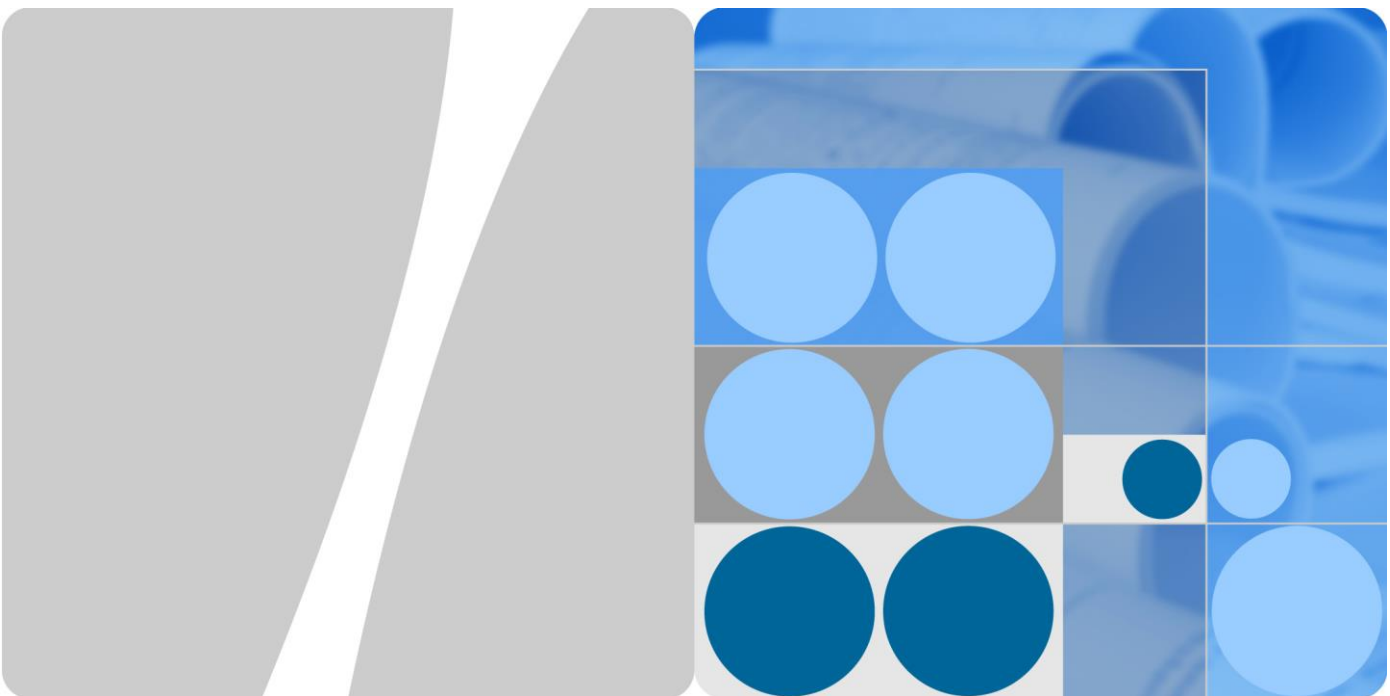




UPS2000-G-(1 kVA-3 kVA)

User Manual

Issue 13
Date 2019-05-05

HUAWEI TECHNOLOGIES CO., LTD.



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About This Document

Purpose

This document describes the UPS2000-G-(1 kVA–3 kVA) in terms of features, performance, appearance, structure, working principle, installation, use, operation, and maintenance. UPS is short for uninterruptible power supply. Unless otherwise specified, UPS refers to all the models discussed in this document.



NOTE

- The UPS applies only to commercial and industrial use, rather than medical facilities and life support equipment.
- The UPS is of C2 (class A). If a C2 (class A) UPS is used in residential areas, additional measures must be taken to prevent radio frequency interferences.

Intended Audience

This document is intended for:

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

Symbol Conventions

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

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

Symbol	Description
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

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

Issue 13 (2019-05-05)

Updated the section "Operating Environment."

Issue 12 (2019-02-26)

Updated the section "Output Electrical Specifications".

Issue 11 (2018-08-29)

- Updated "Buttons".
- Updated the section "Alarm Handling".

Issue 10 (2018-01-16)

Added the description of device application scenarios.

Issue 09 (2017-11-27)

Updated the section "Operating Environment."

Issue 08 (2017-08-04)

Updated the section "Alarm Handling."

Issue 07 (2017-01-19)

- Added the DHCP feature.
- Added an external dry contact card.

Issue 06 (2016-05-15)

- Changed the output wiring terminals of the 3 kVA UPS to a C19 output socket.
- Updated the electrical specifications.
- Updated the function of the ON/MUTE button.
- Added the automatic startup setting.
- Updated the display of battery power backup time.

Issue 05 (2016-01-25)

- Updated 06: Set the battery capacity and 07: Set the discharge time limit in 4.5 Setting Parameters.
- Added bypass overload capability

Issue 04 (2015-11-23)

- Updated settings of the voltage range in ECO mode.
- Added button functions for exiting parameter setting screens and alarm screen.

Issue 03 (2015-10-20)

Updated the button description.

Issue 02 (2015-08-29)

Updated the routine maintenance.

Issue 01 (2015-06-25)

This issue is the first official release.

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1 Precautions

1.1 Transportation

Before transporting the UPS, pack it with original packing materials to protect it from collision.

1.2 Preparation

- The UPS may have condensation inside after it is moved from a cold environment to a warm environment, such as an indoor environment. In this case, install the UPS after it is completely dry. Therefore, install the UPS at least 2 hours after it is placed in the target place.
- Never install the UPS in a damp environment or a place with water nearby.
- Never install the UPS in a place exposed to sunlight or with a heater nearby.
- Never block or shield the air vents on the UPS shell.

1.3 Operating Environment

The UPS is used for commercial and industrial purposes only. It cannot be used as a power supply for life support devices.

The TIER4 or TIER3 power supply architecture specified in TIA942, that is, dual power supply routes, must be used in the power supply systems that are crucial to major economic interests or order of public places, such as the national computing center, military command system, emergency command center, railway signal system and control center, civil aviation air traffic control center, airport command center, financial clearing center, and transaction center.

Ensure that the product is used in an environment that meets the product design specifications (including power grid, temperature, and humidity) to avoid causing malfunctions, damaging components, or voiding the warranty.

The UPS operating environment must meet the requirements for the climate indicator, mechanically active substance indicator, and chemically active substance indicator in ETSI EN 300 019-1 class 3.6.

NOTICE

- After unpacking the UPS, you are advised to power on the UPS as soon as possible. If you temporarily do not use the UPS, take appropriate measures to prevent moisture, dust, and foreign matter from entering the UPS.
- After unpacking batteries, you are advised to connect the battery supply as soon as possible. If you temporarily do not use the batteries, store them in dry and clean environments. If batteries are stored for more than 90 days, charge them in time. Otherwise, the battery lifespan may be affected.

DANGER

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

If the valid mains voltage exceeds 320 V AC, the UPS may be damaged.

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 use manuals when using or storing the device.

Do not place the UPS in the following environments:

- The environment that is close to flammable or explosive materials, dust, corrosive gases or dust, conductive or magnetic dust, abnormal vibration, or collision.
- Rooms or outdoor environments where temperature and humidity are not controlled (with high temperature, low temperature, moisture, direct sunlight, or heat sources).
- Non-confined environment near the ocean (0–3.7 km) and indoor or semi-indoor environment where the temperature and humidity are not controllable, such as a simple equipment room near the ocean, citizen house, garage, corridor, direct ventilation cabinet, house with only the roof, railway station platform, gymnasium, aquarium, and so on.
- The environment that is conducive for the growth of microorganisms such as fungus or mildew.
- The environment where rodents (such as mice) and insects exist.

1.4 Installation

- Never connect a device that will overload the UPS, such as a laser printer, to the output socket of the UPS.
- When routing cables, keep them away from the place where they are easily to be stepped on or make someone stumble.
- Never connect household appliances, such as a hair drier, to the output socket of the UPS.
- The power to the UPS must come from a near grounded cushion socket.
- Use only power cables that comply with Verband Deutscher Electrotechniker (VDE) test standards and Conformité Européenne (CE) certification to connect the UPS to the indoor cushion socket. The power cable can be the main power cable for your PC.

- Use only power cables that comply with VDE test standards and CE certification to connect a load to the UPS.
- When installing the UPS, ensure that the total leakage current of the UPS and connected loads does not exceed 3.5 mA. The recommended upstream earth leakage circuit breaker (ELCB) is more than 30 mA.

1.5 Operation

- Never disconnect the main power cable for the UPS or use the indoor cushion socket when the UPS is running. Otherwise, the grounding for the UPS and connected loads will become invalid.
- Since the UPS contains embedded batteries, its output sockets and output terminals are energized even if the UPS is not connected to a socket.
- To completely disconnect the UPS, shut down the UPS and then unplug the power cable.
- Prevent liquid or any other foreign objects entering the UPS.

1.6 Servicing, Maintenance, and Troubleshooting

- Since the UPS uses dangerous voltages, only qualified personnel are allowed to maintain the UPS.
- Before any maintenance or servicing, remove embedded batteries and ensure that no current exists, especially that no voltage exists between bus capacitors.
- Batteries are allowed to be replaced only by or under the instructions of the personnel that are familiar with batteries under safe conditions. Unauthorized personnel are not allowed to get close to batteries.
- Batteries may generate an extremely high short-circuit current due to short circuits. Therefore, take the following preventive measures before maintaining batteries:
 - Remove any metal objects from yourself, such as watches and rings.
 - Use only insulated tools.
- When replacing batteries, install the batteries of the same quantity and model as the old ones.
- Do not throw batteries into fire, which may cause explosion.
- Do not break down or damage batteries. The electrolyte will damage your skin and eyes once it leaks.
- When replacing fuses, use the fuses with the same model and specifications as the old ones to avoid fire disaster.
- Do not disassemble the UPS.

 CAUTION

- Electric shock risk. The UPS is still energized even if it is disconnected from the socket, because its internal components are still connected to embedded batteries.
 - Electric shock risk. The battery circuit is not disconnected from the input voltage. It is possible to have a dangerous voltage between the battery terminal and the ground cable. Therefore, ensure that no voltage exists before touching the UPS interior.
-

2 Overview

2.1 Model Description

This document discusses the following UPS models, as shown in [Table 2-1](#).

Table 2-1 UPS models

Model	Represented By	Remarks
UPS2000-G-1KRTS	1 K-standard model-rack mounted-IEC	The two models are represented by 1 kVA in the description of their common features and parameters.
UPS2000-G-1KRTL	1 K-long backup time model-rack mounted-IEC	
UPS2000-G-2KRTS	2 K-standard model-rack mounted-IEC	The two models are represented by 2 kVA in the description of their common features and parameters.
UPS2000-G-2KRTL	2 K-long backup time model-rack mounted-IEC	
UPS2000-G-3KRTS	3 K-standard model-rack mounted-IEC	The two models are represented by 3 kVA in the description of their common features and parameters.
UPS2000-G-3KRTL	3 K-long backup time model-rack mounted-IEC	

[Figure 2-1](#) shows the UPS model number.

Figure 2-1 UPS model number

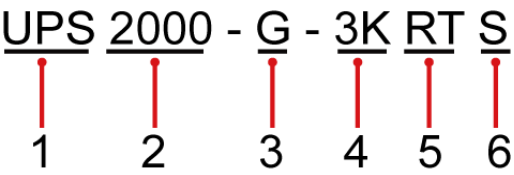


Table 2-2 describes the UPS model number.

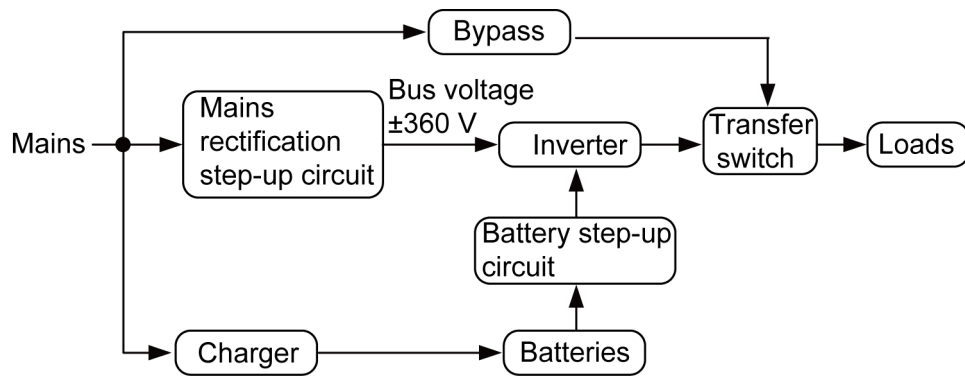
Table 2-2 UPS model number details

No.	Item	Description
1	Product category	UPS
2	Product family	2000: P (capacity) ≤ 20 kVA
3	Product series	- A: tower series - G: rack series
4	Output capacity Unit: VA	1K: 1 kVA 2K: 2 kVA 3K: 3 kVA
5	UPS type	- RT: rack- or tower-mounted UPS - TT: tower-mounted UPS
6	Built-in battery pack (optional)	- S: standard backup time model, which provides only a standard battery pack - L: long backup time model. You need to use an external large-capacity battery pack

2.2 Working Principle

Figure 2-2 shows the UPS conceptual diagram.

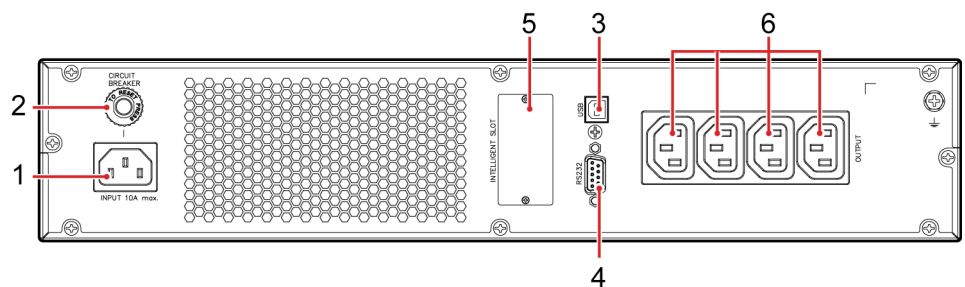
Figure 2-2 UPS conceptual diagram



2.3 Product Structure

Figure 2-3 to Figure 2-8 show the rear view of the 1 kVA, 2 kVA, and 3 kVA UPSs.

Figure 2-3 Rear view of UPS2000-G-1KRTS



(1) Mains input socket (C14)

(2) Input circuit breaker

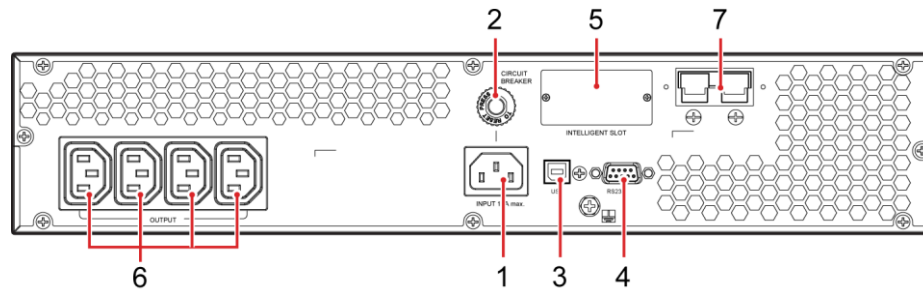
(3) Universal serial bus (USB) port (security protection mechanism supported)

(4) RS232 port

(5) Optional card slot

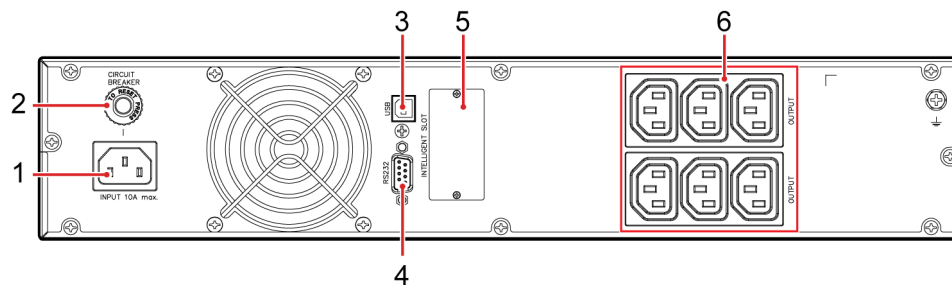
(6) Output socket (C13)

Figure 2-4 Rear view of UPS2000-G-1KRTL



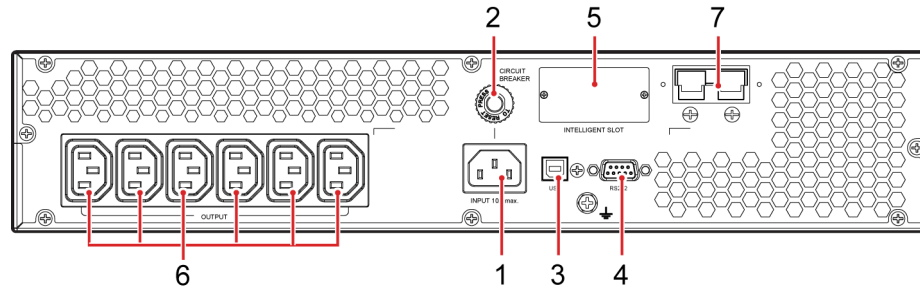
- | | |
|---|---------------------------|
| (1) Mains input socket (C14) | (2) Input circuit breaker |
| (3) USB port (security protection mechanism supported) | (4) RS232 port |
| (5) Optional card slot | (6) Output socket (C13) |
| (7) External battery connector (only for long backup time models) | |

Figure 2-5 Rear view of UPS2000-G-2KRTS



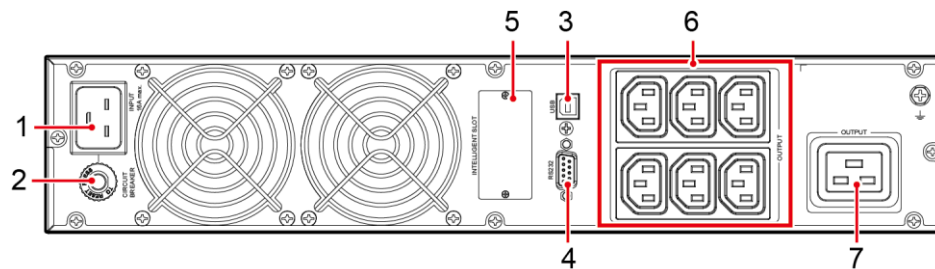
- | | |
|--|---------------------------|
| (1) Mains input socket (C14) | (2) Input circuit breaker |
| (3) USB port (security protection mechanism supported) | (4) RS232 port |
| (5) Optional card slot | (6) Output socket (C13) |

Figure 2-6 Rear view of UPS2000-G-2KRTL



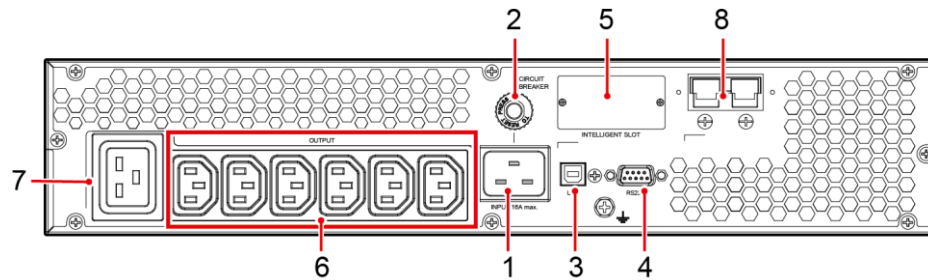
- | | |
|---|---------------------------|
| (1) Mains input socket (C14) | (2) Input circuit breaker |
| (3) USB port (security protection mechanism supported) | (4) RS232 port |
| (5) Optional card slot | (6) Output socket (C13) |
| (7) External battery connector (only for long backup time models) | |

Figure 2-7 Rear view of UPS2000-G-3KRTS



- | | |
|--|---------------------------|
| (1) Mains input socket (C20) | (2) Input circuit breaker |
| (3) USB port (security protection mechanism supported) | (4) RS232 port |
| (5) Optional card slot | (6) Output socket (C13) |
| (7) Output socket (C19) | |

Figure 2-8 Rear view of UPS2000-G-3KRTL



- | | |
|--|---|
| (1) Mains input socket (C20) | (2) Input circuit breaker |
| (3) USB port (security protection mechanism supported) | (4) RS232 port |
| (5) Optional card slot | (6) Output socket (C13) |
| (7) Output socket (C19) | (8) External battery connector (only for long backup time models) |

2.4 Optional Components

Optional Component	Model	Function	Remarks
Ambient temperature and humidity sensor	ENR1DETA MODULE	Measures the UPS ambient temperature (0–50°C) and humidity (0%–100% RH).	Used together with an SNMP card.
Battery pack	ESS-36V12-9*2AHBPV BB01	Contains two battery strings. Each string contains three 9 Ah/12 V DC batteries. The output voltage of the battery pack is 36 V DC.	Applicable to the 1 kVA UPS with long backup time.
	ESS-72V12-9AHBPVBB 01	Contains one battery string with six 9 Ah/12 V DC batteries. The output voltage of the battery pack is 72 V DC.	Applicable to the 2 kVA UPS with long backup time.
	ESS-96V12-9AHBPVBB 02	Contains one battery string with eight 9 Ah/12 V DC batteries. The output voltage of the battery pack is 96 V DC.	Applicable to the 3 kVA UPS with long backup time.

Optional Component	Model	Function	Remarks
SNMP card	RMS-SNMP01B	Monitors the UPS and provides the Ethernet networking solution. It also enables ambient temperature and humidity detection.	None
Modbus card	RMS-MODBUS01B	Provides two cascaded RJ45 ports to implement networking over the Modbus or YDN-23 protocol.	None
Dry contact card	RMS-RELAY01B	Provides dry contact signals and manages the UPS remotely.	None
External dry contact card	RMS-RELAY02B	Provides dry contact signals and monitors the UPS remotely.	Used together with an SNMP card.
External charger	CHG-36V15A-01B	Connects the battery pack or rack to the mains and charges the batteries or battery pack.	Applicable to the 1 kVA UPS with long backup time.
	CHG-72V12A-01B		Applicable to the 2 kVA UPS with long backup time.
	CHG-96V10A-01B		Applicable to the 3 kVA UPS with long backup time.
High-voltage protector	OVCD-230V16A-01B	The OVCD is connected between the mains and the UPS input. If the mains voltage is abnormally high, the OVCD actively disconnects the L wire between the mains input and UPS to prevent the abnormally high voltage from flowing into the UPS and damaging the UPS. In addition, the OVCD provides extra input surge voltage absorbing capability and input	None

Optional Component	Model	Function	Remarks
		filtering capability.	
Guide rail component	None	Secures the UPS or battery pack.	Configured in rack-mounted scenarios.

3 Installing the UPS

3.1 Installation Preparations

Floor Loading Capacity

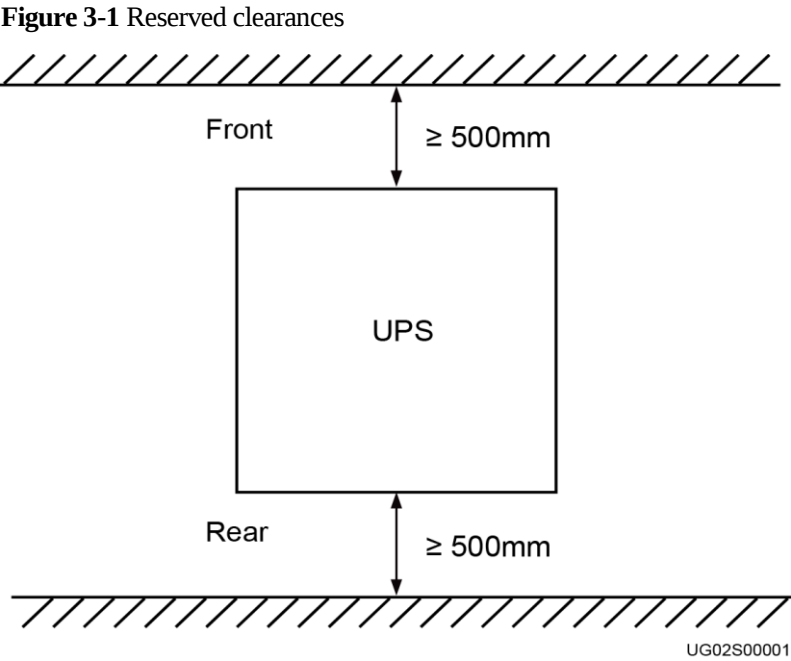
The floor can bear the weight of the UPS and its optional components. In the case of rack installation, ensure that the floor can also bear the weight of the rack.

Installation Requirements

- Do not install the UPS in high temperature, low temperature, and damp areas.
- The installation position is far away from water sources, heat sources, and inflammable materials. The UPS is free from direct sunlight, dust, volatile gases, corrosive materials, and salty air.
- Do not install the UPS in environments with conductive metal scraps in the air.
- The optimal operating temperatures for batteries are 20–30°C. Operating temperatures higher than 30°C shorten the battery lifespan, and operating temperatures lower than 20°C reduce the battery backup time.

Dimensions

- The space allocated for UPS installation has the combined dimensions of the UPS and its input and output socket installed on the rear panel. The depth of the space is the depth of the UPS plus about 100 mm.
- Reserve a clearance of at least 500 mm respectively from the front and rear panels of the UPS to the wall or adjacent equipment to facilitate ventilation and heat dissipation.



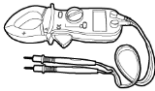
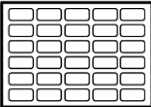
3.2 Tools

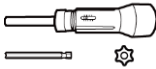
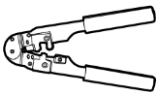
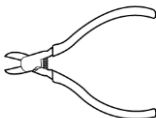
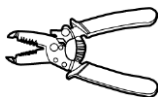
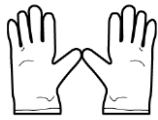
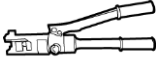
NOTICE

Get tools insulated to prevent electric shocks.

Table 3-1 lists the tools that may be used during installation.

Table 3-1 Tools

Appearance, Specifications, and Name			
Clamp meter	Multimeter	Labels	Phillips screwdriver (PH2 x 150 mm or PH3 x 250 mm)
			
Flat-head screwdriver (2 mm x 80 mm)	Torque screwdriver	Crimping tool	Diagonal pliers

Appearance, Specifications, and Name			
			
Wire stripper	Polyvinyl chloride (PVC) insulation tape	Cotton cloth	Brush
			
Heat shrink tubing	Heat gun	Electrician's knife	Protective gloves
			
Electrostatic discharge (ESD) gloves	Insulation gloves	Hydraulic pliers	Cable tie
			

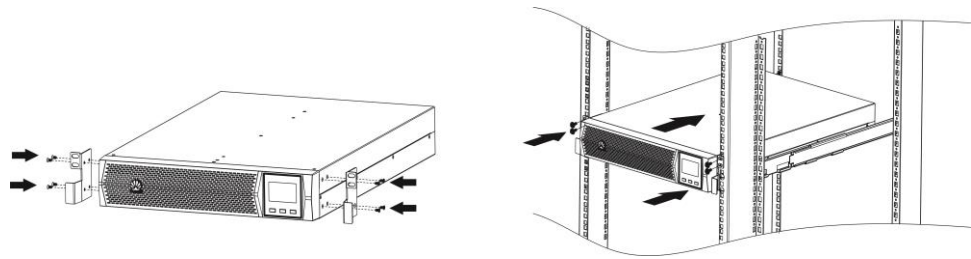
3.3 Installing UPS

The UPS can be installed on a desk or in a 19-inch rack. 1 kVA UPS, 2 kVA UPS, and 3 kVA UPS need 2 U space separately. The installation method for 1 kVA UPS, 2 kVA UPS and 3 kVA UPS are the same. The figures in this chapter based on the 3 kVA UPS.

Rack-mounting a UPS

1. Take out mounting brackets from the fitting bag, and install mounting brackets on UPS.
2. Install guide (2 U) on the Cabinet. Then Place the UPS on the guide rails.

Figure 3-2 Rack-mounting the UPS



Tower-mounting a UPS

1. Remove the UPS front panel.
2. Rotate the control panel 90 degrees clockwise.
3. Rotate the logo 90 degrees clockwise on the front panel. Reinstall the front panel.
4. Assemble support bases. The minimum distance between two support bases should be 150 mm.
5. Place UPS on the support bases in sequence.
6. Adjust the UPS and the support bases to be horizontally.

Figure 3-3 Tower-mounting the UPS

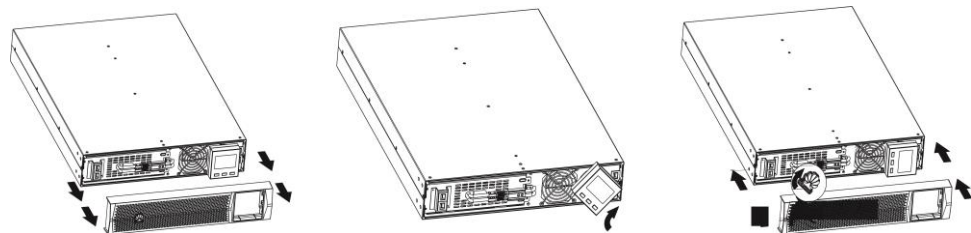
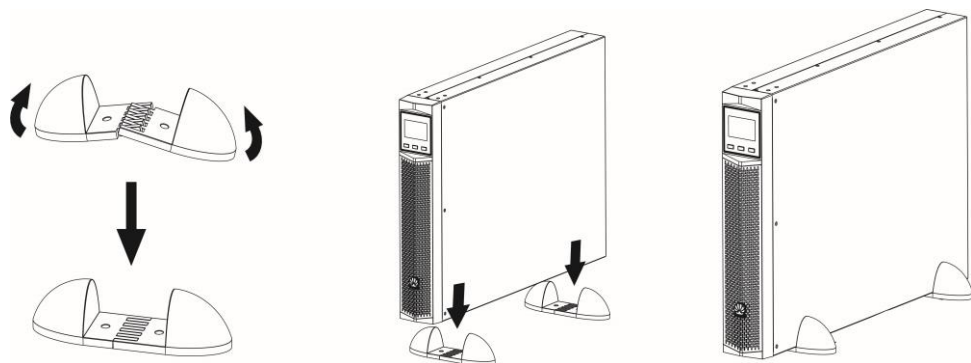


Figure 3-4 Tower-mounting the UPS



3.4 Installing Cables

1. Connect the UPS output power cable.

For socket-type output, connect loads to the UPS output sockets. When a power failure occurs, the UPS automatically supplies power to the loads.

Figure 3-5 Connecting cables to the 1KRTS UPS output

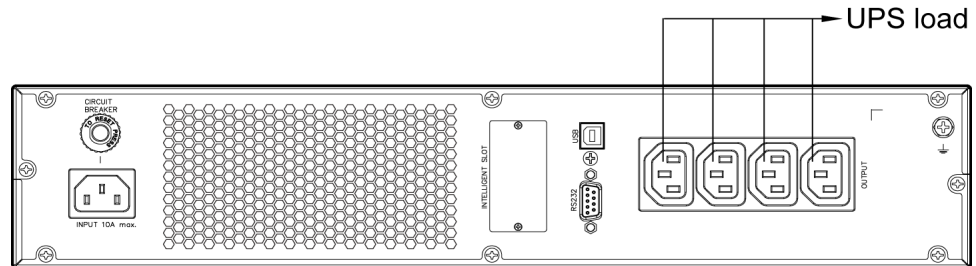


Figure 3-6 Connecting cables to the 1KRTL UPS output

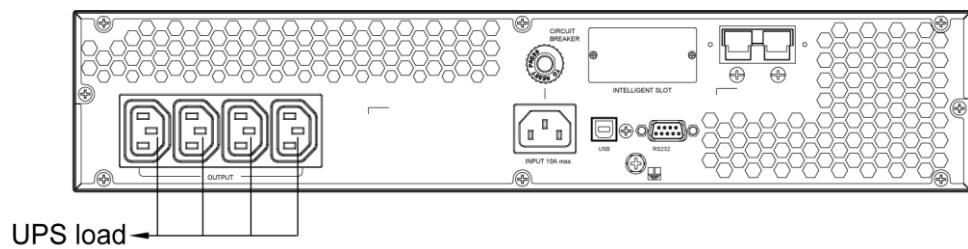


Figure 3-7 Connecting cables to the 2KRTS UPS output

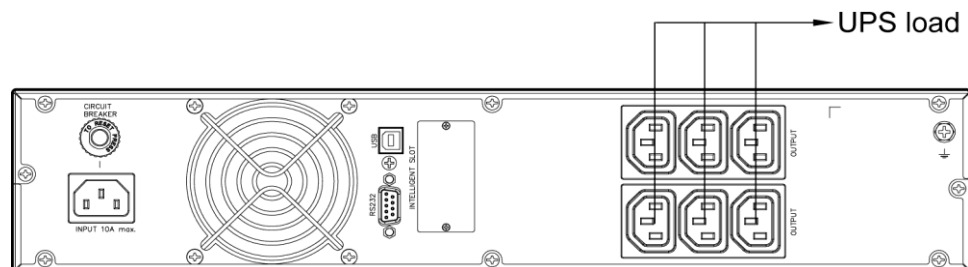


Figure 3-8 Connecting cables to the 2KRTL UPS output

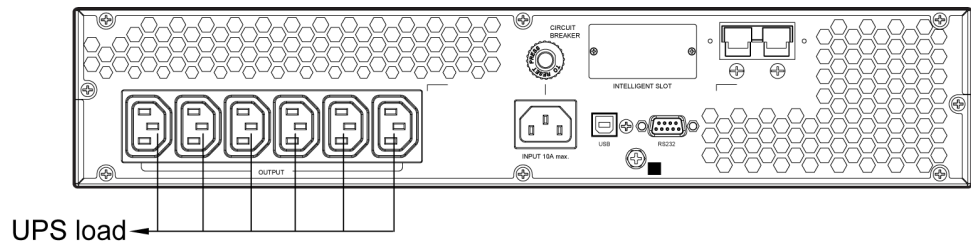


Figure 3-9 Connecting cables to the 3KRTS UPS output

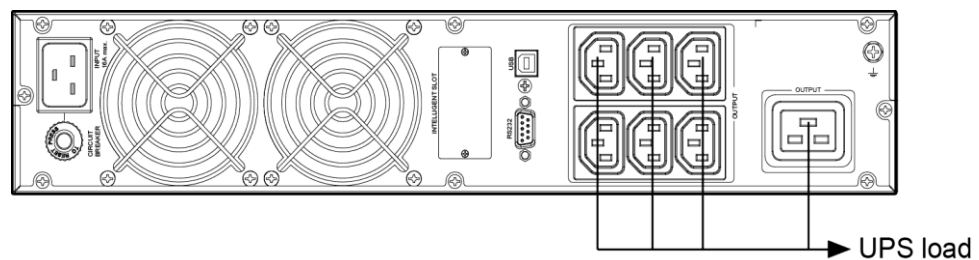
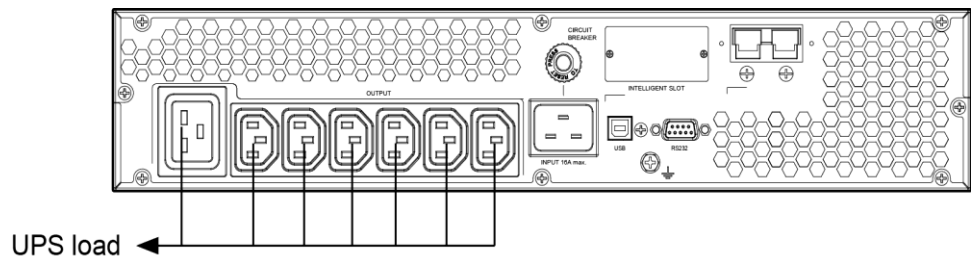
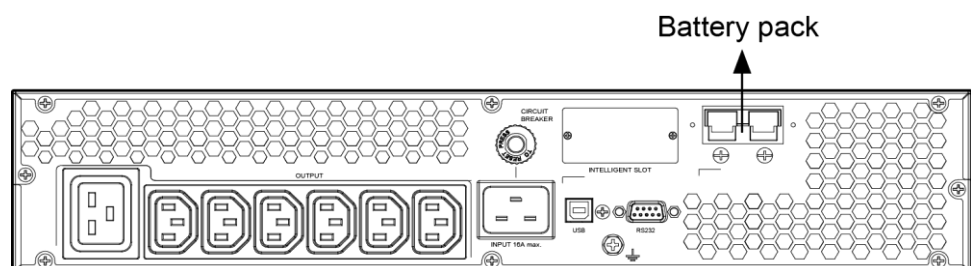


Figure 3-10 Connecting cables to the 3KRTL UPS output



2. Connecting battery power cables to a long backup time model. (The step is optional for long backup time model, the standard model with built-in batteries cannot support external batteries.)

Figure 3-11 Connecting cables to the 3 kVA UPS battery pack



 NOTE

- If the 1 kVA UPS with long backup time needs to connect to external battery strings, each battery string must consist of three 12 V batteries connected in series. If the 2 kVA UPS with long backup time needs to connect to external battery strings, each battery string must consist of six 12 V batteries connected in series. If the 3 kVA UPS with long backup time needs to connect to external battery strings, each battery string must consist of eight 12 V batteries connected in series.
 - The UPS with long backup time provides a charge current of 4 A and the current is not configurable. If the UPS needs to connect to battery packs or battery strings, the total battery capacity must exceed 18 Ah. Otherwise, batteries may be damaged. If the capacity of external battery packs or battery strings to be connected exceeds 40 Ah, it is recommended that an external charger be purchased to increase the charge current. If an external charger is not purchased, the charge time will be long.
 - The battery pack (ESS-36V12-9*2AHBPVBB01) for 1 kVA UPS with long backup time contain two group battery strings. The battery pack (ESS-72V12-9AHBPVBB01) for 2 kVA UPS with long backup time only contain one group battery strings. The battery pack (ESS-96V12-9AHBPVBB02) for 3 kVA UPS with long backup time only contain one group battery strings.
 - The 1 kVA UPS with long backup time is allowed a maximum of two battery packs (ESS-36V12-9*2AHBPVBB01) in parallel. The 2 kVA UPS with long backup time is allowed a maximum of four battery packs (ESS-72V12-9AHBPVBB01) in parallel. The 3 kVA UPS with long backup time is allowed a maximum of four battery packs (ESS-96V12-9AHBPVBB02) in parallel.
3. Install the optional communication card to the UPS. The installation method for 1 kVA UPS, 2 kVA UPS, and 3 kVA UPS are the same. The figures below based on the 3 kVA UPS.

Figure 3-12 Installing an optional card on the 3KRTS UPS

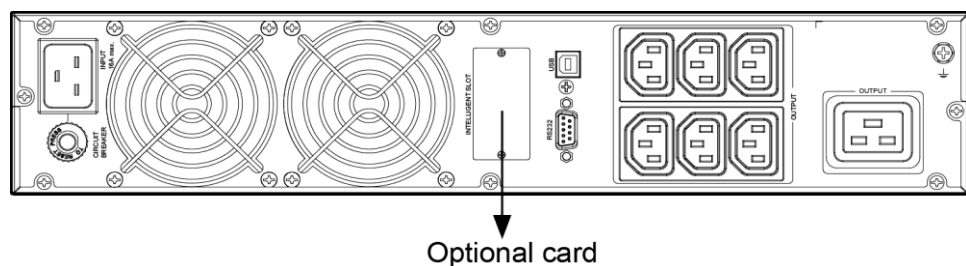
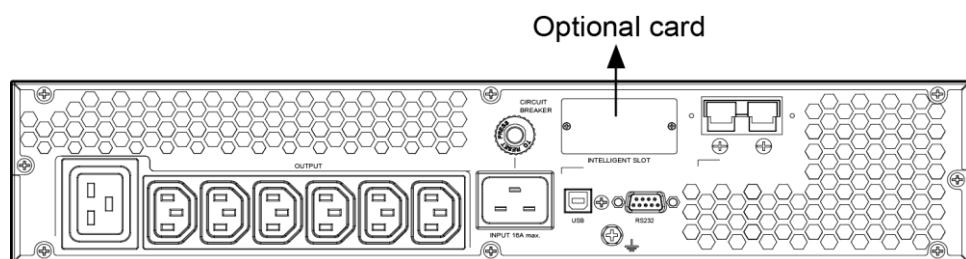


Figure 3-13 Installing an optional card on the 3KRTL UPS



 NOTE

The UPS provides an optional smart slot to support the SNMP card, dry contact card, or Modbus card. Any of the three types of cards offers advanced communication functions and various monitoring options.

4. Connect the UPS to a PC.
- Connect the UPS to the RS232 or USB port on a PC. Then you can monitor the UPS status using the PC as long as you have installed the monitoring software. The

installation method for 1 kVA UPS, 2 kVA UPS, and 3 kVA UPS are the same. The figures below based on the 3 kVA UPS.

Figure 3-14 Connecting communications cables to the 3KRTS UPS

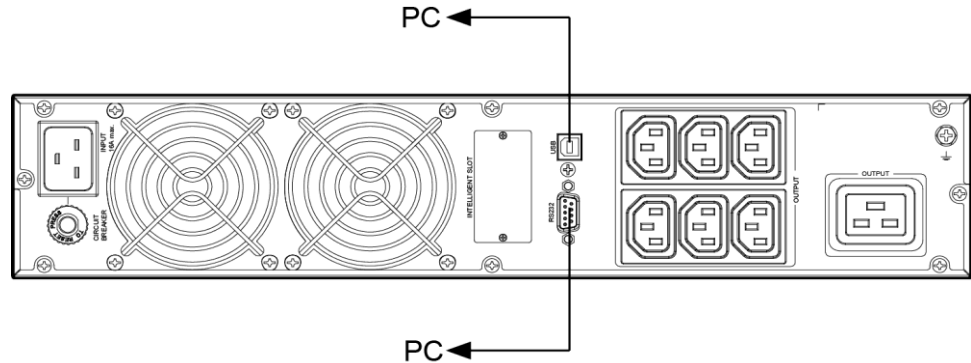
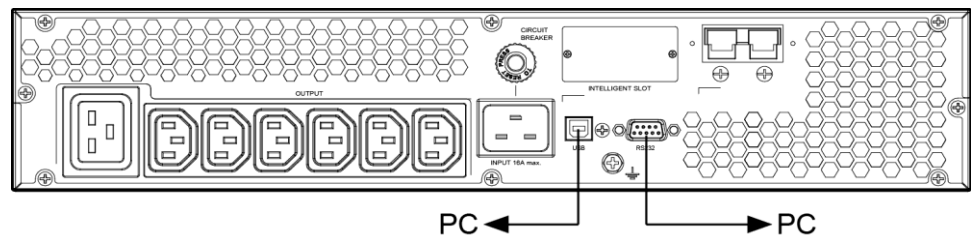


Figure 3-15 Connecting communications cables to the 3KRTL UPS



NOTE

- The USB channel supports a serial data communications protocol between the UPS and the PC.
 - If you connect a DB9 connector to the RS232 port, the UPS can communicate with the PC over serial data.
 - The UPS support either USB or RS232.
 - To monitor the UPS over a PC, need to install the monitoring software iManager NetEco 1000U.
5. Take out input power cables from the fitting bag, and connect mains input power cables to the UPS.

Figure 3-16 Connecting cables to the 1KRTS UPS input

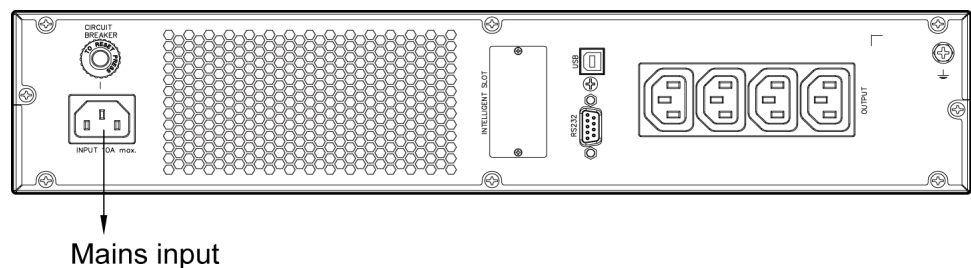


Figure 3-17 Connecting cables to the 1KRTL UPS input

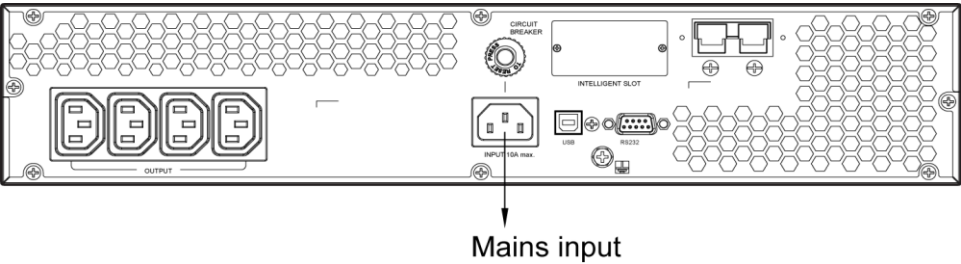


Figure 3-18 Connecting cables to the 2KRTS UPS input

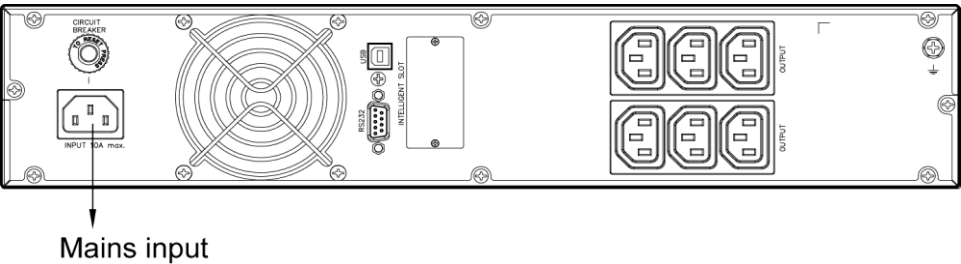


Figure 3-19 Connecting cables to the 2KRTL UPS input

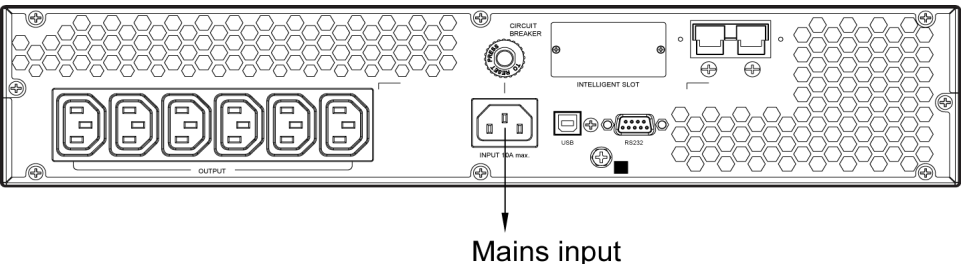


Figure 3-20 Connecting cables to the 3KRTS UPS input

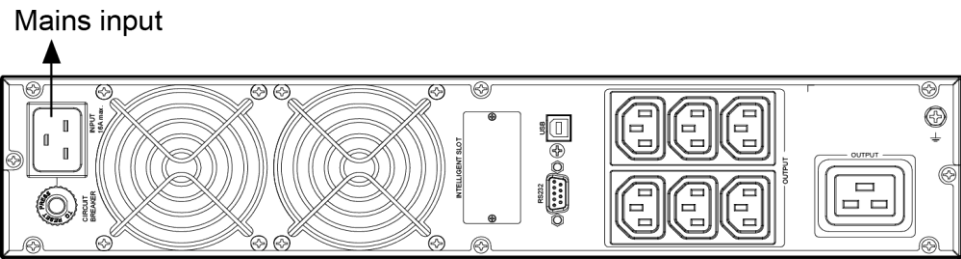
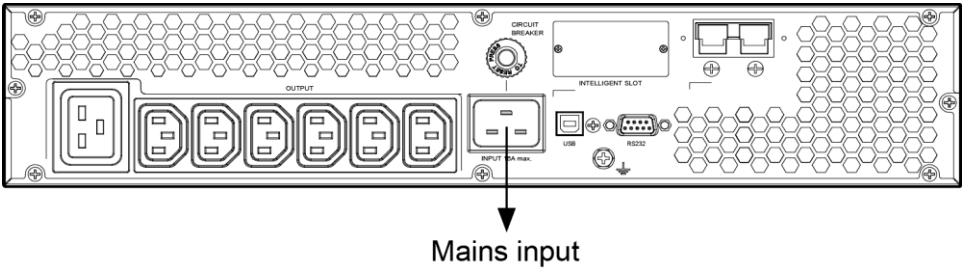


Figure 3-21 Connecting cables to the 3KRTL UPS input



3.5 Installation Verification

Table 3-2 gives the installation verification checklist.

Table 3-2 Installation verification checklist

No.	Item	Acceptance Criterion
1	Cable routing	Cable routing meets engineering requirements.
2	Cable connections	Power cables and battery cables are tightened to specified torques using a torque wrench, connected correctly, and free of damage.
3	Cable connections for USB ports and network ports	Cables to USB ports and network ports are connected correctly and securely.
4	Cable labels	Labels are neatly attached to both ends of each cable, and the information on the labels is concise and understandable.
5	Ground cable connection	The ground cable is securely connected to the equipment room ground bar. Measure the resistance between the UPS ground cable and the equipment room ground bar, which must be less than 0.1 ohm.
6	Distances between cable ties	Distances between cable ties are the same, and no burr exists.
7	Operating environment	Clean the conductive air and other sundries.

4 Setting Control Panel

4.1 LCD Panel

The control panel is on the UPS front panel. The control panel allows you to control and operate the UPS, view the running status, set parameters, and view alarms.

Figure 4-1 LCD panel

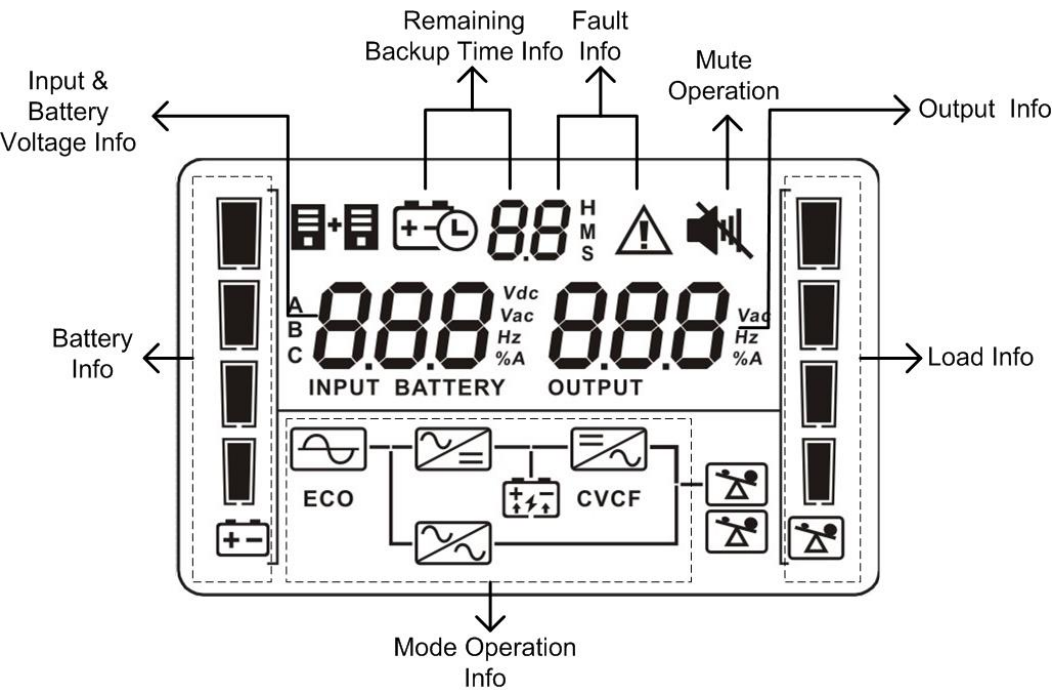
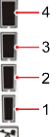
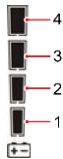


Table 4-1 Icon description

Icon	Function
Backup time information	
	Alternately displays the remaining power backup time, alarm ID, and CF (only displays in frequency conversion

Icon	Function
	mode) in digits. H: hour; M: minute; S: second
Frequency conversion mode information	
	Displays that the UPS is in frequency conversion mode.
Alarm information	
	Indicates that an alarm occurs.
	Indicates the warning or alarm ID.
Muting	
	Mutes the UPS.
Output information	
	Displays the output voltage, frequency, or battery voltage. Vac: output voltage; Hz: output frequency; %: output load ratio; A: output current
Load information	
	 Displays the current load percentage by level: • [0–25%]: Indicator 1 is steady on. • (25%–50%]: Indicators 1 and 2 are steady on. • (50%–75%]: Indicators 1, 2 and 3 are steady on. • (75%–100%]: Indicators 1, 2, 3 and 4 are steady on. • > 100%: Indicators 1, 2, 3 and 4 are blink.
Mode operating information	
	Indicates that the UPS has connected to the mains.
	Indicates that batteries are supplying power.
	Indicates that batteries are being charged.
	Displays that the UPS is in bypass mode.
ECO	Displays that the UPS is in ECO mode.
	Indicates that the frequency conversion circuit is working.
	Displays that the output socket is delivering power output.

Icon	Function
Battery information	
	 Displays the current battery capacity by level: • [0–25%]: Indicator 1 is steady on. • (25%–50%]: Indicators 1 and 2 are steady on. • (50%–75%]: Indicators 1, 2 and 3 are steady on. • (75%–100%]: Indicators 1, 2, 3 and 4 are steady on. • > 100%: Indicators 1, 2, 3 and 4 are blink.
Input voltage information	
	Displays the input voltage, frequency, battery voltage, or input current percentage. Vac: input voltage; Vdc: battery voltage; Hz: input frequency; %A: battery capacity percentage.

4.2 Buzzer Alarm Tones

Table 4-2 describes the buzzer alarm tones.

Table 4-2 Buzzer alarm tone description

Alarm type	Buzzer alarm tone
Battery mode	Beeps once every 4 seconds.
Minor alarm	Beeps once every second.
Overload	Beeps twice every second.
Critical alarm	Buzzes continuously.
Bypass mode	Beeps once every 10 seconds.

4.3 Character Display

Table 4-3 Character display description

Acronym	Display	Description
---------	---------	-------------

Acronym	Display	Description
ENA	ENR	Enable
DIS	di S	Disable
ESC	ESC	Escape
CF	CF	Frequency conversion
TP	TP	Temperature
CH	CH	Charging
FU	FU	Bypass frequency unstable
EE	EE	EEPROM error
VOT	VOT	Voltage
FRE	FRE	Frequency
BVU	BVU	Bypass overvoltage
BVL	BVL	Bypass undervoltage
CAP	CAP	Capacity
DT	DT	Discharge time
ECO	ECO	ECO mode
VU	VU	High voltage
VL	VL	Low voltage
AUT	AUT	Constant-frequency mode
BUZ	BUZ	Buzzer off
AST	AST	Automatic startup
DHP	DHP	Dynamic Host Configuration Protocol (DHCP)
IP ADS	IP ADS	IP address
SUB NET	SUBNET	Subnet mask
GAT UAY	GATWAY	Gateway
NBA	NBA	No battery alarm disabled

4.4 Buttons

The control panel provides three buttons to start and shut down the UPS, and view and set parameters. Table 4-4 describes the three buttons.

Figure 4-2 Schematic Buttons



Table 4-4 Button description

Button	Function
ON/MUTE	- Starting the UPS: Hold down ON/MUTE for over 5 seconds to connect the UPS power supply. - Cold-starting the UPS using batteries: Hold down ON/MUTE for less than 15 seconds to start the UPS inverter. - Enabling or disabling the buzzer: Hold down ON/MUTE for 2–5 seconds to enable or disable the buzzer. However, when the UPS sends a new alarm, the mute function is unavailable, you need to disable the buzzer again. - Selecting the previous option: During the setting of UPS parameters, press ON/MUTE for more than 3 seconds. Release the button when you hear a beep sound to select the previous option. - Transferring to battery self-check: In normal mode, ECO mode, or frequency conversion mode, hold down ON/MUTE for more than 5 seconds to enter the battery self-check test.
OFF/ENTER	- Shutting down the UPS: Hold down OFF/ENTER for over 2 seconds to turn off the UPS in battery mode. If the UPS is originally in normal mode, hold down this button will enable the UPS to enter the standby mode or bypass mode (if set or enabled before). - Confirming setting: During the setting of UPS parameters, press

Button	Function
	OFF/ENTER for more than 3 seconds to confirm the setting. Manually clearing alarms: When an alarm that can be manually cleared exists, hold down OFF/ENTER for over 2 seconds to manually clear the alarm.
SELECT	- Setting UPS parameters: - When the UPS is in standby mode or bypass mode, hold down SELECT for 5 seconds to start setting UPS parameters. Press ON/MUTE or SELECT to switching LCD display. 10 seconds after the button is released, the default display returns. - When the UPS is in normal mode or battery mode, hold down SELECT for 5 seconds to start setting only for 11 UPS buzzer parameters. - Selecting the next option: During the setting of UPS parameters, press SELECT for more than 3 seconds. Release the button when you hear a beep sound to select the next option. - In normal mode, press SELECT twice and ensure that the pressing time is less than 3 seconds each time. Then you can view the input, output, and battery information.
ON/MUTE+ SELECT	- Transferring to bypass mode: When the input power supply is normal and the UPS is started in normal mode, hold down ON/MUTE and SELECT both for 5 seconds to enable the UPS enter the bypass mode. If the input voltage exceeds the acceptable range or the UPS is in frequency conversion mode, the UPS will not enter the bypass mode. - Bypass mode: When the UPS is in bypass mode, hold down ON/MUTE and SELECT both for 5 seconds to enable the UPS enter the invert mode. - Exiting parameter setting screens: Hold down ON/MUTE and SELECT both for 0.5 seconds to exit parameter setting screens. - Exiting cause ID screen: Hold down ON/MUTE and SELECT both for 0.5 seconds to exit alarm cause ID screen.
SELECT+O FF/ENTER	Entering alarm cause ID screen: Hold down SELECT and OFF/ENTER both for 5 seconds to enter the alarm cause ID screen. Press ON/MUTE to view the previous option. Press SELECT to view the next option.

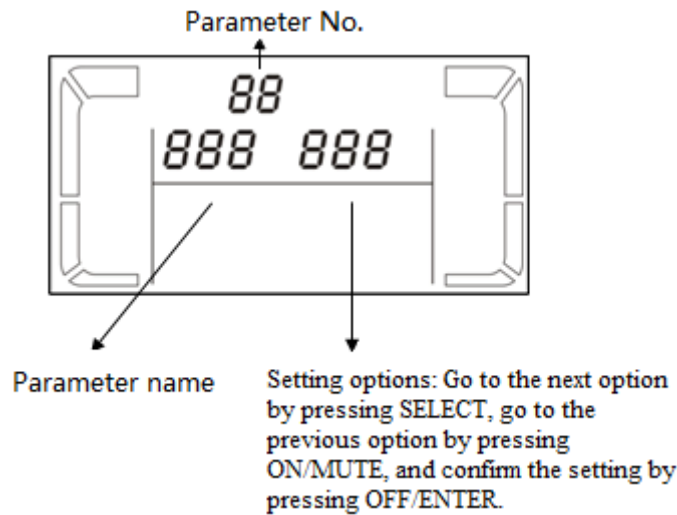
4.5 Setting Parameters

NOTICE

The user interface (UI) snapshots in this document are taken from the software version UPS2000V200R001C01SPC300 (V2R1C1SPC30 is displayed on the NetEco; you can query the version information by choosing **Maintenance > Current Version**).

There are seventeen configurable parameters on the LCD. The following figures show the parameter setting screens.

Figure 4-3 Setting parameters on the LCD



When the UPS is in standby mode or bypass mode, hold down **SELECT** for 5 seconds to start setting UPS parameters.

When the UPS is in normal mode or battery mode, hold down **SELECT** for 5 seconds to enable or disable the buzzer off (BUZ) function, set the DHCP (DHP) function, or view the IP address (IP), subnet mask (SUB), and gateway (GAT).

During the setting of UPS parameters, press **ON/MUTE** for more than 3 seconds. Release the button when you hear a beep sound to select the previous option. During the setting of UPS parameters, press **SELECT** for more than 3 seconds. Release the button when you hear a beep sound to select the next option. Press **OFF/ENTER** for more than 3 seconds to confirm the setting.

The following figures show the seventeen parameter setting screens.

- Set the output voltage.

Display	Setting
	The output voltage can be set as follows: 200: The output voltage is 200 V AC. 208: The output voltage is 208 V AC. 220: The output voltage is 220 V AC. 230: The output voltage is 230 V AC (default value). 240: The output voltage is 240 V AC.

- Enable or disable the frequency conversion mode.

Display	Setting
---------	---------

Display	Setting
	Enable or disable the frequency conversion mode. 50: The output frequency is always 50 Hz, and the frequency conversion mode is enabled. 60: The output frequency is always 60 Hz, and the frequency conversion mode is enabled. AUT: The frequency conversion mode is disabled (default value).



NOTE

The CF frequency conversion mode takes priority over the ECO mode. If the CF frequency conversion mode is enabled, the ECO mode cannot be enabled.

- Enable or disable the bypass mode.

Display	Setting
	Enable or disable the bypass function. ENA: Enables the bypass mode. DIS: Disables the bypass mode (default value).

- Set the highest input voltage in bypass mode.

Display	Setting
	Press ▼ or ▲ to adjust and set the highest input voltage in bypass mode. 230–264: The value range is 230 V AC to 264 V AC, and the default value is 264 V AC.



NOTE

The highest input voltage in bypass mode should be higher than the highest input voltage in ECO mode.

- Set the lowest input voltage in bypass mode.

Display	Setting
---------	---------

Display	Setting
	Press ▼ or ▲ to adjust and set the lowest input voltage in bypass mode. 170–220: The value range is 170 V AC to 220 V AC, and the default value is 170 V AC.



NOTE

The lowest input voltage in bypass mode should be lower than the lowest input voltage in ECO mode.

- Set the battery capacity.

Display	Setting
	Press ▼ or ▲ to adjust and set the UPS battery capacity. 18–999: Set the UPS battery capacity in the range of 18 Ah to 999 Ah. (The default value for standard model is 9 Ah and not configurable. The default value for long backup time model is 18 Ah.)

- Set the discharge time limit.

Display	Setting
	Set the backup time limit. 0–999: Set the battery backup time in battery mode. The value ranges from 0 minutes to 999 minutes. 0: The backup time limit is canceled (default value).

- Enable or disable the ECO mode.

Display	Setting
---------	---------

Display	Setting
	Enable or disable the ECO function. ENA: Enables the ECO mode. DIS: Disables the ECO mode (default value).

- Set the highest allowable voltage in ECO mode.

Display	Setting
	Press ▼ or ▲ to adjust and set the highest input voltage in ECO mode. 13–24: Set the parameter based on the preset output voltage. The value range is +13 V AC to +24 V AC. (The default value is +22 V AC.)

- Set the lowest allowable voltage in ECO mode.

Display	Setting
	Press ▼ or ▲ to adjust and set the lowest input voltage in ECO mode. 13–24: Set the parameter based on the preset output voltage. The value range is –13 V AC to –24 V AC. (The default value is –22 V AC.)

- Set the buzzer off function.

Display	Setting
	Enable or disable the buzzer off function. ENA: used to enable the buzzer off function. DIS: used to disable the buzzer off function. By default, the buzzer off function is disabled.

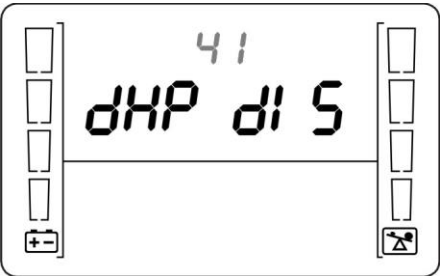
- Set the automatic startup function.

Display	Setting
	Enable or disable the automatic startup function. ENA: Enables the automatic startup function. DIS: Disables the automatic startup function (default value).

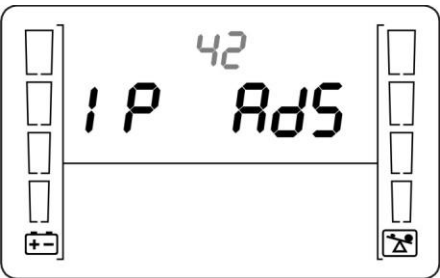
NOTICE

The DHCP function setting, IP address display, subnet mask display, and gateway display are available only when an SNMP card is configured. If no SNMP card is connected, default values are displayed for the IP address, subnet mask, and gateway. If an SNMP card is connected, the IP address, subnet mask, and gateway need to be set on the WebUI of the SNMP card.

- DHCP function setting

Display	Remarks
	Address allocation mode setting: ENA: enabled DIS: disabled (default value)

- IP address display

Display	Remarks
	UPS IP address: can only be displayed but not configurable. Press ▲ or ▼ to switch between different screens. On the ESC screen, press OFF/ENTER to exit. (The default value is 192.168.0.10.)

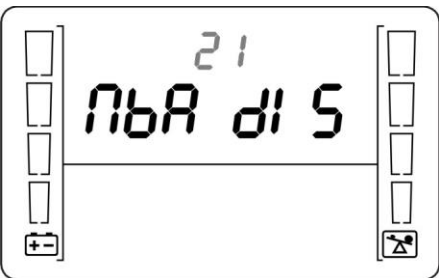
- Subnet mask display

Display	Remarks
	Subnet mask: can only be displayed but not configurable. Press ▲ or ▼ to switch between different screens. On the ESC screen, press OFF/ENTER to exit. (The default value is 255.255.255.0.)

- Gateway display

Display	Remarks
	Gateway: can only be displayed but not configurable. Press ▲ or ▼ to switch between different screens. On the ESC screen, press OFF/ENTER to exit. (The default value is 192.168.0.1.)

- No battery alarm disabled setting

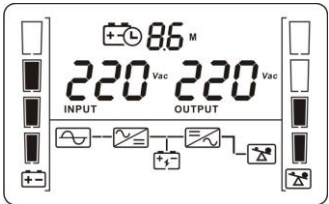
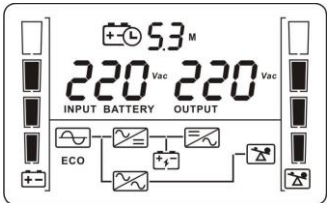
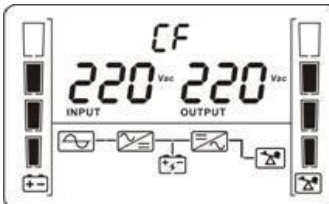
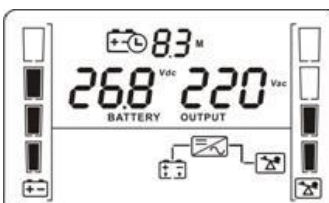
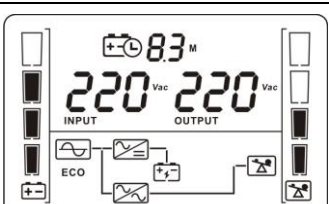
Display	Remarks
	No battery alarm disabled setting: ENA: Disables the function for reporting the no battery alarm. DIS: Enables the function for reporting the no battery alarm (default value).

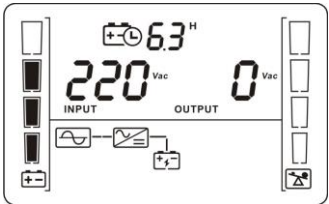
- Exit setting

Display	Remarks
	Exit from the parameter settings screen.

4.6 Operating Modes

Table 4-5 Operating mode description

Operating Mode	Description	Display
Normal mode	When the input voltage is in the acceptable range, the UPS works in normal mode, supplies stable sine wave AC output current, while charging batteries.	
ECO mode	When the input voltage is in the preset range, the UPS transfers to bypass mode to save energy.	
Frequency conversion mode	When the input frequency is in the acceptable range, the UPS sets the output frequency to 50 Hz or 60 Hz and, while charging batteries.	
Battery mode	When the input voltage is abnormal or an outage occurs, the UPS transfers to battery mode. The buzzer beeps once every 4 seconds. The UPS uses batteries to supply power.	
Bypass mode	When the UPS works in online mode and is overloaded, it will enter the bypass mode if the input voltage is in an acceptable range. If the UPS is set to be enables the bypass mode, the UPS automatically transfers to bypass mode after connecting to the mains. When the UPS works in bypass mode, the buzzer beeps once every 10 seconds.	

Operating Mode	Description	Display
Standby mode	When the UPS connects to the mains but is not started in normal mode or not enables the bypass mode, the UPS works in standby mode, in which it only charges batteries but does not deliver output.	

4.7 Alarm Handling



NOTE

When an alarm that can be manually cleared exists, hold down **OFF/ENTER** for over 2 seconds to manually clear the alarm.

Table 4-6 Alarms

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
10	1	Bypass voltage abnormal	Minor	This alarm is automatically cleared.	The bypass voltage is outside the scope.	The UPS remains in the current state. If the UPS works in bypass mode, it transfers to standby mode and has no output.	Possible cause: The bypass input voltage is abnormal. Measure: Check whether the bypass input voltage exceeds the configured range. If yes, change the range or wait until the bypass input recovers.
10	2	Bypass frequency abnormal	Minor	This alarm is automatically cleared.	The bypass frequency is outside the bypass frequency range.	The UPS remains in the current state. If the UPS works in bypass mode, it transfers to standby mode and has no output.	Possible cause: The bypass input frequency is abnormal. Measure: Check whether the bypass input frequency exceeds the configured range. If yes, change the range or wait until the bypass input

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
							recovers.
14	1	Startup timeout	Critical	This alarm must be manually cleared.	The inverter output voltage is not within ± 2 V of the rated output.	If this alarm is generated during the running of the UPS, the UPS transfers to bypass mode.	- Possible cause: The bypass loading capacity exceeds the rated load of the inverter. Measure: Reduce the output load, manually clear the alarm, and restart the UPS. - Possible cause: An internal fault has occurred. Measure: Contact the dealer or Huawei technical support.
			Minor	This alarm is automatically cleared.	Discharge ends for the UPS in battery mode, or the battery voltage is lower than the minimum startup voltage (11.28 V) for the UPS in normal mode.	The UPS fails to start.	Possible cause: The battery voltage is low or the batteries are damaged after EOD. Measure: Wait for the batteries to recover or contact the battery supplier to replace the batteries.
22	1	Battery disconnected	Minor	This alarm is automatically cleared.	Batteries are not connected, connected improperly, or damaged.	The power supply from the UPS is not affected.	Possible cause: No batteries are connected. Measure: Connect batteries.

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
							Possible cause: The batteries are in poor contact. Measure: Check the battery cable connection. If battery cables are loose, connect them securely.
25	1	Battery overvoltage	Critical	This alarm must be manually cleared.	The voltage of each battery exceeds 15 V (when the UPS is started).	This alarm is generated because there are more batteries than required. The impact is as follows: - If batteries are connected before the startup, the UPS fails to start. - If batteries are connected during the running of the UPS, the UPS transfers to bypass mode.	- Possible cause: The actual number of batteries does not meet requirements. Measure: Check that the actual number of batteries meets requirements. - Possible cause: The charger is abnormal. Measure: Check that the charger voltage is normal immediately after the batteries are disconnected.
			Minor	This alarm is automatically	The voltage of each	The UPS automatical	

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
				cleared after the UPS transfers to battery mode.	battery exceeds 14.7 V.	ly transfers to battery mode. When the battery undervoltage alarm is generated, the UPS automatically transfers to normal mode and starts the charger for charging.	
26	1	Battery undervoltage	Critical	This alarm must be manually cleared.	The voltage of each battery is lower than 5 V (when the UPS is started).	This alarm is generated because there are more batteries than required. The impact is as follows: - If batteries are connected before the startup, the UPS fails to start. - If batteries are connected during the running of the UPS, the UPS transfers to bypass	• Possible cause: The actual number of batteries does not meet requirements. Measure: Check that the actual number of batteries meets requirements. • Possible cause: The mains is abnormal, and the batteries are overdischarged. Measure: Connect to the mains in non-battery test state.

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
			Minor	This alarm is automatically cleared.	For standard model, the voltage of each battery is lower than 11.28 V. For long backup time model, the voltage of each battery is lower than 10.9 V.	mode. The power supply from the UPS is not affected.	
29	1	Battery requiring maintenance	Minor	This alarm is automatically cleared.	The battery voltage is lower than the battery replacement voltage (11 V) when batteries are in self-check mode.	The power supply from the UPS is not affected.	- Possible cause: The actual number of batteries does not meet requirements. Measure: Check that the actual number of batteries meets requirements. - Possible cause: The battery is damaged. Measure: Contact the dealer or Huawei technical support to replace batteries.
			Minor	This alarm is automatically cleared.	The voltage of each battery is lower than 5 V, or is higher than 15 V (when the UPS is not started).	The UPS remains in the current state and cannot start.	
30	1	Internal overtemperature	Minor	This alarm is automatically cleared.	The ambient temperature exceeds 50°C.	The UPS remains in the current state and cannot start.	Possible cause: The ambient temperature exceeds 50°C when the UPS is in standby mode. As a result, the UPS cannot start. Measure: Lower the ambient temperature at

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
							which the UPS works.
42	15	Internal fault	Critical	This alarm must be manually cleared.	The bus voltage is lower than 320 V.	This alarm is generated during the startup of the UPS. If this alarm is generated, the UPS fails to start.	Possible cause: The soft-start resistor is damaged. Measure: Contact the dealer or Huawei technical support for repair.
42	17	Internal fault	Critical	This alarm must be manually cleared.	The bus voltage is higher than 450 V.	If this alarm is generated during the running of the UPS, the UPS transfers to bypass mode.	- Possible cause: The mains has experienced a transient high voltage. Measure: Rectify the fault and restart the UPS. - Possible cause: The output supplies power to special loads such as the inductive and rectification loads. Measure: Check that the load types are supported by the UPS. - Possible cause: The hardware is damaged. Measure: Contact the dealer or Huawei technical support.
42	18	Internal fault	Critical	This alarm must be manually cleared.	The bus voltage is lower than	If this alarm is generated during the	Possible cause: The hardware

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
				cleared.	260 V.	running of the UPS, the UPS transfers to bypass mode.	is damaged. Measure: Contact the dealer or technical support. Possible cause: An overload occurred when the input voltage was low. Measure: Rectify the fault and restart the UPS.
42	24	Internal fault	Minor	This alarm is automatically cleared.	An error occurs in the EEPROM.	All UPS parameters are restored to the factory settings. If this alarm is generated, the customer needs to replace the UPS.	Possible cause: The EEPROM is faulty. Measure: Contact the dealer or Huawei technical support.
42	27	Internal fault	Critical	This alarm must be manually cleared.	The inverter voltage is higher than 1.15 times the rated output voltage.	If this alarm is generated during the running of the UPS, the UPS transfers to bypass mode.	Possible cause: The inverter is faulty. Measure: Contact the dealer or Huawei technical support.
		Internal fault	Critical	This alarm must be manually cleared.	The inverter output voltage is lower than 75% of the rated output voltage, and the output current is	If this alarm is generated during the running of the UPS, the UPS transfers to bypass mode.	

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
					lower than 60% of the rated output current.		
42	28	Internal fault	Critical	The first three alarms are cleared automatically in 10 minutes. Later alarms, if generated, must be cleared manually.	The inverter output voltage is lower than 100 V.	If this alarm is generated during the running of the UPS, the UPS transfers to no output. After 10 minutes, the UPS automatically starts the inverter. If this alarm persists, the UPS then transfers to no output again. After the UPS transfers to no output three times, the alarm needs to be manually cleared.	• Possible cause: The output load types are not supported or the load exceeds the specifications. Measure: Check whether the load types are supported and reduce the output load. Then, manually clear the alarm and restart the UPS. • Possible cause: The inverter is faulty. Measure: Contact the dealer or Huawei technical support. • Possible cause: The output is short-circuited. Measure: Check whether the output is short-circuited.
42	31	Internal fault	Critical	This alarm must be manually cleared.	The difference between the absolute value of the positive bus voltage and that of the negative bus voltage is	If this alarm is generated during the running of the UPS, the UPS transfers to bypass mode.	• Possible cause: The hardware is damaged. Measure: Contact the dealer or Huawei technical support.

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
					100 V.		Possible cause: The UPS supplies power to half-wave loads. Measure: Check that the load types are supported by the UPS.
42	32	Internal fault	Critical	This alarm must be manually cleared.	The ambient temperature exceeds 50°C	The UPS transfers to bypass mode. When the temperature decreases, the UPS automatically starts and clears this alarm. If this alarm is generated three times within 3 hours, the UPS does not start or clear the fault.	- Possible cause: The ambient temperature exceeds 50°C. Measure: Lower the ambient temperature. - Possible cause: Air channels are blocked. Measure: Keep the air intake and exhaust vents of the UPS unblocked. - Possible cause: The fan is abnormal. Measure: Clean up the foreign matter around the fan. If the alarm persists, contact the dealer or Huawei technical support.
42	36	Internal fault	Minor	This alarm is automatically cleared.	The charger has no output.	The power supply from the UPS is not affected.	Possible cause: The internal connection of the charger is abnormal. Measure: Contact the dealer or

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
							Huawei technical support.
42	42	Internal fault	Critical	This alarm must be manually cleared.	The voltage of each battery decreases to below 10 V when the charger has no output and the UPS inverter is started.	The UPS transfers to bypass mode.	Possible cause: The charger switching transistor is faulty. Measure: Contact the dealer or Huawei technical support.
66	1	Output overload	Minor	This alarm is automatically cleared.	The inverter output load is more than 105% of the rated load.	The power supply from the UPS is not affected.	Possible cause: The load exceeds the rated loading capacity of the inverter. Measure: Lower the load or replace the UPS with a UPS with a larger capacity.
66	2	Output overload	Minor	This alarm is automatically cleared.	The bypass output load is more than 110% of the rated load.	The power supply from the UPS is not affected.	Possible cause: The load exceeds the rated loading capacity of the bypass. Measure: Lower the load or replace the UPS with a UPS with a larger capacity.
66	3	Output overload	Critical	This alarm must be manually cleared.	- In battery mode, this alarm is generated when the load exceeds the rated load. - In normal mode, when the bypass	- For battery mode, the UPS transfers to no output mode. - If the UPS transfers from normal mode to	Possible cause: The load exceeds the rated loading capacity of the inverter. Measure: Lower the load or replace the UPS with a UPS with a larger capacity.

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
					input is normal, this alarm is generated when the UPS transfers to normal mode three times within 20 minutes after the UPS transfers from normal mode to bypass mode. In normal mode, when the bypass input is abnormal, this alarm is generated when the UPS transfers to no output mode.	bypass mode three times within 20 minutes, the UPS is locked in bypass mode. For normal mode, the UPS transfers to no output mode.	
66	4	Output overload	Critical	This alarm must be manually cleared.	The bypass overload exceeds the time limit.	The UPS transfers to no output.	Possible cause: The load exceeds the rated load of the bypass. Measure: Reduce the load or replace the UPS with a UPS with a larger capacity.
158	1	On bypass	Minor	This alarm is automatically cleared.	The UPS transfers to bypass	If the bypass is abnormal,	Possible cause: The inverter is not started.

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
					mode.	the UPS may power off.	Measure: Check whether other alarms are generated. If other alarms are generated, handle these alarms according to the handling methods. If other alarms are not generated, manually start the UPS. • Possible cause: The load exceeds the rated loading capacity of the inverter. Measure: Reduce the load or replace the UPS with a larger-capacity UPS.
159	1	On battery	Minor	This alarm is automatically cleared.	The UPS transfers to battery mode.	The UPS may power off if batteries are abnormal.	• Possible cause: The mains input is abnormal. Measure: Check the mains input. If the mains input is abnormal, wait for the mains to recover. • Possible cause: The battery self-check is in progress. Measure: Check whether the battery self-check is in

Alarm ID	Alarm Cause ID	Alarm Name	Alarm Severity	Alarm Clear Mode	Trigger Condition	Impact on the System	Repair Proposal
							progress.
9E	1	On bypass	Minor	This alarm is automatically cleared.	- The inverter is not started. - The load power exceeds the rated inverter loading capability. - The temperature exceeds the rated temperature.	If the bypass is abnormal, the UPS may power off.	- Check whether other alarms are generated. If other alarms are generated, clear them. - If there are no other alarms, start the inverter manually.
9F	1	On battery	Minor	This alarm is automatically cleared.	The mains input is abnormal.	When the UPS works in battery mode, the UPS may power off if the batteries are abnormal.	Check the mains input. If the mains input is abnormal, wait until the mains input recovers.

4.8 Alarm Indication

Table 4-7 Alarm indication

Alarm	Display (Blinking)	Buzzer
Insufficient battery capacity		Beeps once every second.
Overload		Beeps twice every second.
Battery disconnection		Beeps once every second.

Alarm	Display (Blinking)	Buzzer
Overcharge		Beeps once every second.

5 Operations

5.1 Checking Before Powering On the UPS

- AC power cable colors comply with local electrical regulations.
- No short circuits occur in inputs and outputs.
- Cables are securely connected.
- Battery cables are correctly connected to battery terminals. The battery voltage meets the requirements.
- Cables are properly connected between the UPS and batteries.
- Power cables and signal cables are correctly identified.
- Cables are neatly routed and securely bound.
- Devices are installed and cables are routed in ways that facilitate modification, capacity expansion, and maintenance.
- The UPS is properly grounded.
- The voltage between the neutral wire and the ground cable is less than 5 V AC.
- The input voltage rang for the mains to start the UPS is 120–280 V AC (or 80–280 V AC after the UPS powers on). The battery voltage range is (Number of batteries x 10.8) to (Number of batteries x 14) V DC.

5.2 Starting the UPS

NOTICE

- In the preset mode, LCD will return to the main page with 10 seconds of no operation.
- If the long backup time model is not connected to an external battery pack, the buzzer keeps buzzing.
- Charge the batteries used for the first time for 5 hours. Otherwise, the battery discharge time will decrease.
- The UPS performs a battery self-check automatically once a week. If batteries are faulty, an alarm is generated.
- If the UPS is connected to the mains, when the battery packs or battery strings connect to the UPS with long backup time for the first time, you must do a battery self-check manually, in order to confirm the battery connection is normal. The method is: hold down the **ON/MUTE** button on the front panel for 5 seconds, then the UPS transfer to battery mode to do a shallow discharge test, after 10 seconds it automatically back to line mode.
- The UPS with long backup time provides a charge current of 4 A and the current is not configurable. If the UPS needs to connect to battery packs or battery strings, the total battery capacity must exceed 18 Ah. Otherwise, batteries may be damaged. If the capacity of external battery packs or battery strings to be connected exceeds 40 Ah, it is recommended that an external charger be purchased to increase the charge current. If an external charger is not purchased, the charge time will be long.
- The 1 kVA UPS with standard backup time has two built-in batteries, the 2 kVA UPS with standard backup time have four built-in batteries, the 3 kVA UPS with standard backup time have six built-in batteries. If the 1 kVA UPS with long backup time needs to connect to external battery strings, each battery string must consist of three 12 V batteries connected in series. If the 2 kVA UPS with long backup time needs to connect to external battery strings, each battery string must consist of six 12 V batteries connected in series. If the 3 kVA UPS with long backup time needs to connect to external battery strings, each battery string must consist of eight 12 V batteries connected in series.
- For the UPS with standard backup time, the battery capacity has a fixed value of 9 Ah and the charge current has a fixed value of 1 A. Set the battery capacity to the total capacity of all batteries actually connected. Set the battery capacity for the long backup time model based on site requirements. The default value is 18 Ah. For example, if eight batteries (9 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 3 kVA long backup time model, set battery capacity to 18 Ah (9 Ah + 9 Ah). This parameter affects the backup time calculation. Incorrect setting will cause incorrect display of the backup time on the LCD.



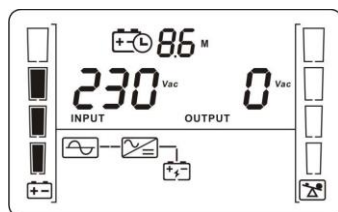
NOTE

During the setting of UPS parameters, press **ON/MUTE** for more than 3 seconds. Release the button when you hear a beep sound to select the previous option. During the setting of UPS parameters, press **SELECT** for more than 3 seconds. Release the button when you hear a beep sound to select the next option. During the setting of UPS parameters, press **OFF/ENTER** for more than 3 seconds to confirm the setting.

Procedure:

1. After power on the UPS, it enters standby mode, as shown in [Figure 5-1](#). Hold down the **SELECT** button for 5 seconds. The UPS enters the preset mode.

Figure 5-1 Power-on and standby screen



2. Set the voltage level based on the actual output voltage. The voltage level can be set to 200 V, 208 V, 220 V, 230 V (default), or 240 V.

Figure 5-2 Setting the output voltage



3. Set the system output frequency based on the rated frequency. The values include 50 Hz, 60 Hz, and AUT (default).

Figure 5-3 Setting the system output frequency



4. (This step is required only for the UPS with long backup time.) Set the battery capacity to the total capacity of all batteries actually connected. The default value is 18 Ah for the UPS with long backup time, and the value can range from 18 Ah to 999 Ah.

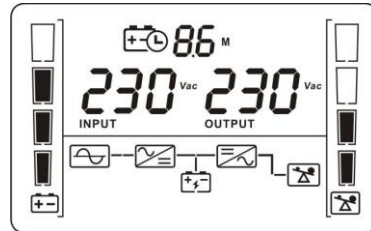
Figure 5-4 Setting the battery capacity



5. Start the UPS to inverter mode.

Hold down the **ON/MUTE** button on the front panel for over 5 seconds to make the UPS transfer to inverter mode output. The default value is 230 V.

Figure 5-5 LCD display after the UPS starts to inverter mode



NOTE

To prevent triggering overload protection, start the loads with higher power and then loads with lower power.

5.3 Shutting Down the UPS

Normal Mode

If the UPS is originally in normal mode, hold down **OFF/ENTER** for over 2 seconds will enable the UPS to enter the standby mode or bypass mode (if set or enabled before).

Battery Mode

Hold down **OFF/ENTER** for over 2 seconds to turn off the UPS in battery mode.

5.4 Transferring to Bypass Mode

When the input power supply is normal and the UPS is started in normal mode, hold down **ON/MUTE** and **SELECT** both for 5 seconds to enable the UPS enter the bypass mode. If the input voltage exceeds the acceptable range, the UPS will not enter the bypass mode.

5.5 Transferring from Bypass Mode to Normal Mode

When the UPS is in bypass mode, hold down **ON/MUTE** and **SELECT** both for 5 seconds to enable the UPS enter the invert mode.

5.6 Transferring to Battery Self-check

In normal mode, ECO mode, or frequency conversion mode, hold down **ON/MUTE** for more than 5 seconds to enter the battery self-check test.

5.7 Enabling or Disabling the Buzzer

- LCD control:

When the UPS is in standby mode or bypass mode, hold down **SELECT** for 5 seconds to start setting UPS parameters. The parameter 11 can enable or disable the buzzer off function. If you enable the buzzer off function on the LCD, you need to disable this function on the LCD if alarm sound is required. Otherwise, if a new alarm is generated, there is no alarm sound. If the UPS is shut down and powered on again, the buzzer restores to the on status.

When the UPS is in normal mode or battery mode, hold down **SELECT** for 5 seconds to start setting only for parameter 11 to enable or disable the buzzer off function.



NOTE

During the setting of UPS parameters, press **ON/MUTE** for more than 3 seconds. Release the button when you hear a beep sound to select the previous option. During the setting of UPS parameters, press **SELECT** for more than 3 seconds. Release the button when you hear a beep sound to select the next option. Press **OFF/ENTER** for more than 3 seconds to confirm the setting.

- Button control:

Hold down **ON/MUTE** for 2–5 seconds when the UPS is in battery mode to enable or disable the buzzer. However, when the UPS sends a new alarm, the mute function is unavailable, you need to disable the buzzer again.

5.8 Manually Clearing Alarms

When an alarm that can be manually cleared exists, hold down **OFF/ENTER** for over 2 seconds to manually clear the alarm.

5.9 Entering Alarm Cause ID Screen

Hold down **SELECT** and **OFF/ENTER** both for 5 seconds to enter the alarm cause ID screen. Press **ON/MUTE** to view the previous option. Press **SELECT** to view the next option.

6 Maintenance and Storage

6.1 Maintenance

The UPS must be maintained or replaced by professionals. Common users are not allowed to perform such a task. If the UPS need to be replaced, contact the dealer.



NOTE

Hand over used batteries to recyclers or pack them with the package for new batteries and send them to the dealer.

6.2 Storage

Before storing the UPS, charge it for 5 hours. The correct way of storing the UPS is standing the UPS without unpacking in a dry place. During the storage period, maintain the UPS by charging its batteries as follows:

Table 6-1 UPS charging during storage

Storage Temperature	Charge Interval	Charge Duration
-25°C to +40°C	Three months	1–2 hours
40°C to 45°C	Two months	1–2 hours

7 Routine Maintenance

7.1 UPS Maintenance

NOTICE

- Only trained personnel are allowed to perform maintenance. 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.
- Use insulated tools when maintaining internal devices. Only trained personnel are allowed to perform maintenance.
- Maintain UPSs regularly based on the following requirements. Otherwise, the UPSs may fail to operate properly and the lifespan may be shortened.

Table 7-1 Routine maintenance items for UPSs

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Operating environment	• Ambient temperature: 0–40°C • Humidity: 0–95% RH (non-condensing)	• If the humidity and temperature are abnormal, check the air conditioner status. • If the input voltage is abnormal, check the power grid status and input cable connection.	Monthly
Control panel	Check that all units are operating properly by observing the status icons on the LCD,	If an alarm is present, rectify the fault by checking the device status and parameters.	Monthly

Check Item	Expected Result	Troubleshooting	Maintenance Interval
	and no fault or alarm information is displayed in active alarm or historical alarms.		
Cleanliness	Wipe the cabinet surface using a white paper and the paper does not turn black.	Clean the dust, especially in the front panel.	Quarterly
Parameter	Check the output voltage level and frequency, the number of batteries and the actual battery capacity.	Reset the parameters.	Quarterly
Power cables and terminals (between the UPS and external power distribution equipment)	The insulation layers of cables are intact and terminals are free from noticeable sparks.	• Replace the cables. • Secure the output terminals.	Quarterly
Battery self-check	No battery alarm is generated.	If an alarm is present, rectify the fault.	Yearly

7.2 Battery Maintenance

NOTICE

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

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

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

Precautions

- Before battery maintenance, get the tools, such as handles, insulated. Do not place metal tools on exposed battery terminals.
- Never use any organic solvent to clean batteries.
- Never try to remove the safety valve or fill anything into batteries.
- Never smoke or use fire around batteries.
- After battery discharge, charge batteries to ensure a required battery capacity.
- Only professionals are allowed to perform maintenance tasks.
- If batteries have not been discharged for a long time, discharge and charge them in equalized mode at least once every three months to activate them. Each charge should last at least 4 hours.
- Normally, discharge and charge batteries once every four to six months. Each charge should last at least 4 hours.
- In high-temperature areas, discharge and charge batteries once every two months. Each charge should last at least 4 hours.
- Do not overdischarge batteries. After discharging batteries, fully charge them within 24 hours.
- Ensure that the battery discharge duration is 999 minutes at most and 0 minute by default. If you set the value to 0 minute, the discharge time is not limited.

Routine maintenance items for batteries

Table 7-2 Routine maintenance items for batteries

Item	Expected Result	Measures	Maintenance Interval
Battery alarm	No battery alarm is generated.	Identify the cause based on the alarm information.	Monthly
Battery appearance	1. The surface is clean and tidy without stains. 2. The battery terminals are intact. 3. Batteries are free from damage and cracks. 4. Batteries are free from acid leakage. 5. Batteries are not deformed or bulged.	If the battery appearance is abnormal, contact Huawei technical support.	Monthly
Battery operating temperature	1. The ambient battery temperature is 25±5°C.	1. Identify the cause of the abnormal battery operating	Monthly

Item	Expected Result	Measures	Maintenance Interval
	- The battery operating temperature is lower than battery temperature + 20°C. - Battery charge and discharge conditions meet the requirements specified in the battery specifications.	- temperature. - If the fault persists, contact Huawei technical support.	
Charge voltage of battery string	- Equalized voltage 14.16 V x Number of batteries (tolerance $\pm 1\%$) - Float voltage 13.68 V x Number of batteries (tolerance $\pm 1\%$)	- If the voltage drop between the battery string output terminals and the battery input terminals at the UPS side is greater than 1% of the battery string voltage, check whether the cable between the battery string and the UPS is excessively long, or the cable diameter is excessively small. - Check whether the equalized charging voltage and float charging voltage are correctly set for the UPS. - If the fault persists, contact Huawei technical support.	Monthly
Battery temperature sensor measurement accuracy	The difference between the temperature measured by the temperature sensor and the temperature	- Install the temperature sensor in the correct position. - Replace the battery	Quarterly

Item	Expected Result	Measures	Maintenance Interval
	displayed on the LCD is less than 3°C.	temperature sensor.	
Battery specifications	The settings of battery management parameters meet the requirements in the user manual.	Set parameters correctly.	Quarterly
Tightness of bolts on battery terminals	The location of the signs marked on battery terminals indicating tight connections does not change.	Take photos from multiple angles and contact Huawei technical support.	Quarterly
Cables between batteries	No cable deteriorates and the insulation layer does not crack.	Replace the faulty cable.	Quarterly
Battery voltage	- Equalized charging voltage: 14.16 V $\pm$ 0.1 V - Float charging voltage: 13.68 V $\pm$ 0.1 V	1. Check whether the equalized charging voltage and float charging voltage of a battery are normal. 2. If the charging voltage of a battery exceeds the specifications requirement, perform a complete forcible equalized charging for the battery, and check again whether the voltage is normal. 3. If the fault persists, contact Huawei technical support.	Quarterly
Battery connection reliability	1. Each battery terminal is connected reliably. (When battery strings are powered off,	1. Rectify any abnormal connection. 2. If the fault persists, contact Huawei technical	Yearly

Item	Expected Result	Measures	Maintenance Interval
	check the reliability of each terminal in the order from positive terminals to negative terminals.) 2. The tightening torque of each battery screw meets the requirements of the battery manufacturer. (A torque wrench is used for checking the torque. After checking that the battery screws meet the requirements, mark the screws for later check.)	support.	

8 Troubleshooting

When the UPS works abnormally, rectify the fault by referring to the following table.

Table 8-1 Faults and troubleshooting measures

Symptom	Possible Cause	Measures
The main power is normal, but no indicator turns on and the buzzer generates no tone.	The mains input power cable is disconnected.	Check the input power cable.
	The mains input power cable is incorrectly connected to the UPS output end.	Correctly connect the mains input power cable to the UPS input terminal.
 and  blink on the LCD and the buzzer beeps once every second.	The external or internal batteries are incorrectly connected.	Check that all batteries are connected correctly.
 and  blink on the LCD and the buzzer beeps twice every second.	The UPS is overloaded.	Remove surplus load from the UPS output end.
	The UPS is overloaded and supplying power to devices in bypass mode.	Remove surplus load from the UPS output end.
	The UPS is overloaded server times within a short period of time. The UPS is locked in bypass mode and loads are directly connected to the main power source.	Remove surplus load from the UPS output end, and then shut down and restart the UPS.
The battery backup time is shorter than the time given in specifications.	Batteries are not fully charged.	Charge batteries for at least 5 hours and then check the battery capacity. If the battery capacity is still insufficient, contact the dealer or Huawei technical support.
	Batteries are faulty.	Contact the dealer or

Symptom	Possible Cause	Measures
		Huawei technical support to replace batteries.

9 Specifications

9.1 Physical Specifications

Table 9-1 Physical specifications

Model	Net dimensions (D mm x W mm x H mm)	Net weight (kg)
UPS2000-G-1KRTS	88mm x 438mm x 310mm	10.7 kg
UPS2000-G-1KRTL	88mm x 438mm x 310mm	5.9 kg
UPS2000-G-2KRTS	88mm x 438mm x 410mm	18.5 kg
UPS2000-G-2KRTL	88mm x 438mm x 410mm	8.6 kg
UPS2000-G-3KRTS	88mm x 438mm x 630mm	27.9 kg
UPS2000-G-3KRTL	88mm x 438mm x 410mm	9.2 kg

9.2 Environmental Specifications

Table 9-2 Environment specifications

Item	1 kVA	2 kVA	3 kVA
Operating temperature	0°C–40°C		
Humidity	0%–95% RH (non-condensing)		
Altitude	< 1000 m		
Storage and transportation temperature	–40°C to +70°C (battery pack: –20°C to +40°C)		
Noise	< 50 dBA @ 1 m		

Item	1 kVA	2 kVA	3 kVA
Defend Level	IP20		

9.3 Mains Input Electrical Specifications

Table 9-3 Mains input electrical specifications

Item		1 kVA	2 kVA	3 kVA
Input power cable		Single-phase (L/N) input +PE cable		
Rated input voltage		200V AC/208V AC/220V AC/230V AC/240V AC		
Input voltage range	Lowest conversion voltage	- When the ambient temperature is 0–35°C: 160/140/120/110 V AC (tolerance ±5%) (Ratio of actual load to rated load: 100%–80%/80%–70%/70%–60%/60%–0) - When the ambient temperature is 35–40°C: 175/155/135/125 V AC (tolerance ±5%) (Ratio of actual load to rated load: 100%–80%/80%–70%/70%–60%/60%–0)		
	Lowest recovery voltage	- When the ambient temperature is 0–35°C: 175/155/135/125 V AC (tolerance ±5%) (Ratio of actual load to rated load: 100%–80%/80%–70%/70%–60%/60%–0) - When the ambient temperature is 35–40°C: 190/170/150/140 V AC (tolerance ±5%) (Ratio of actual load to rated load: 100%–80%/80%–70%/70%–60%/60%–0)		
	Highest conversion voltage	300 V AC (tolerance ±5%, load percentage < 80%) 280 V AC (tolerance ±5%, 80% < load percentage < 100%, after 15 minutes to battery mode)		
	Highest recovery voltage	290 V AC (tolerance ±5%, load percentage < 80%) 270 V AC (tolerance ±5%, 80% < load percentage < 100%)		
Input power factor (100% resistive load)		> 0.99		
Startup voltage		120 V-280 V AC		
Diesel generator input capacity		Minimum 1.5 times the UPS rated capacity		

9.4 Bypass Input Electrical Specifications

Table 9-4 Bypass Input Electrical Specifications

Item	1 kVA	2 kVA	3 kVA
Bypass voltage tolerance	170 V –264 V AC		
Bypass frequency tolerance	47–53 Hz or 57–63 Hz		
Bypass overload capability	• 110%–120%, 30 minutes • 120%–130%, 10 minutes • 130%–150%, 1 minute		
Input mode	One mains input		



NOTE

The upper and lower thresholds of bypass voltage tolerance are configurable on the LCD.

9.5 Output Electrical Specifications

Table 9-5 Output electrical specifications

Item	1 kVA	2 kVA	3 kVA
Rated capacity	1000 VA/800 W	2000 VA/1600 W	3000 VA/2400 W
Output power factor (PF)	0.8		
Rated output voltage	200 V AC/208 V AC/220 V AC/230 V AC/240 V AC		
Output voltage tolerance	±1%		
Output frequency range	• In normal mode, the UPS output frequency is consistent with the input frequency, which is 50 Hz or 60 Hz with the tolerance of ±3 Hz. • In battery mode, the frequency is 50 Hz or 60 Hz (tolerance ±0.05%).		
Total distortion of output voltage waveform (THDv)	• < 6% (non-resistive load) • < 3% (resistive load)		
Crest factor	A maximum of 3:1		
Inverter overload capability	• When the ambient temperature is 0–35°C: – 105%–110%: The UPS automatically shuts down (in battery mode) or transfers to bypass		

Item		1 kVA	2 kVA	3 kVA
		mode (in line mode) after 10 minutes. – 110%–130%: The UPS automatically shuts down (in battery mode) or transfers to bypass mode (in line mode) after 1 minutes. – 130%–150%: The UPS automatically shuts down (in battery mode) or transfers to bypass mode (in line mode) after 3 seconds. – > 150%: The UPS automatically shuts down (in battery mode) or transfers to bypass mode (in line mode) after 0.5 seconds max. • When the ambient temperature is 35–40°C: – 105%–110%: The UPS automatically shuts down (in battery mode) or transfers to bypass mode (in line mode) after 5 minutes. – 110%–130%: The UPS automatically shuts down (in battery mode) or transfers to bypass mode (in line mode) after 30 seconds. – 130%–150%: The UPS automatically shuts down (in battery mode) or transfers to bypass mode (in line mode) after 1.5 seconds. – > 150%: The UPS automatically shuts down (in battery mode) or transfers to bypass mode (in line mode) after 0.5 seconds max.		
Dynamic voltage tolerance $\pm 5\%$		$\pm 5\%$		
Average frequency tracking rate		1 Hz/s		
Transfer time	Transferring from normal mode to battery mode	0		
	Bypass to ECO or ECO to bypass	4 ms (100% R Load)		
Waveform (battery mode)		Sine wave		



NOTE

- In frequency conversion mode, the output load is derated to 80% of the rated capacity.
- If the output voltage is 200 V AC or 208 V AC, the output load is derated to 80% of the rated capacity.

9.6 Battery Specifications

Table 9-6 Battery specifications

Item		1 kVA	2 kVA	3 kVA
Rated battery voltage	Standard model	24 V DC	48 V DC	72 V DC
	Long backup time model	36 V DC	72 V DC	96 V DC
Number of batteries	Standard model	2	4	6
	Long backup time model	3	6	8
Battery leakage current	Standard model	17 μ A	25.7 μ A	27.4 μ A
	Long backup time model	25.4 μ A	28.5 μ A	32.8 μ A
Battery type		12 V DC VRLA battery		
Battery capacity		9 Ah		
Backup time	Standard model	> 4 minutes (at full rated load)		
	Long backup time model	Depending on the capacity of external batteries.		
Charger rated charge current	Standard model	1 A		
	Long backup time model	4 A		
Float charging voltage	Standard model	27.3 V DC $\pm$ 1%	54.7 V DC $\pm$ 1%	82.1 V DC $\pm$ 1%
	Long backup time model	41.0 V DC $\pm$ 1%	82.1 V DC $\pm$ 1%	109.4 V DC $\pm$ 1%
Equalized charging voltage	Standard model	28.3 V DC $\pm$ 1%	56.6 V DC $\pm$ 1%	84.9 V DC $\pm$ 1%
	Long backup time model	42.5 V DC $\pm$ 1%	84.9 V DC $\pm$ 1%	113.3 V DC $\pm$ 1%

Table 9-7 Power backup specifications of the battery pack

Battery Pack	Load	UPS2000-G-1KR TL (min)	UPS2000-G-2KR TL (min)	UPS2000-G-3KR TL (min)
1 Battery group	100%	15.0	6.5	7.0
	75%	21.0	10.0	11.0
	50%	39.0	18.0	17.0
	25%	77.0	37.0	45.0

Battery Pack	Load	UPS2000-G-1KR TL (min)	UPS2000-G-2KR TL (min)	UPS2000-G-3KR TL (min)
2 Battery groups	100%	36.0	17.0	16.0
	75%	47.0	25.0	25.0
	50%	83.0	45.0	45.0
	25%	159.0	85.0	85.0
3 Battery groups	N/A	N/A	39.0	27.0
	N/A	N/A	55.0	40.0
	N/A	N/A	95.0	70.0
	N/A	N/A	175.0	130.0
4 Battery groups	N/A	N/A	63.0	39.0
	N/A	N/A	87.0	55.0
	N/A	N/A	147.0	95.0
	N/A	N/A	267.0	175.0



NOTE

- The battery pack (ESS-36V12-9*2AHBPVBB01) for 1 kVA UPS with long backup time contain two group battery strings. The battery pack (ESS-72V12-9AHBPVBB01) for 2 kVA UPS with long backup time only contain one group battery strings. The battery pack (ESS-96V12-9AHBPVBB02) for 3 kVA UPS with long backup time only contain one group battery strings.
- The 1 kVA UPS with long backup time is allowed a maximum of two battery packs (ESS-36V12-9*2AHBPVBB01) in parallel. The 2 kVA UPS with long backup time is allowed a maximum of four battery packs (ESS-72V12-9AHBPVBB01) in parallel. The 3 kVA UPS with long backup time is allowed a maximum of four battery packs (ESS-96V12-9AHBPVBB02) in parallel.

9.7 ECO Feature

Table 9-8 ECO feature

Item	1 kVA	2 kVA	3 kVA
ECO voltage tolerance	Default value: ± 22 V A (configurable on the LCD) The range is $\pm(13$ V AC-24 V AC)		
ECO frequency tolerance	± 3 Hz		

9.8 System Electrical Specifications

Table 9-9 System Electrical Specifications

Item	1 kVA	2 kVA	3 kVA
Number of UPSs connected in parallel	Cannot support		
System efficiency	88%	89%	90%

9.9 Safety Regulations and EMC

Table 9-10 Safety Regulations and EMC

Item	Standards Compliance
Conducted emission (CE)	IEC62040-2, Category C2
Radiated emission (RE)	IEC62040-2, Category C2
Low frequency signal	IEC61000-2-2
Anti-electromagnetic interference	IEC61000-4-2
Conducted emission	IEC61000-4-6
Radiated susceptibility (RS)	IEC61000-4-3
Electrical fast transient/burst (EFT/B)	IEC61000-4-4
Surge	IEC61000-4-5
Power magnetic susceptibility (PMS)	IEC61000-4-8
Harmonic current	IEC61000-3-12
Flashing	IEC61000-3-11 (input current > 16 A)
Impact current (lightning protection)	• IEC/EN60240-2 • IEC/EN61000-4-5 • YD/T1095-2000 • YD/T944-2007

A

Acronyms and Abbreviations

C

CE Conformité Européenne

E

ECO Economy Control Operation

EEPROM Electrically erasable programmable read-only memory

H

HTTP HTTP-Hypertext Transfer Protocol

L

LCD Liquid crystal display

P

PFC Power Factor Correction

R

RS232 Recommend Standard 232

S

SNMP Simple Network Management Protocol

T

THDv Total harmonic distortion of output voltage

U

UPS Uninterruptible power system