to signal of the output dry contact DO_3 on the MUS05A.
- **MUS05A DO_4**
Corresponds to signal of the output dry contact DO_4 on the MUS05A.
- **MUE07A DO_1**
Corresponds to signal of the output dry contact DO_1 on the MUE07A.
- **MUE07A DO_2**
Corresponds to signal of the output dry contact DO_2 on the MUE07A.
- **MUE07A DO_3**
Corresponds to signal of the output dry contact DO_3 on the MUE07A.
- **MUE07A DO_4**
Corresponds to signal of the output dry contact DO_4 on the MUE07A.
- **MUE07A DO_5**
Corresponds to signal of the output dry contact DO_5 on the MUE07A.
- **MUE07A DI_1**
Corresponds to signal of the input dry contact DI_1 on the MUE07A.
- **MUE07A DI_2**
Corresponds to signal of the input dry contact DI_2 on the MUE07A.
- **MUE07A DI_3**
Corresponds to signal of the input dry contact DI_3 on the MUE07A.
- **MUE07A DI_4**
Corresponds to signal of the input dry contact DI_4 on the MUE07A.
- **MUE07A DI_5**
Corresponds to signal of the input dry contact DI_5 on the MUE07A.

Intelligent Power Settings

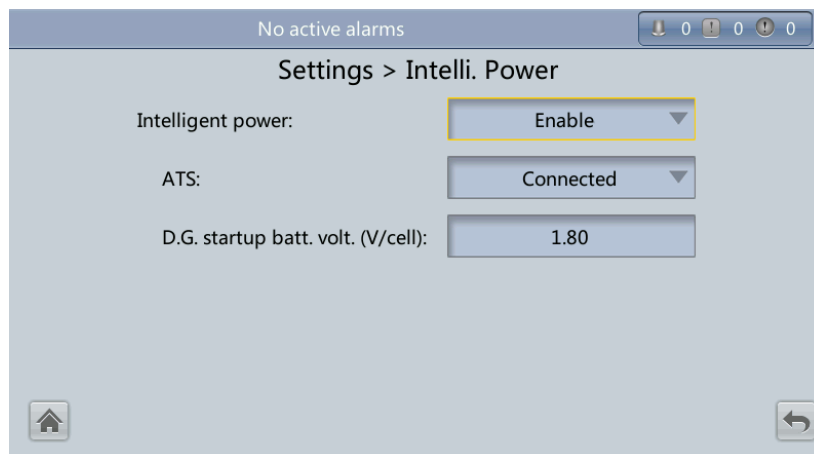
Figure 4-51 shows the **Intelli. Power** screen.

Figure 4-51 Intelli. Power screen




The default value of **Intelligent power** is **Disable**. If you select **Enable**, intelligent power supply parameters are displayed, as shown in [Figure 4-52](#).

Figure 4-52 Intelligent power parameters



- **Intelligent power**
Intelligent power mode is applicable when a D.G. is configured, which enables D.G. power supply when an outage occurs. For details about the installation and configurations, contact Huawei technical support.
- **ATS**
Works with the intelligent power device.
- **D.G startup batt. volt. (V/cell)**
Works with the intelligent power device. The value range is 1.80–2.00 V/cell, and the default value is 1.80 V/cell.

4.1.3.5 Maintenance Screen

On the **System Info** screen, click . If you have not logged in, a dialog box is displayed, asking you to enter a user name and password. After you log in, the **Maintenance** screen is

displayed, as shown in [Figure 4-53](#). You can perform **Battery Maint.**, **USB Operations**, **Inv. ON**, **Inv. OFF**, **ECM Switchover** and **Screen Calib.** on the **Maintenance** screen. You can also perform **Paral. Inv. ON** and **Paral. Inv. OFF** for parallel systems, as shown in [Figure 4-54](#).

Figure 4-53 Maintenance Screen (single UPS)

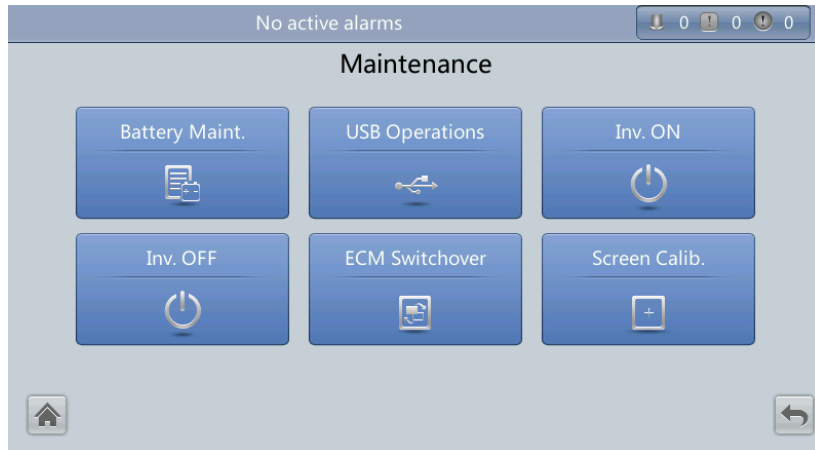
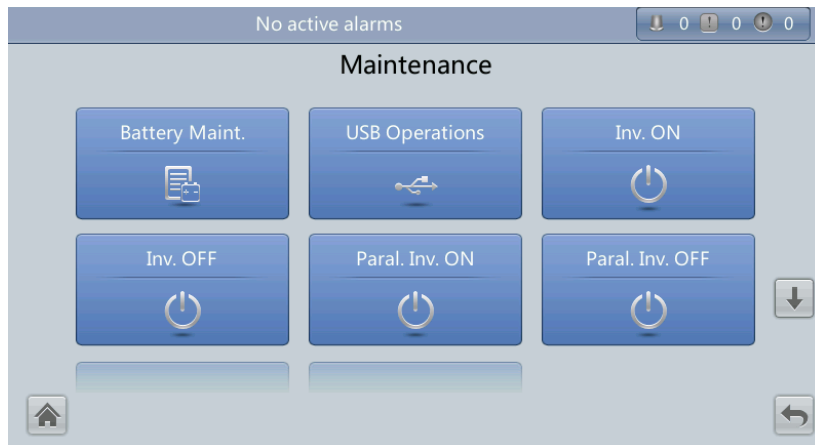


Figure 4-54 Maintenance Screen (parallel system)



Battery Maint. Menu

NOTICE

- Perform battery maintenance when no alarm is active on the UPS. Otherwise, the UPS may supply no power.
- A proportion of battery capacity will discharge during battery maintenance. This reduces the discharge time before the next charge.
- Do not perform battery maintenance when a D.G. is connected.

Perform battery maintenance periodically to increase the battery lifespan and improve the UPS reliability. Battery maintenance includes **Forced Equalized Charging**, **Shallow Dis. Test**, and **Capacity Test**. The next maintenance time displayed on the screen reminds you of the upcoming time to check batteries. [Figure 4-55](#) shows the **Battery Maint.** screen.

Figure 4-55 Battery Maint. screen



- **Forced Equalized Charging**
Perform equalized charging on batteries forcibly.
- **Shallow Dis. Test**
Discharge partial capacities of batteries.
- **Capacity Test**
Discharge full capacities of batteries.

USB Operations

The **USB Operations** screen provides the following functions: **Remove USB**, **Upgrade Software**, **Load Config.**, **Export Config.**, **Export Logs**, **Export E-labels**, and **Export Alarms**.

This screen allows you to load software online, upgrade software, and download system data, as shown in [Figure 4-56](#) and [Figure 4-57](#).

Figure 4-56 USB Operations screen 1



Figure 4-57 USB Operations screen 2



Inv. ON and Inv. OFF Menus

You can start and shut down the inverter using the LCD. Before the inverter starts, the system asks for confirmation to prevent misoperation. [Figure 4-58](#) shows the **Inv. ON** screen, and [Figure 4-59](#) shows the **Inv. OFF** screen.

Figure 4-58 Inv. ON screen

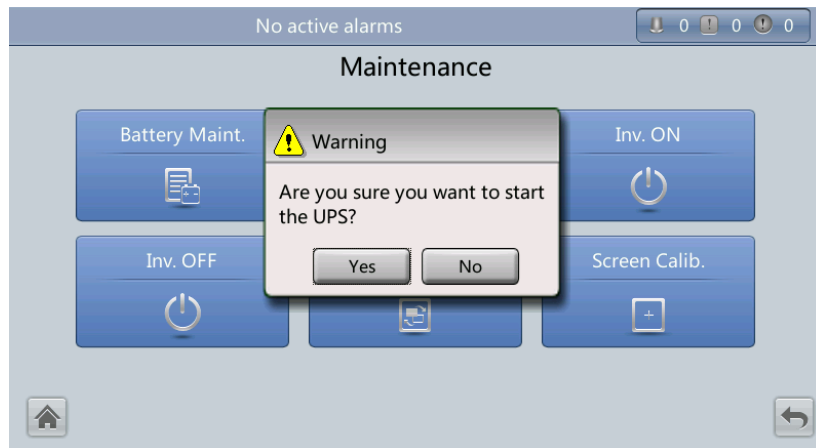
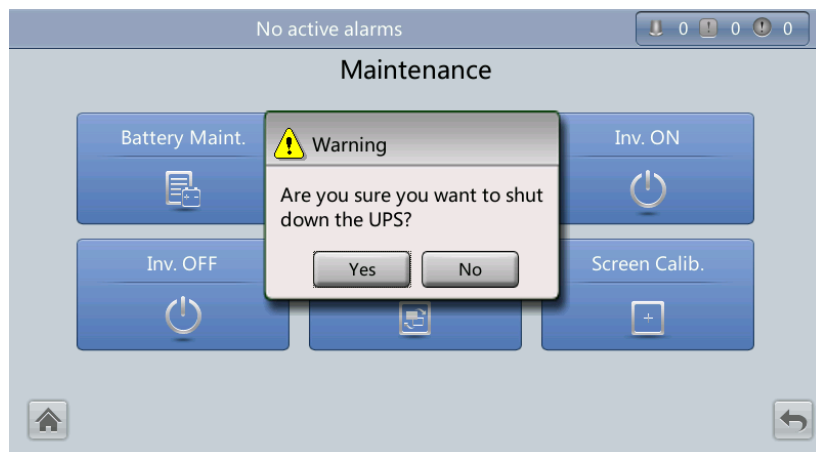


Figure 4-59 Inv. OFF screen



- **Inv. ON**
The **Inv. ON** screen allows you to start the inverter manually.
- **Inv. OFF**
The **Inv. OFF** screen allows you to shut down the inverter manually.

ECM Switchover Menu



NOTICE

Only professional personnel are allowed to use this button.

This menu allows you to perform active/standby switchover on the UPS. When you need to maintain an ECM and it is working, perform active/standby switchover on the ECM, as

shown in [Figure 4-60](#). After switchover, ensure that the ECM stops working (the yellow or red indicator is on, or the green indicator is blinking) before you maintain it.

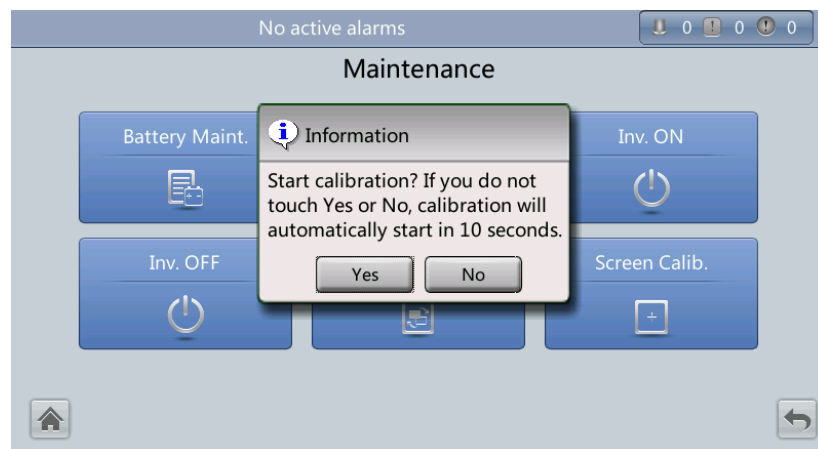
Figure 4-60 ECM switchover



Screen Calib. Menu

You can calibrate the screen, as shown in [Figure 4-61](#).

Figure 4-61 Screen Calib. screen



4.1.3.6 About Screen

On the **System Info** screen, tap **About**. On the **About** screen, you can view the UPS model, manufacturer, monitoring version, and power version, as shown in [Figure 4-62](#). To view version details, tap **Version Info**.

Figure 4-62 About screen

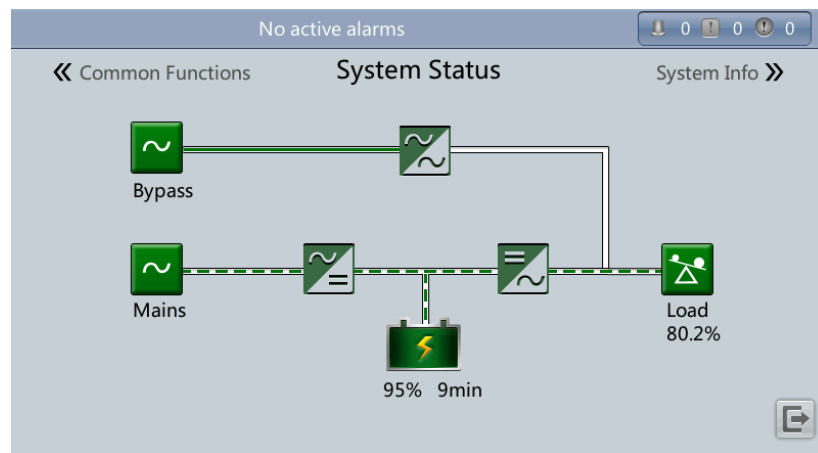


4.1.4 System Status Screen

On the main screen, select **System Status**, See [Figure 4-63](#).

On the **System Status** screen, you can view the mains input, bypass input, load, and battery information.

Figure 4-63 System Status screen



 **NOTE**

For details about the menus on the **System Status** screen, see appendix [A.1 Menus on the LCD](#).

4.1.5 Common Functions Screen

On the main screen, choose **Common Functions**. The **Common Functions** screen is displayed, as shown in [Figure 4-64](#) and [Figure 4-65](#).

The **Common Functions** screen allows you to query the information about the mains input, AC output, and loads, start or shut down an inverter, control the buzzer, and query historical alarms.

Figure 4-64 Common Functions screen 1

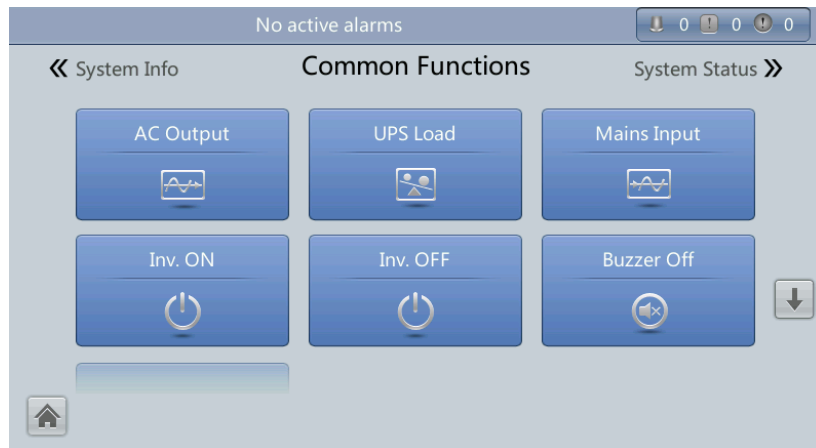


Figure 4-65 Common Functions screen 2



 **NOTE**

For details about the menus on the **Common Functions** screen, see appendix [A.1 Menus on the LCD](#).

4.2 WebUI

4.2.1 Login

Procedure

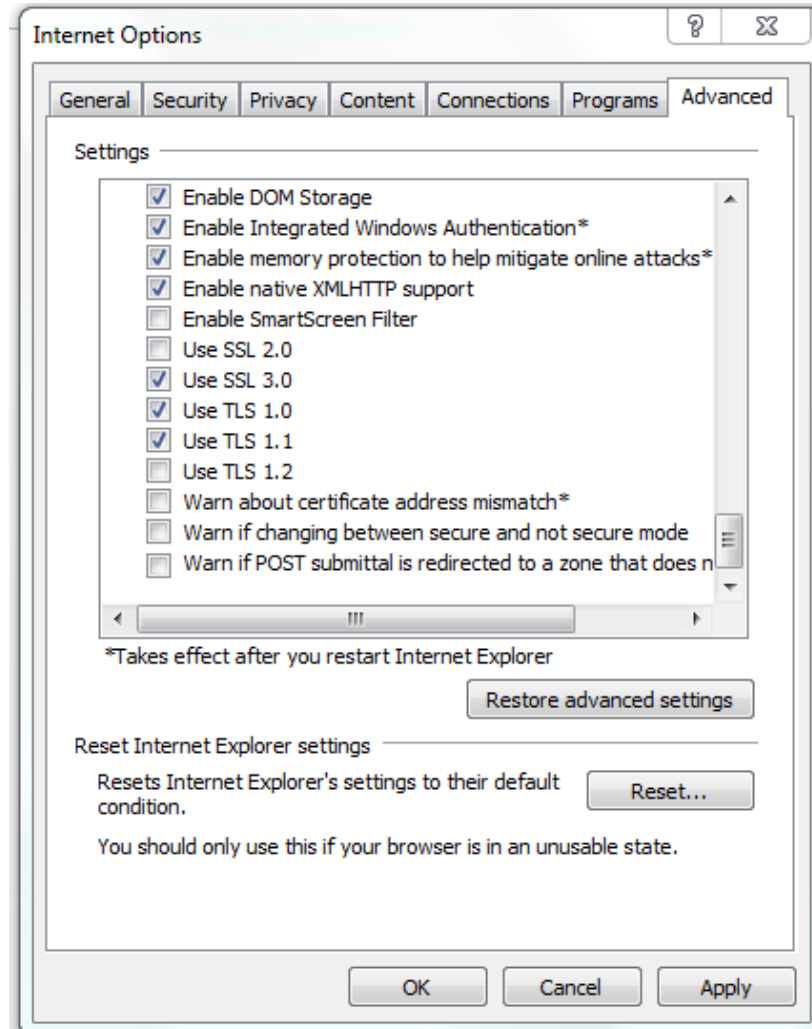
- Step 1** Open the browser (Internet Explorer 8 as an example) and choose **Tools > Internet Options**.
- Step 2** On the **Advanced** tab page, ensure that **Use TLS 1.0**, and **Use TLS 1.1** are selected and click **OK**, as shown in [Figure 4-66](#).



NOTE

- In monitoring and power versions earlier than V100R001C10SPC008 (software package version: V100R001C10SPC700), the software package version uses default Internet Explorer settings. In this case, ensure that **Use SSL 3.0** and **Use TLS 1.0** are selected.
- In monitoring and power version V100R001C10SPC008 (software package version: V100R001C10SPC700) or later, the software package version also requires the selection of **Use TLS 1.1** in addition to the default Internet Explorer settings. In this case, ensure that **Use TLS 1.0** and **Use TLS 1.1** are selected.

Figure 4-66 Settings in the Internet Options dialog box



Step 3 Enter **https://UPS IP address** in the address box of Internet Explorer, select a language, set **User name** and **Password**, and click **Login**. The system supports Internet Explorer 8, and Firefox 31.0. [Table 4-4](#) describes the system users.



NOTE

The preset UPS IP address is 192.168.0.10. You can set the UPS Ethernet IP address on the LCD or WebUI. The value range is 0.0.0.0–255.255.255.255.

Table 4-4 Description of default users

Default User	LCD Preset Password	Web Preset Password	User Rights
admin (administrator)	000001	Changeme	Performs all operations on the LCD and WebUI, including system running information browsing, system information (historical alarms, logs, e-labels, and fault data) exporting, parameter (system parameters and battery parameters) setting, system control (startup, shutdown, troubleshooting, runtime clearing, and battery management), system configuration (network parameters, user management, time and date, and site information), and system maintenance (upgrade, calibration, and variables commissioning).
operator (common user)	000001	Changeme	Only browses the system running information, exports system information (historical alarms, logs, e-labels, and fault data), starts/shuts down the inverter, rectify faults, and controls the buzzer.
browser (browser)	000001	N/A	Only browses the system running information.



NOTE

- If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.
- After you log in to the WebUI, you will be logged out if another user logs in with the same user name.
- Change the password after your first login, preventing unauthorized access. Choose **Config.** > **User Mgmt.** to change the password. You can change the password in **User Mgmt.** on the **Config.** page.

----End

4.2.2 Monitoring Page

After you log in to the WebUI, the **Monitoring** page is displayed by default, as shown in [Figure 4-67](#).

Figure 4-67 Monitoring page

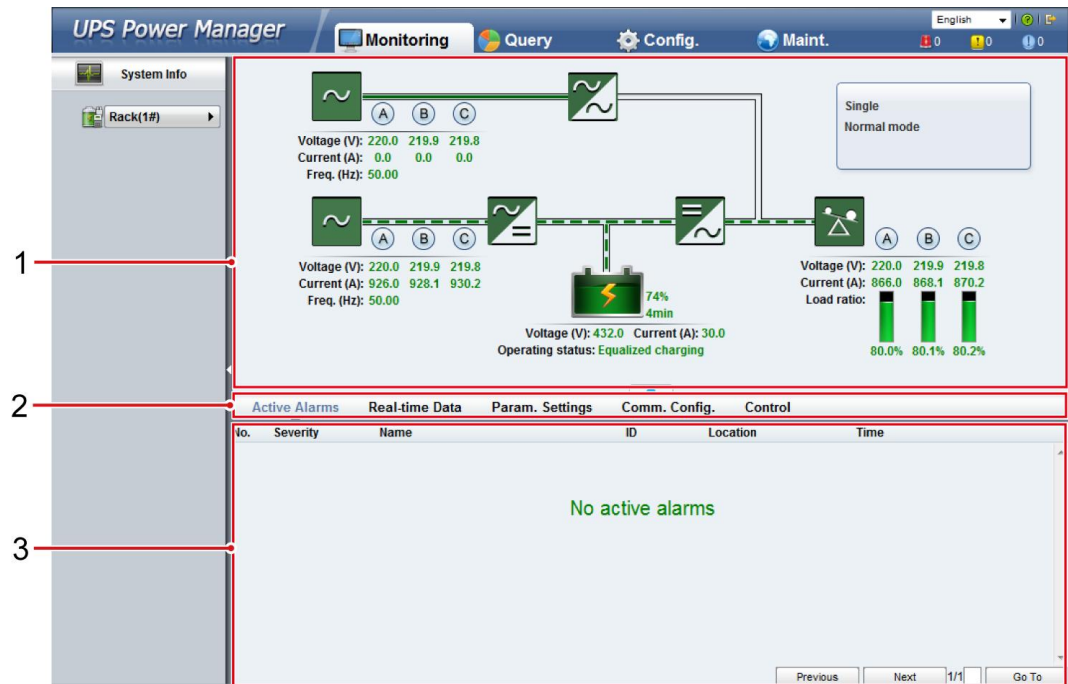


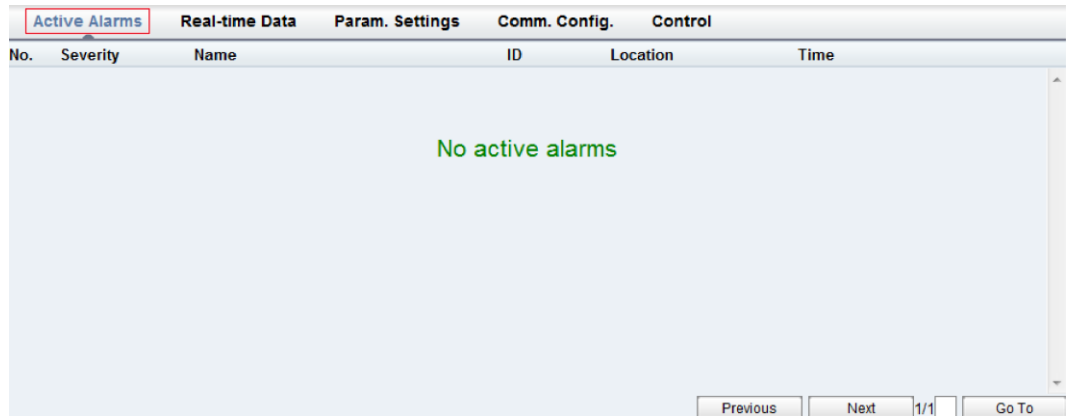
Table 4-5 Monitoring page details

Number	Area	Function
1	Running status area	Displays the power flow and UPS running information.
2	Menu bar	Displays active alarms and real-time data, sets parameters, sets communications information, and provides control commands. The Active Alarms page is displayed by default.
3	Information area	Displays system monitoring information.

4.2.2.1 Active Alarms Page

You can view active alarms on the **Active Alarms** page, as shown in [Figure 4-68](#).

Figure 4-68 Active Alarms page



4.2.2.2 Real-time Data Page

You can view the real-time system running data on the **Real-time Data** page, as shown in [Figure 4-69](#).

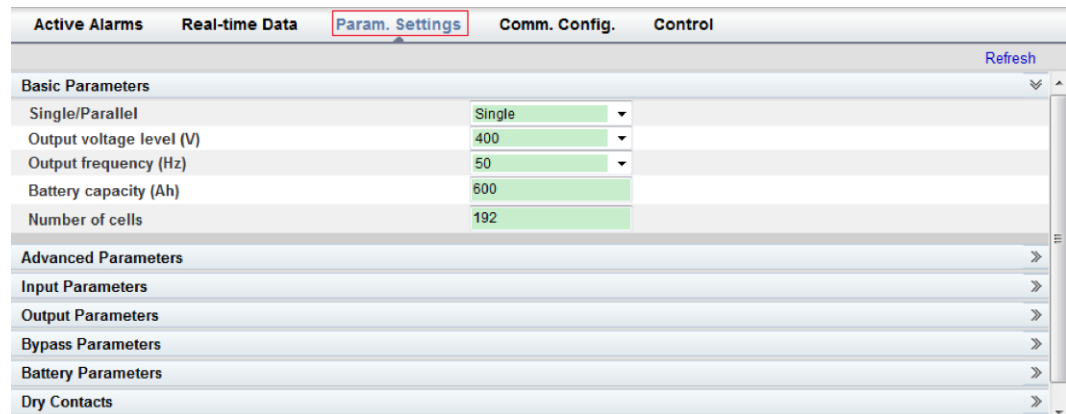
Figure 4-69 Real-time Data page

Active Alarms					Real-time Data	Param. Settings	Comm. Config.	Control
					Refresh			
UPS								
Input	Phase voltage (V)	A: 220.0	B: 219.9	C: 219.8				
	Line voltage (V)	AB: 380.0	BC: 379.9	CA: 379.8				
	Current (A)	A: 808.3	B: 810.2	C: 812.2				
	Power factor	A: 0.98	B: 0.99	C: 0.99				
	Frequency (Hz)	50.00						
Bypass	Phase voltage (V)	A: 220.0	B: 219.9	C: 219.8				
	Line voltage (V)	AB: 380.0	BC: 379.9	CA: 379.8				
	Current (A)	A: 0.0	B: 0.0	C: 0.0				
	Power factor	A: 0.00	B: 0.00	C: 0.00				
	Frequency (Hz)	50.00						
Phase voltage (V)		A: 220.0	B: 219.9	C: 219.8				

4.2.2.3 Param. Settings Page

On the **Param. Settings** page, you can set basic parameters, advanced parameters, input parameters, output parameters, bypass parameters, battery parameters, and dry contacts. The settings are the same as those on the LCD in [4.1.3.4 Settings Screen](#). See [Figure 4-70](#).

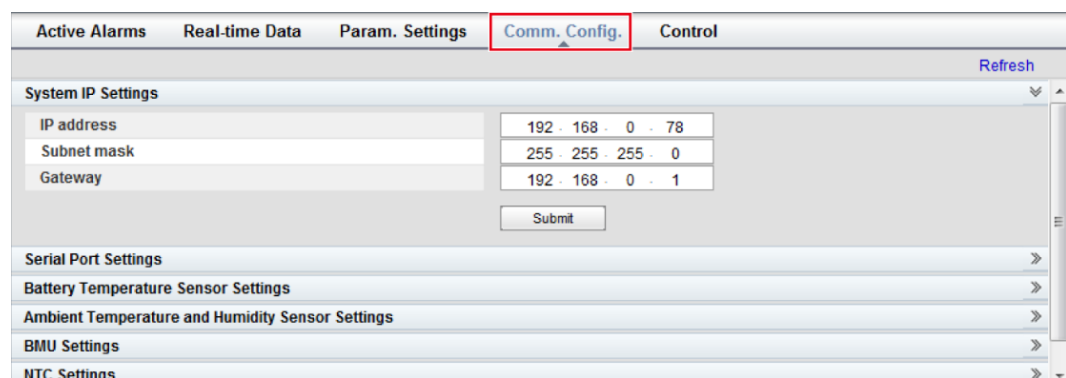
Figure 4-70 Param. Settings page



4.2.2.4 Comm. Config. Page

You can set communications information on the **Comm. Config.** page, The settings are the same as those on the LCD in 4.1.3.4 Settings Screen. See Figure 4-71.

Figure 4-71 Comm. Config. page



4.2.2.5 Control Page

On the **Control** page, you can control the system, as shown in Figure 4-72. For parallel systems, you can also perform **Paral. Inv. ON** and **Paral. Inv. OFF**, as shown in Figure 4-73.

Figure 4-72 Control page (single UPS)

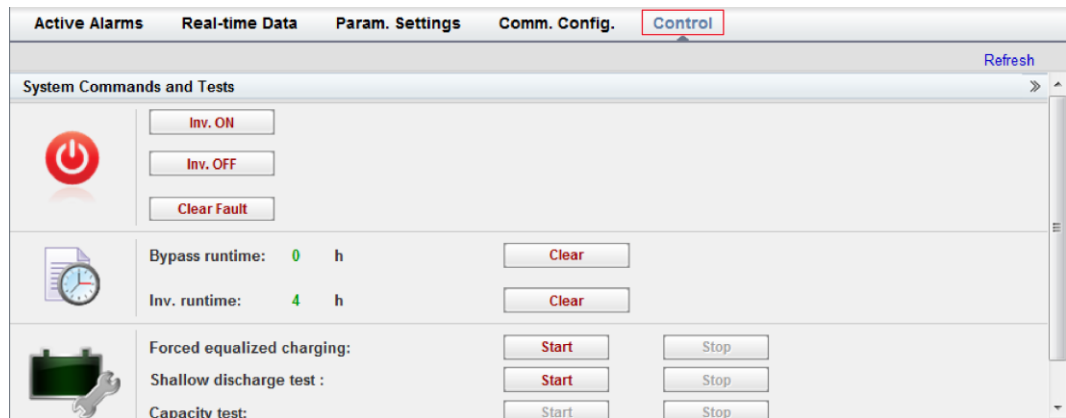
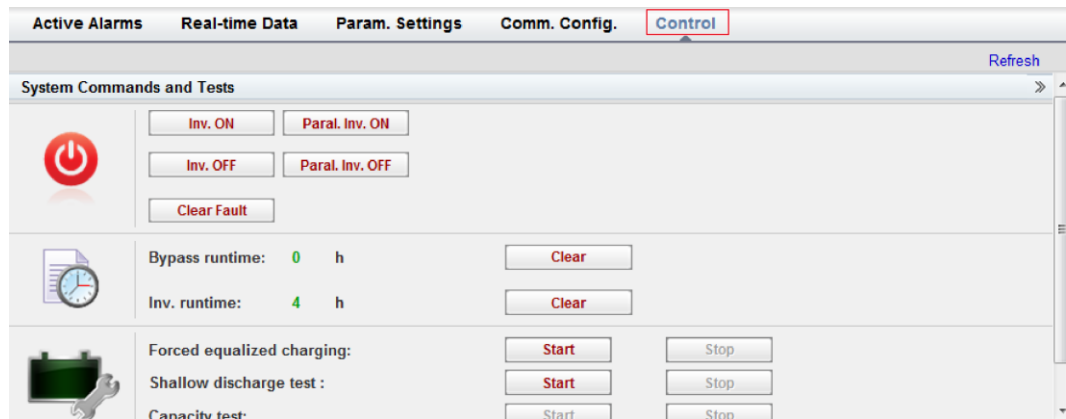


Figure 4-73 Control page (parallel system)



 **NOTE**

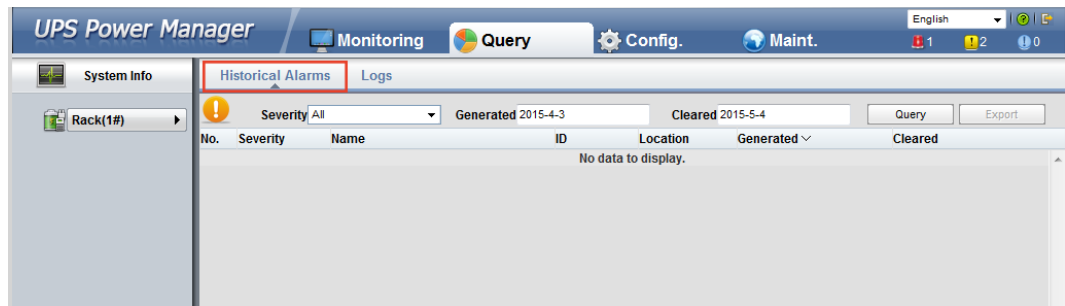
For details about the menus on the **Monitoring** page, see [A.2 Menus on the WebUI](#).

4.2.3 Query Page

4.2.3.1 Historical Alarms Page

On the homepage, click the **Query** tab. On the **Historical Alarms** page, you can query historical alarms based on severity, generation time, and clear time, as shown in [Figure 4-74](#).

Figure 4-74 Historical Alarms Page



4.2.3.2 Logs Page

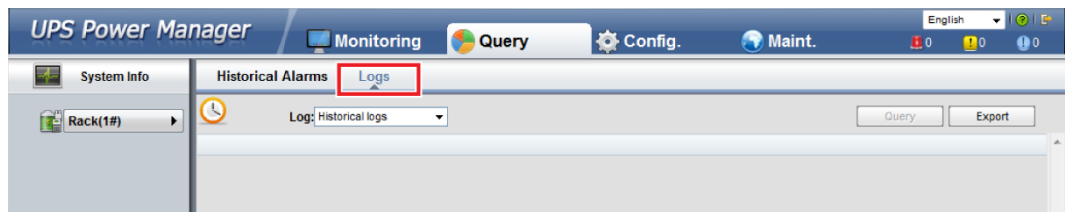
On the **Logs** page, you can set **Logs** to **Historical logs**, **Cap. test logs**, or **Common test logs**, and query or export logs, as shown in [Figure 4-75](#).



NOTE

You can export historical logs but cannot query them.

Figure 4-75 Logs Page



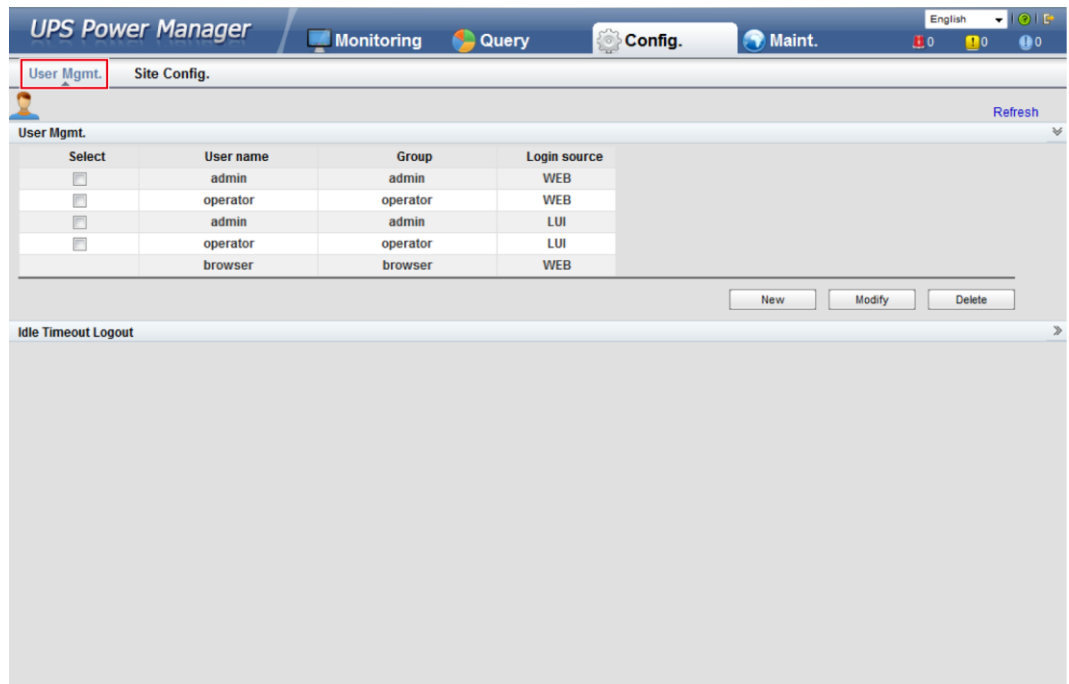
NOTE

For details about the menus on the **Query** page, see [A.2 Menus on the WebUI](#).

4.2.4 Config. Page

On the homepage, click **Config.** On the **Config.** page, you can set the user and site information, as shown in [Figure 4-76](#) and [Figure 4-77](#).

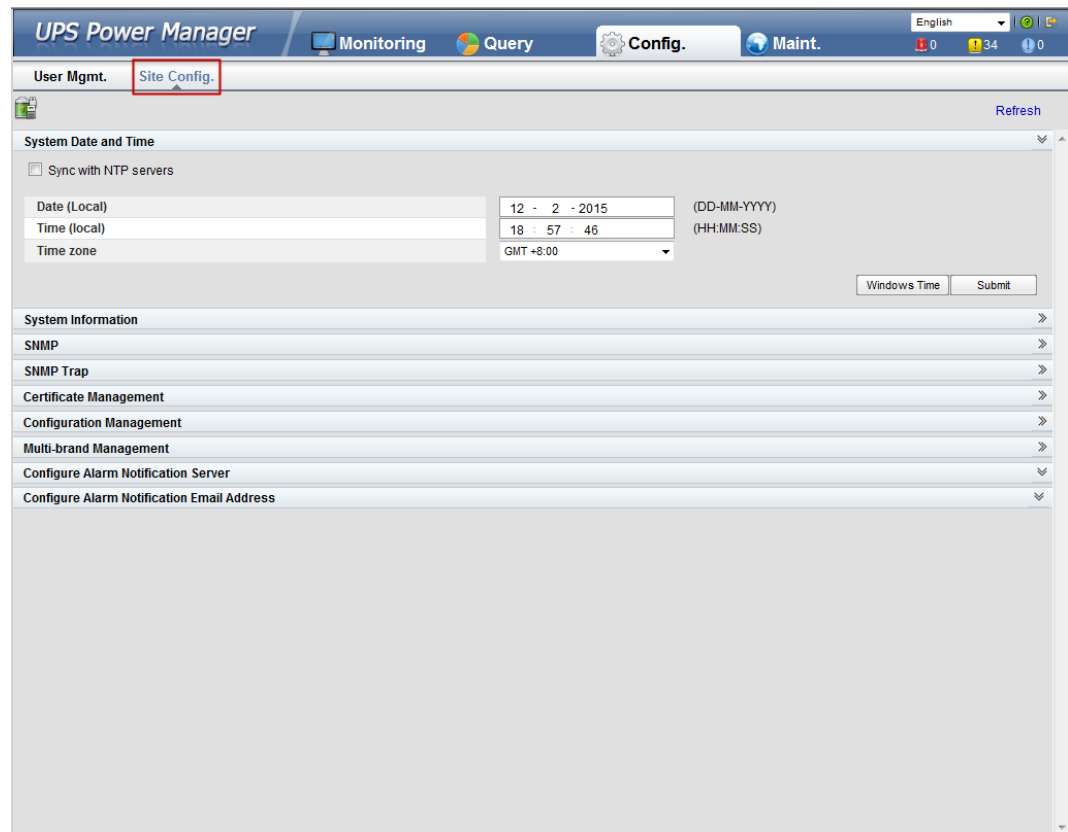
Figure 4-76 User Mgmt. page



 **NOTE**

On the **User Mgmt.** page, you can add, modify, or delete users and change user passwords.

Figure 4-77 Site Config. page



NOTE

- The NTP parameters are used to set the NTP server address, port number, and synchronization interval.
- The default SNMP version is SNMPv3. For a version earlier than UPS V100R001C10SPC008, the preset password is **12345678**; for UPS V100R001C10SPC008 and later, the preset MD5/SHA password is **Changeme1**, and the preset DES/AES password is **Changeme2**. Change the password after your first login, preventing unauthorized access.
- For SNMPv2, the default read and write community names are **sread** and **swrite** respectively.
- To obtain the MIB file, choose **Config. > Site Config > SNMP > Download HUAWEI_UPS_MIB..**
- **SNMP Trap** indicates the IP address of the server configured with NMS software. If **SNMP Trap** is incorrectly set or not set, system information will be lost or not reported in time.
- The certificate is used for Secure Sockets Layer (SSL) encryption protection for WebUI login. You need to apply to a third-party institution for the certificate.
- **Configuration Management** is used to upload and export configuration parameters in the monitoring system.
- **Multi-brand Management** is used to load the brand information of a partner to the corresponding WebUI.
- Specify **Email server IP address**, **Sender's email**, and **User account authentication required** when sending a mail and click **Test** to check whether the test email can be received. **Configure Alarm Notification Server** is used to configure a server for receiving alarm emails from the monitoring system.
- Set **Email** and **Alarm Severity** and simulate an alarm. Check that the alarm email can be received. **Configure Alarm Notification Email Address** is used to configure the email address for receiving alarm emails from the monitoring system.

- For details about the menus on the **Config.** page, see appendix [A.2 Menus on the WebUI](#).

4.2.5 Maint. Page

On the homepage, click the **Maint.** tab. The **Maint.** page provides the **Calib.**, **Commissioning Var.**, **Upgrade**, and **Download** tabs. The maintenance operations cover the **Bypass**, **Module**, and **ECM**, as shown in [Figure 4-78](#), [Figure 4-79](#), [Figure 4-80](#), and [Figure 4-81](#).

Figure 4-78 Calib. page

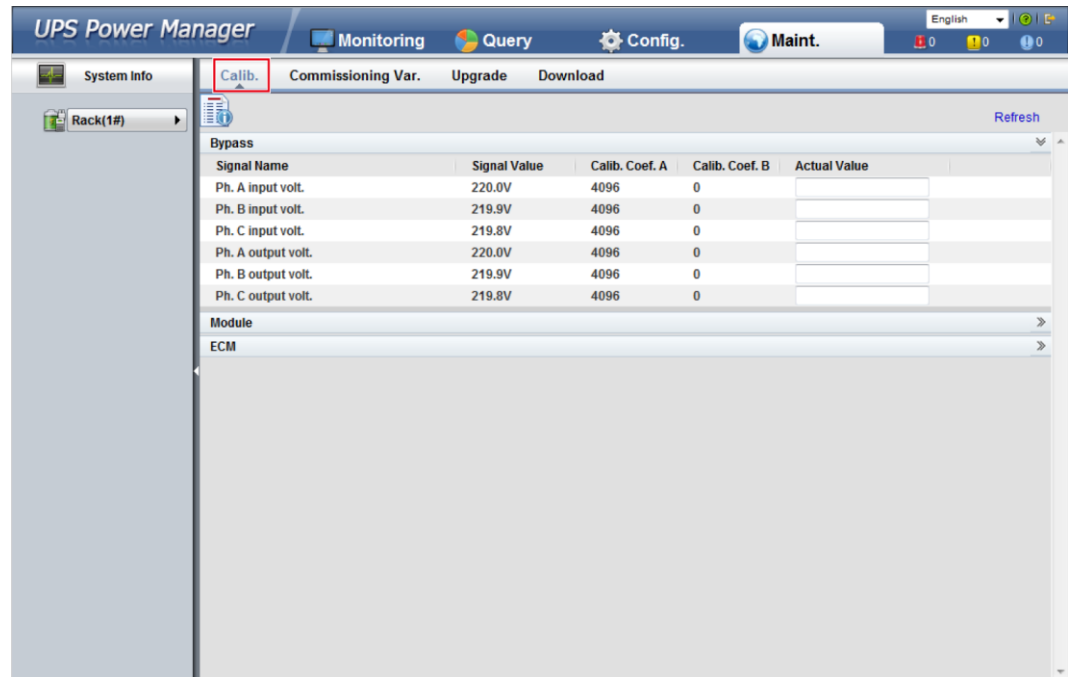


Figure 4-79 Commissioning Var. page

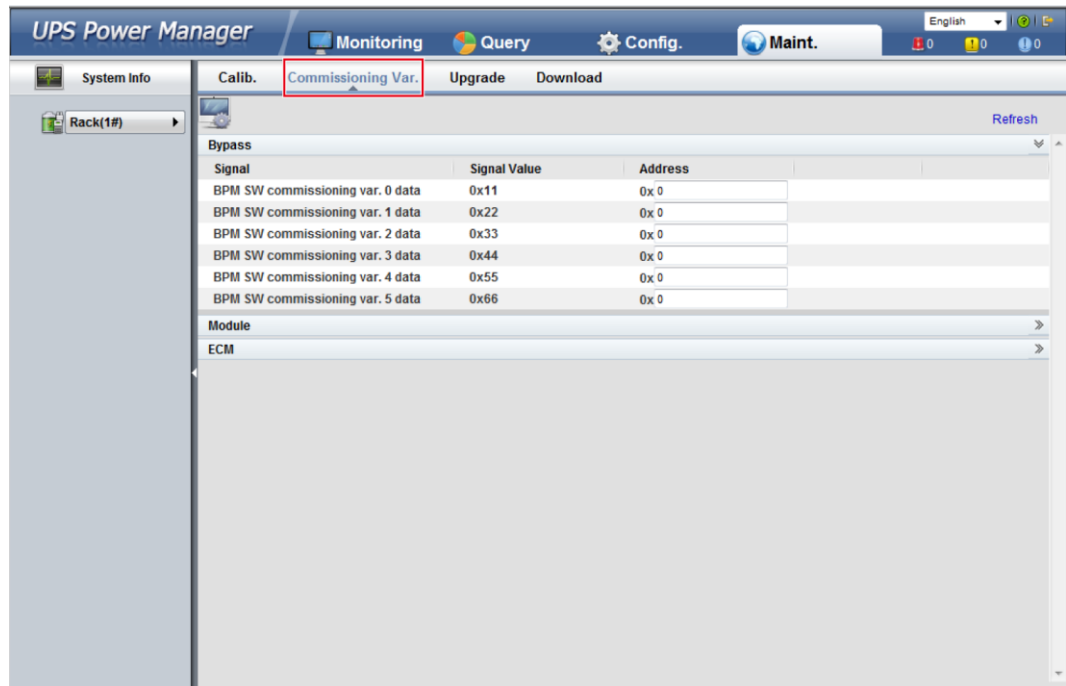


Figure 4-80 Upgrade page

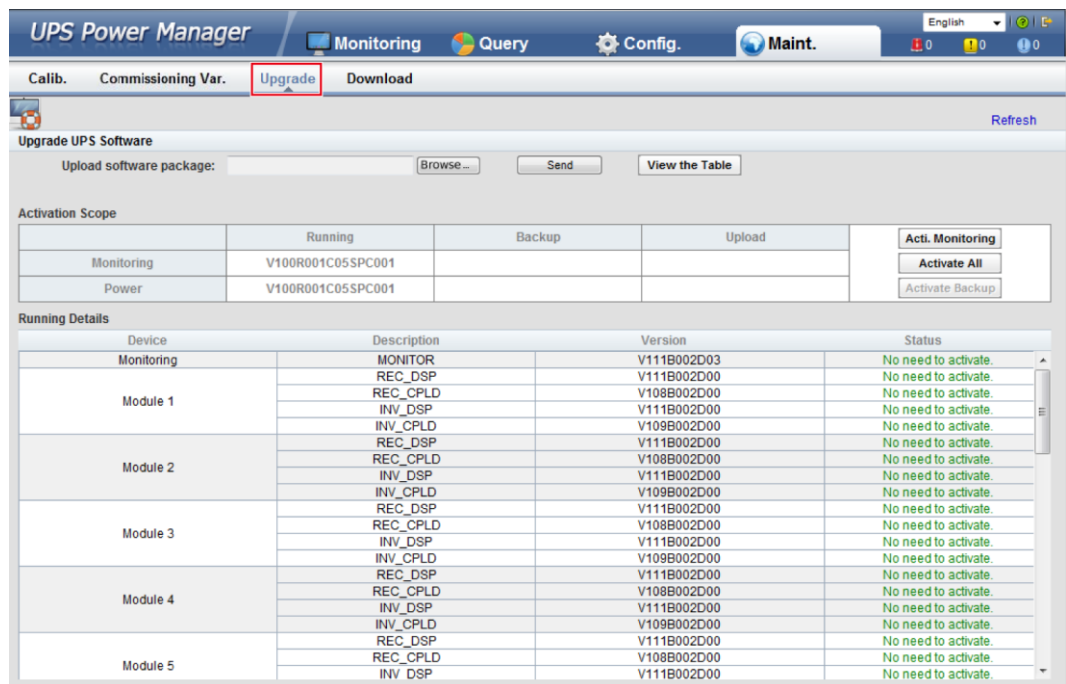
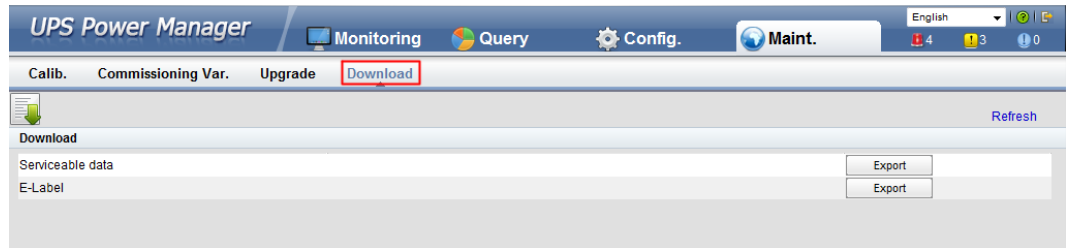


Figure 4-81 Download page



 **NOTE**

For details about the menus on the **Maint.** page, see appendix [A.2 Menus on the WebUI](#).

5 Operations

5.1 Single UPS Operations

5.1.1 Powering On and Starting the UPS

Prerequisites



NOTICE

Measure the main and bypass input voltage and frequency of the UPS bypass cabinet or measure the voltage and frequency delivered by the external input power distribution cabinet to the UPS. The voltage range is 138–485 V AC, and the frequency range is 40–70 Hz.

Context

 **NOTICE**

- The following operations are specified for a single UPS. For parallel systems, contact Huawei technical support.
- Before you power on the UPS, check that the UPS has passed all check items described in section [3.5 Installation Verification](#).
- Before you power on the UPS, check that all external and internal switches are OFF (except that the ready switches for the power module and bypass module are in locked state. [Figure 5-1](#) shows the bypass module ready switch on the 600 kVA UPS. [Figure 5-2](#) shows the bypass module ready switch on the 800 kVA UPS. [Figure 5-3](#) shows the power module ready switch).

Figure 5-1 Bypass module ready switch on the 600 kVA UPS

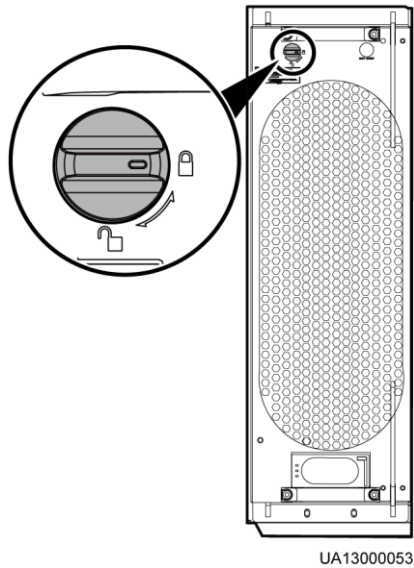


Figure 5-2 Bypass module ready switch on the 800 kVA UPS

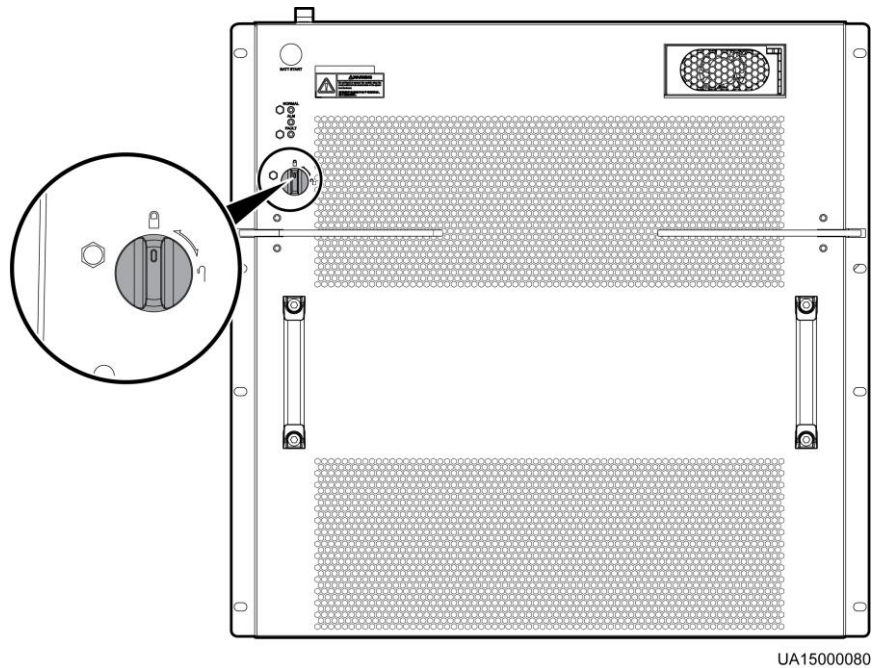
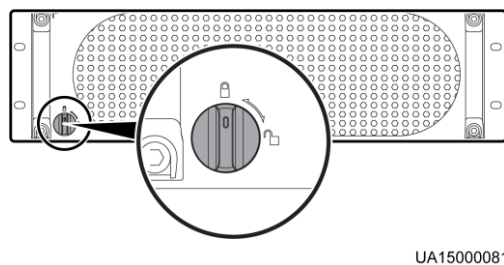


Figure 5-3 Power module ready switch



Procedure

Step 1 Power on the UPS. The following describes how to power on the UPS in full configuration and standard configuration.

- To power on a UPS in full configuration (configured with an internal mains input switch, internal bypass input switch, internal output switch, and internal maintenance bypass switch), perform the following operations:
 - a. Turn on the external bypass and mains input switches.
 - b. Turn on the internal bypass input switch.
 - c. Turn on the internal output switch.
 - d. Turn on the internal mains input switch.
 - e. Close the external input surge protection circuit breaker (if any).

The UPS starts initialization. The LCD displays the Huawei logo and an initialization progress bar.

- To power on a UPS in standard configuration (configured only with an internal maintenance bypass switch), perform the following operations:
 - a. Turn on the external bypass and mains input switches.
 - b. Close the external input surge protection circuit breaker (if any).The UPS starts initialization. The LCD displays the Huawei logo and an initialization progress bar.



NOTE

If you do not close the input surge protection circuit breaker (if any on the input PDC), the system can start properly but will generate an alarm, asking you to close the input surge protection circuit breaker.

Step 2 After the LCD starts, perform the following steps:

- If the UPS is starting for the first time, set the language, date and time, network parameters, and system parameters on the **Settings Wizard** screen.
- If this is not the first startup, retain the previous settings.



NOTE

After you specify the settings, the **Bypass mode** and **No battery** alarms are displayed on the LCD.

The main buttons on the **Settings Wizard** screen are described as follows:

- Tap **Previous** to return to the upper-level screen.
 - Tap **Next** to go to the next screen.
 - Tap **Cancel** to exit the **Settings Wizard** screen.
1. Various languages are available, such as Chinese and English. Press **Down** and **Up** to view the language types, as shown in [Figure 5-4](#).

Figure 5-4 Language screen



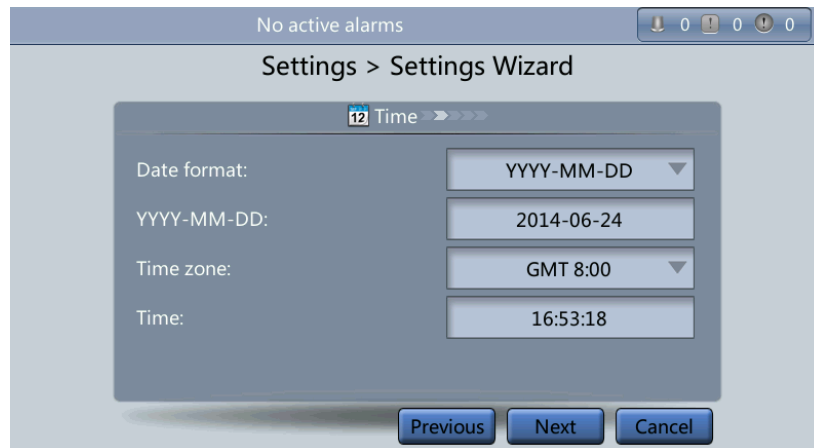
2. After selecting the language, tap **Next** to open the date and time setting page. Select the date format, for example, *YYYY-MM-DD*. See [Figure 5-5](#).



NOTICE

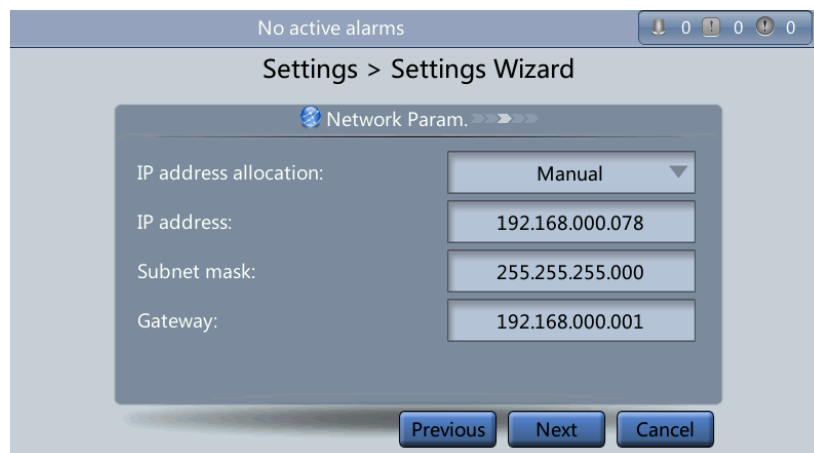
Set the date and time correctly. Incorrect time display in running and alarm information would lead to analysis errors during maintenance or repair.

Figure 5-5 Setting the date and time



3. On the **Network Param.** screen, set **IP address allocation**, **IP address**, **Subnet mask**, and **Gateway**, as shown in [Figure 5-6](#). For details, see [4.1.3.4 Settings Screen](#).

Figure 5-6 Network Param. screen



 **NOTE**

After you set network parameters, connect the UPS to the network over a network cable, which enables you to remotely manage the UPS. If you do not need remote management, retain the default network parameter settings.

4. On the **System Param.** screen, select **Single** (default value) or **Parallel**, as shown in [Figure 5-7](#). Set the voltage level, output frequency, battery capacity, and the number of batteries, as shown in [Figure 5-8](#).



NOTICE

System parameter settings affect UPS operation. When you set system parameters, note the following:

- Set **Single/Parallel** after confirmation.
- **Output voltage level** refers to the line voltage level. Set it based on the site requirements.
- Set **Output frequency** correctly; otherwise, loads may not work properly.

Figure 5-7 System Param. screen 1

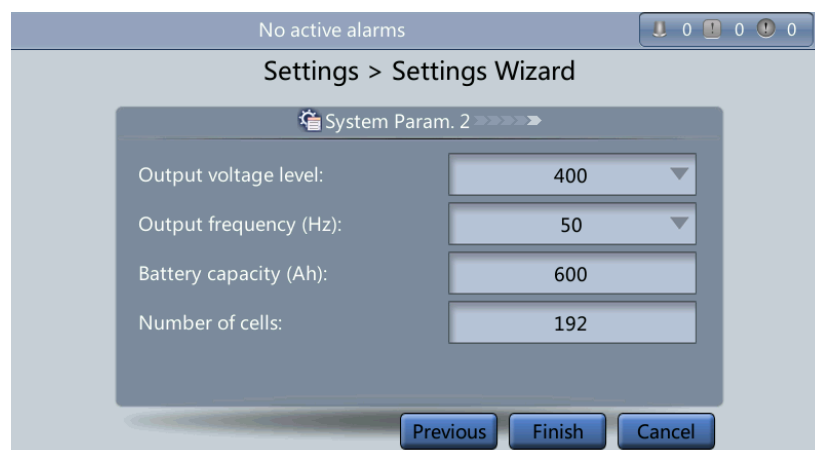


NOTICE

Battery parameter settings have great impact on battery maintenance, battery lifespan, and UPS discharge time. When you set battery parameters, note the following:

- Set **Battery capacity** after repeated confirmation. An incorrect setting reduces the charging power.
- When a battery string is shared, the battery capacity of each UPS is the total capacity of battery strings; when no battery string is shared, the battery capacity of each UPS is the battery capacity of the single UPS.
- A high or low charging power tends to shorten the battery lifespan, or even damages batteries. To seek help about how to determine the battery capacity, contact Huawei technical support.
- **Number of cells** refers to the number of 2 V cells in a single battery string connected to the UPS, and the number of cells must be a multiple of 12 (for example, 180 and 192). For example, if 36 batteries (150 Ah, 12 V) are connected in series to form a battery string, and two of such battery strings are connected in parallel and then to the UPS, set **Number of cells** to **216** (36 x 6) and **Battery capacity** to **300 Ah** (150 Ah + 150 Ah). If 192 batteries (300 Ah, 2 V) are connected in series to form a battery string, and two of such battery strings connected in parallel and then to the UPS, set **Number of cells** to **192** (192 x 1) and **Battery capacity** to **600 Ah** (300 Ah + 300 Ah). It affects the charge voltage and discharge time. An incorrect setting will cause a high or low charge voltage, which greatly shortens the battery lifespan. In addition, the UPS may shut down before the batteries are fully discharged, which may lead to a data backup fault.

Figure 5-8 System Param. screen 2



Step 3 If no exception alarm is reported on the monitoring page after you specify settings on the **Settings Wizard** screen, perform subsequent steps. If exception alarms are reported on the monitoring page, clear all the alarms.

NOTE

- After you set parameters on the **Settings Wizard** screen, tap **System Info > Settings > Advanced Param.** Check that **System Capacity**, **Power module capacity**, **Requisite modules**, and **Redundant modules** match the actual values.
- Tap **System Info > Settings > Dry contacts**. Set the dry contacts that are used to **Enabled** and the dry contacts that are not used to **Disabled**.

Step 4 Check that the bypass input is normal and the system has transferred to bypass mode. You can confirm this by viewing the system running diagram on the LCD.

Step 5 Start the inverter.

- Method for starting the inverter on the LCD


- a. On the main screen, tap **Common Functions**. Tap **Inv. ON**.
- b. If you have not logged in, enter a user name and password, and tap  on the login screen displayed, as shown in [Figure 5-9](#).

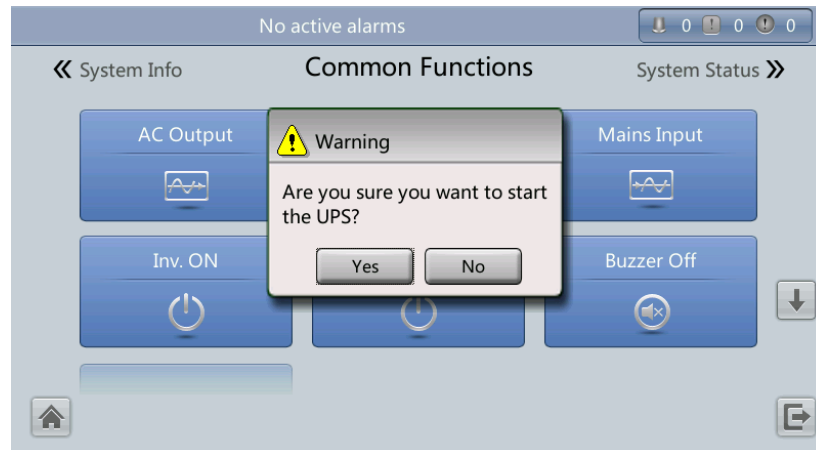
Figure 5-9 Login



 **NOTE**

- [Table 4-4](#) lists the default user names and preset passwords and describes the permission of the default users.
 - If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.
- c. In the displayed dialog box, tap **Yes** to start the inverter, as shown in [Figure 5-10](#).

Figure 5-10 Starting the inverter



 **NOTE**

You can also tap **System Info** > **Maintenance** and start the inverter on the **Maintenance** screen.

- Method for starting the inverter on the WebUI
 - a. Open the browser (Internet Explorer 8 as an example) and choose **Tools** > **Internet Options**.

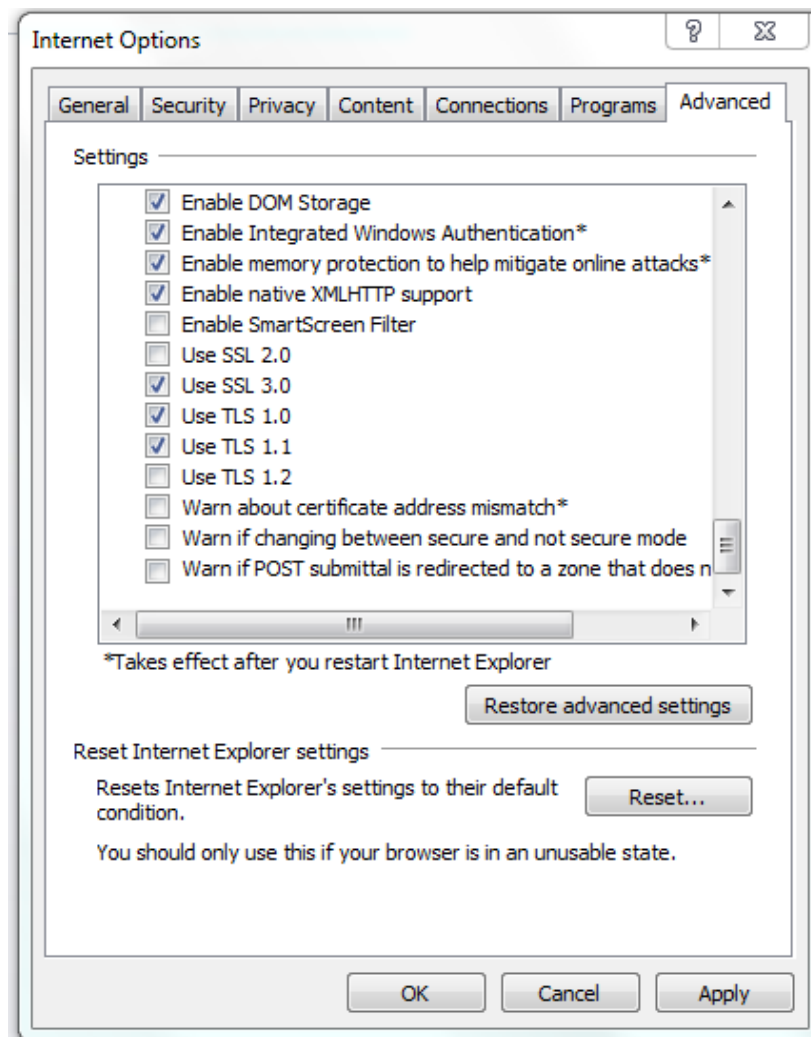
- b. On the **Advanced** tab page, ensure that **Use TLS 1.0**, and **Use TLS 1.1** are selected and click **OK**, as shown in [Figure 5-11](#).



NOTE

- In monitoring and power versions earlier than V100R001C10SPC008 (software package version: V100R001C10SPC700), the software package version uses default Internet Explorer settings. In this case, ensure that **Use SSL 3.0** and **Use TLS 1.0** are selected.
- In monitoring and power version V100R001C10SPC008 (software package version: V100R001C10SPC700) or later, the software package version also requires the selection of **Use TLS 1.1** in addition to the default Internet Explorer settings. In this case, ensure that **Use TLS 1.0** and **Use TLS 1.1** are selected.

Figure 5-11 Settings in the Internet Options dialog box



- c. Enter **https://UPS IP address** in the address box of Internet Explorer.
- d. On the login page, select a display language, enter a user name and password, and click **Login**, as shown in [Figure 5-12](#). The UPS supports Internet Explorer 8, and Firefox 31.0.

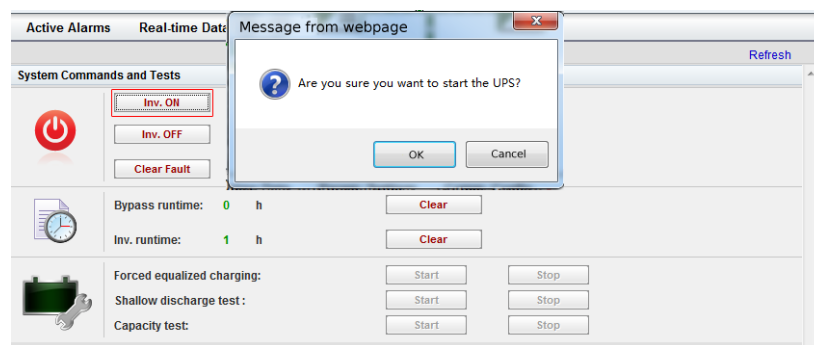
Figure 5-12 Login



NOTE

- [Table 4-4](#) lists the default user names and preset passwords and describes the permission of the default users.
 - If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.
- e. On the homepage, choose **Monitoring > Control**, and click **Inv. ON**. In the displayed dialog box, click **OK** to start the inverter, as shown in [Figure 5-13](#).

Figure 5-13 Starting the inverter



NOTE

If the power module receives a startup command when it cannot be started, the startup command will be kept for 1 minute. If the startup command is not cleared within 1 minute (for example, other faults occur on the module, or you perform shutdown or rectify faults) and the module can be started, the module responds to the startup command.

- Step 6** Ensure that the UPS transfers to normal mode. View the system running diagram to check that the **Bypass mode** alarm disappears on the LCD. Check the UPS three-phase output voltage and frequency by viewing the AC output on the LCD, as shown in [Figure 5-14](#) and [Figure 5-15](#). Use a multimeter to measure the three-phase output voltage and frequency.

NOTE

The three-phase output voltage should be 220 V, 230 V, or 240 V, and the frequency should be 50 Hz or 60 Hz.

Check on the LCD. See [Figure 5-14](#) and [Figure 5-15](#).

Figure 5-14 Common Functions

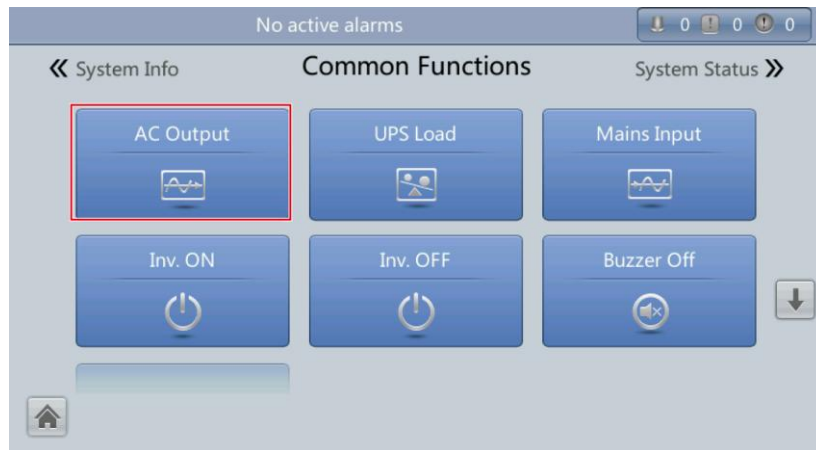
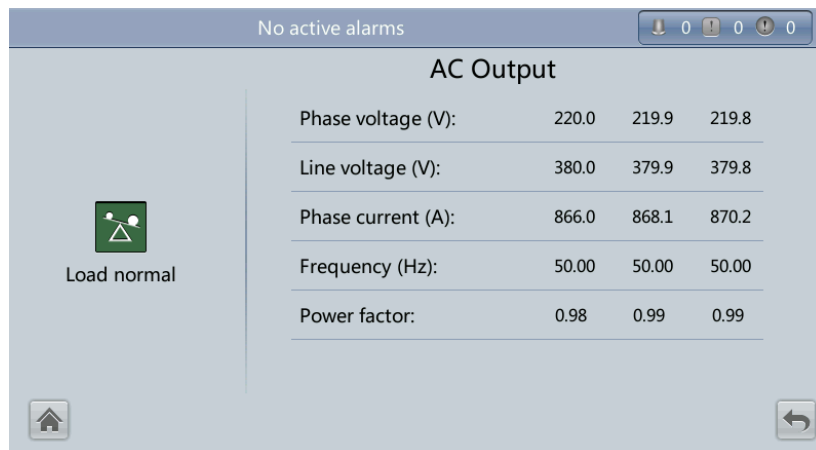


Figure 5-15 AC Output screen



- Step 7** Verify that the number of battery strings is consistent with the result calculated based on the number of cells displayed on the LCD. Each cell is 2 V. For example, if a battery provides a voltage of 12 V, it is regarded as six cells. If each battery provides a voltage of 2 V, the number of cells is the same as the number of batteries. Use a multimeter to check that the sum of the absolute voltages of positive and negative battery strings are greater than a certain value (1.9 x Number of cells) to ensure that the battery strings are connected properly.



NOTICE

Number of cells indicates the number of 2 V cells connected to the UPS. **Number of cells** affects the charge voltage and discharge time. Incorrect setting will cause a high or low charge voltage, which greatly shortens the battery lifespan. In addition, the UPS may shut down before the discharging is completed, which may result in data backup failure. The [Table 5-1](#) lists examples of setting battery parameters.

Table 5-1 Battery parameter settings

Battery Specifications	Number of Batteries	Number of Battery Strings	Number of Cells	Battery Capacity
150 Ah/12 V	36 batteries in series	Two battery strings connected in parallel	$36 \times 6 = 216$	150 Ah + 150 Ah = 300 Ah
300 Ah/2 V	192 batteries in series	Two battery strings connected in parallel	$192 \times 1 = 192$	300 Ah + 300 Ah = 600 Ah
300 Ah/12 V	40 batteries in series	Three battery strings connected in parallel	$40 \times 6 = 240$	300 Ah + 300 Ah + 300 Ah = 900 Ah
300 Ah/2 V	240 batteries in series	Four battery strings connected in parallel	$240 \times 1 = 240$	300 Ah + 300 Ah + 300 Ah + 300 Ah = 1200 Ah

Step 8 After checking that the battery strings are properly connected, close the battery circuit breaker (if there are multiple battery strings, close the circuit breaker for each battery string and then the general circuit breaker between battery strings and the UPS).



NOTE

After you turn on the battery string input switch, the **No batteries** alarm disappears on the LCD, while batteries are in the charged state.

Step 9 Turn on the external output switches to supply power to loads.



NOTICE

When the UPS is started for the first time, perform a battery capacity test to ensure that battery parameters are correctly displayed. For details, see [5.1.6.3 Capacity Test](#).



NOTE

If the UPS has been powered on or is working in bypass mode and you want the UPS to transfer to normal mode, perform [Step 5](#) only if no alarm is generated. If the UPS is completely disconnected from the power supply system, perform all steps.

----End

5.1.2 Shutting Down and Powering Off the UPS

Context




NOTICE

After the inverter is shut down, the system transfers to the bypass mode if the system bypass operates properly or provides no output for loads if the system bypass becomes faulty. Before you shut down the UPS, ensure that the loads are disconnected to meet any power failure conditions.

Procedure

Step 1 Shut down the inverter.

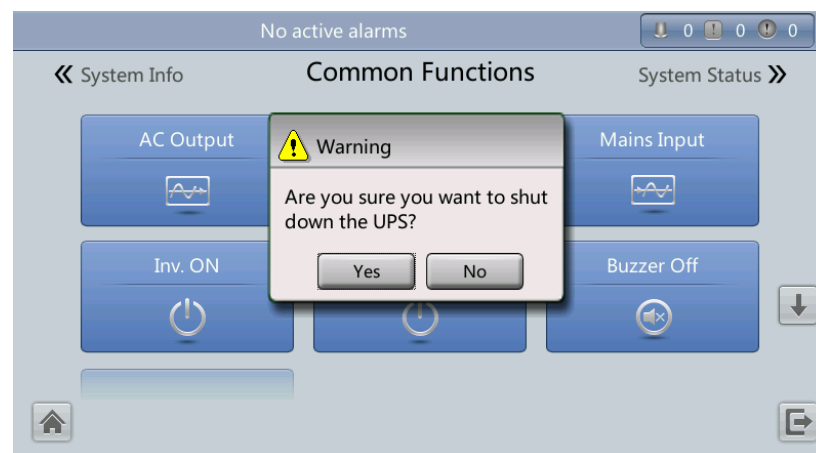
- Method for shutting down the inverter on the LCD
 - a. On the main screen, tap **Common Functions**. Tap **Inv. OFF**.
 - b. If you have not logged in, enter a user name and password, and tap  on the login screen displayed.



NOTE

- [Table 4-4](#) lists the default user names and preset passwords and describes the permission of the default users.
- If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.
- c. In the displayed dialog box, tap **Yes** to shut down the inverter, as shown in [Figure 5-16](#).

Figure 5-16 Inv. OFF screen



NOTE

You can also tap **System Info** > **Maintenance** and shut down the inverter on the **Maintenance** screen.

- Method for shutting down the inverter on the WebUI
 - a. In a web browser, enter the **https://UPS IP address**.
 - b. On the login page, select a display language, enter a **user name** and **password**, and click **Login**.

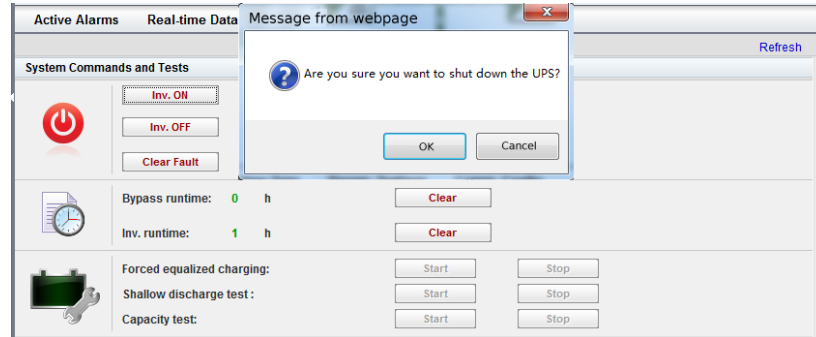


NOTE

- [Table 4-4](#) lists the default user names and preset passwords and describes the permission of the default users.
- If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.

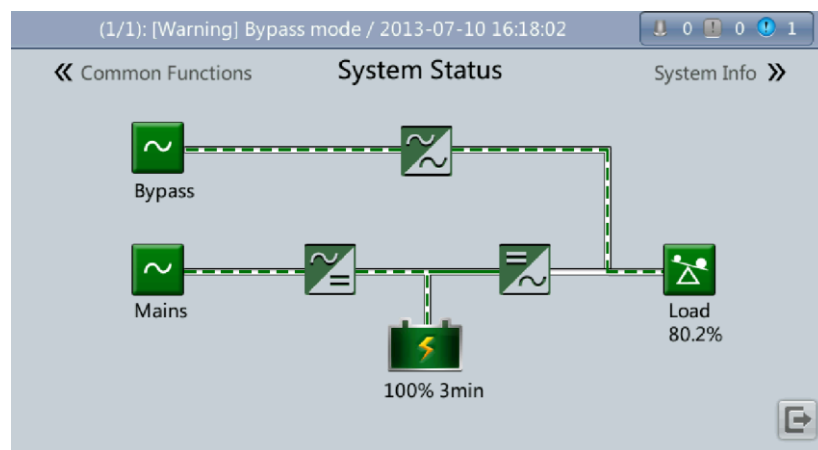
- c. On the homepage, choose **Monitoring > Control**, and click **Inv. OFF**. In the displayed dialog box, click **OK** to shut down the inverter, as shown in [Figure 5-17](#).

Figure 5-17 Shutting down the inverter



Step 2 After the inverter shuts down, if the bypass is normal, the UPS transfers to bypass mode; if the bypass is abnormal, the UPS supplies no power, and the loads shut down, as shown in [Figure 5-18](#) and [Figure 5-19](#).

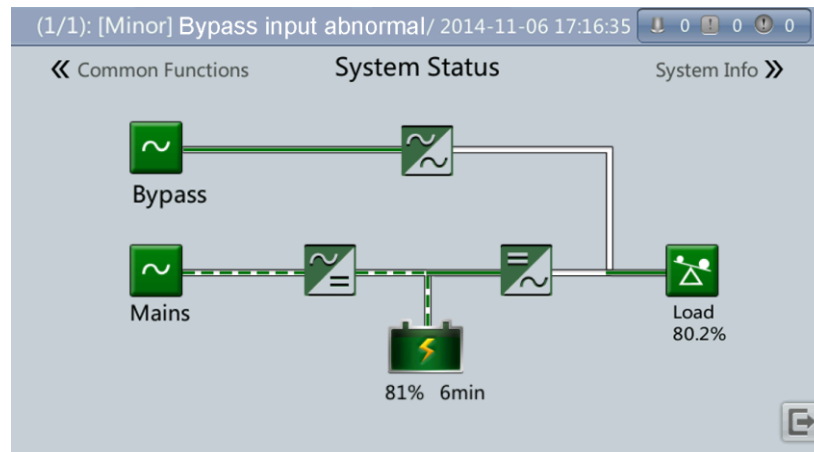
Figure 5-18 Normal bypass



NOTE

After you shut down the inverter, the **Bypass mode** alarm is displayed on the LCD.

Figure 5-19 Abnormal bypass



- Step 3** After the inverter shuts down, turn off the external output switch.
- Step 4** Open the battery string circuit breaker. If there are multiple battery strings, open the general circuit breaker between battery strings and the UPS and then the circuit breaker for each battery string.
- Step 5** Power off the UPS. The following describes how to power off the UPS in full configuration and standard configuration.
- To power off a UPS in full configuration (configured with an internal mains input switch, internal bypass input switch, internal output switch, and internal maintenance bypass switch), perform the following operations:
 - a. Turn off the UPS internal mains and bypass input switches.
 - b. Turn off the UPS internal output switch.
 - c. Turn off the external mains and bypass input switches.
 - d. Open the input surge protection circuit breaker (if any) on the input PDC.
 - To power off a UPS in standard configuration (configured only with an internal maintenance bypass switch), perform the following operations:
 - a. Turn off the external mains and bypass input switches.
 - b. Open the input surge protection circuit breaker (if any) on the input PDC.

 **NOTE**

If you need only to shut down inverters to transfer the UPS to bypass mode, perform only [Step 1](#) after checking that the UPS has generated no alarm; if you need to shut down the UPS, perform all the preceding steps.

----End

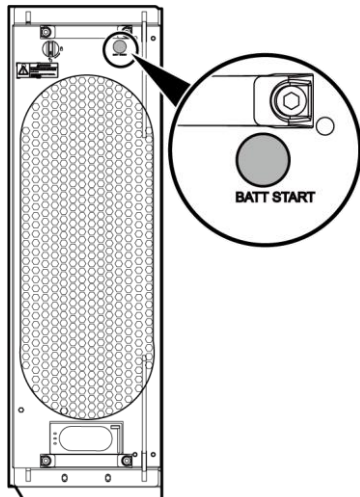
5.1.3 Starting the UPS in Battery Mode

Battery cold start can be performed only if no AC input is available.

Procedure

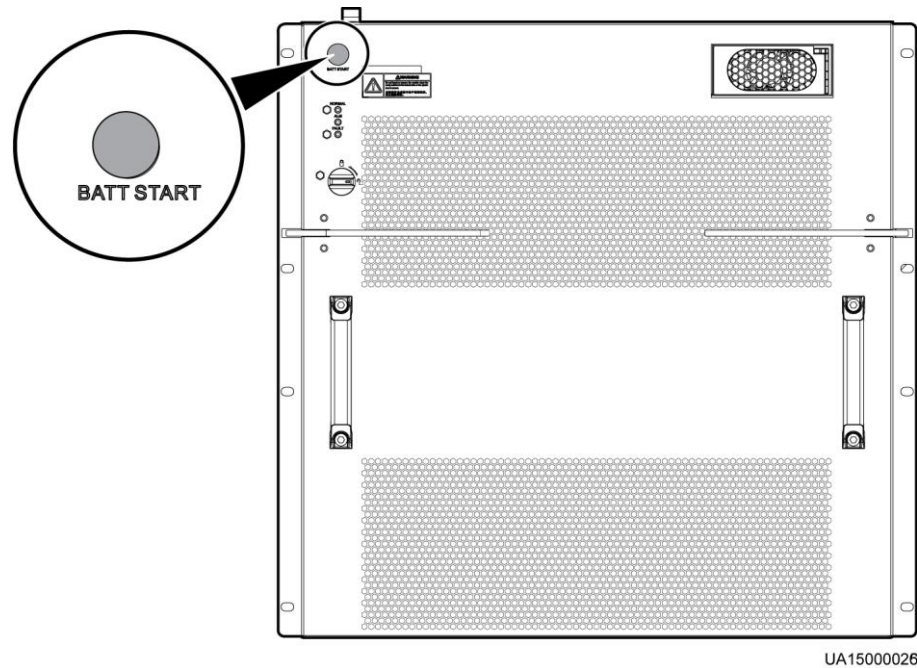
- Step 1** Ensure that batteries are properly connected. Use a multimeter to check that the sum of the absolute voltages of positive and negative battery strings are greater than a certain value ($1.9 \times \text{Number of cells}$).
- Step 2** Turn off the mains and bypass input switches. When the mains and bypass have no input, close the battery circuit breaker. If there are multiple battery strings, close the circuit breaker for each battery string and then the general circuit breaker between battery strings and the UPS.
- Step 3** Measure the UPS battery string voltages in the battery input route by using a multimeter. If the sum of the absolute voltages of positive and negative battery strings are greater than a certain value ($1.9 \times \text{Number of cells}$), the batteries are connected properly.
- Step 4** Press the **BATT START** button on the bypass module, as shown in [Figure 5-20](#) and [Figure 5-21](#). The system enters the battery cold-start status. The LCD displays the Huawei logo and an initialization progress bar.

Figure 5-20 Battery cold-start button (600 kVA UPS)



UA13000054

Figure 5-21 Battery cold-start button (800 kVA UPS)



Step 5 After LCD initialization, start the inverter by following [Step 4](#) to [Step 5](#) in [5.1.1 Powering On and Starting the UPS](#).



NOTE

If no mains input is available, perform battery cold start.

----End

5.1.4 Transferring to Bypass Mode



NOTICE

Before you shut down the inverter, ensure that the bypass is normal. If the bypass is abnormal, after you shut down the inverter, the UPS supplies no power, and the loads shut down.

Perform [Step 1](#) in section [5.1.2 Shutting Down and Powering Off the UPS](#) to shut down the inverter over the LCD or WebUI. After you shut down the inverter, the UPS transfers to bypass mode.



NOTE

If you shut down the inverter when the input voltage or frequency exceeds the specified threshold, the UPS supplies no power, and the loads shut down.

5.1.5 Setting ECO Mode

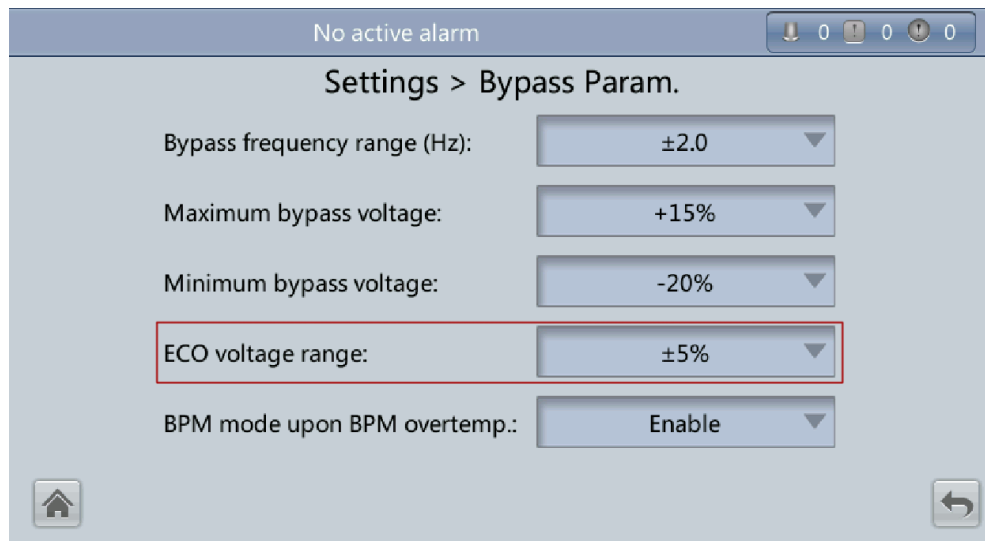
Context

- The UPS is set to non-ECO mode by default. Set the UPS to ECO mode when energy saving is required.
- When the UPS works in ECO mode, the bypass module takes precedence over the power module in supplying power to loads. When the bypass module is disconnected, the UPS switches to the power module. The switchover time is less than 2 ms for typical working conditions and is 10 ms under harsh working conditions.
- Both a single UPS and the parallel system support the ECO mode for higher efficiency.
- To avoid frequent transfer between ECO mode and normal mode, do not set the ECO mode when the bypass input is unstable or is sensitive to load changes.
- ECO mode is not recommended when the load is less than 10%.
- Before transferring the UPS to ECO mode, ensure that the bypass module works properly.

Procedure

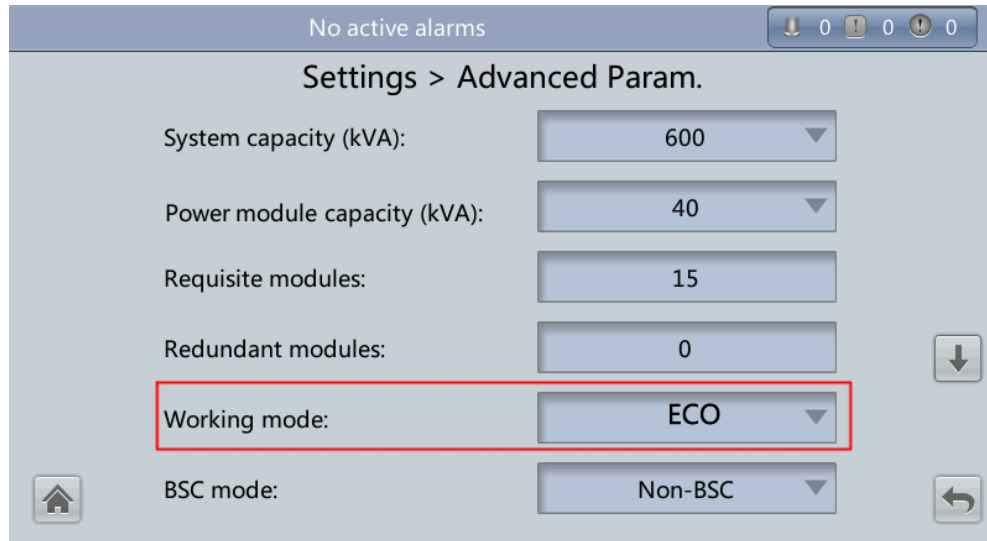
- Step 1** Manually shut down the inverter to transfer the UPS to bypass mode. For details, see [Step 1 in 5.1.2 Shutting Down and Powering Off the UPS](#).
- Step 2** Select a value ($\pm 5\%$, $\pm 6\%$, $\pm 7\%$, $\pm 8\%$, $\pm 9\%$, or $\pm 10\%$) from the **ECO voltage range** drop-down list box, as shown in [Figure 5-22](#).

Figure 5-22 Setting ECO voltage range



- Step 3** Set **Working mode** to **ECO**, as shown in [Figure 5-23](#). Information indicating that the UPS works in ECO mode is displayed on the LCD.

Figure 5-23 Setting ECO mode



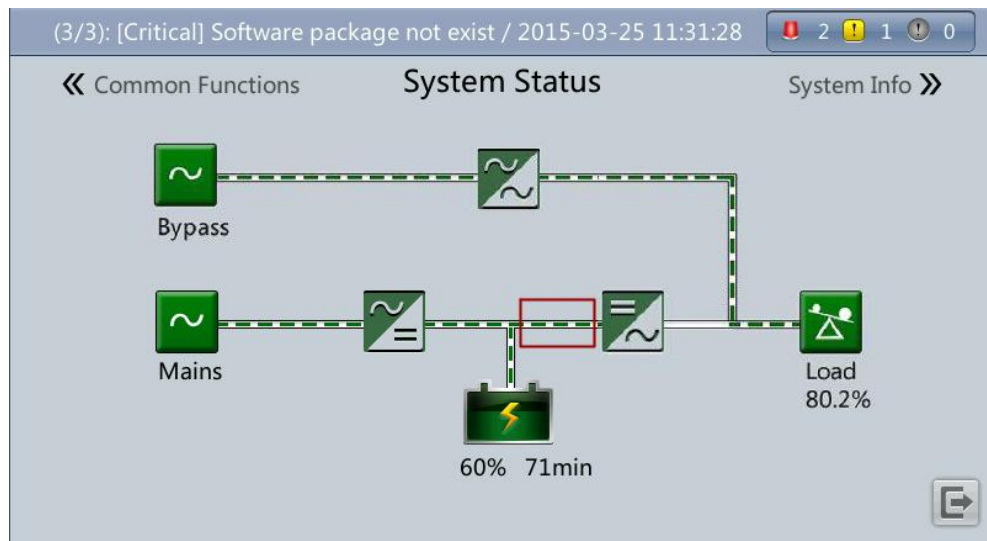
Step 4 Manually start the inverter.



NOTICE

After the inverter starts, the UPS still works in bypass mode and the inverter is standby. [Figure 5-24](#) shows the power flow displayed on the **System Status** screen. If the bypass is abnormal, the inverter supplies power immediately. If the inverter is not started, the UPS may be disconnected.

Figure 5-24 System Status screen



----End

5.1.6 Testing Batteries

5.1.6.1 Forced Equalized Charge Test

Context




NOTICE

Before a forced equalized charge test, ensure that:

- The mains is normal.
- Batteries are properly connected.
- Batteries are not in the equalized charge state.

Procedure

Step 1 On the main screen of the LCD, tap **System Info**. Tap . The **Maintenance** screen is displayed.

Step 2 (Optional) If you have not logged in, enter a user name and a password, and then tap .

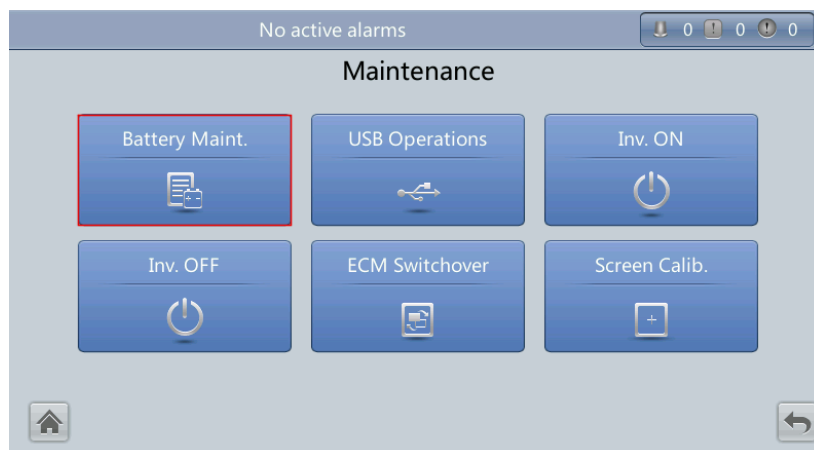


NOTE

- [Table 4-4](#) lists the default user names and preset passwords and describes the permission of the default users.
- If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.

Step 3 On the **Maintenance** screen, tap **Battery Maint.**, as shown in [Figure 5-25](#).

Figure 5-25 Maintenance screen



Step 4 Tap **Start** for **Forced Equalized Charging** to start a forcible equalized charging test, as shown in [Figure 5-26](#).

Figure 5-26 Starting a forced equalized charge test



NOTE

The forced equalized charge test stops in any of the following cases:

- The forced equalized charge test duration reaches the forced equalized charge protection time (12–24 h, 18 h by default).
- The UPS generates a battery overtemperature, overvoltage, or overcurrent alarm.
- The UPS generates an alarm.

You tap **Stop** on the right of **Forced Equalized Charging**.

----End

5.1.6.2 Shallow Discharge Test

Context




NOTICE

Before a shallow discharge test, ensure that:

- The UPS works in normal mode with a load ratio change rate less than 10%.
- The UPS has generated no battery overtemperature, overvoltage, or overcurrent alarm. No generator is connected to the UPS.
- The mains, batteries, charger, and discharger are normal. No overload alarm is generated.

Procedure

Step 1 On the main screen of the LCD, tap **System Info**. Tap . The **Maintenance** screen is displayed.

Step 2 (Optional) If you have not logged in, enter a user name and a password, and then tap .

 **NOTE**

- Table 4-4 lists the default user names and preset passwords and describes the permission of the default users.
- If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.

Step 3 On the **Maintenance** screen, tap **Battery Maint.**, as shown in Figure 5-25.

Step 4 Tap **Start** on the right of **Shallow Dis. Test** to start a shallow discharge test, as shown in Figure 5-27.

Figure 5-27 Starting a shallow discharge test



 **NOTE**

When the battery test is complete, the test data is used as common test data. You need to record the data obtained from the latest five tests.

The shallow discharge test stops in any of the following cases:

- The battery discharge capacity reaches the specified value (10%–50%, 20% by default).
- The discharge voltage reaches the alarm threshold (calculated in real time).
- The load change rate exceeds 10%.
- An alarm is generated.

You tap **Stop** on the right of **Shallow Dis. Test**.

----End

5.1.6.3 Capacity Test

Context




NOTICE

Before a capacity test, ensure that:

- The UPS is working in normal mode; float charging or hibernation has lasted for 2 hours after the state of charge (SOC) reaches 100%; and the load ratio change rate less than 10%.
- The UPS has generated no battery overtemperature, overvoltage, or overcurrent alarm. No generator is connected to the UPS.
- The mains, batteries, charger, and discharger are normal. No overload alarm is generated.

Procedure

Step 1 On the main screen of the LCD, tap **System Info**. Tap . The **Maintenance** screen is displayed.

Step 2 (Optional) If you have not logged in, enter a user name and a password, and then tap .



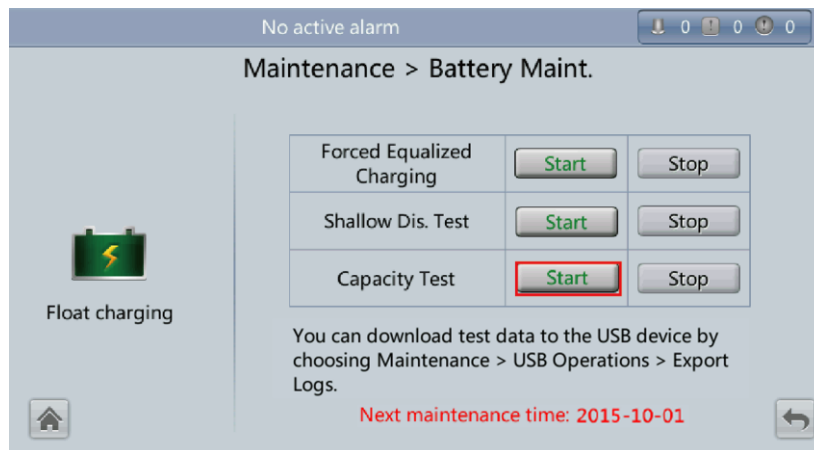
NOTE

- [Table 4-4](#) lists the default user names and preset passwords and describes the permission of the default users.
- If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.

Step 3 On the **Maintenance** screen, tap **Battery Maint.**, as shown in [Figure 5-25](#).

Step 4 Tap **Start** on the right of **Capacity Test** to start a capacity test, as shown in [Figure 5-28](#).

Figure 5-28 Starting a capacity test



NOTE

The capacity test stops in any of the following cases:

- The battery discharge voltage reaches the end of discharge (EOD) voltage plus 0.01 V.
- The load change rate exceeds 10%.
- An alarm is generated.

You tap **Stop** on the right of **Capacity Test**.



When the EOD voltage reaches EOD + 0.01 V, the test is complete. The test data is used as capacity test data. You need to select the test data obtained from a capacity test that has the maximum discharge capacity as the test data for the current month. Store the test data that you have obtained from the latest 36 tests.

----End

5.1.6.4 Test Data Download

Download over the LCD

Procedure

- Step 1** Insert a USB flash drive into the USB port on the MDU.
- Step 2** On the main screen of the LCD, choose **System Info**. Tap . The **Maintenance** screen is displayed.
- Step 3** (Optional) If you have not logged in, enter a user name and a password, and then tap .



NOTE

- [Table 4-4](#) lists the default user names and preset passwords and describes the permission of the default users.
 - If you enter incorrect passwords for three consecutive times, you will be locked out for 5 minutes.
- Step 4** Choose **USB Operations** > **Download Logs**, and select a log download path, as shown in [Figure 5-29](#).

Figure 5-29 Downloading logs



- Step 5** Tap **Next**. In the displayed dialog box, tap **Yes** to download data, as shown in [Figure 5-30](#).

Figure 5-30 Confirming the path



----End

Download over the WebUI

Procedure

- Step 1** Log in to the WebUI.
- Step 2** Choose **Query > Logs**, select **Cap. test logs** or **Common test logs** from the **Log** drop-down list box, then click **Export** to export logs, as shown in [Figure 5-31](#) and [Figure 5-32](#).

Figure 5-31 Capacity test logs

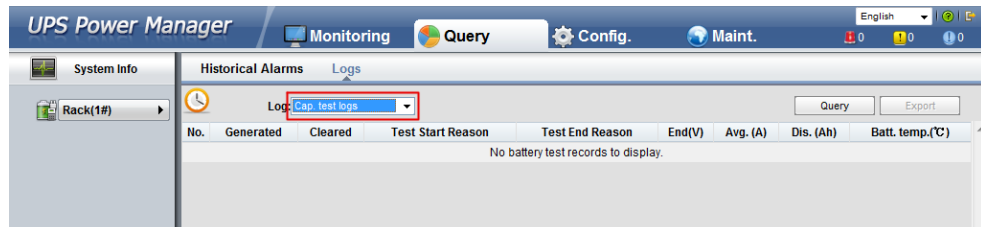
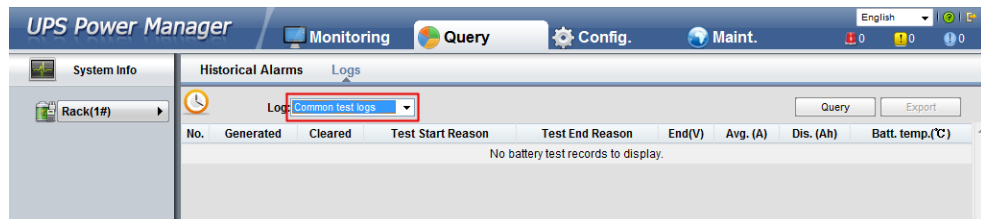


Figure 5-32 Common test logs



----End

5.1.7 Transferring to Maintenance Bypass Mode

Context



NOTICE

- You are advised to install a lock on the maintenance bypass switch. The lock core has a diameter of 5–10 mm.
 - Strictly observe the following procedure to transfer the UPS to maintenance bypass mode. Otherwise, loads may power off.
 - In maintenance bypass mode, the mains supplies power to the loads directly over the maintenance bypass. If the mains is abnormal, the loads may power off.
-

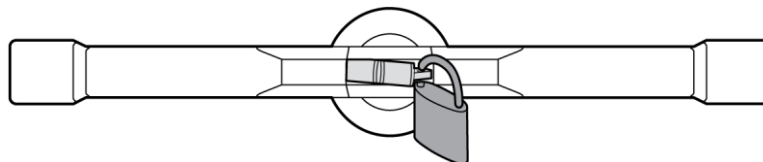
Procedure

- Step 1** Transfer the UPS to bypass mode by following the steps in section [5.1.4 Transferring to Bypass Mode](#).
- Step 2** Turn on the maintenance bypass switch.

If the maintenance bypass switch is locked, unlock it first. [Figure 5-33](#) shows a locked maintenance bypass switch. After you turn on the maintenance bypass switch, the UPS transfers to maintenance bypass mode. The maintenance bypass switch is OFF by default. To turn on the maintenance bypass switch, rotate it to the ON position, as shown in [Figure 5-34](#).

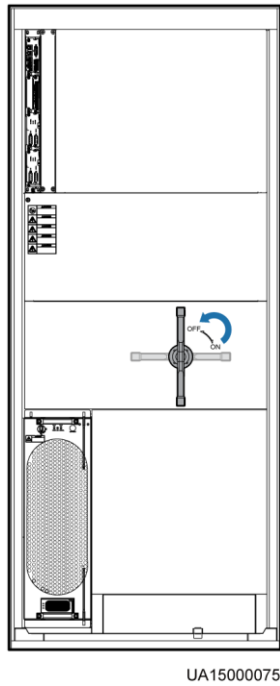
The **Maint. breaker closed** alarm is displayed in the alarm list, as shown in [Figure 5-35](#).

Figure 5-33 Locked maintenance bypass switch



UA15000091

Figure 5-34 Turning on the maintenance bypass switch (600 kVA UPS in standard configuration)



NOTE

- The preceding figure uses the 600 kVA UPS in standard configuration as an example. The operations are the same for the 600 kVA UPS in full configuration and the 800 kVA UPS.
- Exercise force when turning on or off the bypass maintenance switch.

Figure 5-35 Maint. breaker closed alarm

(2/2): [Warning] Bypass mode / 2013-07-10 16:18:02

Active Alarms					
No.	Severity	Name	ID	Location	Time
1	Critical	Maint. breaker closed	0340-01	ECM 1	2013-07-10 16:36:21
2	Warning	Bypass mode	0358-01	UPS system	2013-07-10 16:18:02

NOTE

After the UPS transfers to maintenance bypass mode, the **Maint. breaker closed** and **Bypass mode** alarms are displayed on the LCD.

----End

5.1.8 Transferring from Maintenance Bypass Mode to Normal Mode

Context



NOTICE

Before you transfer the UPS from maintenance bypass mode to normal mode, ensure that the bypass input and output are normal.

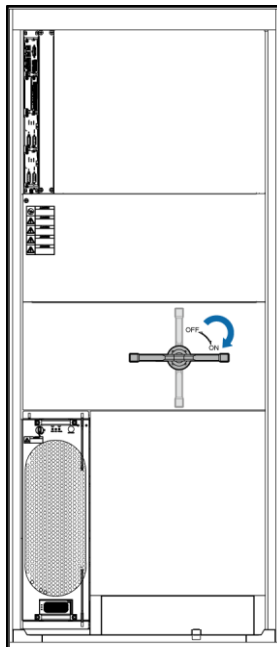
Procedure

- Step 1** Turn off the maintenance bypass switch.

Turn the maintenance bypass switch from the ON position to the OFF position, as shown in [Figure 5-36](#).

The **Maint. breaker closed** alarm disappears from the alarm list. Check whether the UPS works in bypass mode by viewing the system running status diagram on the LCD or WebUI.

Figure 5-36 Turning off the maintenance bypass switch (600 kVA UPS in standard configuration)



UA15000074



NOTE

The preceding figure uses the 600 kVA UPS in standard configuration as an example. The operations are the same for the 600 kVA UPS in full configuration and the 800 kVA UPS.

- Step 2** Start the inverters. For details, see [Step 4](#) to [Step 5](#) in [5.1.1 Powering On and Starting the UPS](#).
- End

5.1.9 Performing EPO

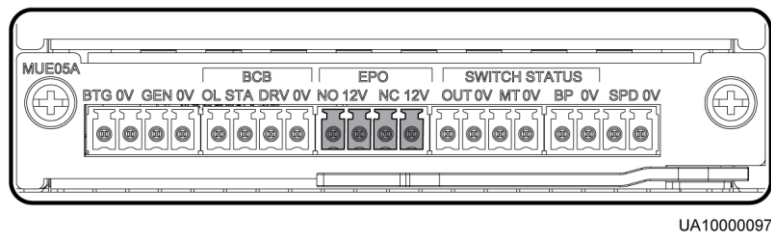


NOTICE

- After you turn on the EPO switch, the UPS supplies no power, and the loads shut down.
- In maintenance bypass mode, the UPS still supplies power after you turn on the EPO switch.

Press the EPO switch connected to the dry contact card on the UPS or remove the 4-pin terminal from the EPO port on the dry contact card, as shown in [Figure 5-37](#). The UPS transfers to the EPO state. An alarm is generated on the MDU and WebUI, as shown in [Figure 5-38](#) and [Figure 5-39](#).

Figure 5-37 EPO ports

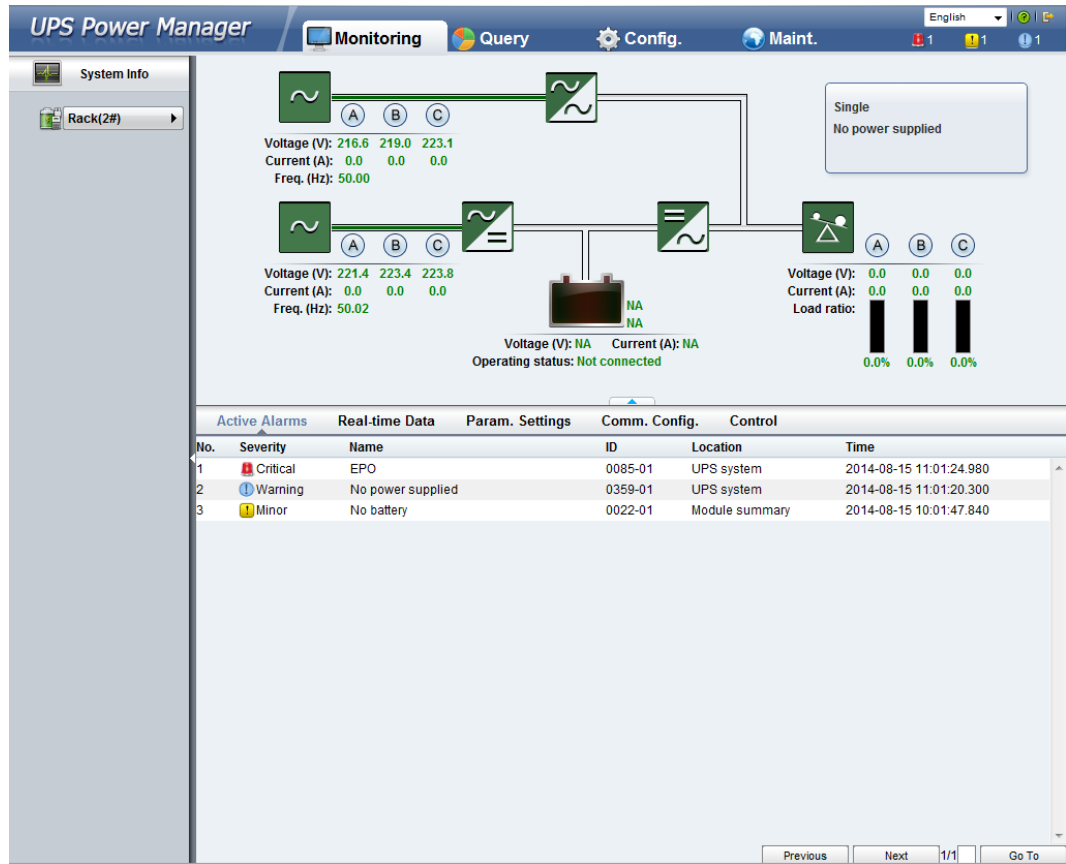


UA10000097

Figure 5-38 EPO alarm on the LCD

(1/2): [Warning] No power supplied / 2013-07-10 16:48:17					
Active Alarms					
No.	Severity	Name	ID	Location	Time
1	Warning	No power supplied	0359-01	UPS system	2013-07-10 16:48:17
2	Critical	EPO	0085-01	ECM 1	2013-07-10 16:42:29

Figure 5-39 EPO alarm on the WebUI



NOTE

After you turn on the EPO switch, the **EPO** and **No power supplied** alarms are displayed on the LCD.

5.1.10 Clearing the EPO State

Procedure

Step 1 Turn off the EPO switch to clear the EPO state.

Step 2 Clear the EPO alarm.

- LCD

On the main screen, tap **System Info** and . On the **Alarms** screen, tap **Clear Faults**.


If you have not logged in, enter a user name and password, and tap  on the login screen displayed. In the displayed dialog box, tap **Yes** to clear the EPO alarm, as shown in [Figure 5-40](#) and [Figure 5-41](#).

Figure 5-40 Alarms screen

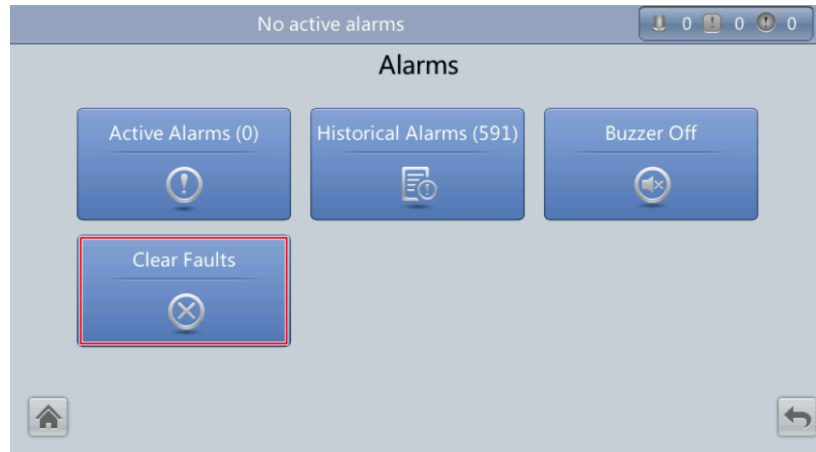


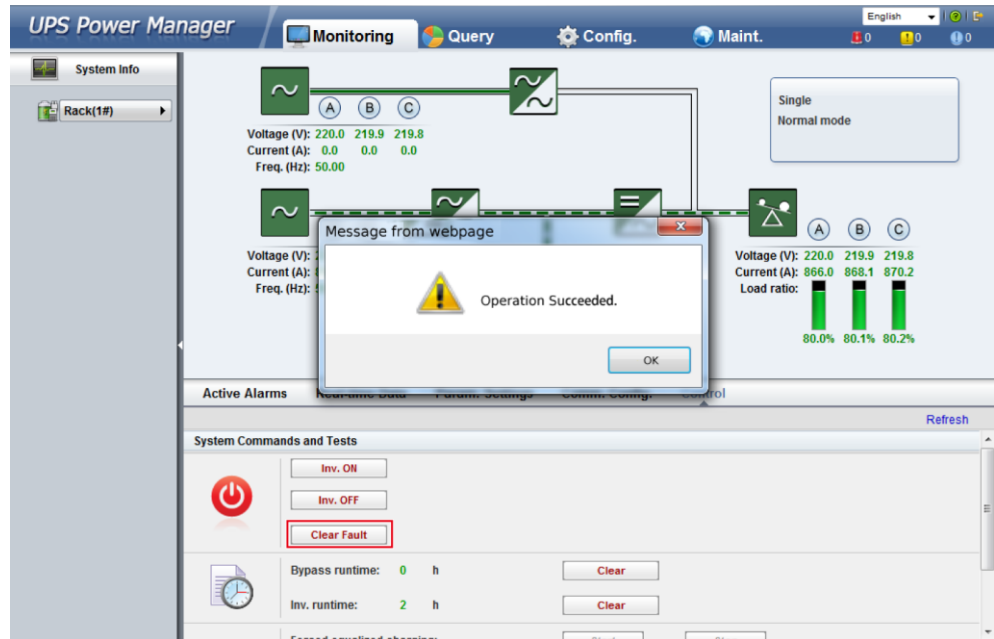
Figure 5-41 Clearing the alarm



- WebUI

In a web browser, enter the **https://UPS IP address**. On the login page, select a display language, enter a **user name** and **password**, and click **Login**. On the homepage, choose **Monitoring > Control**, and click **Clear Fault** to clear the EPO alarm, as shown in [Figure 5-42](#).

Figure 5-42 Clearing the alarm



Step 3 View active alarms and ensure that the EPO alarm is cleared. If the input of the system bypass is normal, the UPS transfers to the bypass mode.

- LCD



On the main screen, tap **System Info** and . On the **Alarms** screen, tap **Active Alarms** to check that the EPO alarm disappears from the alarm list, as shown in [Figure 5-43](#).

Figure 5-43 Active Alarms screen

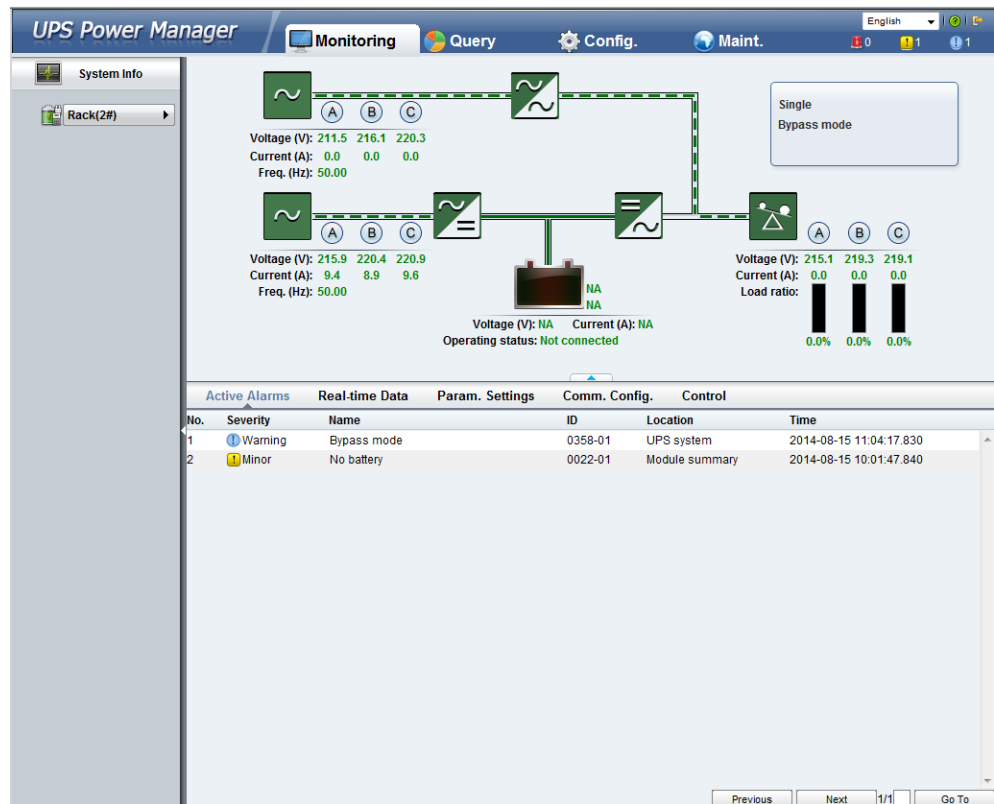
(1/1): [Warning] Bypass mode / 2013-07-10 16:18:02					
Active Alarms					
No.	Severity	Name	ID	Location	Time
1	 Warning	Bypass mode	0358-01	UPS system	2013-07-10 16:18:02

- WebUI

In a web browser, enter the **https://UPS IP address**. On the login page, select a display language, enter a **user name** and **password**, and click **Login**. On the homepage, choose **Monitoring > Active Alarms** to check that the EPO alarm disappears from the alarm list.

If the bypass is normal, the UPS transfers to bypass mode, as shown in [Figure 5-44](#).

Figure 5-44 Active Alarms page



Step 4 Start the inverter by following [Step 4](#) to [Step 5](#) in section [5.1.1 Powering On and Starting the UPS](#).

----End

5.2 Setting Hibernation Mode

Context

When the load power is small and stable, the inverters in some power modules shut down so that these power modules enter hibernation state and the other power modules bear all the load power. This improves the system efficiency, reduces power consumption, and increases the power module service life.




NOTICE

- Before you start hibernation mode, ensure that the load power is stable. When the system load power fluctuation is greater than the rated capacity of half a module (for example, the single-phase load fluctuation is greater than 6.67 kVA for a 40 kVA module), the UPS may enter and exit from hibernation mode repeatedly.
- Before you start hibernation mode, check that the number of redundant power modules and racks are appropriate. If the number is insufficient, the UPS may not enter hibernation mode.

You can set hibernation mode on the LCD or WebUI.


5.2.1 LCD

Procedure

Step 1 On the main screen, tap **System Info** and . The **Settings** screen is displayed.

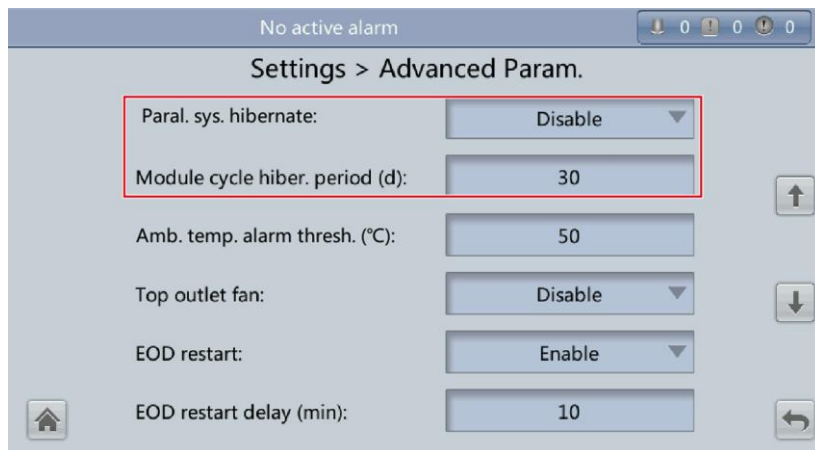


NOTE

If you have not logged in, enter a user name and password, and tap  on the login screen displayed.

Step 2 Tap **Advanced Param.**. Tap  or  to browse the parameters, as shown in [Figure 5-45](#).

Figure 5-45 Hibernation parameters on the LCD



Step 3 On the LCD, set **Paral. sys. hibernate** to **Enable**. A confirmation message and security warning are displayed, as shown in [Figure 5-46](#) and [Figure 5-47](#).

Figure 5-46 Confirmation message

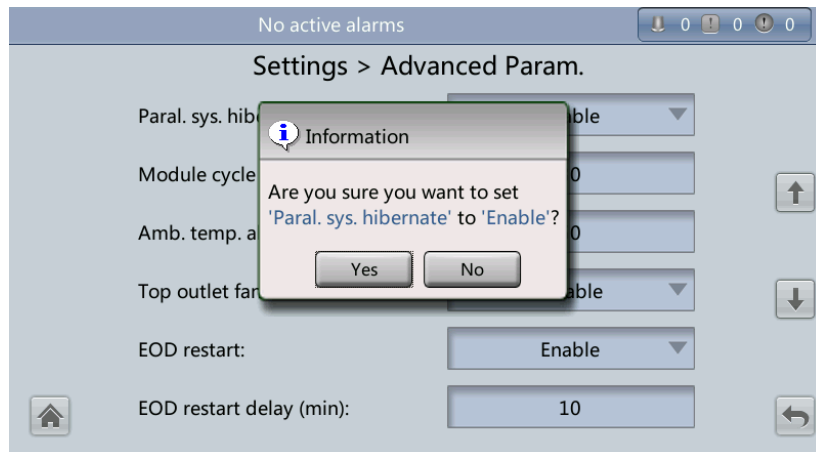
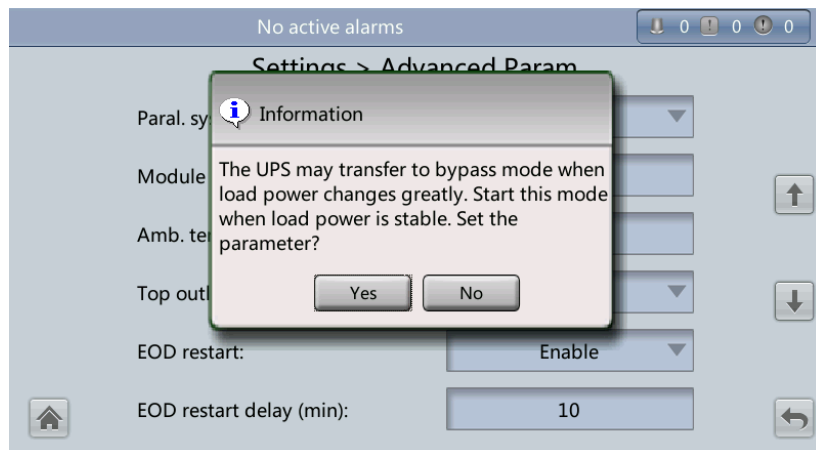


Figure 5-47 Security warning



Step 4 Check that the load power is stable (that is, no transient surge results in overload, which may cause the UPS to transfer to bypass mode), and tap **Yes**.

Step 5 Set **Module cycle hiber. period (d)** to an integer ranging from **1** to **100**. The default value is **30**.

----End

5.2.2 WebUI

Procedure

Step 1 On the login page, enter a user name and password, and click **Login**.

Step 2 Choose **Monitoring > Param. Settings > Advanced Parameters**, as shown in [Figure 5-48](#).

Figure 5-48 Hibernation parameters on the WebUI

Active Alarms	Real-time Data	Param. Settings	Comm. Config.	Control
Refresh				
Advanced Parameters				
System capacity (kVA)	600			
Power module capacity (kVA)	40			
Requisite modules	15			
Redundant modules	0			
Working mode	Normal mode			
BSC mode	Non-BSC			
Paral. sys. hibernate	Disable			
Module cycle hiber. period (d)	30			
Amb. temp. alarm thresh. (°C)	50			
Tan. outlet fan	Disable			

- Step 3** On the WebUI, set **Paral. sys. hibernate** to **Enable**, and click **Submit**. A security warning is displayed, and click **OK**.
- Step 4** Set **Module cycle hiber. period (d)** to an integer ranging from **1** to **100**. The default value is **30**.



NOTE

Click **Submit** after you set the parameter on the WebUI.

----End

5.3 Setting Intelligent Power Mode

Context




NOTICE

Before you connect the D.G. to a UPS system, check that the system is a single UPS system and that the system is working in non-inverter mode and has connected to batteries.

When the UPS is working, the D.G. starts if a mains outage occurs and the battery voltage reaches the specified threshold. You can set intelligent power mode on the LCD or WebUI.


5.3.1 LCD

Procedure

- Step 1** On the main screen, tap **System Info** and . The **Settings** screen is displayed.



NOTE

If you have not logged in, enter a user name and password, and tap  on the login screen displayed.

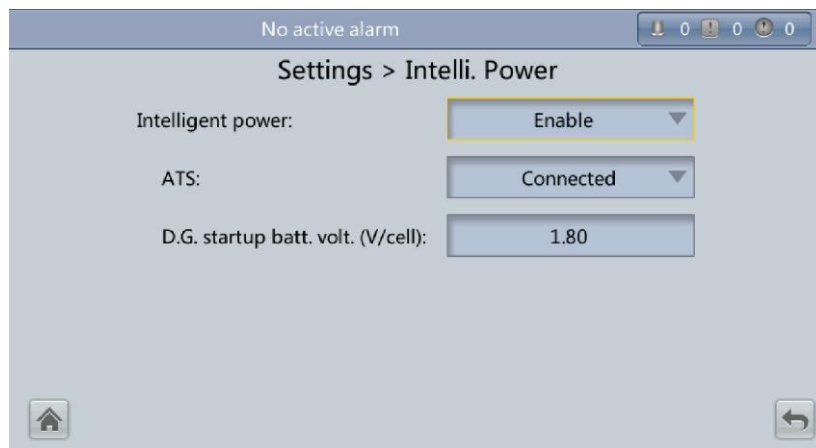
- Step 2** On the **Settings** screen, tap **Intelli. Power**. The **Intelli. Power** screen is displayed, as shown in [Figure 5-49](#).

Figure 5-49 Intelli. Power screen



Step 3 Set **Intelligent power** to **Enable**. In the warning dialog box, tap **Yes**. The intelligent power parameters are displayed, as shown in [Figure 5-50](#).

Figure 5-50 Intelligent power parameters



- **Intelligent power**
The value can be **Enable** or **Disable**. The intelligent power function is available only if the value is **Enable**. The default value is **Disable**.
- **ATS**
The value can be **Connected** or **Not connected**. When the value is **Connected**, the UPS works in the ATS scenario; when the value is **Not connected**, the UPS works in the reused scenario. The default value is **Connected**. This parameter is available only after you set **Intelligent power** to **Enable**.
- **D.G. startup batt. volt. (V/cell)**
The value ranges from **1.80** to **2.00**. The default value is **1.80**. This parameter is available only after you set **Intelligent power** to **Enable**.



NOTE

Set the preceding three parameters when you connect the D.G. to the UPS to ensure that the UPS runs properly.

Step 4 After you set **Intelligent power** to **Enable**, the system automatically changes some parameters associated with intelligent power. [Figure 5-51](#) to [Figure 5-56](#) show the changed parameters on the LCD.

Figure 5-51 Parameters associated with intelligent power on the LCD (1)

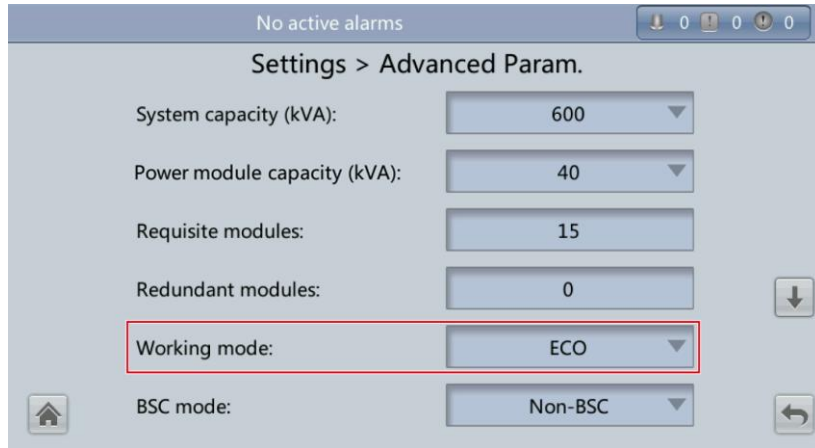


Figure 5-52 Parameters associated with intelligent power on the LCD (2)

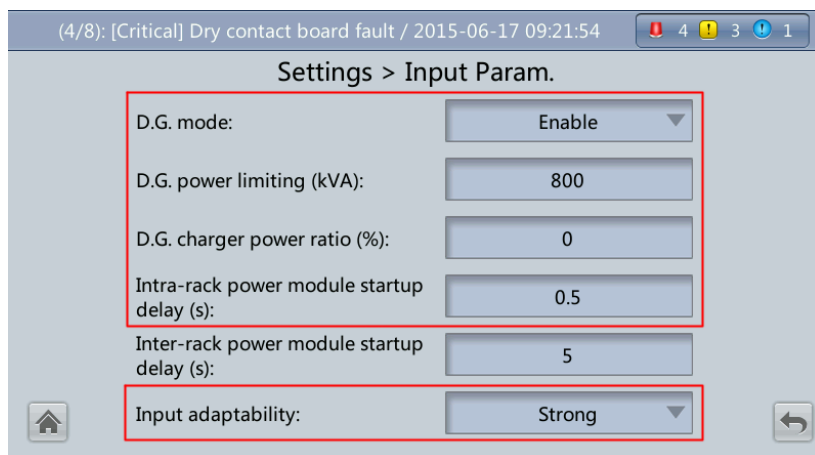


Figure 5-53 Parameters associated with intelligent power on the LCD (3)

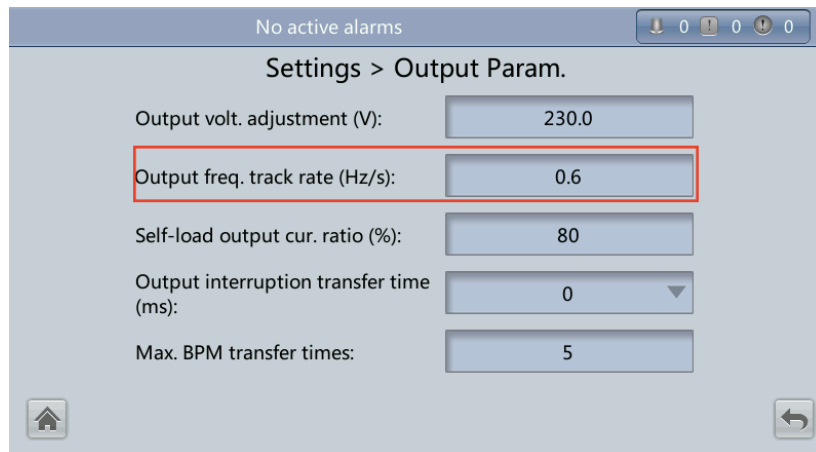


Figure 5-54 Parameters associated with intelligent power on the LCD (4)

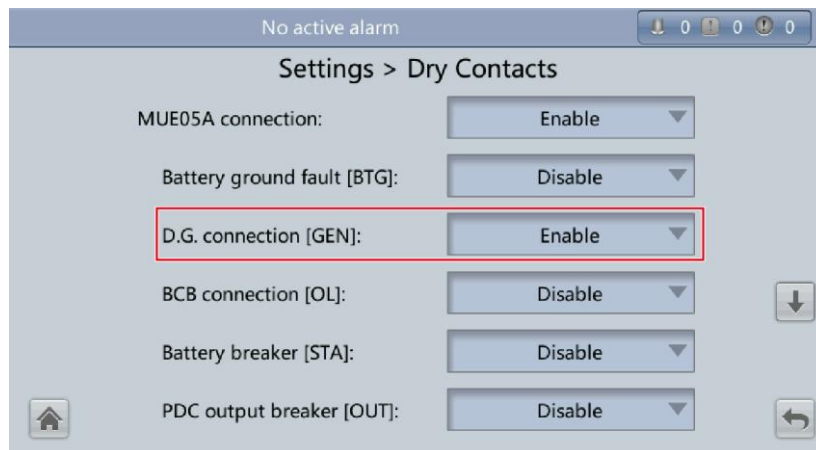


Figure 5-55 Parameters associated with intelligent power on the LCD (5)

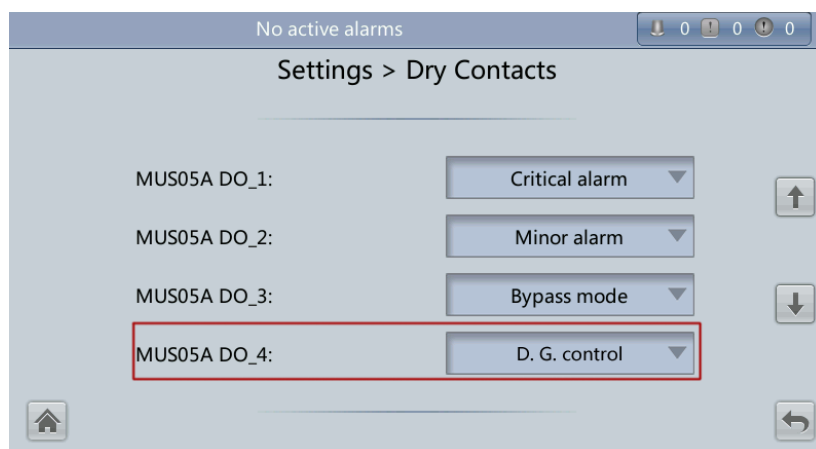


Figure 5-56 Parameters associated with intelligent power on the LCD (6)

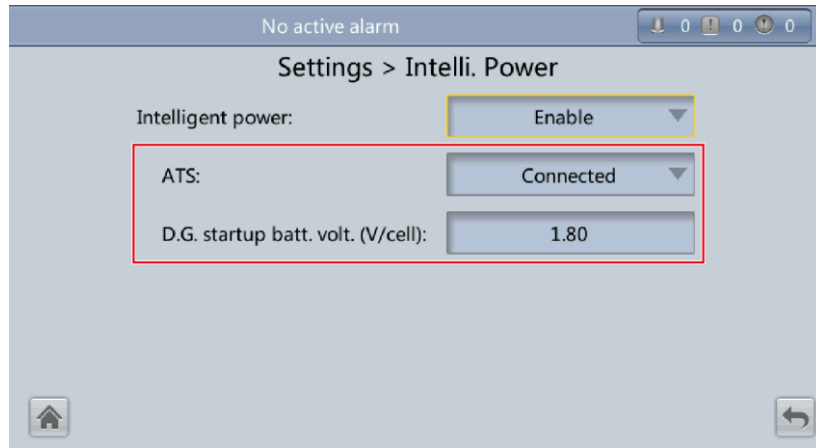


Table 5-2 lists the parameters associated with intelligent power.

Table 5-2 Parameters associated with intelligent power

Parameter	Value	Remarks
Working mode	ECO	N/A
D.G. mode	Enable	You cannot change the value.
Intra-rack power module start delay (s)	5	N/A
Input adaptability	Strong	N/A
Output freq. track rate (Hz/s)	0.6	N/A
D.G. connection [GEN]	Enable	N/A
MUS05A DO_4	D.G. control	N/A
ATS	Connected	N/A
D.G. startup batt. volt. (V/cell)	1.80	N/A
D.G. power limiting (kVA)	N/A	Indicates the actual D.G. power. Set it as required.
D.G. charger power ratio (%)	N/A	Indicates the percentage of the battery power provided by the charger. Set it as required.

 **NOTE**

- In battery mode (not battery test state), when the battery voltage reaches **D.G. startup batt. volt.** or **Low battery voltage**, the UPS triggers D.G. startup signals.
- In normal mode or bypass mode, if the mains is normal (the mains supplies power for 1 minute and the D.G. runs for 15 minutes), the UPS triggers D.G. shutdown signals.

- If the battery voltage is greater than **D.G. startup batt. volt.**, the UPS exits intelligent power mode and triggers D.G. shutdown signals. If the battery voltage is less than **D.G. startup batt. volt.**, a dialog box is displayed, indicating potential risks. Tap **OK** to exit intelligent power mode.
- To disable the D.G. from the UPS system, set **Intelligent power** to **Disable**. The system changes **Working mode** to **Normal mode**, **Intra-rack power module start delay (s)** to **5**, **Output freq. track rate (Hz/s)** to **0.6**, **Input adaptability** to **Weak**, **D.G. mode** to **Disable**, and **D.G. connection [GEN]** to **Disable**. You can change these values.

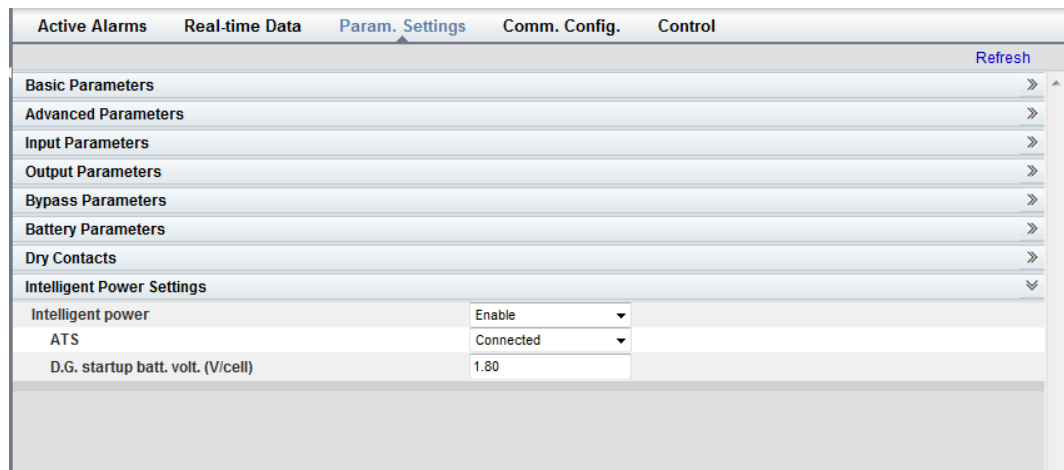
----End

5.3.2 WebUI

Procedure

- Step 1** On the login page, enter a user name and password, and click **Login**.
- Step 2** Choose **Monitoring > Param. Settings**. Under **Intelligent Power Settings**, set **Intelligent power** to **Enable**, as shown in [Figure 5-57](#).

Figure 5-57 Intelligent power parameters on the WebUI



- **Intelligent power**
The value can be **Enable** or **Disable**. The intelligent power function is available only if the value is **Enable**. The default value is **Disable**.
- **ATS**
The value can be **Connected** or **Not connected**. When the value is **Connected**, the UPS works in the ATS scenario; when the value is **Not connected**, the UPS works in the reused scenario. The default value is **Connected**. This parameter is available only after you set **Intelligent power** to **Enable**.
- **D.G. startup batt. volt. (V/cell)**
The value ranges from **1.80** to **2.00**. The default value is **1.80**. This parameter is available only after you set **Intelligent power** to **Enable**.



NOTE

Set the preceding three parameters when you connect the D.G. to the UPS to ensure that the UPS runs properly.

Step 3 After you set **Intelligent power** to **Enable**, the system automatically changes some parameters associated with intelligent power. [Figure 5-58](#) to [Figure 5-63](#) show the changed parameters on the WebUI.

Figure 5-58 Parameters associated with intelligent power on the WebUI (1)

Active Alarms	Real-time Data	Param. Settings	Comm. Config.	Control
				Refresh
Number of cells		192		
Advanced Parameters				
System capacity (kVA)		600		
Power module capacity (kVA)		40		
Requisite modules		15		
Redundant modules		0		
Working mode		ECO		
BSC mode		Non-BSC		
Paral. sys. hibernate		Disable		
Module cycle hiber. period (d)		30		
Amb. temp. alarm thresh. (°C)		50		

Figure 5-59 Parameters associated with intelligent power on the WebUI (2)

Active Alarms	Real-time Data	Param. Settings	Comm. Config.	Control
				Refresh
Advanced Parameters				
Input Parameters				
D.G. mode		Enable		
D.G. power limiting (kVA)		800		
D.G. charger power ratio (%)		0		
Intra-rack power module startup delay (s)		5.0		
Inter-rack power module startup delay (s)		5		
Input adaptability		Strong		
Output Parameters				
Bypass Parameters				

Figure 5-60 Parameters associated with intelligent power on the WebUI (3)

Active Alarms	Real-time Data	Param. Settings	Comm. Config.	Control
				Refresh
Basic Parameters				
Advanced Parameters				
Input Parameters				
Output Parameters				
Output volt. adjustment (V)		230.0		
Output freq. track rate (Hz/s)		0.6		
Self-load output cur. ratio (%)		80		
Output interruption transfer time (ms)		0		
Max. BPM transfer times		5		
Bypass Parameters				
Battery Parameters				
Dry Contacts				
Intelligent Power Settings				

Figure 5-61 Parameters associated with intelligent power on the WebUI (4)

Active Alarms	Real-time Data	Param. Settings	Comm. Config.	Control
Refresh				
Battery Parameters				
Dry Contacts				
MUE05A connection		Enable		
Battery ground fault [BTG]		Disable		
D.G. connection [GEN]		Enable		
BCB connection [OL]		Disable		
Battery breaker [STA]		Disable		
PDC output breaker [OUT]		Disable		
PDC maintenance breaker [MT]		Disable		
BP/SYSMT Switch		Disable		
SPD/SYSOUT Switch		Disable		
MUE06A connection		Disable		

Figure 5-62 Parameters associated with intelligent power on the WebUI (5)

Active Alarms	Real-time Data	Param. Settings	Comm. Config.	Control
Refresh				
MUE07A DO_3 Action		Close		
MUE07A DO_4 Action		Close		
MUE07A DO_5 Action		Close		
MUS05A DO_1		Critical alarm		
MUS05A DO_2		Minor alarm		
MUS05A DO_3		Bypass mode		
MUS05A DO_4		D. G. control		
MUE07A DO_1		Low batt. volt.		
MUE07A DO_2		None		
MUE07A DO_3		None		
MUE07A DO_4		None		
MUE07A DO_5		None		

Figure 5-63 Parameters associated with intelligent power on the WebUI (6)

Active Alarms	Real-time Data	Param. Settings	Comm. Config.	Control
Refresh				
Basic Parameters				
Advanced Parameters				
Input Parameters				
Output Parameters				
Bypass Parameters				
Battery Parameters				
Dry Contacts				
Intelligent Power Settings				
Intelligent power		Enable		
ATS		Connected		
D.G. startup batt. volt. (V/cell)		1.80		

Table 5-3 lists the parameters associated with intelligent power.

Table 5-3 Parameters associated with intelligent power

Parameter	Value	Remarks
Working mode	ECO	N/A
D.G. mode	Enable	You cannot change the value.
Intra-rack power module start delay (s)	5	N/A
Input adaptability	Strong	N/A
Output freq. track rate (Hz/s)	0.6	N/A
D.G. connection [GEN]	Enable	N/A
MUS05A DO_4	D.G. control	N/A
ATS	Connected	N/A
D.G. startup batt. volt. (V/cell)	1.80	N/A
D.G. power limiting (kVA)	N/A	Indicates the actual D.G. power. Set it as required.
D.G. charger power ratio (%)	N/A	Indicates the percentage of the battery power provided by the charger. Set it as required.

 **NOTE**

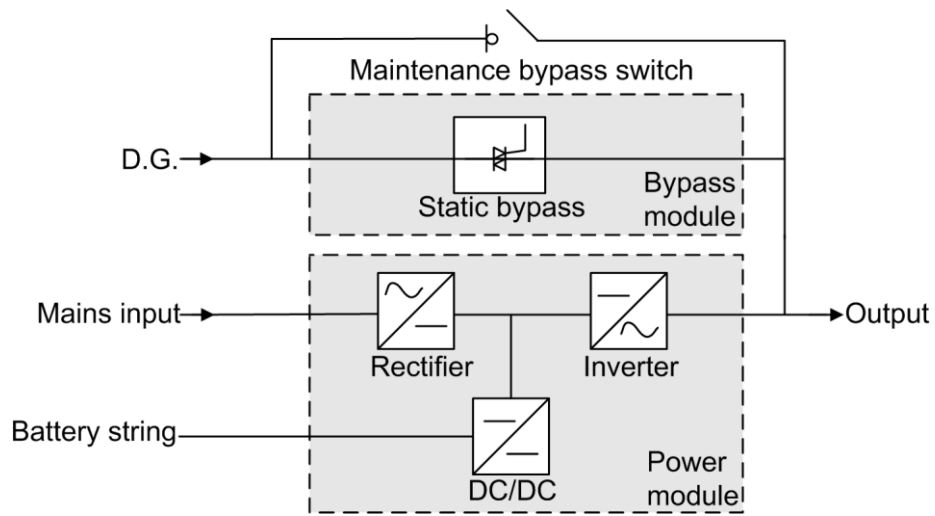
- In battery mode (not battery test state), when the battery voltage reaches **D.G. startup batt. volt.** or **Low battery voltage**, the UPS triggers D.G. startup signals.
- In normal mode or bypass mode, if the mains is normal (the mains supplies power for 1 minute and the D.G. runs for 15 minutes), the UPS triggers D.G. shutdown signals.
- If the battery voltage is greater than **D.G. startup batt. volt.**, the UPS exits intelligent power mode and triggers D.G. shutdown signals. If the battery voltage is less than **D.G. startup batt. volt.**, a dialog box is displayed, indicating potential risks. Tap **OK** to exit intelligent power mode.
- To disable the D.G. from the UPS system, set **Intelligent power** to **Disable**. The system changes **Working mode** to **Normal mode**, **Intra-rack power module start delay (s)** to **5**, **Output freq. track rate (Hz/s)** to **0.6**, **Input adaptability** to **Weak**, **D.G. mode** to **Disable**, and **D.G. connection [GEN]** to **Disable**. You can change these values.

----End

5.3.3 Reused Scenario

In reused scenarios, the D.G. connects to the UPS over the bypass module. Dry contacts control D.G. startup and shutdown. [Figure 5-64](#) shows the working principles.

Figure 5-64 Reused scenario

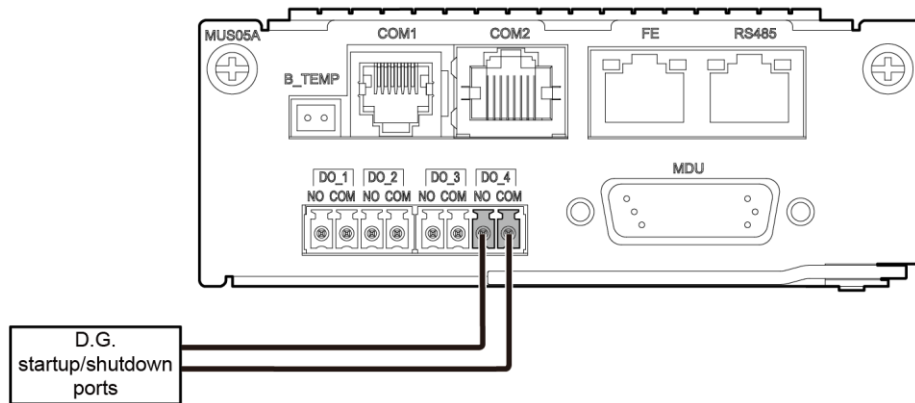


In reused scenarios, the following parameters need to be set:

- Set **ATS** to **Not connected**.
- **Working mode** is automatically set to **ECO** and cannot be changed.

Connect the DO_4 dry contact port on the UPS monitoring interface card to the startup/shutdown control port on the D.G. The initial status of the DO_4 dry contact is normally open (NO). When it is closed, the D.G. starts. [Figure 5-65](#) shows the signal cable connection between the UPS and the D.G. in reused scenarios.

Figure 5-65 Connecting signal cables in the reused scenario

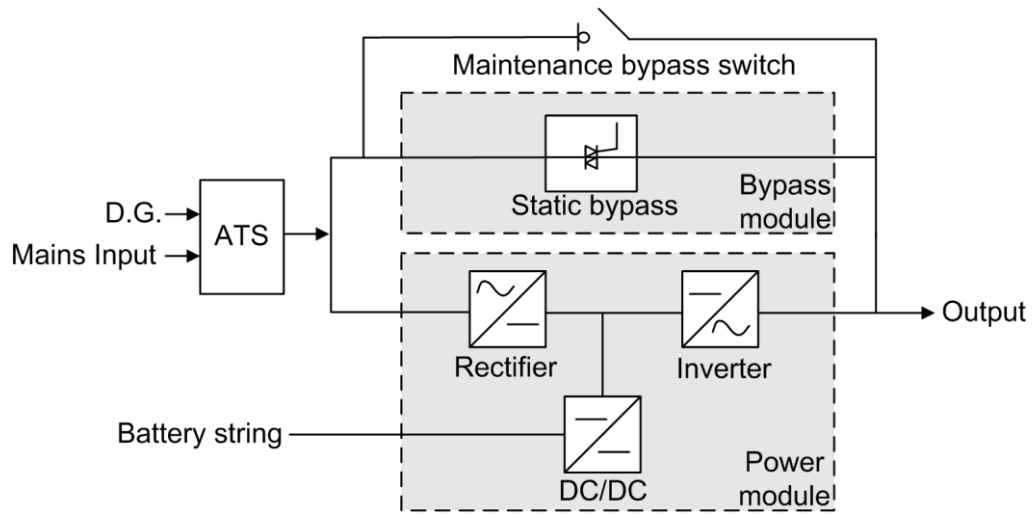


UA100E0100

5.3.4 ATS Scenario

The D.G. and mains connect to the UPS over an ATS. The MDU obtains the D.G. startup/shutdown status over the dry contact signals sent from the ATS, and controls D.G. startup/shutdown over dry contacts. [Figure 5-66](#) shows the working principles.

Figure 5-66 ATS scenario

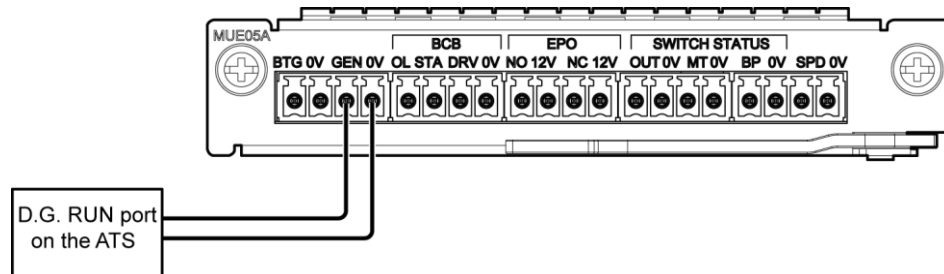


In ATS scenarios, the default parameter settings are used. **Working mode** can be set based on the site requirements.

Connect the DO_4 dry contact port on the UPS monitoring interface card to the startup/shutdown control port on the D.G. The initial status of the DO_4 dry contact is normally open (NO). When it is closed, the D.G. starts. [Figure 5-65](#) shows the signal cable connection between the UPS and the D.G.

The D.G. RUN port of the ATS connects to the dry contact card, as shown in [Figure 5-67](#).

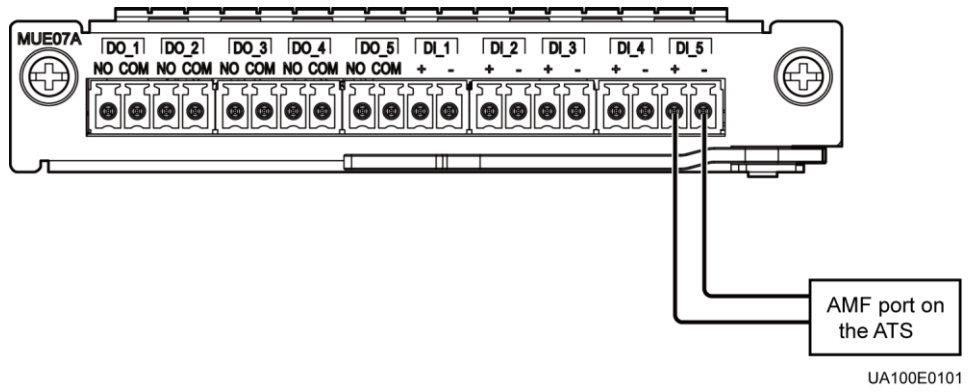
Figure 5-67 Connecting signal cables in the ATS scenario (1)



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The AMF port of the ATS connects to the DI_5 port on the dry contact extended card, as shown in [Figure 5-68](#).

Figure 5-68 Connecting signal cables in the ATS scenario (2)



5.4 Parallel System Operations

For detailed parallel system operations, contact Huawei technical support.

6 Routine Maintenance

6.1 UPS Maintenance



NOTICE

- Only trained personnel are allowed to perform maintenance. Before performing operations on the UPS, wear electrostatic discharge (ESD) clothes, ESD gloves, and an ESD wrist strap. Remove conductive objects such as jewelry or watches during operations to avoid electric shocks or burns.
- Use insulated tools when maintaining internal devices. Only trained personnel are allowed to perform maintenance. Customers are not allowed to maintain components behind protective covers that can be removed only using tools. If the components are to be maintained, contact Huawei technical support.
- Only maintenance engineers can maintain power modules and bypass module.
- Maintain UPSs regularly based on the following requirements. Otherwise, the UPSs may fail to operate properly and the service life may be shortened.

Table 6-1 Routine maintenance items for UPSs

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Operating environment	<ul style="list-style-type: none">• Ambient temperature: 0–40 °C• Humidity: 0–95% RH (non-condensing)	<ul style="list-style-type: none">• If the humidity and temperature are abnormal, check the air conditioner status.• If the input voltage is abnormal, check the power grid status and input cable connection.	Monthly

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Liquid crystal display (LCD)	According to the status icons on the LCD, all units are operating properly. No fault or alarm information is found in the active and historical alarm records.	If an alarm is present, rectify the fault by checking the device status and parameters.	Monthly
Cleanliness	Wipe the cabinet surface using a white paper and the paper does not turn black.	Remove the dust, especially from the air filter on the front door, or replace the air filter.	Quarterly
Parameter configuration	The configuration of the output voltage grade, frequency, number of batteries, and battery capacity meets requirements.	Reset the parameters.	Quarterly
Power cables and terminals (between the UPS and the power distribution cabinet)	The insulation layer of cables is intact and terminals are free from noticeable sparks.	<ul style="list-style-type: none"> Replace the cables. Secure output terminals. 	Quarterly

To prevent system failures caused by the deterioration of some key UPS components, you are advised to check the key components on a regular basis and replace them within the service life. [Table 6-2](#) lists the service life parameters for key components and recommended replacement intervals.

Table 6-2 Service life parameters for replaceable components and recommended replacement intervals

Key Component	Design Service Life	Recommended Replacement Interval
Power module	≥ 15 years (131,000 hours)	7–10 years
Bypass module	≥ 15 years (131,000 hours)	7–10 years
Fan	≥ 7 years (62,000 hours)	5–6 years
Valve regulated lead acid (VRLA) battery	5 years	3–4 years

6.2 Battery Maintenance



NOTICE

Before installing batteries, read through the battery user manuals and pay attention to safety precautions and connection methods provided by battery manufacture.

When installing and maintaining batteries, pay attention to the following points:

- Wrap tools with insulation tape to prevent electric shock.
- Protect your eyes with relevant devices and apply other protective measures.
- Wear rubber gloves and a protective coat in case of electrolyte overflow.
- When moving batteries, avoid handling the battery upside down, handle batteries gently, and pay attention to personal safety.
- Keep the battery switch off when installing or maintaining the batteries.

Precautions

- Before battery maintenance, get the tools, such as handles, insulated. Do not place other objects on the top of batteries.
- Never use any organic solvent to clean batteries.
- Never try to remove the safety valve or pour anything into batteries.
- Never smoke or have an open flame around batteries.
- After battery discharge, charge the battery in time to maintain a good service life.
- Only professionals are allowed to perform the maintenance tasks.

Routine maintenance items for batteries

Table 6-3 Routine maintenance items for batteries

Item	Expected Result	Troubleshooting	Maintenance Interval
Battery management alarm	No battery management alarm is generated.	Identify the cause of an alarm based on the alarm information.	Monthly
Battery appearance	<ol style="list-style-type: none"> 1. The surface is clean and tidy without stains. 2. The battery terminals are intact. 3. Batteries are free from damage and cracks. 4. Batteries are free from acid leakage. 5. Batteries are not deformed or bulged. 	If the battery appearance is abnormal, contact Huawei technical support.	Monthly

Item	Expected Result	Troubleshooting	Maintenance Interval
Battery operating temperature	<ol style="list-style-type: none"> 1. The ambient battery temperature is 25 ± 5 °C. 2. The battery operating temperature is lower than battery temperature + 20 °C. 3. Battery charge and discharge conditions meet the requirements specified in the battery specifications. 	<ol style="list-style-type: none"> 1. Identify the cause of an abnormal battery operating temperature. 2. If the fault persists, contact Huawei technical support. 	Monthly
Charge voltage of battery string	<ul style="list-style-type: none"> • Equalized charging voltage: 2.35 V/cell $\pm 1\%$ x number of battery cells • Float charging voltage: 2.25 V/cell $\pm 1\%$ x number of battery cells 	<ol style="list-style-type: none"> 1. If the voltage drop between the battery string output terminals and the battery input terminals at the UPS side is greater than 1% of the battery string voltage, check whether the cable between the battery string and the UPS is excessively long, or the cable diameter is excessively small. 2. Check whether the equalized charging voltage and float charging voltage are correctly set for the UPS. 3. If the fault persists, contact Huawei technical support. 	Monthly
Battery temperature sensor measurement accuracy	The difference between the temperature measured by the temperature sensor and the temperature displayed on the MDU is less than 3 °C.	<ol style="list-style-type: none"> 1. Install the temperature sensor in the correct position. 2. Replace the battery temperature sensor. 	Quarterly
Battery management parameter settings	The settings of battery management parameters meet the requirements	Set parameters correctly.	Quarterly

Item	Expected Result	Troubleshooting	Maintenance Interval
	in the user manual.		
Tightness of battery screws	The location of the signs marked on battery terminals indicating tight connections does not change.	Take photos from multiple angles and contact Huawei technical support.	Quarterly
Cables between batteries	No cable deteriorates and the insulation layer does not crack.	Replace the faulty cable.	Quarterly
Battery voltage	<ul style="list-style-type: none"> • Equalized charging voltage: 2.35 V/cell ± 0.02 V/cell • Float charging voltage: 2.25 V/cell ± 0.02 V/cell 	<ol style="list-style-type: none"> 1. Check whether the equalized charging voltage and float charging voltage of a battery are normal. 2. If the charging voltage of a battery exceeds the specifications requirement, perform a complete forcible equalized charging for the battery, and check again whether the voltage is normal. 3. If the fault persists, contact Huawei technical support. 	Quarterly
Shallow discharge test (recommended)	Conduct a shallow discharge test when the UPS is backed up to verify that the batteries can discharge normally.	<ol style="list-style-type: none"> 1. Locate the cause when an exception is identified. 2. If the fault persists, contact Huawei technical support. 	Quarterly
Capacity Test (recommended)	When the UPS is backed up, discharge a battery to the undervoltage alarm threshold, to refresh the capacity of the battery.	<ol style="list-style-type: none"> 1. Locate the cause when an exception is identified. 2. If the fault persists, contact Huawei technical support. 	Yearly
Battery connection reliability	<ol style="list-style-type: none"> 1. Each battery terminal is connected reliably. (When battery strings are powered off, check the reliability of each terminal in the order from positive 	<ol style="list-style-type: none"> 1. Rectify any abnormal connection. 2. If the fault persists, contact Huawei technical support. 	Yearly

Item	Expected Result	Troubleshooting	Maintenance Interval
	<p>terminals to negative terminals.)</p> <p>2. The tightening torque of each battery screw meets the requirements of the battery manufacturer. (A torque wrench is used for checking the torque. After checking that the battery screws meet the requirements, mark the screws for later check.)</p>		

7 Troubleshooting



WARNING

If the UPS is faulty, alarm information is displayed on the LCD. Clear critical alarms before powering on the UPS again. Otherwise, the fault scope expands or the UPS is damaged.



NOTICE

- If the LCD still displays the alarm information after a UPS is troubleshot and started, choose **System Info > Alarms > Clear Faults** to clear the alarm and then start the inverter.
- When batteries reach EOD, the battery switch in the BCB box trips if the BCB box is configured. To restore battery discharge, turn on the battery switch in the BCB box (if any) first.
- To restore battery discharge after batteries reach EOD, use one of the following methods: 1. Switch to another battery string. Ensure that each battery has a voltage greater than the EOD voltage and 11.3 V/cell. 2. Restore the mains power supply to start the inverter. Turn on the battery switch and charge batteries until each battery has a voltage greater than the EOD voltage and 11.3 V/cell.

For details about how to rectify common faults, see [Table 7-1](#). If any other unmentioned faults occur, see the chapter of alarm list and contact Huawei technical support.

Table 7-1 Troubleshooting

Case	Symptom	Possible Cause	Measure
The rectifier is abnormal.	The rectifier cannot work, and the bus voltage is not boosted.	The mains voltage exceeds the upper threshold 278 V or is less than the lower threshold 80 V.	Check whether the mains voltage exceeds the threshold. If yes, contact the electric power company.
		PFC soft-startup fails.	Replace the power

Case	Symptom	Possible Cause	Measure
			module.
		The power module is faulty.	Replace the power module.
The inverter is abnormal.	The buzzer buzzes, the Fault indicator is on, the inverter is faulty, and the UPS transfers to bypass mode.	The UPS is overloaded or short-circuited.	Reduce load or rectify short circuits.
		Inverter overtemperature occurs.	Install more air conditioners or ventilation devices to ensure normal temperatures inside the equipment room.
		The power module is faulty.	Replace the power module.
The charger generates an alarm.	The buzzer buzzes, the Fault indicator is on, and the charging function fails.	The charger fails.	Replace the power module.
		The charger experiences overcurrent.	Replace the power module.
		The charger experiences undervoltage.	Check whether the configured number of batteries is correct. If the value is correct but the alarm persists, replace the power module.
The UPS works in bypass mode and does not transfer to inverter mode.	When the mains is normal, the UPS works in bypass mode and does not transfer to inverter mode.	Set the UPS working mode to ECO mode.	Set the working mode correctly.
		The bypass transfer times reach the upper threshold.	Clear the bypass transfer times on the LCD.
The bypass is abnormal.	The buzzer buzzes, and the Fault indicator is on.	The bypass thyristor is damaged.	Replace the bypass module.
		The bypass module experiences overtemperature.	Reduce the load, or improve ventilation.



NOTE

For details about component replacement and maintenance involved in Troubleshooting and Alarm List, consult Huawei maintenance engineers.

8 Technical Specifications

8.1 Physical Specifications

Item	600 kVA	800 kVA
Cabling mode	Cables are routed from the top or bottom.	
Protection level	IP20 (protected to IP21 by configuring IP21 components)	
Dimensions (H x W x D)	2000 mm x 2000 mm x 850 mm	2000 mm x 2400 mm x 850 mm
Communication	Supports dry contacts, RS485 ports, and FE ports. Supports Simple Network Management Protocol (SNMP).	
Weight	<ul style="list-style-type: none"> UPS5000-E-600K: 1350 kg in full configuration. Each power module is 32 kg. A maximum of 15 power modules are supported. UPS5000-E-800K: 1670 kg in full configuration. Each power module is 32 kg. A maximum of 20 power modules are supported. 	

8.2 Environmental Specifications

Item	600 kVA	800 kVA
Operating temperature	0–40 °C	
Storage temperature	–40 °C to +70 °C	
Humidity	0%–95% RH (non-condensing)	
Altitude	1000–4000 m When the altitude is above 1000 m, the load that the UPS can support decreases by 1% for each additional 100 m.	

Item	600 kVA	800 kVA
Noise	< 70 dB	

8.3 Safety Regulations and EMC

Item	600 kVA	800 kVA
Safety regulations	EN62040-1: 2008 IEC62040-1: 2008	
EMC	EN62040-2 IEC62040-2 IEC61000-2-2 IEC61000-4-2 IEC61000-4-4 IEC61000-4-5 EN61000-4-3 EN61000-4-6 IEC61000-4-8 IEC61000-4-11	

8.4 Mains Input Electrical Specifications

Item	600 kVA	800 kVA
Input system	Three-phase, five-wire	
Rated input voltage	380 V AC, 400 V AC, or 415 V AC (line voltage)	
Input voltage	138–485 V AC (line voltage) The UPS power is not derated at 305–485 V AC and is linearly derated at 305–138 V AC.	
Rated frequency	50 Hz or 60 Hz	
Input frequency	40–70 Hz	
Input PF	<ul style="list-style-type: none"> • 0.99 (full load) • 0.98 (half load) 	
THDi	<ul style="list-style-type: none"> • < 3% (full linear load) • < 5% (full non-linear load) 	

8.5 Bypass Input Electrical Specifications

Item	600 kVA	800 kVA
Input system	Three-phase, five-wire	
Rated input voltage	380 V AC, 400 V AC, or 415 V AC (line voltage)	
Rated frequency	50 Hz or 60 Hz	
Input frequency	±6 Hz (0.5–6 Hz, ±2 Hz by default)	
Input system	The mains input and bypass input can share a power source or use different power sources.	
Bypass current sharing function	In a parallel system, control the cable length to equalize the current. The current unbalance must be less than 25%.	

8.6 Battery Specifications

Item	600 kVA	800 kVA
Battery voltage	360–552 V DC (30–46 batteries, 40 by default; 6% derated when 30 batteries are configured)	
Battery management	Intelligent battery management	
One-button cold start	In the case of a mains failure, batteries can start the UPS to power loads.	
Battery string sharing	The UPSs connected in parallel can share battery strings. By default, battery strings are not shared.	
Charge voltage	<ul style="list-style-type: none"> Equalized voltage: 2.35 V/cell Float voltage: 2.25 V/cell 	

NOTE

In monitoring and power versions earlier than V100R001C10SPC008 (software package version: V100R001C10SPC700), the battery voltage is 360–480 V DC (30 to 40 batteries, 32 by default).

8.7 Output Electrical Specifications

Item	600 kVA	800 kVA
Output system	Three-phase, five-wire	

Item	600 kVA	800 kVA
Voltage	380 V AC, 400 V AC, or 415 V AC (tolerance $\pm 1\%$) (line voltage)	
Frequency	<ul style="list-style-type: none"> In normal mode, the mains frequency is synchronous with the bypass input frequency. In battery mode, the frequency is 50 Hz or 60 Hz (tolerance $\pm 0.25\%$). 	
Total harmonic distortion of output voltage (THDv)	<ul style="list-style-type: none"> < 1% (full linear load) < 4% (full non-linear load) 	
Output PF	1	
Transfer time	0 ms	
Output voltage unbalance	Voltage unbalance: $\pm 3\%$; phase unbalance: $\pm 2^\circ$	
Overload capability	Inverter overload capability: <ul style="list-style-type: none"> 105% < load \leq 110%: transfer to bypass mode after 60 min 110% < load \leq 125%: transfer to bypass mode after 10 min 125% < load \leq 150%: transfer to bypass mode after 1 min Load > 150%: transfer to bypass mode after 200 ms 	
	Bypass overload capability: <ul style="list-style-type: none"> Load \leq 125%: run continuously in bypass mode 1000% load: run for 100 ms 	Bypass overload capability: <ul style="list-style-type: none"> Load \leq 135%: run continuously in bypass mode 1000% load: run for 100 ms

8.8 System Electrical Specifications

Item	600 kVA	800 kVA
Redundancy design	The auxiliary power supplies, centralized controllers, and parallel signals use redundancy design.	
Number of UPSs connected in parallel	≤ 4	
ECO	Supported	

A Menu Hierarchy

A.1 Menus on the LCD

Level-1 Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu
System Info	Runn Info	AC Output	-
		UPS Load	-
		Mains Input	-
		Bypass Input	-
		Battery Status	-
		Cabinet 1 Data	-
		Cabinet 2 Data	-
		Total Runtime	-
		Environment Data	-
	Alarms	Active Alarms	-
		Historical Alarms	-
		Buzzer Off	-
		Clear Faults	-
	Settings	Basic	-
		Communication	-
		Basic Param.	-
		Advanced Param.	-
		Input Param.	-
		Output Param.	-
		Bypass Param.	-

Level-1 Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu	
		Battery Param.	-	
		Dry Contacts	-	
		Intelli. Power	-	
		Settings Wizard	-	
		Parameter Sync. (available in parallel UPS mode)	-	
	Maintenance	Battery Maint.	-	
		USB Operations	Remove USB	
			Upgrade Software	
			Load Config.	
			Export Config.	
			Export Logs	
			Export E-labels	
			Export Alarms	
			Multi-brand	
		Serviceable data		
		Inv. ON	-	
		Inv. OFF	-	
		ECM Switchover	-	
	Screen Calib.	-		
	About	Model	-	
		Manufacturer	-	
		Monitoring Version	-	
		Power Version	-	
		Version Info	-	
Common Functions	AC Output	Phase voltage	-	
		Line voltage	-	
		Phase current	-	
		Frequency	-	
		Power factor	-	
	UPS Load	Active power	-	

Level-1 Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu
		Apparent power	-
		Reactive power	-
		Load ratio	-
		Crest factor	-
	Mains Input	Phase voltage	-
		Line voltage	-
		Phase current	-
		Frequency	-
		Power factor	-
	Inv. ON	-	-
	Inv. OFF	-	-
	Buzzer Off	-	-
	Historical Alarms	-	-
System Status	Bypass	-	-
	Mains	-	-
	Load	-	-
	Battery	-	-

A.2 Menus on the WebUI

Level-1 Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu	Level-5 Menu
Monitoring	Active Alarms	-	-	-
	Real-time Data	UPS	Input	Phase voltage
				Line voltage
				Current
				Power factor
				Frequency
	Bypass			Phase voltage
				Line voltage

Level-1 Menu	Level-2 Menu	Level- Menu	Level-4 Menu	Level-5 Menu
				Current
				Power factor
				Frequency
			Output	Phase voltage
				Line voltage
				Current
				Power factor
				Frequency
				Crest factor
				Load ratio
				Active power
				Apparent power
				Reactive power
				System active power
				System apparent power
				System reactive power
			Battery	Voltage
				Current
				Bus voltage
				Battery temperature
				Backup time
				Remaining capacity
			Environment Data	Ambient temperature
				Ambient humidity

Level-1 Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu	Level-5 Menu
		Module	Rectifier	Phase voltage
				Line voltage
				Current
				Power factor
				Frequency
				Zero sequence current
				Bus voltage
				Battery voltage
				Battery current
			Inverter	Phase voltage
				Line voltage
				Current
				Inductance current
				Output phase voltage
				Frequency
				Active power
				Apparent power
				Reactive power
				Power factor
				Load ratio
		Crest factor		
	Param. Settings	Basic Param.	Single/Parallel	-
			Voltage level	-
			Output frequency	-
			Battery capacity	-

Level-1 Menu	Level-2 Menu	Level- Menu	Level-4 Menu	Level-5 Menu
			Number of cells	-
		Advanced Param.	System capacity	-
			Power module capacity	-
			Requisite modules	-
			Redundant modules	-
			Working mode	-
			BSC mode	-
			Inverter operating mode	-
			Converter mode	-
			Paral. sys. hibernate	-
			Module cycle hiber. period	-
			Amb. temp. alarm thresh	-
			Top outlet fan	-
			EOD restart	-
			EOD restart delay	-
			Inverter async. alarm	-
			Bus overvoltage recovery	-
		Bus overvolt. recovery time	-	
		Input cur. limiting	-	
		Input cur.	-	

Level-1 Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu	Level-5 Menu
			limiting ratio	
			No-load output shows zero	-
			Inv. load mode	-
		Input Param.	D.G. mode	-
			D.G. power limiting	-
			D.G. charger power ratio	-
			Intra-rack power module start delay (s)	-
			Inter-rack power module start delay (s)	-
			Input adaptability	-
		Output Param.	Output volt. adjustment	-
			Outp. transf. interrupt time	-
			Self-load output cur. ratio	-
			Output interruption transfer time	-
			Max. BPM transfer times	-
		Bypass Param.	Bypass frequency range	-
			Maximum bypass voltage	-
			Minimum bypass voltage	-
			ECO voltage range	-

Level-1 Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu	Level-5 Menu
			BPM supply on OL & Overtmp.	-
		Battery Param.	Installation time	-
			Maintenance period	-
			Battery type	-
			Chg. cur. limiting coef.	-
			Cell float voltage	-
			Cell equalized volt	-
			Transfer-to-equalized charging cur. coef.	-
			Automatic equalized charging	-
			Forced equalized charging protection time	-
			Equalized charging protection interval	-
			Scheduled equalized charging interval	-
			Float volt. temp. comp.	-
			Float volt. temp. comp. coef.	-
			Max batt. dis.time	-

Level-1 Menu	Level-2 Menu	Level- Menu	Level-4 Menu	Level-5 Menu
			Sched. shallow dis. test	-
			Sched. shallow dis. test time	-
			Sched. shallow dis. test interval	-
			Shallow dis. test dis. ratio	-
			Undertemp. alarm thresh.	-
			Overtemp. alarm thresh.	-
			Backup time warning	-
			Backup time warn. thresh.	-
			Remain. cap. warning	-
			Remain. cap. warn. thresh.	-
			Dis.cur.0.1C EOD	-
			Dis. cur.0.3C EOD	-
			Dis. cur.0.5C EOD	-
			Dis. cur.1.0C EOD	-
			Intelligent hibernation	-
			Class 1 grid hiber. time	-
			Class 2 grid hiber. time	-
			Chg. volt. over range	-

Level-1 Menu	Level-2 Menu	Level- Menu	Level-4 Menu	Level-5 Menu
			point	
			Dis. volt. over range point	-
		Dry Contacts	MUE05A connection	-
			Battery ground fault	-
			D.G. connection	-
			BCB connection	-
			Battery breaker	-
			PDC output breaker	-
			PDC maintenance breaker	-
			BP/SYSMT Switch	-
			BP/SYSMT switch function	-
			SPD/SYSOU T Switch	-
			SPD/SYSOU T switch function	-
			MUE06A connection	-
			MUS05A DO_1 Action	-
			MUS05A DO_2 Action	-
			MUS05A DO_3 Action	-
			MUS05A DO_4 Action	-
			MUE07A	-

Level-1 Menu	Level-2 Menu	Level- Menu	Level-4 Menu	Level-5 Menu
			DO_1 Action	
			MUE07A DO_2 Action	-
			MUE07A DO_3 Action	-
			MUE07A DO_4 Action	-
			MUE07A DO_5 Action	-
			MUS05A DO_1	-
			MUS05A DO_2	-
			MUS05A DO_3	-
			MUS05A DO_4	-
			MUE07A DO_1	-
			MUE07A DO_2	-
			MUE07A DO_3	-
			MUE07A DO_4	-
			MUE07A DO_5	-
			MUE07A DI_1	-
			MUE07A DI_2	-
			MUE07A DI_3	-
			MUE07A DI_4	-
			MUE07A DI_5	-
		Intelligent	Intelligent	-

Level-1 Menu	Level-2 Menu	Level- Menu	Level-4 Menu	Level-5 Menu	
		Power Settings	power supply		
	Comm. Config.	System IP Settings	IP Address	-	
			Subnet Mask	-	
			Default Gateway	-	
		Serial Port Settings	RS485 Com Baud Rate	-	
			RS485 Com Address	-	
		Battery Temperature Sensor Settings	Start Addr. of batt. Temp. sensor	-	
			Batt. Temp. sensors	-	
		Ambient Temperature and Humidity Sensor Settings	Start Addr. of ambient temp. & H. sensor	-	
			Ambient Temp. & H. sensors	-	
		BMU Settings	BMU start address	-	
			BMUs	-	
		NTC Settings	NTC	-	
		Control	System Commands and Tests	Inv. ON	-
				Inv. OFF	-
	Clear Fault			-	
	Bypass runtime			-	
	Inv. runtime			-	
	Forced Equalized Charging			-	
	Shallow Dis. Test			-	
	Capacity Test			-	
Query	Alarm History	Query	-	-	

Level-1 Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu	Level-5 Menu	
		Export	-	-	
	Logs	Historical log	-	-	
		Cap. test log	-	-	
		Common test log	-	-	
Config.	User Mgmt.	New	-	-	
		Modify	-	-	
		Delete	-	-	
	Site Config.	System Date and Time	Date(Local)	-	-
			Time(Local)	-	-
			Time zone	-	-
		System Information	Name	-	-
			Location	-	-
			Contact information	-	-
		SNMP	SNMP version	-	-
			SNMP port	-	-
		SNMP Trap	No.	-	-
			Trap addr.	-	-
			Trap port	-	-
		Certificate Management	Upload	-	-
			Export certificate	-	-
		Configuration Management	Upload configuration file	-	-
			Export configurations	-	-
		Multi-brand Management	Upload	-	-
		Configure Alarm Notification	Email server IP address	-	-
Sender's email	-		-		

Level-1 Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu	Level-5 Menu
		Server	User account authentication required when sending a mail	-
		Configure Alarm Notification Email Address	No.	-
			Email	-
			Language	-
			Alarm Severity	-
			Scheduled Notifi.	-
Maint.	Calib	Bypass	Ph. A input volt.	-
			Ph. B input volt.	-
			Ph. C input volt.	-
			Ph. A output volt.	-
			Ph. B output volt.	-
			Ph. C output volt.	-
		Module	Ph. A input volt.	-
			Ph. B input volt.	-
			Ph. C input volt.	-
			Ph. A input cur.	-
			Ph. B input cur.	-
			Ph. C input cur.	-
			Pos. bus volt.	-
			Neg. bus volt.	-

Level-1 Menu	Level-2 Menu	Level- Menu	Level-4 Menu	Level-5 Menu
			Zero sequence cur.	-
			Pos. batt. volt.	-
			Pos. batt. chg. volt.	-
			Pos. batt. chg. cur.	-
			Pos. batt. dis. cur.	-
			Neg. batt. volt.	-
			Neg. batt. chg. volt.	-
			Neg. batt. chg. cur.	-
			Neg. batt. dis. cur.	-
			Inv. ph. A volt.	-
			Inv. ph. B volt.	-
			Inv. ph. C volt.	-
			Ph. A output volt.	-
			Ph. B output volt.	-
			Ph. C output volt.	-
			Inv. ph. A cur.	-
			Inv. ph. B cur.	-
			Inv. ph. C cur.	-
			Inv. ph. A induc. cur.	-
			Inv. ph. B induc. cur.	-
			Inv. ph. C	-

Level-1 Menu	Level-2 Menu	Level- Menu	Level-4 Menu	Level-5 Menu
			induc. cur.	
		ECM	BPM ph. A input volt.	-
			BPM ph. B input volt.	-
			BPM ph. C input volt.	-
			Rack ph. A output cur.	-
			Rack ph. B output cur.	-
			Rack ph. C output cur.	-
			Rack ph. A output volt.	-
			Rack ph. B output volt.	-
			Rack ph. C output volt.	-
	Commissioning Var.	Bypass	BPM SW commissioning var. 0 data	-
			BPM SW commissioning var. 1 data	-
			BPM SW commissioning var. 2 data	-
			BPM SW commissioning var. 3 data	-
			BPM SW commissioning var. 4 data	-
			BPM SW commissioning var. 5 data	-
		Module	Rec. SW commissioning var. 0 data	-

Level-1 Menu	Level-2 Menu	Level- Menu	Level-4 Menu	Level-5 Menu
			Rec. SW commissioning var. 1 data	-
			Rec. SW commissioning var. 2 data	-
			Rec. SW commissioning var. 3 data	-
			Rec. SW commissioning var. 4 data	-
			Rec. SW commissioning var. 5 data	-
			Inv. SW commissioning var. 0 data	-
			Inv. SW commissioning var. 1 data	-
			Inv. SW commissioning var. 2 data	-
			Inv. SW commissioning var. 3 data	-
			Inv. SW commissioning var. 4 data	-
			Inv. SW commissioning var. 5 data	-
		ECM	ECM SW commissioning var. 0 data	-
			ECM SW commissioning var. 1 data	-
			ECM SW commissioning var. 2 data	-

Level-1 Menu	Level-2 Menu	Level- Menu	Level-4 Menu	Level-5 Menu
			ECM SW commissioning var. 3 data	-
			ECM SW commissioning var. 4 data	-
			ECM SW commissioning var. 5 data	-
	Upgrade	Upgrade UPS Software	-	-
	Download	Download	Serviceable data	-
			E-Label	-

B Alarm List

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
0001-1	Mains voltage abnormal	Minor	<ul style="list-style-type: none"> • Cable connections are incorrect. • The mains is abnormal. • The power module is faulty. 	<ol style="list-style-type: none"> 1. Check whether cables to mains are disconnected, loose, or incorrectly connected. 2. If cable connections are correct, measure the mains voltage with a multimeter. If the mains voltage exceeds 280 V, the mains input is abnormal; if the mains voltage is less than 272 V, the sampling circuit of the power module is abnormal. Replace the faulty module.
0001-2			<ul style="list-style-type: none"> • Cable connections are incorrect. • The mains is abnormal. • The mains input fuse for the power module is blown. 	<ol style="list-style-type: none"> 1. Check whether cables to mains are disconnected, loose, or incorrectly connected. 2. If cable connections are correct, measure the mains voltage with a multimeter. If the mains voltage is less than 80 V, the mains voltage is abnormal; if the mains voltage exceeds 88 V, the power module sampling circuit or fuse may be abnormal. Replace the faulty module.
0001-3			The mains is abnormal.	Check the mains.
0004-1	Mains ph. Reversed	Minor	Cable connections are incorrect.	Verify the cable connections.

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
0005-1	Mains neutral absent	Minor	Cable connections are incorrect.	<ol style="list-style-type: none"> 1. Secure or connect the neutral wire to the cabinet if it is loose or disconnected. 2. Check that the neutral wire to the power distribution system is normal.
0006-1	Mains undervoltage	Minor	<ul style="list-style-type: none"> • The mains is abnormal. • The power module sampling circuit is abnormal. 	Check whether the mains voltage ranges from 80 V (excluding 80 V) to 176 V. If no, the mains monitoring circuit for the power module is faulty. Replace the faulty module.
0010-1	Abnormal bypass voltage	Minor	<ul style="list-style-type: none"> • The bypass voltage range is not correctly set. • The bypass input voltage is abnormal. 	<ol style="list-style-type: none"> 1. Check the bypass input voltage or cable connections with a multimeter. 2. Check the voltage system and bypass voltage thresholds configured on the LCD.
0010-2			<ul style="list-style-type: none"> • The bypass frequency range is not correctly set. • The bypass input frequency is abnormal. 	<ol style="list-style-type: none"> 1. Check the bypass input voltage or cable connections with a multimeter. 2. Check the bypass input frequency. Check the rated frequency and frequency range configured on the LCD.
0011-1	Bypass phase reversed	Minor	The phase sequence of the three-phase bypass input	Check whether the cable phase sequence is correct using a multimeter. If no multimeter is available, exchange the positions of any two cables.

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
			is reversed.	
0012-1	Bypass neutral absent	Minor	The neutral wire of bypass input is absent.	<ol style="list-style-type: none"> Secure or connect the neutral wire to the cabinet if it is loose or disconnected. Check that the neutral wire to the power distribution system is normal.
0020-1	Battery connected reversely	Critical	Batteries are not properly installed.	<ol style="list-style-type: none"> Check whether battery polarities are correctly installed by using a multimeter. If no, correct the installation. Check whether the battery input voltage of the UPS is normal. If yes, the battery sampling circuit of the power module is faulty. Replace the power module.
0021-1	Battery EOD	Critical	The battery voltage reaches the EOD voltage threshold due to continuous discharge.	If the BCB box is configured, check whether the BCB box trips. If it trips, turn on the BCB box switch.
0022-1	No battery	Minor	<ul style="list-style-type: none"> There is no battery string. The battery string is not properly installed. The power module battery fuse is blown. 	<ol style="list-style-type: none"> Check that battery cables are correctly connected. Check that the battery terminal voltage is normal. Check that the battery fuse in the power module is intact.
0025-1	Battery overvoltage	Minor	<ul style="list-style-type: none"> The configured number of batteries is less than the 	<ol style="list-style-type: none"> Check whether battery parameters are correctly set. If they are correctly set, certain batteries may be faulty. Check whether the battery neutral wire is correctly connected.

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
			actual number. <ul style="list-style-type: none"> The battery neutral wire is absent. 	
0026-1	Low battery voltage	Minor	<ul style="list-style-type: none"> Battery discharge results in low battery voltage. The battery neutral wire is absent. The charger is faulty. 	<ol style="list-style-type: none"> If the low battery voltage alarm is generated in battery mode, check whether the mains voltage recovers. If yes, charge batteries immediately. Check whether the battery neutral wire is correctly connected. If this alarm is generated in normal mode, check whether the battery switch is ON. If yes, the charger may be faulty. Replace the related power module.
0530-1	Battery ground fault	Critical	<ul style="list-style-type: none"> The battery string is not properly grounded. The battery ground monitoring cable is faulty. The dry contact board is faulty. 	<ol style="list-style-type: none"> Check whether the positive and negative terminals of the battery string are grounded or have sufficient resistance to the ground. Check whether the battery grounding failure detector is faulty by replacing it with a new one. If no battery grounding failure detector is available, check on the dry contact board whether the battery grounding failure detector is enabled. If yes, disable it and check whether the alarm is cleared. If the alarm persists, the dry contact board may be faulty. Replace the board.
0032-1	Battery overvoltage protection	Critical	<ul style="list-style-type: none"> The battery voltage is greater than the upper 	<ol style="list-style-type: none"> Check the battery voltage. Check that the configured number of batteries matches the actual number. Check that the actual number of batteries meets requirements.

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
			<p>threshold.</p> <ul style="list-style-type: none"> The configured number of batteries is less than the actual number. The actual number of batteries does not meet requirements. 	
0036-2	Battery maintenance reminder	Warning	The time for maintenance arrives.	Maintain the batteries.
0037-1	Battery undervoltage	Critical	<ul style="list-style-type: none"> The UPS has worked in battery mode for a long time. The charger is faulty. 	<ol style="list-style-type: none"> Check whether the battery voltage is normal. Check whether the output is overloaded. Check whether any battery is damaged. If yes, replace the battery. Check whether any battery charger generates an alarm. If yes, replace the faulty module.
0040-7	Rectifier abnormal	Critical	<ul style="list-style-type: none"> The fan for the power module is abnormal. The air channel for the power module is obstructed. 	<ol style="list-style-type: none"> Check that the air channel for the module is free from blockage. Check whether the fans are abnormal. Replace the power module if the fans are faulty.
0043-1	Fan abnormal	Critical	<ul style="list-style-type: none"> The fan for the power 	Replace the faulty power module.

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
			module is abnormal. <ul style="list-style-type: none"> The fan monitoring cable for the power module is abnormal. 	
0043-2			The fan is faulty.	Check the fan or replace the bypass module.
0043-3			<ul style="list-style-type: none"> The fan is faulty. The fan monitoring cable is faulty. 	1. Replace the fan. 2. Check the fan monitoring cable.
0043-4				
0047-1	Not ready	Critical	The ready switch is OFF.	Turn on the ready switch.
0060-4	Inverter abnormal	Critical	<ul style="list-style-type: none"> A load short-circuit occurs. A short circuit occurs inside the module. (This fault seldom occurs.) 	1. Check load cable distributions. 2. If load cable distributions are normal, replace the power module.
0061-2	Inverter alarm	Minor	<ul style="list-style-type: none"> The I2C bus is abnormal. The E2PROM is faulty. 	1. Manually rectify the fault and check whether the alarm is cleared. 2. If the alarm is generated again, replace the power module.
0061-7	Inverter alarm	Minor	The bypass waveform is abnormal.	1. If not all modules generate the alarm, start the UPS and transfer it to normal mode and replace the faulty module. 2. If all modules generate the alarm, turn off the bypass input

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
				circuit breaker. After the inverter relay is closed, turn on the bypass input circuit breaker 10 seconds later.
0564-1	Overload timeout	Critical	<ul style="list-style-type: none"> The load is excessive. Derating reduces the rated system power. The module is damaged. 	<ol style="list-style-type: none"> Check that there is no overload. Check that the module power is not derated due to a fan fault. If the alarm persists, replace the power module.
0565-1	Load impact transfer-to-bypass	Minor	<ul style="list-style-type: none"> A large-power RCD load is instantly connected, or the output load short-circuits. The inverter bridge short-circuits. 	<ol style="list-style-type: none"> Check the load. If the load is normal, replace the power module.
0566-1	Output overload	Minor	<ul style="list-style-type: none"> The load is excessive. Derating reduces the rated system power. The module is damaged. 	<ol style="list-style-type: none"> Check that there is no overload. Check that the module power is not derated due to a fan fault. If the alarm persists, replace the power module.
0570-4	BPM module	Critical	<ul style="list-style-type: none"> The bypass fan is 	<ol style="list-style-type: none"> Check the bypass fan and air channel. If the fan is faulty, replace it.

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
	abnormal		abnormal, or the air channel is blocked. <ul style="list-style-type: none"> The ambient temperature exceeds the upper threshold. The load is excessive. 	2. Check that the ambient temperature is within 40 °C. 3. Check that there is no overload.
0583-1	Inter-rack par. cable abnormal	Critical	<ul style="list-style-type: none"> The inter-rack parallel system CAN bus is disconnected or short-circuited. Only one rack works in a parallel system. An ECM is faulty. 	1. Check the inter-rack parallel system CAN bus. 2. Rectify the disconnection or short-circuit fault. 3. Replace the ECM.
0583-4			The inter-rack industrial frequency synchronization cable is broken.	Replace the inter-rack parallel cable.
0583-5			The inter-rack carrier synchronization cable is broken.	
0583-6			<ul style="list-style-type: none"> The intra-rack 	

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
			INVBYP cable is broken. <ul style="list-style-type: none"> The parallel CAN bus is broken. 	
0584-2	Inter-rack par. cable alarm	Minor	The inter-rack parallel cable is faulty.	Replace the inter-rack parallel cable.
0584-4			The inter-rack industrial frequency synchronization cable is broken.	
0085-1	EPO	Critical	The EPO button is pressed.	Restore the EPO button status. Start the UPS after the alarm is cleared.
0086-1	Max. number of BPM transfers	Minor	The system frequently transfers to bypass mode due to overload timeout or load impact.	Check the load.
0087-1	System transfer-to-bypass	Warning	The neighboring UPS is abnormal and transfers to bypass mode.	Check the reason why the neighboring UPS transfers to bypass mode.
0088-1	Rack address conflict	Critical	The configured rack address conflicts with another one.	Check the rack address setting.
0089-1	Rack output overload	Minor	<ul style="list-style-type: none"> The load is excessive. 	1. Check the load. Remove some loads or expand the UPS power capacity if the UPS is overloaded.

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
			<ul style="list-style-type: none"> The rack capacity setting is not appropriate. 	2. Check that the configured rack capacity meets requirements.
0090-1	Dry contact board fault	Critical	I2C communication with the dry contact board MUE05A fails.	Replace the dry contact board MUE05A.
0090-2			I2C communication with the dry contact board MUE06A fails.	Replace the dry contact board MUE06A.
0356	Battery Mode	Minor	The UPS is working in battery mode.	Running status displayed. See details about how to handle other alarms.
0359	No power supplied	Warning	No power is supplied.	Running status displayed. See details about how to handle other alarms.
0332	Output disabled	Minor	The output is disabled.	Running status displayed. See details about how to handle other alarms.
0334	BSC master system	Warning	BSC master system.	Running status displayed. No suggested measures.
0334	BSC slave system		BSC slave system.	Running status displayed. No suggested measures.
0337	PDC bypass input breaker open	Critical	The bypass input circuit breaker on the PDC is OFF.	Running status displayed. No suggested measures.
0338	PDC output breaker open	Critical	The output circuit breaker on the PDC is	<ol style="list-style-type: none"> Check that all UPS output circuit breakers are ON. On the LCD, check that PDC output breaker open alarm has

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
			OFF.	disappeared. If the alarm persists, tap the Clear Fault button to clear the alarm.
0341	PDC Maint. breaker closed	Minor	The maintenance circuit breaker on the PDC is ON.	Running status displayed. No suggested measures.
0342	Mains input breaker open	Critical	The mains input circuit breaker is OFF.	Running status displayed. No suggested measures.
0343	BPM input breaker open	Critical	The bypass input circuit breaker is OFF.	Running status displayed. No suggested measures.
0340	Maint. breaker closed	Minor	The maintenance circuit breaker is ON.	Running status displayed. No suggested measures.
0345	Battery breaker open	Critical	The battery circuit breaker is OFF.	Running status displayed. See details about how to handle other alarms.
0335	Generator connected	Warning	The generator is connected.	Running status displayed. No suggested measures.
0594-1	Insufficient redundant racks	Minor	<ul style="list-style-type: none"> The load is excessive. The configured number of redundant racks is incorrect. 	<ol style="list-style-type: none"> Reduce the load. Decrease the configured number of redundant racks.
0095-1	Insuffi. redundancy	Minor	<ul style="list-style-type: none"> The load is excessive. The configured 	<ol style="list-style-type: none"> Reduce the load. Decrease the configured number of redundant modules.

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
			<p>Number of redundant modules is incorrect.</p>	
0096-1	ECO volt. Abnormal	Minor	<ul style="list-style-type: none"> The ECO bypass voltage or frequency is out of the preset range. The ECO bypass voltage or frequency range is incorrectly set. The bypass input sequence is reverse or the neutral wire is disconnected. 	<ol style="list-style-type: none"> Check the bypass input voltage and frequency. Check that the rated voltage, rated frequency, ECO bypass voltage range, and frequency range are correctly set. Check that the bypass cables and circuit breakers are correctly connected.
0098-1	Bypass current not shared	Minor	<ul style="list-style-type: none"> The output and input circuit breakers are OFF. The length of the bypass input or output cables is incorrect. The bypass SCR 	<ol style="list-style-type: none"> Check that the output and bypass input circuit breakers on each rack are ON. Check that bypass input and output power cables on each rack meet the length requirements. Rectify any bypass SCR open-circuit.

Alarm ID (Alarm ID-Cause ID)	Alarm Name	Severity	Cause	Solution
			open-circuits.	
0150-1	Inverter asynchronous	Minor	<ul style="list-style-type: none"> The bypass frequency changes fast. The output frequency track rate is incorrectly set. 	<ol style="list-style-type: none"> Check that the bypass output frequency does not change fast. Check that the Output freq. track rate is properly set.
0101-1	BSC signal abnormal	Minor	<ul style="list-style-type: none"> The dual bus connector is loose. Parameters are set incorrectly. 	<ol style="list-style-type: none"> Check the dual bus connector. Check the parameter settings.
0102-1	Maint. breaker misoperation	Critical	The user operation is incorrect.	<ol style="list-style-type: none"> Shut down the inverter and then turn on the maintenance circuit breaker. After maintenance, turn off the maintenance circuit breaker and then start the inverter.
0380	In self-check	Warning	The inverter is in self-check.	Wait until the inverter self-check is complete.

C Acronyms and Abbreviations

A

ATS

AC transfer switch

AWG

American wire gauge

B

BSC

bus synchronization controller

BCB-BOX

battery circuit breaker box

BBB-BOX

battery bus bar box

C

CE

Conformite Europeenne

CM

control module

D

DSP

digital signal processing

E

ECO

economy control operation

EPO

emergency power off

ECM

energy control module

EOD

end of discharge

I

IEC

International Electrotechnical

	Commission
L	
LCD	liquid crystal display
M	
MDU	monitor display unit
P	
PE	protective earthing
PDU	power distribution unit
R	
RS485	Recommend Standard 485
S	
STS	static transfer switch
SNMP	Simple Network Management Protocol
T	
THDi	total distortion of the input current waveform
THDv	total harmonic distortion of output voltage
U	
UPS	uninterruptible power system
USB	Universal Serial Bus
V	
VRLA	valve-regulated lead acid battery