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1 Safety Information

1.1 General Safety Information

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 installation or maintenance. The “NOTICE”, “CAUTION”, “WARNING”, and “DANGER” statements in this document do notrepresent all the safety instructions. They are only supplements to the safety instructions. Onlytrained and qualified personnel are allowed to install, operate, and maintain the equipment, and they must understand basic safety precautions to avoid hazards.

To ensure safety of humans and the equipment, pay attention to the safety symbols on the equipment and all the safety instructions in this document. This company will not be liable for any consequence caused by the violation of the safety operation regulations and design, production, and usage standards.

Declaration

This company does not take responsibilities for the following situations:

- Operation under severe environments that are not specified in this document
- Usage under installation and operating environments that are not specified in relatedinternational specifications
- Unauthorized product changes and software code modification
- Operation ignoring safety precautions and operation guidance specified in this document
- Damage caused by abnormal natural environments
- Damage caused by using batteries provided by this company for UPSs that are not provided by this company
- Damage caused by using batteries not provided by this company

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 (IEC60364-3).

Local Safety Regulations

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

Only trained and qualified personnel are allowed to install, operate, and maintain our equipment, and they must understand basic safety precautions to avoid hazards.

- Only trained and qualified personnel are allowed to install, operate, and maintain the UPS.
- Only trained and qualified personnel are allowed to remove safety facilities and inspect the equipment.
- Only personnel certified or authorized by this company are allowed to replace or change the devices or components (including software).
- Installation personnel must report faults or errors that might cause serious safety issuesto 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 orcomponent damage are beyond the warranty scope.

Grounding Requirements

Equipment to be grounded (excluding the energy storage system) must meet the following requirements:

- Ground the device before you install it and disconnect the ground cable after you removethe device.
- Do not damage the ground conductor.
- Do not perform operations on the device if the ground conductor is not installed.
- The device must be grounded permanently. Before performing operations on the device, check the electrical connection of the device to ensure that it is securely grounded.

Personal Security

- Do not perform operations on devices or cables during lightning strikes.
- To avoid electric shocks, do not connect safety extra-low voltage (SELV) circuit totel ecommunication network voltage (TNV) circuits.
- Before performing operations on a device, wear electrostatic discharge (ESD) clothes, ESD gloves, and an ESD wrist strap. Do not wear jewelry or watches during the operation to avoid electric shocks or burns.
- In the case of fire, leave the building or the equipment room immediately, and turn on thefire 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 security, discuss with the manufacturerin advance about the applicability, settings, management, and maintenance of the UPS, which require special considerations during design.

Device Security

- 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 it is securely screwed and will not fall overduring 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 inductive loads, and half-wave rectification loads. It does not apply to the regeneration load.
- Without prior consent from the manufacturer, do not alter the UPS internal structure or installation procedure.
- Never use water to clean electrical components in the interior and exterior of 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 high voltage and AC mains supply may result inserious injury.

- 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 safety regulations and rules.
- During the installation of the AC power supply facility, follow the local safety regulations.
- Before cable connections, ensure that the mains switch, bypass switch, and mains distribution switch are OFF.
- Dedicated tools must be used during high voltage and AC operations. Avoid using 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 Electrical Leakage

 **DANGER**

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

- If a "high electrical leakage" tag is attached to the power terminal of the device, you mustground the protective ground terminal to the device enclosure before powering the deviceon, thereby preventing electric shocks.
- The UPS is a large leakage current device. Do not configure a circuit breaker that has the leakage current protection function.

Power Cable

 **DANGER**

Do not install or remove power cables when the device is on. Transient contact between thecore 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 and wait about five 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 the label on the power cable is correct.

Fuse

DANGER

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

Backfeed Protection

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 overstatic bypass circuits. If the installation and maintenance personnel do not need to usebackfeed protection, paste labels on the mains and bypass input circuit breakers, informingthat the UPS is connected to backfeed protection circuits. Disconnect the backfeed protection card from the UPS before performing operations on the UPS.

Electrostatic Discharge

NOTICE

The static electricity generated by human bodies may damage the electro static-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 onhuman 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 well-grounded ESD wrist strap when touching thedevice or handling boards or application-specific integrated circuits (ASICs).

1.3 Operating Environment

DANGER

Do not place the device in an environment that has inflammable and explosive air or gas. Donot perform any operation in this kind of environment.

Any operation on any electrical device in an environment that has inflammable air can cause extreme danger. Strictly obey the operating environmental requirements specified in related user 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℃ 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, salts, or flammable gases.

- Sea 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 ocean.
– 3 km away from serious pollution sources, such as metallurgic plants, coal mines, and heat and power plants.
– 2 km away from secondary pollution sources, such as chemical factories, rubber plants, and electroplating factories.
– 1 km away from light pollution sources, such as food factories, tanneries, and heating boilers.

1.4 Battery

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 security and efficient battery management, use the batteries delivered with the UPS. This company shall not be responsible for battery damage caused by using batteries not provided by this company for this company's 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 circuitboards, and ultimately damage the device and cause short circuits of 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 circuits, acid leaks, and even human injuries may result.

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	2.23V/cell～2.27V/cell	2.3V/cell～2.4V/cell	1.6V/cell～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 special insulation tools.
- Take care to protect your eyes when operating batteries.
- Wear rubber gloves and a protective coat in case of electrolyte overflow.
- When moving a battery, ensure that its electrodes are upward. Leaning or reversing the battery is prohibited.
- Switch off the power supply during installation and maintenance.

Short Circuit

DANGER

Battery short circuits may cause human injuries. Although the voltage of ordinary batteries is low, the instantaneous high current caused by the short circuit releases a great deal of energy.

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

Harmful Gas

DANGER

Do not use unsealed lead-acid batteries. Place and secure lead-acid batteries horizontally to avoid inflammation or device corrosion due to flammable gases emitted from batteries.

The lead-acid batteries in use may emit flammable gases. Therefore, store the batteries in aplace with good ventilation, and take precautions against fire.

Battery Temperature

DANGER

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

- Install or store batteries far away from fire and heating sources, such as transformers. Never burn batteries.
- When the temperature of the battery is higher than 60℃, check the battery for electrolyte overflow. If the electrolyte overflows, absorb and counteract the electrolyte immediately.

Acid leakage

DANGER

In the case of electrolyte leaks, 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 supplier.

If your body meets the acid, wash the part that has met the acid with clean water immediately, or immediately call a doctor if the situation is serious.

1.5 Hoisting Heavy Objects

 **DANGER**

When heavy objects are being hoisted, do not walk below the cantilever or hoisted objects.

When working at heights, observe the following points:

- Only trained and qualified personnel can perform hoisting operations.
- Before hoisting heavy objects, ensure that the hoisting tools are fixed to a secure objector wall with good bearing capacity.
- Ensure that the angle formed by two cables is not greater than 90 degrees.

1.6 Mechanical Safety

Moving Sharp Objects

 **CAUTION**

Wear protective gloves when moving sharp objects.

 **DANGER**

- Perform operations by strictly following the symbols of instructions on the device.
- Exercise caution to prevent 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.

1.7 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℃.
- Before laying out cables that have been stored in a temperature lower than 0℃, 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. No cable should be allowed to pass through the rear of the air outlet of the cabinet. The air outlet should not be blocked byany foreign matter.

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

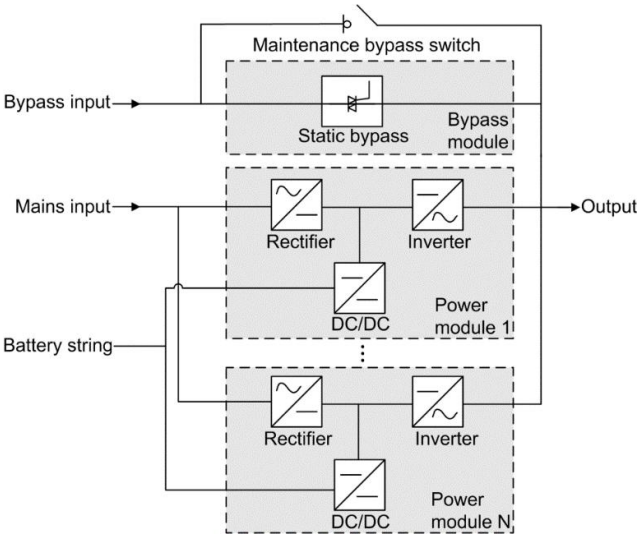
2 Introduction

2.1 Working Principle

2.1.1 Schematic Diagram

1-16×50 kVA (200 kVA/300 kVA/400 kVA/500 kVA/600 kVA/800 kVA) modular UPS adopts online double conversion design, providing high efficiency and high power density power supply for users. Figure 2-1 shows the UPS schematic diagram.

Figure 2-1 UPS schematic diagram

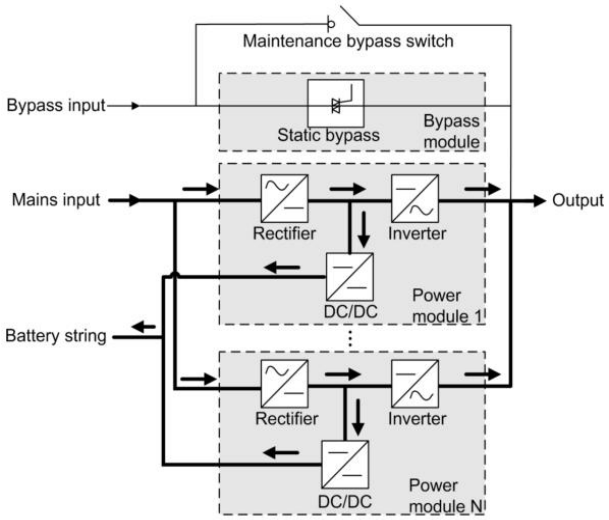


2.1.2 Working Modes

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 2-2 shows the schematic diagram of the UPS working in normal mode.

Figure 2-2 UPS schematic diagram in normal mode



NOTE

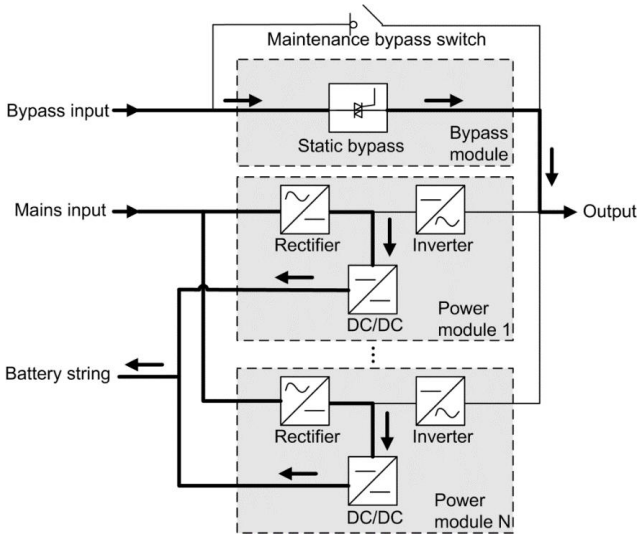
- "⟶" indicates an input mode.

- "→" indicates energy flow direction.

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 outages, and abnormal AC voltage and frequency. Figure 2-3 shows the schematic diagram ofthe UPS working in bypass mode.

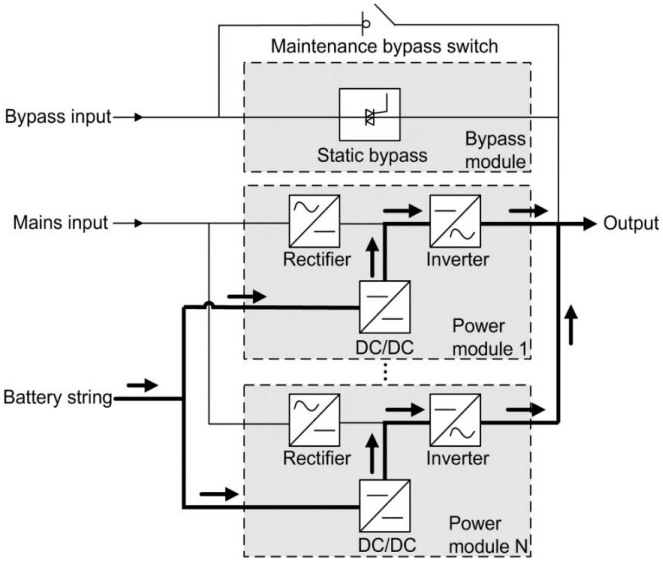
Figure 2-3 UPS schematic diagram in bypass mode



Battery Mode

If the rectifier AC input voltage is abnormal, the UPS transfers to battery mode. The power module obtains DC power from batteries, which is converted into AC outputs by the inverter. Figure 2-4 shows the schematic diagram of the UPS working in battery mode.

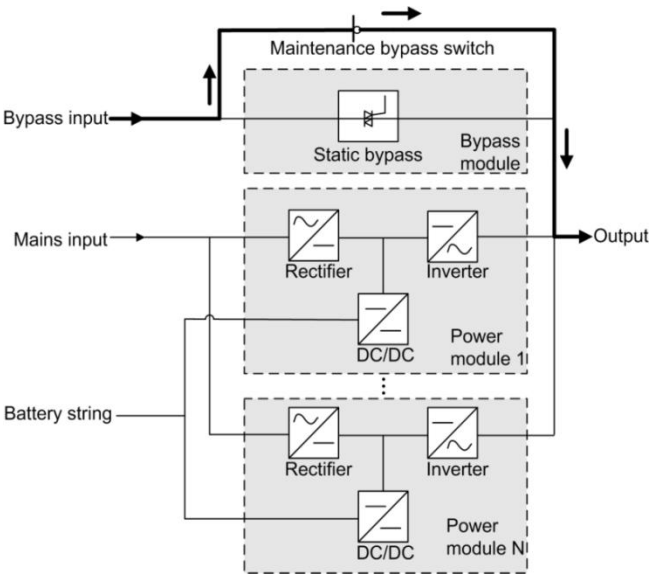
Figure 2-4 UPS schematic diagram in battery mode



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 2-5 shows the schematic diagram of the UPS working in maintenance bypass mode.

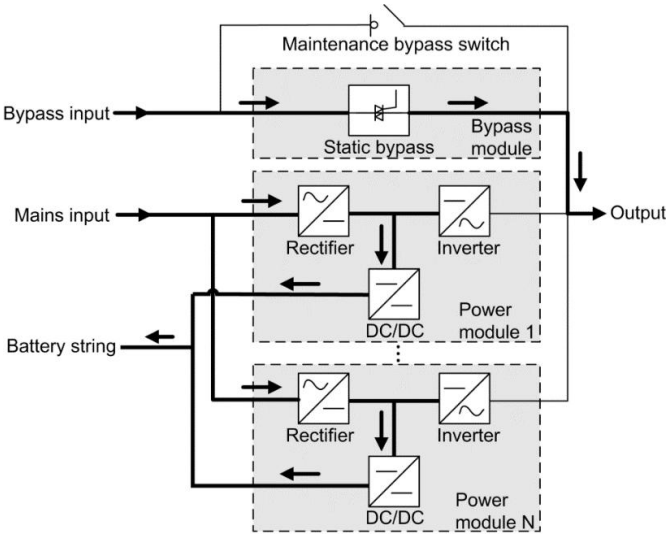
Figure 2-5 UPS schematic diagram in maintenance bypass mode



ECO Mode

The energy control operation (ECO) mode is an energy-saving mode that can be configured on the product's 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 turnson, 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 delivers a higher efficiency. Figure 2-6 shows the schematic diagram of theUPS working in ECO mode.

Figure 2-6 UPS schematic diagram in ECO mode

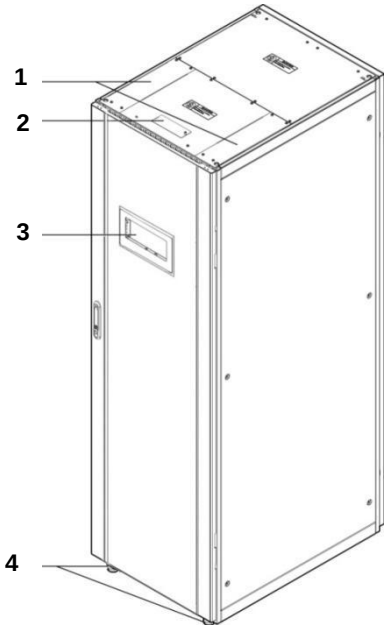


2.2 Product Overview

2.2.1 Front View

Figure 2-7 shows the front view of 200 kVA/300 kVA UPS.

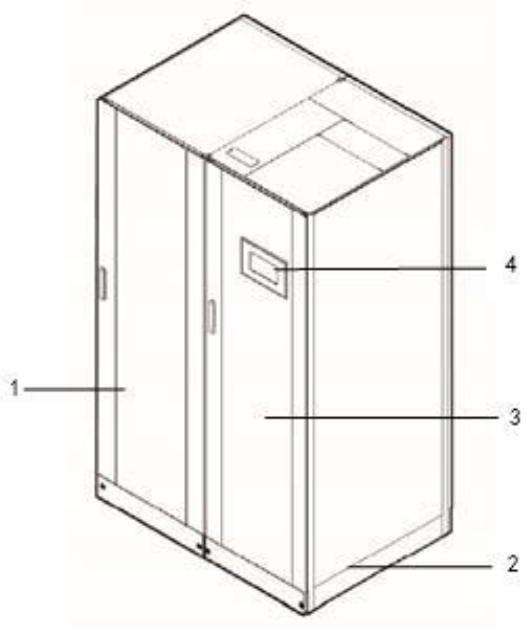
Figure 2-7 200 kVA/300 kVA UPS



1 Top outlet hole cover	2 Control cable outlet hole cover	3 Monitor display unit (MDU)	4 Idler wheel

Figure 2-8shows the front view of 400 kVA/500 kVAUPS.

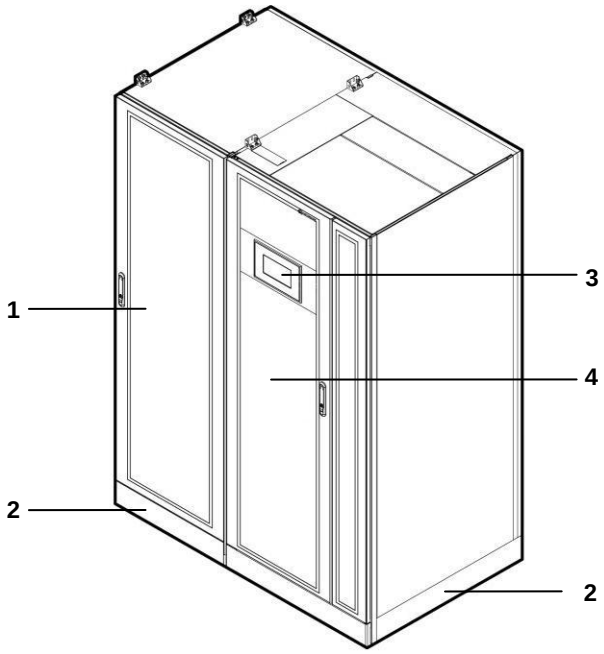
Figure 2-8 400 kVA/500 kVA UPS



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

Figure 2-9 shows the front view of 600 kVA UPS.

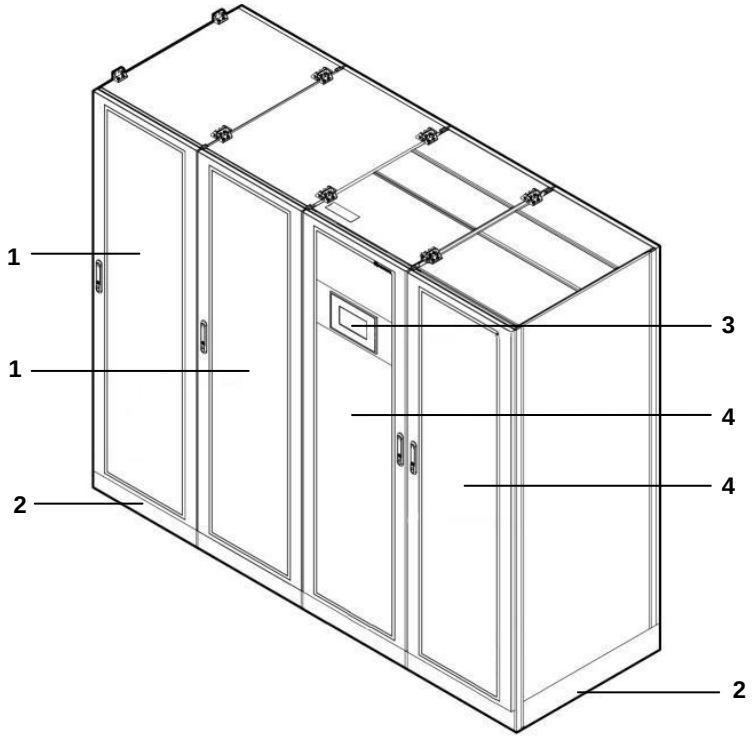
Figure 2-9 600 kVA UPS



1 Powercabinet	2 Anchor baffle plates	3 Monitor display unit (MDU)	4 Bypasscabinet

Figure 2-10 shows the front view of 800 kVA UPS.

Figure 2-10 800 kVA UPS

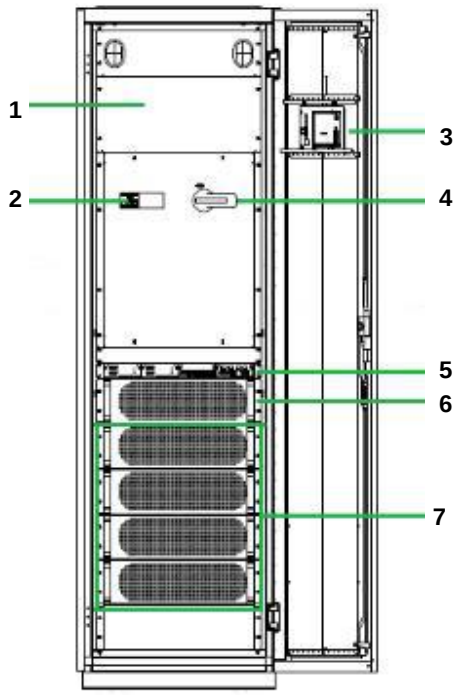


1 Powercabinet	2 Anchor baffleplates	3 Monitor display unit (MDU)	4 Bypasscabinet

2.2.2 Product Structure

Figure 2-11 shows the product structures of 200 kVA UPS in standard configuration.

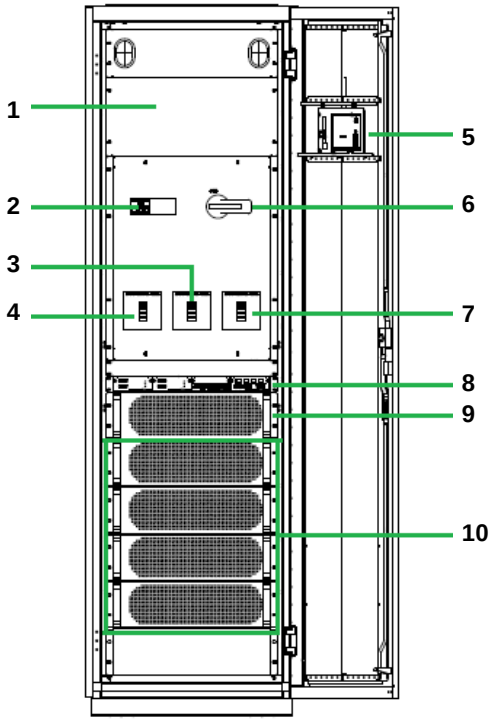
Figure 2-11 200 kVA UPS structure in standard configuration



1 Power distribution subrack cover	2 Lightning protection device (optional)	3 Monitor display unit (MDU)	4 Maintenance bypass switch
5 Control module	6 Bypass module	7 Power module	

Figure 2-12 shows the product structures of 200 kVA UPS in full configuration.

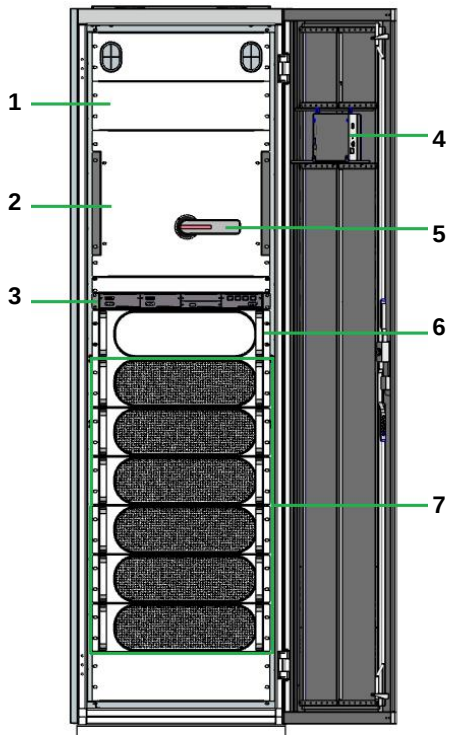
Figure 2-12 200 kVA UPS structure in full configuration



1 Power distribution subrack cover	2 Lightning protection device (optional)	3 Bypass input switch
4 Mains input switch	5 Monitor display unit (MDU)	6 Maintenance bypass switch
7 Output switch	8 Control module	9 Bypass module
10 Power module		

Figure 2-13 shows the product structure of 300 kVA UPS (top cable entery).

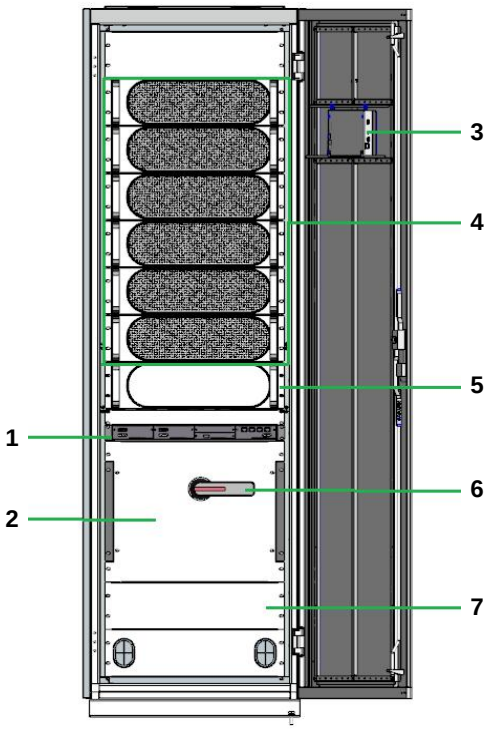
Figure 2-13 300 kVA UPS structure (top cable entery)



1 Filler panel	2 Power distribution subrack cover	3 Control module
4 Monitor display unit (MDU)	5 Maintenance bypass switch	6 Bypass module
7 Power module		

Figure 2-14 shows the product structure of 300 kVA UPS (bottom cable entery).

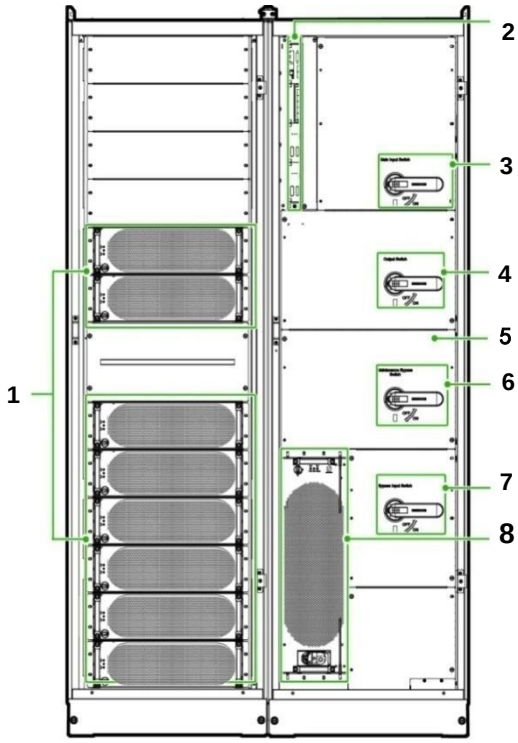
Figure 2-14 300 kVA UPS structure (bottom cable entery)



1 Control module	2 Power distribution subrack cover	3 Monitor display unit (MDU)
4 Power module	5 Bypass module	6 Maintenance bypass switch
7 Filler panel		

Figure 2-15 shows the product structure of 400 kVA UPS in full configuration.

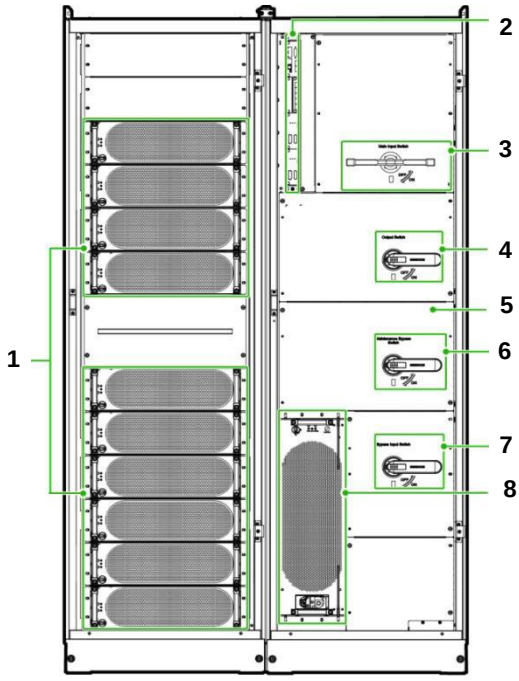
Figure 2-15 400 kVA UPS structure



1 Power modules	2 Control module, optional card slot	3 Mains input switch
4 Output switch	5 Power distribution panel	6 Maintenance bypass switch
7 Bypass input switch	8 Bypass module	

Figure 2-16 shows the product structure of 500 kVA UPS in full configuration.

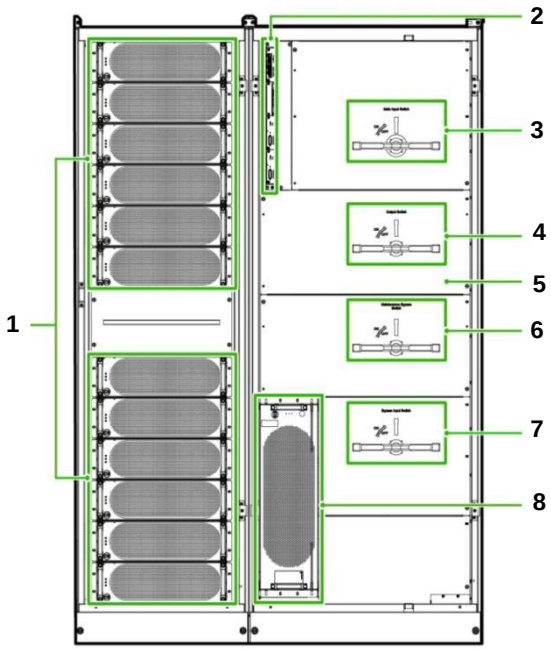
Figure 2-16 500 kVA UPS structure



1 Power modules	2 Control module, optional card slot	3 Mains input switch
4 Output switch	5 Power distribution panel	6 Maintenance bypass switch
7 Bypass input switch	8 Bypass module	

Figure 2-17 shows the product structure of 600 kVA UPS in full configuration.

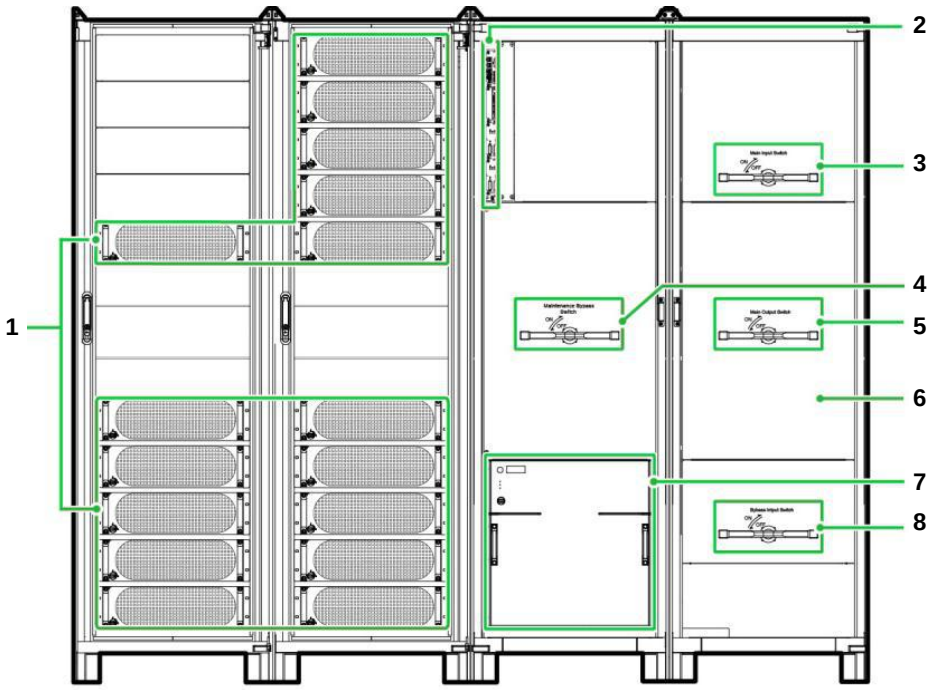
Figure 2-17 600 kVA UPS structure



1 Power modules	2 Control module, optional card slot	3 Mains input switch
4 Output switch	5 Power distribution module panel	6 Maintenance bypass switch
7 Bypass input switch	8 Bypass module	

Figure 2-18 shows the product structures of 800 kVA UPS in full configuration.

Figure 2-18 800 kVA UPS structure



1 Power modules	2 Control module, optional card slot	3 Mains input switch
4 Maintenance bypass switch	5Output switch	6 Power distribution module panel
7 Bypass input switch	8 Bypass module	

2.2.3 Control Module

Overview

For200 kVA UPS, the CM is located above the bypass module; for 300 kVA/400 kVA/500 kVA/600 kVA/800 kVA UPS, the CM is located in the upper left corner of the bypass cabinet.

In a standard configuration, the CM provides two energy control modules (ECMs), one drycontact card, and one monitoring interface card (from bottom to top).

Figure 2-19 shows the CM.

Figure 2-19 CM

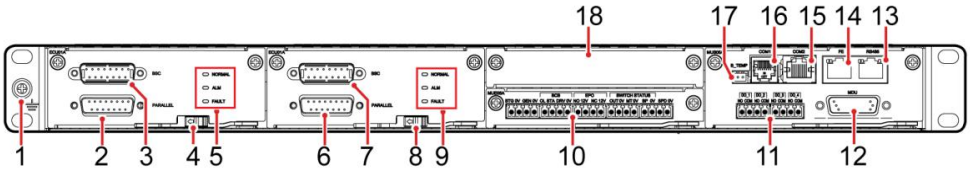


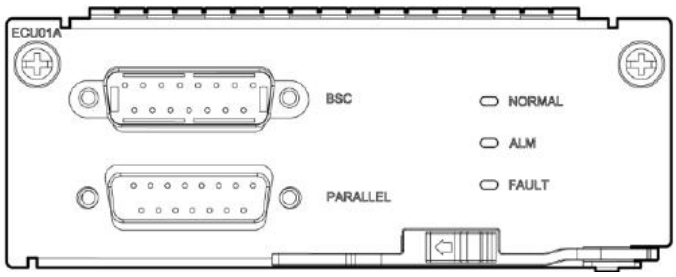
Table 2-1 CM

1 Ground terminal	2 Parallel port 1	3 BSC port 1	4 ECM switch 1
5 ECM1 indicator	6 Parallel port 2	7 BSC port 2	8 ECM switch 2
9 ECM2 indicator	10 Dry contact card	11 Dry contact port	12 MDU port
13 RS485 port	14 FE port	15 COM2 Port	16COM1 Port
17 Temperature and humidity sensor port	18 Optional board subrack cover		

ECM

The CM provides two active/standby energy control modules (ECMs). Each ECM provides one BSC port and one parallel port, as shown in Figure 2-20.

Figure 2-20 ECM



To connect UPSs in parallel, use a parallel cable to connect the parallel ports on the ECMs onthe two UPSs. A hot swappable BSC is used in a dual-bus system to process thecommunication information of two UPS systems. Table 2-2 describes the functions of the ECMs.

Table 2-2 Functions of the ECMs

Silk Screen	Description
PARALLEL	This port transmits parallel signals. To connect UPSs in parallel, use aparallel cable to connect the parallel ports on the UPSs in a loop. *N* UPSsrequire *N* parallel cables so that at least two parallel cables are connected to each UPS, which improves reliability.
BSC	This port is used in a dual-bus system to balance output frequencies and phases between UPS systems, ensuring that two buses can switch witheach other. The BSC port processes UPS system communications information.

Dry contact card

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

Figure 2-21 shows the signal ports on the dry contact card.

Figure 2-21 Dry contact card

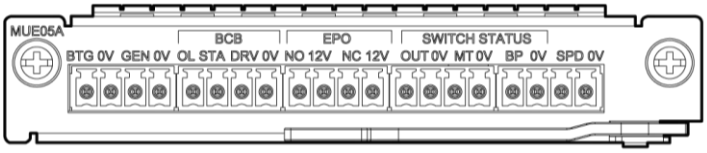


Table 2-3 describes the ports on the dry contact card.

Table 2-3 Ports on the dry contact card

Silkscreen	Description	Status	Initial status
BTG	Port for detecting battery grounding faults	• Connected: battery grounding fault • Disconnected: no battery grounding fault	Disconnected
0V	Secondary sideground		
GEN	Port for detecting diesel generator (D.G.) mode	• Connected: D.G.mode • Disconnected:non-D.G. mode	Disconnected
0V	Secondary side ground		
BCB_OL	Port for detecting the BCB box	• Grounded: BCB box connected • Floated: BCB boxnot connected	Grounded
BCB_STA	Port for monitoring the battery switch	• Connected: battery switch ON • Disconnected: battery switch OFF	Disconnected
BCB_DRV	Controls the trip of the battery switch in the BCB box.	0 V: battery switch not tripped 12 V: battery switch tripped	0V
BCB_0V	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.	The initial status is Disconnected. If the normally open (NO) port is connected to the EPO_12V port, EPO is triggered.	Disconnected
EPO_12V	+12V		
EPO_NC	EPO port, if the normally closed (NC) port is disconnected from the EPO_12V port, EPO is triggered.	The initial status is Connected. If the normally closed (NC) port is disconnected from the EPO_12V port, EPO is triggered.	Connected
EPO_12V	+12V		
SWITCH STATUS_OUT	Monitors the UPS output circuit breaker	• Connected: UPS output switch ON • Disconnected: UPS output switch OFF	Connected
SWITCH STATUS_0V	Secondary side ground		
SWITCH STATUS_MT	Monitors the maintenance circuit breaker	• Connected:maintenance switch ON • Disconnected: maintenance switch OFF	Disconnected
SWITCH STATUS_0V	Secondary side ground		
SWITCH STATUS_BP	Monitors the bypass input circuit breaker	• Connected: bypass input switch ON • Disconnected: bypass input switch OFF	Connected
SWITCH STATUS_0V	Secondary side ground		

Silkscreen	Description	Status	Initial status
SPD	Monitors the input AC SPD	Connected: SPD enabled Disconnected: SPD disabled	Connected
0V	Secondary side ground		

NOTE

NO is short for normally open, and NC is short for normally closed.

Monitoring Interface Card

The monitoring interface card provides external ports for the MDU and certain monitoringand control functions. It provides ports for sensors, the BMU, the fast Ethernet (FE) and the network management interface.

NOTICE

- The FE port resembles the RS485 port. Therefore, follow the silk screen when you connectcommunication cables. If you mistake the RS485 port as the FE port during cableconnection, the WebUI and MDU communication fails. If you mistake the FE port as theRS485 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 yourectify 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 theunused state on the WebUI or LCD.
- In a parallel system, ensure that used dry contacts properly connect to each UPS.

Figure 2-22 shows the monitoring interface card.

Figure 2-22 Monitoring interface card

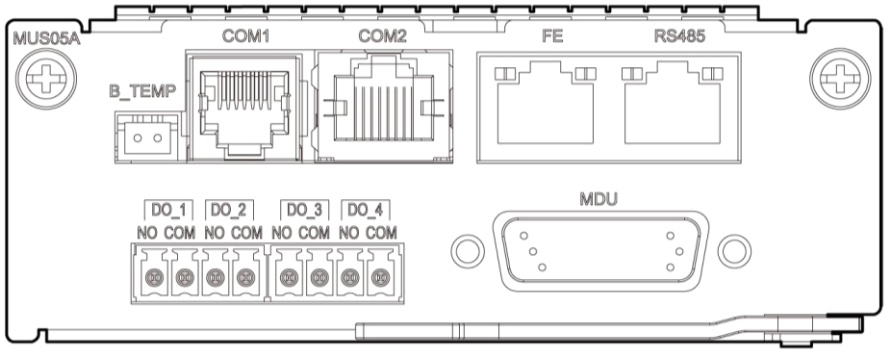


Table 2-4 describes the ports on the monitoring interface card.

Table 2-4 Ports on the monitoring interface card

Port	Silkscreen	Description
DO_1	NO	DO indicates critical alarms, minor alarms, bypass mode,battery mode, low battery voltage, or D.G. control. DO_1indicates any of the six meanings (except for D.G. control); bydefault, it indicates critical alarms. The maximum voltage and the maximum current is 30VDC/1 A.
	COM	
DO_2	NO	DO indicates critical alarms, minor alarms, bypass mode,battery mode, low battery voltage, or D.G. control. DO_2indicates any of the six meanings (except for D.G. control); bydefault, it indicates minor alarms. The maximum voltageand the maximum current is 30VDC/1 A.
	COM	

Port	Silkscreen	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); bydefault, it indicates minor alarms. The maximum voltageand the maximum current is 30VDC/1 A.
	COM	
DO_4	NO	DO indicates critical alarms, minor alarms, bypass mode,battery mode, low battery voltage, or D.G. control. DO_4indicates any of the five meanings (except for D.G. control); bydefault, it indicates battery mode. The maximum voltage and the maximum current is 30VDC/1 A. When the UPS worksin intelligent mode, DO_4 indicates D.G. control, whichcannot be changed.
	COM	
DB26	MDU	DB26 provides FE, RS485, Inter-Integrated Circuit (I2C), andcontrol area network (CAN) signals.
Batterytemperatur esensorport	B_TEMP	Connects to an indoor battery temperature sensor. This portcan connect to a short-distance battery temperature sensor.
Southboundport 1	COM1	Connects to an ambient temperature and humidity sensor overtwo wires.
Southboundport 2	COM2	Connects to a southbound device, such as a BMU.
Northboundcomm unications port	FE	Connects to the network port on a PC.
	RS485	Connects to a northbound network management device orthird-party network management device over two wires.

NOTE

- Signal cables must be double-insulated twisted cables. If the cable length is 25–50 m, thecross-sectional area must be 0.5–1.5 mm^2.
- RS485 cables and FE cables must be shielded cables.

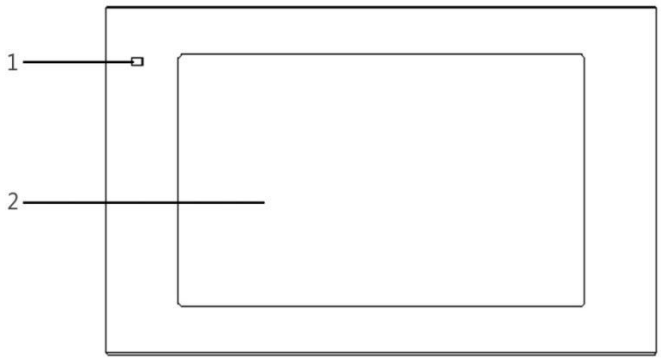
3 User Interface

3.1 LCD Interface

3.1.1 LCD

The MDU is located on the front door of the cabinet. The MDU allows you to control the UPSoperation, set parameters, and view running status and alarms. The MDU provides a statusindicator and an LCD touchscreen, as shown in Figure 3-1.

Figure 3-1 MDU



1 Fault indicator	2 LCD touchscreen

NOTE

Touch the LCD screen firmly if you are using your fingertips. It is recommended that you use yourfingernails to click on the screen for accurate selection and quick response, as shown in Figure 3-2.

Figure 3-2 Clicking on the LCD

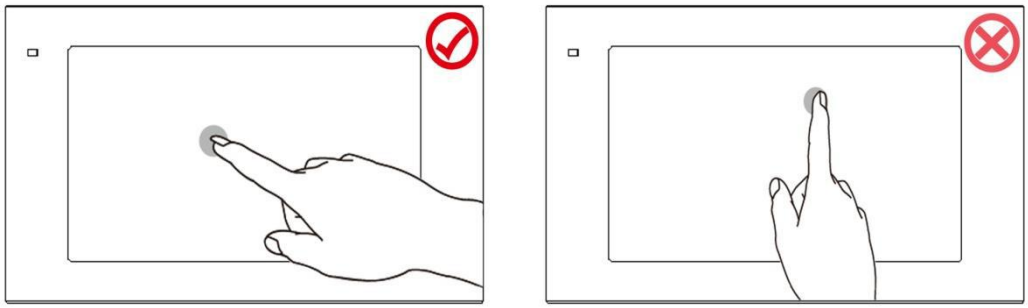


Table 3-1 describes the status of the indicator.

Table 3-1 Status of the indicator

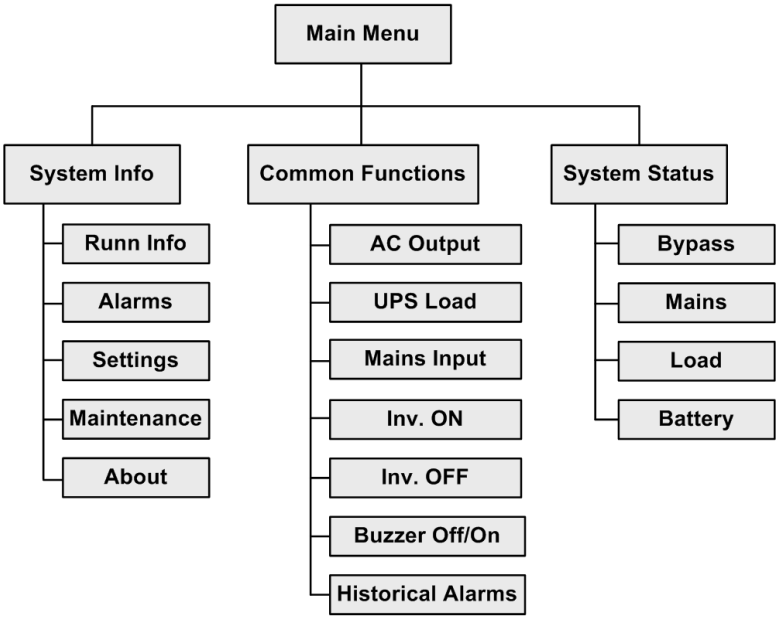
Status	Indicator	Explanation
On	Red	A critical alarm has been generated, and thebuzzer sounds continuously.
	Yellow	A minor alarm has been generated and thebuzzer sounds intermittently at 2 Hz.
	Green	The UPS is running properly.
Off	-	The MDU is powered off.

3.1.2 LCD Menu

Menu Hierarchy

Figure 3-3 shows the LCD menu hierarchy.

Figure 3-3 Menu Hierarchy



Initial Startup

NOTICE

User interfaces displayed in this document take 500 kVA UPS as an example and the information of menu pictures areonly for reference.

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 3-4. You can set Language, Time, Network Param., and System Param. on the Settings Wizard screen.

Figure 3-4 Settings Wizard

Main Menu

The LCD screen is divided into three parts: status bar, alarm bar and information area. Figure 3-5 shows the default main screen. Table 3-2 describes functions of all domains on the screen.

Figure 3-5 Main Menu

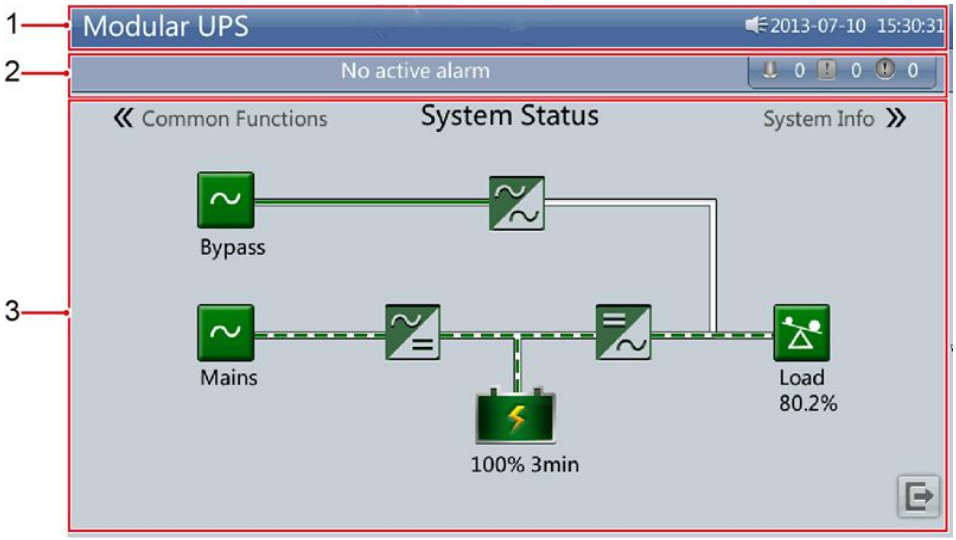


Table 3-2 Main screen description

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 asload and battery information. Tap the Bypass, Mains, Battery, and Load icons to view details.

Table 3-3 describes the functions of common buttons.

Table 3-3 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.
	Returns to the upper-level menu.
	Logs out.

3.1.3 System Info. Screen

On the main screen, tap System Info. The System Info screen is displayed, as shown in Figure 3-6.

Figure 3-6 System Info.

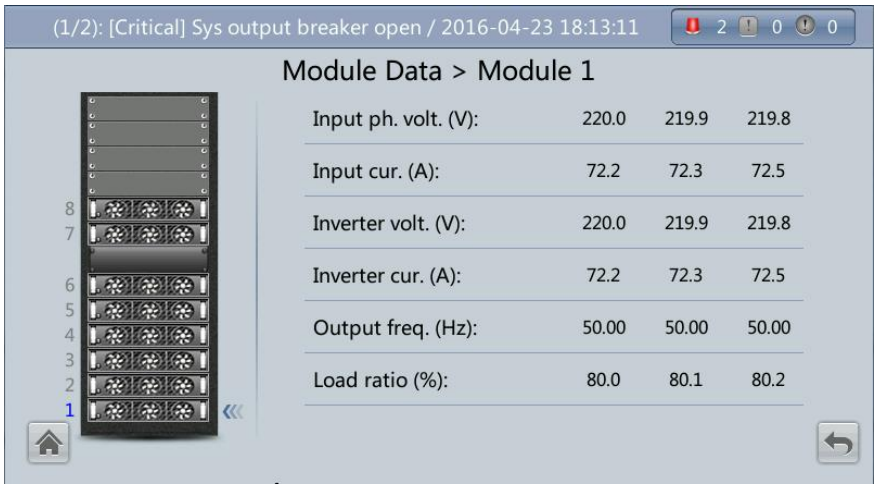
NOTE

For details about the menus on the System Info screen, see appendix A.1 Menus on the LCD.

Cabinet Data Screen

On the System Info screen, tap the UPS picture. On the Module Data screen, select a module to view its running data. Points to a selected module, as shown in Figure 3-7.

Figure 3-7 Module Data



Run 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 3-8 and Figure 3-9.

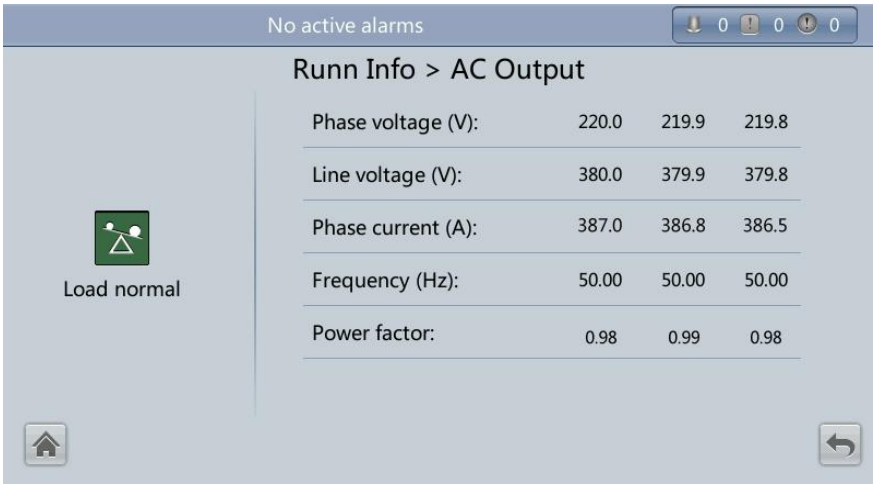
Figure 3-8 Runn Info screen 1

Figure 3-9 Runn Info screen 2

AC Output

Figure 3-10 shows the AC Output screen.

Figure 3-10 AC Output

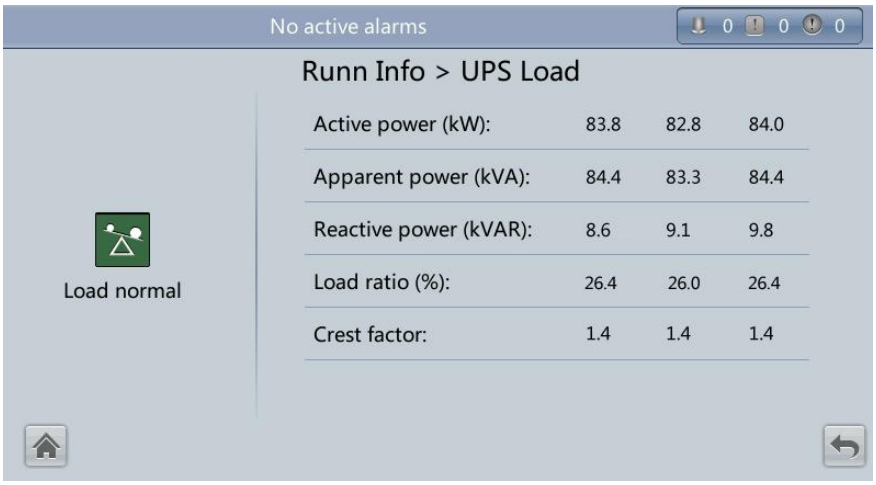


- Phase voltage (V)/Line voltage (V)/Phase current (A)/Frequency (Hz)
- AC output phase voltage/AC output line voltage/AC output phase current/AC output frequency.
- Power factor: Proportion of output active power to output apparent power.

UPS Load

Figure 3-11 shows the UPS Load screen.

Figure 3-11 UPS Load

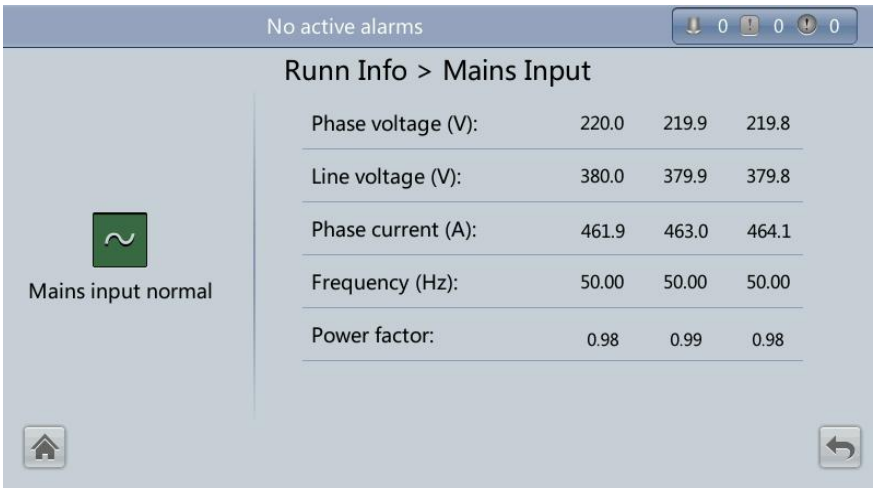


- Active power (kW): Output active power of each phase on the UPS.
- Apparent power (kVA): Output apparent power of each phase on the UPS.
- Reactive power (kVAR): Output reactive power of each phase on the UPS.
- Load ratio (%): Load ratio of each phase on the UPS, that is, proportion of actual power to rated power.
- Crest factor: Proportion of the pea kVA value of load current to the valid value.

Mains Input

Figure 3-12 shows the Mains Input screen.

Figure 3-12 Mains Input

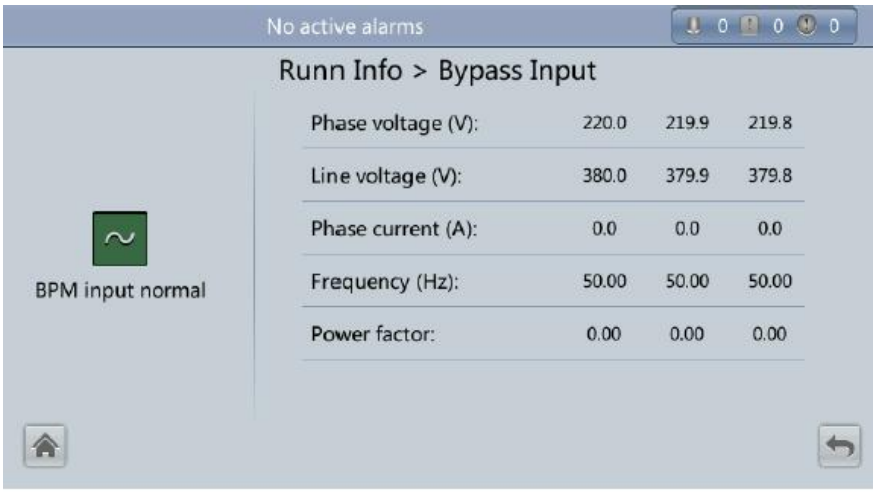


- Phase voltage (V)/Line voltage (V)/Phase current (A)/Frequency (Hz)
- Mains input phase voltage/Mains input line voltage/Mains input phase current/Mains input frequency.
- Power factor: Proportion of the mains input active power to the mains input apparent power.

Bypass Input

Figure 3-13 shows the Bypass Input screen

Figure 3-13 Bypass Input

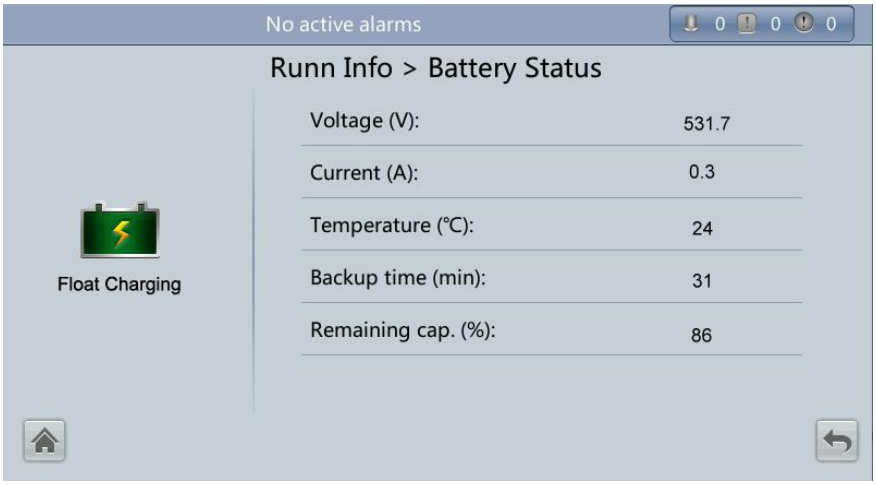


- Phase voltage (V)/Line voltage (V)/Phase current (A)/Frequency (Hz): Bypass input phase voltage/Bypass input line voltage/Bypass input phase current/Bypass input frequency.
- Power factor: Proportion of the bypass input active power to the bypass input apparent power.

Battery Status

Figure 3-14 shows the Battery Status screen.

Figure 3-14 Battery Status

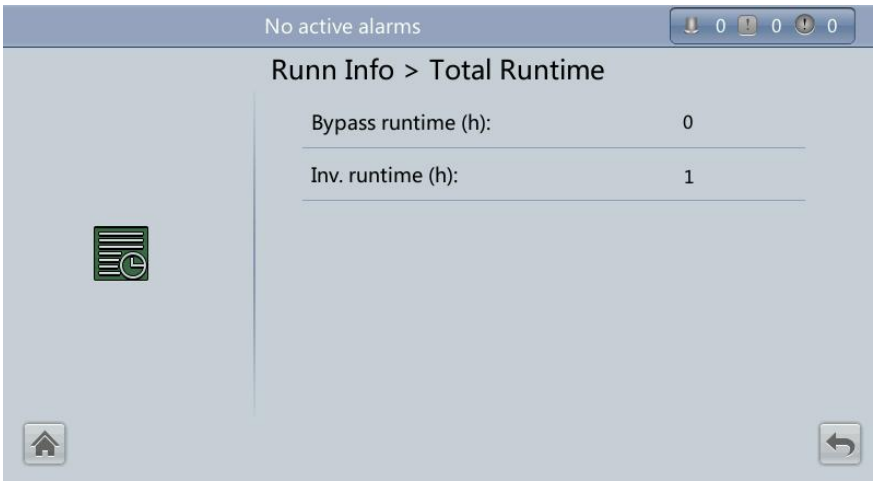


- Battery Status: The value can be Not connected, Not chg. or dis., Hibernating, Float charging, Equalized charging, or discharging.
- Voltage (V): Voltage of the battery string.
- Current (A): Current of the battery string. The current is “+” when batteries are being charged and “-“ when discharged.
- Temperature (℃): 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 3-15 shows the Total Runtime screen.

Figure 3-15 Total Runtime



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

NOTE

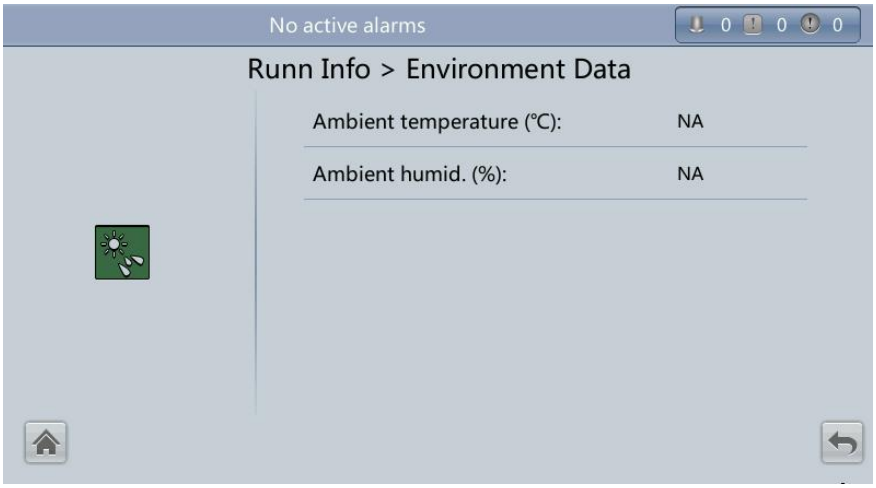
The value takes an integer. For example,

- 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 3-16 shows the Environment Data screen.

Figure 3-16 Environment Data



- Ambient temperature (℃): 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).

Alarms Screen

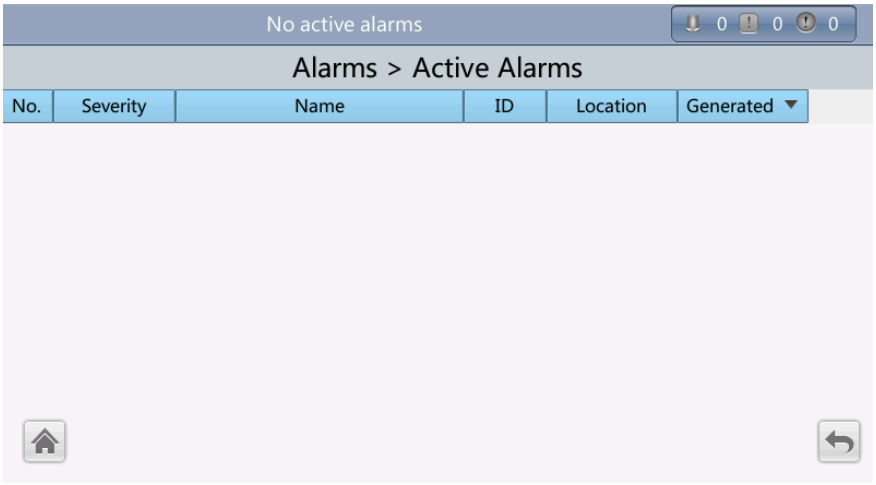
On the System Info screen, tap to enter the Alarms screen, on the Alarms screen, youcan view Active Alarms and Historical Alarms, Buzzer Off, and Clear Faults, as shown in Figure 3-17.

Figure 3-17 Alarms screen

Active Alarms

Figure 3-18 shows the Active Alarms screen. The active alarm information, including the alarm severity, name, ID, location, and generation time, is displayed on this screen.

Figure 3-18 Active Alarms



Historical Alarms

Figure 3-19 shows the Historical Alarms screen. The historical alarm information, including the alarm severity, name, ID, location, generation time, and clear time, is displayed on this screen.

Figure 3-19 Historical Alarms

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.

If the buzzer is enabled, 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 3-20 shows the Buzzer Off screen.

Figure 3-20 Buzzer Off

Clear Faults

Figure 3-21 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 3-21 Clear Faults

NOTE

- Table 3-4 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.

Settings Screen

On the System Info screen, click . If you have not logged in, a login screen is displayed, as shown in Figure 3-22.

Figure 3-22 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 3-23 and Figure 3-24.

NOTE

- Table 3-4 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 3-23 Settings screen 1

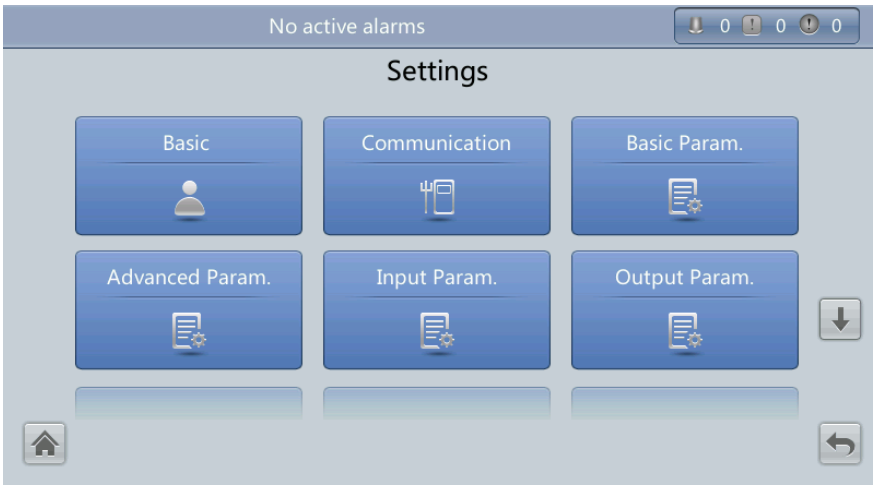
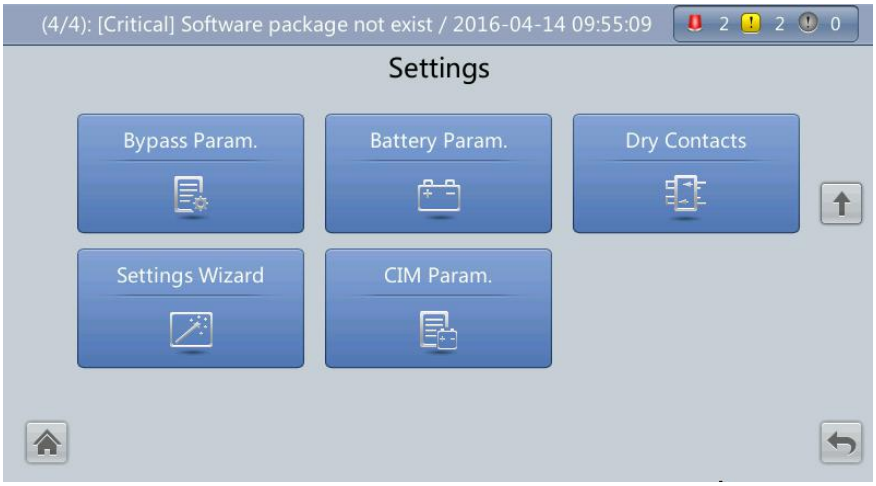


Figure 3-24 Settings screen 2



Basic Settings

Set basic parameters, as shown in Figure 3-25 and Figure 3-26.

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 3-25 Basic screen 1

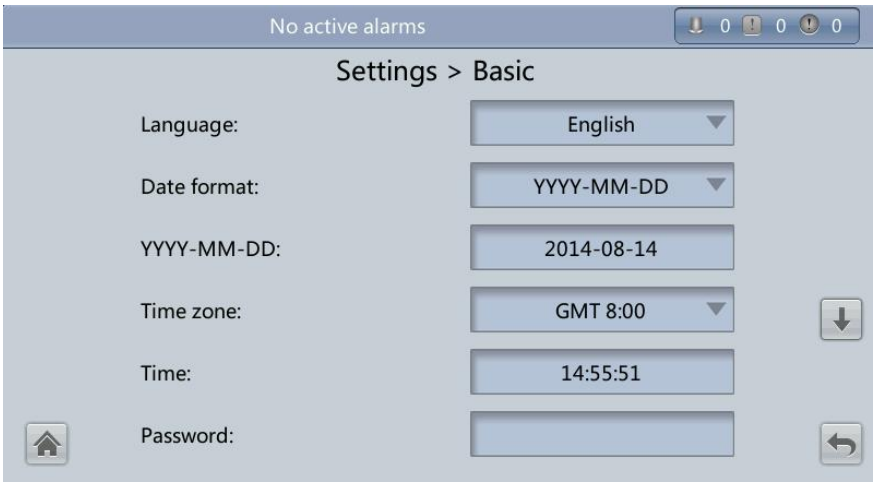
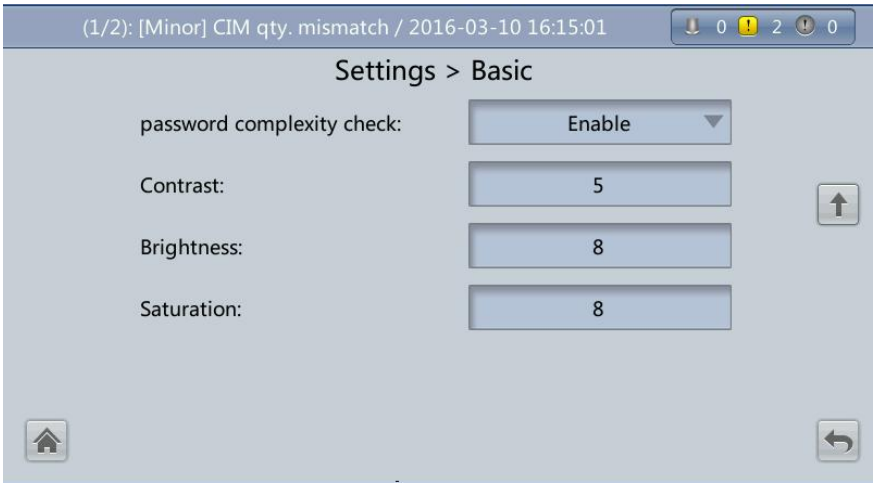


Figure 3-26 Basic screen 2



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 3-27, Figure 3-28, and Figure 3-29.

Figure 3-27 Communication screen 1

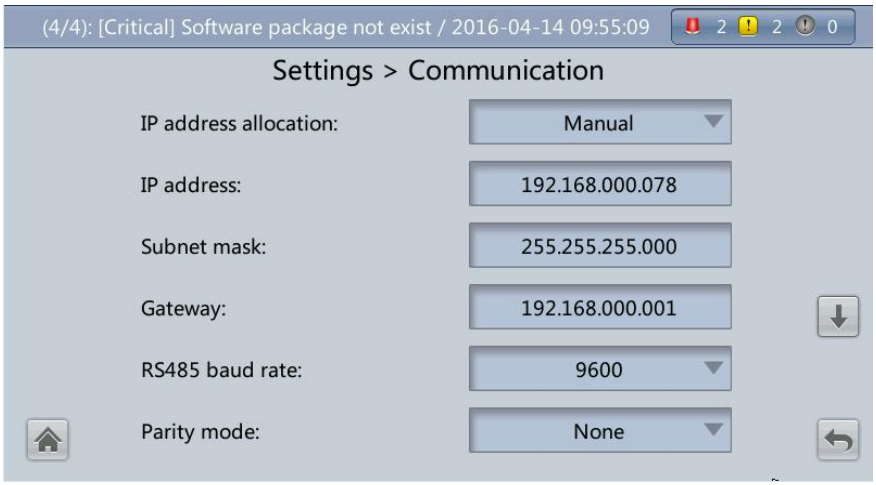


Figure 3-28 Communication screen 2

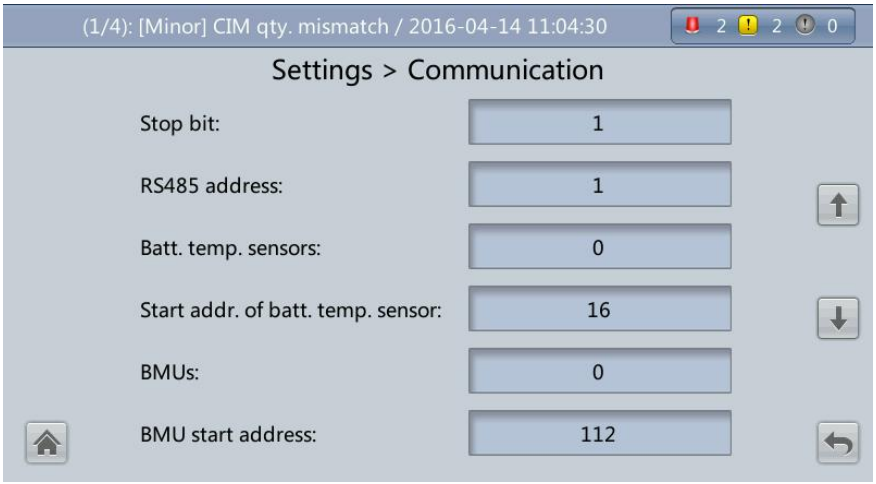
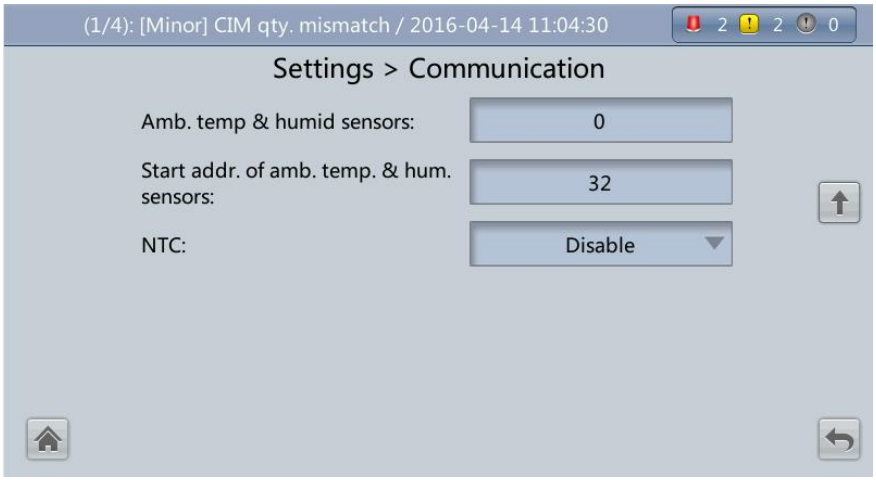


Figure 3-29 Communication screen 3



IP address allocation parameter

You can set IP address allocation to Manual or Automatic.

- Manual: After the MDU connects to the PC over a network cable, 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 parameter

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 parameter

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.

Geteway parameter

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 ~ 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 asthat 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 abattery 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.

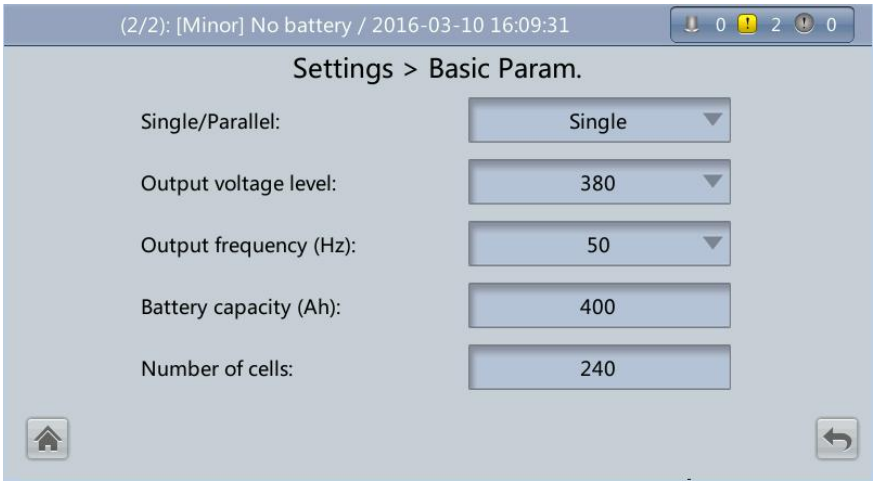
Basic Parameter Settings

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 3-30.

Figure 3-30 Basic Param.



Single/Parallel

Set the UPS running mode. The value can be Single (default) or Parallel.

Output voltage level (V)

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 and the default value is 50 Hz.

Battery capacity (Ah)

Set the battery string capacity. The value range is 5Ah ~ 3000 Ah. The default value is set according to the device model and capacity. 350 Ah is for the 300 kVA, 500 Ah is for the 400 kVA, 600 Ah is for the 500 kVA.

Number of cells

Set the number of cells. Each 12 V battery consists of six cells. The value range is 180 ~ 240, 240 by default.

NOTE

- A cell consists of electrodes and electrolytes, which is the basic unit for the battery. Each cell has anominal 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 (forexample, 180 and 240).
- 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 UPS model, System capacity, and Power module capacity, as shown in Figure 3-31, Figure 3-32, Figure 3-33, and Figure 3-34.

Figure 3-31 Advanced Param. screen 1

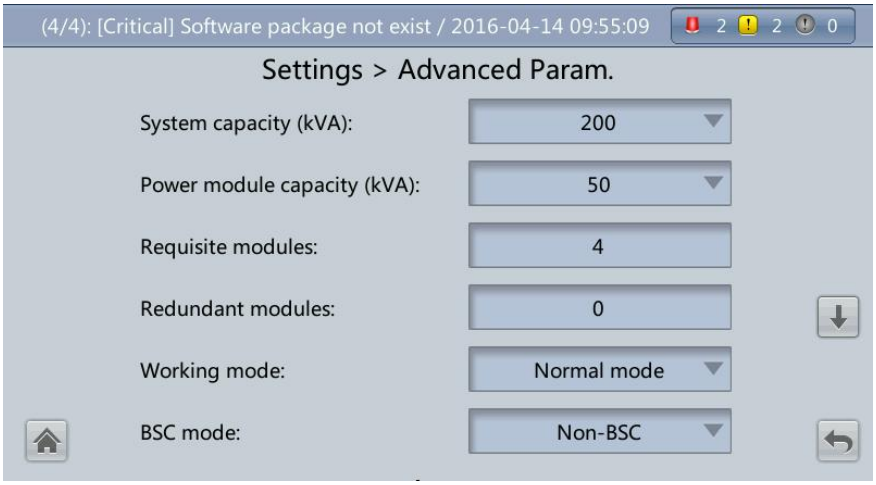


Figure 3-32 Advanced Param. screen 2

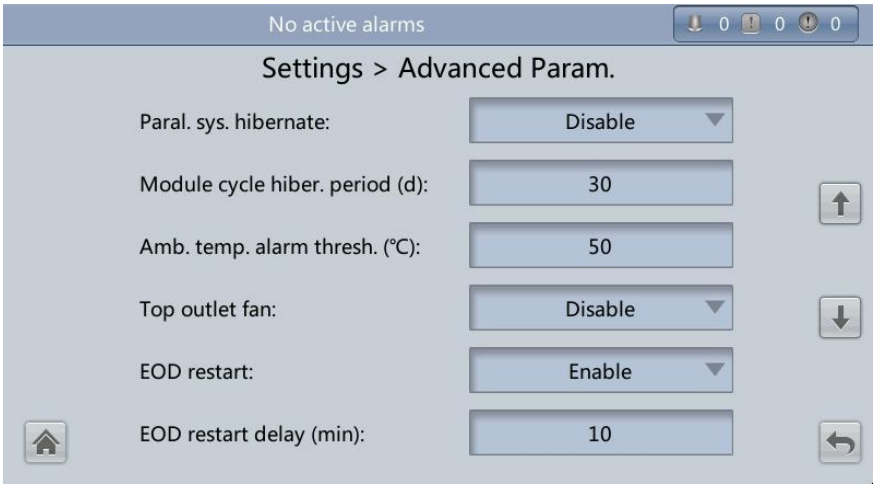


Figure 3-33 Advanced Param. screen 3

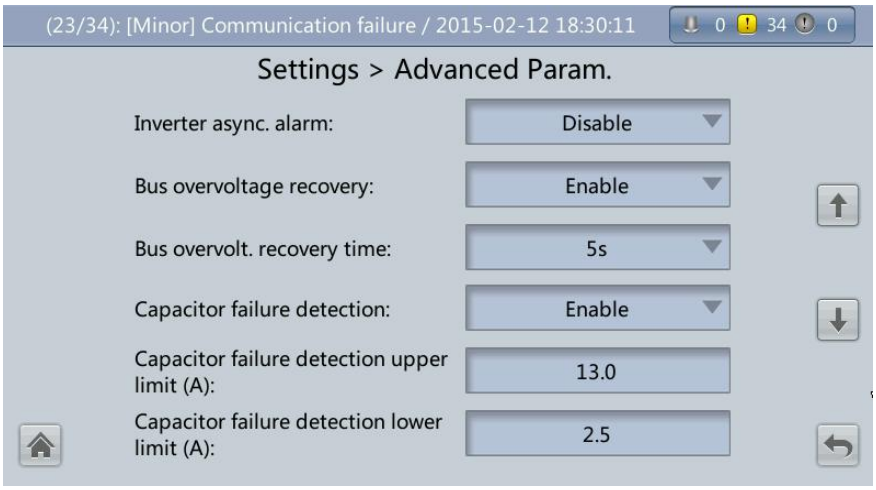
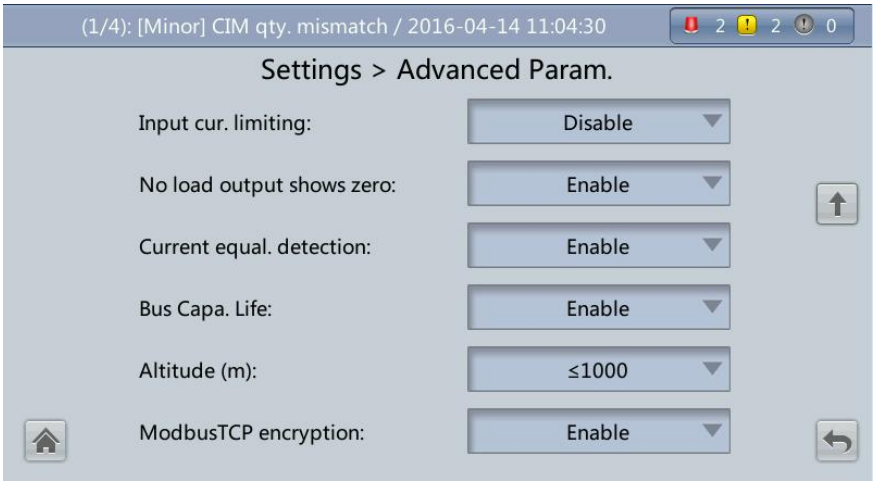


Figure 3-34 Advanced Param. screen 4



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

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.
- Adual-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 sametime. 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 isproperly connected and that BSC-related hardware is properly installed.

Paral.sys. hibernate

When the customer load is light, set parallel hibernation to alternate modules inhibernation can prolong their service life as well as improve the system efficiency.

Module cycle hiber.period (d)

0 to 100 days can be set. The default value is 30 days.

Amb.temp. alarm thresh. (℃)

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 theUPS.

EOD restart delay (min)

If EOD restart is set to Enabled, 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 youset the parameter to Enabled or Disabled.

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.

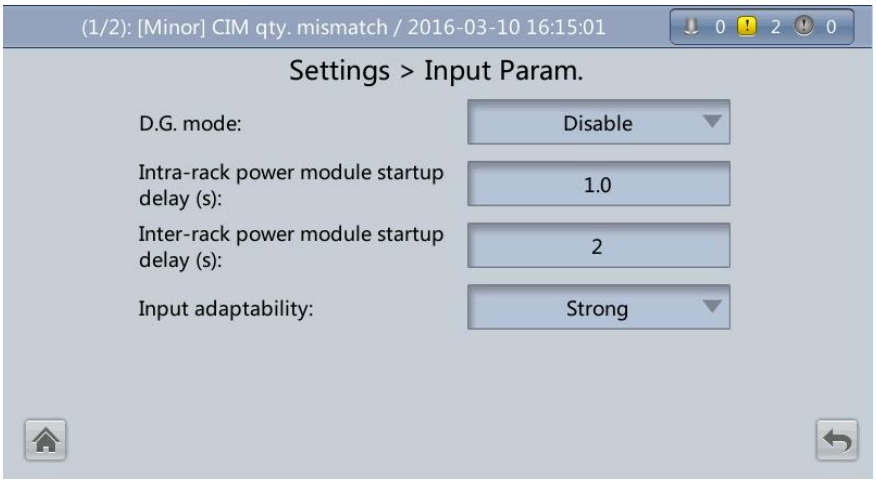
No-load output shows zero

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 loadratio will not be displayed as 0 in the case of zero load.

Input Parameter Settings

Set input parameters, as shown in Figure 3-35.

Figure 3-35 Input Param.



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 impactand to enhance the work with the D.G. The D.G. power limiting value range is 0~5000 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)

Control the time interval for each rack (or unit) to transfer from battery mode to normal mode, which reduces the impact on the D.G. or power grid. In the case of battery undervoltage, the system automatically shortens the transfer delay to 1/8 of the normal delay to accelerate the transfer and prevent battery overdischarge. The value can be 2~120 seconds, 5 seconds by default. The delay depends on the rack number and module number. Unit 1 in rack 1 has no start delay.

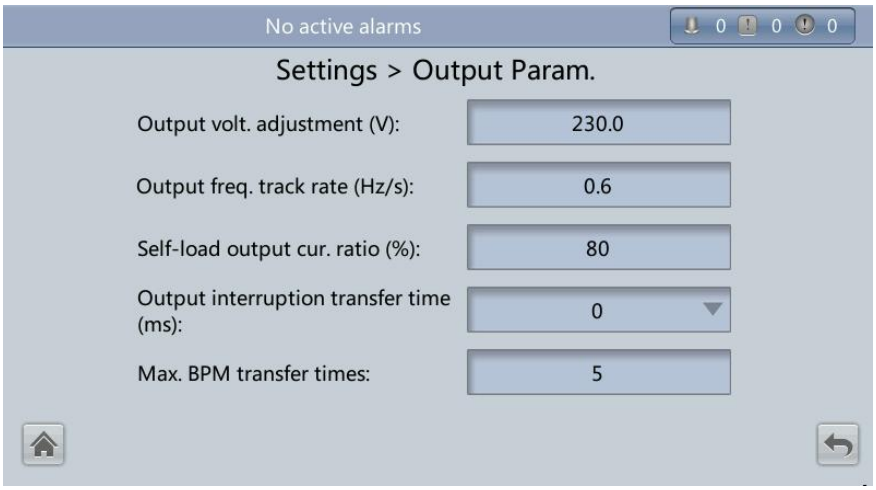
Input adaptability

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 3-36.

Figure 3-36 Output Param.



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 ± 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 ~ 2ms, and the transfer from bypass mode to inverter mode takes 0 ~ 20 ms. Users should set according to acceptable output time for the load.

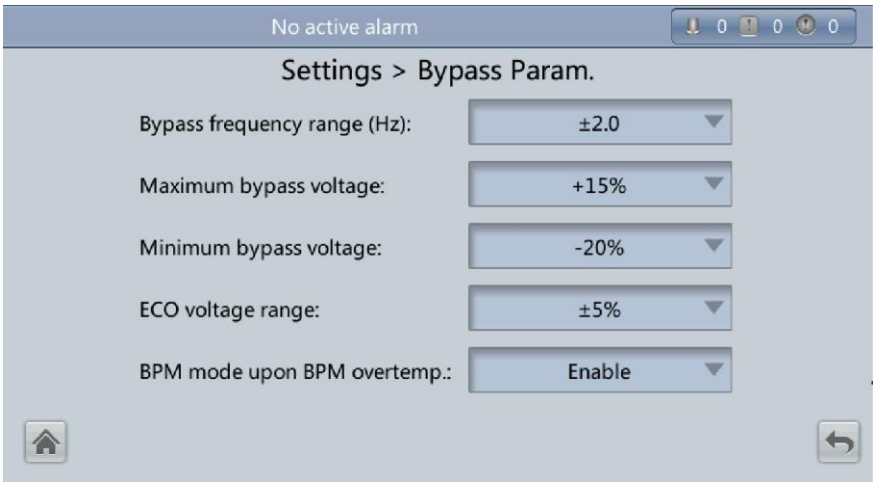
Max. BPM transfer times

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 ~ 10, 5 by default.

Bypass Parameter Settings

Set bypass parameters, such as the bypass voltage and frequency range, as shown in Figure 3-37.

Figure 3-37 Bypass Param.



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 valuerange is ±6 Hz, and the default value i s ±2 Hz.

Maximum 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 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 the bypass is unavailable. The value can be –10%, –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 ±5% (default), ±6%, ±7%, ±8%, ±9%, or ±10%.

BPM mode upon BPM overtemperature

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 damagebatteries. 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 volt. thresh.
- 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 (Charge/Discharge voltage – Average voltage)/Average voltage x 100%. Thecharge/discharge voltage and average voltage are obtained from the BMU. If the BMU isnot configured, you do not need to set these two parameters.

Set battery parameters, as shown in Figure 3-38 to Figure 3-42.

Figure 3-38 Battery Param. screen 1

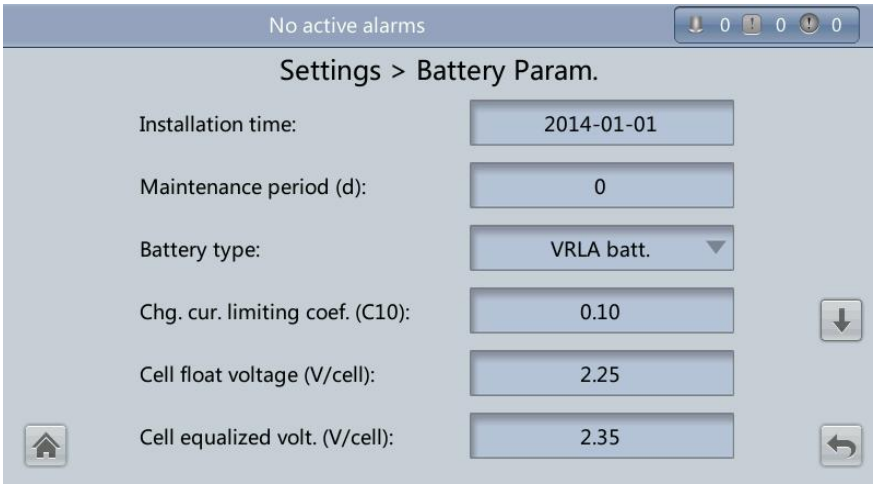


Figure 3-39 Battery Param. screen 2

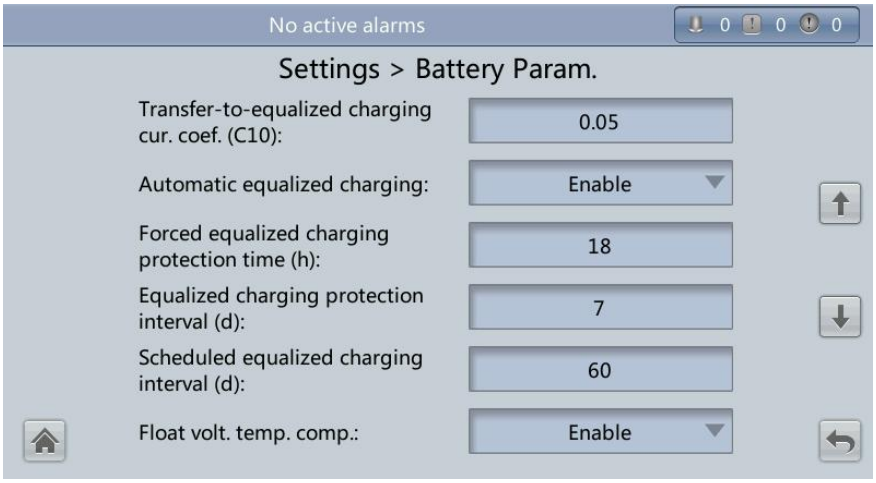


Figure 3-40 Battery Param. screen 3

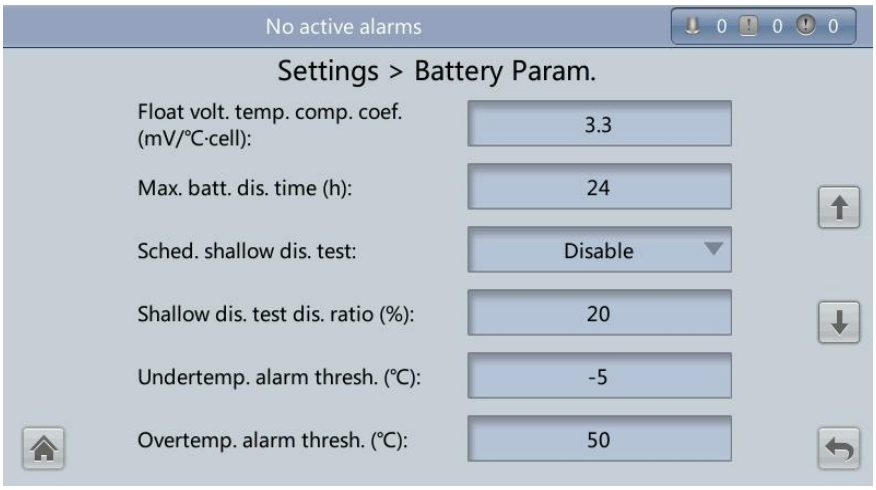


Figure 3-41 Battery Param. screen 4

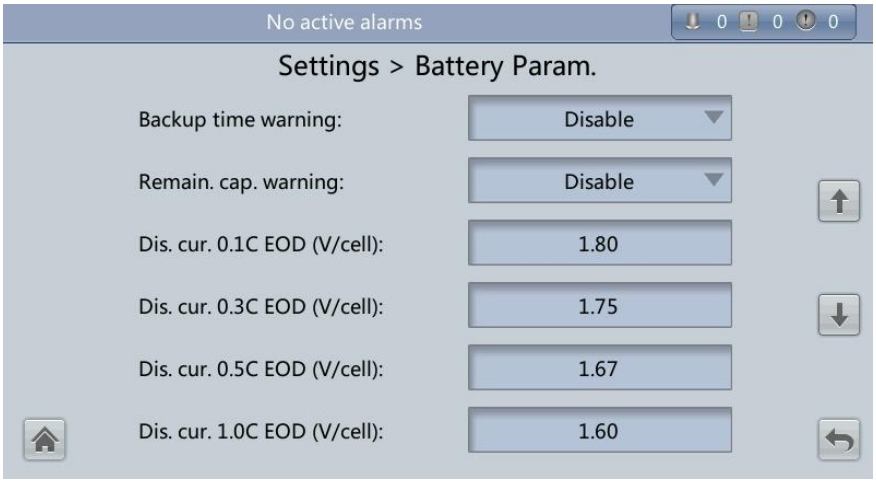
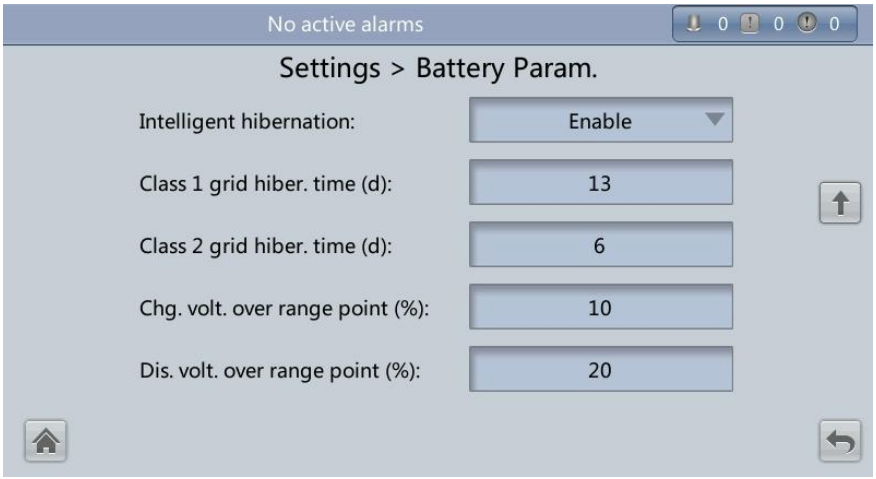


Figure 3-42 Battery Param. screen 5



Installation time

A battery maintenance reminder is displayed when the maintenance time (counted fromthe 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 ~ 0.15C10 optional, 0.1C10 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 charginginterval (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 Equalizedcharging 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/℃*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 toloads. The system records the battery discharge data as the reference for battery capacityand 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. (℃) and Overtemp.alarm thresh. (℃)

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℃) is generated.

Backup time warning and Remain.cap.warning

When the first two parameters are set to Enabled, 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 arenot 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 nohibernation.

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.

Monitoring interface card (MUS05A): provides four routes of configurable output dry contact signals.

Set the dry contact parameters, as shown in Figure 3-43 to Figure 3-46.

Figure 3-43 Dry Contacts screen 1

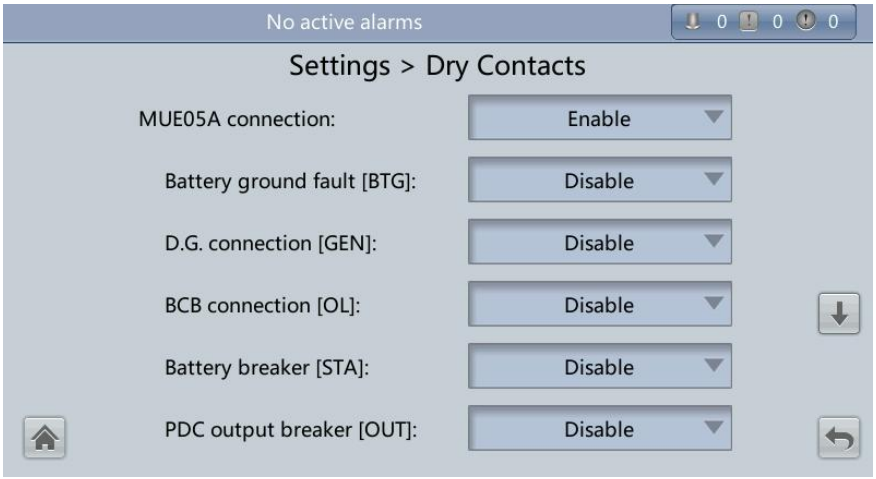


Figure 3-44 Contacts screen 2

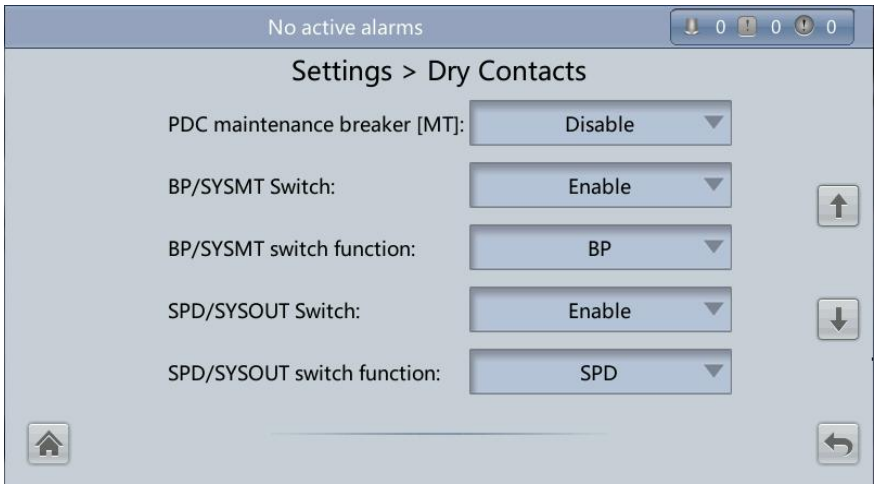
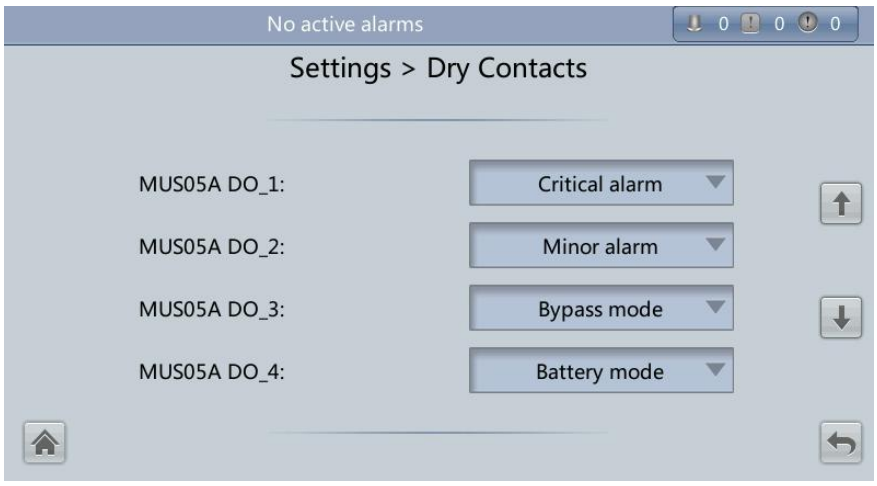


Figure 3-45 Dry Contacts screen 3

Figure 3-46 Dry Contacts screen 4



MUE05A connection

MUE05A connection status. Independent input signals can be enabled only when this parameter is set to Enabled.

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 Enabled, 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 Enabled, this parameter is displayed on the screen. A user can set this parameter to determine whether the port is used to detect the status ofthe PDU bypass input switch or system maintenance switch.

SPD/SYSOUT Switch

If the SPD/SYSOUT switch is set to Enabled, 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 Enabled, 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.

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.

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 3-47. You can perform Battery Maint., USB Operations, Inv.ON, Inv. OFF, ECM Switchover and Screen Calib on the Maintenance screen. You canalso perform Parallel Inv. ON and Parallel Inv. OFF for parallel systems, as shown in Figure 3-48.

Figure 3-47 Maintenance (single system)

Figure 3-48 Maintenance (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 3-49 shows the Battery Maint. screen.

Figure 3-49 Battery Maint.

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, Multi-brand and Serviceable data.

This screen allows you to load software online, upgrade software, and download system data, as shown in Figure 3-50 and Figure 3-51.

Figure 3-50 USB Operations screen 1

Figure 3-51 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 3-52 shows the Inv. ON screen, and Figure 3-53 shows the Inv. OFF screen.

Figure 3-52 Inv. ON

Figure 3-53 Inv. OFF

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.
- After an ECM is inserted, active and standby switchover is supported only after the ECM is configured and starts working properly (about 30 seconds).

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, asshown in Figure 3-54. After switchover, ensure that the ECM stops working (the yellow or redindicator is on, or the green indicator is blinking) before you maintain it.

Figure 3-54 ECM switchover

Screen Calib. Menu

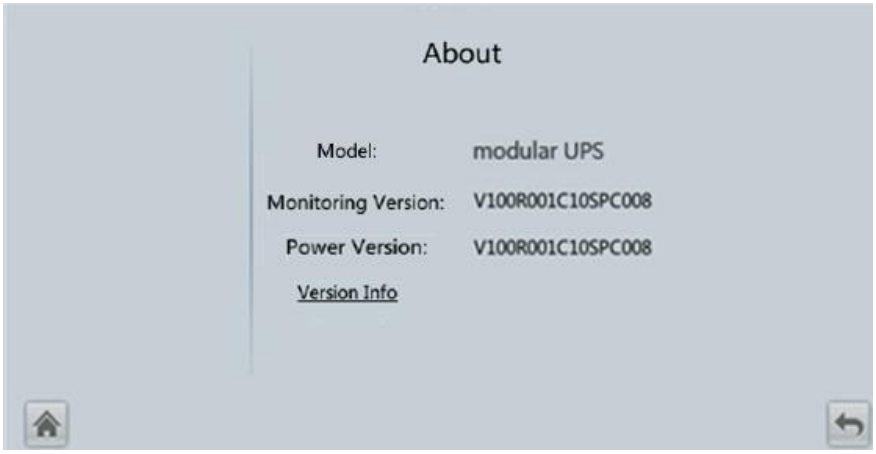
You can calibrate the screen, as shown in Figure 3-55.

Figure 3-55 Screen Calib.

About Screen

On the System Info screen, tap Abouton the About screen, you can view the UPS model, manufacturer, monitoring version, and power version, as shown in Figure 3-56. To view version details, tap Version Info.

Figure 3-56 About screen

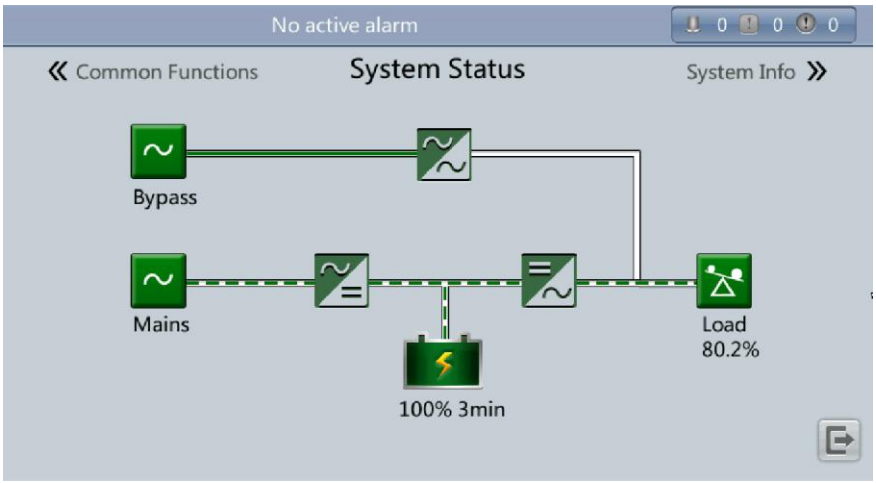


3.1.4 System Status Screen

On the main screen, select System Status, See Figure 3-57.

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

Figure 3-57 System Status



NOTE

For details about the menus on the System Status screen, see appendix A.1 Menus on the LCD.

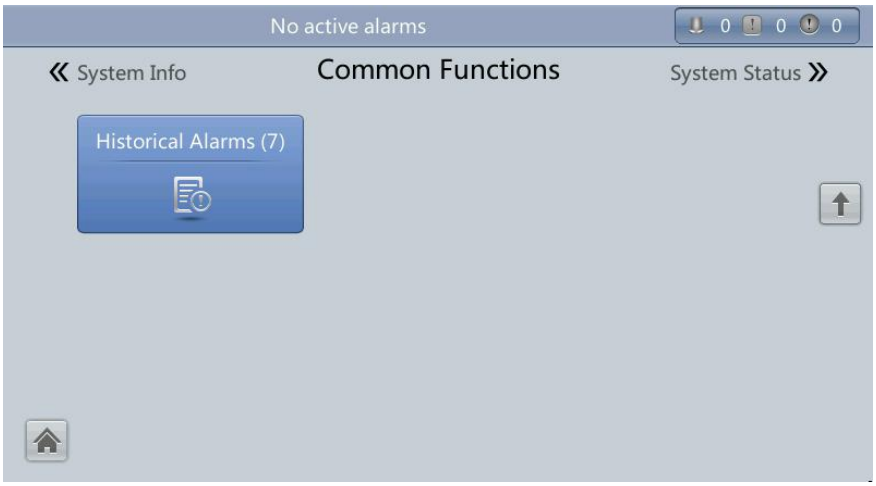
3.1.5 Common Functions Screen

On the main screen, choose Common Functions. The Common Functions screen is displayed, as shown in Figure 3-58 and Figure 3-59.

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 3-58 Common Functions screen 1

Figure 3-59 Common Functions screen 2



NOTE

For details about the menus on the Common Functions screen, see appendix A.1 Menus on the LCD.

3.2 WebUI

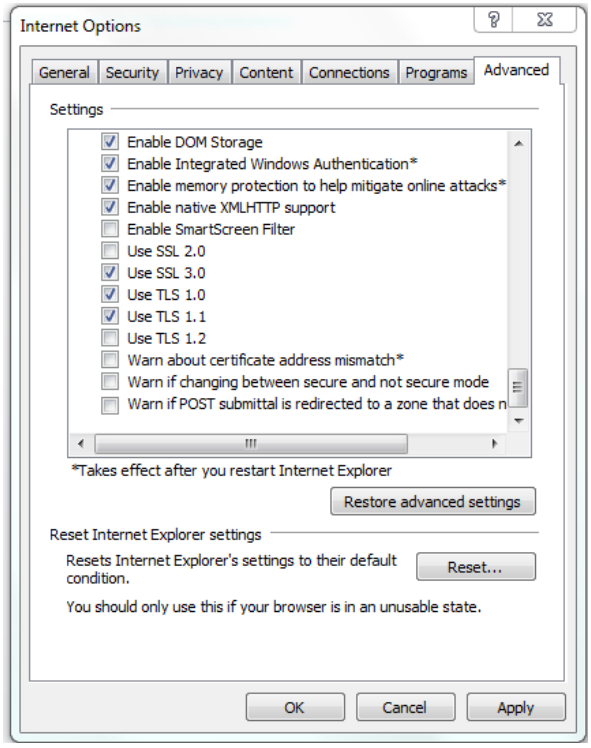
3.2.1 Login

Procedure

Step 1 Open the browser (Internet Explorer 10 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 3-60.

Figure 3-60 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 IE10, Firefox 31.0 and Google Chrome. Table 3-4 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 3-4 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, andbattery management), system configuration (network parameters, user management, timeand date, and site information), and system maintenance (upgrade, calibration, andvariables commissioning).
Operator (common user)	000001	Changeme	Only browses the system running information, exports system information (historical alarms, logs, e-labels, and faultdata), start/shut down the inverter, clear faults. Other parameter settings, control and maintenance functions that may affect the system operation are not visible.
Browser(browser)	000001	—	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 username.
- 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.

3.2.2 Monitoring Page

After you log in to the WebUI, the Monitoring page is displayed by default, as shown in Figure 3-61.

Figure 3-61 Monitoring page

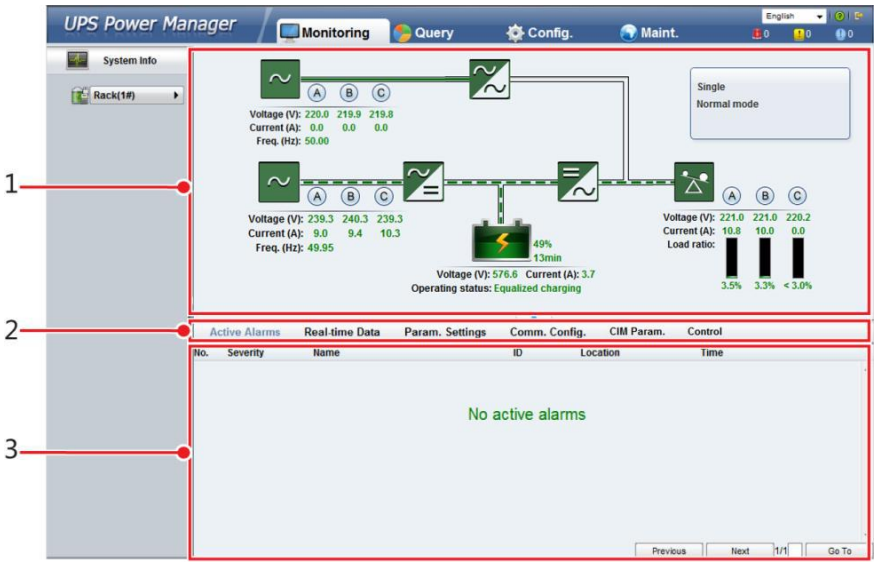


Table 3-5 Monitoring page details

Number	Area	Function
1	Running status area	Displays the power flow and UPS running information.
2	Menu bar	Displays active alarms, 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.

Active Alarms Page

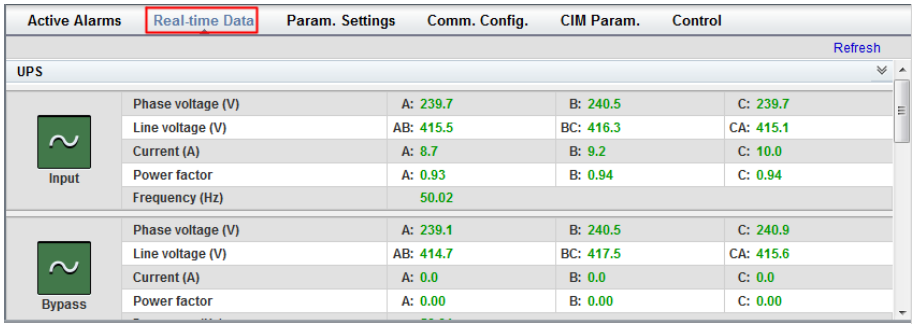
You can view active alarms on the Active Alarms page, as shown in Figure 3-62.

Figure 3-62 Active Alarms page

Real-time Data Page

You can view the real-time system running data on the Real-time Data page, as shown in Figure 3-63.

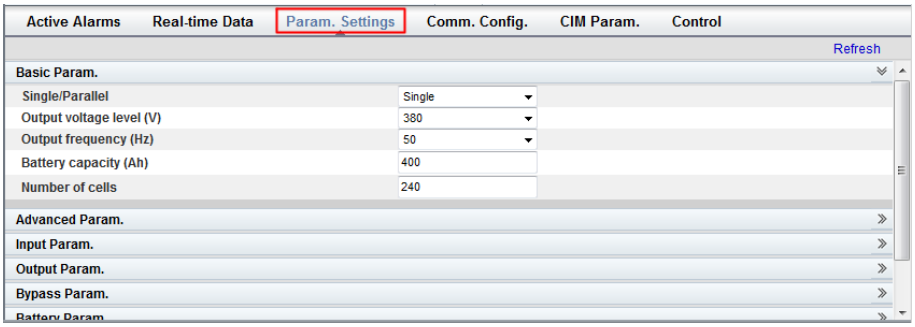
Figure 3-63 Real-time Data page



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 3.1.3 System Info Screen. See Figure 3-64.

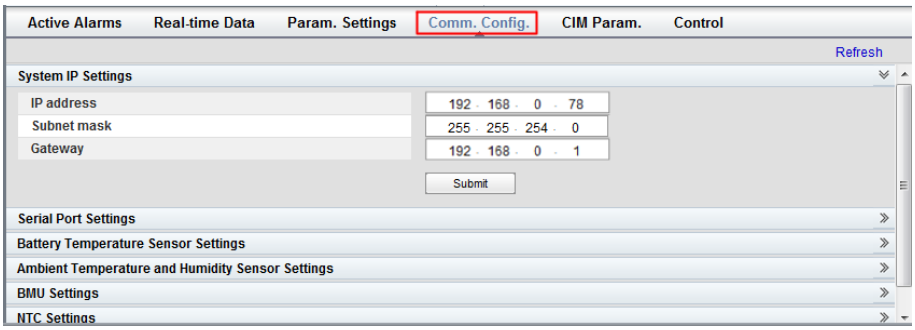
Figure 3-64 Param. Settings page



Comm. Config. Page

You can set communications information on the Comm. Config. page, the settings are the same as those on the LCD Monitoring Settings Screen (table 3-4). See Figure 3-65.

Figure 3-65 Comm. Config. page



Control Page

On the Control page, you can control the system, as shown in Figure 3-66. For parallel systems, you can also perform Parallel Inv. ON and Parallel Inv. OFF, as shown in Figure 3-67.

Figure 3-66 Control page (single system)

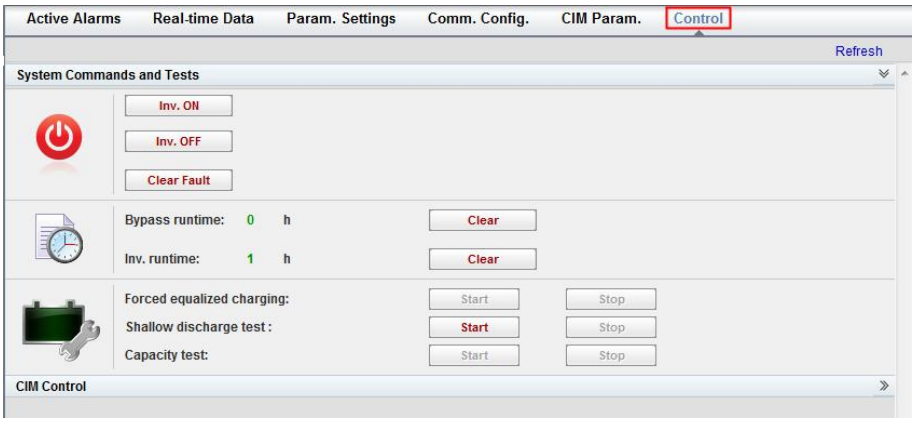
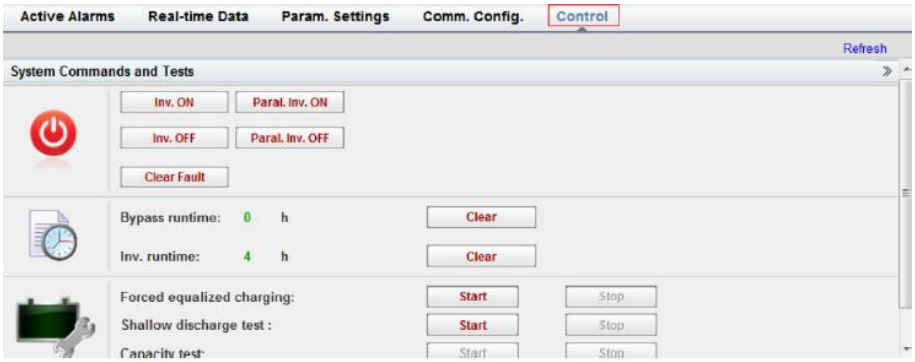


Figure 3-67 Control page (parallel system)



NOTE

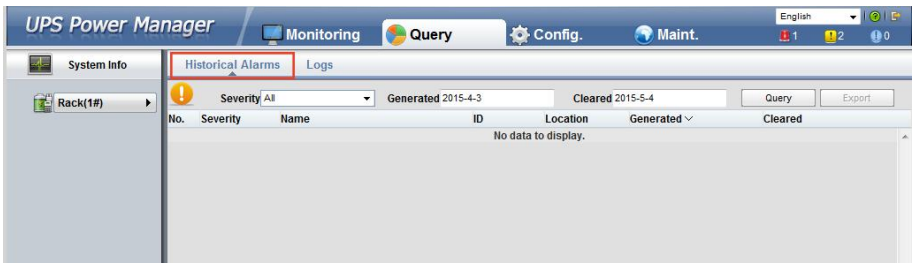
For details about the menus on the Monitoring page, see A.2 Menus on the WebUI.

3.2.3 Query Page

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 3-68.

Figure 3-68 Historical Alarms Page



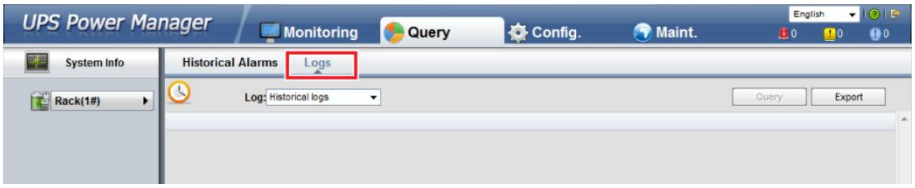
Logs Page

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 3-69.

NOTE

You can export historical logs but cannot query them.

Figure 3-69 Logs Page



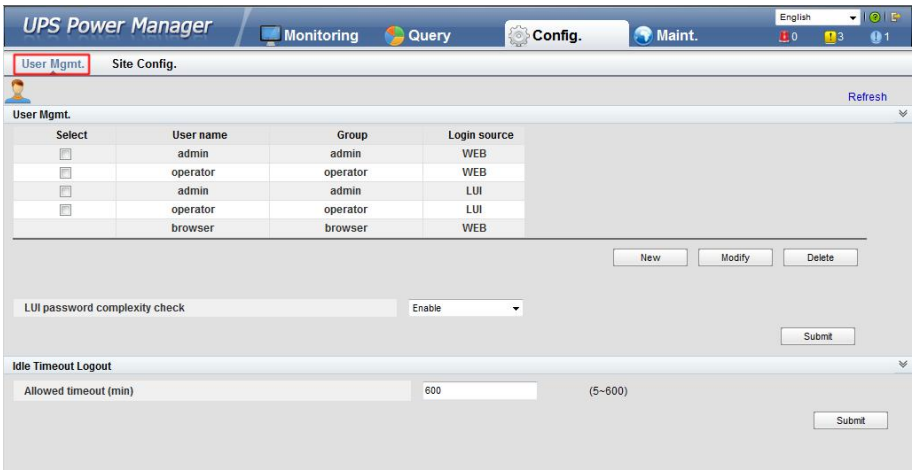
NOTE

For details about the menus on the Query page, see A.2 Menus on the WebUI.

3.2.4 Config. Page

On the homepage, click Config. On the Config. page, you can set the user and site information, as shown in Figure 3-70 and Figure 3-71.

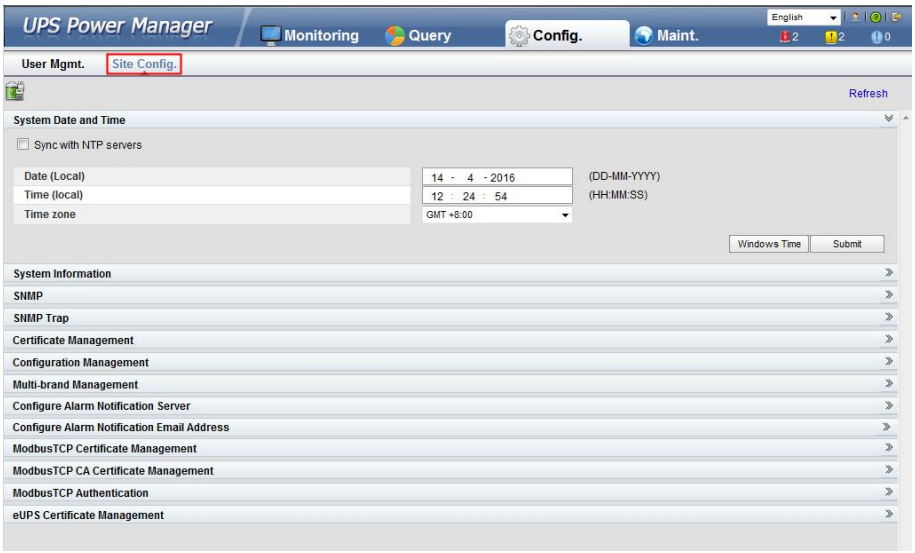
Figure 3-70 User Mgmt. page



NOTE

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

Figure 3-71 Site Config. page



3.2.5 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, power module, and ECM, as shown in Figure 3-72, Figure 3-73, Figure 3-74 and Figure 3-75.

Figure 3-72 Calib. page

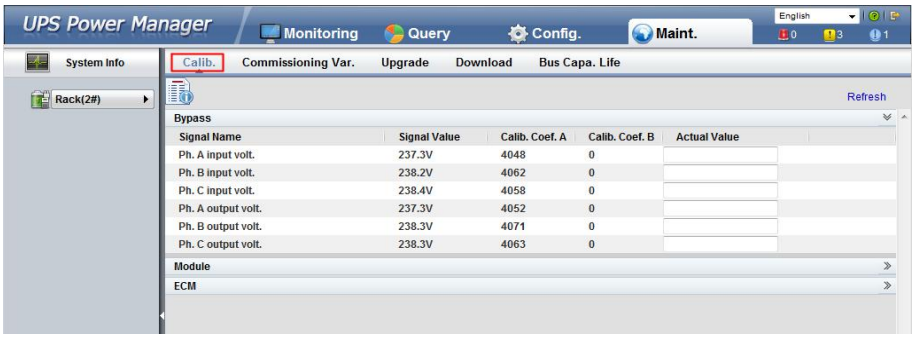


Figure 3-73 Commissioning Var. page

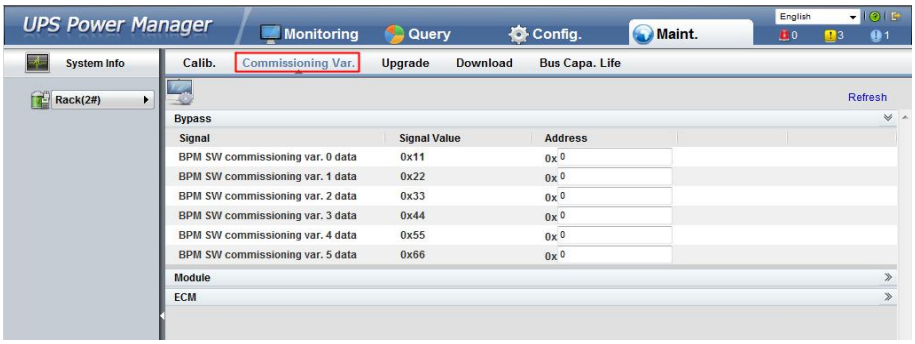


Figure 3-74 Upgrade page

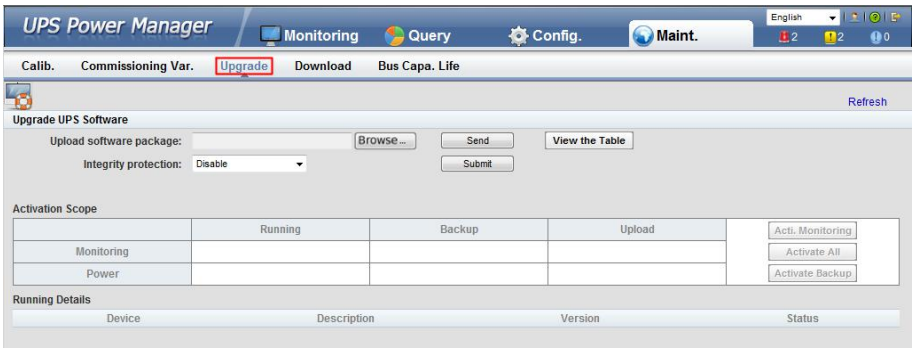
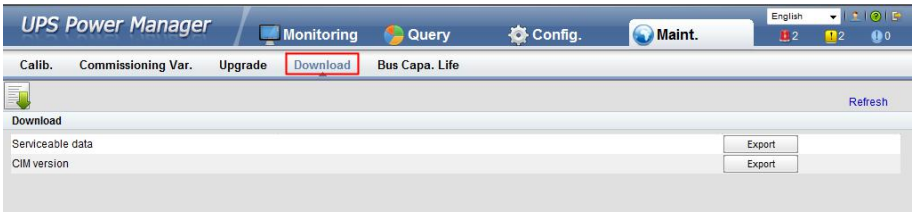


Figure 3-75 Download page



NOTE

For details about the menus on the Maint. page, see appendix A.2 Menus on the WebUI.

4 Operations

4.1 Single UPS Operations

4.1.1 Powering On the UPS

Prerequisites

NOTICE

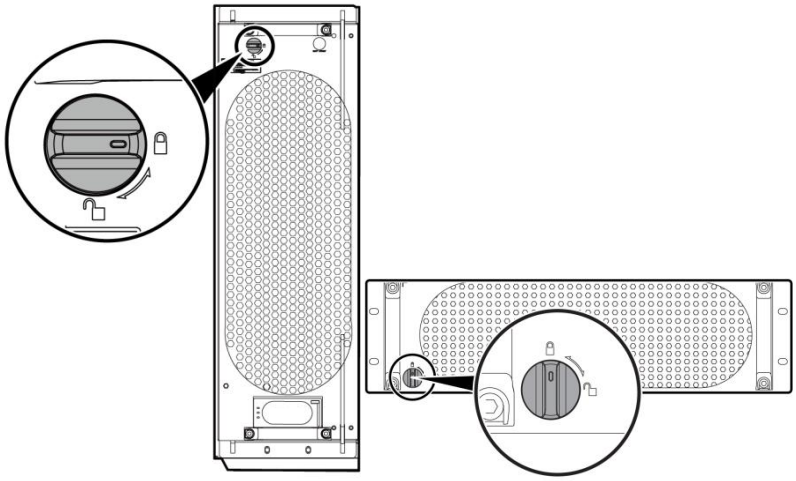
Measure the main and bypass input voltage and frequency of the UPS bypass cabinet or measure the voltage and frequency delivered by the external input power distribution cabinet to the UPS. The voltage range is 138 V AC ~ 485 V AC, and the frequency range is 40 ~ 70 Hz.

Context

NOTICE

- The following operations are specified for a single UPS. For parallel systems, contact the technical support.
- Before you power on the UPS, check that the UPS has passed all check items described inInstallation 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 4-1 shows the bypass module ready switch.)

Figure 4-1 Bypass unit ready switch



Procedures

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

For the 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:

- Turn on the external bypass and mains input switches.
- Turn on the internal bypass input switch.
- Turn on the internal output switch.
- Turn on the internal mains input switch.
- Close the external input surge protection circuit breaker (if any).

The UPS starts initialization. The LCD displays the initialization progress bar.

For the UPS in standard configuration (configured only with an internal maintenance bypass switch), perform the following operations:

- Turn on the external bypass and mains input switches.
- Close the external input surge protection circuit breaker (if any).
- The system is in mains power supply mode. The UPS starts initialization. The LCD displays the initialization progress bar.

NOTE

- For the UPS in full configuration, if you turn on the internal input switch prior to the internal output switch, the Zero Line Lose alarm may be generated. Before you turn on the mains input switch, the alarm is normal and does not need to be handled.
- 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.

(a) Various languages are available, such as Chinese and English. Press Down and Up to view the language types, as shown in Figure 4-2.

Figure 4-2 Language setting

(b) 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 4-3.

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 4-3 Date and time settings

(c) On the Network Param. screen, set IP address allocation, IP address, Subnet mask,and Gateway, as shown in Figure4-4.

Figure 4-4 Network Param. setting

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.

(d) On the System Param. screen, select Single (default value) or Parallel, as shown inFigure 4-5.

Set the voltage level, output frequency, battery capacity, and the number of batteries, as shown in Figure 4-6.

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.

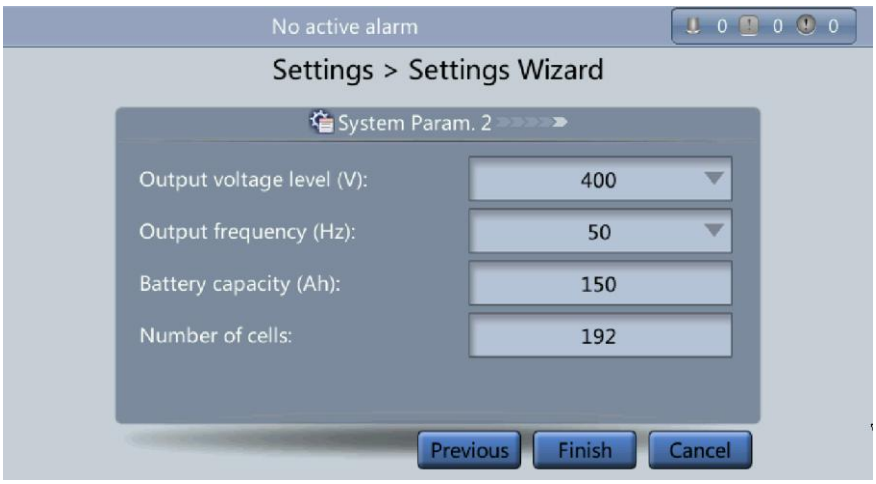
Figure 4-5 System Param. 1

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 the 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=216) and Battery capacity to 300 Ah (150 Ah + 150 Ah=300Ah). 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=192) and Battery capacity to 600 Ah (300 Ah + 300 Ah=600Ah). It affects the charge voltage and discharge time. An incorrect setting will cause a high or low charge voltage, which greatly shortensthe battery lifespan. In addition, the UPS may shut down before the batteries are fully discharged, which may lead to a data backup fault.

Figure 4-6 System Param. 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 > 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 4-7.

Figure 4-7 Login

NOTE

- Table 3-4 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 4-8.

Figure 4-8 Starting the inverter

NOTE

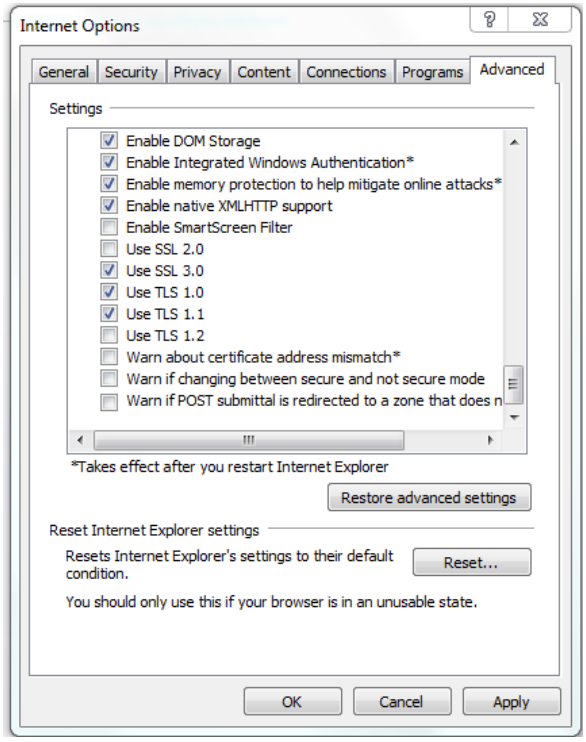
You can also tap System Info > Maintenance and start the inverter on the Maintenance screen.

Method for starting the inverter on the WebUI:

(a) Open the browser (Internet Explorer 10 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 4-9.

Figure 4-9 Options settings



(c) Enter https://UPS IP address in the address box of Internet Explorer.On the login page, select a display language, enter a user name and password, and click Login, as shown in Figure 4-10.

The UPS supports IE10, Firefox 31.0and Google Chrome.

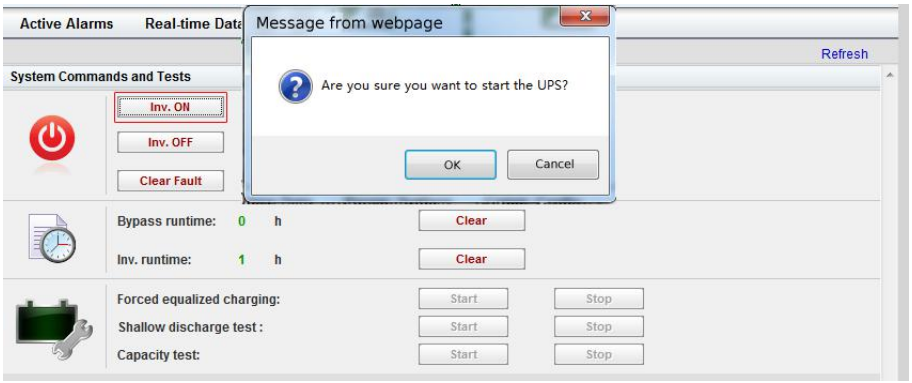
Figure 4-10 WEB Login

NOTE

- Table 3-4 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.

(d) 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 4-11.

Figure 4-11 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 occuron the module, or you perform shutdown or rectify faults) and the module can be started, the module responds to the startup command.

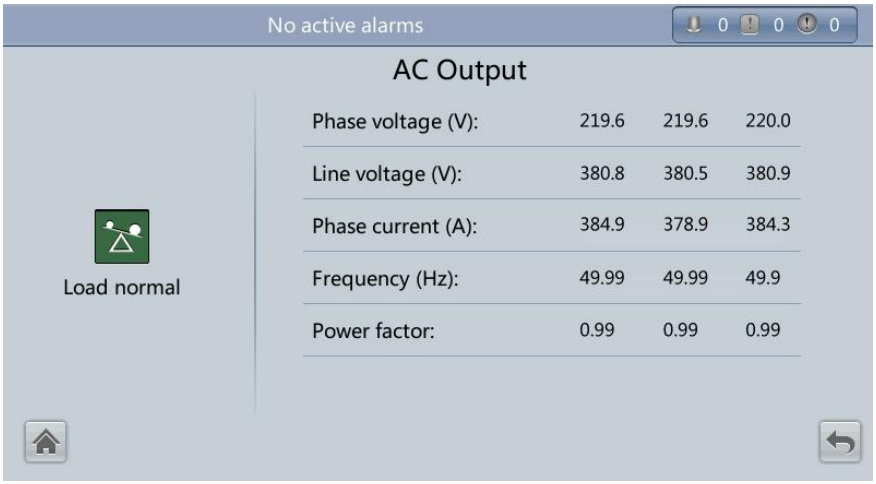
Step 6 Ensure that the UPS transfers to normal mode. View the system running diagram to check that the Bypass mode alarm disappears on the LCD. Check the UPS three-phase output voltage and frequency by viewing the AC output on the LCD, as shown in Figure 4-12 and Figure 4-13. Use a multimeter to measure the three-phase output voltage and frequency.

NOTE

The three-phase output voltage should be 220 V / 230 V / 240 V, and the frequency should be 50 Hz or60 Hz.

Figure 4-12 Common Functions

Figure 4-13 AC Output



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 avoltage 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. Verify that the sum of the absolute values of the voltages of the positive and negative battery strings is greater than a specified value (1.9 x number of cells) using a multimeter. If the sum is greater than the specified value, the battery strings are properly connected.

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 4-1 lists examples of setting battery parameters.

Table 4-1 Battery parameter settings

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

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).

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

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.

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 4.1.6 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.

4.1.2 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 3-4 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 4-14.

Figure 4-14 Inv. OFF

NOTE

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

Method for powering off the inverter on the WebUI

(a) In a web browser, enter the UPS IP address.

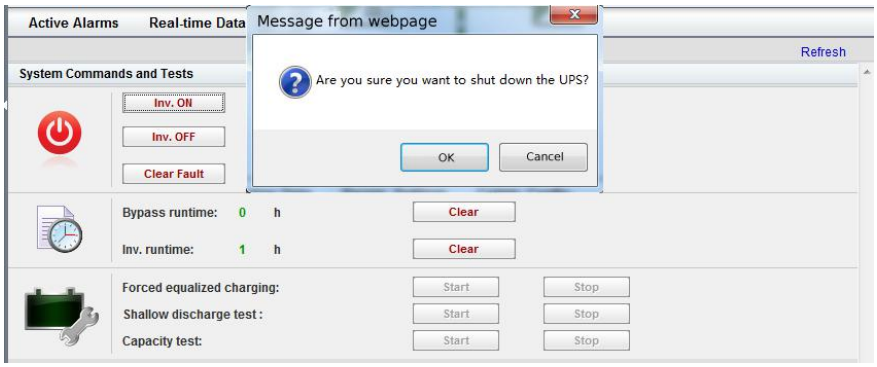
(b)On the login page, select a display language; enter a user name and password, and click Login.

NOTE

- Table 3-4 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.

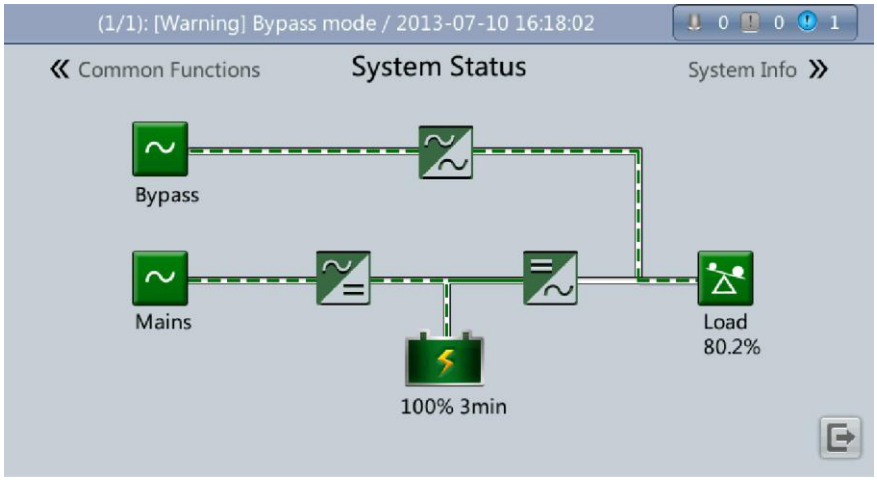
(c) On the homepage, choose Monitoring > Control, and click Inv. OFF. In the displayed dialog box, click OK to shut down the inverter, as shown in Figure 4-15.

Figure 4-15 Shutting down the inverter



Step 2 After the inverter is 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 4-16 and Figure 4-17.

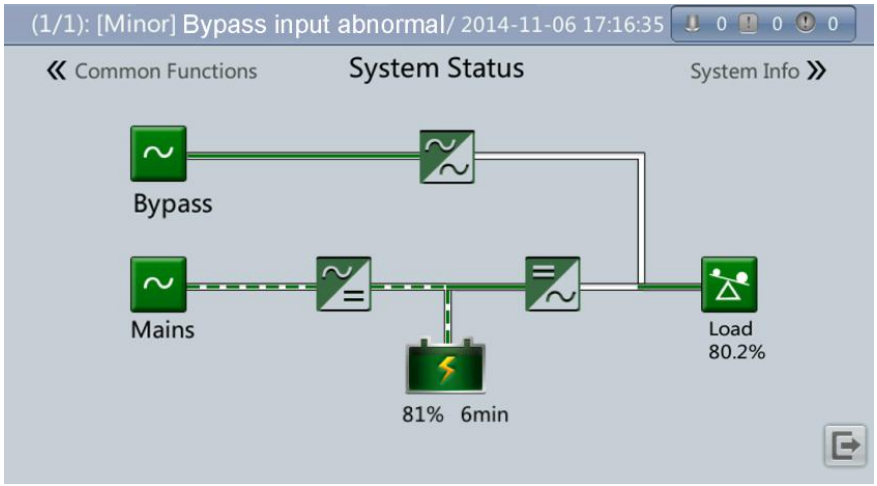
Figure 4-16 Normal bypass



NOTE

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

Figure 4-17 Abnormal bypass



Step 3 After the inverter shuts down, turn off the external output switch.

Step 4 Turn off the battery circuit breaker. If there are multiple battery strings, turn off the general circuit breaker between battery strings and the UPS and then the circuit breaker for each battery string.

Step 5 Turn 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.

Turn 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.
- For the UPS in full configuration, if you turn off the internal output switch prior to the internal input switch, the Zero Line Lose alarm may be generated. The alarm is normal and does not need to be handled.

4.1.3 Starting the UPS in Battery Mode

Procedure

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

Procedure

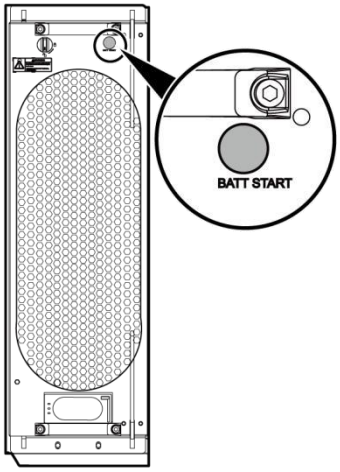
Step 1 Ensure that batteries are properly connected. Use a multimeter to check that the absolute battery string voltage is greater than a specified value (1.9 x 6 x Number of batteries).

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 absolute battery string voltage is greater than a certain value (1.9 x 6 x Number of batteries), the batteries are connected properly.

Step 4 Press the battery cold-start button on the bypass module, as shown in Figure 4-18. The system enters the battery cold-start status. The LCD displaysan initialization progress bar.

Figure 4-18 Battery cold-start button (500 kVA UPS)



Step 5 After LCD initialization, start the inverter by following Step 4 to Step 5 in 4.1.1 Powering On the UPS.

4.1.4 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 4.1.2 Powering Off the UPS to shut down theinverter 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.

4.1.5 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 UPSs switch 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.

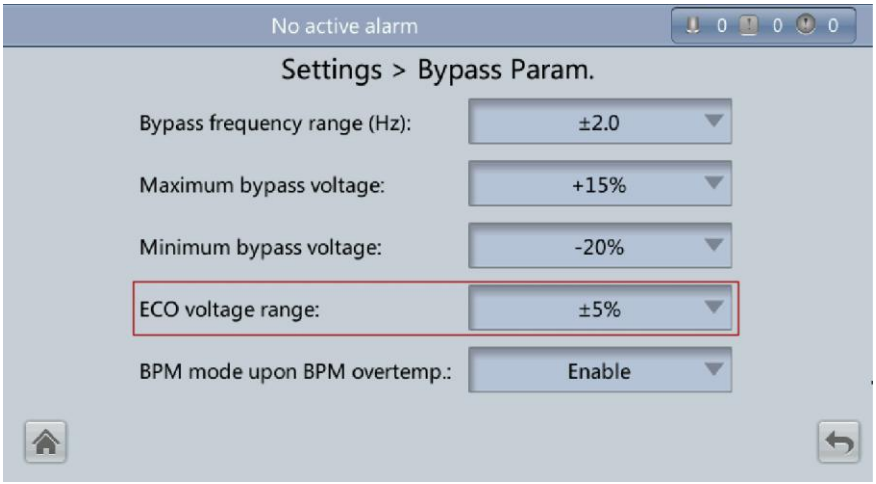
ECO mode is not recommended when the load is less than 10%.

Before transferring the UPS to ECO mode, ensure that the bypass module works properly.

Procedure

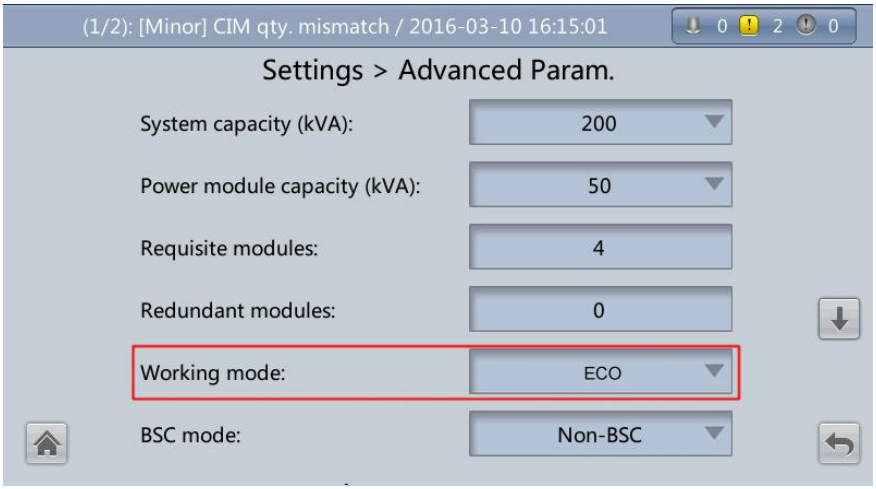
Step 1 Manually shut down the inverter to transfer the UPS to bypass mode. For details, see Step 1 in 4.1.2 Shutting Down and Powering Off the UPS. Select a value (±5%, ±6%, ±7%, ±8%, ±9%, or ±10%) from the ECO voltage rangedrop-down list box, as shown in Figure 4-19.

Figure 4-19 Setting ECO voltage range



Step 2 Set Working mode to ECO, as shown in Figure 4-20. Information indicating that the UPS works in ECO mode is displayed on the LCD.

Figure 4-20 ECO mode

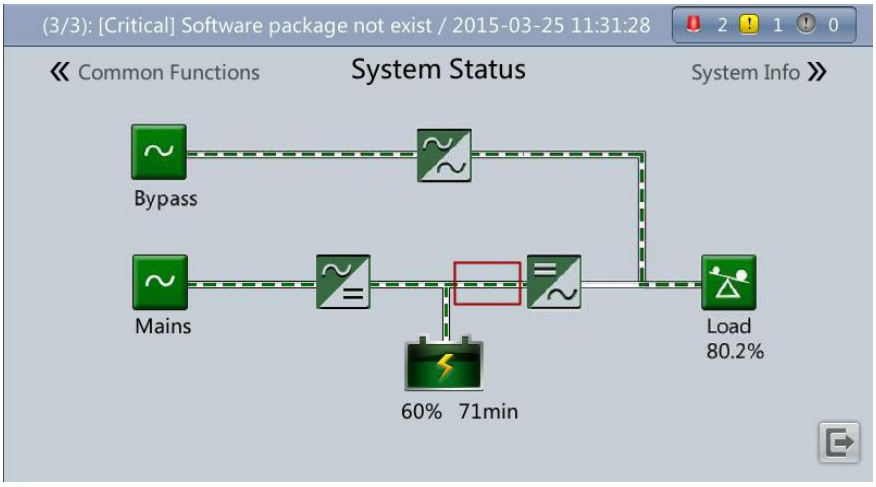


Step 3 Manually start the inverter.

NOTICE

After the inverter starts, the UPS still works in bypass mode and the inverter is standby. Figure 4-21 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 maybe disconnected.

Figure 4-21 System Status



4.1.6 Testing Batteries

Forced equalized Charging Test

Context

NOTICE

Before a forced equalized charge test, ensure that:

- The mains input 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.

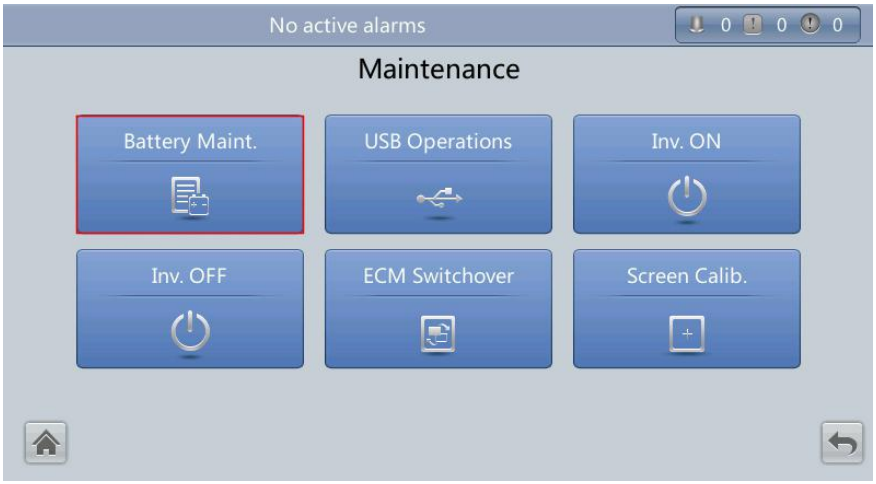
Step 2 If you have not logged in, enter a user name and a password, and then tap .

NOTE

- Table 3-4 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.

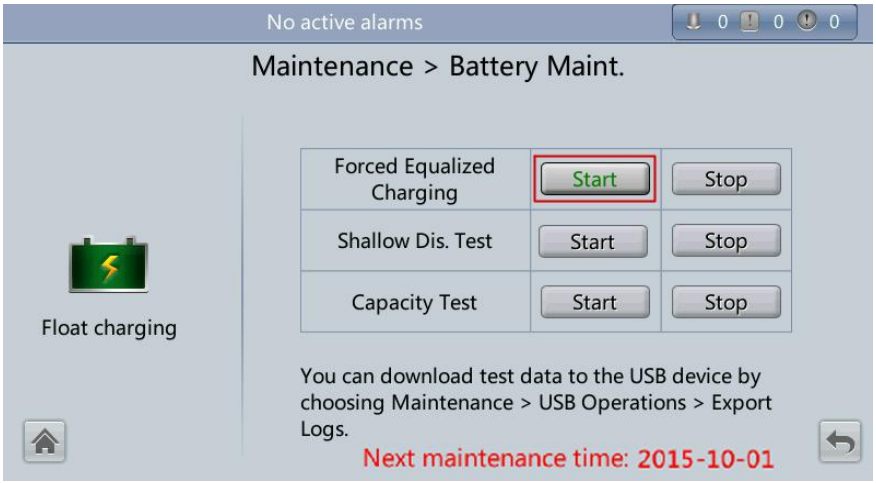
Step 3 On the Maintenance screen, tap Battery Maint., as shown in Figure 4-22.

Figure 4-22 Battery Maint.



Step 4 Tap Start for Forced Equalized Charging to start the forced equalized charging test, as shown in Figure 4-23.

Figure 4-23 Startingthe 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.

Shallow Discharge Test

Context

NOTICE

Before a shallow discharge test, ensure that:

- The UPS works in normal mode at a stable load rate with a 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 If you have not logged in, enter a user name and a password, and then tap .

NOTE

- Table 3-4 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 Tap Start on the right of Shallow Dis. Test to start the shallow discharge test, as shown in Figure 4-24.

Figure 4-24 Startingthe 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.

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%; the load rate is stable, and the load change rate is 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.

Procedures

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

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

NOTE

- Table 3-4 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 4-22.

Step 4 Tap Start on the right of Capacity Test to start the capacity test, as shown in Figure 4-25.

Figure 4-25 Startingthe capacity test

NOTE

The capacity test stops in any of the following cases:

- The battery discharge voltage reaches the end of discharge EOD + 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.

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 If you have not logged in, enter a user name and a password, and then tap  .

NOTE

- Table 3-4 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 4-26.

Figure 4-26 Download logs

Step 5 Tap Next in the displayed dialog box, tap Yes to download data, as shown in Figure 4-27.

Figure 4-27 Confirm download path

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 drop-down list, and click Export to export logs, as shown in Figure 4-28 and Figure 4-29.

Figure 4-28 Capacity test logs

Figure 4-29 Common test logs

4.1.7 Transferring to Maintenance Bypass Mode

Context

NOTICE

- You are advised to install a lock on the maintenance bypass switch. The lock core has adiameter 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 4.1.4 Transferring to Bypass Mode.

Step 2 Turn on the maintenance bypass switch.

If the maintenance bypass switch is locked, unlock it first. Figure 4-30 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. Toturn on the maintenance bypass switch, rotate it to the ON position, as shown in Figure 4-31. The Maint. breaker closed alarm is displayed in the alarm list, as shown in Figure 4-32. The UPS transfers to maintenance bypass mode.

Figure 4-30 Lock maintenance bypass switch

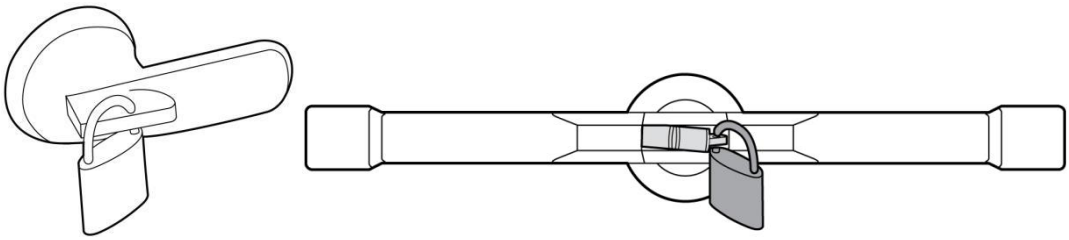
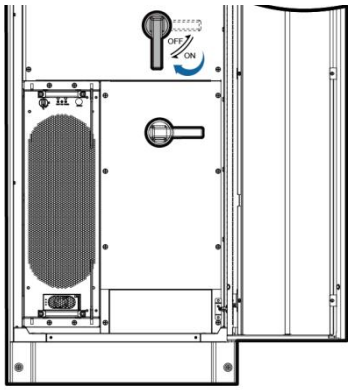


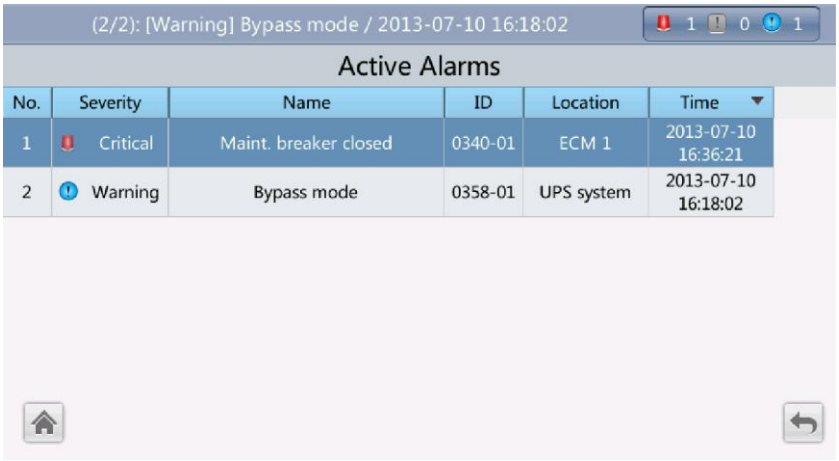
Figure 4-31 Close the maintenance bypass switch (500 kVA UPS in full configuration)



NOTE

- Take the 500 kVA UPS in full configuration as an example.
- Exercise force when turning on or off the bypass maintenance switch.

Figure 4-32 Maint. breaker close alarm



NOTE

After the UPS transfers to maintenance bypass mode, the Maint. breaker closed and Bypass modealarms are displayed on the MDU.

4.1.8 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.

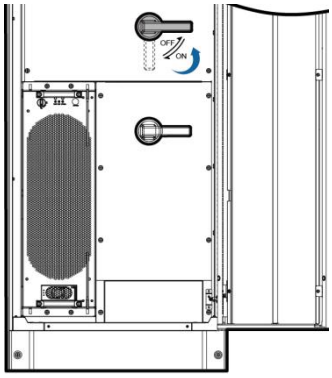
Procedure

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 4-33 (take 500 kVA UPS as an example).

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 4-33 Disconnect the maintenance bypass switch (500 kVA UPS in full configuration)



NOTE

Take the 500 kVA UPS in full configuration as an example.

Step 2 Start the inverters. For details, see Step 4 to Step 5 in 4.1.1 Powering On the UPS.

4.1.9 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 4-34. The UPS transfers to the EPO state. An alarm is generated on the MDU and WebUI, as shown in Figure 4-35 and Figure 4-36.

Figure 4-34 EPO ports

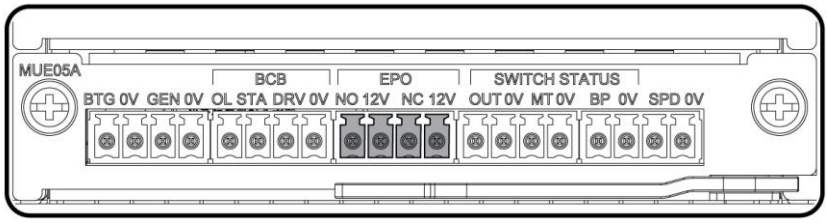


Figure 4-35 Alarms on the MDU

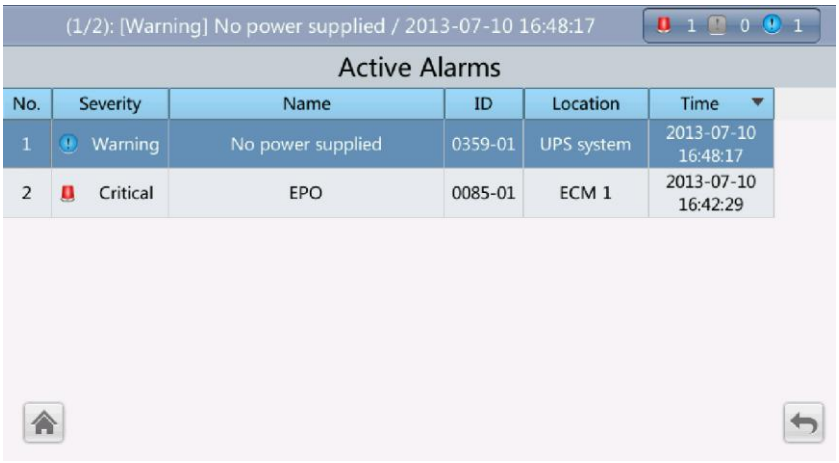
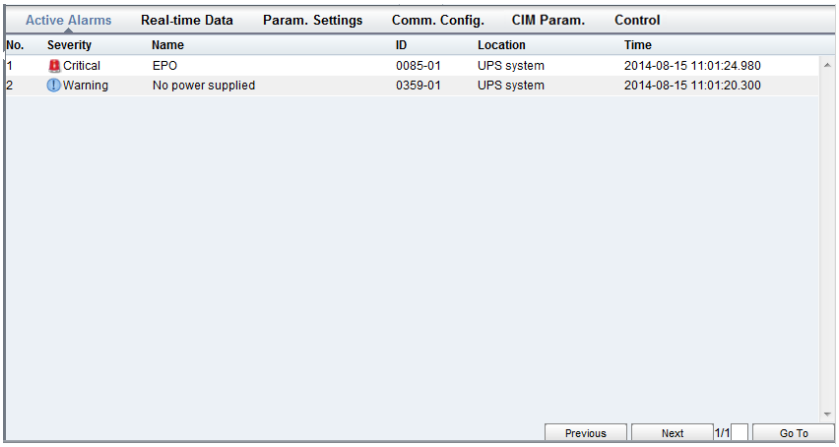


Figure 4-36 EPO alarm on the WebUI



NOTE

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

4.1.10 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 Yesto clear the EPO alarm, as shown in Figure 4-37 and Figure 4-38.

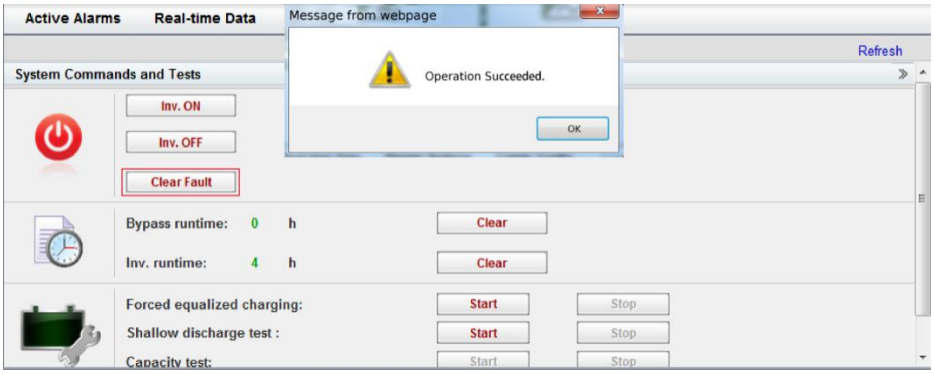
Figure 4-37 Alarms

Figure 4-38 Clear Faults

WebUI

In a web browser, enter the 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 4-39.

Figure 4-39 Clear fault

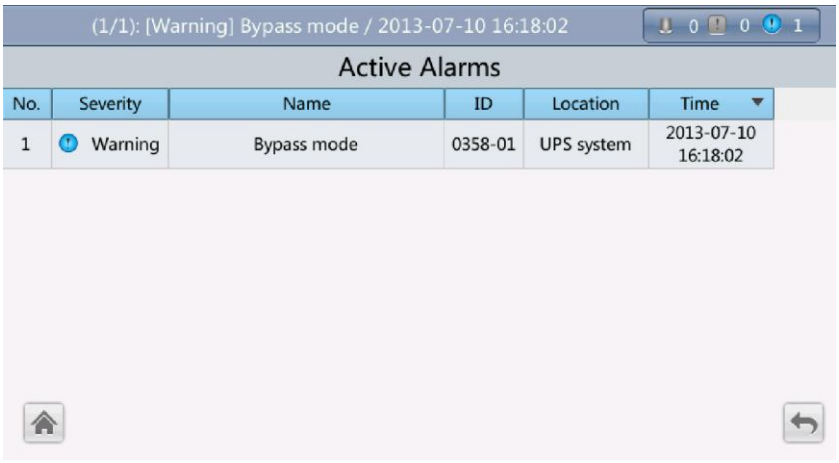


Step 3 View active alarms and ensure that the EPO alarm is cleared. If the input of the system bypassis normal, the UPS transfers to the bypass mode.

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 4-40.

Figure 4-40 Active Alarms

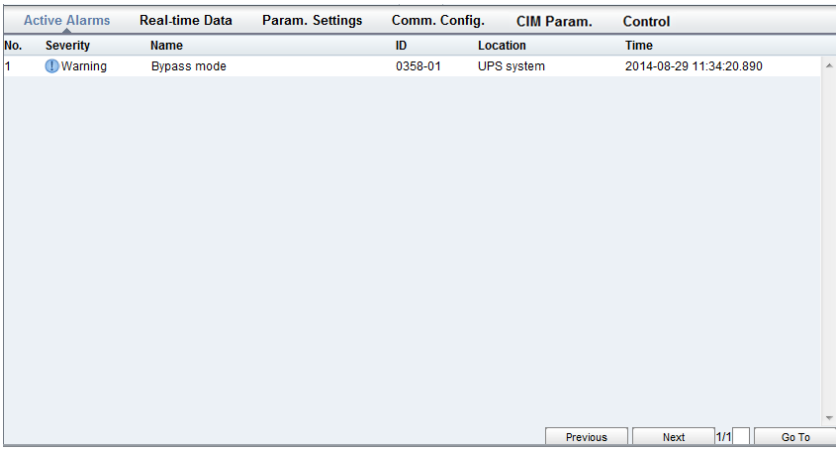


WebUI

In a web browser, enter the 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 4-41.

Figure 4-41 Active Alarms



Step 4 Start the inverter by following Step 4 to Step 5 in section 4.1.1 Powering On and Starting the UPS.

4.1.11 Setting Hibernation Mode

Context

When the load power is small and stable, the inverters in some power modules shut down sothat 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.
- Before you start hibernation mode, check the number of redundant power modules and the number of redundant UPSs. If the number is insufficient, the UPS may not enter hibernation mode.

Set hibernation mode on the LCD or WebUI as follows:

LCD

Procedure

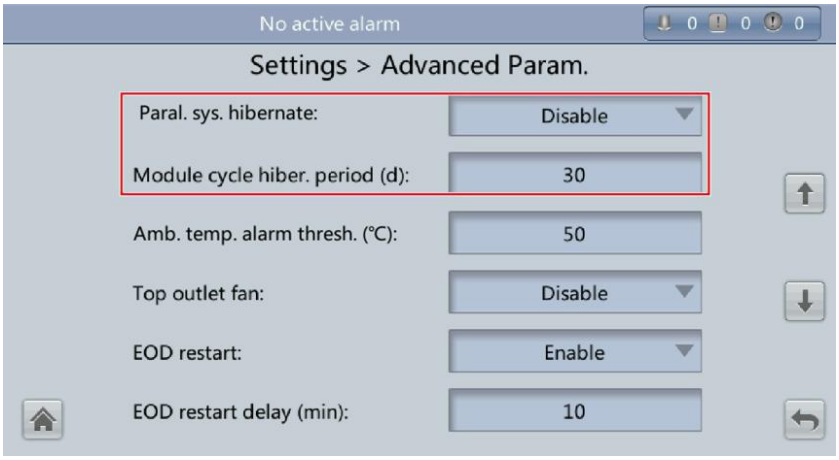
Step 1 On the main screen, tap System Info and . The Settings screen is displayed.

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 4-42.

Figure 4-42 Advancedparam.



Step 3 On the LCD, set Para. sys. hibernate to Enabled. A confirmation message and security warning are displayed, as shown in Figure 4-43 and Figure 4-44.

Figure 4-43 Confirmation message

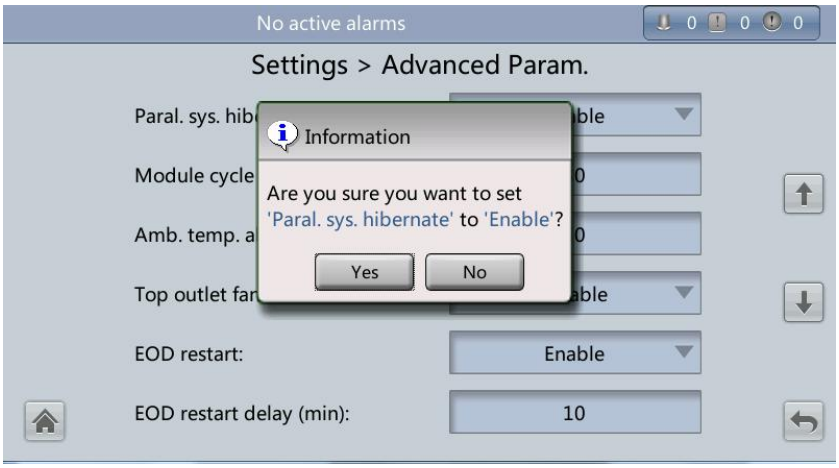
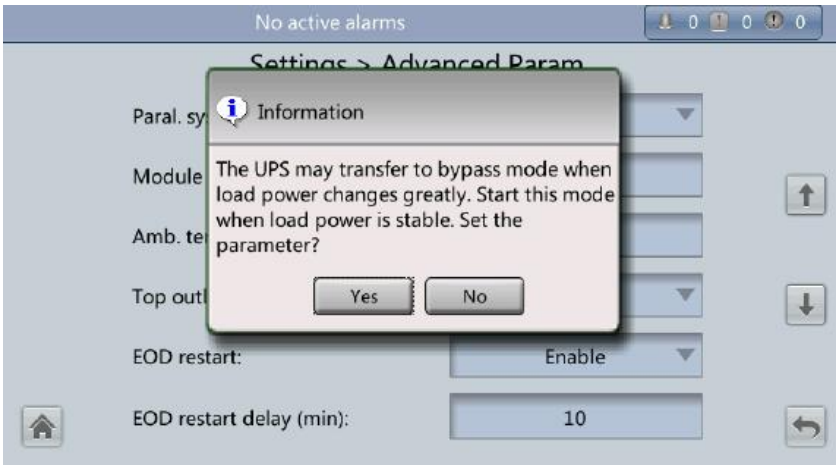


Figure 4-44 Security message



Step 4 Check that the load power is stable (overload due to transient surge may cause the UPS totransfer to bypass mode), and click Yes.

Step 5 Set the Module cycle hiber. period (days) parameter to an integer ranging from 0 ~ 100.The default value is 30. If the value is 0, the hibernation period is 2 minutes. That is, the module starts automatically after 2 minutes hibernation.

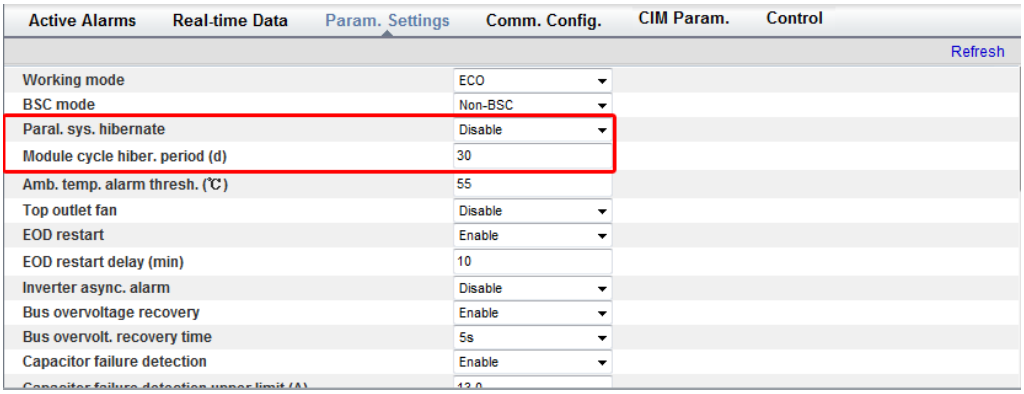
WebUI

Procedure

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

Step 2 Choose Monitoring >Param. Settings > Advanced Param., as shown in Figure 4-45.

Figure 4-45 Hibernation parameters on the WebUI



Step 3 On the WebUI, set Para. sys. hibernate to Enable, and click Submit. A security waning is displayed, and click OK.

Step 4 Set the Module cycle hiber. period (days) parameter to an integer ranging from 0 to 100.The default value is 30. If the value is 0, the hibernation period is 2 minutes. That is, the module starts automatically after 2 minutes hibernation.

NOTE

Click Submit after you set the parameter on the WebUI.

4.1.12 Setting Intelligent Mode

Context

NOTICE

Before connecting 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 main outage occurs and the battery voltage reaches the specified threshold. To set intelligent mode on the LCD or WebUI, perform the following steps:

LCD

Procedure

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

NOTE

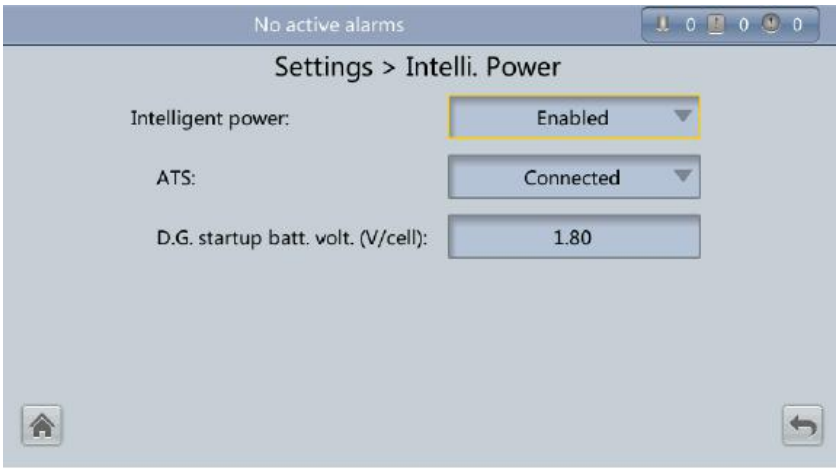
If you have not logged in, enter a user name and password, and tap on the login screen displayed.

Step 2 On the Settings screen, tap Intelli. Power. The Intelli. Power screen is displayed, as shownin Figure 4-46.

Figure 4-46 Intelli. Power

Step 3 Set Intelligent power to Enabled. In the warning dialog box, tap Yes. The intelligent power parameters are displayed, as shown in Figure 4-47.

Figure 4-47 Intelligent power parameters



- Intelligent Power Supply parameter: The value can be Enabled or Disabled. The default value is Disabled.
- ATS parameter: 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, theUPS works in the reuse scenario. The default value is Connected. This parameter isavailable only after you set Intelligent Power Supply to Enabled.

- D.G. startup batt. volt. (V/cell) parameter: The value ranges from 1.80V/cell~ 2.00 V/cell. The default value is 1.80 V/cell. This parameter is available only after you set Intelligent Power Supply to Enabled.

NOTE

Set the preceding three parameters when you connect the D.G. to the UPS.

Step 4 After you set Intelligent Power Supply to Enabled, the system changes some parameter values associated with intelligent power supply. Figure 4-48~ Figure 4-53 show the changed parameter values on the LCD.

Figure 4-48 Associated intelligent power supply parameters on the LCD 1

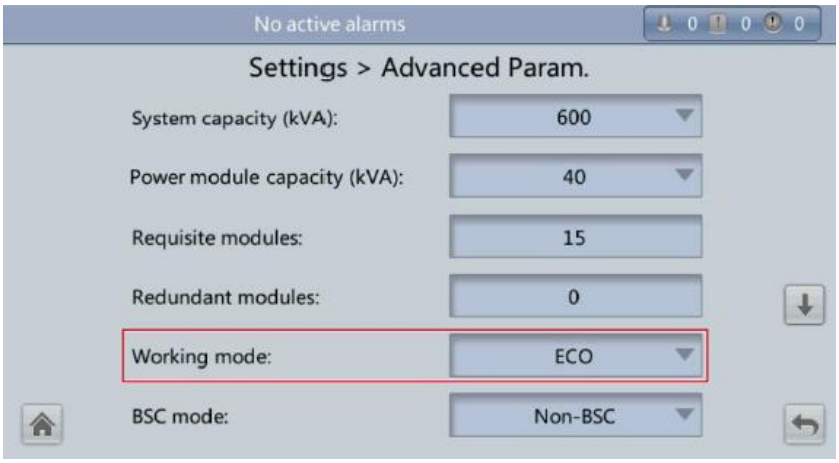


Figure 4-49 Associated intelligent power supply parameters on the LCD 2

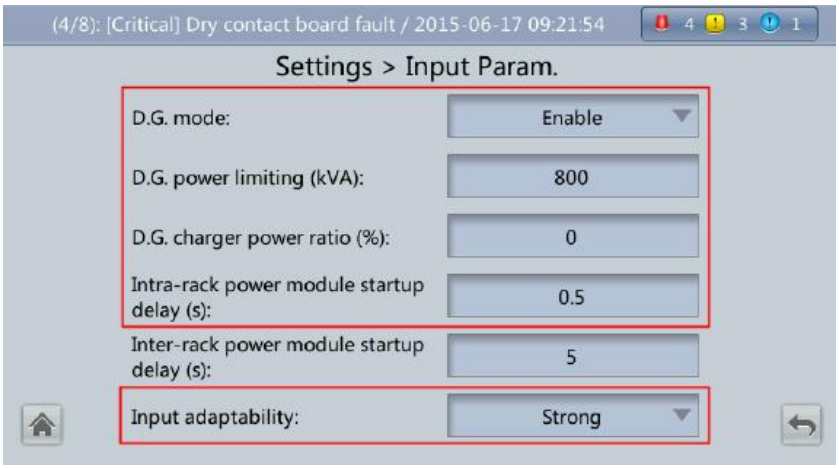


Figure 4-50 Associated intelligent power supply parameters on the LCD 3

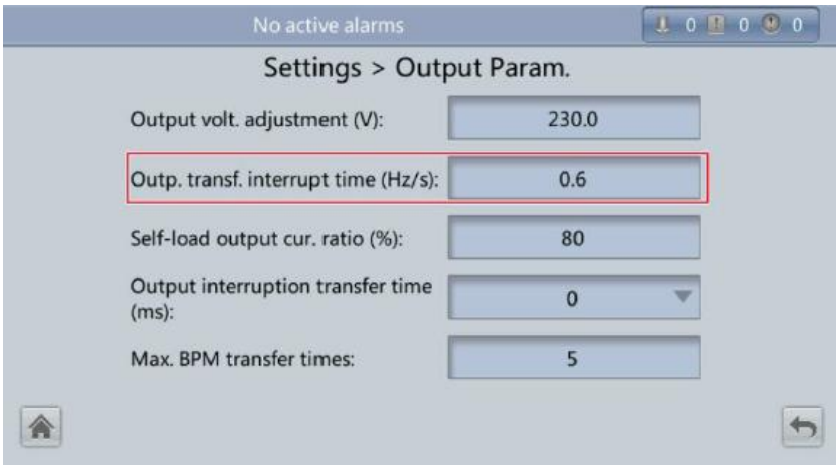


Figure 4-51 Associated intelligent power supply parameters on the LCD 4

Figure 4-52 Associated intelligent power supply parameters on the LCD 5

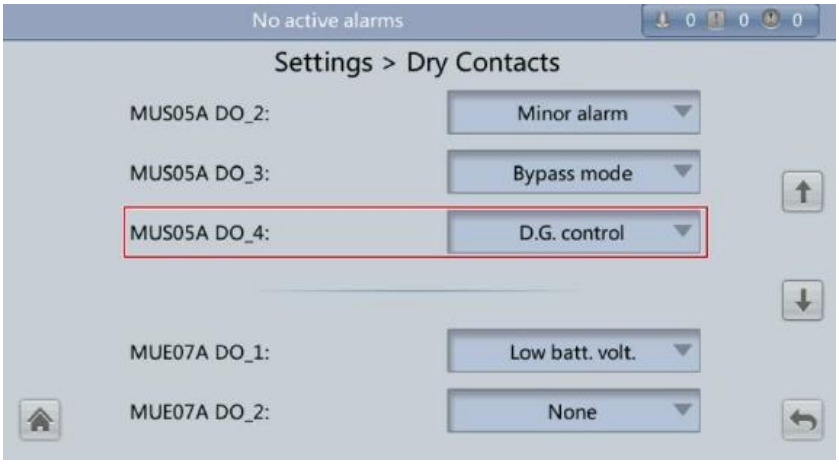


Figure 4-53 Associated intelligent power supply parameters on the LCD 6

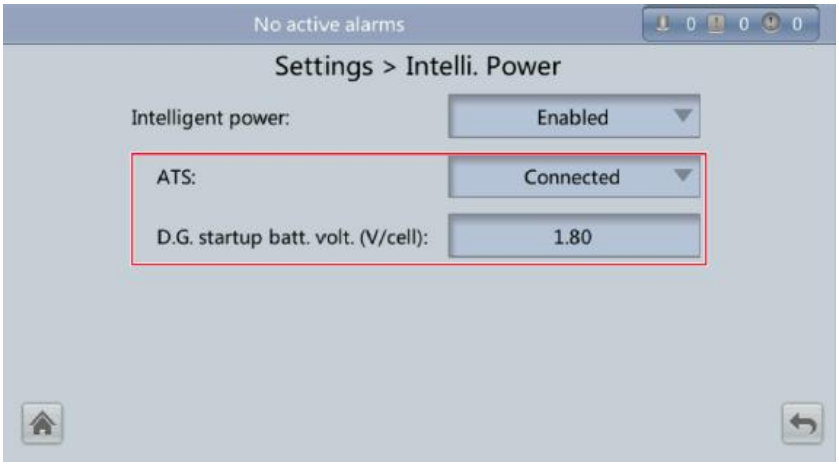


Table 4-2 lists the associated intelligent power supply parameters.

Table 4-2 Associated intelligent power supply parameters

Parameter	Value	Remarks
Working mode	ECO	-
D.G. mode	Enabled	You cannot change the value.
Intra-rack power unitstart delay (s)	5s	-
Input adaptability	Strong	-
Output freq. track rate(Hz/s)	0.6Hz/s	-
D.G. connection [GEN]	Enabled	-
MUS05A DO_4	D.G. control	-
ATS	Connected	-
D.G. connection [GEN]	1.80V/cell	-
D.G. power limiting(kVA)	-	Indicates the actual D.G.power. Set it as required.
D.G. charger power ratio	-	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 mode and triggers D.G. shutdown signals. If the battery voltage is less than D.G. startup batt. volt., a dialogbox is displayed, indicating potential risks. Tap OK to exit intelligent mode.
- To disable the D.G. from the UPS system, set Intelligent Power Supply to Disabled.

The system changes Working mode to Normal mode, Intra-rack power unit start delay (s) to 5, Output freq. track rate (Hz/s) to 0.6, Input adaptability to Weak, D.G. mode to Disabled, and D.G.connection [GEN] to Disabled. You can change the values.

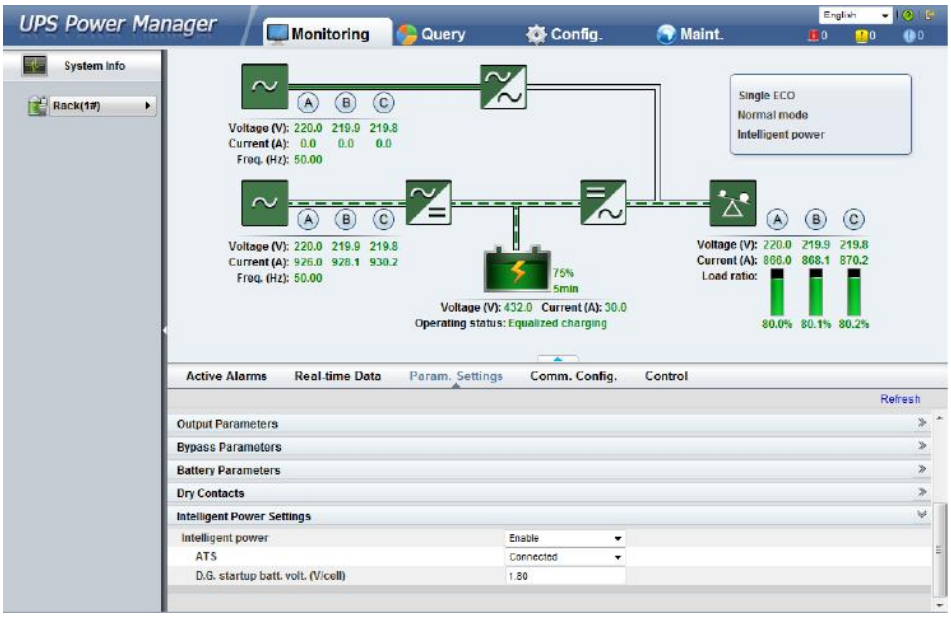
WebUI

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 Settings to Enabled, as shown in Figure 4-54.

Figure 4-54 Intelligent power parameters on the WebUI



- Intelligent Power Supply parameter: The value can be Enabled or Disabled. The default value is Disabled.
- ATS parameter: 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 reuse scenario. The default value is Connected. This parameter is available only after you set Intelligent Power Supply to Enabled.
- D.G. startup batt. volt. (V/cell) parameter: The value ranges from 1.80V/cell ~ 2.00V/cell. The default value is 1.80V/cell. This parameter is available only after you set Intelligent Power Supply to Enabled.

NOTE

Set the preceding three parameters when you connect the D.G. to the UPS.

Step 3 After you set Intelligent Power Supply to Enabled, the system changes some parameter values associated with intelligent power supply. Figure 4-55 ~ Figure 4-60 show the changed parameter values on the WebUI.

Figure 4-55 Associated intelligent power supply parameters on the WebUI 1

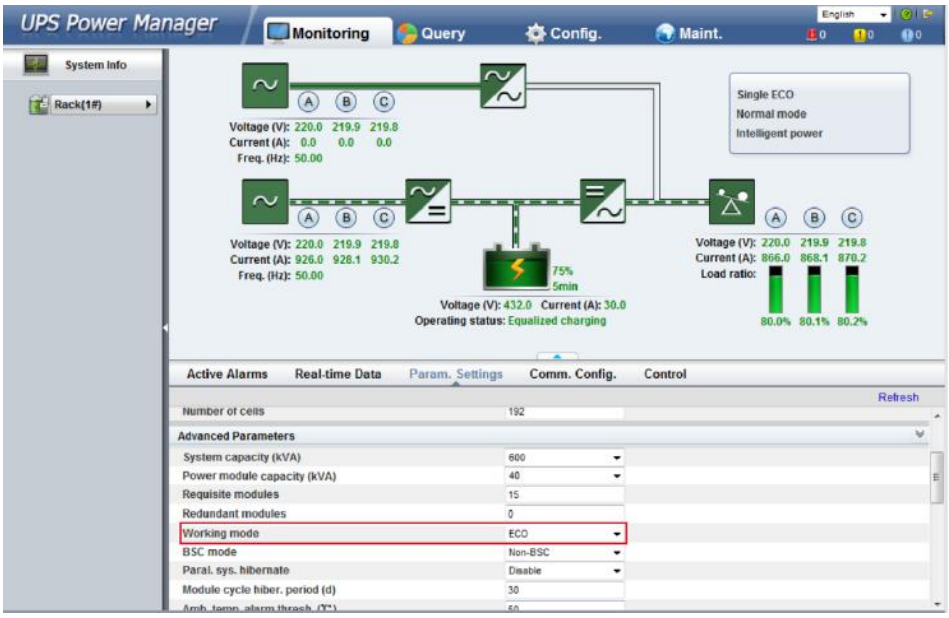


Figure 4-56 Associated intelligent power supply parameters on the WebUI 2

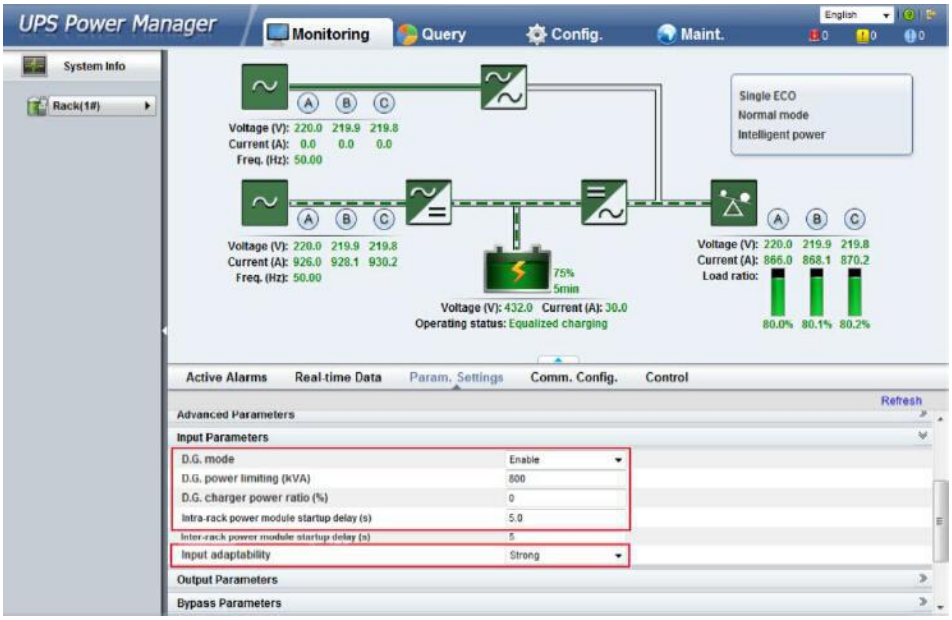


Figure 4-57 Associated intelligent power supply parameters on the WebUI 3

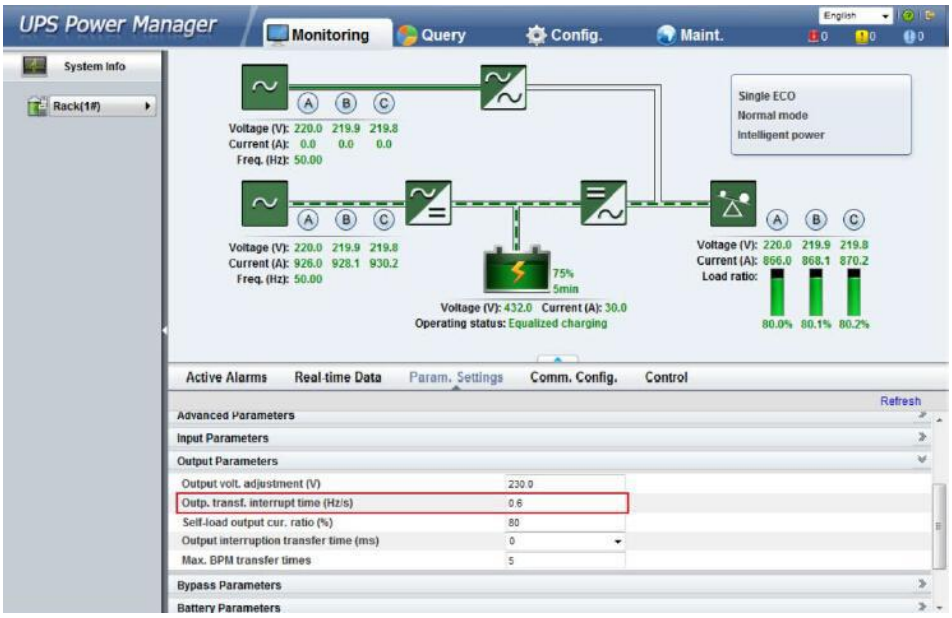


Figure 4-58 Associated intelligent power supply parameters on the WebUI 4

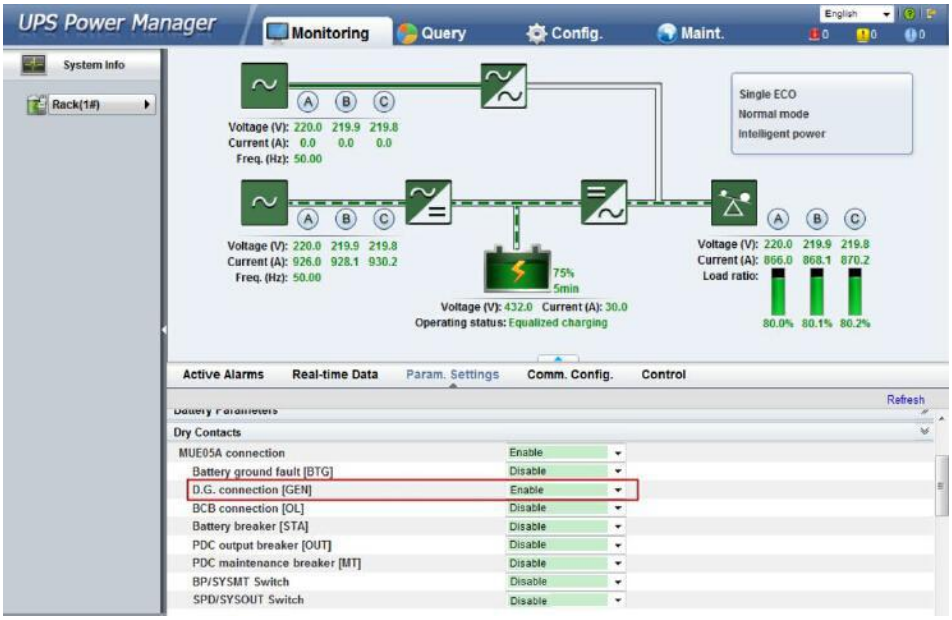


Figure 4-59 Associated intelligent power supply parameters on the WebUI 5

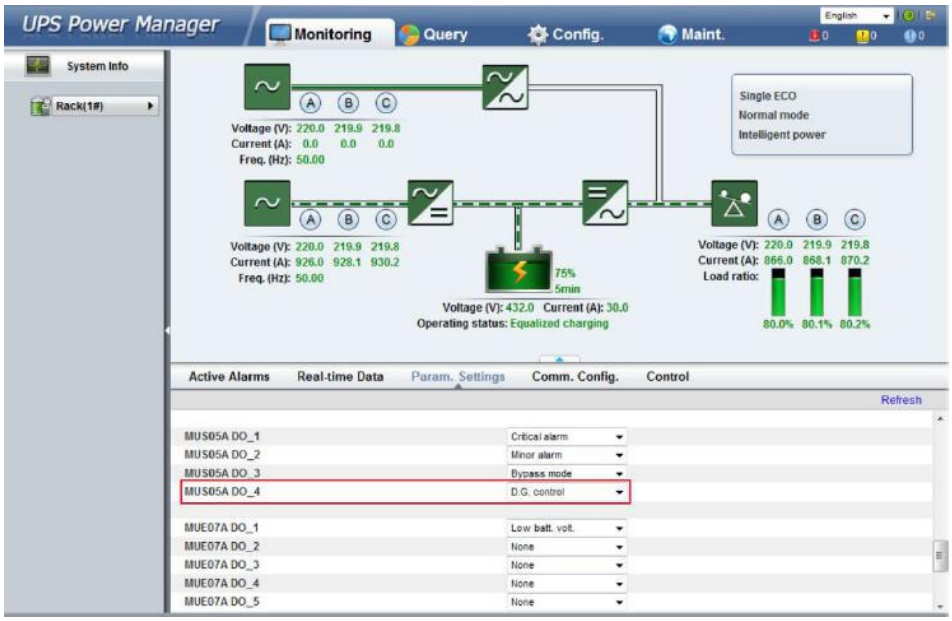


Figure 4-60 Associated intelligent power supply parameters on the WebUI 6

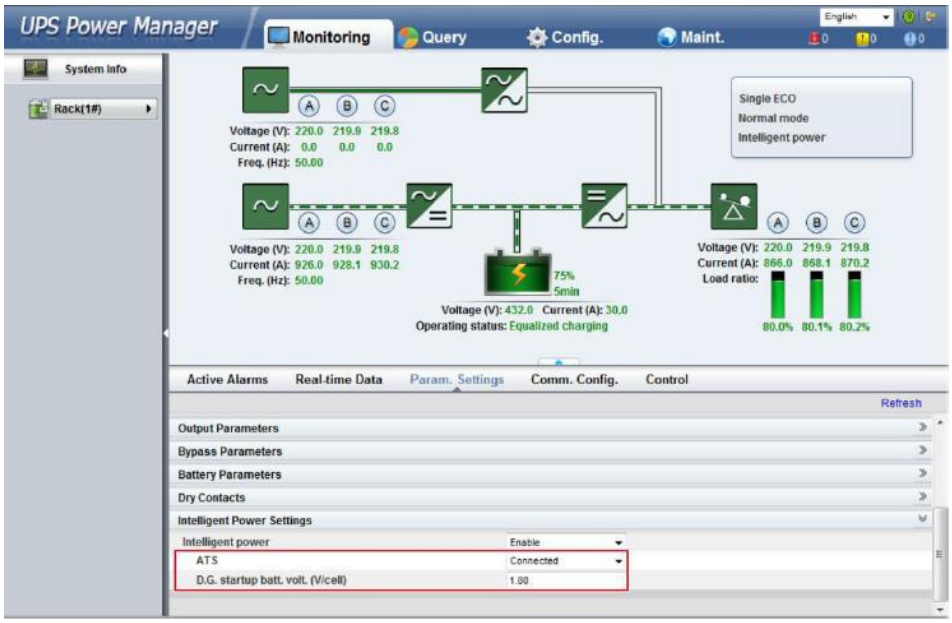


Table 4-3 lists the associated intelligent power supply parameters.

Table 4-3 Associated intelligent power supply parameters

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

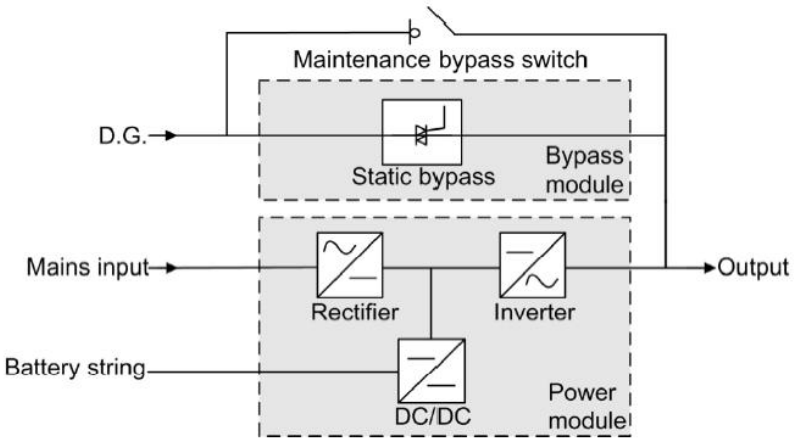
NOTE

- 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 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 mode.
- To disable the D.G. from the UPS system, set Intelligent Power Supply to Disabled.
- The system changes Working mode to Normal mode, Intra-rack power unit start delay (s) to 5s, Output freq. track rate (Hz/s) to 0.6Hz/s, Input adaptability to Non-strong input, D.G. mode to Disabled, and D.G. connection [GEN] to Disabled. You can change the values.

Reuse Scenario

In non-ATS scenarios, the D.G. connects to the UPS over the bypass module. Dry contacts control D.G. startup and shutdown. Figure 4-61 shows the working principles.

Figure 4-61 Reuse scenario

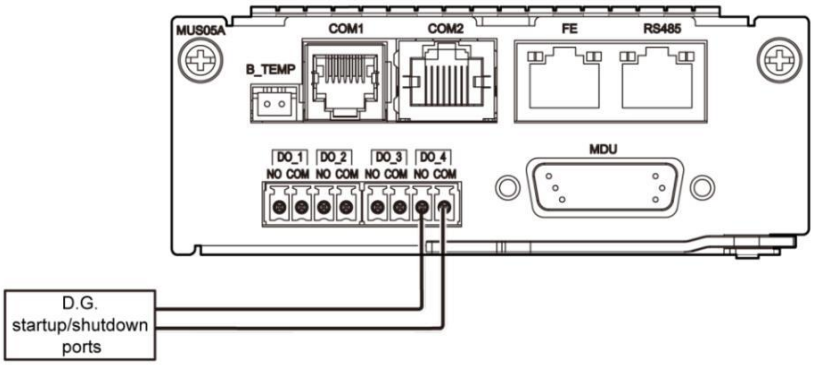


In reused D.G. scenarios, the following parameters need to be set:

- ATS: Set ATS to Not connected.
- Working mode: The system will set the working mode to ECO and it is unchangeable.

The dry contact port DO_4 of the UPS monitoring port card connects to the startup/shutdown control port of the D.G. The DO_4 port is normally on (NO) initially. When it is on, the D.G.starts. Figure 4-62 shows the signal cable connection between the UPS and the D.G. in reused scenarios.

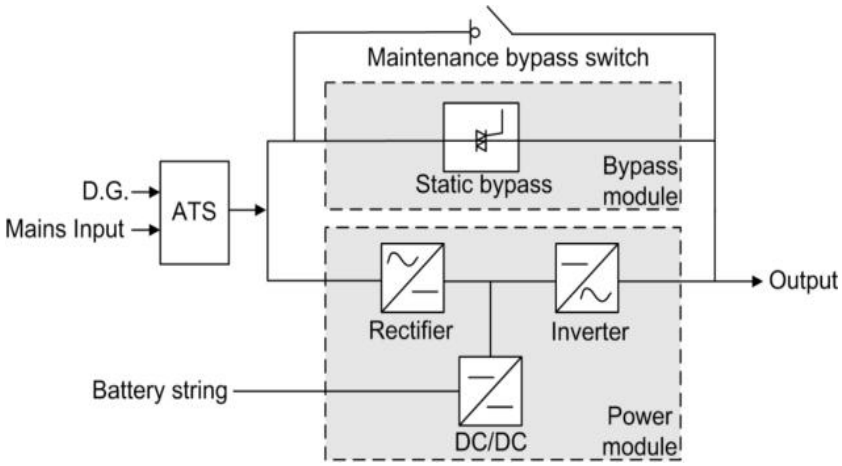
Figure 4-62 Connecting signal cables in the reused scenario



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 4-63 shows the working principles.

Figure 4-63 ATS Scenario

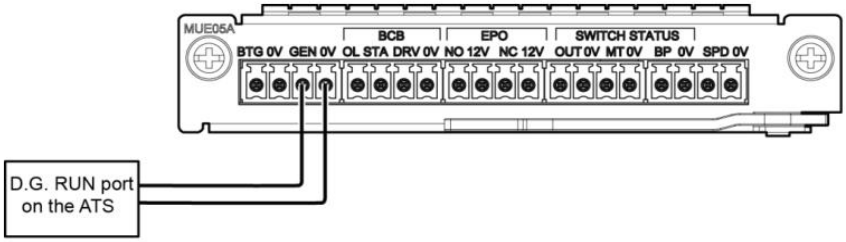


In ATS scenarios, the default parameter settings are used. Working mode can be set based onthe site requirements.

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 NO.When it is closed, the D.G. starts. Figure 5-64 shows the signal cable connection between the UPS and the D.G.

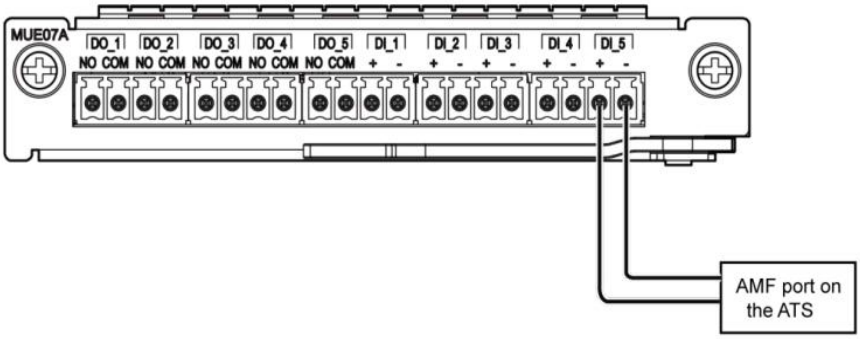
The D.G. RUN port of the ATS connects to the dry contact card, as shown in Figure 4-64.

Figure 4-64 Connecting signal cables in the ATS scenario 1



The AMF port of the ATS connects to the DI_5 port on the dry contact extended card, asshown in Figure 4-65.

Figure 4-65 Connecting signal cables in the ATS scenario 2



4.2 Parallel System Operations

For detailed parallel system operations, contact the technical support.

5 Maintenance

5.1 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 wriststrap. 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 the technical support.
- Only maintenance engineers can maintain power modules and bypass modules.
- Maintain UPSs regularly based on the following requirements. Otherwise, the UPSs may fail to operate properly and the service life may be shortened.

5.1.1 Monthly Maintenance

Check Item	Expected Result	Troubleshooting
Operating environment	• Ambient temperature: 0 ~ 40℃ • Humidity: 0 ~ 95% RH (non-condensing) • Input voltage: 380 VAC / 400 VAC / 415 VAC(line voltage) • Output voltage: 380 VAC / 400 VAC / 415 VAC (tolerance ±1%, linevoltage) • Frequency: 40 ~ 70 Hz	• 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. • If the output voltage is abnormal, check the UPS running status and check whether an alarm is present.
Noise	At atmospheric pressure(25℃), 100% load: 70 dB	Check whether the fans are rotating normally and check whether an alarm is present.
Control panel	Check that all units are operating properly by observing the status icons on the LCD, all operating parameters are within their normal ranges, and no fault or alarm information is displayed.	If an alarm is present, rectify the fault by checking the device status and parameters.
Abnormal noise	No abnormal noise is generated.	Check where the abnormal noise comes frome specially fans, input and output transformer (if configured), power module, and bypass module. If the problem is not resolved, contact the technical support.
Cleanliness	Wipe the cabinet surface using a white paper and the paper does not turn black.	Clean the dust.
UPS parameters	See related parameter setting descriptions in section 3.	Reset the parameters.
Cables	Cables are intact and do not deteriorate or damage.	If a cable is damaged, find the reason and apply protective measures such as rodent-proof measures.
Load change	-	Regularly check and record the adding and removal of loads.
UPS maintenance report	-	Categorize exceptions and alarms.
Exported alarm	-	Analyze and export alarm analysis report.

5.1.2 Quarterly Maintenance

Besides the monthly check, Table 5-1 items should be checked quarterly.

Table 5-1 Quarterly Maintenance

Check Item	Expected Result	Troubleshooting
Cleanliness	Wipe the cabinet surface using a white paper and the paper does not turn black.	Clean the dust, especially inthe fans and air inlets and outlets.
External cable and terminal	Cables and terminals are free from deterioration, damage, spark signs, and looseness.	Replace the cables. Secure the output terminals.
Internal cable and terminal	Cable surfaces are free from damage, crack, and scratch.	Secure power cable terminals and the flat cables between panels.
Input and output transformer(if configured)	The input and output transformer does not discolor due to overtemperature and is free from delamination or flaking off. Connection terminals are secured and donot rust or corrode.	Secure terminals. Replace the transformer if it discolors, delaminates, flakes off, or corrodes.
Parameter	The input, output, battery, and load currents and voltages measured by amultimeter and a clampmeter match the values displayed on the LCD.	Reset the parameters.

5.1.3 Semi-Yearly Maintenance

Semi-yearly maintenance tasks include quarterly maintenance tasks and the following:

Clear dust from the top, inside, and front of the UPS.

Check that the nuts of the internal capacitor, inductor, and transformer in the UPS are secure, and tighten any loose nuts.

5.1.4 Yearly Maintenance

Yearly maintenance tasks include semi-yearly maintenance tasks.

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 5-2 lists the service life parameters for key components and recommended replacement intervals.

Table 5-2 Service life parameters for key components and recommended replacement intervals

Key Component	Expected Service Life	Recommended Replacement Interval
AC capacitor	≥ 7 years (62,000 hours)	5 ~ 6 years
Electrolytic capacitor	≥ 7 years (62,000 hours)	5 ~ 6 years
Fan	≥ 7 years (62,000 hours)	5 ~ 6 years
VRLA battery	years	3~ 4 years

5.2 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.

5.2.1 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 use any organic solvent to clean 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.

5.2.2 Monthly Maintenance

Clean the battery room.
Check battery management parameters on the power system.
Check each battery for terminal damage, overheating, shell damage, and acid leaks.
Measure and record the battery room temperature, battery string voltage, battery voltage, and charge current, as shown in Table 5-3.

Table 5-3 Monthly battery maintenance

Item	Expected Result	Troubleshooting
Battery management parameters	Parameters settings meet requirements. The capacity value matches the actual value.	Set parameters correctly.
Battery management alarm	No battery management alarm is generated.	Identify the cause of an alarm based ont he alarm information.
Charge current	The charge current is less than or equal to 0.15C10 A.	Adjust the charge current limit of UPShost.
Battery string charge voltage	• Equalized charging voltage: (2.35 V/cell ±1%) x number of battery cells • Float charging voltage:(2.25 V/cell ± 1%) xnumber of battery cells	• If the voltage drop between the battery string output terminals and the battery input terminals at the UPS host side is greater than 1% ofthe battery string voltage, check whether the cable between the battery string and the UPS is excessively long, or the cable diameter is excessively small. • Check whether the equalized charging voltage and float charging voltage are correctly set for the UPS host. • If the fault persists, contact the technical support.

Item	Expected Result	Troubleshooting
Battery appearance	• The battery shell isintact, without acid leaks, deformation, orbulges. • The battery is free from dust or dirt.	• Take photos of any deformed or faulty parts of batteries. • Check and record the charge voltage and current of the battery string as well as the voltage of each battery. • Check the battery surface temperature. • Keep deformed and bulged faulty batteries still for 30 minutes and then check and record open-circuit voltage of the faulty battery. • If the fault persists, contact the technical support.
Battery connection	Battery terminals and cables are in good contact.	Ensure that battery terminals and cables are in good contact.
Battery operating temperature	• The difference between temperature reported by the battery temperature sensor and the actual temperature is less than2℃. • The service temperature of a working battery does not exceed 45℃.	• Identify the cause of the false temperature sensor alarm. • Identify the cause of the abnormal battery operating temperature. • If the fault persists, contact the technical support.

5.2.3 Quarterly Maintenance

Besides the monthly check, the following items should be checked quarterly.

Item	Expected Result	Troubleshooting
Battery voltage	• Equalized charging voltage: (2.35 V/cell ± 0.02 V/cell) x number of battery cells • Float charging voltage:(2.25 V/cell ± 0.02V/cell) x number of battery cells	• Check whether the equalized charging voltage and float charging voltage of abattery is normal. • If the charging voltage ofa battery exceeds the specifications requirement, perform acomplete forcible equalized charging for the battery and check again whether thevoltage is normal. • If the fault persists, contact the technical support.
Shallow discharge test (recommended)	Conduct a shallow discharge test when the UPS is backed up to verify that the batteries can discharge normally.	Locate the cause whenan exception is identified. If the fault persists, contact the technical support.

5.2.4 Yearly Maintenance

In addition to quarterly maintenance tasks, yearly maintenance tasks include the following:

Item	Expected Result	Troubleshooting
Capacity Test (recommended)	When the UPS is backed up, discharge a battery to the undervoltage alarm threshold, to refresh the capacity of the battery.	Locate the cause when an exception is identified. If the fault persists, contact the technical support.

6 Troubleshooting

CAUTION

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

- 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) at first.
- To restore battery discharge function after batteries reach EOD, use one of the following methods:
- Switch to another battery string. Ensure that each battery has a voltage greater than the EOD voltage and 11.3 V/cell.
- Restore the mains power supply and the rectifier start working. Close the battery switch and charge batteries until each battery voltage greater than the EOD voltage and 11.3 V/cell.

For details about how to clear common faults, see Table 6-1. If any faults that cannot be located or solved occur, or any other unmentioned faults occur, see Alarm List and contact the technical support.

Table 6-1 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 isless than the lowerthreshold 80 V.	Check whether the mains voltage exceeds the threshold.If yes, contact the electric power company.
		PFC soft-startup fails.	Replace the powermodule.
		The power module isfaulty.	
The inverter is abnormal.	The buzzer sounds continuously, the Fault indicator is on, the inverter is faulty, and the UPS transfers to bypass mode.	The UPS is overloaded orshort-circuited.	Reduce load or rectifyshort circuits.
		Inverter overtemperature occurs.	Install more air conditioners or ventilation devices to ensure normal temperatures inside the equipment room.
		The power module isfaulty.	Replace the power module.
The charger generates an alarm.	The buzzer sounds continuously, the Fault indicator ison, and the charging function fails.	The charger fails.	Replace the power module.
		The charger experiences overcurrent	
		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 worksin 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 theLCD.
Thebypassisabnormal.	The buzzer sounds continuously, and the Fault indicator is on.	The bypass thyristoris damaged.	Replace the bypass module.
		The bypass module experiences overtemperature.	Reduce the load, or improve ventilation.

NOTE

If any faults that cannot belocated or solved are met, or any other unmentioned faults occur, please contact the technical support.

7 Technical Specifications

7.1 Physical Specifications

Physical Specifications	
Cabling mode	• 200 kVA: available for upper wiring • 300 kVA/400 kVA/500 kVA/600 kVA/800 kVA: available for inlet and outlet wires from both top and bottom
Protection level	• IP20 (IP21 for optional configuration)
Dimensions (H x Wx D)	• 200 kVA: 2000mm×600mm×850mm • 300 kVA: 2000mm×600mm×850mm • 400 kVA /500 kVA: 2000mm×1200mm×850mm • 600 kVA: 2000mm×1400mm×850mm • 800 kVA: 2000mm×2400mm×850mm
Communication	Supports dry contacts, RS485 ports, and FE ports; supports Simple Network Management Protocol (SNMP).
Weight	• 200 kVA: 213 kg in standard configuration • 200 kVA: 233 kg in full configuration • 300 kVA: 242 kg in standard configuration • 400 kVA: 415 kg in full configuration • 500 kVA: 465 kg in full configuration • 600 kVA: 617 kg in full configuration • 800 kVA: 1025 kg in full configuration

7.2 Environmental Specifications

Environmental Specifications	
Operating temperature	0℃～40℃
Storage temperature	-40℃～+70℃
Humidity	0%RH ~ 95% RH (non-condensing)
Altitude	0m ~ 1000m, no derating When the altitude is above 1000 m,refer to the IEC62040-3 standard derating, the maximum altitude is 4000m.
Noise	< 70dB

7.3 Safety Regulations and EMC

Safety Regulations and EMC	
Safety regulations	EN62040-1：2008 IEC62040-1：2008
EMC	EN62040-2 IEC62040-2 IEC61000-2-2 IEC61000-3-2 IEC61000-3-4 IEC61000-3-5 EN61000-3-3 EN61000-3-6 IEC61000-3-8 IEC61000-3-11

7.4 Mains Input Electrical Specifications

Mains Input Electrical Specifications	
Input system	Three-phase, five-wire
Rated input voltage	380 VAC, 400 VAC, or 415 VAC (line voltage)
Input voltage	138V AC ~ 485V AC(line voltage) The UPS power is not derated at 305 VAC ~ 485 VAC and islinearly derated at 305 VAC ~ 138 VAC.
Rated frequency	50Hz/60Hz
Input frequency	40Hz ~ 70Hz
Input PF	full load > 0.99 half load > 0.98
THDi	THDi< 3% (linear full load) THDi< 5%(non-linear full load)

7.5 Bypass Input Electrical Specifications

Bypass Input Electrical Specifications	
Input system	Three-phase, five-wire
Rated input voltage	380VAC /400VAC /415VAC (line voltage)
Rated frequency	50Hz/60Hz
Input frequency	±6 Hz (0.5Hz ~ 6 Hz, ±2 Hz by default)
Input system	Single mains and dual mains are available.
Bypass currentsharing function	In a parallel system, control the cable length to equalize thecurrent. The current unbalance must be less than 25%.

7.6 Battery Specifications

Battery Specifications	
Battery voltage	360 VDC ~ 552 VDC (30 ~ 46 batteries, 40 by default); 38 and 36 batteries: no derating for output power; 34 batteries: the output power derating to 0.9; 32 and 30 batteries: the output power derating to 0.8.
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	Equalized voltage: 2.35 V/cell Float voltage: 2.25 V/cell

7.7 Output Electrical Specifications

Output Electrical Specifications	
Output system	Three-phase, five-wire
Voltage	380 VAC, 400 VAC, or 415 VAC ±1%(line voltage)

Output Electrical Specifications	
Frequency	The mains frequency is synchronous with the bypass input frequency (in normal mode). The frequency is 50 Hz or 60 Hz±0.25% (In battery mode).
Total harmonic distortion of output voltage (THDv)	Full linear load THDv<2% Full non-linear load THDv<5%
Output PF	0.9
Transfer time	0ms
Output voltage unbalance	Voltage unbalance: ±3%; ±2?phase unbalance: ±2°
Overload capability	Inverter overload capability: 105% <load ≤ 110%, transfer to bypass mode after 60 min 110% < load ≤ 125%, transfer to bypass mode after 10 min 125% < load ≤ 150%, transfer to bypass mode after 1 min Load > 150%: transfer to bypass mode after 200 ms
	Bypass overload capability: Under 30℃,load ≤ 135%, run continuously in bypass mode; Under 40℃, load ≤125%, run continuously in bypass mode; 1000% load: run for 100ms

7.8 System Electrical Specifications

System Electrical Specifications	
System efficiency	95%
Redundancy design	The auxiliary power supplies, centralized controllers, and parallel signals are redundant.
Number of UPSsconnected in parallel	≤ 4
ECO	Support

A Menu Hierarchy

A.1 Menus on the LCD

Level-1Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu
System Info	Runn Info	AC Output	-
		UPS Load	-
		Mains Input	-
		Bypass Input	-
		Battery Status	-
		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.	-
		Battery Param.	-
		Dry Contacts	-
		Settings Wizard	-
		Parameter Sync. (availablein parallel UPS	-
	Maintenance	Battery Maint.	-
		USB Operations	Remove USB
			Upgrade Software
			Load Config.
			Export Config.
			Export Logs
			Load fault data
			Export E-labels
			Export Alarms
			Multi-brand
			Fault Report

Level-1Menu	Level-2 Menu	Level-3 Menu	Level-4 Menu
			Inspection Report
			Black Box Data
		Inv. ON	-
		Inv. OFF	-
		ECM Switchover	-
		Screen Calib.	-
	About	Model	-
		Manufacturer	-
		Monitoring Version	-
		Power Version	-
		Version Info	-
CommonFunctions	AC Output	Phase voltage	-
		Line voltage	-
		Phase current	-
		Phase current	-
		Power factor	-
	UPS Load	Power factor	-
		Apparent power	-
		Apparent power	-
		Load ratio	-
		Crest factor	-
	Mains Input	Phase voltage	-
		Line voltage	-
		Phase current	-
		Frequency	-
		Power factor	-
	Inv. ON	-	-
	Inv. OFF	-	-
	Buzzer Off	-	-
	HistoricalAlarms	-	-
System Status	Bypass	-	-
	Mains	-	-
	Load	-	-
	Battery	-	-

A. 2 **Menus on the WebUI**

Level–1Menu	Level–2 Menu	Level–3 Menu	Level–4Menu	Level–5Menu
Monitoring	Active Alarms	-	-	-
	Real-time Data	UPS	Input	Phase voltage
				Line voltage
				Current
				Power factor
				Frequency
			Bypass	Phase voltage
				Line voltage
				Current
				Power factor
				Frequency
			Output	Phase voltage
				Line voltage
				Current
				Power factor
				Frequency
				Crest factor
				Load ratio
				Active power
				Apparentpower
				Reactivepower
				System activepower
				System apparentpower
				System reactive power
			Battery	Voltage
				Current
				Bus voltage
				Batterytemperature
				Batterytemperature
				Remainingcapacity
			EnvironmentData	Ambienttemperature

Level–1Menu	Level–2 Menu	Level–3 Menu	Level–4Menu	Level–5Menu
				Ambienthumidity
	Param. Settings	Basic Param.	Single/Parallel	-
			Voltage level	-
			Outputfrequency	-
			Batterycapacity	-
			Number ofcells	-
		AdvancedParam.	Workingmode	-
			BSC mode	-
			Amb. temp.alarm thresh	-
			EOD restart	-
			EOD restartdelay	-
			Inverterasync. alarm	-
			Busovervoltagerecovery	-
			Bus overvolt.recovery time	-
			Capacitance fault detection	-
			Capacitance fault detectionthreshold high limiting	-
			Capacitance fault detection threshold low limiting	-
			Input cur.limiting	-
			limiting ratio	-
			No-loadoutput shows zero	-
			Inv. Loadmode	-
		Input Param.	D.G. mode	-
			D.G. powerlimiting	-
			D.G. chargerpower ratio	-
			Intra-rackpower modulestart delay (s)	-
			Inter-rackpower module start delay (s)	-
			Inputadaptability	-
		Output Param.	Output volt.adjustment	-

Level–1Menu	Level–2 Menu	Level–3 Menu	Level–4Menu	Level–5Menu
			Outp. transf.interrupt time	-
			Self-loadoutput cur.ratio	-
			Outputinterruptiontransfer time	-
			Max. BPMtransfer time	-
		Bypass Param.	Bypassfrequencyrange	-
			Maximumbypass voltage	-
			Minimumbypass voltage	-
			ECO voltagerange	-
			BPM supplyon OL &Overtemp.	-
		Battery Param.	Installationtime	-
			Maintenanceperiod	-
			Battery type	-
			Chg. cur.limitingcoef.	-
			Cell floatvoltage	-
			Cell equalizedvolt.	-
			Transfer-to-equalizedcharging cur.	-
			Automaticequalizedcharging	-
			Forcedequalizedchargingprotectiontime	-
			Equalizedchargingprotection interval	-
			Scheduledequalizedcharginginterval	-
			Float volt.temp. comp.	-
			Float volt.temp. comp.coef.	-
			Max batt.dis.time	-
			Sched.shallowdis.test	-
			Sched.shallowdis.test time	-
			Undertemp.alarm thresh.	-
			Overtemp.alarm thresh.	-
			Backup timewarning	-
			Remain. cap.warning	-

Level–1Menu	Level–2 Menu	Level–3 Menu	Level–4Menu	Level–5Menu
			Dis.cur.0.1CEOD	-
			Dis. cur.0.3CEOD	-
			Dis. cur.0.5CEOD	-
			Dis. cur.1.0CEOD	-
			Intelligenthibernation	-
			Class 1 gridhiber. time	-
			Class 2 gridhiber. time	-
			Chg. volt.over rangepoint	-
			Dis. volt. overrange point	-
		Dry Contacts	MUE05Aconnection	-
			Batteryground fault [BTG]	-
			D.G.connection [GEN]	-
			BCBconnection [OL]	-
			Batterybreaker [STA]	-
			PDC outputbreaker [OUT]	-
			PDCmaintenancebreaker [MT]	-
			BP/SYSMTSwitch	-
			BP/SYSMTswitchfunction	-
			SPD/SYSOUTSwitch	-
			SPD/SYSOUTswitchfunction	-
			MUE06Aconnection	-
			MUS05A DO_1Action	-
			MUS05A DO_2Action	-
			MUS05A DO_3Action	-
			MUS05A DO_4Action	-
			MUE07A DO_1Action	-
			MUE07A DO_2Action	-
			MUE07A DO_3Action	-
			MUE07A DO_4Action	-
			MUE07A DO_5Action	-
			MUS05A DO_1	-

Level–1Menu	Level–2 Menu	Level–3 Menu	Level–4Menu	Level–5Menu
			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	-
	Comm. Config.	System IPSettings	IP Address	-
			Subnet Mask	-
			DefaultGateway	-
		Serial PortSettings	RS485 ComBaud Rate	-
			RS485 ComAddress	-
		BatteryTemperature Sensor Settings	Start Addr. OfBatt. Temp.sensor	-
			Batt. Temp.sensors	-
		AmbientTemperatureand HumiditySensor Settings	Start Addr. Ofambient temp. & H. sensor	-
			AmbientTemp. & H. sensors	-
		BMU Settings	BMU startaddress	-
			BMUs	-
		NTC Settings	NTC	-
	Control	SystemCommandsandTests	Inverter On	-
			Inverter Off	-
			Clear Fault	-
			Bypassruntime	-
			Inv. runtime	-
			ForcedEqualizedCharging	-

Level–1Menu	Level–2 Menu	Level–3 Menu	Level–4Menu	Level–5Menu
			Shallow Dis.Test	-
			Capacity Test	-
Query	Alarm History	Query	-	-
		Export	-	-
	Logs	Historical log	-	-
		Cap. test log	-	-
		Common testlog	-	-
Config.	User Mgmt.	User Mgmt.	New	-
			Modify	-
			Delete	-
		User idle time-out	Timeout waiting time	-
	Site Config.	System Dateand Time	Date(Local)	-
			Time(Local)	-
			Time zone	-
		SystemInformation	Name	-
			Location	-
			Contactinformation	-
		SNMP	SNMP version	-
			SNMPport	-
		SNMP Trap	No.	-
			Trapaddr.	-
			Trapport	-
		CertificateManagement	Upload	Summit
			Exportcertificate	Export
		ConfigurationManagement	Uploadconfigurationfile	Send
			Exportconfigurations	Export
		Multi-brandManagement	Upload	Send
		ConfigureAlarmNotificationServer	Email serverIP address	-
			Sender's email	-
			User accountauthenticationrequired whensending a mail	-

Level–1Menu	Level–2 Menu	Level–3 Menu	Level–4Menu	Level–5Menu
		ConfigureAlarmNotificationEmail Address	No.	-
			Emai	-
			Language	-
			AlarmSeverity	-
			ScheduledNotifi.	-
Maint.	Calib	Bypass	Ph. A inputvolt.	-
			Ph. B inputvolt.	-
			Ph. C inputvolt.	-
			Ph. A outputvolt.	-
			Ph. B outputvolt.	-
			Ph. C output volt.	-
		Module	Ph. A inputvolt.	-
			Ph. B inputvolt.	-
			Ph. C inputvolt.	-
			Ph. A inputcur.	-
			Ph. B inputcur.	-
			Ph. C inputcur.	-
			Pos. bus volt.	-
			Neg. bus volt.	-
			Zero sequencecur.	-
			Pos. batt. volt.	-
			Pos. batt. chg.volt.	-
			Pos. batt. chg.volt.	-
			Pos. batt. dis.cur.	-
			Neg. batt.volt.	-
			Neg. batt. chg.volt.	-
			Neg. batt. chg.cur.	-
			Neg. batt. dis.cur.	-
			Inv. ph. Avolt.	-
			Inv. ph. Bvolt.	-
			Inv. ph. Cvolt.	-
			Ph. A outputvolt.	-
			Ph. B outputvolt.	-

Level–1Menu	Level–2 Menu	Level–3 Menu	Level–4Menu	Level–5Menu
			Ph. C outputvolt.	-
			Inv. ph. A cur.	-
			Inv. ph. B cur.	-
			Inv. ph. C cur.	-
			Inv. ph. Ainduc. cur.	-
			Inv. ph. Binduc. cur.	-
			Inv. ph. C induc. cur.	-
		ECM	BPM ph. Ainput volt.	-
			BPM ph. Binput volt.	-
			BPM ph. Cinput volt.	-
			Rack ph. Aoutput cur.	-
			Rack ph. Boutput cur.	-
			Rack ph. Coutput cur.	-
			Rack ph. Aoutput volt.	-
			Rack ph. Boutput volt.	-
			Rack ph. Coutput volt.	-
	CommissioningVar.	Bypass	BPM SWcommissioning var. 0 data	-
			BPM SWcommissioning var. 1 data	-
			BPM SWcommissioning var. 2 data	-
			BPM SWcommissioning var. 3 data	-
			BPM SWcommissioning var. 4 data	-
			BPM SWcommissioning var. 5 data	-
		Module	Rec. SWcommissioning var. 0 data	-
			Rec. SWcommissioning var. 1 data	-
			Rec. SWcommissioning var. 2 data	-
			Rec. SWcommissioning var. 3 data	-
			Rec. SWcommissioning var. 4 data	-

Level–1Menu	Level–2 Menu	Level–3 Menu	Level–4Menu	Level–5Menu
			Rec. SWcommissioning var. 5 data	-
			Inv. SWcommissioning var. 0 data	-
			Inv. SWcommissioning var. 1 data	-
			Inv. SWcommissioning var. 2 data	-
			Inv. SWcommissioning var. 2 data	-
			Inv. SWcommissioning var. 4 data	-
			Inv. SWcommissioning var. 5 data	-
		ECM	ECM SWcommissioning var. 0 data	-
			ECM SWcommissioning var. 1 data	-
			ECM SWcommissioning var. 2 data	-
			ECM SWcommissioning var. 3 data	-
			ECM SWcommissioning var. 4 data	-
			ECM SWcommissioning var. 5 data	-
	Upgrade	Upgrade UPSSoftware	-	-
	Download	Download	Serviceabledata	-
			Fault Report	-
			InspectionReport	-
			Black Box Data	-
			E-Label	-

B Alarm List

AlarmID(AlarmID-Cause ID)	Alarm Name	Severity	Cause	Solution
0001-1	Mains voltageabnormal	Minor	The mainsvoltage is high.	Check mains input voltage
0001-2			The mainsvoltage is low.	Check mains input voltage
0001-3			The mainsfrequency isabnormal.	Check mains input frequency
0003-1	Mains ph.Reversed	Minor	Mains ph.Reversed.	Check mains input cables
0004-1	The mainsneutral wire isabsent.	Minor	The mainsneutral wire isabsent.	Check mains input cables
0006-1	Mainsundervoltage	Minor	Mainsundervoltage.	Check mains input voltage
0010-1	The bypassvoltage isabnormal.	Minor	The bypassvoltage isabnormal.	• Check thebypass inputvoltage orcabledistribution. • Check thevoltagesystem andbypassvoltagethresholds seton theWebUI orLCD.
0010-2		Minor	The bypassfrequency isabnormal.	• Check thebypass inputfrequency. • Check theconfiguredratedfrequencyandfrequencyrange.
0011-1	Bypass phasereversed	Minor	Bypass phasereversed.	Check the three phase bypass input cables
0012-1	Bypass neutralabsent	Minor	Bypass neutralabsent	Check the three phase bypass input cables
0020-1	Batteryconnectedreversely	Critical	Batteryconnectedreversely	Checkwhetherbatterypolarities arecorrectlyinstalled byusing amultimeter.If no, correcttheinstallation.
0021-1	Battery EOD	Critical	The batteryvoltage reachesthe EOD voltagethreshold due tocontinuousdischarge.	Check themains, andchargebatteries in atimelymanner.
0022-1	No battery	Critical	Nobattery.	• Check that the battery terminalvoltage is normal. • Check thatthe batteryfuse in thepowermodule isintact.
0024-1	Batteryovervoltage	Minor	The batteryvoltage>theovervoltagealarm threshold(equalizedvoltage + 0.05V/cell) for 30seconds.	• Check theconfigurednumber ofbatteries. • Check thatthe batteryneutral wireis securelyconnected.

AlarmID(AlarmID -Cause ID)	Alarm Name	Severity	Cause	Solution
0026-1	Low batteryvoltage	Minor	The batteryvoltage <the warningthreshold.	• Check themains input,and chargebatteries. • Check thatthe batteryneutral wireis securelyconnected.
0530-1	Battery groundfault	Critical	Battery groundfault.	• Checkwhether thepositive andnegativeterminals ofthe batterystrings aregrounded. • Checkwhether thebatterygroundingfailure detector isfaulty byreplacing itwith a newone. • If MUE05A dry contact board is faulty. Replace theMUE05A dry contact board.
0032-1	Batteryovervoltageprote ction	Critical	• Each cell batteryvoltage is greaterthan the (equalizedvoltage + 0.1V/cell) for 6s. • Single battery voltage is greater than 310Vfor 6s.	• Check that the configurednumber of batteries matches the actual number. • Check that the actual number of batteries meets requirements. • Check thatthe batteryneutral wireis securelyconnected.
0036-2	Battery maintenance reminder	Warning	The time for Maintenancearrives.	• Confirm battery maintenance warning after battery maintenance • If there is a warning when the UPS is powered on for the first time, update the installation time to the present time.
0037-1	Batteryovervoltage	Critical	Battery undervoltage. After the calibration filter, the battery voltage is less than 1.5/cell for 8s.	• Check the battery voltage. • Check whether overload

AlarmID(AlarmID-Cause ID)	Alarm Name	Severity	Cause	Solution
0040-7	Rectifierabnormal	Critical	• The moduleexperiencesovertemperature. • Rectification or inverter power experiences overtemperature: the temperature of cooling fin exceeds the set overtemperture point 90°C for 3s. • The temperature of rectifier switch cooling fin exceeds the set overtemperature point 95°C for 1s.	• Checkwhether thefan isblocked. Ifyes, rectifythe fault toresume thenormaloperation ofthe fan. • Replace thepowermodule if thefan is faulty.
0043-1	Fan abnormal	Critical	The rectifierPWM fan isabnormal.	Check whetherfans are blocked.If yes, recovernormal fanrunning, orreplace themodule.
0047-1	Not ready	Critical	The powermodule is notready.	Turn on theready switch.
0047-2				
0047-3			The ECM ejectorlevel is notclosed.	• Close theejector level. • If the faultpersists,replace themodule.
0060-4	Inverterabnormal	Critical	The inverteroutputshort-circuits.	Check whetherthe moduleoutputshort-circuits. Ifyes, replace themodule. If not,check the loadpowerdistribution.
0061-7	Inverter alarm	Minor	The relay is notclosed due tolarge voltage differencesbetween bothends of the relay.	• If not allmodulesgenerate thealarm, startthe UPS andtransfer it tonormal modeand replacethe faultymodule. • Ifallmodulesgenerate thealarm, openthe bypassinput circuitbreaker.After theinverter relayis closed,close thebypass inputcircuitbreaker 10seconds later.

AlarmID(AlarmID-Cause ID)	Alarm Name	Severity	Cause	Solution
0563-1	Module overloadtimeout	Critical	• The moduleoverload timesout. • The load is excessive. • Derating reduces the rated system power. • The module is damaged.	• Check thatthe loadpower iswithin theappropriaterange. • Check thatthe modulepower is notderated dueto fan faults. • If the faultpersists,replace themodule.
0564-1	The UPStransfers tobypassmode dueto loadimpact.	Minor	• The UPStransfers tobypass mode dueto load impact. • Large-power RCDload or output short-circuit. • The inverter bridge short-circuits.	• Check that a large-power RCD load is not instantly connected. • Check that the output load does not short-circuit. • If the load is normal, replace the module.
0566-1	The moduleoutput isoverloaded.	Minor	• The moduleoutput isoverloaded. • The load is excessive. • Derating reduces the rated system power. • The module is damaged.	• Check thatthe loadpower iswithin theappropriaterange. • Check thatthe modulepower is notderated dueto fan faults. • If the faultpersists,replace themodule.
0570-4	Bypass module abnormal	Critical	Bypass overtemperature	• Check whether the bypass output is overcurent. If yes, reduce the loads. • Check whether the air flue is blocked. If yes, remove blockage. • Check whether fans are blocked. If yes, recover normal fan running, orreplace themodule.
0583-1	Inter-rack par. Cableabnormal	Critical	Theinter-rackparallel CANis faulty.	• Check the parallel cablesbetween UPSs are loose. • If the parallel cables are notloose, replace the cables.
0583-4			The inter-rack industrial-frequency synchronizationfails.	• Check the parallel cablesbetween UPSs are loose. • If the alarmpersists,replace parallelcablesbetween UPSs.
0583-5			The inter-rack carrier synchronizationcable is faulty.	
0583-6			The inter-rack INVBYP isfaulty.	
0583-2	The inter-rackparallel cablegenerates an	Minor	The inter-rackparallel cablegenerates an alarm.	• Check whether the parallel cables between UPSs are

AlarmID(AlarmID-Cause ID)	Alarm Name	Severity	Cause	Solution
0583-4	alarm.		The inter-rack industrial-frequency synchronizationgenerates an alarm.	loose. • If the parallel cables are notloose, replace the cables.
0084-1	EPO	Critical	EPO	Check the EPOswitch status,and tap the**Clear Fault** button.
0086-1	Max. number of BPM transfers	Warning	Max. number of BPM transfers	• Check the load status. • Checkwhetheroverload timeoutor load impacttransfer-to-bypass frequently has occurred.
0087-1	System transfer- to-bypass	Warning	System transfer-to-bypass	Check the reason why theneighboring UPS transfers to bypass mode.
0089-1	Rack output overload	Minor	Rack output overload	• Check that the load is excessive. • Check that the configured UPScapacity meets requirements.
0090-1	Dry contact board fault	Critical	The dry contact board MUE05A I2Ccommunication fails.	Replace the dry contact boardMUE05A.
0356	Batterymode	Minor	Batterymode	• Running status displayed. • Seedetails about how to handle other alarms.
0359	No powersupplied	Warning	No powersupplied	• Running status displayed. • Seedetails about how to handle other alarms.
0332	Output disabled	Minor	Output disabled	• Running status displayed. • Seedetails about how to handle other alarms.
0334	BSC mastersystem	Warning	Mastersystem	• Running statusdisplayed. • No suggestedmeasures.
0334	BSC slavesystem	Warning	BSC slavesystem	• Running statusdisplayed. Nosuggestedmeasures.
0342	Mains input breaker open	Critical	Mains input breaker open	• Running statusdisplayed. • Nosuggestedmeasures.
0343	BPM input breaker open	Critical	BPM input breaker open	• Running statusdisplayed. Nosuggestedmeasures.
0340	Maint. breaker closed	Minor	Maint. breaker closed	• Running statusdisplayed. • Nosuggestedmeasures.
0345	Battery breaker open	Critical	Battery breaker open	• Running status displayed. • Seedetails about how to handle other alarms.
0335	Generator connected	Warning	Generator connected	• Running statusdisplayed. • Nosuggestedmeasures.
0593-1	Insufficient redundantracks	Minor	Insufficient redundantracks	Decrease the configured number of redundant racks.

AlarmID(AlarmID-Cause ID)	Alarm Name	Severity	Cause	Solution
0096-1	ECO voltage abnormal	Minor	ECO bypass range abnormal	• Check that the bypass input voltage and frequency. • Check that the rated voltage, ratedfrequency, ECO bypass voltage range, and frequency range are correctly set. • Check that the bypass power cable or circuit breaker is connected.
0098-1	Bypass current not shared	Minor	Bypass current not shared	• Check that the output andbypass input circuit breakers oneach rack are ON. • Check that bypass input and output power cables on each rack meet the length requirements. • If the fault persists, remove the bypass module, tap the Clear Fault button, and install a newbypass module.
0150-1	Inverter asynchronous	Minor	Inverter asynchronous	• Check that the bypass input does not frequency change fast. • Check that the configured slewrate is correct.
0101-1	BSC signalabnormal	Minor	BSC signalabnormal.	• Check that the BSC system iscorrectly configured. • Check that the rack BSC synchronization cable is notloose. • If the fault persists, replace the inter-rack BSC synchronization cable.
0102-1	The maintenance circuit breakerexperiences amisoperation.	Critical	The maintenance circuit breakerexperiences amisoperation.	• Follow thecorrect operation procedure. Shut down the inverter, and close the maintenance circuit breaker. • After maintenance, turn off the maintenance bypass switch, and start the inverter so that the UPS transfers to normal mode.
0380	Inverterself-checking progress	Warning	The inverteris inself-check.	• Wait until the inverter self-check is complete.

C Abrreviations

A
ATS AC transfer switch
AWG American wire gauge

B
BSC bus synchronization controller

C
CE ConformiteEuropeenne

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

N
NTC negative temperature coefficient resistor
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