

UPS2000-G-(3 kVA-20 kVA)-V2

User Manual (Two Live Wires)

Issue 07
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About This Document

Purpose

This document describes the UPS2000-G-(3 kVA–20 kVA)-V2 in terms of features, performance, appearance, structure, working principle, installation, operation, and maintenance. UPS is short for uninterruptible power system.





Intended Audience


This document is intended for:

- Sales Engineer
- Technical Support Engineer
- System Engineer
- Hardware Installation Engineer
- Commissioning Engineer
- Data Configuration Engineer
- Maintenance Engineer

Symbol Conventions

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

Symbol	Description
	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Indicates a hazard with a low level of risk which, if not avoided, could 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.

Symbol	Description
 NOTE	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

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

Issue 07 (2019-12-19)

Added the USB port description for the new product structure.

Issue 06 (2019-05-05)

Updated the section "Operating Environment".

Issue 05 (2018-01-16)

Added the description of device application scenarios.

Issue 04 (2017-11-27)

Updated the section "Operating Environment".

Issue 03 (2017-07-03)

This is the third release.

Issue 02 (2016-01-06)

- The short busbars for UPS2000-G-15 kVA/20 kVA are changed.
- Updated the routine maintenance.
- Updated the software.
- Updated the battery shallow discharge test.
- Updated the SNMP card.

Issue 01 (2015-05-25)

This is the first release.

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1 Safety Information

1.1 General Safety

Statement

Before installing, operating, and maintaining the equipment, read this document and observe all the safety instructions on the equipment and in this document.

The "NOTICE", "WARNING", and "DANGER" statements in this document do not cover all the safety instructions. They are only supplements to the safety instructions. Huawei will not be liable for any consequence caused by the violation of general safety requirements or design, production, and usage safety standards.

Ensure that the equipment is used in environments that meet its design specifications. Otherwise, the equipment may become faulty, and the resulting equipment malfunction, component damage, personal injuries, or property damage are not covered under the warranty.

Follow local laws and regulations when installing, operating, or maintaining the equipment. The safety instructions in this document are only supplements to local laws and regulations.

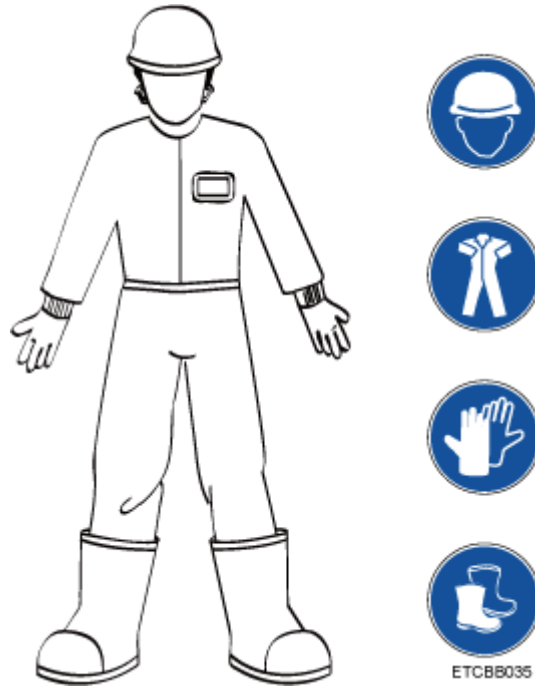
Huawei will not be liable for any consequences of the following circumstances:

- Operation beyond the conditions specified in this document
- Installation or use in environments which are not specified in relevant international or national standards
- Unauthorized modifications to the product or software code or removal of the product
- Failure to follow the operation instructions and safety precautions on the product and in this document
- Equipment damage due to force majeure, such as earthquakes, fire, and storms
- Damage caused during transportation by the customer
- Storage conditions that do not meet the requirements specified in this document

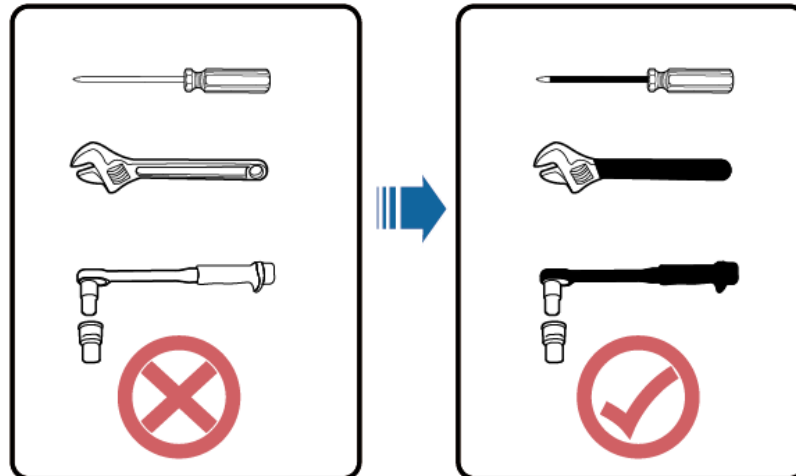
General Requirements

- Do not install, use, or operate outdoor equipment and cables (including but not limited to moving equipment, operating equipment and cables, inserting connectors to or removing connectors from signal ports connected to outdoor facilities, working at heights, and performing outdoor installation) in harsh weather conditions such as lightning, rain, snow, and level 6 or stronger wind.

- Before installing, operating, or maintaining the equipment, remove any conductive objects such as watches or metal jewelry like bracelets, bangles, and rings to avoid electric shock.
- When installing, operating, or maintaining the equipment, wear dedicated protective gears such as insulation gloves, goggles, and safety clothing, helmet, and shoes, as shown in the following figure.

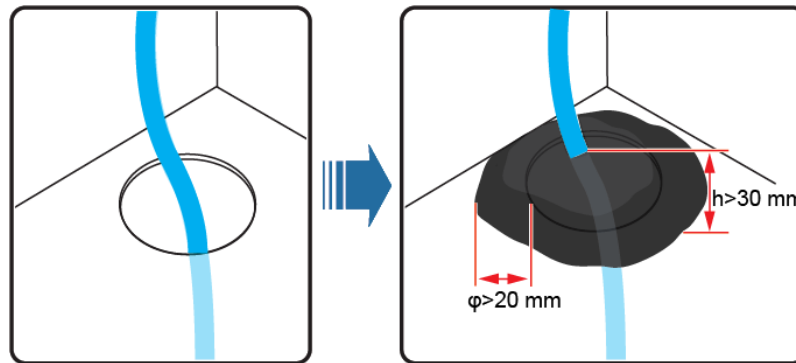


- Follow the specified procedures for installation, operation, and maintenance.
- Before handling a conductor surface or terminal, measure the contact point voltage and ensure that there is no risk of electric shock.
- After installing the equipment, remove idle packing materials such as cartons, foam, plastics, and cable ties from the equipment area.
- In the case of a fire, immediately leave the building or the equipment area, and turn on the fire alarm bell or make an emergency call. Do not enter the building on fire in any case.
- Do not stop using protective devices. Pay attention to the warnings, cautions, and related precautionary measures in this document and on the equipment. Promptly replace warning labels that have worn out.
- Keep irrelevant people away from the equipment. Only operators are allowed to access the equipment.
- Use insulated tools or tools with insulated handles, as shown in the following figure.



TN01H00005

- All cable holes should be sealed. Seal the used cable holes with firestop putty. Seal the unused cable holes with the caps delivered with the cabinet. The following figure shows the criteria for correct sealing with firestop putty.



TN01H00006

- Do not scrawl, damage, or block any warning label on the equipment.
- Tighten the screws using tools when installing the equipment.
- Do not work with power on during installation.
- Repaint any paint scratches caused during equipment transportation or installation in a timely manner. Equipment with scratches cannot be exposed to an outdoor environment for a long period of time.
- Before operations, ensure that the equipment is firmly secured to the floor or other solid objects, such as a wall or an installation rack.
- Do not use water to clean electrical components inside or outside of a cabinet.
- Do not change the structure or installation sequence of equipment without permission.
- Do not touch a running fan with your fingers, components, screws, tools, or boards before the fan is powered off or stops running.

Personal Safety

- If there is a probability of personal injury or equipment damage during operations on the equipment, immediately stop the operations, report the case to the supervisor, and take feasible protective measures.
- To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telecommunication network voltage (TNV) circuits.

- Do not power on the equipment before it is installed or confirmed by professionals.

1.2 Personnel Requirements

- Personnel who plan to install or maintain Huawei equipment must receive thorough training, understand all necessary safety precautions, and be able to correctly perform all operations.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain the equipment.
- Only qualified professionals are allowed to remove safety facilities and inspect the equipment.
- Personnel who will operate the equipment, including operators, trained personnel, and professionals, should possess the local national required qualifications in special operations such as high-voltage operations, working at heights, and operations of special equipment.
- Professionals: personnel who are trained or experienced in equipment operations and are clear of the sources and degree of various potential hazards in equipment installation, operation, maintenance
- Trained personnel: personnel who are technically trained, have required experience, are aware of possible hazards on themselves in certain operations, and are able to take protective measures to minimize the hazards on themselves and other people
- Operators: operation personnel who may come in contact with the equipment, except trained personnel and professionals
- Only professionals or authorized personnel are allowed to replace the equipment or components (including software).

1.3 Electrical Safety

Grounding

- For the equipment that needs to be grounded, install the ground cable first when installing the equipment and remove the ground cable last when removing the equipment.
- Do not damage the ground conductor.
- Do not operate the equipment in the absence of a properly installed ground conductor.
- Ensure that the equipment is connected permanently to the protective ground. Before operating the equipment, check its electrical connection to ensure that it is securely grounded.

General Requirements

Use dedicated insulated tools when performing high-voltage operations.

AC and DC Power

 **DANGER**

Do not connect or disconnect power cables with power on. Transient contact between the core of the power cable and the conductor will generate electric arcs or sparks, which may cause fire or personal injury.

- If a "high electricity leakage" tag is attached on the equipment, ground the protective ground terminal on the equipment enclosure before connecting the AC power supply; otherwise, electric shock as a result of electricity leakage may occur.
- Before installing or removing a power cable, turn off the power switch.
- Before connecting a power cable, check that the label on the power cable is correct.
- If the equipment has multiple inputs, disconnect all the inputs before operating the equipment.
- A circuit breaker equipped with a residual current device (RCD) is not recommended.
- A damaged power cable must be replaced by the manufacturer, service agent, or professionals to avoid risks.
- High voltage operations and installation of AC-powered facilities must be performed by qualified personnel.

Cabling

- When routing cables, ensure that a distance of at least 30 mm exists between the cables and heat-generating components or areas. This prevents damage to the insulation layer of the cables.
- Do not route cables behind the air intake and exhaust vents of the equipment.
- Ensure that cables meet the VW-1 flame spread rating requirements.
- Bind cables of the same type together. When routing cables of different types, ensure that they are at least 30 mm away from each other.
- If an AC input power cable is connected to the cabinet from the top, bend the cable in a U shape outside the cabinet and then route it into the cabinet.
- When the temperature is low, violent impact or vibration may damage the plastic cable sheathing. To ensure safety, comply with the following requirements:
- Cables can be laid or installed only when the temperature is higher than 0 °C. Handle cables with caution, especially at a low temperature.
- Cables stored at subzero temperatures must be stored at room temperature for at least 24 hours before they are laid out.
- Do not perform any improper operations, for example, dropping cables directly from a vehicle.
- When selecting, connecting, and routing cables, follow local safety regulations and rules.

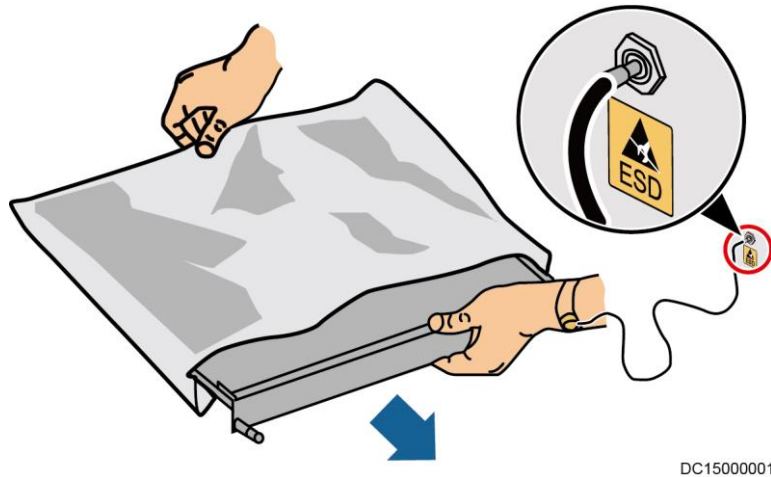
ESD

NOTICE

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

- Wear ESD gloves or a well-grounded ESD wrist strap when touching the device or handling boards or application-specific integrated circuits (ASICs).
- When holding a board, hold its edge without touching any components. Do not touch the components with your bare hands.
- Package boards with ESD packaging materials before storing or transporting them.

Figure 1-1 Wearing an ESD wrist strap



Neutral-Ground Voltage

It is recommended that the three-phase loads be equalized and the neutral-ground voltage be kept at less than 2 V to meet power distribution requirements.

1.4 Installation Environment Requirements

- To prevent fire due to high temperature, ensure that the ventilation vents or heat dissipation system are not blocked when the equipment is running.
- Install the equipment in an area far away from liquids. Do not install it under areas prone to condensation, such as under water pipes and air exhaust vents, or areas prone to water leakage, such as air conditioner vents, ventilation vents, or feeder windows of the equipment room. Ensure that no liquid enters the equipment to prevent faults or short circuits.
- If any liquid is detected inside the equipment, immediately disconnect the power supply and contact the administrator.
- Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.
- Ensure that the equipment room provides good heat insulation, and the walls and floor are dampproof.
- Install a rat guard at the door of the equipment room.

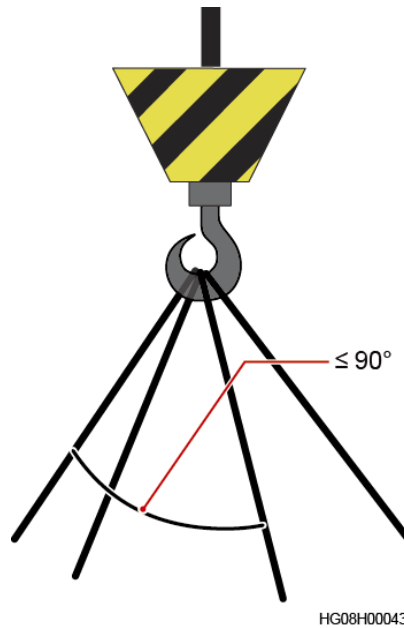
Installation at Heights

- Working at heights refers to operations that are performed at least 2 meters above the ground.
- Do not work at heights if the steel pipes are wet or other potential danger exists. After the preceding conditions no longer exist, the safety director and relevant technical personnel need to check the involved equipment. Operators can begin working only after obtaining consent.
- When working at heights, comply with local relevant laws and regulations.
- Only trained and qualified personnel are allowed to work at heights.
- Before working at heights, check the climbing tools and safety gears such as safety helmets, safety belts, ladders, springboards, scaffolding, and lifting equipment. If they do not meet the requirements, take corrective measures or disallow working at heights.
- Wear personal protective equipment such as the safety helmet and safety belt or waist rope and fasten it to a solid structure. Do not mount it on an insecure moveable object or metal object with sharp edges. Make sure that the hooks will not slide off.
- Set a restricted area and eye-catching signs for working at heights to warn away irrelevant personnel.
- Carry the operation machinery and tools properly to prevent them from falling off and causing injuries.
- Personnel involving working at heights are not allowed to throw objects from the height to the ground, or vice versa. Objects should be transported by tough slings, hanging baskets, highline trolleys, or cranes.
- Ensure that guard rails and warning signs are set at the edges and openings of the area involving working at heights to prevent falls.
- Do not pile up scaffolding, springboards, or other sundries on the ground under the area involving working at heights. Do not allow people to stay or pass under the area involving working at heights.
- Inspect the scaffolding, springboards, and workbenches used for working at heights in advance to ensure that their structures are solid and not overloaded.
- Any violations must be promptly pointed out by the site manager or safety supervisor and the involved personnel should be prompted for correction. Personnel who fail to stop violations will be forbidden from working.

1.5 Mechanical Safety

Hoisting Devices

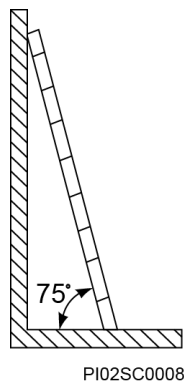
- Do not walk under hoisted objects.
- Only trained and qualified personnel should perform hoisting operations.
- Check that hoisting tools are available and in good condition.
- Before hoisting objects, ensure that hoisting tools are firmly secured onto a load-bearing object or wall.
- Ensure that the angle formed by two hoisting cables is no more than 90 degrees, as shown in the following figure.



- Do not drag steel ropes and hoisting tools or bump hoisted objects against hard objects during hoisting.

Using Ladders

- Use wooden or fiberglass ladders when you need to perform live working at heights.
- When a step ladder is used, ensure that the pull ropes are secured and the ladder is held firm.
- Before using a ladder, check that it is intact and confirm its load bearing capacity. Do not overload it.
- Ensure that the ladder is securely positioned. The recommended angle for a ladder against the floor is 75 degrees, as shown in the following figure. An angle rule can be used to measure the angle. Ensure that the wider end of the ladder is at the bottom, or protective measures have been taken at the bottom to prevent the ladder from sliding.



- When climbing a ladder, take the following precautions to reduce risks and ensure safety:
 - Keep your body steady.
 - Do not climb higher than the fourth rung of the ladder from the top.
 - Ensure that your body's center of gravity does not shift outside the legs of the ladder.

Drilling Holes

When drilling holes into a wall or floor, observe the following safety precautions:

NOTICE

Do not drill holes into the equipment. Doing so may affect the electromagnetic shielding of the equipment and damage components or cables inside. Metal shavings from drilling may short-circuit boards inside the equipment.

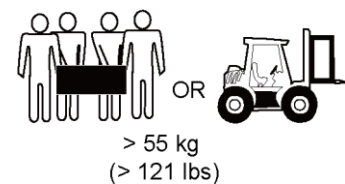
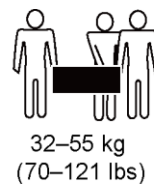
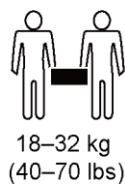
- Obtain the consent from the customer, subcontractor, and Huawei before drilling.
- Wear goggles and protective gloves when drilling holes.
- When drilling holes, protect the equipment from shavings. After drilling, clean up any shavings that have accumulated inside or outside the equipment.

Moving Heavy Objects

DANGER

When removing a heavy or unstable component from a cabinet, be aware of unstable or heavy objects on the cabinet.

- Be cautious to avoid injury when moving heavy objects.



NH01H00144

- When moving the equipment by hand, wear protective gloves to prevent injuries.
- Move or lift the equipment by holding its handles or lower edges. Do not hold the handles of modules (such as power supply units, fans, and boards) that are installed in the equipment because they cannot support the weight of the equipment.
- Avoid scratching the cabinet surface or damaging cabinet components and cables during equipment transportation.
- When transporting the equipment using a forklift truck, ensure that the forks are properly positioned to ensure that the equipment does not topple. Before moving the equipment, secure it to the forklift truck using ropes. When moving the equipment, assign dedicated personnel to take care of it.
- Choose railways, sea, or a road with good condition for transportation to ensure equipment safety. Avoid tilt or jolt during transportation.
- Move a cabinet with caution. Any bumping or falling may damage the equipment.

1.6 Device Running Safety

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

For power supply systems that are critical to significant economic interests or public order, such as the national computing center, military command system, emergency command center, railway signal system and control center, civil aviation and air traffic control center, airport command center, financial clearing center, and transaction center, the Tier 4 or 3 power architecture specified in TIA-942 must be used. That is, two power supplies must be used to supply power to loads.

Ensure that the equipment is used in an environment that meets the product design specifications (including power grid, temperature, and humidity). Otherwise, the equipment may become faulty, and the resulting equipment malfunction and component damage are not covered under 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 a dry and clean environment. If batteries are stored for more than 90 days, charge them in time. Otherwise, the battery lifespan may be affected.
- Install the UPS in an area far away from liquids. Do not install it under areas prone to water leakage, such as air conditioner vents, ventilation vents, or feeder windows of the equipment room. Ensure that no liquid enters the UPS to prevent short circuits. Ensure that there is no condensation inside the equipment or equipment room.
- If any liquid is detected inside the equipment, immediately disconnect the power supply and contact the administrator.

DANGER

- Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.
- During installation and maintenance, ensure that sundries do not enter the UPS. Otherwise, equipment damage, load power derating, power failure, and personal injury may occur.

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

A UPS can be used to serve resistive-capacitive loads, resistive loads, and micro-inductive loads. It is recommended that a UPS not be used for pure capacitive loads, pure inductive loads, and half-wave rectification loads. A UPS does not apply to regeneration loads.

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.

The UPS can be configured with a backfeed protection dry contact to work with an external automatic circuit breaker, preventing the voltage from flowing back to input terminals over static bypass circuits. If the installation and maintenance personnel do not need backfeed

protection, paste labels on external mains and bypass input switches, informing that the UPS is connected to a backfeed protection card. Disconnect the backfeed protection card from the UPS before operating the UPS.

Do not use the UPS in the following places:

- Environments that are 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 environments near the ocean (0–3.7 km) and indoor or semi-indoor environments where the temperature and humidity are not controllable, such as simple equipment rooms, civil houses, garages, corridors, and direct ventilation cabinets near the sea; or houses with only roofs, railway station platforms, gymnasiums, and aquariums
- Environments that are conducive for the growth of microorganisms such as fungus or mildew
- Environments where rodents (such as mice) and insects exist

1.7 Battery Safety

Basic Requirements

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

DANGER

- Do not expose batteries at high temperatures or around heat-generating devices, such as sunlight, fire sources, transformers, and heaters. Excessive heat exposure may cause the batteries to explode.
 - Do not burn batteries. Otherwise, the batteries may explode.
 - To avoid leakage, overheating, fire, or explosions, do not disassemble, alter, or damage batteries, for example, insert sundries into batteries or immerse batteries in water or other liquids.
-
- Wear goggles, rubber gloves, and protective clothing to prevent skin contact with electrolyte in the case of electrolyte overflow. If a battery leaks, protect the skin or eyes from the leaking liquid. If the skin or eyes come in contact with the leaking liquid, wash it immediately with clean water and go to the hospital for medical treatment.
 - Use dedicated insulated tools.
 - Move batteries in the required direction. Do not place a battery upside down or tilt it.
 - Keep the battery loop disconnected during installation and maintenance.
 - Use batteries of specified models. Using batteries of other models may damage the batteries.
 - Dispose of waste batteries in accordance with local laws and regulations. Do not dispose of batteries as household waste. If a battery is disposed of improperly, it may explode.

- The site must be equipped with qualified fire extinguishing facilities, such as firefighting sands and powder fire extinguishers.

NOTICE

To ensure battery safety and battery management accuracy, use batteries provided with the UPS by Huawei. Huawei is not responsible for any battery faults caused by batteries not provided by Huawei.

Battery Installation

Before installing batteries, observe the following safety precautions:

- Install batteries in a well-ventilated, dry, and cool environment that is far away from heat sources, flammable materials, moistures, extensive infrared radiation, organic solvents, and corrosive gases. Take fire prevention measures.
- Place and secure batteries horizontally.
- Note the polarities when installing batteries. Do not short-circuit the positive and negative poles of the same battery or battery string. Otherwise, the battery may be short-circuited.
- Check battery connections periodically, ensuring that all bolts are securely tightened.
- When installing batteries, do not place installation tools on the batteries.

Battery Short Circuit

DANGER

Battery short circuits can generate high instantaneous current and release a great amount of energy, which may cause equipment damage or personal injury.

To avoid battery short-circuit, do not maintain batteries with power on.

Flammable Gas

NOTICE

- Do not use unsealed lead-acid batteries.
 - To prevent fire or corrosion, ensure that flammable gas (such as hydrogen) is properly exhausted for lead-acid batteries.
-

Lead-acid batteries emit flammable gas when used. Ensure that batteries are kept in a well-ventilated area and take preventive measures against fire.

Battery Leakage

NOTICE

Battery overheating causes deformation, damage, and electrolyte spillage.

WARNING

When the electrolyte overflows, absorb and neutralize the electrolyte immediately. When moving or handling a battery whose electrolyte leaks, note that the leaking electrolyte may hurt human bodies.

- If the battery temperature exceeds 60 °C, check for and promptly handle any leakage.
- Electrolyte overflow may damage the equipment. It will corrode metal parts and boards, and ultimately damage the boards.
- If the electrolyte overflows, follow the instructions of the battery manufacturer or neutralize the electrolyte by using sodium bicarbonate (NaHCO₃) or sodium carbonate (Na₂CO₃).

Lithium Battery

The safety precautions for lithium batteries are similar to those for lead-acid batteries except that you also need to note the precautions described in this section.

WARNING

There is a risk of explosion if a battery is replaced with an incorrect model.

- A battery can be replaced only with a battery of the same or similar model recommended by the manufacturer.
- When handling a lithium battery, do not place it upside down, tilt it, or bump it with other objects.
- Keep the lithium battery loop disconnected during installation and maintenance.
- Do not charge a battery when the ambient temperature is below the lower limit of the operating temperature (charging is forbidden at 0 °C). Low-temperature charging may cause crystallization, which will result in a short circuit inside the battery.
- Use batteries within the allowed temperature range; otherwise, the battery performance and safety will be compromised.
- Do not throw a lithium battery in fire.
- When maintenance is complete, return the waste lithium battery to the maintenance office.

1.8 Others

- Exercise caution when manually shutting down the UPS inverter for transferring to bypass mode, or when adjusting the UPS output voltage level or frequency. Doing so may affect the power supply to equipment.

- Exercise caution when setting battery parameters. Incorrect settings will affect the power supply and battery lifespan.

2 Quick Introduction

2.1 Model Description

This document describes the following UPS models:

Model	Represented By	Remarks
UPS2000-G-3KRTL-V2	UPS2000-G-3 kVA long backup time model	The model is represented by UPS2000-G-3 kVA in the description of their common features and parameters.
UPS2000-G-6KRTL-V2	UPS2000-G-6 kVA long backup time model	The model is represented by UPS2000-G-6 kVA in the description of their common features and parameters.
UPS2000-G-10KRTL-V2	UPS2000-G-10 kVA long backup time model	The model is represented by UPS2000-G-10 kVA in the description of their common features and parameters.
UPS2000-G-15KRTL-V2	UPS2000-G-15 kVA long backup time model	The model is represented by UPS2000-G-15 kVA in the description of their common features and parameters.
UPS2000-G-20KRTL-V2	UPS2000-G-20 kVA long backup time model	The model is represented by UPS2000-G-20 kVA in the description of their common features and parameters.

Figure 2-1 shows a UPS model number.

Figure 2-1 Model number

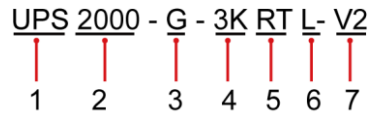


Table 2-1 describes the model number.

Table 2-1 Model number details

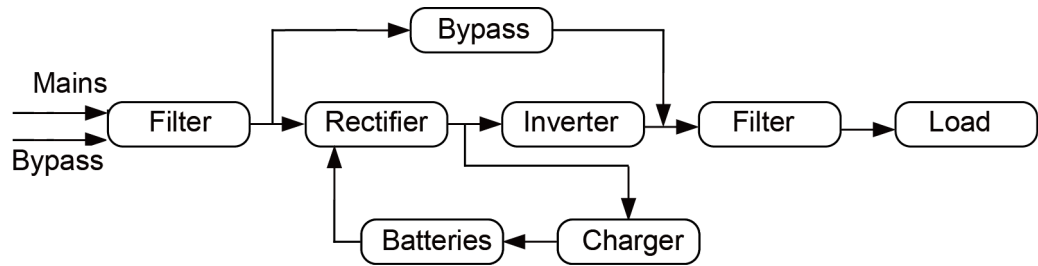
No.	Item	Description
1	Product category	UPS
2	Product family	2000: Capacity ≤ 20 kVA
3	UPS subcategory	G
4	Output capacity	3K: 3 kVA 6K: 6 kVA 10K: 10 kVA 15K: 15 kVA 20K: 20 kVA
5	UPS type	RT: rack- and tower-mounted unit RR: rack-mounted unit TT: tower-mounted unit TM: modular tower-mounted unit RM: modular rack-mounted unit
6	Built-in battery (optional)	S: standard model, which provides only a standard battery pack. L: long backup time model. You need to use an external large-capacity battery pack.
7	Input model	V2: 208 V/220 V, two live wires.

2.2 Working Principle

2.2.1 Conceptual Diagram

Figure 2-2 shows the UPS conceptual diagram.

Figure 2-2 Conceptual diagram



2.2.2 Working Modes

The UPS has the following working modes:

- Normal mode
When the mains is normal, the rectifier boosts the mains input voltage and converts the AC power into stable DC power for the inverter, and the mains charges batteries over a charger. Then the inverter converts the DC power into stable AC power, which is supplied to loads.
- Battery mode
When the mains is abnormal or disconnected, the DC-DC step-up transformer boosts the DC power supplied from batteries. Then the inverter converts the DC power into stable AC power for powering loads.
- Bypass mode
The mains supplies power directly to loads after filtering. The UPS transfers to bypass mode when overload, overtemperature, or faults occur. This mode does not provide battery backup capability.
- Economy control operation (ECO) mode
If the bypass voltage and frequency are in the specified range, the UPS supplies power to loads over the bypass. If the bypass voltage and frequency are outside the range, the UPS transfers to normal or battery mode. ECO is short for economy control operation.

NOTE

- The UPS2000-G-15 kVA/20 kVA supports battery ECO mode only in the case of two mains inputs. In battery ECO mode, the bypass supplies power to the UPS, and batteries are used as backup power. If the bypass is abnormal, the UPS transfers to battery mode.
- By default, ECO mode described in this document refers to mains ECO mode.

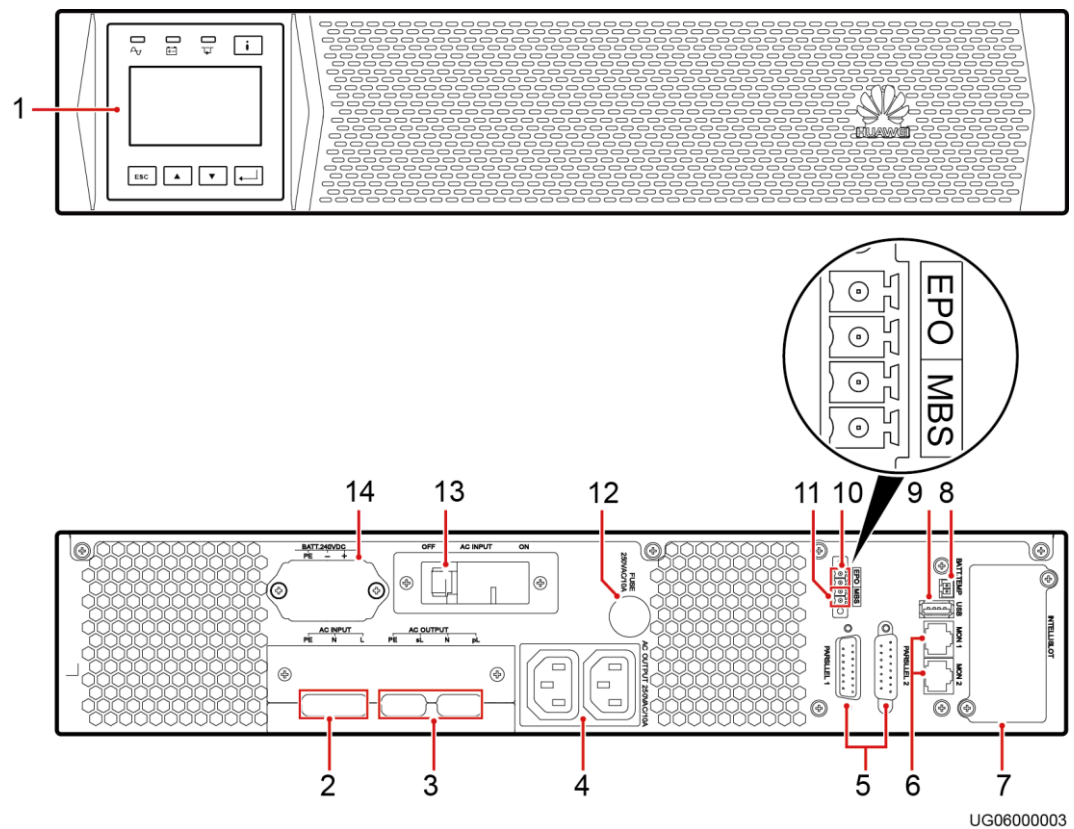
2.3 Appearance

NOTICE

- For UPS2000-G-3 kVA, UPS2000-G-6 kVA and UPS2000-G-10 kVA, if the UPS input uses two live wires (208 V/220 V system), all L and N wires change to L1 and L2 wires. If the AC input of the UPS2000-G-10 kVA uses two live wires, connect AC INPUT L1, L2, and L3 that are short-circuited with a short-circuit busbar to live wire L1, and connect AC INPUT N to live wire L2.
- If the AC input of the UPS2000-G-15 kVA/20 kVA uses two live wires, connect bypass and mains input bL1, bL2, bL3, mL1, mL2, and mL3 that are short-circuited with a short-circuit busbar to live wire L1, and connect the input N and N with a short-circuit busbar to live wire L2.
- In addition, if the AC input and AC output uses two live wires, the input and output ends must connect to two-pole circuit breakers, that provided by the user.

Figure 2-3 shows the front and rear views of the UPS2000-G-3 kVA/6 kVA. Figure 2-4 shows the front and rear views of the UPS2000-G-10 kVA. Figure 2-5 shows the front and rear views of the UPS2000-G-15 kVA/20 kVA.

Figure 2-3 Front and rear views of the UPS2000-G-3 kVA/6 kVA



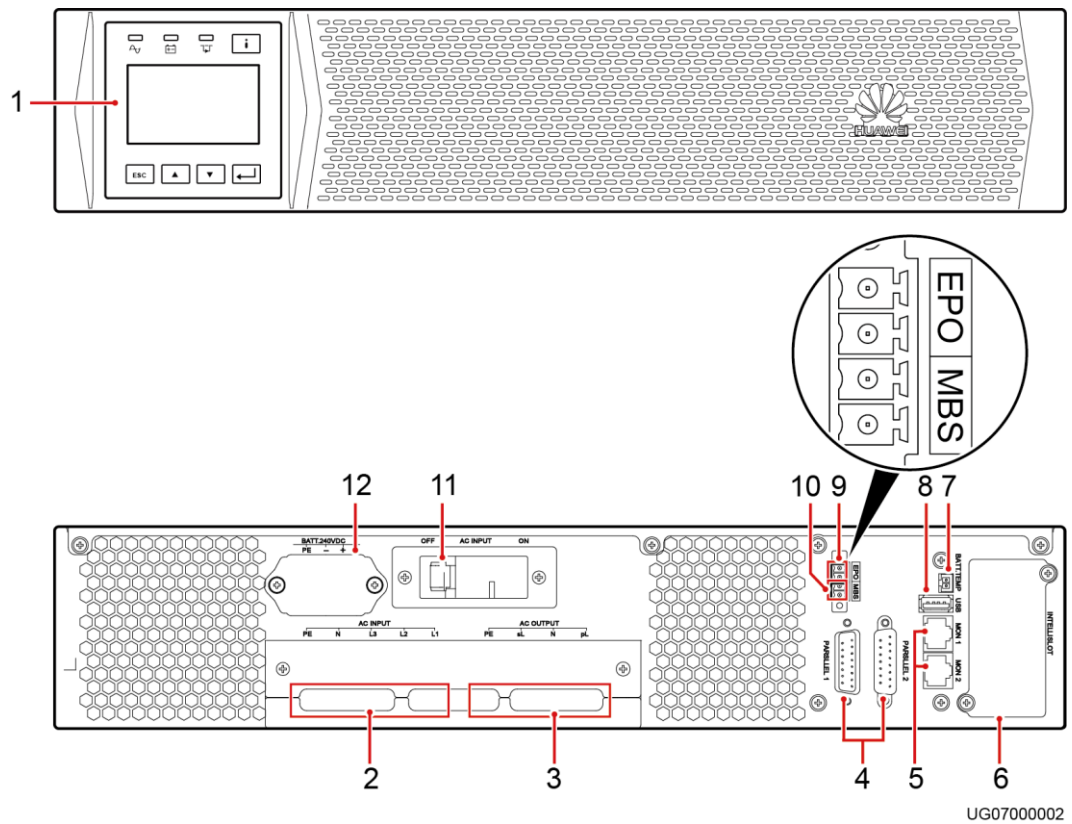
- | | | | |
|---------------------------|---|---------------------------------|-------------------------------------|
| (1) Control panel | (2) AC input port | (3) AC output ports (pL and sL) | (4) Output sockets |
| (5) Parallel ports | (6) Control area network (CAN) communications ports (MON1 and MON2) | (7) Optional card slot | (8) Battery temperature sensor port |
| (9) USB port ^a | (10) Emergency power-off | (11) Maintenance | (12) Fuse base |

- | | | |
|---|-------------------|-------------------|
| (security protection mechanism supported) | (EPO) port | bypass port (MBS) |
| (13) Input circuit breaker | (14) Battery port | |

NOTE

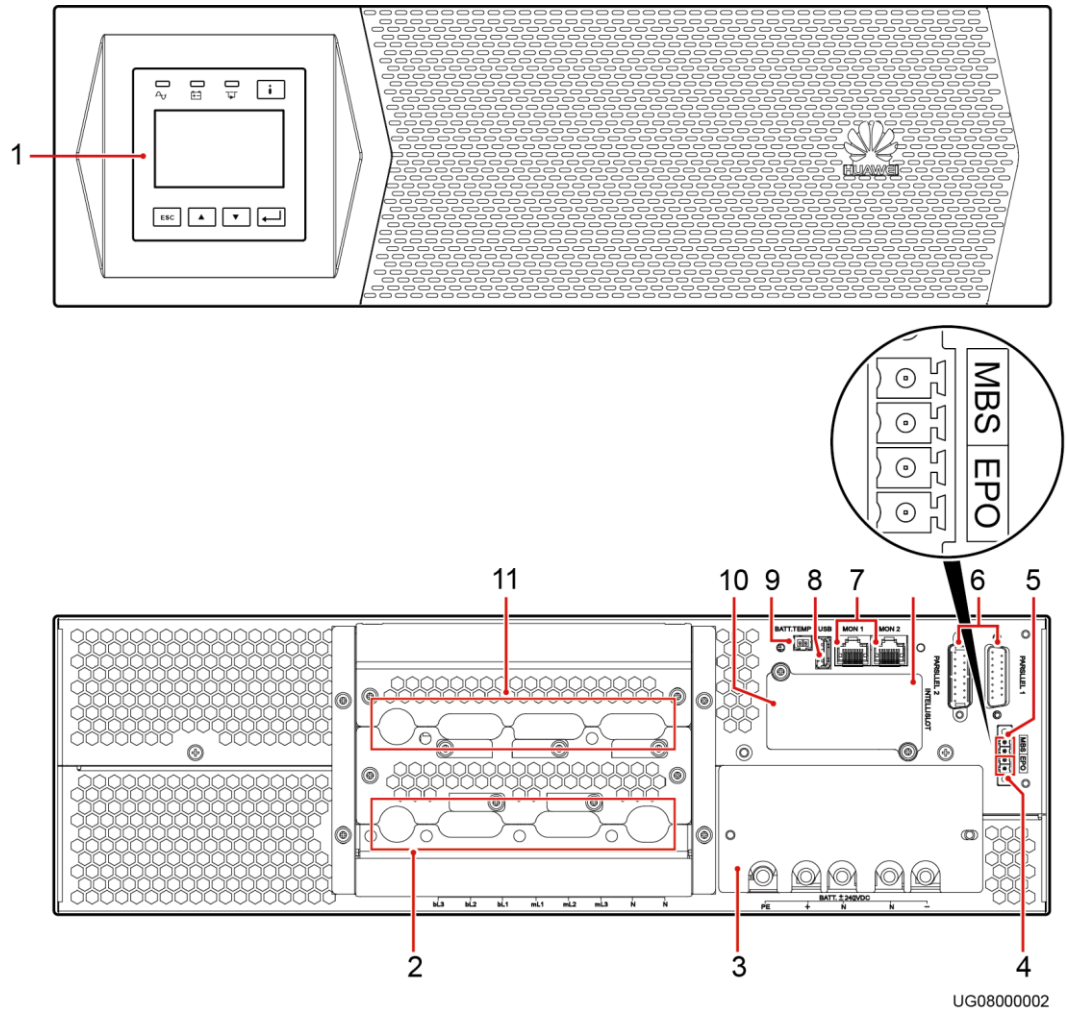
The total load current supported by the two output sockets (C13) cannot exceed 10 A.
 The fuse used on the UPS2000-G-3 kVA/6 kVA meets the 250V-10A-IEC specifications.

Figure 2-4 Front and rear views of the UPS2000-G-10 kVA



- | | | | |
|--|------------------------------------|-------------------------------------|---|
| (1) Control panel | (2) AC input ports | (3) AC output ports (pL and sL) | (4) Parallel ports |
| (5) CAN communications ports (MON1 and MON2) | (6) Optional card slot | (7) Battery temperature sensor port | (8) USB port ^a (security protection mechanism supported) |
| (9) EPO port | (10) Maintenance bypass port (MBS) | (11) Input circuit breaker | (12) Battery port |

Figure 2-5 Front and rear views of the UPS2000-G-15 kVA/20 kVA



- | | | | |
|-------------------------------------|---------------------------------------|--|---|
| (1) Control panel | (2) AC input ports (mains and bypass) | (3) Battery terminals | (4) EPO port |
| (5) Maintenance bypass port (MBS) | (6) Parallel ports | (7) CAN communications ports (MON1 and MON2) | (8) USB port ^a (security protection mechanism supported) |
| (9) Battery temperature sensor port | (10) Optional card slot | (11) AC output ports (pL and sL) | |

NOTE

a: The USB port supports the standard Modbus protocol and connects to a PC through a USB cable so that you can access the NMS, configure parameters, export data, and upgrade software.

2.4 Optional Components

NOTICE

- UPS2000-G-3 kVA cannot support parallel system.
- For UPS2000-G-10 kVA/15 kVA/20 kVA, if the AC input and AC output uses two live wires, PDC-0038V4ACIOA, PDC-0091V2ACIOA, and PDC-0038V4ACIOA-V2 cannot be used.

Table 2-2 Optional components

Component	Model	Function	Remarks
Parallel cable	DB15M, CC8P0.48B(S), DB15F	Connect UPSs in parallel for UPS2000-G-6 kVA/10 kVA/15 kVA/20 kVA.	A parallel cable is 1.5 meters long.
Battery temperature sensor	TE820E10B/W103-B02-L1	Measures the ambient temperature of the external power module and battery pack.	The temperature ranges from $-40\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$. The standard cable is 2 meters long. To increase the length, install a magnetic ring at the sensor plug.
Ambient temperature and humidity sensor	WS302M2A-5 ENR1DETA MODULE	Measures the UPS ambient temperature and humidity.	The ambient temperature ranges from $0\text{--}50\text{ }^{\circ}\text{C}$. The ambient humidity ranges from $0\text{--}100\%$ RH. It is used together with a Simple Network Management Protocol (SNMP) card.
SNMP card	RMS-SNMP01A	Monitors the UPS and the ambient temperatures and humidity (if required) and allows for Ethernet networking.	N/A
6 kVA output isolation	DGL-6/0.22	Provides isolation solutions for customer	The output isolation

Component	Model	Function	Remarks
transformer box		equipment. Compared with the output transformer on an industrial frequency UPS, the output transformer box provides isolation functions even in bypass mode. The isolation transformer is a 2:1:1 industrial-frequency transformer. It converts one 220 V output voltage into two isolated 110 V outputs.	transformer box is 6 kVA, single-phase. It is used for the UPS2000-G-6 kVA.
10 kVA output isolation transformer box	DGL-10/0.22		The output isolation transformer box is 10 kVA, single-phase. It is used for the UPS2000-G-10 kVA.
Standard battery pack (7 Ah, 20 batteries)	ESS-240V12-7AhBPVBA0 1 ESS-240V12-7AhBPVBA0 2	Each battery pack consists of twenty 12 V, 7 Ah VRLA batteries connected in series. It is a standard configuration for the UPS2000-G-6 kVA. A maximum of four battery packs are connected in parallel.	The UPS2000-G-15 kVA/20 kVA uses at least two battery packs.
Standard battery pack (9 Ah, 20 batteries)	ESS-240V12-9AhBPVBA0 1 ESS-240V12-9AhBPVBA0 2	Each battery pack consists of twenty 12 V, 9 Ah VRLA batteries connected in series. It is a standard configuration for the UPS2000-G-10 kVA. A maximum of four battery packs are connected in parallel.	
Modbus card	RMS-MODBUS01A	Provides two cascaded RJ45 ports to implement networking over the Modbus or YDN-23 protocol.	N/A
Dry contact card	RMS-RELAY01A	Provides six alarm dry contact outputs (normal mode, battery mode, bypass mode, low battery voltage, bypass backfeed, and UPS faults) and two dry contract control inputs (one is the shutdown	N/A

Component	Model	Function	Remarks
		signal input, and the other is reserved).	
Power distribution unit (PDU) (PDC-0038V4ACIOA)	PDC-0038V4ACIOA	Controls and protects input and output power, increases output sockets, and distributes power for 1+1 parallel systems, and implements online maintenance.	The PDU is designed for a 1+1 UPS2000-G-15 kVA/20 kVA parallel system (three-phase input three-phase output).
PDU (PDC-0091V2ACIOA)	PDC-0091V2ACIOA		<p>The PDU is designed for a 1+1 UPS2000-G-15 kVA/20 kVA parallel system (three-phase input single-phase output and single-phase input single-phase output).</p> <p>It can also be used in a UPS2000-G-6 kVA (single-phase input single-phase output), UPS2000-G-10 kVA (three-phase input single-phase output and single-phase input single-phase output) 1+1 parallel system and 2+0 parallel system.</p>
PDU (PDC-0038V4ACIOA-V2)	PDC-0038V4ACIOA-V2		The PDU works with the UPS2000-G-3 kVA/6 kVA

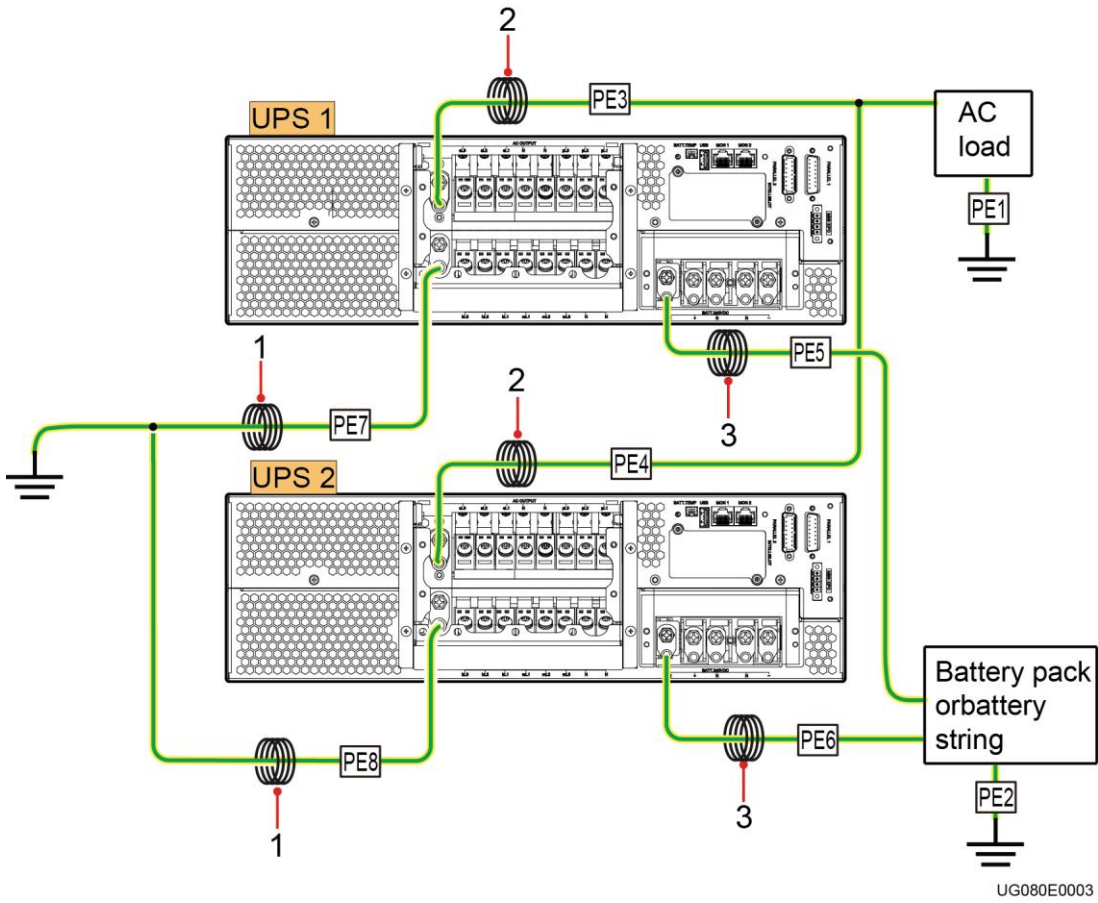
Component	Model	Function	Remarks
			(dual-live-wire input and dual-live-wire output) to provide the maintenance bypass and load expansion functions.
Magnetic loop	DN85H, H38x22x15 (DMEGC) E2F, 38x22x15 (FENGYI)	Optimizes the performance of the TN-C power distribution system in the parallel system scenario.	In a UPS2000-G-15 kVA/20 kVA parallel system using the TN-C power distribution system, install four magnetic rings on the PE cables on each UPS, bind the four magnetic rings together using binding tape, and secure them to the nearest place.

 **NOTE**

It is recommended that you install the battery temperature sensor (secured with an adhesive) on the surface of batteries in the middle of the battery rack.

In a UPS2000-G-15 kVA/20 kVA parallel system using the TN-C power distribution system, there are two scenarios for installing magnetic rings on the UPS mains input PE cables:

Figure 2-6 Installing magnetic rings (numbered 1) on branch PE cables

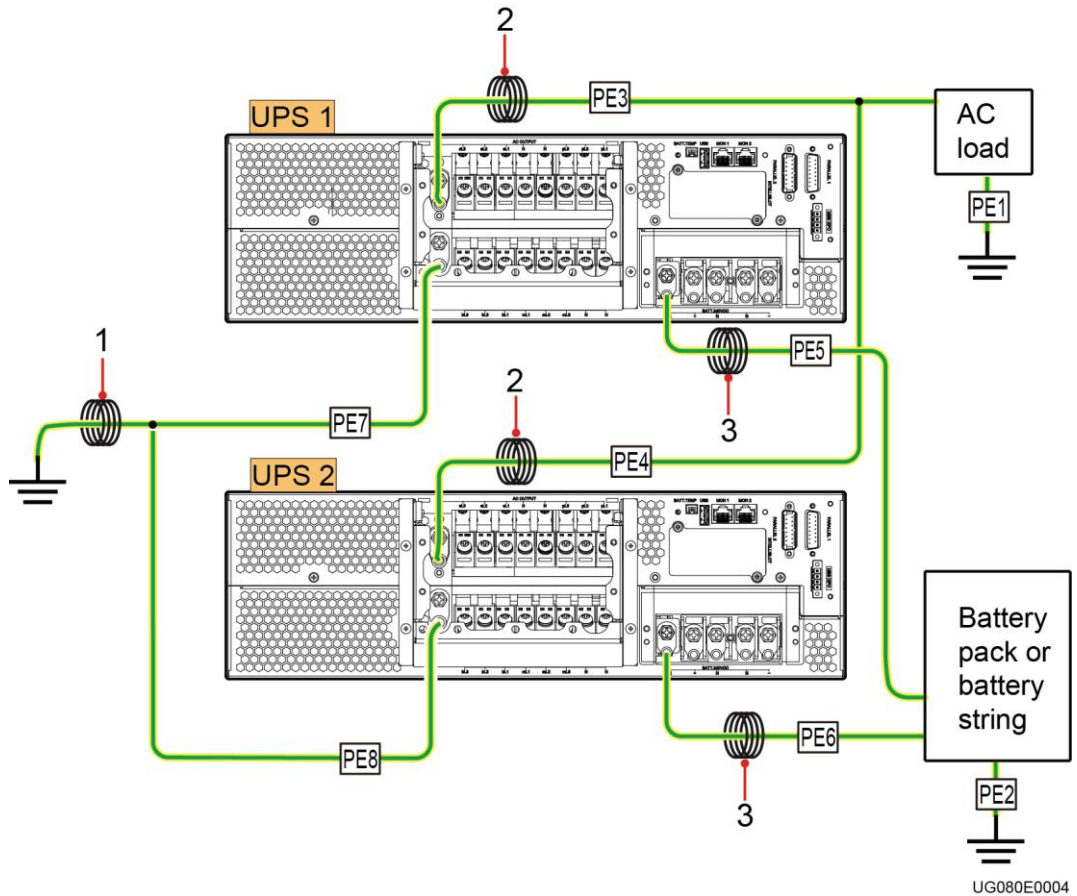


(1) Magnetic rings 1

(2) Magnetic rings 2

(3) Magnetic rings 3

Figure 2-7 Installing a magnetic ring (numbered 1) on the general PE cable



UG080E0004

- (1) Magnetic rings 1 (2) Magnetic rings 2 (3) Magnetic rings 3

NOTE

Perform the following operations in a parallel system using the TN-C power distribution system:

- Short-circuit battery terminals N in the parallel system.
- It is recommended that you connect AC loads and battery packs only to the UPS PE terminal.
- If you have directly grounded AC loads and battery packs and connected them to the UPS PE terminal, install magnetic rings 2 and 3 on the PE3, PE4, PE5, and PE6 ground cables. You need to purchase magnetic rings 2 and 3.
- The recommended type for magnetic rings 1, 2, and 3 is DN85Hx4 or E2Fx4.

Table 2-3 Specifications of magnetic rings from three vendors

Vendor	Magnetic Ring
DMEGC	R10K
TDK	HS10
TDG	TS10

 **NOTE**

The magnetic conductivity of manganese and zinc magnetic rings is greater than 10,000, and the recommended internal diameter of magnetic rings is greater than 10 mm (easy for wire coiling). The number of coiling circles is 5 or greater.

3 Installation

3.1 Preparations

3.1.1 Site

Floor Bearing

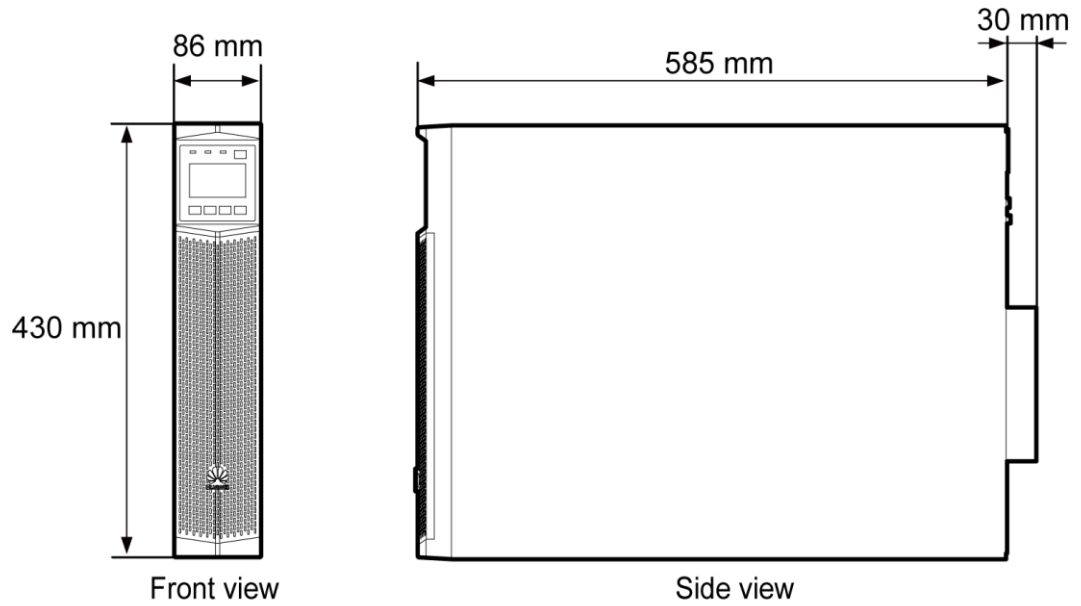
The floor can bear the weight of the UPS and its optional components. In the case of rack installation, ensure that the floor can also bear the weight of the rack.

Environment

- Do not install the UPS in an environment outside the specifications.
- Keep the UPS far away from water, heat sources, and flammable and explosive substances. Install the UPS in an environment free of dust, volatile gas, salt, and corrosive materials. Avoid direct sunlight.
- Do not install the UPS in environments with conductive metal scraps in the air.
- The ideal operating temperature for batteries is 20–30 °C. Temperatures higher than 30 °C shorten the battery lifespan and temperatures lower than 20 °C reduces the backup time.

UPS2000-G-3 kVA/6 kVA/10 kVA Dimensions

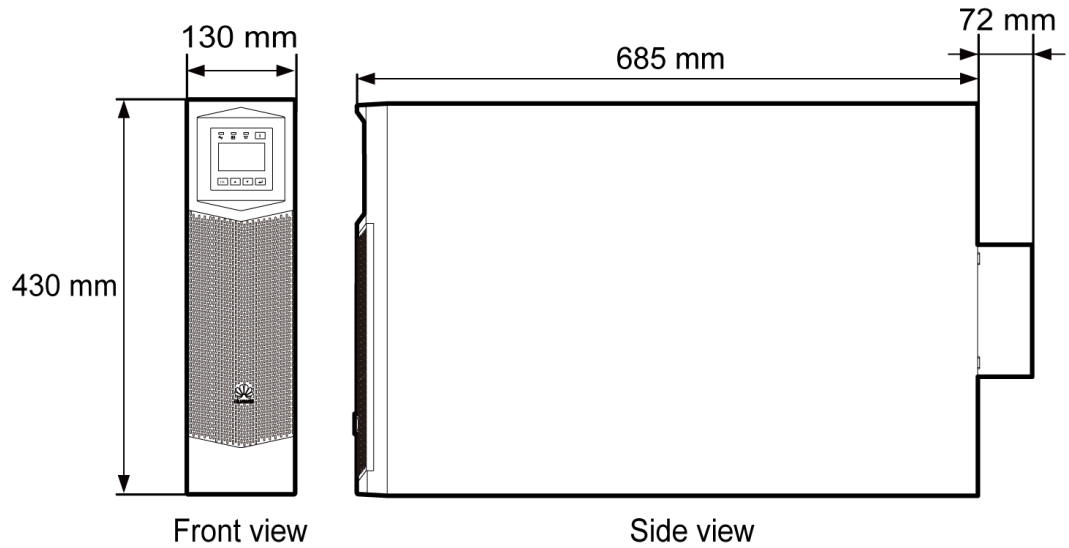
Figure 3-1 UPS2000-G-3 kVA/6 kVA/10 kVA installation dimensions



UG060E0004

UPS2000-G-15 kVA/20 kVA Dimensions

Figure 3-2 UPS2000-G-3 kVA/6 kVA/10 kVA installation dimensions



UG080E0005

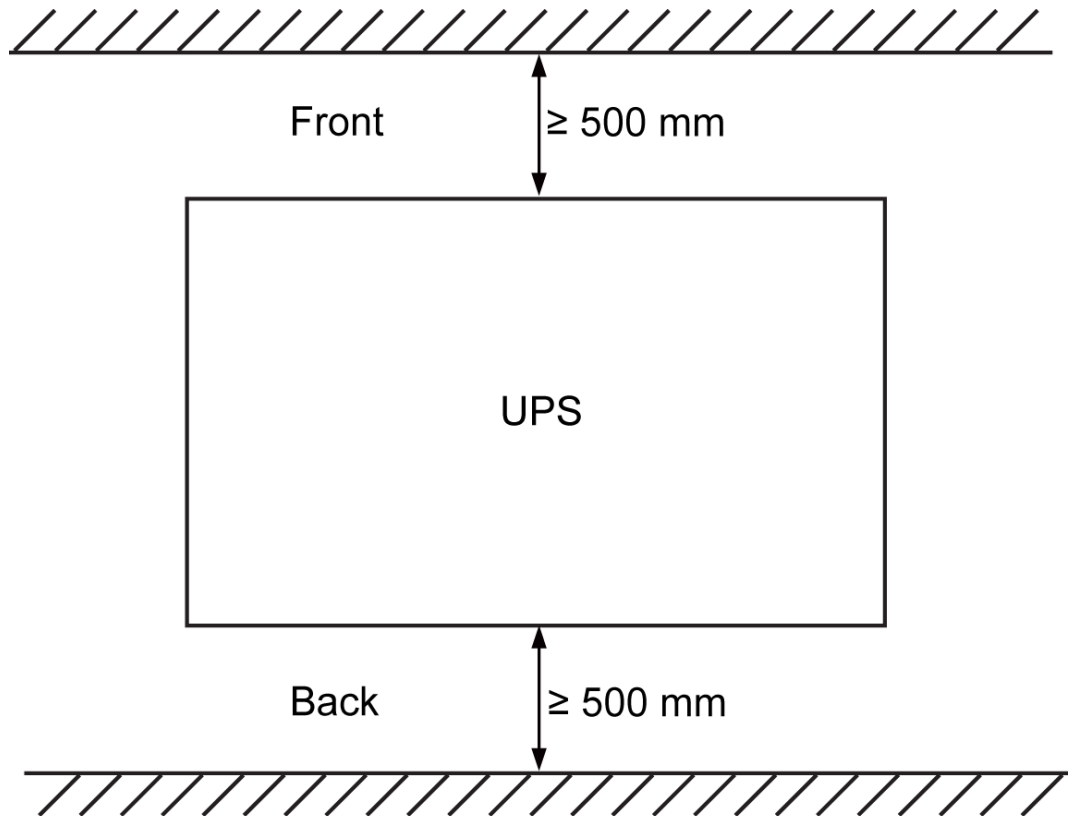
Clearances

NOTICE

The distance between UPS air vents and the wall or obstacle is greater than or equal to 500 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.

Figure 3-3 Reserved clearances



UG060E0005

3.1.2 Tools



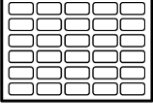


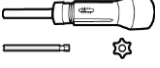
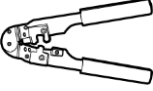
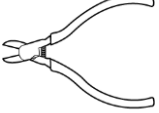
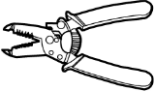


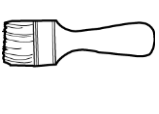
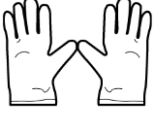

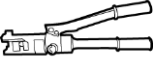

NOTICE

Get installation tools insulated to prevent electric shocks.

Table 3-1 lists the installation tools.

Table 3-1 Tools

Tools			
Clamp meter	Multimeter	Label	Phillips

Tools			
			screwdriver (PH 2 x 150 mm or PH 3 x 250 mm)
			
Flat-head screwdriver (2 mm x 80 mm)	Torque screwdriver	Crimping tool	Diagonal pliers
			
Wire stripper	Polyvinyl chloride (PVC) insulation tape	Cotton cloth	Brush
			
Heat shrink tubing	Heat gun	Electrician's knife	Protective gloves
			
ESD gloves	Insulated gloves	Hydraulic pliers	Cable tie

3.1.3 Power Cables

NOTICE

- In the case of three-phase input, install a three-phase disconnecter. In the case of single-phase input, you are advised to install a disconnecter.
- When used to power IT system, the UPS (three-phase output) should provide 4-pole disconnectors, and the UPS (single-phase output) should provide 2-pole disconnectors.
- The UPS is a large leakage current device. Do not configure a circuit breaker that has the leakage current protection function. If you need leakage current protection function, use the earth leakage circuit breaker recommended.
- The leakage current of the 3 kVA or 6 kVA UPS is less than or equal to 100 mA. The leakage current of the 10 kVA UPS is less than or equal to 200 mA. The leakage current of the 15 kVA or 20 kVA UPS is less than or equal to 500 mA.
- When selecting the earth leakage circuit breaker (ELCB), consider the leakage current of the UPS and downstream loads.
- The battery cable cannot be longer than 10 m.
- You can install linked circuit breakers for both the N wire and L wire. No independent circuit breaker is allowed for only the N wire.
- For 15 kVA/20 kVA model, use ground cables that have a cross-sectional area of 25 mm² and M6 OT terminals that are 90 °bent and have a cross-sectional area of 25 mm².
- For 15 kVA/20 kVA model, use battery cables that have a cross-sectional area of 16 mm² and M6 OT terminals that are 90 °bent and have a cross-sectional area of 16 mm².
- For 3 kVA model, use ground cables that have a cross-sectional area of 4 mm² and M4 OT terminals and have a cross-sectional area of 4 mm².
- For 6 kVA model, use ground cables that have a cross-sectional area of 6 mm² and M4 OT terminals and have a cross-sectional area of 6 mm².
- For 10 kVA model, use ground cables that have a cross-sectional area of 10 mm² and M6 OT terminals and have a cross-sectional area of 10 mm².

Table 3-2 lists the recommended power cable specifications.

Table 3-2 Recommended power cable specifications

Model	Wiring Terminal	Number of Phases	Rated Voltage	External Circuit Breaker	Cross-sectional Area	Terminal Type	Torque for Tightening Bolts
3 kVA (dual-live-wire input dual-live-wire output)	Dual-live-wire input	2	208 V AC, 220 V AC	32 A (the characteristics of D)	4 mm ²	4 mm ² M4 OT terminal	1.4 N m
	Dual-live-wire output	2		32 A (the characteristics of D)			
	Battery	N/A	240 V DC	32 A	4 mm ²		N/A
3 kVA (single-ph)	Input	1	220 V AC, 230	32 A (the characteri	4 mm ²	4 mm ² M4 OT	1.4 N

Model	Wiring Terminal	Number of Phases	Rated Voltage	External Circuit Breaker	Cross-sectional Area	Terminal Type	Torque for Tightening Bolts
Single-phase input single-phase output)	Output	1	220 V AC, or 240 V AC	32 A (the characteristics of D)		terminal	m
	Battery	N/A	240 V DC	32 A			4 mm ²
	6 kVA (dual-live-wire input dual-live-wire output)	Dual-live-wire input	2	208 V AC, 220 V AC	50 A (the characteristics of D)	6 mm ²	6 mm ² M4 OT terminal
Dual-live-wire output	2	50 A (the characteristics of D)					
Battery	N/A	240 V DC	50 A	6 mm ²	N/A		
6 kVA (single-phase input single-phase output)	Input	1	220 V AC, 230 V AC, or 240 V AC	50 A (the characteristics of D)	6 mm ²	6 mm ² M4 OT terminal	1.4 N m
	Output	1		50 A (the characteristics of D)			
	Battery	N/A	240 V DC	50 A	6 mm ²	N/A	
10 kVA (dual-live-wire input dual-live-wire output)	Dual-live-wire input	2	208 V AC, 220 V AC	63 A (the characteristics of D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N m
	Dual-live-wire output	2		63 A (the characteristics of D)			
	Battery	N/A	240 V DC	63 A	10 mm ²	N/A	
10 kVA (single-phase input single-phase output)	Input	1	220 V AC, 230 V AC, or 240 V AC	63 A (the characteristics of D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N m
	Output	1		63 A (the characteristics of D)			
	Battery	N/A	240 V DC	63 A	10 mm ²	N/A	

Model	Wiring Terminal	Number of Phases	Rated Voltage	External Circuit Breaker	Cross-sectional Area	Terminal Type	Torque for Tightening Bolts
10 kVA (three-phase input single-phase output)	Input	3	380 V AC, 400 V AC, or 415 V AC	63 A (the characteristics of D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N m
	Output	1	220 V AC, 230 V AC, or 240 V AC	63 A (the characteristics of D)			
	Battery	N/A	240 V DC	63 A	10 mm ²	N/A	
15 kVA (dual-live-wire input dual-live-wire output)	Dual-live-wire input	2	208 V AC, 220 V AC	100 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m
	Battery	N/A	±240 V DC	63 A	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N m
	Dual-live-wire Output	2	208 V AC, 220 V AC	100 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m
15 kVA (single-phase input single-phase output)	Input	1	220 V AC, 230 V AC, or 240 V AC	100 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m
	Battery	N/A	±240 V DC	63 A	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N m
	Output	1	220 V AC, 230 V AC, or 240 V AC	100 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m
15 kVA (three-phase input single-phase output)	Bypass input	1	220 V AC, 230 V AC, or 240 V AC	100 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m

Model	Wiring Terminal	Number of Phases	Rated Voltage	External Circuit Breaker	Cross-sectional Area	Terminal Type	Torque for Tightening Bolts
se output)			AC				
	Mains input	3	380 V AC, 400 V AC, or 415 V AC	50 A (the characteristics of D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N m
	Battery	N/A	±240 V DC	63 A	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N m
	Output	1	220 V AC, 230 V AC, or 240 V AC	100 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m
15 kVA (three-phase input three-phase output)	Bypass input	3	380 V AC, 400 V AC, or 415 V AC	50 A (the characteristics of D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N m
	Mains input	3					
	Battery	N/A	±240 V DC	63 A	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N m
	Output	3	380 V AC, 400 V AC, or 415 V AC	50 A (the characteristics of D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N m
20 kVA (dual-live-wire input dual-live-wire output)	Dual-live-wire input	2	208 V AC, 220 V AC	125 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m
	Battery	NA	±240 V DC	63 A	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N m
	Dual-live-wire Output	2	208 V AC, 220 V AC	125 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m

Model	Wiring Terminal	Number of Phases	Rated Voltage	External Circuit Breaker	Cross-sectional Area	Terminal Type	Torque for Tightening Bolts
20 kVA (single-phase input single-phase output)	Input	1	220 V AC, 230 V AC, or 240 V AC	125 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m
	Battery	NA	±240 V DC	63 A	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N m
	Output	1	220 V AC, 230 V AC, or 240 V AC	125 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m
20 kVA (three-phase input single-phase output)	Bypass input	1	220 V AC, 230 V AC, or 240 V AC	125 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m
	Mains input	3	380 V AC, 400 V AC, or 415 V AC	63 A (the characteristics of D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N m
	Battery	N/A	±240 V DC	63 A	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N m
	Output	1	220 V AC, 230 V AC, or 240 V AC	125 A (the characteristics of D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N m
20 kVA (three-phase input three-phase output)	Bypass input	3	380 V AC, 400 V AC, or 415 V AC	63 A (the characteristics of D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N m
	Mains input	3					
	Battery	N/A	±240 V DC	63 A	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N m

Model	Wiring Terminal	Number of Phases	Rated Voltage	External Circuit Breaker	Cross-sectional Area	Terminal Type	Torque for Tightening Bolts
	Output	3	380 V AC, 400 V AC, or 415 V AC	63 A (the characteristics of D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N m

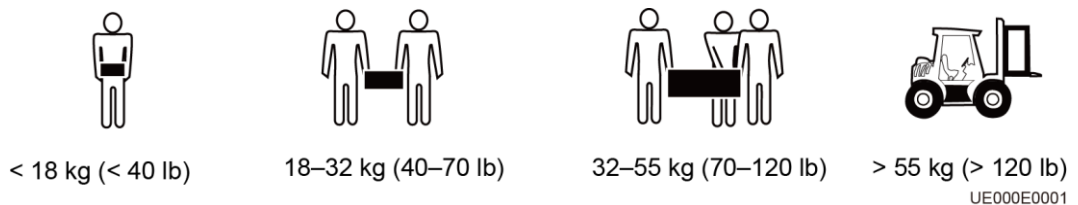
NOTE

- If customers purchase input and output power cables by themselves, use the cables that comply with standards proposed by Underwriters Laboratories (UL) or International Electrotechnical Commission (IEC).
- Two-mains-input scenarios are not supported on the UPS2000-G-15 kVA/20 kVA (single-phase input single-phase output).

3.1.4 Unpacking and Checking

Figure 3-4 shows the transportation safety requirements.

Figure 3-4 Transportation safety requirements



NOTICE

- Only trained personnel are allowed to move the UPS.
- Do not move the UPS by holding its mounting ears, front panel, terminal cover, or monitoring module.
- At least two persons are required to move the battery pack and transformer because they are heavy. Exercise caution when moving them. Prevent the battery pack from falling over; otherwise, fire accidents may occur. Remove rings, watches, and other metal objects when you move the battery pack.
- To prevent shocks or falls, move the UPS gently. After placing the UPS in the installation position, unpack it carefully to prevent scratches.

Procedure

- Step 1** Visually inspect the UPS appearance for shipping damage. If any shipping damage is found, report it to the carrier immediately.

Step 2 Move the UPS to the installation position.

Step 3 Unpack the case.

Step 4 Check the UPS packing.

1. Check the UPS bar code (which is at the rear panel of the UPS, near the air exhaust vent), and ensure that it complies with the order.
2. If there is any discrepancy, contact your local Huawei office immediately.

----End

3.2 Installation Procedure

UPS installation includes mechanical installation and cable connection. Installation modes include tower installation and rack installation. You can select an installation mode based on the site requirements.

3.3 Installing a Backfeed Protection Device

NOTICE

The UPS has no built-in backfeed protection device. You can install a backfeed protection device on the input front side.

If you do not install a backfeed protection device on the input front side, attach a warning label to the main power isolation device. The label reads like this: "This circuit supplies power to the UPS. Before cable connection, disconnect the UPS, and check the voltage across wiring terminals."

When battery mode is unavailable or the mains fails, the UPS internal voltages or energy may flow back directly, or through a leakage path, to an input terminal. To minimize the risk of electric shocks, install a backfeed protection device on the input side.

Table 3-3 lists the rated voltages and currents for backfeed protection contactors on the UPSs.

Table 3-3 Rated voltages and currents for backfeed protection contactors

Model	Single-phase/three-phase		Two live wires	
	Rated Voltage and Current	Recommended Contactor Models (Schneider contactors)	Rated Voltage and Current	Recommended Contactor Models (ABB contactors)
UPS2000-G-3KRTL-V2	220 V AC, 230 V AC, 240 V AC, 17 A	LC1-D40A	208 V AC, 220 V AC, 17 A	AF50-30-11*70
UPS2000-G-6KRTL-	220 V AC, 230 V AC, 240 V AC, 40	LC1-D40A	208 V AC, 220 V AC, 40	AF50-30-11*

Model	Single-phase/three-phase		Two live wires	
	Rated Voltage and Current	Recommended Contactor Models (Schneider contactors)	Rated Voltage and Current	Recommended Contactor Models (ABB contactors)
V2	A		A	70
UPS2000-G-10KRTL-V2	220 V AC, 230 V AC, 240 V AC, 65 A	<ul style="list-style-type: none"> LC1-D50A for single-phase input LC1-DT60A for three-phase input 	208 V AC, 220 V AC, 65 A	AF50-30-11*70
UPS2000-G-15KRTL (three-phase input)	220 V AC, 230 V AC, 240 V AC, 32 A	LC1-DT60A for three-phase input	N/A	N/A
UPS2000-G-20KRTL (three-phase input)	220 V AC, 230 V AC, 240 V AC, 40 A		N/A	N/A
UPS2000-G-15KRTL (single-phase input) UPS2000-G-20KRTL (single-phase input)	220 V AC, 230 V AC, 240 V AC, 125 A	LC1-D80 for single-phase input	208 V AC, 220 V AC, 125 A	AF110-30-11*70

Table 3-4 Control relay parameters

Recommended Model	Parameters
HF18FF/012 (HONGFA control relay)	Dry contact: NC
MY2N-J DC12V (OMRON control relay)	Breaking capability: 250 V AC, 5 A
HJ2-L-DC12V (Panasonic control relay)	Coil: 12 V rated voltage; rated current of less than 1 A

3.3.1 Feedback Prevention Connections (With Dry Contract Control)

Figure 3-5, Figure 3-6, Figure 3-7, Figure 3-8 and Figure 3-9 show backfeed protection connections (with dry contract control).

Figure 3-5 Bypass backfeed protection connections for the UPS2000-G-3 kVA/6 kVA/10 kVA/15 kVA/20 kVA (two live wires)

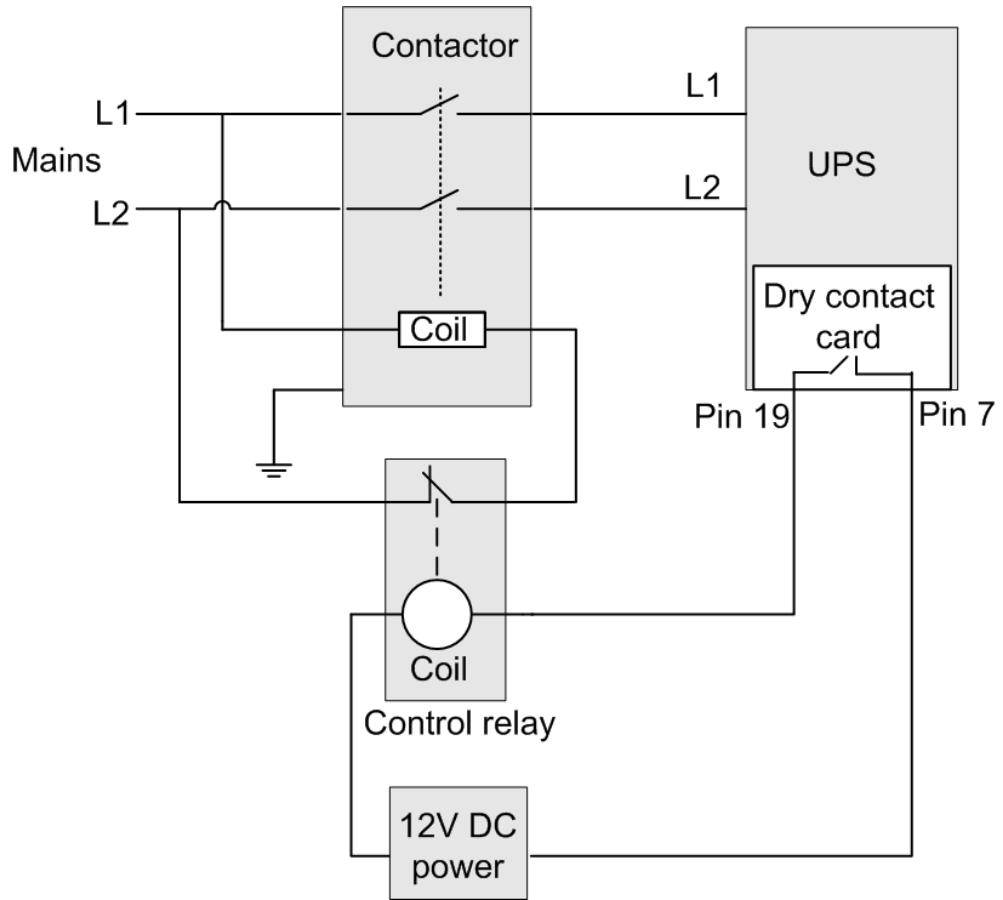


Figure 3-6 Bypass backfeed protection connections for the UPS2000-G-3 kVA/6 kVA/10 kVA/15 kVA/20 kVA (single-phase input single-phase output)

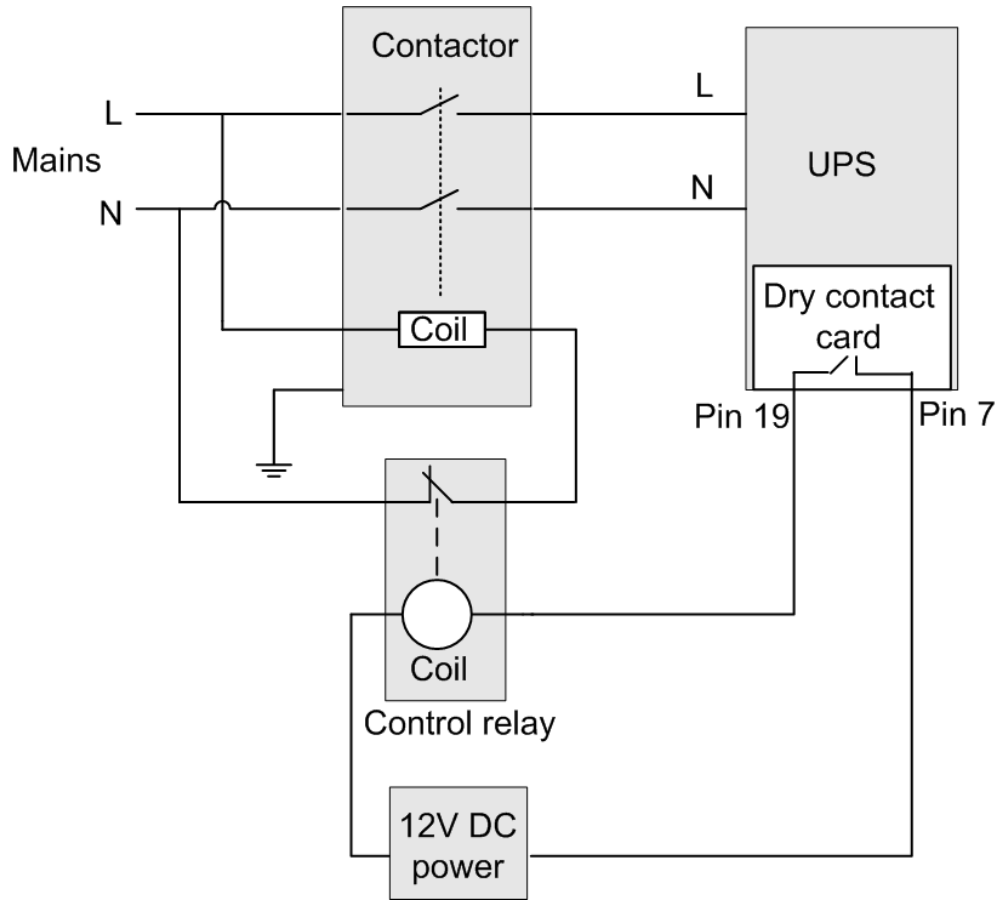


Figure 3-7 Bypass backfeed protection connections for the UPS2000-G-10 kVA (three-phase input single-phase output)

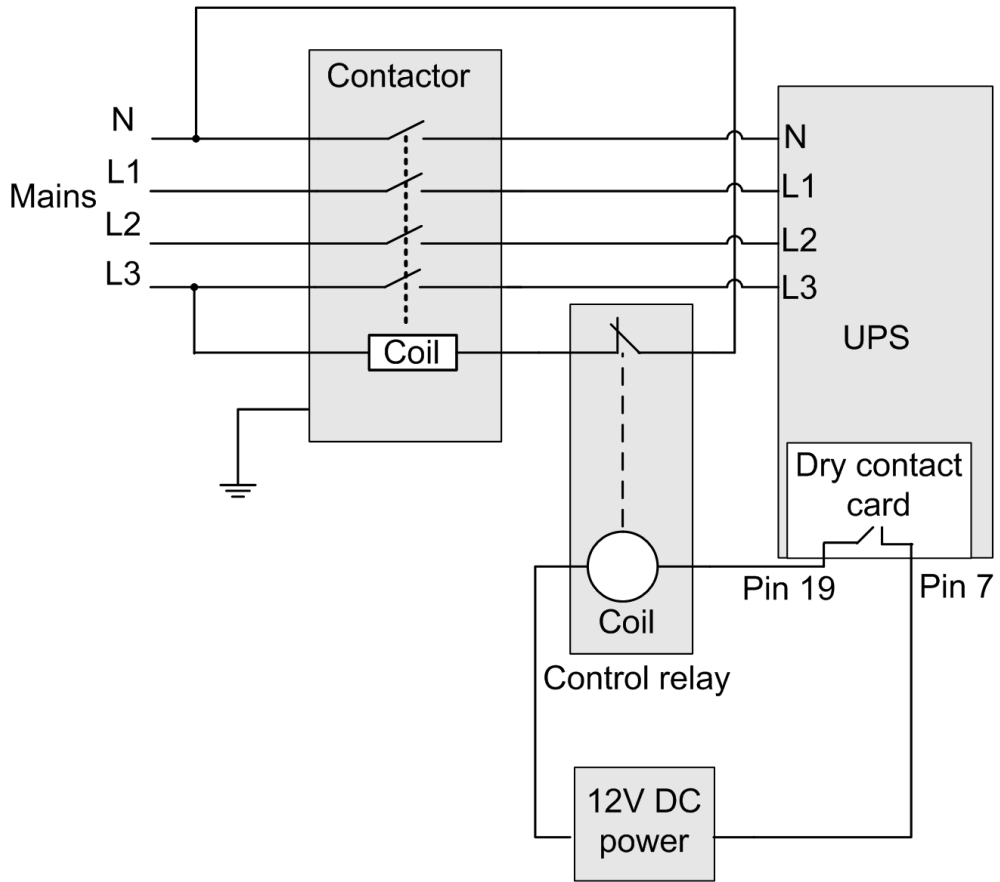


Figure 3-8 Bypass backfeed protection connections for the UPS2000-G-15 kVA/20 kVA (three-phase input three-phase output)

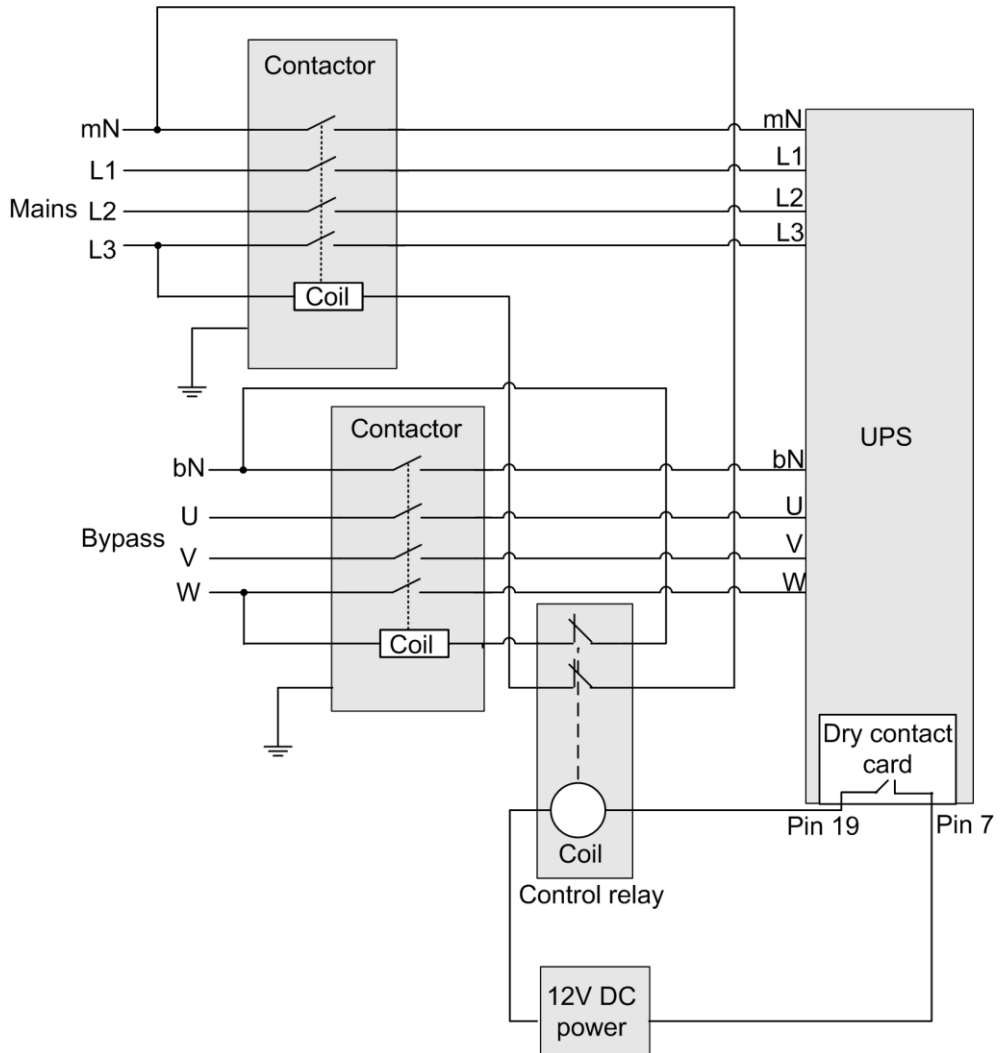
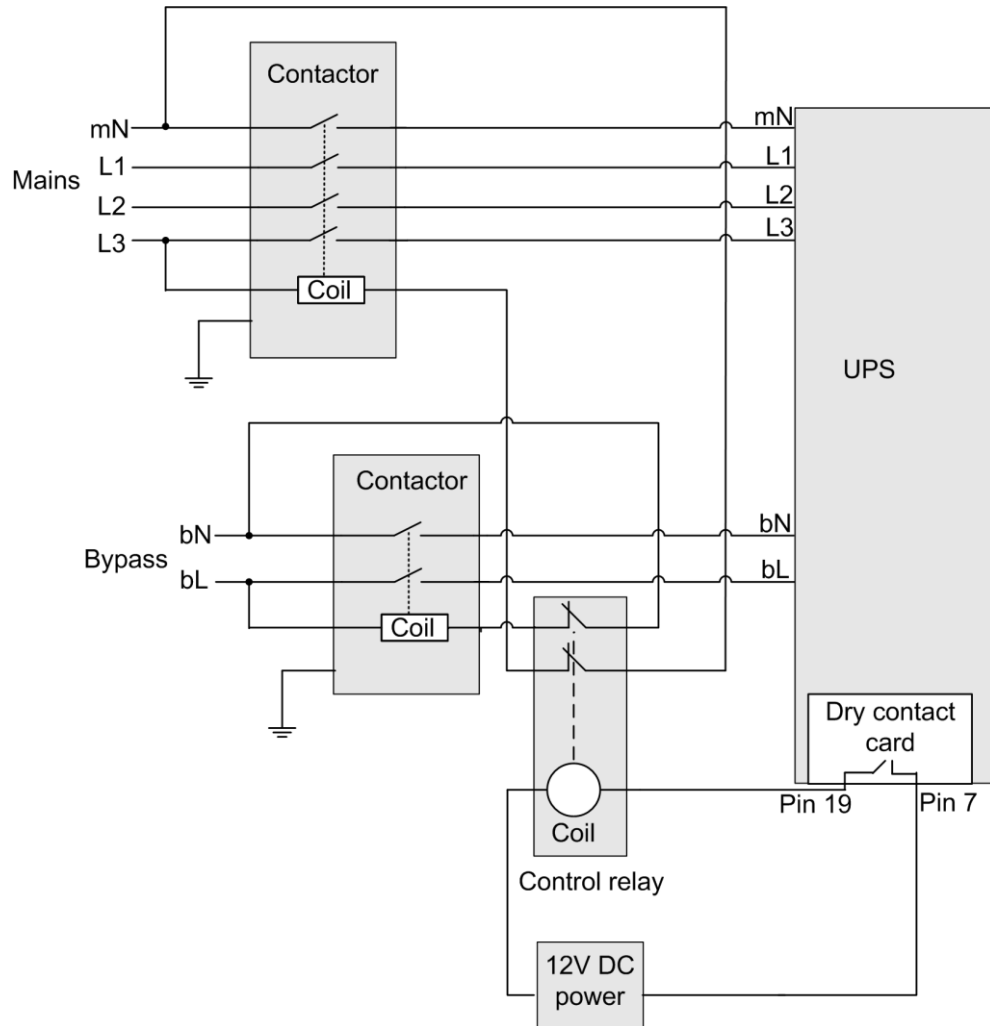


Figure 3-9 Bypass backfeed protection connections for the UPS2000-G-15 kVA/20 kVA (three-phase input single-phase output)



3.4 Check After Installation

Table 3-5 lists the check items.

Table 3-5 Post-installation check items

No.	Item	Expected Result
1	Cable routing	Cable routing meets engineering requirements.
2	Cable connections	Input cables, output 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.

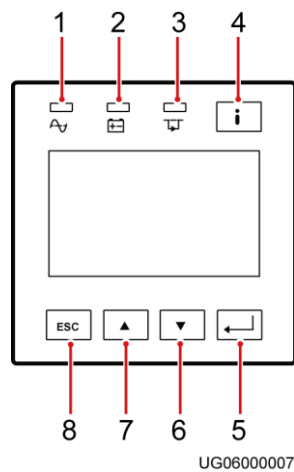
No.	Item	Expected Result
4	Labels	Labels are neatly attached to both ends of each cable, and the information on the labels is concise and understandable.
5	Ground cable connection	The ground cable is securely connected to the equipment room ground bar. Measure the resistance between the UPS ground cable 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 Control Panel

4.1 Introduction

The control panel, located on the front panel of the UPS, controls UPS running, displays running data, and allows you to set parameters and view alarms. [Figure 4-1](#) shows the control panel.

Figure 4-1 Control panel



- | | | | |
|--|-----------------------|----------------------|---------------------------------|
| (1) Mains indicator | (2) Battery indicator | (3) Bypass indicator | (4) Fault indicator/INFO button |
| (5) Startup/Enter/Battery Self-Check/Mute button | (6) Down button | (7) Up button | (8) Shutdown/Back button |

4.2 Indicators

[Table 4-1](#) describes the indicators on the control panel.

Table 4-1 Indicator description

Indicator	Color	Status	Meaning
Mains indicator	Green	On	The UPS is in normal mode.
		Off	The UPS is not in normal mode.
Battery indicator	Yellow	On	The UPS is in battery mode.
		Off	The UPS is not in battery mode.
		Blinking	The remaining battery capacity is less than 25%.
Bypass indicator	Yellow	On	The UPS is in bypass mode.
		Off	The UPS is not in bypass mode.
Fault indicator/INFO button	Red	On	The UPS is faulty.
	Red	Blinking	The UPS generates an alarm.
	Green	On	The UPS is running properly.



 **NOTE**





The UPS is in ECO mode when the mains indicator and bypass indicator are both on.

4.3 Functional Buttons

The control panel provides five buttons to start and shut down the UPS and set parameters. [Table 4-2](#) describes the buttons.

Table 4-2 Button description

Button	Meaning	Description
ESC	Shutdown/Back	<ul style="list-style-type: none"> On the default screen, press ESC for more than 5 seconds. Release the button when you hear a beep sound. The inverter shuts down. On any other screen, press ESC to return to the upper-level menu (the default screen is the upper-level screen for the main menu screen).
▲	Up	Press ▲ or ▼ to scroll upward or downward. You can set a value by using the list or step increase or decrease.
▼	Down	
	Enter/Startup/Battery Self-Check/Mute	<ul style="list-style-type: none"> On the default screen in bypass mode, hold down  for more than 5 seconds. Release the button when you hear a beep sound. The UPS starts.

Button	Meaning	Description
		<ul style="list-style-type: none"> On the default screen, press . The main menu is displayed. On any menu screen, press . The lower-level menu is displayed. If the menu is the last level, an information screen is displayed. On the default screen in normal mode, hold down  for more than 5 seconds. Release the button when you hear a beep sound. The battery test starts. When the buzzer buzzes, hold down  for 2–5 seconds. The buzzer is muted when you release the button.
i	Fault indicator/INFO button	<ul style="list-style-type: none"> When an alarm is generated, press i to view the active alarm information. When no alarm is generated, press i to return to the default screen.

 **NOTE**



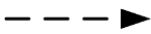
- Battery self-check: After the UPS starts in normal mode, it transfers to battery mode for 10 seconds to check that the battery status (if no battery is connected, **No battery** is displayed) and that the UPS can transfer to battery mode. The purpose is to prevent power backup failure when the UPS needs to transfer to battery mode.
- If you do not press any button within 60 seconds, the default screen is displayed.

4.4 LCD

The LCD displays the UPS running data and alarm information, and allows you to set parameters and control operation. The backlight turns off if you do not press any button within 30 seconds.

4.5 LCD Startup Screens

Table 4-3 Symbol conventions

Symbol	Description
	Press A.
	Press B after you press A.
	Indicates omitted screens.

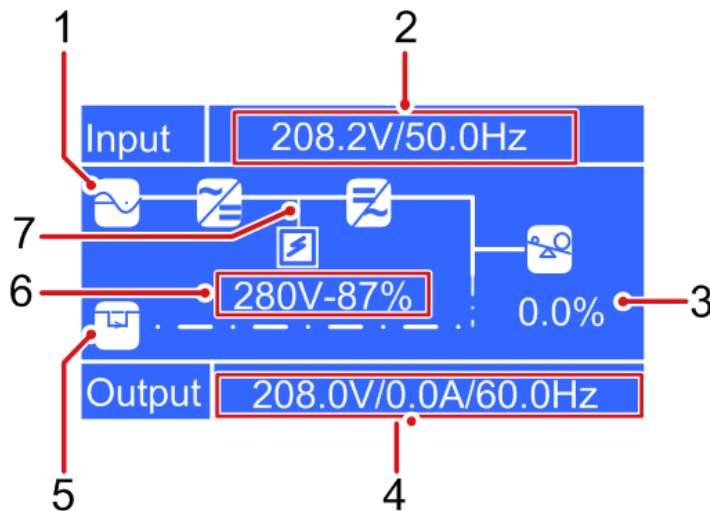
NOTE

The symbol conventions apply to all chapters in this document.

NOTICE

- The LCD figures in this document correspond to V100R001C10SPC802.
- The screen in this document based on the UPS2000-G-15 kVA/20 kVA. The parameter values in the menu pictures in this document are for reference only.

Figure 4-2 Description of the startup screen



(1) Normal mode (The solid line indicates normal mode. The dotted line indicates non-normal mode.)

(2) Input voltage and frequency

(3) Load power

(4) Output voltage, current, and frequency



(5) Bypass mode (The solid line indicates bypass mode. The dotted line indicates non-bypass mode.)






(6) Battery voltage and capacity displayed during charge; Battery discharge time and capacity displayed during discharge.

(7) Battery mode (The solid line indicates battery in charge or discharge mode. The dotted line indicates non-battery mode.)

Table 4-4 describes the icons on the screen.

Table 4-4 Icons on the screen

Icon	Meaning	Icon	Meaning
	Mains input		Rectifier/PFC working

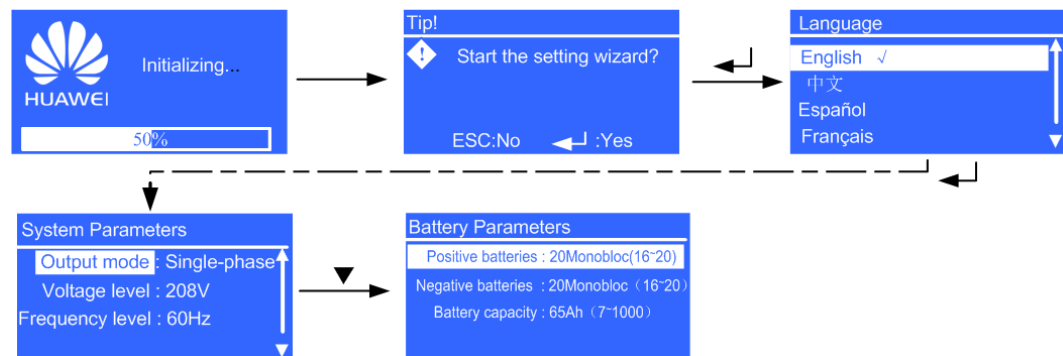
Icon	Meaning	Icon	Meaning
	Inverter working		Bypass mode
	Load power		Battery charging
	Battery discharging	N/A	N/A

4.5.1 Starting the UPS in Normal Mode

Initial Startup

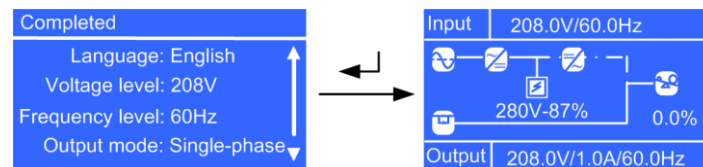
The settings wizard starts automatically when you start the UPS for the first time or when you restart the UPS after restoring factory settings. The settings wizard provides the **Language**, **System Parameters**, and **Battery Parameters** screens.

Figure 4-3 Settings wizard



After you complete the settings, press . The standby screen is displayed.

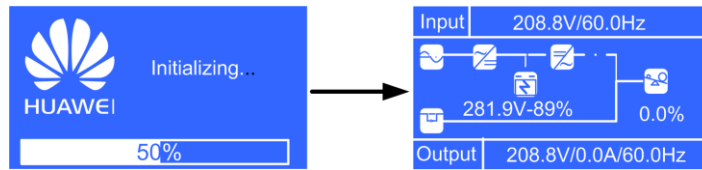
Figure 4-4 Standby screen displayed after initial startup



Non-initial Startup

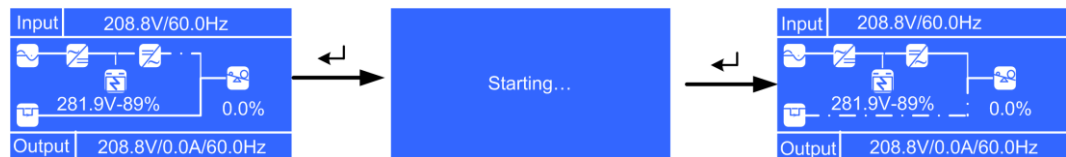
When the initialization is complete, the standby screen is displayed.


Figure 4-5 Standby screen displayed after non-initial startup



After the UPS starts, it enters normal mode.

Figure 4-6 Normal mode



Press . The main menu screen is displayed.

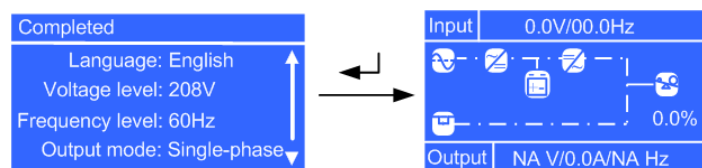
4.5.2 Starting the UPS in Battery Mode

Initial Startup

The settings wizard starts automatically when you start the UPS for the first time or when you restart the UPS after restoring factory settings. The settings wizard provides the **Language**, **System Parameters**, and **Battery Parameters** screens.

After you complete the settings, press . The standby screen is displayed.

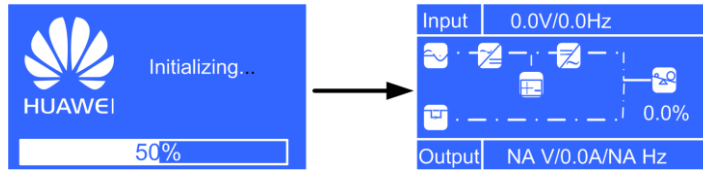
Figure 4-7 Standby screen displayed after initial startup



Non-initial Startup

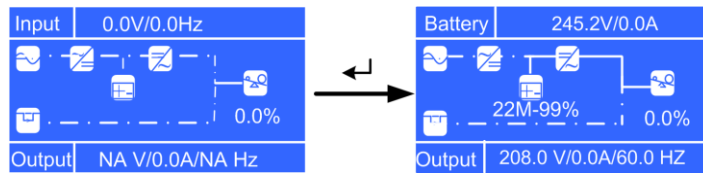
When the initialization is complete, the standby screen is displayed.


Figure 4-8 Standby screen displayed after non-initial startup



After the UPS starts, it enters battery mode.

Figure 4-9 Battery mode



Press . The main menu screen is displayed.

4.6 LCD Menu Hierarchy

Figure 4-10 Main Menu screen

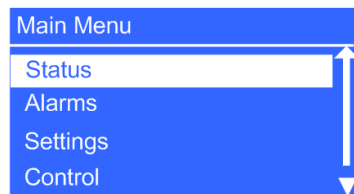
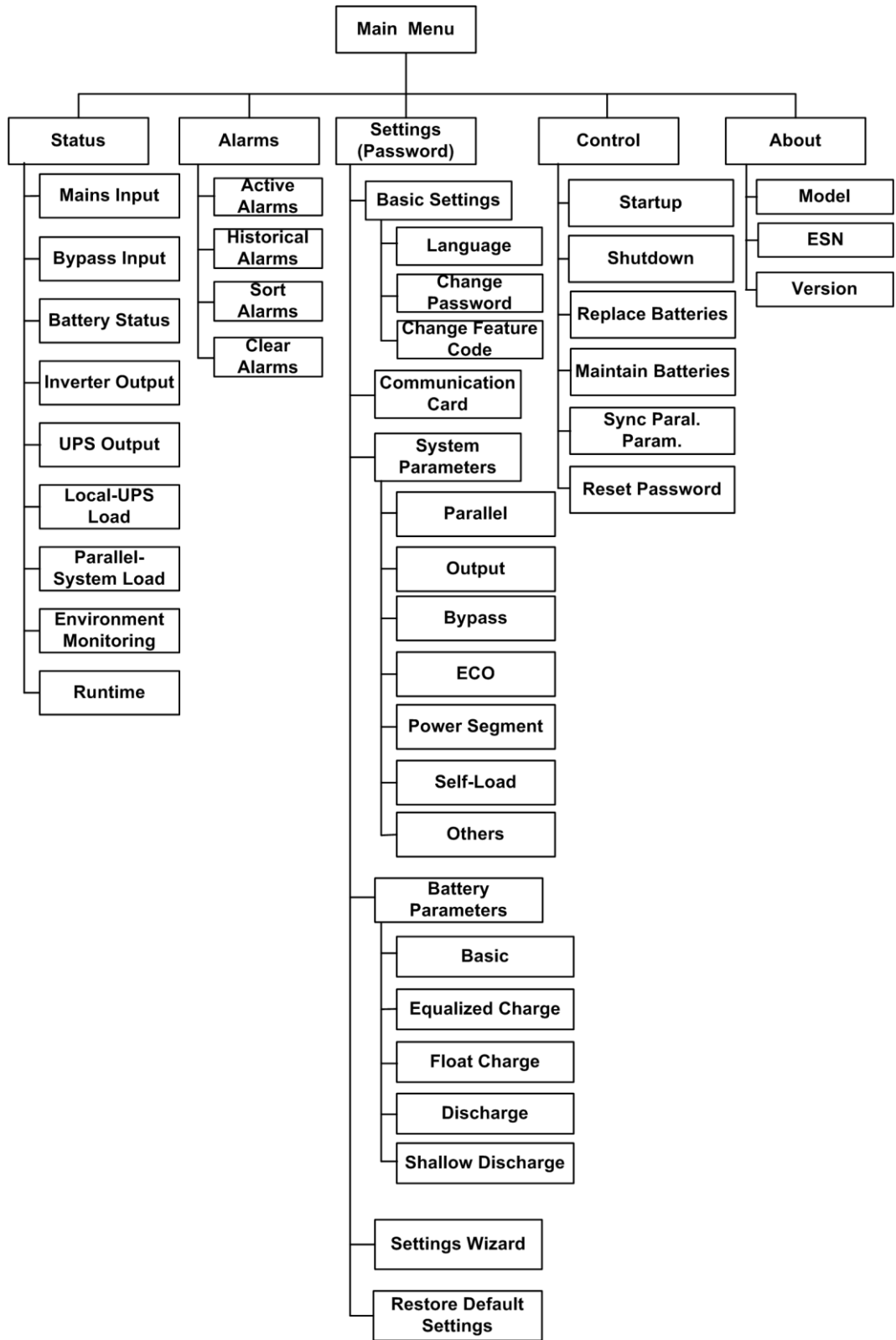



Figure 4-11 shows the LCD menu hierarchy.

Figure 4-11 LCD menu hierarchy



UG06C00020

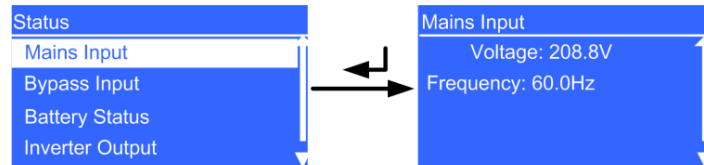
4.6.1 Status Screen

On the **Main Menu** screen, select **Status**, and press . The **Status** screen is displayed.

Mains Input Screen

Figure 4-12 shows the **Mains Input** screen.

Figure 4-12 Mains Input screen

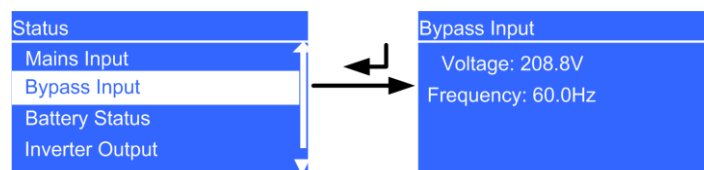


- **Voltage** parameter
Phase voltages displayed on the **Mains Input** screen (The parameter is **Van**, **Vbn**, and **Vcn** in the case of three-phase input.)
- **Frequency** parameter
Frequency displayed on the **Mains Input** screen.
- **Vab**, **Vbc**, and **Vca** parameters
Line voltages displayed on the **Mains Input** screen (The parameters are not displayed in the case of single-phase input.)

Bypass Input Screen

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

Figure 4-13 Bypass Input screen

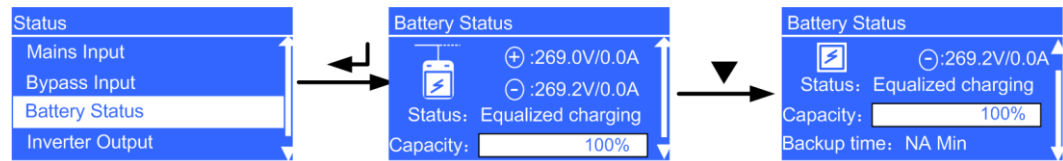


- **Voltage** parameter
Phase voltages displayed on the **Bypass Input** screen (The parameter is **Van**, **Vbn**, and **Vcn** in the case of three-phase input.)
- **Frequency** parameter
Frequency displayed on the **Bypass Input** screen.

Battery Status Screen

Figure 4-14 shows the **Battery Status** screen.

Figure 4-14 Battery Status screen

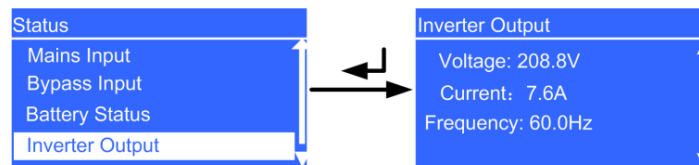


- **Battery voltage** parameter
 Battery string voltage (positive and negative battery string voltages in the case of the UPS2000-G-15 kVA/20 kVA)
- **Battery current** parameter
 Battery string current (positive and negative battery string currents in the case of the UPS2000-G-15 kVA/20 kVA). + is displayed during battery charge, and – is displayed during battery discharge.
- **Status** parameter
 The battery status is **NA** (battery not connected or reversely connected), **Equalized charging**, **Float charging**, **Hibernating**, or **Discharging**.
- **Capacity** parameter
 Remaining battery capacity.
- **Backup time** parameter
 Estimated backup time. The value is **NA** during battery charge.

Inverter Output Screen

Figure 4-15 shows the **Inverter Output** screen.

Figure 4-15 Inverter Output screen

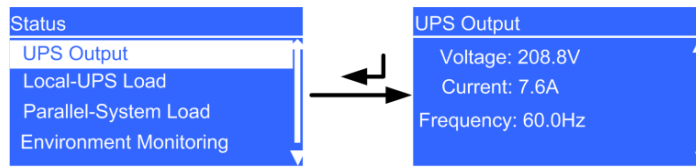


- **Voltage** parameter
 Phase voltages displayed on the **Inverter Output** screen (The parameter is **V_{an}**, **V_{bn}**, and **V_{cn}** in the case of three-phase input.)
- **Current** parameter
 Phase currents displayed on the **Inverter Output** screen (The parameter is **I_a**, **I_b**, and **I_c** in the case of single-phase input.)
- **Frequency** parameter
 Frequency displayed on the **Inverter Output** screen

UPS Output Screen

Figure 4-16 shows the **UPS Output** screen.

Figure 4-16 UPS Output screen

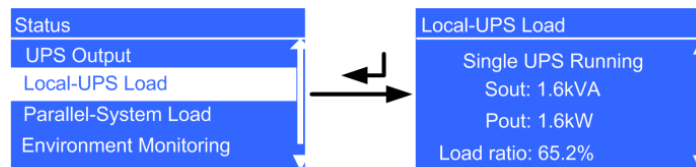


- **Voltage** parameter
Phase voltages displayed on the **UPS Output** screen (The parameter is **Van**, **Vbn**, and **Vcn** in the case of three-phase input.)
- **Current** parameter
Phase currents displayed on the **UPS Output** screen (The parameter is **la**, **lb**, and **lc** in the case of three-phase input.)
- **Frequency** parameter
Frequency on displayed the **UPS Output** screen.

Local-UPS Load Screen

Figure 4-17 shows the **Local-UPS Load** screen.

Figure 4-17 Local-UPS Load screen

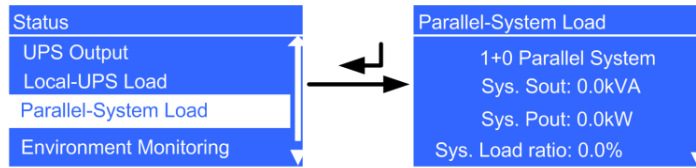


- **Single UPS Running** screen
A single UPS is running.
- **Sout** parameter
Phase A, B, and C apparent power displayed on the **Local-UPS Load** screen (The parameter is **Sout_A**, **Sout_B**, and **Sout_C** in the case of three -phase input.)
- **Pout** parameter
Phase A, B, and C active power displayed on the **Local-UPS Load** screen (The parameter is **Pout_A**, **Pout_B**, and **Pout_C** in the case of three-phase input.)
- **Load ratio** parameter
Phase A, B, and C load ratio displayed on the **Local-UPS Load** screen (the parameter is **Load ratio_A**, **Load ratio_B**, and **Load ratio_C** in the case of three-phase input.)

Parallel-System Load Screen

Figure 4-18 shows the **Parallel-System Load** screen.

Figure 4-18 Parallel-System Load screen



- **N+X Parallel-System** screen
 A parallel system is running. X (value range: 0–3) indicates the number of redundant UPSs (configurable on the LCD); N (value range: 1–4) indicates the number of requisite UPSs (total number of UPSs minus X). The total number of UPSs is automatically identified by the system.
- **Sys. Sout** parameter
 System phase A, B, and C apparent power displayed on the **Parallel-System Load** screen. The parameter is **Sys. Sout_A**, **Sys. Sout_B**, and **Sys. Sout_C** in the case of three-phase input; the parameters are not displayed in single UPS mode.
- **Sys. Pout** parameter
 System phase A, B, and C active power displayed on the **Parallel-System Load** screen. The parameter is **Sys. Pout_A**, **Sys. Pout_B**, and **Sys. Pout_C** in the case of three-phase input; the parameters are not displayed in single UPS mode.
- **Sys. Load ratio** parameter
 System phase A, B, and C load ratio displayed on the **Parallel-System Load** screen. The parameter is **Sys. Load ratio_A**, **Sys. Load ratio_B**, and **Sys. Load ratio_C** in the case of three-phase input, and the parameters are not displayed in single UPS mode.

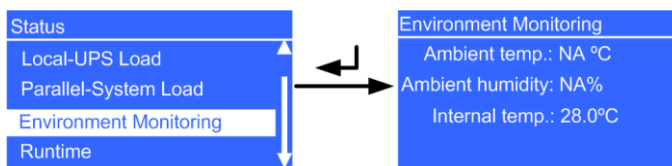
NOTE

System information is not displayed in single UPS mode.

Environment Monitoring Screen

Figure 4-19 shows the **Environment Monitoring** screen.

Figure 4-19 Environment Monitoring screen



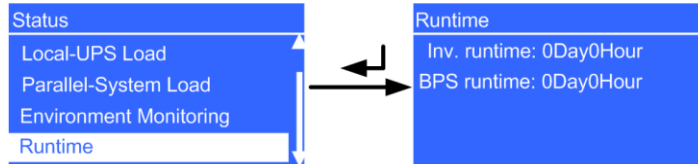
- **Ambient temp.** parameter
 Temperature detected by the ambient temperature and humidity sensor (used together with an SNMP card; if the sensor is not connected, **NA** is displayed.)
- **Ambient humidity** parameter
 Temperature and humidity sensor humidity (Install an SNMP card and a temperature and humidity sensor; if they are not installed, **NA** is displayed.)
- **Internal temp.** parameter

Temperature in the UPS cabinet

Runtime Screen

Figure 4-20 shows the **Runtime** screen.

Figure 4-20 Runtime screen



- **Inv. runtime** parameter
Time during which the UPS runs in inverter output state
- **BPS runtime** parameter
UPS bypass running duration

4.6.2 Alarms Screen

On the **Main Menu** screen, select **Alarms**, and press . The **Alarms** screen is displayed.

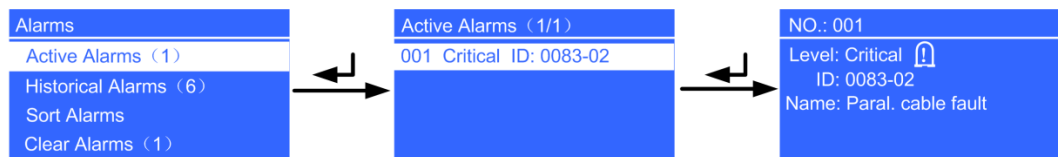
NOTE

When the buzzer buzzes, hold down for 2–5 seconds to mute it. The buzzer is muted when you release the button. When the buzzer is mute, it cannot be buzzes again, until a new alarm is generated.

Active Alarms Screen

The **Active Alarms** screen displays the active alarm information, such as the alarm serial number, severity, ID, and name, as shown in Figure 4-21.

Figure 4-21 Active Alarms screen



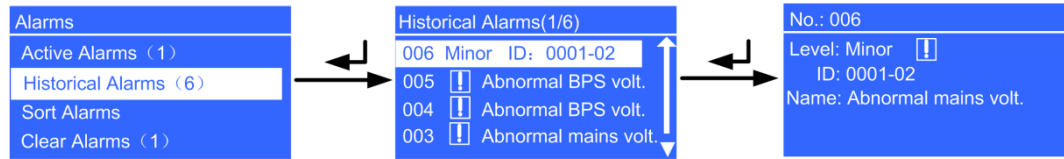
NOTE

If an alarm is generated, press the INFO button on the default screen. On the **Active Alarms** screen, view the active alarms.

Historical Alarms Screen

The **Historical Alarms** screen displays the historical alarm information, such as the alarm serial number, severity, ID, and name, as shown in Figure 4-22.

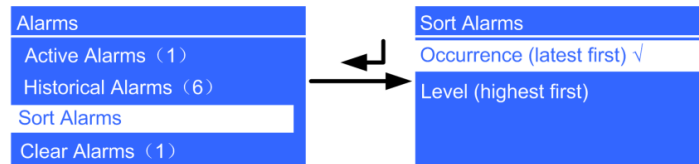
Figure 4-22 Historical Alarms screen



Sort Alarms Screen

The **Sort Alarms** screen allows you to view alarms by occurrence time or severity, as shown in [Figure 4-23](#).

Figure 4-23 Sort Alarms screen



- **Occurrence (latest first)** parameter
 Alarms are sorted by occurrence time. The latest alarms are listed first.
- **Level (highest first)** parameter
 Active alarms are displayed by severity. The most critical alarms are listed first.

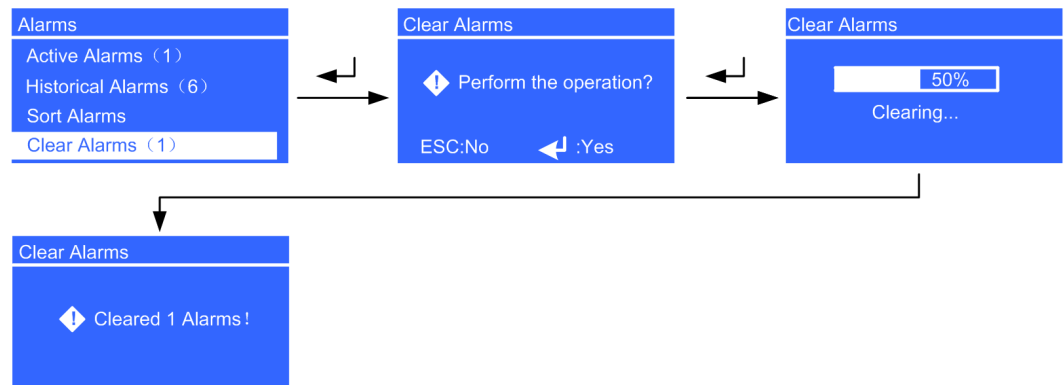
NOTE

✓ is displayed next to a selected **Sort Alarms**.

Clear Alarms Screen

Clear the alarms that you can clear manually, as shown in [Figure 4-24](#).

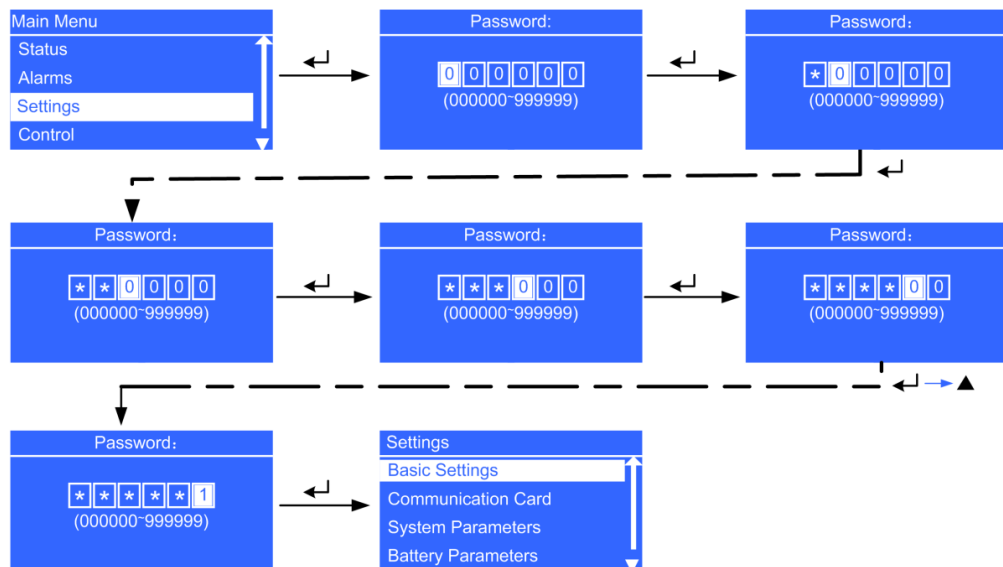
Figure 4-24 Clear Alarms screen



4.6.3 Settings Screen

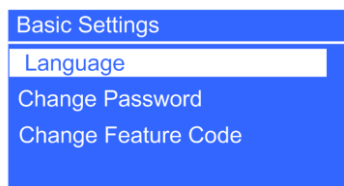
On the **Main Menu** screen, select **Settings**, and press . The **Settings** login screen is displayed. The preset password is **000001**. After you enter a password, press . The **Settings** screen is displayed, as shown in [Figure 4-25](#).

Figure 4-25 Settings screen



Basic Settings Screen

Figure 4-26 Basic Settings screen

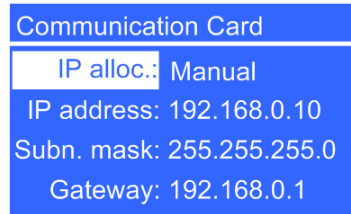


- **Language** parameter
 You can select **Chinese**, **English** (preset), **Spain**, **French**, and **Russian**.
- **Change Password** parameter
 You can change the password by choosing **Settings > Basic Settings > Change Password**. The preset password is **000001**. The password allows you to enter the **Settings** screen.
- **Change Feature Code** parameter
 You can change the feature code by choosing **Settings > Basic Settings > Change Feature Code**. The preset feature code is **999999**. The feature code is used to restore the preset password.

Communication Card Screen

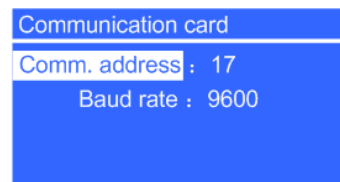
- If an SNMP card is connected, set the following parameters:

Figure 4-27 SNMP card settings



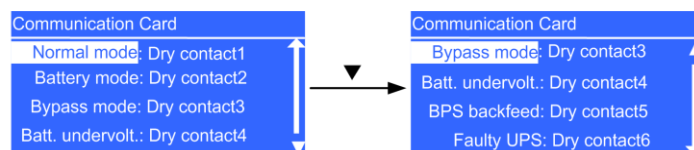
- **IP address** parameter
Set an IP address for the SNMP card. The value ranges from **0.0.0.0** to **255.255.255.255**. The default value is **192.168.0.10**.
 - **Subn. mask** parameter
Set a subnet mask for the SNMP card. The value ranges from **0.0.0.0** to **255.255.255.255**. The default value is **255.255.255.0**.
 - **Gateway** parameter
Set a gateway address for the SNMP card. The value ranges from **0.0.0.0** to **255.255.255.255**. The default value is **192.168.0.1**.
- If a Modbus card is connected, the following parameters are displayed:

Figure 4-28 Modbus card settings



- **Comm. address** parameter
Set a communications address for the Modbus card over the dual in-line package (DIP) switch on the Modbus card. The value cannot be changed on the LCD.
 - **Baud rate** parameter
Set a baud rate for the Modbus card over the DIP switch on the Modbus card. The value cannot be changed on the LCD.
- If a dry contact card is connected, set the following parameters:

Figure 4-29 Dry contact card settings



NOTE

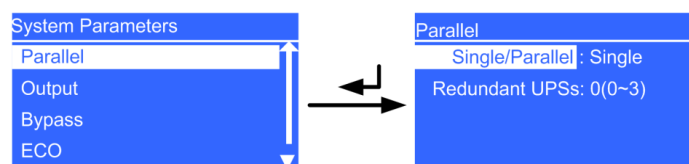
Multiple statuses can be associated with one dry contact, but one status cannot be associated with multiple dry contacts.

- **Normal mode** parameter
Set the output dry contact associated with normal mode. When the UPS is in normal or ECO mode, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact1**.
- **Battery mode** parameter
Set the output dry contact associated with battery mode. When the UPS is in battery or ECO mode, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact2**.
- **Bypass mode** parameter
Set the output dry contact associated with bypass mode. When the UPS is in bypass or ECO mode, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact3**.
- **Batt. undervolt** parameter
Set the output dry contact associated with low battery voltages. When the system battery voltage is low, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact4**.
- **BPS backfeed** parameter
Set the output dry contact associated with bypass backfeed. When a bypass backfeed alarm is generated, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact5**.
- **Faulty UPS** parameter
Set the output dry contact associated with UPS faults. When a critical alarm is generated, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact6**.

System Parameters Screen

- **Parallel** screen

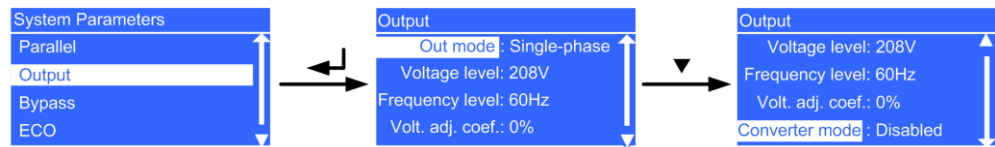
Figure 4-30 Parallel screen



- **Single/Parallel** parameter
The values include **Single** and **Parallel**. The default value is **Single**. The parameter is configurable after the inverter shuts down.
- **Redundant UPSs** parameter
Set the number of redundant UPSs. The value ranges from 0 to 3. The default value is 0. The parameter is configurable after the inverter shuts down.

- **Output** screen

Figure 4-31 Output screen



NOTE

The UPS supports 208 V output. In the case of 208 V output, the power is derated to 90%. For cable configurations and connections, see the details about 220 V output.

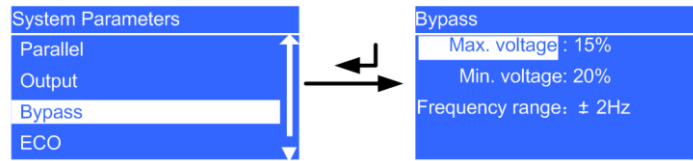
- **Output mode** parameter
 Set the system output mode. The value is not configurable on the UPS2000-G-3 kVA/6 kVA/10 kVA. The default value is **Single-phase**. The parameter is configurable on the UPS2000-G-15 kVA/20 kVA. The values include **Single-phase** and **Three-phase**. The default value is **Three-phase**. The input mode is identified automatically by the system. The parameter is configurable after the inverter shuts down.
- **Voltage level** parameter
 Set the system output voltage level. The values include 208 V, 220 V (default), 230 V, and 240 V on the UPS2000-G-3 kVA/6 kVA/10 kVA. The values include 208 V, 220 V (default), 230 V, and 240 V on the UPS2000-G-15 kVA/20 kVA (single-phase output). The values include 380 V (default), 400 V, and 415 V on the UPS2000-G-15 kVA/20 kVA (three-phase output). After you change the voltage level, the upper thresholds for bypass voltages restore to default values 15% and 20% respectively. The parameter is configurable after the inverter shuts down.
- **Frequency level** parameter
 Set the system output frequency level. The values include 50 Hz (default), 60 Hz, and **Automatic**. If the value is **Automatic**, the power-on bypass frequency ranges from 40 Hz to 55 Hz, and the system output frequency is 50 Hz; if the power-on bypass frequency ranges from 55 Hz to 70 Hz (excluding 55 Hz), and the system output frequency is 60 Hz. The parameter is configurable after the inverter shuts down.
- **Volt. adj. coef.** parameter
 You can adjust the inverter rated output voltage. The values include $\pm 5\%$, $\pm 4\%$, $\pm 3\%$, $\pm 2\%$, $\pm 1\%$, and 0% (default). Press + or - to increase or decrease the output voltage. The parameter is configurable after the inverter shuts down.

NOTICE

If you set **Converter mode** to **Enabled**, the UPS cannot transfer to bypass mode or maintenance bypass mode. If you shut down the inverter, the loads power off.

- **Converter mode** parameter
 Determine whether to enable inverter mode. The values include **Disabled** and **Enabled**. The default value is **Disabled**. In converter mode, the output voltage and frequency are fixed at the specified values. The parameter is configurable after the inverter shuts down.
- **Bypass** screen

Figure 4-32 Bypass screen



– **Max. voltage** parameter

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

The **Max. voltage** parameter is associated with the system voltage level. The default value is 15%.

If the voltage system is 208 V, the values include 10%, 15%, 20%, 25%, and 30%.

If the voltage system is 220 V (380 V in the case of three-phase outputs), the values include 10%, 15%, 20%, and 25%.

If the voltage system is 230 V (400 V in the case of three-phase outputs), the values include 10%, 15%, and 20%.

If the voltage system is 240 V (415 V in the case of three-phase outputs), the values include 10% and 15%.

The parameter is configurable after the inverter shuts down.

– **Min. voltage** parameter

Lower threshold for the bypass voltage. If the difference between the bypass voltage and the rated output voltage exceeds this value, the system determines that the bypass voltage is abnormal and that the bypass is unavailable. The values include 10%, 20% (default), 30%, 40%, 50%, and 60%. The parameter is configurable after the inverter shuts down.

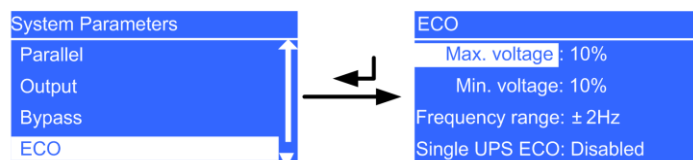
– **Frequency range** parameter

Bypass frequency range. 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 frequency range must be greater than the ECO frequency range. The values include ±0.5 Hz, ±1 Hz, ±2 Hz (default), ±3 Hz, ±4 Hz, ±5 Hz, and ±6 Hz. The parameter is configurable after the inverter shuts down.

• **ECO** screen

Figure 4-33 ECO screen

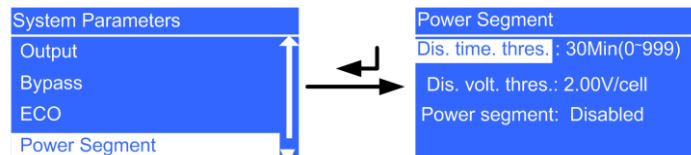


NOTE

You can use the ECO function only if power grid conditions are good and the voltage and frequency fluctuation is within the specified ECO voltage and frequency range.

- **Max. voltage** parameter
Upper threshold for the ECO voltage. 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 include 5%, 6%, 7%, 8%, 9%, and 10% (default). The parameter is configurable after the inverter shuts down.
- **Min. voltage** parameter
Lower threshold for the ECO voltage. 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 include 5%, 6%, 7%, 8%, 9%, and 10% (default). The parameter is configurable after the inverter shuts down.
- **Frequency range** parameter
ECO frequency range. In ECO mode, when the difference between the bypass frequency and the rated frequency is greater than this range, the system determines that the ECO frequency is abnormal and transfers to normal mode.
The frequency range must be less than the current bypass frequency range. The values include ± 0.5 Hz, ± 1 Hz, ± 2 Hz (default), and ± 3 Hz. The parameter is configurable after the inverter shuts down.
- **Single UPS ECO** parameter
Determine whether to support ECO mode on a single UPS (ECO mode is not supported in a parallel system). The values include **Disabled** and **Enabled**. The default value is **Disabled**. The parameter is configurable after the inverter shuts down.
- **Power Segment** screen

Figure 4-34 Power Segment screen



NOTE

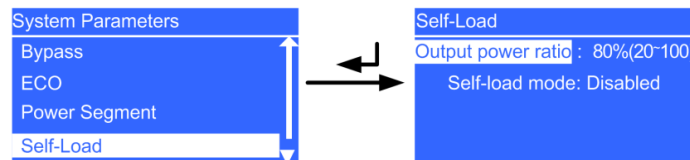
- In single UPS mode, primary loads connect to sL, and secondary loads connect to pL.
- In single UPS mode, if power segment is enabled, pL is disconnected and sL continues with power output when an overload occurs.
- In a parallel system, UPS AC output power cables connect to pL.
- **Dis. time. thres.** parameter
pL terminal loading time in battery mode when power segment (not supported in a parallel system) is enabled. In battery mode, if the discharge time exceeds this value, the UPS disconnects from secondary loads. The value ranges from 0 to 999, in units of minutes. The default value is 30. The parameter is configurable in non-battery mode or non-battery ECO mode.

NOTE

The UPS2000-G-15 kVA/20 kVA supports battery ECO mode only in the case of two mains inputs. In battery ECO mode, the bypass supplies power to the UPS, and batteries are used as backup power. If the bypass is abnormal, the UPS transfers to battery mode.

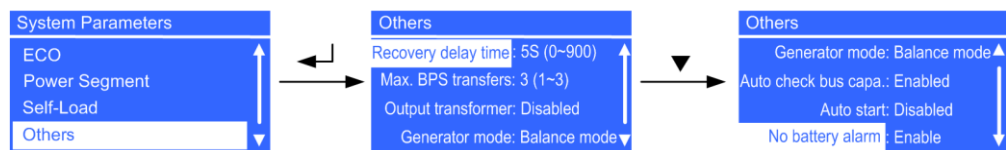
- **Dis. volt. thres.** parameter
 Set the lower threshold for the battery voltage when pL loading is allowed in battery mode when power segment (not supported in a parallel system) is enabled. In battery mode, if the battery voltage is less than this value, the UPS disconnects from secondary loads. The value ranges from 1.90 V/cell to 2.25 V/cell. The default value is 2.00 V/cell. The parameter is configurable in non-battery mode or non-battery ECO mode.
- **Power segment** parameter
 Determine whether to enable power segment in single UPS mode (power segment is not supported in a parallel system). The values include **Disabled** and **Enabled**. The default value is **Disabled**. The parameter is configurable after the inverter shuts down.
- **Self-Load** screen

Figure 4-35 Self-Load screen



- **Output power ratio** parameter
 This parameter is used during the tests before shipment. The value ranges from 20% to 100%. The default value is 80%. The parameter is configurable after the inverter shuts down.
- **Self-load mode** parameter
 This parameter is used during the tests before shipment. The values include **Disabled** and **Enabled**. The default value is **Disabled**. The parameter is configurable after the inverter shuts down.
- **Others** screen

Figure 4-36 Others screen



- **Recovery delay time** parameter
 Delay time that the UPS takes in transferring from battery mode to normal mode when the mains recovers. The value ranges from **0S** to **900S**. The default value is **5S**. The parameter is configurable after the inverter shuts down.

NOTE

If **Recovery delay time** is set to **0S**, the actual recovery delay time is 1 second.

- **Max. BPS transfers** parameter

Maximum number of bypass transfers within 30 minutes. The value ranges from 1 to 3. The default value is 3. When the number of bypass transfers exceeds the maximum, the UPS keeps running in bypass mode (in ECO mode, the UPS keeps running in normal mode). The parameter is configurable after the inverter shuts down.

NOTICE

Do not set the UPS to ECO mode when the system output connects to an isolated transformer.

- **Output transformer** parameter

If an output transformer is connected, set the parameter to **Enabled**; otherwise, set it to **Disabled**. The values include **Disabled** and **Enabled**. The default value is **Disabled**. The parameter is configurable after the inverter shuts down.

NOTE

When you install a transformer on the output side, you are advised to connect the load to the pL terminal and disable power segment.

- **Generator mode** parameter

The values include **Weak adaptability mode**, **Balance mode**, and **Strong adaptability mode**. The default value is **Balance mode**. When the mains input voltage quality is good, select **Weak adaptability mode**; when the quality is average (for example, the mains input is from a high-performance generator or a common power grid), select **Balance mode**; when the quality is poor (for example, the mains input is from a common generator), select **Strong adaptability mode**. The parameter is configurable after the inverter shuts down.

- **Auto check bus capa.** parameter

Determine whether to automatically check the bus capacitance upon power-on and generate capacitance failure warnings. The values include **Disabled** and **Enabled**. The default value is **Enabled**. If the value is **Enabled**, UPS startup takes additional 30–180 seconds. The parameter is configurable after the inverter shuts down.

- **Auto start** parameter

Determine whether to automatically start inverter output after the UPS connects to the mains. The values include **Disabled** and **Enabled**. The default value is **Disabled**. The parameter is configurable after the inverter shuts down.

- **No battery alarm**

This parameter is set to **Enabled** by default. If it is set to **Disabled**, the **No battery alarm** will not be reported. This parameter automatically changes to **Enabled** after batteries are connected. It is configurable only when batteries are not connected.

NOTE

If the batteries have been connected and you try to set this parameter, a message "Batteries have been connected. This parameter cannot be set." will be displayed.

Battery Parameters Screen

CAUTION

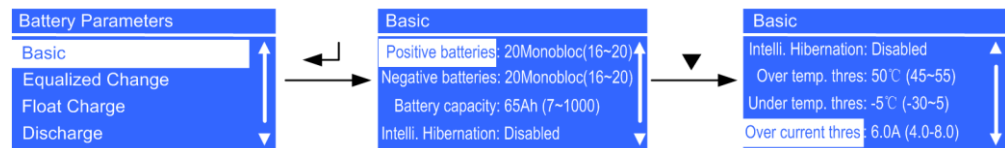
The configured number of batteries must match the actual number. When the actual number changes, change the configured number. If the configured number is less than the actual number, the battery lifespan is shortened. If the configured number is greater than the actual number, battery leakage may cause a fire.

NOTICE

- The UPS2000-G-6 kVA/10 kVA parallel system cannot shares a battery string.
- If a UPS2000-G-15 kVA/20 kVA parallel system shares a battery string, set the same battery string capacity and charge current for each UPS.
- Battery capacity (Ah) = Capacity of a single battery string x Number of parallel battery strings/Number of parallel UPSs sharing a battery string. Maximum charge current (Ah) = 0.1 x Capacity of a single battery string x Number of parallel battery strings/Number of parallel UPSs sharing a battery string. If the calculated maximum charge current is greater than 4 A, set it 4 A. Use two UPSs sharing a 65 Ah battery string as an example: If the calculated battery capacity is 65 x 1/2 = 32.5, set it to 32 Ah; if the calculated maximum current is 0.1 x 65 x 1/2 = 3.25, set it to 3.0 A.
- If a single 15 kVA/20 kVA UPS connects to two battery packs, the maximum charge current must be less than or equal to 2.0 A.

- **Basic screen**

Figure 4-37 Basic screen



- **Batteries/Positive batteries/Negative batteries** parameters
 Set the number of batteries. The value ranges from 16 to 20. The default value is 20. When the number of batteries N is less than 20, the system output power is derated to $N/20$ in battery mode. The parameter is configurable in non-battery mode or non-battery ECO mode. You need to set Number of batteries on the UPS2000-G-3 kVA/6 kVA/10 kVA, and set two battery strings (positive and negative) on the UPS2000-G-15 kVA/20 kVA.
- **Battery capacity** parameter
 Set the battery string capacity. The value ranges from 7 Ah to 1000 Ah. For the UPS2000-G-3 kVA/6 kVA, the default value is 7 Ah on a standard model and 40 Ah on a long backup time model; for the UPS2000-G-10 kVA, the default value is 9 Ah on a standard model and 65 Ah on a long backup time model; for the UPS2000-G-15 kVA/20 kVA, the default value is 65 Ah on a long backup time model. Battery capacity is the sum of all battery capacities, set the parameters based on the actual battery capacity. The parameter is configurable in non-battery mode or non-battery ECO mode.
- **Intelli. Hibernation** parameter

This parameter is set to disabled by default. When it is set to enabled, the intelligent battery hibernation function is enabled. The parameter is configurable in any mode.

– **Overtemp. thres.** parameter

Set an alarm threshold for high battery temperatures. The value ranges from 45 °C to 55 °C. The default value is 50 °C. The parameter is configurable in any mode.

– **Undertemp. thres.** parameter

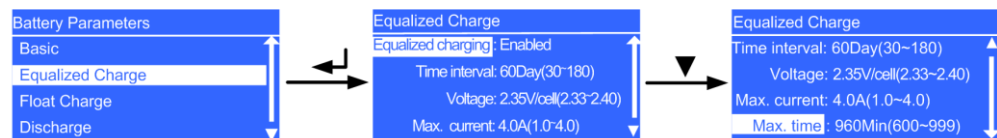
Set an alarm threshold for low battery temperatures. The value ranges from –30 °C to +5 °C. The default value is –5 °C. The parameter is configurable in any mode.

– **Overcurrent thres.** parameter

Set an alarm threshold for battery overcurrent. On a standard model, the value ranges from 2.0 A to 4.0 A, and the default value is 3.0 A. On a long backup time model, the value ranges from 4.0 A to 8.0 A, and the default value is 6.0 A. The parameter is configurable in any mode.

• **Equalized Charge** screen

Figure 4-38 Equalized Charge screen



– **Equalized charging** parameter

Determine whether to enable equalized charging. The values include **Disabled** and **Enabled**. The default value is **Enabled**. The parameter is configurable in any mode.

– **Time interval** parameter

Set the time interval for equalized charging. The value ranges from **30Day** to **180Day**. The default value is **60Day**. The parameter is configurable in any mode.

– **Voltage** parameter

Set the battery equalized voltage. The value ranges from 2.33 V/cell to 2.40 V/cell. The default value is 2.35 V/cell. The parameter is configurable in any mode.

– **Max. current** parameter

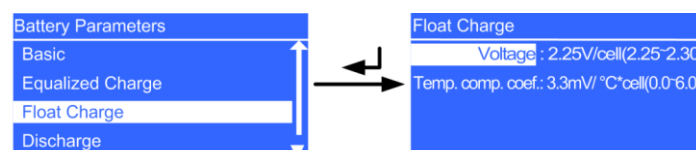
Set the maximum equalized current. On a long backup time model, the value ranges from 1.0 A to 4.0 A, and the default value is 2.0 A. The parameter is configurable in any mode.

– **Max. time** parameter

Set the maximum equalized charge time. The value ranges from **600Min** to **999Min**. The default value is **960Min**. The parameter is configurable in any mode.

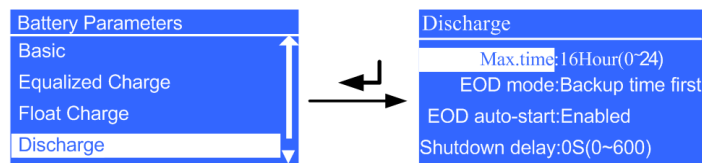
• **Float Charge** screen

Figure 4-39 Float Charge screen



- **Voltage** parameter
 Set the battery float voltage. The value ranges from 2.25 V/cell to 2.30 V/cell. The default value is 2.25 V/cell. The parameter is configurable in any mode.
- **Temp. comp. coef.** parameter
 Set a float voltage correction coefficient based on the battery temperature when a battery temperature sensor is connected. The value ranges from 0.0 mV/ °C*cell to 6.0 mV/ °C*cell. The default value is 3.3 mV/ °C*cell. The parameter is configurable in any mode.
- **Discharge** screen

Figure 4-40 Discharge screen



- **Max. time** parameter
 Set the maximum discharge time. When the discharge time reaches the value, the UPS powers off. The value ranges from **0Hour** to **24Hour**. The default value is **16Hour**. If you set the value to **0Hour**, the discharge time is not limited. The parameter is configurable in non-battery mode or non-battery ECO mode.

NOTE

- If you expect the battery discharge time to be greater than 24 hours, set **Max. time** to 0 hour. Otherwise, the system may power off.
- If you set **Max. time** to 0 hour, the battery string may remain in the small-current discharge state according to the proportion of the battery capacity to the load power, which affects the battery lifecycle.
- **EOD mode** parameter
 Determine the power backup time. The values include **Backup time first** (ensures system running and has a long backup time, [Table 4-5](#) shows the EOD setting values), **Batt. protect first** (protects batteries and extends the battery lifespan, [Table 4-6](#) shows the EOD setting values), and **Balanced mode** ([Table 4-7](#) shows the EOD setting values). The default value is **Backup time first**. The parameter is configurable in non-battery mode or non-battery ECO mode. EOD is short for end of discharge.

Table 4-5 Backup time first EOD setting values

Expected backup time	≤ 0.1 CA	0.1 CA to 0.5 CA	0.5 CA to 1 CA	1 CA to 3 CA	> 3 CA
Low voltage warning threshold (V/cell)	1.85	1.85	1.85	1.85	1.85
EOD threshold	1.75	1.67	1.60	1.60	1.60

Expected backup time	≤ 0.1 CA	0.1 CA to 0.5 CA	0.5 CA to 1 CA	1 CA to 3 CA	> 3 CA
(V/cell)					

Table 4-6 Batt. protect first EOD setting values

Expected backup time	≤ 0.1 CA	0.1 CA to 0.5 CA	0.5 CA to 1 CA	1 CA to 3 CA	> 3 CA
Low voltage warning threshold (V/cell)	1.90	1.90	1.90	1.90	1.90
EOD threshold (V/cell)	1.85	1.85	1.83	1.75	1.67

Table 4-7 Balanced mode EOD setting values

Expected backup time	≤ 0.1 CA	0.1 CA to 0.5 CA	0.5 CA to 1 CA	1 CA to 3 CA	> 3 CA
Low voltage warning threshold (V/cell)	1.85	1.85	1.85	1.85	1.85
EOD threshold (V/cell)	1.80	1.75	1.70	1.67	1.65

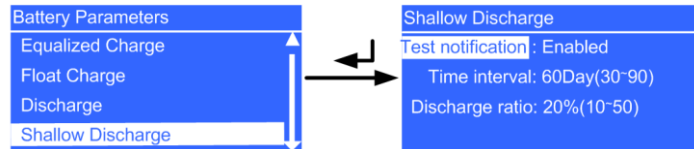
- **EOD auto-start** parameter
 Determine whether to automatically start inverter output after the mains becomes normal. The values include **Disabled** and **Enabled**. The default value is **Enabled**. The parameter is configurable after the inverter shuts down.
- **Shutdown delay** parameter
 When the delay time reaches the value after UPS transfers to battery mode, the UPS powers off. The value ranges from 0S to 600S. The default value is 0S. The value interval is 30s. For example, the value can be 0s, 30s, 60s, and 90s. If the delay time is set to 0S, the shutdown delay function is disabled. If the delay time is set to other values, ensure that backup time is greater than shutdown delay time. Otherwise, the power supply to loads may be disconnected. The parameter is configurable in non-battery mode or non-battery ECO mode.

NOTE

Shutdown delay parameters are asynchronous in a parallel system. When used in a parallel system, set the same shutdown delay parameter for different UPSs.

- **Shallow Discharge** screen

Figure 4-41 Shallow Discharge screen



- **Test notification** parameter
Determine whether to periodically send shallow discharge test notifications. The values include **Disabled** and **Enabled**. The default value is **Disabled**. If the value is **Enabled**, the system sends shallow discharge test notifications. The parameter is configurable in any mode.
- **Time interval** parameter
Set the time interval for shallow discharge tests. The value ranges from **30Day** to **90Day**. The default value is **60Day**. The parameter is configurable in any mode.
- **Discharge ratio** parameter
Set the proportion of the discharge capacity to the total discharge capacity. The value ranges from 10% to 50%. The default value is 20%. The parameter is configurable in any mode.

Restoring Factory Settings

You can restore factory settings after the inverter shuts down.

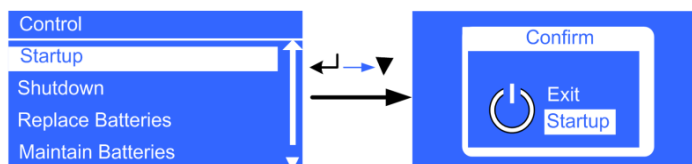
4.6.4 Control Screen

On the **Main Menu** screen, select **Control**, and press . The **Control** screen is displayed.

Startup Menu

The **Startup** menu allows you to restart the inverter.

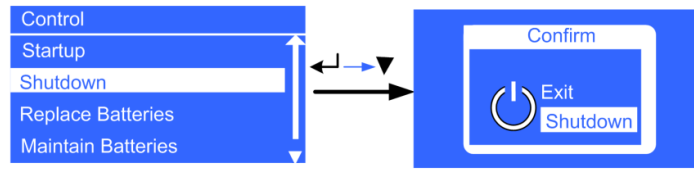
Figure 4-42 Startup screen



Shutdown Menu

The **Shutdown** menu allows you to shut down the inverter.

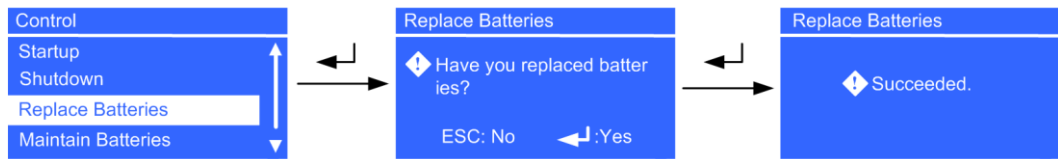
Figure 4-43 Shutdown screen



Replace Batteries Menu

This menu allows you to clear all the battery data after you replace batteries.

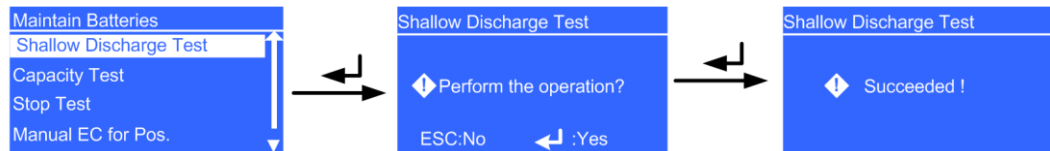
Figure 4-44 Replace Batteries screen



Maintain Batteries Menu

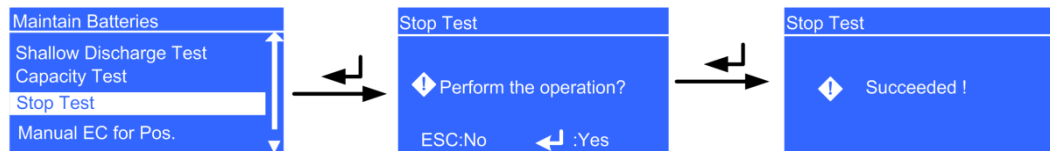
- **Shallow Discharge Test** menu

Figure 4-45 Shallow Discharge Test screen



- **Capacity Test** menu
After you completely discharge batteries, the load ratio must be in the range of 20%–80%.
- **Stop Test**

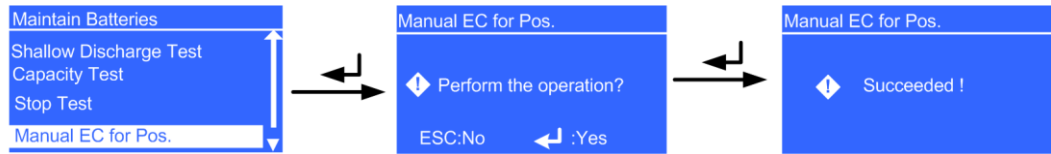
Figure 4-46 Stop Test screen



Stop the shallow discharge test or capacity test.

- **Manual EC for Pos.** menu

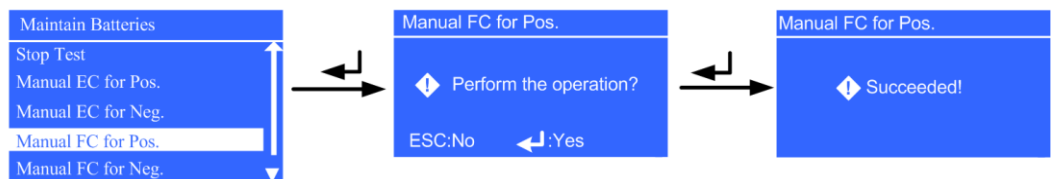
Figure 4-47 Manual EC for Pos. screen



Perform equalized charging on batteries forcibly. For the 3 kVA, 6 kVA and 10 kVA UPSs, perform manual equalized charging. For the 15 kVA and 20 kVA UPSs, batteries in positive and negative groups are manually switched to equalized charging respectively.

- **Manual FC for Pos. menu**

Figure 4-48 Manual FC for Pos. screen

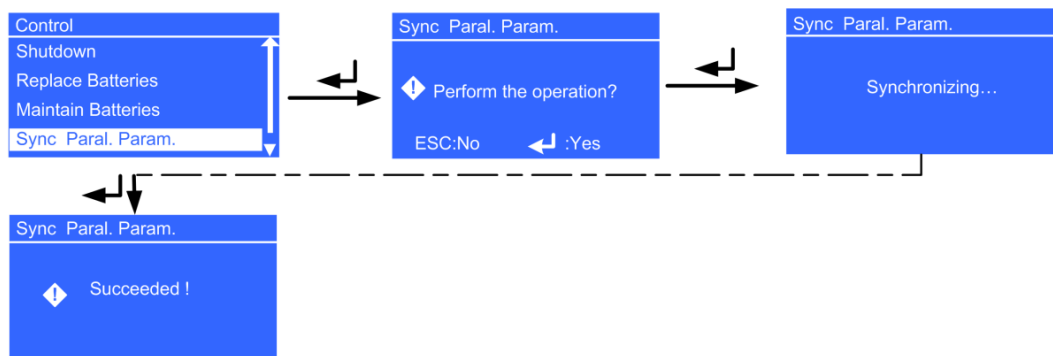


Perform float charging on batteries forcibly. For the 3 kVA, 6 kVA and 10 kVA UPSs, perform manual float charging. For the 15 kVA and 20 kVA UPSs, batteries in positive and negative groups are manually switched to float charging respectively.

Sync Paral. Param. Menu

The menu allows you to synchronize the parameters from one UPS to the other UPSs in the parallel system. The UPS running in inverter output state cannot be synchronized.

Figure 4-49 Sync Paral. Param. screen



Resetting the Password

Enter a feature code to restore the preset password.

Figure 4-50 Resetting the password

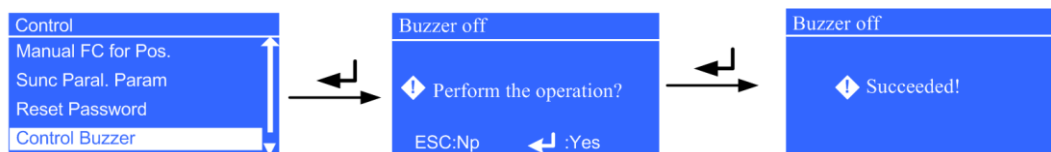


Control Buzzer

Control Buzzer controls the buzzer on/off.

If the buzzer on, click **Control Buzzer** transfers to **Buzzer off**.

Figure 4-51 Buzzer off

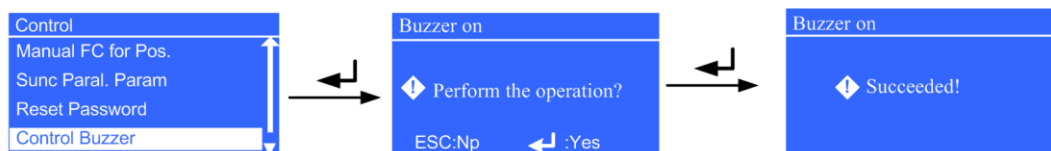


NOTE

If **Control Buzzer** is used for muting the alarm tone, the alarm tone should be unmuted by using **Control Buzzer** or power on the UPS again. Otherwise, when a new alarm is generated, it cannot be buzzes again.

If the buzzer off, click **Control Buzzer** transfers to **Buzzer on**.

Figure 4-52 Buzzer on

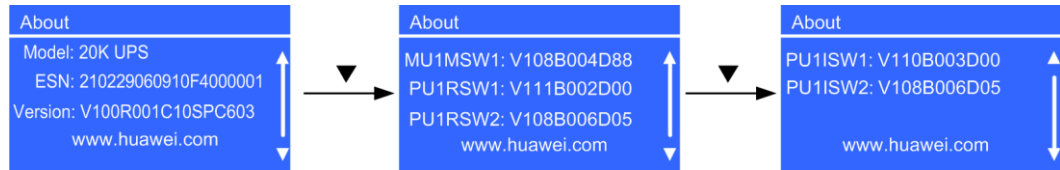


4.6.5 About Screen

On the **Main Menu** screen, select **About**, and press . The **About** screen is displayed, as shown in [Figure 4-53](#).

You can view the UPS model, equipment serial number (ESN), and version number.

Figure 4-53 About screen



NOTE

MU1MSW1, PU1RSW1, PU1RSW2, PU1ISW1, and PU1ISW2 is the version for the component. When the component does not exist, NA is displayed for Version. PU1ISW1 and PU1ISW2 are not available for the 3 kVA, 6 kVA and 10 kVA UPS.

- **Model** parameter
The UPS model is **20K UPS**.
- **ESN** parameter
This item provides the UPS ESN.
- **Version** parameter
This item provides the UPS version.
- **MU1MSW1** parameter
This item provides the main monitoring software version.
- **PU1RSW1** parameter
This item provides rectifier power software version.
- **PU1RSW2** parameter
This item provides the rectifier logic software version.
- **PU1ISW1** parameter
This item provides the inverter power software version.
- **PU1ISW2** parameter
This item provides the inverter logic software version.

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.
- Input circuit breakers and load circuit breakers are OFF.
- Power cables and signal cables are correctly identified.
- The input phase sequence is correct.
- Cables are neatly routed and securely bound.
- Devices are installed and cables are routed in ways that facilitate modification, capacity expansion, and maintenance.
- Parallel cables are properly connected.
- 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)–280 V DC.

5.2 Single UPS Operations

5.2.1 Starting the UPS

CAUTION

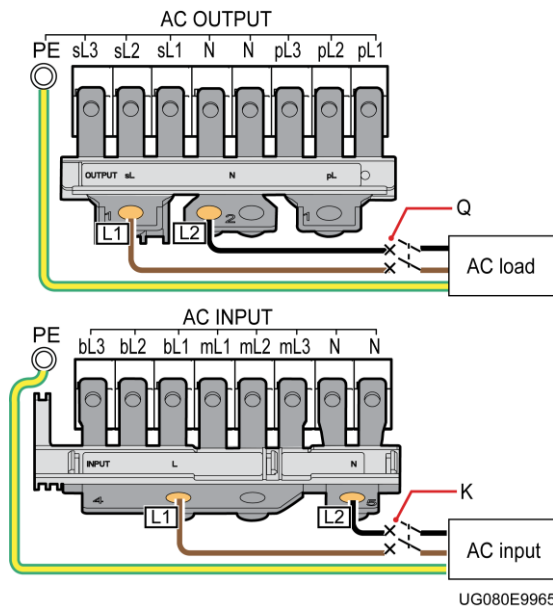
The configured number of batteries must match the actual number. When the actual number changes, change the configured number. If the configured number is less than the actual number, the battery lifespan is shortened. If the configured number is greater than the actual number, battery leakage may cause a fire.

NOTICE

- If the system uses dual-live-wire input dual-live-wire output, three-phase input single-phase output or single-phase input single-phase output, set **Output mode** to **Single-phase**. If the system uses three-phase input three-phase output, set **Output mode** to **Three-phase**.
- Set **Voltage level** and **Frequency level** based on the rated voltage and frequency. In the case of single-phase output, set **Voltage level** to 208 V, 220 V (default), 230 V, or 240 V; in the case of three-phase output, set **Voltage level** to 380 V (default), 400 V, or 415 V.
- Battery parameters are configurable in non-battery mode or non-battery ECO mode.
- Set **Positive batteries** and **Negative batteries**. The value ranges from 16 to 20. The default value is 20.
- Set **Battery capacity** to the total capacity of all batteries actually connected. The value ranges from 7 Ah to 1000 Ah. The default value is 65 Ah.

This section describes how to start the UPS2000-G-15 kVA/20 kVA (dual-live-wire input dual-live-wire output).

Figure 5-1 Connecting cables to the UPS2000-G-15 kVA/20 kVA(dual-live-wire input dual-live-wire output)



NOTE

The colors in the figure are for reference only.

Starting the UPS in Normal Mode

Step 1 Close the external battery circuit breaker (if there is), or connect battery cables.

Step 2 Close the UPS AC input circuit breaker K.


The initialization screen is displayed.

NOTE


Perform [Step 2](#) when there are two mains inputs. In the case of one mains input, you need only to close the UPS mains input circuit breaker.

Step 3 The UPS enters bypass mode. The UPS sL delivers bypass voltages, and pL delivers no voltage. When the initialization is complete, perform the following operations:




- Initial startup

On the **Settings wizard** screen, set the language (the preset language is English), system parameters, and battery parameters. Press . The standby screen is displayed.

- Non-initial startup

When the initialization is complete, the standby screen is displayed. On the standby screen, press  to enter the main menu. Choose **Main Menu > Settings > System Parameters > Output** to view output settings: if the system uses three-phase input single-phase output or single-phase input single-phase output, **Output mode** is set to **Single-phase**; if the system uses three-phase input three-phase output, **Output mode** is set to **Three-phase**. **Voltage level** and **Frequency level** are set based on the rated voltage and frequency. Press **ESC** to return to the standby screen.

Step 4 Start the UPS in normal mode by using one of the following methods:

- On the standby screen, hold down  more than 5 seconds. Release the button when you hear a beep sound. The startup screen is displayed. If the UPS starts successfully, it enters normal mode.
- On the standby screen, hold down  to enter the main menu. Select **Startup** in the **Control** menu, and press . The **Starting** message is displayed. If the UPS starts successfully, it enters normal mode.

NOTE

The two methods in [Step 4](#) are called "startup operations" in this section.

Step 5 When the UPS runs properly, close the UPS AC output circuit breaker Q, and start the loads.


NOTE

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

----End


Starting the UPS in Battery Mode

Step 1 Close the external battery circuit breaker (if there is), or connect battery cables.


Step 2 Press  on the control panel.

The LCD starts. The initialization screen is displayed.

- Initial startup

When the initialization is complete, the **Settings wizard** screen is displayed. Set the language (the preset language is English), system parameters, and battery parameters, and press . The standby screen is displayed.

- Non-initial startup

When the initialization is complete, the standby screen is displayed. On the standby screen, press  to enter the main menu. Choose **Main Menu > Settings > System Parameters > Output** to view output settings: if the system uses three-phase input single-phase output or single-phase input single-phase output, **Output mode** is set to **Single-phase**; if the system uses three-phase input three-phase output, **Output mode** is set to **Three-phase**. **Voltage level** and **Frequency level** are set based on the rated voltage and frequency. Press **ESC** to return to the standby screen.

Step 3 Perform "startup operations" on the UPS. The UPS runs in battery mode.

Step 4 When the UPS runs properly, close the UPS AC output circuit breaker Q, and start the loads.

 **NOTE**


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

----End

5.2.2 Shutting down the UPS

Shutting down the Inverter

To shut down the inverter, perform any of the following operations:

- On the default screen, hold down **ESC** for more than 5 seconds. Release the button when you hear a beep sound. The inverter shuts down, and the UPS transfers to bypass mode.
- On the default screen, press  to enter the main menu. Choose **Shutdown** to shut down the inverter. The UPS transfers to bypass mode.

 **NOTE**

The two methods are called "shutdown operations" in this section.

Shutting down the UPS

Step 1 Shut down the loads.

Step 2 Perform "shutdown operations" on the UPS. The inverter shuts down. The UPS transfers to bypass mode.

Step 3 Open the UPS AC input circuit breaker K, and AC output circuit breaker Q.

 **NOTE**

Perform [Step 3](#) when there are two mains inputs. In the case of one mains input, you need only to open the UPS mains input circuit breaker.

Step 4 Open the external battery circuit breaker (if there is), or disconnect battery cables.

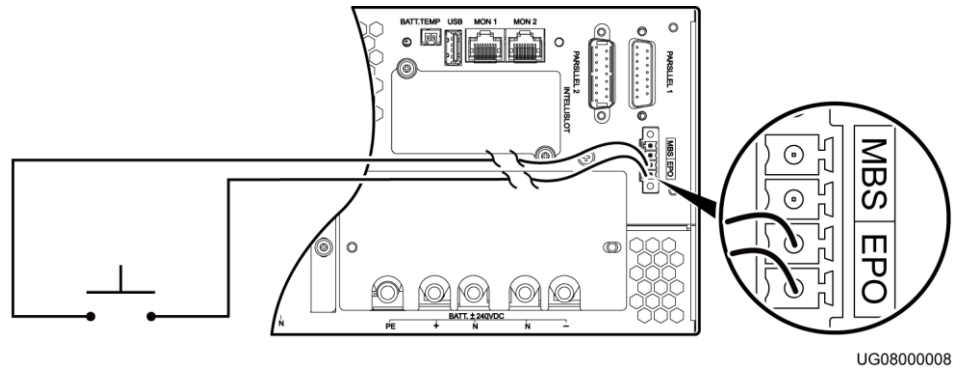
----End

5.2.3 Performing EPO

Turn on the EPO switch (provided by the customer). The UPS enters the EPO state. That is, the inverter shuts down, and the UPS will not transfer to bypass mode.

Figure 5-2 shows the EPO cable connection on a single UPS.

Figure 5-2 EPO cable connection on a single UPS



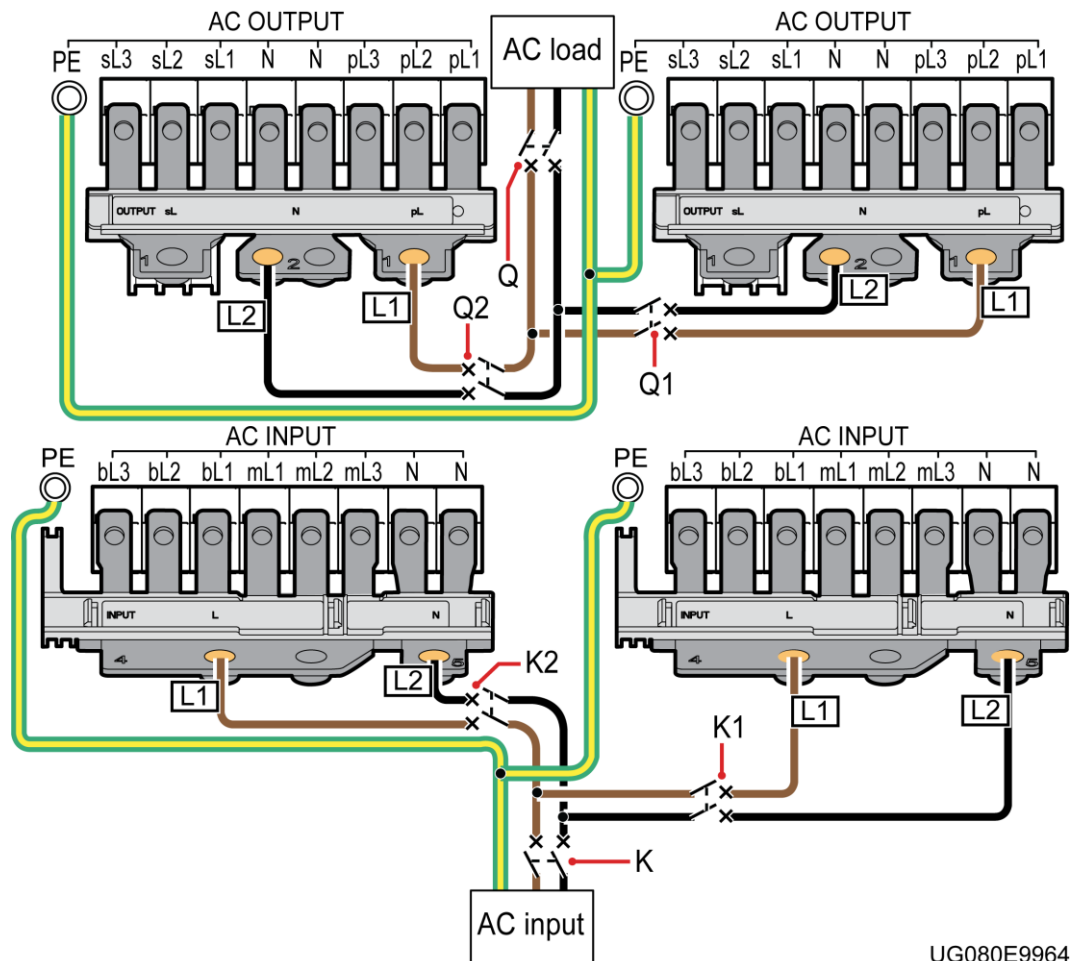
NOTE

- Connect an external switch to the EPO port on the UPS. After you turn on the switch, the inverter shuts down, and the UPS will not transfer to bypass mode. Output terminals completely power off, which meets the EPO purpose.
- The external EPO switch (switch or dry contact signals controlled by a switch) is provided by the customer.

5.3 Parallel System Operations

This section describes operations on a UPS2000-G-15 kVA/20 kVA (dual-live-wire input dual-live-wire output) parallel system.

Figure 5-3 Connecting cables to the UPS2000-G-15 kVA/20 kVA parallel system (dual-live-wire input dual-live-wire output)



5.3.1 Starting the Parallel System

⚠ CAUTION

The configured number of batteries must match the actual number. When the actual number changes, change the configured number. If the configured number is less than the actual number, the battery lifespan is shortened. If the configured number is greater than the actual number, battery leakage may cause a fire.

NOTICE

- If a parallel system shares a battery string, set the same battery string capacity and charge current for each UPS.
- Before you start the parallel system, ensure that UPS output circuit breakers are both ON.
- Check that parallel parameters have been synchronized.
- In a 4+0 parallel system, the four parallel cables must be of the same length (1 meter or longer), and connect to a remote junction box.
- In the parallel system that uses the TN-C power distribution system, install four magnetic rings on the PE cable on each UPS, bind the four magnetic rings together using binding tape, and secure them in the nearest place.
- Before starting a parallel system, ensure that all circuit breakers on the output side are OFF, and do not start loads.
- To prevent triggering overload protection, start the loads with higher power and then loads with lower power.

Starting the Parallel System in Normal Mode

Step 1 Close the external battery circuit breakers (if there are), or connect battery cables.

Step 2 Close the following circuit breakers in sequence: UPS AC input circuit breakers K1 and K2, general AC input circuit breaker K, and UPS AC output circuit breakers Q1 and Q2.

The initialization screen is displayed. The parallel system supplies no power.


NOTE

- Perform [Step 2](#) when there are two mains inputs. In the case of one mains input, you need only to close the UPS mains input circuit breakers and general mains input circuit breaker.
- If a PDU is configured, close the following circuit breakers: general mains input circuit breaker, general bypass input circuit breaker, mains input circuit breakers for all UPSs on the PDU, bypass input circuit breakers, and output circuit breakers for all UPSs on the PDU. The initiation screen is displayed.


Step 3 Perform the following operations on each UPS:

- Initial startup


- a. Setting parameters on the **Settings wizard** screen.

When the initialization is complete, the **Settings wizard** screen is displayed. Set the language, system parameters, and battery parameters, and press . The standby screen is displayed.

- b. Settings for transferring from single mode (preset) to parallel mode.

On the standby screen, press . Choose **Main Menu > Settings > System Parameters > Parallel > Single/Parallel** to transfer from single mode to parallel mode. Press **ESC** to return to the standby screen.

- Non-initial startup

When the initialization is complete, the standby screen is displayed. On the standby screen, press  to enter the main menu. Choose **Main Menu > Settings > System Parameters > Output** to view output settings: if the system uses three-phase input single-phase output or single-phase input single-phase output, **Output mode** is set to **Single-phase**; if the system uses three-phase input three-phase output, **Output mode** is

set to **Three-phase. Voltage level** and **Frequency level** are set based on the rated voltage and frequency. Press **ESC** to return to the standby screen.

Step 4 Perform "startup operations" on each UPS in the parallel system.

The parallel system transfers to normal mode.

 **NOTE**

After you perform "startup operations" on UPS 1 to UPS *n* one by one, UPS 1 to UPS *n* are starting. If you do not perform "startup operations" on the other UPSs in 5 minutes, UPS 1 to UPS *n* enter normal mode, and the other UPSs supply no power.


Step 5 When the parallel system runs properly, close the general AC output circuit breaker Q (provided by the customer) and then branch AC output circuit breakers (provided by the customer), and start the loads.


----End

Starting the Parallel System in Battery Mode



Step 1 Close the external battery circuit breakers (if there are), or connect battery cables.

Step 2 Close the AC output circuit breakers Q1 and Q2 for the parallel system.

Step 3 Press  on each control panel.

The initialization screen is displayed on each LCD. On the standby screen, press  to enter the main menu. Choose **Main Menu > Settings > System Parameters > Output** to view output settings: if the system uses three-phase input single-phase output or single-phase input single-phase output, **Output mode** is set to **Single-phase**; if the system uses three-phase input three-phase output, **Output mode** is set to **Three-phase. Voltage level** and **Frequency level** are set based on the rated voltage and frequency. Press **ESC** to return to the standby screen.

Step 4 Perform the following operations on each UPS:

- Initial startup
 - a. Setting parameters on the **Settings wizard** screen
When the initialization is complete, the **Settings wizard** screen is displayed. Set the language, system parameters, and battery parameters, and press . The standby screen is displayed.
 - b. Settings for transferring from single mode (preset) to parallel mode
On the standby screen, press . Choose **Main Menu > Settings > System Parameters > Parallel > Single/Parallel** to transfer from single mode to parallel mode. Press **ESC** to return to the standby screen.
- Non-initial startup
When the initialization is complete, the standby screen is displayed.

Step 5 Perform "startup operations" on each UPS.

The parallel system transfers to battery mode.

 **NOTE**

After you perform "startup operations" on UPS 1 to UPS n one by one, UPS 1 to UPS n are starting. If you do not perform "startup operations" on the other UPSs in 5 minutes, UPS 1 to UPS n enter normal mode, and the other UPSs supply no power.

- Step 6** When the parallel system runs properly, close the general output circuit breaker Q (provided by the customer) and then branch output circuit breakers (provided by the customer), and start the loads.

----End

5.3.2 Shutting down the Parallel System

Shutting down a Single UPS in the Parallel System

- Step 1** Perform "shutdown operations" twice on a single UPS within 30 seconds in the parallel system. The UPS is shutting down. The other UPSs continue working.

 **NOTE**

The UPSs in the parallel system have shut down supply no power (the mains indicator, bypass indicator, and battery indicator are Off).

- Step 2** Open the UPS AC input circuit breakers K1 and the AC output circuit breaker Q1. After all indicators turn off and fans stop, the UPS shuts down.

- Step 3** Open the external battery circuit breaker (if there is), or disconnect battery cables. The UPS exits the parallel system.

 **NOTE**

To merely shut down the UPS, perform [Step 1](#) only.

----End

Transferring the Parallel System to Bypass Mode

Perform "shutdown operations" on each UPS in the parallel system. All inverters shut down at the same time, and the parallel system transfers to bypass mode.

Shutting down the Parallel System

- Step 1** Shut down the loads.

- Step 2** Perform "shutdown operations" on each UPS in the parallel system. All inverters shut down at the same time. The parallel system transfers to bypass mode.

- Step 3** Open the following circuit breakers in sequence for each UPS: UPS AC input circuit breakers K1 and K2, general AC input circuit breaker K, UPS AC output circuit breakers Q1 and Q2, and general AC output circuit breaker Q. After all indicators turn off and fans stop, the UPSs shut down, and the loads power off.

 **NOTE**

Perform [Step 3](#) when there are two mains inputs. In the case of one mains input, you need only to open the following circuit breakers in sequence for each UPS: UPS mains input circuit breakers, general mains input circuit breaker, UPS AC output circuit breakers, and general AC output circuit breaker.

Step 4 Open the external battery circuit breaker for each UPS or the general battery circuit breaker (when all UPSs share a battery string). If no external battery circuit breaker is configured, disconnect battery cables from each UPS.

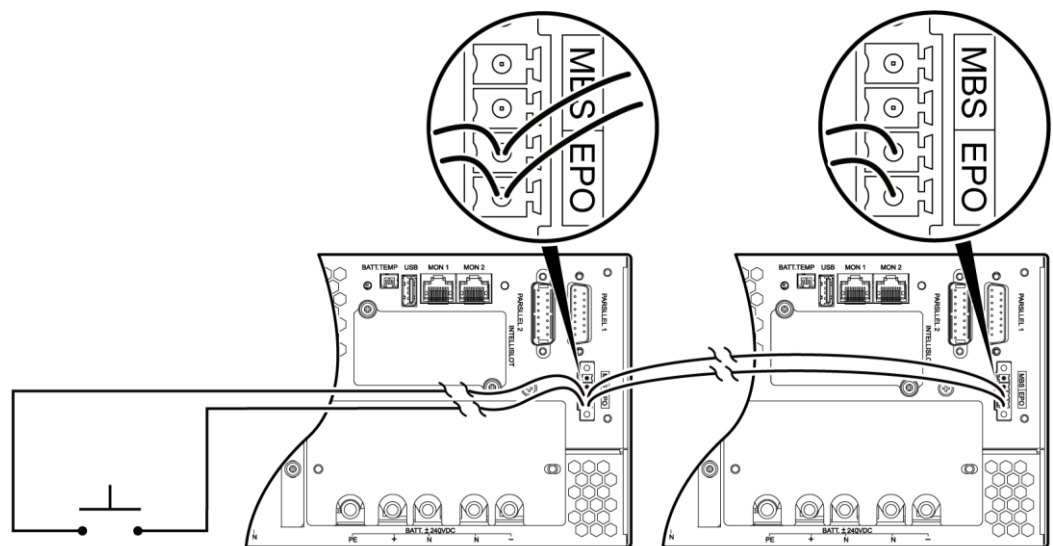
----End

5.3.3 Performing EPO

Turn on the EPO switches (provided by the customer). The parallel system enters the EPO state. That is, the inverters shut down, and the parallel system will not transfer to bypass mode.

Figure 5-4 shows the EPO cable connection in a parallel system.

Figure 5-4 EPO cable connection in a parallel system



UG08000010

NOTE

- Connect an external switch to the EPO port on the UPS. After you turn on the switch, the UPS stops inverter output and does not transfer to bypass mode. Output terminals completely power off, which meets the emergency power-off purpose.
- The external EPO switch (switch or dry contact signals controlled by a switch) is provided by the customer.

6 Communications

6.1 Optional Communications Components

The optional communications components include the SNMP card, Modbus card, and dry contact card.

6.2 SNMP Card

The SNMP card is an optional monitoring component of the UPS. It provides Simple Network Management Protocol (SNMP) agent and web management functions. The SNMP card allows users to remotely manage the UPS by using a network management system (NMS), NetEco, or a web browser on a computer network. A maximum of 16 SNMPv3 users and 1 SNMPv1&SNMPv2c user can manage the UPS. A maximum of 2 web users can manage the UPS online.

The SNMP card has an exquisite, advanced, and unique design, and features high performance and reliability. It has the following functions and features:

- Supports UPS2000-G series and implements parallel system management using only one SNMP card.
- Adapts to the 10 Mbit/s, 100 Mbit/s fast Ethernet (FE) by using an IP address that is configurable on the LCD.
- Supports SNMP, Hypertext Transfer Protocol Secure (HTTPS), and Secure Shell (SSH).
- Supports SNMP agent v1, v2c, and v3. The UPS MIB library can be downloaded from its own web page, instead of any CD-ROM.
- Enables remote management on Windows or Linux using a web browser. The supported web browsers include Internet Explorer 8, Internet Explorer 9, Internet Explorer 10, Internet Explorer 11, and Firefox 33.1.
- Provides an access security mechanism, assigns rights to users based on roles, and implements IP address control over HTTPS, SNMPv3, and SNMP access to prevent unauthorized access.
- Provides comprehensive UPS management, such as producing a current diagram, displaying alarms, controlling UPS running, collecting performance data statistics, as well as allowing users to view, retrieve, and export historical alarms and operation logs.
- Supports optional components such as temperature and humidity modules, AI/DI Module, iBAT 2.0, and external dry contact card.

- Works with NetShutdown, a computer and server security shutdown program developed by Huawei, to automatically shut down the computers and servers where NetShutdown is installed to protect customer data and reduce loss.
- Works with RCCMD, a client shutdown software developed by Generex, to automatically and safely shut down the client that is installed with the RCCMD, thereby protecting customers' data and preventing loss.
- Alarm information is sent to the specified user mailbox at the specified time.

6.3 Modbus Card

The RMS-MODBUS01A provides an RS485 networking solution to remotely manage the UPS.

The card implements the following functions by setting the DIP switches:

- Selects the Modbus protocol by using a DIP switch over the RS485 communications protocol.
- Uses a DIP switch to select a two-wire or four-wire system.
- Provides a DIP switch to select a build-out resistor.
- Provides a DIP switch for setting the optional card address.
- Supports hot swap.

6.4 Dry Contact Card

The RMS-RELAY01A is installed in an optional card slot and supports hot swap.

The dry contact card provides six alarm dry contact outputs (normal mode, battery mode, bypass mode, low battery voltage, bypass backfeed, and UPS faults) and two dry contact control inputs (one is the shutdown signal input, and the other is reserved).

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	<ul style="list-style-type: none">• Ambient temperature: 0–40 °C• Humidity: 0–95% RH (non-condensing)	<ul style="list-style-type: none">• If the humidity and temperature are abnormal, check the air conditioner status.• If the input voltage is abnormal, check the power grid status and input cable connection.	Monthly
Control panel	Check that all units are operating properly by observing the status icons on the LCD,	If any 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 UPS 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 the power distribution cabinet)	The insulation layers of cables are intact and terminals are free from noticeable sparks.	<ul style="list-style-type: none"> • Replace the cables. • Secure the output terminals. 	Quarterly
EPO (if configured)	Check the reliability of the EPO cable connection.	Secure the terminals.	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 24 hours at most and 16 hours by default. If you set the value to 0 hour, 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	<ol style="list-style-type: none"> 1. The surface is clean and tidy without stains. 2. The battery terminals are intact. 3. Batteries are free from damage and cracks. 4. Batteries are free from acid leakage. 5. Batteries are not deformed or bulged. 	If the battery appearance is abnormal, contact Huawei technical support.	Monthly

Item	Expected Result	Measures	Maintenance Interval
Battery operating temperature	<ol style="list-style-type: none"> The ambient battery temperature is 25 ± 5 °C. The battery operating temperature is lower than battery temperature + 20 °C. Battery charge and discharge conditions meet the requirements specified in the battery specifications. 	<ol style="list-style-type: none"> Identify the cause of the abnormal battery operating temperature. If the fault persists, contact Huawei technical support. 	Monthly
Charge voltage of battery string	<ul style="list-style-type: none"> Equalized voltage $14.1 \text{ V} \times \text{Number of batteries}$ (tolerance $\pm 1\%$) Float voltage $13.5 \text{ V} \times \text{Number of batteries}$ (tolerance $\pm 1\%$) 	<ol style="list-style-type: none"> 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 displayed on the LCD is less than 3 °C.	<ol style="list-style-type: none"> Install the temperature sensor in the correct position. Replace the battery temperature sensor. 	Quarterly
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	No cable deteriorates and	Replace the faulty cable.	Quarterly

Item	Expected Result	Measures	Maintenance Interval
batteries	the insulation layer does not crack.		
Battery volta	<ul style="list-style-type: none"> Equalized charging voltage: 14.1 V \pm0.1 V Float charging voltage: 13.5 V \pm0.1 V 	<ol style="list-style-type: none"> Check whether the equalized charging voltage and float charging voltage of a battery are normal. 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. If the fault persists, contact Huawei technical support. 	Quarterly
Shallow discharge test (recommended)	Conduct a shallow discharge test when the UPS is backed up to verify that the batteries can discharge normally.	<ol style="list-style-type: none"> Locate the cause when an exception is identified. If the fault persists, contact Huawei technical support. 	Quarterly
Capacity Test (recommended)	When the UPS is backed up, discharge a battery to the undervoltage alarm threshold, to refresh the capacity of the battery.	<ol style="list-style-type: none"> Locate the cause when an exception is identified. If the fault persists, contact Huawei technical support. 	Yearly
Battery connection reliability	<ol style="list-style-type: none"> Each battery terminal is connected reliably. (When battery strings are powered off, check the reliability of each terminal in the order from positive terminals to negative terminals.) 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 	<ol style="list-style-type: none"> Rectify any abnormal connection. If the fault persists, contact Huawei technical support. 	Yearly




Item	Expected Result	Measures	Maintenance Interval
	later check.)		

8 Troubleshooting

⚠ CAUTION

When a UPS is faulty, alarm information is displayed on the LCD. Critical alarms must be processed before the UPS is powered on again. Otherwise, the fault may be extended, or the UPS may be damaged.

Table 8-1 Solutions to common faults

No.	Symptom	Possible Cause	Measure
1	The mains switch is ON. The LCD does not display anything. The system does not perform self-tests.	The input power supply is not connected.	Check the input power cable connection.
		The input voltage exceeds the limit.	Use a multimeter to check that the UPS input voltage meets specifications.
2	The mains is normal, but the AC input indicator is off. The UPS runs in battery mode.	The mains switch is OFF.	Turn on the mains switch.
		The input power cable is not securely connected.	Check the input power cable connection.
3	The UPS does not report faults, but has no output voltage.	The output power cable is not securely connected.	Check the output power cable connection.
4	The UPS does not start after you press  .	 is not pressed long enough.	Press  for more than 5 seconds until you hear a beep sound.
		Overload occurs.	Disconnect all loads, and restart the UPS.

No.	Symptom	Possible Cause	Measure
5	The Mains indicator is off.	The mains voltage or frequency exceeds the UPS input range.	Use a multimeter to check that the input voltage and frequency meet specifications.
6	The battery discharge time is much less than the standard time.	Batteries are not fully charged.	Charge batteries for more than 8 hours when the mains is normal. Test the discharge time again.
		The battery performance deteriorates.	Contact local Huawei technical support to replace batteries.
7	Abnormal noises or smell is generated in the UPS cabinet.	The UPS is faulty.	Shut down the UPS immediately and cut off the input power supply. Contact local Huawei technical support.
8	The battery indicator is blinking yellow. The buzzer buzzes 1 second and then stops 1 second. The battery capacity is insufficient. The UPS is shutting down.	<ul style="list-style-type: none"> The remaining battery capacity is insufficient. The UPS is shutting down, and the loads are powering off. Parameters settings of battery number or battery capacity are not correct. 	<ul style="list-style-type: none"> Save load data immediately and power off critical loads. Connect UPS input terminals to the backup AC power supply. Set parameters of battery number and battery capacity correctly.
9	You forget the password.	N/A	<ul style="list-style-type: none"> If you forget only the LCD password (the preset password is 000001), use the feature code (the preset feature code is 999999) to activate the LCD password. If you forget both the password and the feature code, contact local Huawei technical support.

9 Technical Specifications

9.1 Physical Specifications

Table 9-1 Physical specifications

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
Dimensions (H x W x D)	430 mm x 86 mm x 615 mm			430 mm x 130 mm x 757 mm	
Weight	14 kg	14 kg	16 kg	32 kg	32 kg

9.2 Environmental Specifications

Table 9-2 Environmental specifications

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
Operating temperature	0–40 °C				
Humidity	0%–95% RH (non-condensing)				
Altitude	< 1000 meters When the altitude is 1000–4000 meters, see IEC62040-3 to check how the UPS power is derated.				
Storage and transportation temperature	–40 °C to +70 °C (battery pack: –20 °C to +40 °C)				

9.3 Mains Input Electrical Specifications

NOTICE

- For UPS2000-G-3 kVA, UPS2000-G-6 kVA and UPS2000-G-10 kVA, if the UPS input uses two live wires (208 V/220 V system), all L and N wires change to L1 and L2 wires. If the AC input of the UPS2000-G-10 kVA uses two live wires, connect AC INPUT L1, L2, and L3 that are short-circuited with a short-circuit busbar to live wire L1, and connect AC INPUT N to live wire L2.
- If the AC input of the UPS2000-G-15 kVA/20 kVA uses two live wires, connect bypass and mains input bL1, bL2, bL3, mL1, mL2, and mL3 that are short-circuited with a short-circuit busbar to live wire L1, and connect the input N and N with a short-circuit busbar to live wire L2.
- In addition, if the AC input and AC output uses two live wires, the input and output terminals must connect to two-pole circuit breakers, that provided by the user.

Table 9-3 Mains input electrical specifications

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
Input power cable	Single-phase (L/N) input + PE cable	Single-phase (L/N) input + PE cable	Single-phase (L/N) input + PE cable Three-phase (L1/L2/L3/N) input + PE cable	Single-phase (L/N) input + PE cable Three-phase (L1/L2/L3/N) input + PE cable	Single-phase (L/N) input + PE cable Three-phase (L1/L2/L3/N) input + PE cable
Rated input voltage	208 V AC, 220 V AC, 230 V AC, or 240 V AC	208 V AC, 220 V AC, 230 V AC, or 240 V AC	208 V AC, 220 V AC, 230 V AC, or 240 V AC (single-phase input) 380 V AC, 400 V AC, or 415 V AC (three-phase input)	208 V AC, 220 V AC, 230 V AC, or 240 V AC (single-phase input) 380 V AC, 400 V AC, or 415 V AC (three-phase input)	208 V AC, 220 V AC, 230 V AC, or 240 V AC (single-phase input) 380 V AC, 400 V AC, or 415 V AC (three-phase input)
Input voltage	80–280 V AC (When the voltage is 80–176 V AC, the load power is linearly derated)	80–280 V AC (When the voltage is 80–176 V AC, the load power is linearly derated to 40%–100)	80–280 V AC (When the voltage is 80–176 V AC, the load power is linearly derated to 40%–100%.)	80–280 V AC, single-phase (When the voltage is 80–176 V AC, the load power is linearly derated to 40%–100%.)	80–280 V AC, single-phase (When the voltage is 80–176 V AC, the load power is linearly derated to 40%–100%.)

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
	to 40%–100%.)	%.)		138–485 V AC, three-phase (When the voltage is 138–305 V AC, the load power is linearly derated to 40%–100%.)	138–485 V AC, three-phase (When the voltage is 138–305 V AC, the load power is linearly derated to 40%–100%.)
Input power factor (100% load)	> 0.99	> 0.99	> 0.99 (single-phase input) > 0.95 (three-phase input)	> 0.99	> 0.99
No-load loss	< 54 W	< 54 W	< 90 W	< 180 W	
Double-power input	Disabled	Disabled	Disabled	Enabled	Enabled
Startup voltage	120–280 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	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
Bypass voltage	<ul style="list-style-type: none"> Upper threshold: 10%/15%/20%/25%/30% @208 V AC Upper threshold: 10%/15%/20%/25% @220 V AC Upper threshold: 10%/15%/20% @230 V AC Upper threshold: 10%/15% @240 V AC Lower threshold: 10%/20%/30%/40%/50%/60% 				
Bypass frequency tolerance	Maximum ± 6 Hz (configurable on the LCD)				
Bypass overload capability	<ul style="list-style-type: none"> Load < 125%: continuous in bypass mode 				

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
	<ul style="list-style-type: none"> • $125\% \leq \text{load} < 150\%$: 1 minute in bypass mode • $\text{Load} \geq 150\%$: 100 milliseconds in bypass mode The input switch may trip in advance.				
Input mode	One mains input			<ul style="list-style-type: none"> • One mains input • Two mains inputs 	

 **NOTE**

The upper and lower thresholds are configurable on the LCD.

9.5 Output Electrical Specifications

Table 9-5 Output electrical specifications

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
Rated capacity	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
Output PF	0.9				
Rated output voltage	208 V AC, 220 V AC, 230 V AC, or 240 V AC (single-phase output; select a voltage system by setting a voltage level on the LCD.)			208 V AC, 220 V AC, 230 V AC, or 240 V AC (single-phase output; select a voltage system by setting a voltage level on the LCD.) 380 V AC, 400 V AC, or 415 V AC (three-phase output; select a voltage system by setting a voltage level on the LCD.)	
Output voltage tolerance	$\pm 1\%$				
Total harmonic distortion of output voltage (THD _v)	< 4% (non-linear load)				
	< 2% (resistive load)				
Crest factor	A maximum of 3:1				
Inverter overload capability	<ul style="list-style-type: none"> • $105\% \leq \text{load} < 125\%$: transfer to bypass mode after 5 minutes • $125\% \leq \text{load} < 150\%$: transfer to bypass mode after 1 minute • $\text{Load} \geq 150\%$: transfer to bypass mode after 0.1 second The UPS stops supplying power if the bypass is abnormal.				

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
Dynamic voltage tolerance	±5%				
Output voltage unbalance	N/A			<ul style="list-style-type: none"> • ±1% (balanced load) • ±3% (unbalanced load) 	
Average frequency tracking rate	0.5–2 Hz/s (single UPS) or 0.5–1 Hz/s (parallel system)				
Power segment (only in single UPS mode)	<ul style="list-style-type: none"> • If overloaded, the UPS disconnects from secondary loads and checks whether it is still overloaded. • In battery mode, the UPS disconnects from secondary loads if the battery voltage is less than the specified value. • In battery mode, the UPS disconnects from secondary loads if the discharge time is more than the specified value. 				

9.6 Battery Specifications

Table 9-6 Battery specifications

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
Rated battery voltage	240 V DC			±240 V DC	
Number of batteries	16–20, each 12 V DC. If the smaller value between the numbers of batteries, N , is less than 20, the battery power is derated to $N/20$.			16–20, respectively in the positive and negative battery strings. The rated number is 20. If the smaller value between the numbers of batteries in the positive and negative battery strings, N , is less than 20, the battery power is derated to $N/20$.	
Battery string sharing in a parallel system	Disabled	Disabled	Disabled	Enabled	Enabled
Leakage current	≤ 500 μA				
Depth of discharge (DOD) protection	The discharge time exceeds 16 hours (configurable on the LCD).				
	The single-battery voltage drops below 10.8 V in normal mode.				
Backup time	> 4 minutes (at full rated load), Figure 9-1 , Figure 9-2 , Figure 9-3 , and Figure 9-4 show the battery pack backup time.				

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
Parallel feature	Batter strings can be connected in parallel. If the user prepares batteries, the maximum number of battery strings in parallel is specified by the battery manufacturer. A maximum of four battery strings are recommended.				
Maximum charging current of the charger	4 A (tolerance ± 0.5) for long backup time models				
Charger charge time	It depends on battery capacity for long backup time models.				
Charger rated charge voltage	Each cell has an equalized voltage of 2.35 V and a float voltage of 2.25 V. Both are configurable on the LCD.				

NOTICE

- The parameters in [Figure 9-1](#), [Figure 9-2](#), [Figure 9-3](#), and [Figure 9-4](#) are provided based on the new battery pack used first.
- The ESS-240V12-7AhBPVBA01 part number is 02310PFD.
- The ESS-240V12-9AhBPVBA01 part number is 02310MWN.

Table 9-7 Backup time parameters for the ESS-240V12-7AhBPVBA01 battery pack (6 kVA, battery efficiency assumed as 94%)

Load (%)	Load (W)	One Battery pack (min)	Two Battery packs (min)	Three Battery packs (min)	Four Battery packs (min)
100	5400	6	19	29	46
80	4320	9	25	43	57
50	2700	19	46	68	92
30	1620	36	77	120	174

Figure 9-1 Backup time parameters for the ESS-240V12-7AhBPVBA01 battery pack (6 kVA, battery efficiency assumed as 94%)

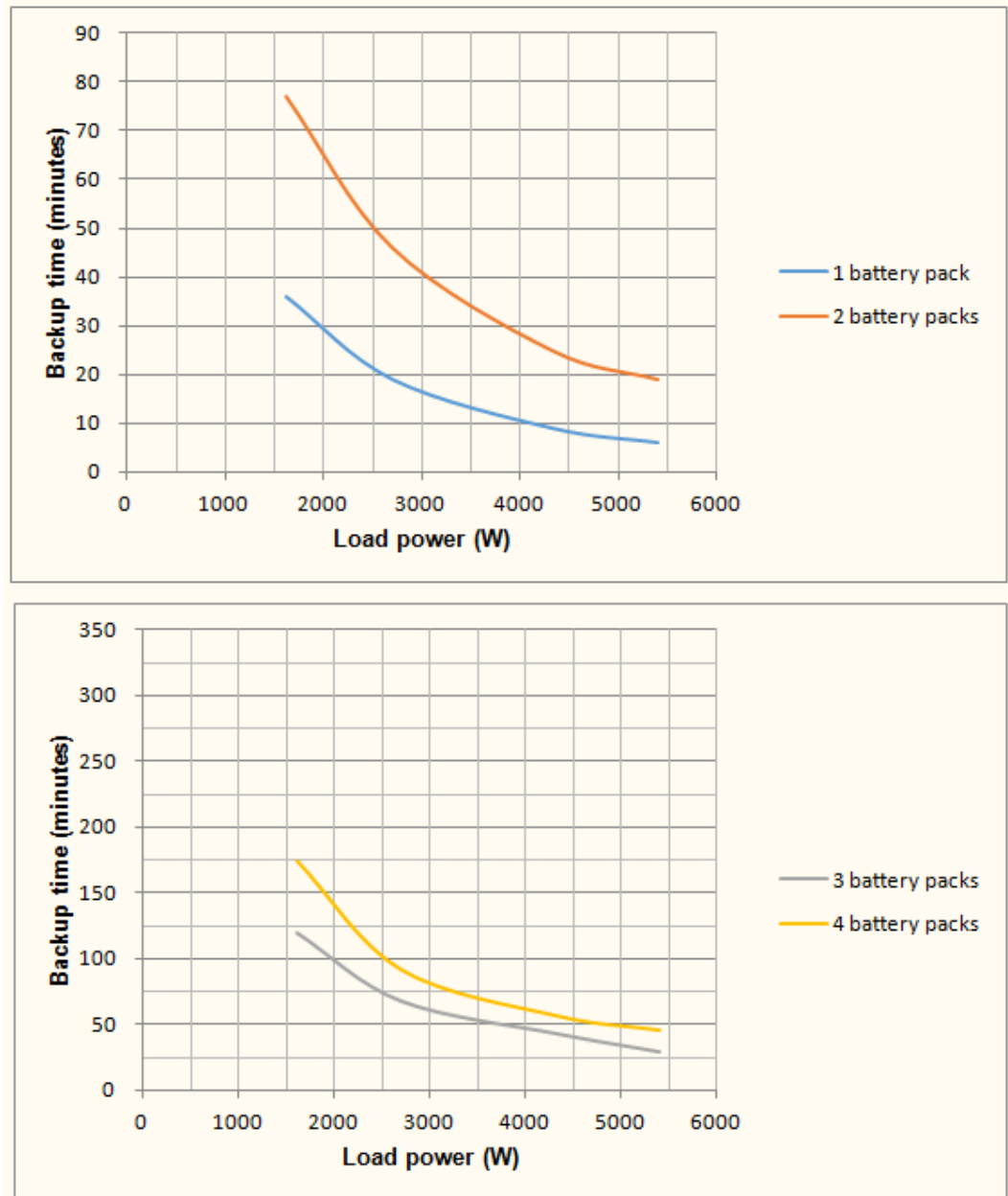


Table 9-8 Backup time parameters for the ESS-240V12-9AhBPVBA01 battery pack (10 kVA, battery efficiency assumed as 94%)

Load (%)	Load (W)	One Battery pack (min)	Two Battery packs (min)	Three Battery packs (min)	Four Battery packs (min)
100	9000	4	12	23	32
80	7200	7	17	29	44

Load (%)	Load (W)	One Battery pack (min)	Two Battery packs (min)	Three Battery packs (min)	Four Battery packs (min)
50	4500	12	32	53	70
30	2700	26	57	88	125

Figure 9-2 Backup time parameters for the ESS-240V12-9AhBPVBA01 battery pack (10 kVA, battery efficiency assumed as 94%)

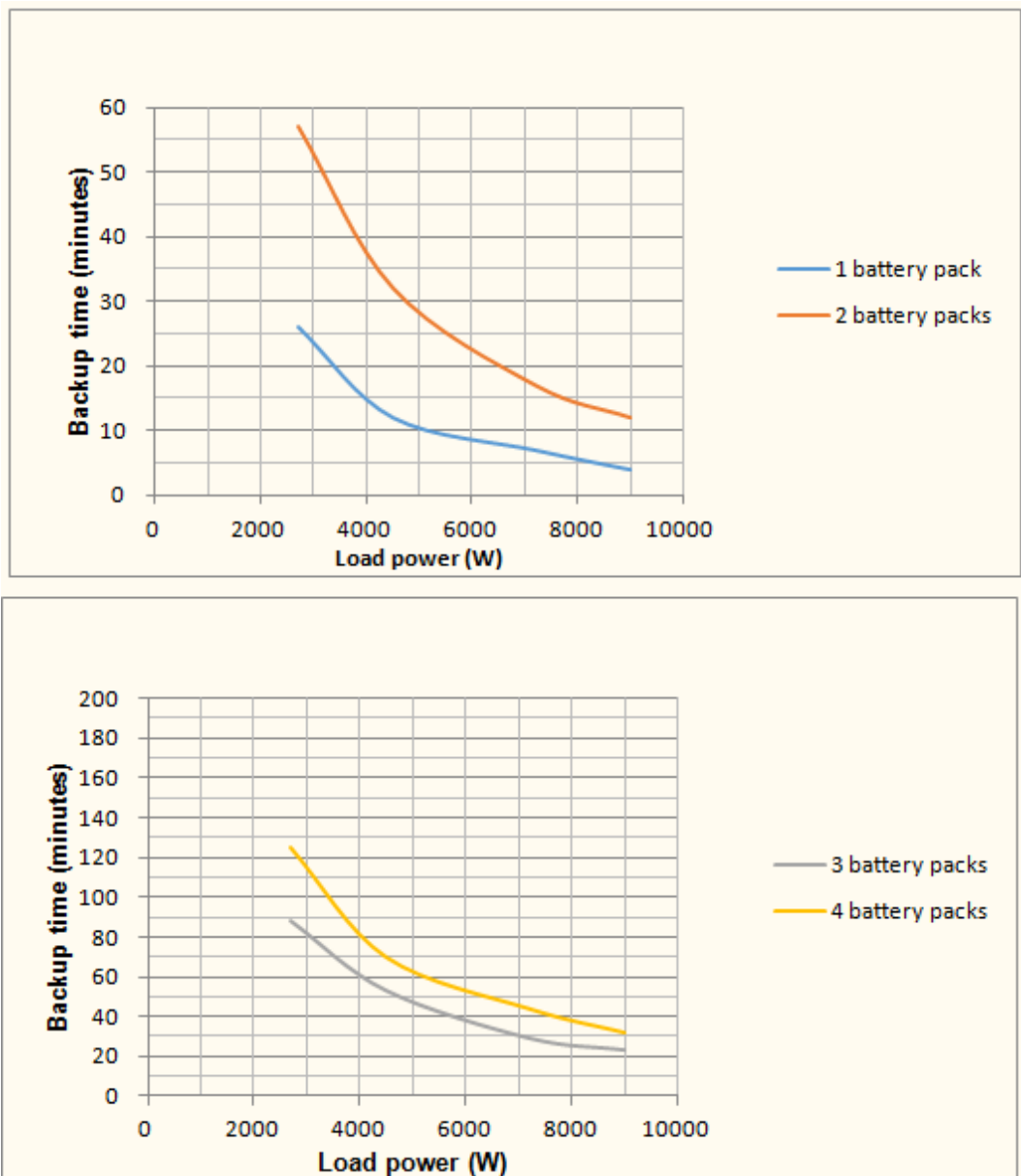


Table 9-9 Backup time parameters for the ESS-240V12-9AhBPVBA01 battery pack (15 kVA, battery efficiency assumed as 94%)

Load (%)	Load (W)	Two Battery packs (min)	Four Battery packs (min)	Six Battery packs (min)	Eight Battery packs (min)
100	13500	7	19	32	48
80	10800	9	26	44	57
50	6750	18	48	70	96
30	4050	35	79	125	171

Figure 9-3 Backup time parameters for the ESS-240V12-9AhBPVBA01 battery pack (15 kVA, battery efficiency assumed as 94%)

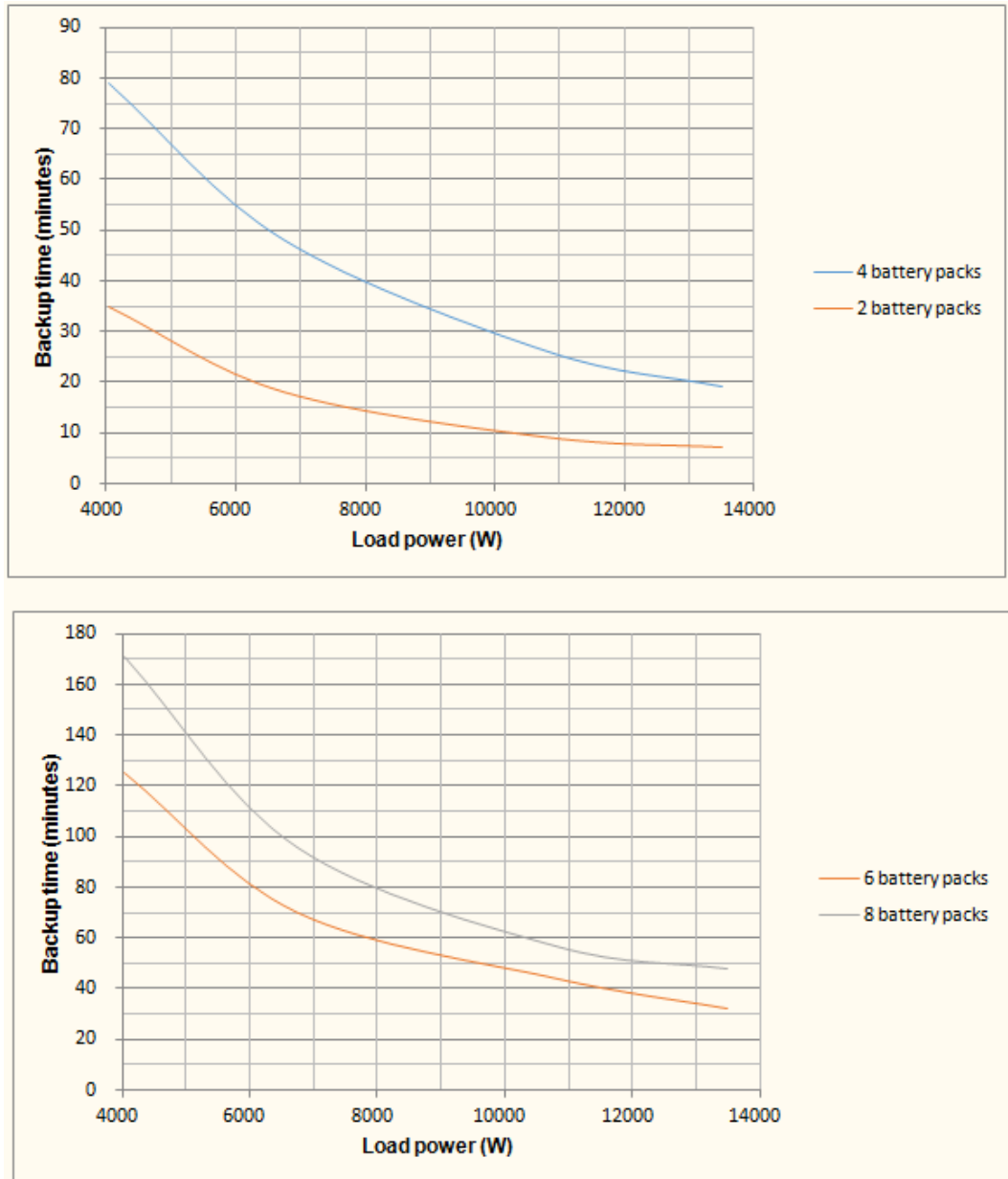
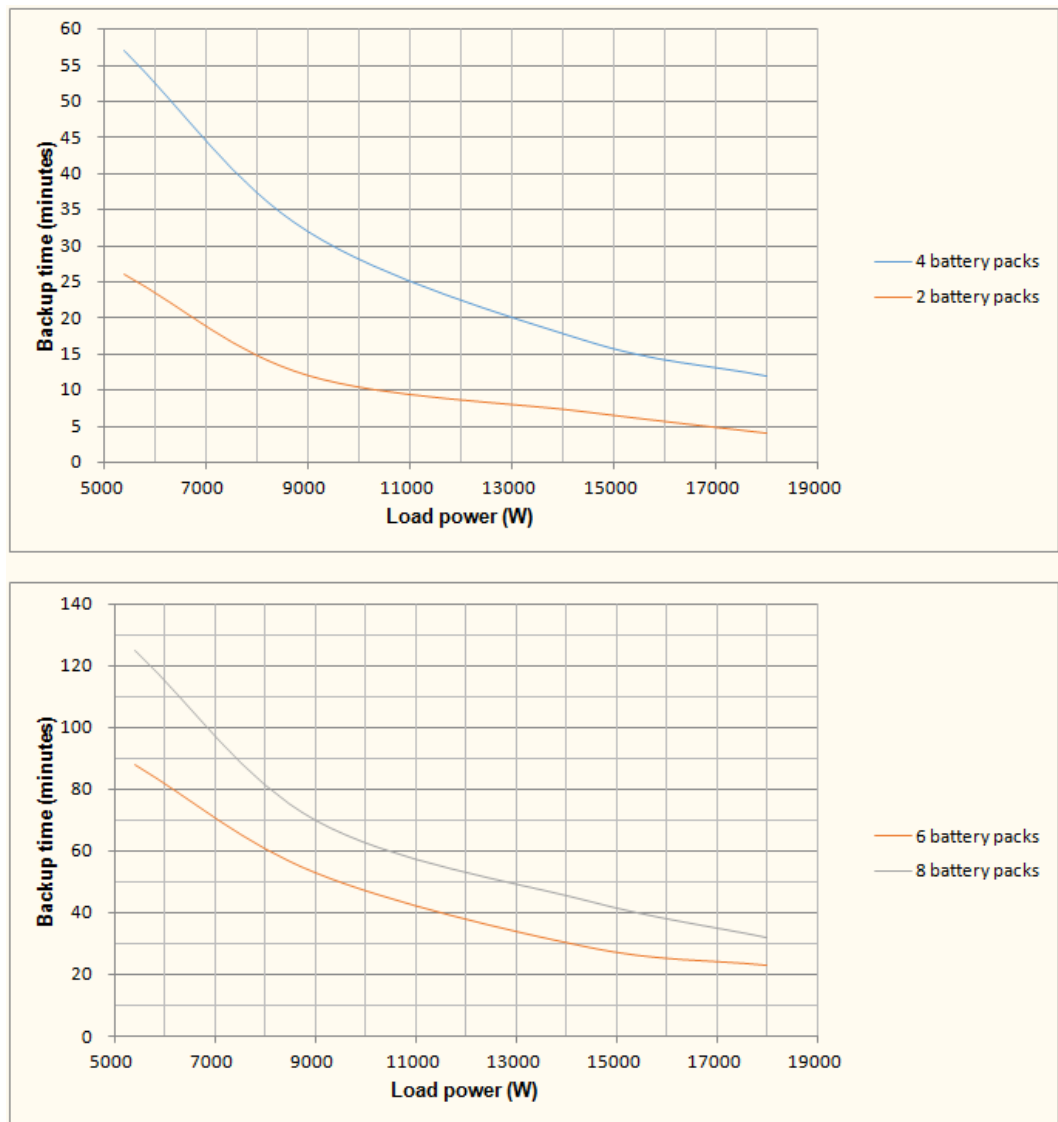


Table 9-10 Backup time parameters for the ESS-240V12-9AhBPVBA01 battery pack (20 kVA, battery efficiency assumed as 94%)

Load (%)	Load (W)	Two Battery packs (min)	Four Battery packs (min)	Six Battery packs (min)	Eight Battery packs (min)
100	18000	4	12	23	32
80	14400	7	17	29	44

Load (%)	Load (W)	Two Battery packs (min)	Four Battery packs (min)	Six Battery packs (min)	Eight Battery packs (min)
50	9000	12	32	53	70
30	5400	26	57	88	125

Figure 9-4 Backup time parameters for the ESS-240V12-9AhBPVBA01 battery pack (20 kVA, battery efficiency assumed as 94%)



9.7 ECO Feature

Table 9-11 ECO feature

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
ECO voltage tolerance	Default value: $\pm 10\%$ (configurable on the LCD) The range is $\pm 5\%$ to $\pm 10\%$				
ECO frequency tolerance	Default value: ± 2 Hz (configurable on the LCD) The range is ± 0.5 Hz to ± 3 Hz				

9.8 Parallel Feature

Table 9-12 Parallel feature

Item	3 kVA	6 kVA	10 kVA	15 kVA	20 kVA
Number of UPSs in parallel (two live wires)	N/A	1+1			
Number of UPSs in parallel (other mode except two live wires)	N/A	≤ 4			

NOTE

The UPS2000-G-15 kVA/20 kVA (single-phase input single-phase output) supports 3+1 parallel systems at most, instead of 4+0 parallel systems.

9.9 Safety Regulations and EMC

Table 9-13 Safety regulations and EMC

Item	Standards Compliance	Remarks
Electromagnetic compatibility	Conducted radiation: IEC/EN62040-2	N/A
	Voltage change, fluctuations, and flicker $I \leq 16$ A, IEC/EN61000-3-3; 16 A $< I \leq 75$ A, IEC/EN61000-3-11	N/A

Item	Standards Compliance	Remarks
	Harmonic interference: $16 A < I \leq 75 A$, IEC/EN61000-3-12	N/A
Impact current (lightning protection)	IEC/EN60240-2 IEC/EN61000-4-5 YD/T1095-2000 YD/T944-2007	The AC input side meets Level D lightning protection (differential mode and common mode: 5 kA and 8/20 μ s).

A Parallel Parameter List

Parallel Parameter	Synchronization	Parallel Parameter	Synchronization
Parallel system redundant UPSs	Yes	ECO frequency range	Yes
Voltage level	Yes	ECO max. voltage	Yes
Volt. adj. coef.	Yes	ECO min. voltage	Yes
Frequency level	Yes	Output mode	Yes
ECO enabled	Yes	Auto check bus capa.	Yes
Output transformer	Yes	Auto start	Yes
Recovery delay time	Yes	Bypass max. voltage	Yes
Bypass frequency range	Yes	Bypass min. voltage	Yes
Self-load output power ratio	Yes	Generator mode	Yes
Max. BPS transfers	Yes	EOD auto-start	Yes
Converter mode	Yes	Self-load mode	Yes

NOTE

You can set parameters on one UPS, and then synchronize the parameters to the other UPSs.

B LCD Menus and Parameters

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
Status	Mains Input	Voltage	N/A	N/A	N/A
		Frequency			
	Bypass Input	Voltage			
		Frequency			
	Battery Status	Battery voltage/Battery current			
		Status			
		Capacity			
		Backup time			
	Inverter Output	Voltage			
		Current			
		Frequency			
	UPS Output	Voltage			
		Current			
		Frequency			
	Local-UPS Load	Single UPS Running/N+X Parallel-System			
		Sout			
		Pout			
		Load ratio			
	Parallel-System	Single UPS			

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
	Load	Running/N+X Parallel-System			
		Sys. Sout			
		Sys. Pout			
		Sys. Load ratio			
	Environment Monitoring	Ambient temp.			
		Ambient humidity			
		Internal temp.			
	Runtime	Inv. runtime			
		BPS runtime			
	Alarms	Active Alarms			
Historical Alarms		Historical alarms	Details		
Sort Alarms		Occurrence (latest first)	N/A		
		Level (highest first)			
Clear Alarms		N/A			
Settings	Basic Settings	Language	N/A	English, Chinese, Spanish, French, and Russian	English
		Change Password	N/A	000000–999999	000001
		Change Feature Code	N/A	000000–999999	999999
	Communication Card	IP address (SNMP Card)	N/A	0.0.0.0–255.255.255.255	192.168.0.10
		Subn. mask (SNMP Card)	N/A	0.0.0.0–255.255.255.255	255.255.255.0
		Gateway (SNMP Card)	N/A	0.0.0.0–255.255.255.255	192.168.0.1
		Communication address (Modbus Card)	N/A	N/A	N/A
		Baud rate (Modbus Card)	N/A	N/A	N/A

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		Normal mode (Dry contact)	N/A	Dry contact 1–6	Dry contact 1
		Battery mode (Dry contact)	N/A	Dry contact 1–6	Dry contact 2
		Bypass mode (Dry contact)	N/A	Dry contact 1–6	Dry contact 3
		Batt. undervolt (Dry contact)	N/A	Dry contact 1–6	Dry contact 4
		BPS backfeed (Dry contact)	N/A	Dry contact 1–6	Dry contact 5
		Faulty UPS (Dry contact)	N/A	Dry contact 1–6	Dry contact 6
	System Parameters	Parallel (configurable after the inverter shuts down)	Single/Parallel	Single and Parallel	Single
			Redundant UPSs	0–3	0
		Output (configurable after the inverter shuts down)	Output mode (configurable only on the UPS2000-G-15 kVA/20 kVA)	Single-phase/Three-phase	Three-phase (on the UPS2000-G-15 kVA/20 kVA)
			Voltage level	<ul style="list-style-type: none"> • 208 V, 220 V, 230 V, and 240 V (on the UPS2000-G-6 kVA/10 kVA) • 208 V, 220 V, 230 V, and 240 V, single-phase (on the UPS2000-G-15 kVA/20 kVA) • 380 V, 400 V, and 415 V, three-phase (on the UPS2000-G-15 kVA/20 kVA) 	<ul style="list-style-type: none"> • 220 V (on the UPS2000-G-3 kVA/6 kVA/10 kVA) • 220 V, single-phase (on the UPS2000-G-15 kVA/20 kVA) • 380 V, three-phase (on the UPS2000-G-15 kVA/20 kVA)
			Frequency level	50 Hz, 60 Hz, and Automatic	50 Hz
			Volt. adj. coef.	±5%, ±4%, ±3%, ±2%, ±1%, and 0%	0%

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
			Converter mode	Enabled and Disabled	Disabled
		Bypass (configurable after the inverter shuts down)	Max. voltage	10%, 15%, 20%, 25%, and 30%	15%
			Min. voltage	10%, 20%, 30%, 40%, 50%, and 60%	20%
			Frequency range	±0.5 Hz, ±1 Hz, ±2 Hz, ±3 Hz, ±4 Hz, ±5 Hz, and ±6 Hz	±2 Hz
		ECO (configurable after the inverter shuts down)	Max. voltage	5%, 6%, 7%, 8%, 9%, and 10%	10%
			Min. voltage	5%, 6%, 7%, 8%, 9%, and 10%	10%
			Frequency range	±0.5 Hz, ±1 Hz, ±2 Hz, and ±3 Hz	±2 Hz
			Single UPS ECO	Enabled and Disabled	Disabled
		Power segment	Dis. time thres. (configurable in non-battery mode)	0–999 minutes	30 Min
			Dis. volt. thres. (configurable in non-battery mode)	1.90–2.25 V/cell	2.00 V/cell
			Power Segment (configurable after the inverter shuts down)	Enabled and Disabled	Disabled
		Self-Load (configurable after the inverter shuts down)	Output power ratio	20%–100%	80%
			Self-load mode	Enabled and Disabled	Disabled
		Others (configurable after the inverter shuts down)	Recovery delay time	0–900 seconds	5S
			Max. BPS transfers	1–3	3
			Output transformer	Enabled and Disabled	Disabled
			Generator mode	Weak adaptability mode, Balanced mode, and Strong	Balanced mode

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
				adaptability mode	
			Auto check capa.	Enabled and Disabled	Enabled
			Auto start	Enabled and Disabled	Disabled
	Battery Parameters	Basic	Batteries /Positive batteries/Negative batteries (configurable in non-battery mode)	16–20 monoblocs	20 Monobloc
			Battery capacity (configurable in non-battery mode)	7–1000 Ah	<ul style="list-style-type: none"> For the UPS2000-G-3 kVA/6 kVA, the default value is 7 Ah on a standard model and 40 Ah on a long backup time model. For the UPS2000-G-10 kVA, the default value is 9 Ah on a standard model and 65 Ah on a long backup time model. For the UPS2000-G-15 kVA/20 kVA, the default value is 65 Ah on a long backup time model.
			Overtemp. thres.	45–55 °C	50 °C
			Undertemp. thres.	–30 °C to +5 °C	–5 °C
			Overcurrent thres.	<ul style="list-style-type: none"> 2.0–4.0 A (standard model) 4.0–8.0 A (long backup time model) 	<ul style="list-style-type: none"> 3.0 A (standard model) 6.0 A (long backup time model)

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		Equalized Charge	Equalized charging	Enabled and Disabled	Enabled
			Time interval	30–180 days	60 Day
			Voltage	2.33–2.40 V/cell	2.35 V/cell
			Max. current	<ul style="list-style-type: none"> 1.0–2.0 A (standard model) 1.0–4.0 A (long backup time model) 	<ul style="list-style-type: none"> 2.0 A (standard model) 4.0 A (long backup time model)
			Max. time	600–999 minutes	960 Min
		Float Charge	Voltage	2.25–2.30 V/cell	2.25 V/cell
			Temp. comp. coef.	0.0–6.0 mV/ °C*cell	3.3 mV/ °C*cell
		Discharge	Max. time (configurable in non-battery mode)	0–24 hours	16 Hour
			EOD mode (configurable in non-battery mode)	Batt. protect first, Backup time first, and Balanced mode	Backup time first
			EOD auto-start (configurable after the inverter shuts down)	Enabled and Disabled	Enabled
	Shutdown delay		0–600 seconds	0S	
	Shallow Discharge	Test notification	Enabled and Disabled	Disabled	
		Time interval	30–90 days	60 Day	
		Discharge ratio	10%–50%	20%	
	Settings wizard (configurable after the inverter shuts down)	Language	N/A	English, Chinese, Spanish, French, and Russian	English
		System Parameters	Voltage level	<ul style="list-style-type: none"> 208 V, 220 V, 230 V, and 240 V (on the UPS2000-G-6 kVA/10 kVA) 208 V, 220 V, 230 V, and 240 V, single-phase (on the 	<ul style="list-style-type: none"> 220 V (on the UPS2000-G-3 kVA/6 kVA/10 kVA) 220 V, single-phase (on the UPS2000-G-1 5 kVA/20

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
				UPS2000-G-15 kVA/20 kVA) <ul style="list-style-type: none"> 380 V, 400 V, and 415 V, three-phase (on the UPS2000-G-15 kVA/20 kVA) 	kVA) <ul style="list-style-type: none"> 380 V, three-phase (on the UPS2000-G-15 kVA/20 kVA)
			Frequency level	50 Hz, 60 Hz, and Automatic	50 Hz
			Output mode (configurable only on the UPS2000-G-15 kVA/20 kVA)	Single-phase and Three-phase	Three-phase (on the UPS2000-G-15 kVA/20 kVA)
		Battery Parameters	Batteries /Positive batteries/Negative batteries	16–20 monoblocs	20 Monobloc
			Battery capacity	7–1000 Ah	<ul style="list-style-type: none"> For the UPS2000-G-3 kVA/6 kVA, the default value is 7 Ah on a standard model and 40 Ah on a long backup time model. For the UPS2000-G-10 kVA, the default value is 9 Ah on a standard model and 65 Ah on a long backup time model. For the UPS2000-G-15 kVA/20 kVA, the default value is 65 Ah on a long backup time model.
		Restore Default Settings	N/A	N/A	N/A

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
	(configurable after the inverter shuts down)				
Control	Startup	N/A	N/A	N/A	N/A
	Shutdown				
	Replace Batteries				
	Maintain Batteries	Shallow Discharge Test			
		Capacity Test			
		Stop Test			
		Manual Equalized Charging/Manual EC for Pos./Manual EC for Pos.			
		Manual Float Charging/Manual FC for Neg./Manual FC for Neg.			
Sync Paral. Param.	N/A				
Reset Password					
About	Model	N/A	N/A	N/A	N/A
	ESN				
	Version				

 **NOTE**

- The bypass frequency range is associated with the ECO frequency range (the bypass frequency range is ± 0.5 Hz, ± 1 Hz, ± 2 Hz, ± 3 Hz, ± 4 Hz, ± 5 Hz, or ± 6 Hz; the ECO frequency range is ± 0.5 Hz, ± 1 Hz, ± 2 Hz, or ± 3 Hz).
 The bypass frequency range must be greater than or equal to the current ECO frequency range (if the ECO frequency range is ± 3 Hz, the bypass frequency range is ± 3 Hz, ± 4 Hz, ± 5 Hz, or ± 6 Hz).
 The ECO frequency range must be less than or equal to the current bypass frequency range (if the bypass frequency range is ± 1 Hz, the ECO frequency range is ± 0.5 Hz or ± 1 Hz).
- The voltage level is associated with the upper threshold for bypass voltages (10%, 15%, 20%, 25%, or 30%).

If the voltage level is 208 V, the upper threshold for bypass voltages is 10%, 15% (default), 20%, 25%, or 30%.

If the voltage level is 220 V (line voltage: 380 V), the upper threshold for bypass voltages is 10%, 15% (default), 20%, or 25%.

If the voltage level is 230 V (line voltage: 400 V), the upper threshold for bypass voltages is 10%, 15% (default), or 20%.

If the voltage level is 240 V (line voltage: 415 V), the upper threshold for bypass voltages is 10% or 15% (default).

C Alarm Handling

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
0001-01	Abnormal mains volt.	Minor	Automatic clear	<ul style="list-style-type: none"> The UPS transfers to battery mode. If no battery is equipped, the UPS shuts down. 	<p>Possible causes:</p> <ul style="list-style-type: none"> The mains voltage exceeds 280 V. The mains voltage is less than 80 V. The mains frequency is not in the range of 40 Hz to 70 Hz. <p>Measures:</p> <ul style="list-style-type: none"> Check whether the mains input voltage is less than 272 V. If not, wait until the mains recovers. Check whether the mains input voltage is greater than 88 V. If not, wait until the mains recovers. Check the mains input frequency. If the mains input frequency is abnormal, wait until the mains input recovers.
0001-02	Abnormal mains volt.	Minor			
0001-03	Abnormal mains volt.	Minor			
0004-01	Mains phase reverse	Minor	Automatic clear	<ul style="list-style-type: none"> The rectifier transfers to battery mode, without affecting the power supply. If no batteries are installed, the UPS shuts 	<p>Possible cause: The mains input three-phase sequence is incorrect.</p> <p>Measure: Check that mains input power cables are correctly connected.</p>

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
				down. • The UPS may transfer to another working mode or shut down.	
0005-01	Mains neutral loss	Minor	Automatic clear	• The UPS transfers to battery mode. • If no battery is equipped, the UPS shuts down. • The UPS changes the working mode or shuts down.	Possible cause: The mains input neutral wire is not connected. Measure: Check that mains input power cables are correctly connected.
0007-01	Batt. trans. overlimit	Minor	Manual clear/Power-off clear/Automatic clear	The UPS does not transfer back to normal mode even when the mains is normal.	Possible cause: The mains voltage fluctuates frequently. The UPS has transferred from normal mode to battery mode within 2 minutes for 10 consecutive times. The rectifier locks out in battery mode. Measure: Check the mains.
0008-01	Rect. start overlimit	Minor	Manual clear/Power-off clear	The UPS cannot start.	Possible cause: The mains voltage frequently becomes abnormal during startup. Measure: Check the mains input voltage. If the voltage becomes normal, clear the alarm and restart the UPS.
0010-01	Abnormal BPS volt.	Minor	Automatic clear	The UPS cannot transfer to bypass mode. If the bypass is supplying power, the UPS changes the working mode.	Possible causes: • The bypass input voltage is abnormal. • The bypass input frequency is abnormal. Measures: • Check whether the bypass input voltage exceeds the configured range. If yes,
0010-02	Abnormal BPS volt.	Minor			

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					change the range or wait until the bypass input recovers. <ul style="list-style-type: none"> • Check whether the bypass input frequency exceeds the configured range. If yes, change the range or wait until the bypass input recovers.
0011-01	BPS phase reverse	Minor	Automatic clear	<ul style="list-style-type: none"> • If the inverter has not started, the system has no output, and inverter startup is prohibited. • If the inverter has started, the inverter still works properly, but the system cannot transfer to bypass mode. 	Possible cause: The bypass input three-phase sequence is incorrect. Measure: Check that bypass input power cables are correctly connected.
0012-01	BPS neutral loss	Minor	Automatic clear	If the inverter has not started, the system has no output, and inverter startup is prohibited. If the inverter has started, the inverter still works properly, but the system cannot transfer to bypass mode.	Possible cause: The bypass input neutral wire is not connected. Measures: Check that bypass input power cables are correctly connected.
0014-01	Start timeout	Critical	Manual clear/Power-off clear	The UPS cannot start.	Possible causes: <ul style="list-style-type: none"> • The bypass load exceeds the rated inverter load. • An internal fault occurs in the UPS. Measures: <ul style="list-style-type: none"> • Reduce the output load,

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					manually clear the alarm, and restart the UPS. <ul style="list-style-type: none"> Contact Huawei technical support for repair.
0020-01	Batt. reverse	Critical	Automatic clear	The power supply from the UPS and system is not affected.	Possible cause: Batteries are reversely connected. Measure: Check the battery installation, and reinstall the batteries.
0022-01	No battery	Minor	Automatic clear	The power supply from the UPS and system is not affected.	Possible causes: <ul style="list-style-type: none"> Batteries are not connected. Batteries are not securely connected. Measures: <ul style="list-style-type: none"> Connect batteries. Check that batteries are securely connected.
0023-01	Batt. overtemp.	Minor	Automatic clear	An alarm is generated, and the battery lifespan is affected.	Possible causes: <ul style="list-style-type: none"> The ambient temperature exceeds the battery high temperature alarm threshold (default value: 50 ℃) The battery charge/discharge current exceeds the upper threshold. Measures: <ul style="list-style-type: none"> Install more cooling equipment such as air conditioners. Control the battery charge/discharge current by reducing loads.
0025-01	Batt. overvolt.	Minor	Automatic clear	An alarm is generated, and the battery lifespan is affected.	Possible causes: <ul style="list-style-type: none"> The configured number of batteries is less than the actual number. The battery string charge voltage exceeds the upper threshold.

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					Measures: <ul style="list-style-type: none"> • Check battery parameter settings. • Disconnected the external battery charger, check whether the alarm is cleared. If not, contact Huawei technical support for repair.
0026-01	Batt. undervolt.	Minor	Automatic clear	An alarm is generated, and the system may shut down due to EOD.	Possible cause: The mains input is abnormal. Battery discharge results in a low battery voltage. Measure: If possible, connect to the mains power when the UPS is in non-battery test state.
0027-01	Batt. overcurrent	Minor	Automatic clear	An alarm is generated, and the battery lifespan is affected.	Possible causes: The charger is abnormal. Measure: Contact Huawei technical support for repair.
0028-01	Breaker OFF	Critical	Automatic clear	N/A	Possible causes: <ul style="list-style-type: none"> • The mains input power cables are incorrectly connected. • The mains input circuit breaker is OFF. Measure: Check whether mains input power cables are correctly connected. If yes, switch on the mains input circuit breaker.
0028-02	Breaker OFF	Critical	Automatic clear	N/A	Possible causes: <ul style="list-style-type: none"> • The bypass is short-circuited or the bypass input experiences overcurrent. • The bypass input circuit breaker is OFF. Measures: <ul style="list-style-type: none"> • Check whether the bypass output load is short-circuited using a

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					multimeter. <ul style="list-style-type: none"> • Check whether cable connections are correct. If yes, switch on the bypass input circuit breaker.
0028-03	Breaker OFF	Critical	Automatic clear	N/A	Possible causes: <ul style="list-style-type: none"> • The bypass is short-circuited or the bypass input experiences overcurrent. • The bypass input circuit breaker is OFF. Measures: <ul style="list-style-type: none"> • Check whether the circuit breaker downstream load is short-circuited using a multimeter. • Check whether cable connections are correct. If yes, switch on the output circuit breaker.
0029-01	Maintain batt.	Minor	Automatic clear	The battery backup time is affected.	Possible causes: <ul style="list-style-type: none"> • The battery capacity is incorrectly set. • The battery loop cannot be discharged. • The battery capacity is low. Measures: <ul style="list-style-type: none"> • Check whether the configured battery capacity matches the connected battery capacity. • Check battery connections and the status of each battery. • Contact Huawei technical support for repair.
0030-01	UPS inter overtemp.	Minor	Automatic clear	The power supply from the UPS and system is not affected.	Possible causes: <ul style="list-style-type: none"> • The ambient temperature exceeds 40 °C. • The air channel is

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					<p>blocked.</p> <ul style="list-style-type: none"> The fan is abnormal. <p>Measures:</p> <ul style="list-style-type: none"> Decrease the ambient temperature. Keep the air intake and exhaust vents of the UPS unobstructed. Clean off the foreign objects around the fan. If the alarm persists, contact Huawei technical support for repair.
0032-01	Batt. OVP	Critical	Automatic clear	An alarm is generated, and the battery lifespan is affected.	<p>Possible causes:</p> <ul style="list-style-type: none"> The configured number of batteries is less than the actual number. The actual number of batteries does not meet specifications. The charger is abnormal. <p>Measures:</p> <ul style="list-style-type: none"> Check that the configured number of batteries matches the actual number. Check that the actual number of batteries meets requirements. Disconnected the external battery charger, check whether the alarm is cleared. If not, contact Huawei technical support for repair.
0034-01	Remaining cap. warning	Minor	Automatic clear	If no action is taken, continued discharge will result in system shutdown due to EOD.	<p>Possible cause:</p> <ul style="list-style-type: none"> The battery discharge lasts too long. The mains input is abnormal. The number of batteries or battery capacity is incorrectly set.

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					Measure: <ul style="list-style-type: none"> Check the mains, and charge batteries in a timely manner. Check the configured battery capacity.
0036-01	Batt. maint. notif	Minor	Automatic clear	An alarm is generated. If the shallow discharge test is not performed for a long time, the battery power backup function may be affected.	Possible cause: The battery does not experience shallow discharge, and the maintenance period expires. Measure: Perform the following steps: Click the alarm. The battery maintenance menu is displayed. Perform a shallow discharge test. The alarm will be automatically cleared no matter whether test conditions are met.
0040-01	Rectifier fault	Critical	Manual clear/Power-off clear	The UPS shuts down. The UPS transfers to another working mode or shuts down.	Possible cause: The soft-start resistor is damaged. Measure: Contact Huawei technical support for repair.
0040-02	Rectifier fault	Critical	Manual clear/Power-off clear	The UPS cannot be started.	Possible causes: <ul style="list-style-type: none"> The mains input harmonic is large. The rectifier startup circuit is damaged. Measures: <ul style="list-style-type: none"> After you rectify the fault, restart the UPS. Contact Huawei technical support for repair.
0040-04	Rectifier fault	Critical	Manual clear/Power-off clear/Automatic clear	The UPS shuts down. The UPS transfers to another working mode or shuts down.	Possible causes: <ul style="list-style-type: none"> The mains experiences instantaneous high-voltage impact. The output has special loads such as inductive loads and rectification

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					<p>loads.</p> <ul style="list-style-type: none"> The output has transformer loads but the transformer mode is not set. The hardware is damaged. <p>Measures:</p> <ul style="list-style-type: none"> After you rectify the fault, restart the UPS. Check whether the load type is supported by the UPS. Enable the transformer mode. Contact Huawei technical support for repair.
0040-05	Rectifier fault	Critical	Manual clear/Power-off clear/Automatic clear	<p>The UPS shuts down.</p> <p>The UPS transfers to another working mode or shuts down.</p>	<p>Possible cause: The hardware is damaged.</p> <p>Measure: Contact Huawei technical support for repair.</p>
0040-06	Rectifier fault	Critical	Power-off clear	<p>The UPS shuts down.</p> <p>The UPS transfers to another working mode or shuts down.</p>	<p>Possible cause: The hardware is damaged.</p> <p>Measure: Contact Huawei technical support for repair.</p>
0040-07	Rectifier fault	Critical	Automatic clear	<p>The UPS shuts down.</p> <p>The UPS transfers to another working mode or shuts down.</p> <p>The charger stops working.</p>	<p>Possible causes:</p> <ul style="list-style-type: none"> The ambient temperature exceeds 40 ℃. The air channel is blocked. The fan is abnormal. <p>Measures:</p> <ul style="list-style-type: none"> Decrease the ambient temperature. Keep the air intake and exhaust vents of the UPS unobstructed.

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					<ul style="list-style-type: none"> Clean off the foreign objects around the fan. If the alarm persists, contact Huawei technical support for repair.
0040-09	Rectifier fault	Critical	Power-off clear	<p>The rectifier transfers to battery mode, and the power supply is not affected.</p> <p>If no battery is installed, the UPS shuts down.</p> <p>The UPS transfers to another working mode or shuts down.</p>	<p>Possible cause: The rectifier is faulty.</p> <p>Measure: Contact Huawei technical support for repair.</p>
0040-10	Rectifier fault	Critical	Manual clear/Power-off clear	The UPS shuts down.	<p>Possible cause: The digital signal processing (DSP) or complex programmable logical device (CPLD) chip is faulty.</p> <p>Measure: Contact Huawei technical support for repair.</p>
0041-01	Rectifier alarm	Minor	Manual clear/Power-off clear	N/A	<p>Possible cause: The EEPROM chip is faulty.</p> <p>Measure: Contact Huawei technical support for repair.</p>
0041-02	Rectifier alarm	Minor	Automatic clear	<p>The UPS shuts down.</p> <p>The UPS may transfer to another working mode or shut down.</p>	<p>Possible cause: The single-side bus capacitor is faulty.</p> <p>Measure: Contact Huawei technical support for repair.</p>
0041-03	Rectifier alarm	Minor	Manual clear/Power-off clear	The power supply from the UPS and system is not affected.	<p>Possible cause: The bus capacitor is faulty.</p> <p>Measure: Contact Huawei technical support for repair.</p>
0041-10	Rectifier alarm	Minor	Automatic clear	N/A	Possible cause: The load power exceeds the loading

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					capacity of the batteries. Measure: Reduce the load power or verify the number of batteries.
0042-01	Internal fault	Critical	Manual clear/Power-off clear	The UPS shuts down.	Possible cause: The auxiliary power source is faulty. Measure: Contact Huawei technical support for repair.
0042-02	Internal fault	Critical	Manual clear/Power-off clear	The UPS shuts down.	Possible cause: The soft-start resistor is damaged. Measure: Contact Huawei technical support for repair.
0042-03	Internal fault	Minor	Automatic clear	The power supply from the UPS and system is not affected.	Possible cause: The NTC is not connected or is damaged. Measure: Contact Huawei technical support for repair.
0042-09	Internal fault	Critical	Automatic clear	The inverter shuts down.	Possible cause: Self-load cable connections are incorrect. Measure: Reconnect cables.
0042-10	Internal fault	Critical	Automatic clear	If the inverter has not started, the UPS has no output, and inverter startup is not allowed. If the inverter has started, inverter operation is not affected, but transfer to bypass mode is not allowed.	Possible cause: The bypass input cable connections do not match the output system. Measure: Ensure that the bypass input cable connections match the output system.
0042-11	Internal fault	Critical	Power-off clear	After the parallel system is powered on, an incorrect bypass phase sequence is detected on a UPS. The parallel system has not output.	Possible cause: The bypass phase sequences in the parallel system do not match. Measure: Check bypass input phase sequences in the parallel system.

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
				<p>The parallel system works in inverter mode. The newly added UPS has no output because bypass cables are incorrectly connected.</p> <p>The parallel system works in bypass mode. The parallel system has no output because bypass cables for the newly added UPS are incorrectly connected.</p>	
0042-12	Internal fault	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	<p>Possible cause: The three-phase power cable lengths vary greatly.</p> <p>Measure: Ensure that the lengths of three-phase power cables vary within a difference of 5%.</p>
0042-13	Internal fault	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	<p>Possible cause: The inverter is faulty.</p> <p>Measure: Contact Huawei technical support for repair.</p>
0043-01	Fan fault	Critical	Automatic clear	The power supply from the UPS and system is not affected.	<p>Possible cause: The fan is abnormal.</p> <p>Measure: Clean off the foreign objects around the fan. If the alarm persists, contact Huawei technical support for repair.</p>
0043-06	Fan fault	Critical	Automatic clear	The power supply from the UPS and system is not affected.	<p>Possible cause: The fan is abnormal.</p> <p>Measure: Clean off the foreign objects around the fan. If the alarm persists, contact Huawei technical support for repair.</p>

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
0044-01	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: An error occurred during software loading. Measure: Contact the manufacturer to load software.
0044-02	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: Software and hardware versions do not match. Measure: Contact the manufacturer to load software.
0044-03	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: Software and hardware versions do not match. Measure: Contact the manufacturer to load software.
0044-04	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: An error occurred during software loading. Measure: Contact the manufacturer to load software.
0044-05	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: Software and hardware versions do not match. Measure: Contact the manufacturer to load software.
0044-06	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: Software and hardware versions do not match. Measure: Contact the manufacturer to load software.
0045-03	Charger alarm	Critical	Manual clear/Power-off clear	The charger in the UPS stops.	Possible cause: The charger capacitor is faulty. Measure: Contact Huawei technical support for repair.
0045-04	Charger alarm	Critical			Possible cause: The charger output is short-circuited.

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					Measure: Rectify battery port short circuits. After you clear the alarm, restart the UPS. If the alarm persists, contact Huawei technical support for repair.
0045-06	Charger alarm	Critical			Possible cause: The charger is faulty. Measure: Contact Huawei technical support for repair.
0045-07	Charger alarm	Critical	Manual clear/Power-off clear	The charger in the UPS stops. (The 20 kVA has no action.)	Possible cause: The charger is faulty. Measure: Contact Huawei technical support for repair.
0045-08	Charger alarm	Critical	Manual clear/Power-off clear/Automatic clear	The charger in the UPS stops.	
0045-09	Charger alarm	Critical	Manual clear/Power-off clear		
0045-10	Charger alarm	Critical			
0049-01	Battery qty. wrong	Minor	Manual clear/Power-off clear/Automatic clear	An alarm is displayed, and the battery service life may be shortened.	
0060-01	Inverter fault	Critical	Power-off clear	The inverter shuts down. The UPS transfers to	Possible cause: The inverter is faulty. Measure: Contact Huawei

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
				bypass mode or has no output based on the transfer logic.	technical support for repair.
0060-02	Inverter fault	Critical	Power-off clear	The UPS shuts down. The UPS may transfer to another working mode or shut down.	Possible cause: The inverter relay is faulty. Measure: Contact Huawei technical support for repair.
0060-03	Inverter fault	Critical	Power-off clear		
0060-04	Inverter fault	Critical	Power-off clear		Possible cause: The inverter output is short-circuited. Measure: Rectify output port short circuits. After you clear the alarm, restart the UPS. If the alarm persists, contact Huawei technical support for repair.
0060-05	Inverter fault	Critical	Automatic clear		Possible causes: <ul style="list-style-type: none"> • The mains experiences instantaneous high-voltage impact. • The output has special loads such as sensitive loads and rectification loads. • The output has transformer loads but the transformer mode is not set. • The hardware is faulty. Measures: <ul style="list-style-type: none"> • After you rectify the fault, restart the UPS. • Check whether the load type is supported by the UPS. • Enable the transformer mode. • Contact Huawei technical support for repair.
0060-07	Inverter fault	Critical	Automatic clear	The UPS starts upon shutdown. The UPS may transfer to	Possible causes: <ul style="list-style-type: none"> • The ambient temperature exceeds 40 ℃. • The air channel is

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
				another working mode or shut down.	<p>blocked.</p> <ul style="list-style-type: none"> The fan is abnormal. <p>Measures:</p> <ul style="list-style-type: none"> Decrease the ambient temperature. Keep the air intake and exhaust vents of the UPS unobstructed. Clean off the foreign objects around the fan. If the alarm persists, contact Huawei technical support for repair.
0060-08	Inverter fault	Critical	Manual clear/Power-off clear	The UPS shuts down.	<p>Possible cause: The DSP or CPLD chip is faulty.</p> <p>Measure: Contact Huawei technical support for repair.</p>
0061-01	Inverter alarm	Minor	Manual clear/Power-off clear/Automatic clear	<p>The UPS shuts down.</p> <p>The UPS may transfer to another working mode or shut down.</p>	<p>Possible causes:</p> <ul style="list-style-type: none"> Parallel cables are incorrectly connected. The lengths of parallel cables vary greatly. <p>Measures:</p> <ul style="list-style-type: none"> Reconnect cables. The lengths of parallel cables vary within a range of 5%.
0061-02	Inverter alarm	Minor	Manual clear/Power-off clear	N/A	<p>Possible cause: The EEPROM chip is faulty.</p> <p>Measure: Contact Huawei technical support for repair.</p>
0064-01	OL timeout	Critical	Automatic clear	<p>The UPS automatically starts after shutdown.</p> <p>The UPS transfers to another working mode or shuts down.</p>	<p>Possible cause: The load exceeds the rated inverter loading capacity.</p> <p>Measure: Reduce the load or replace the UPS with a larger-capacity UPS.</p>
0064-02	OL timeout	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: The load exceeds the rated bypass

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
			clear		loading capacity. Measure: Reduce the load or replace the UPS with a larger-capacity UPS.
0065-01	Power segment	Minor	Manual clear/Power-off clear	In single UPS mode, the loads connected to pL power off.	Possible cause: The load exceeds the rated loading capacity. Measure: Reduce the load or replace the UPS with a larger-capacity UPS.
0065-02	Power segment	Minor	Automatic clear/Manual clear		Possible causes: <ul style="list-style-type: none"> The battery voltage is below the battery protection voltage. The battery discharge time exceeds the battery protection time. Measures: <ul style="list-style-type: none"> Check the battery voltage. Modify the power segment settings on the LCD.
0066-01	Output overload	Minor	Automatic clear	Continuous overload causes the UPS to transfer to bypass mode or supply no power.	Possible cause: The load exceeds the rated loading capacity. Measure: Reduce the load or replace the UPS with a larger-capacity UPS.
0066-02	Output overload	Minor	Automatic clear	Continuous overload causes the UPS to supply no power.	Possible cause: The load exceeds the rated bypass loading capacity. Measure: Reduce the load or replace the UPS with a larger-capacity UPS.
0067-01	Paral. set failure	Minor	Automatic clear	UPS startup is not allowed.	Possible cause: The single UPS and parallel system settings do not match cable connections. Measures: <ul style="list-style-type: none"> Check the single UPS and parallel system settings. Check that parallel cable

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					connections match the settings.
0071-01	BPS backfeed	Critical	Power-off clear	The bypass input circuit breaker in the PDU is OFF.	Possible cause: The bypass component is faulty. Measure: Contact Huawei technical support for repair.
0083-01	Paral. cable fault	Critical	Manual clear/Power-off clear	The UPS shuts down. The parallel system shuts down.	Possible causes: <ul style="list-style-type: none"> The parallel cable is loose. The parallel cable is damaged. Measures: <ul style="list-style-type: none"> Check that the parallel cable is securely connected. Replace the parallel cable. Contact Huawei technical support for repair.
0083-02	Paral. cable fault	Critical			
0083-04	Paral. cable fault	Critical	Manual clear/Power-off clear/Automatic clear	The UPS shuts down. The parallel system transfers to another working mode.	
0083-05	Paral. cable fault	Critical			
0084-02	Paral. cable alarm	Minor	Automatic clear	N/A	
0084-03	Paral. cable alarm	Minor			
0085-01	EPO	Critical	Manual clear/Power-off clear	The UPS shuts down.	Possible cause: The EPO button is pressed. Measure: Restore the EPO button status. Start the UPS after the alarm is cleared.
0086-01	BPS trans. overlimit	Minor	Manual clear/Power-off clear	Transfer to an unstable side is not allowed.	Possible cause: The output transfer times within 30 minutes exceed the configured value (3 by default).

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					Measure: Restart the UPS after the alarm is cleared.
0094-01	Redundancy failure	Minor	Automatic clear	N/A	Possible causes: <ul style="list-style-type: none"> The configured number of redundant UPSs exceeds the maximum allowed value. The load exceeds the rated loading capacity of the requisite UPSs in the parallel system. Measures: <ul style="list-style-type: none"> Reduce the number of redundant UPSs or set the system to be non-redundant. Reduce the load or replace the UPS with a larger-capacity UPS.
0096-01	Abnormal ECO volt.	Minor	Automatic clear	Transfer to bypass mode is prohibited. If the bypass is supplying power, the UPS transfers to another working mode.	Possible cause: The ECO input is abnormal. Measure: Check whether the ECO input voltage or frequency exceeds the configured range. If yes, change the range or wait until the bypass input recovers.
0105-05	Comm. failed.	Minor	Automatic clear	The monitoring module cannot monitor the digital signal processor (DSP) of the power module.	Possible causes: <ul style="list-style-type: none"> The communications cable is faulty. An internal fault occurs in the UPS. Measures: <ul style="list-style-type: none"> Check the communications cable. Contact Huawei technical support for repair.
0125-01	Incon. paral. param.	Critical	Automatic clear	An alarm is generated, and all the UPSs in the parallel system cannot	Possible cause: The parallel parameters are not set consistently on the UPSs. Measure: Set the parallel parameters consistently, or

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
				start inverters.	perform parallel parameter synchronization. NOTE After you perform parallel parameter synchronization, contact Huawei technical support if some parallel parameters are still inconsistent.
0131-01	Ambient overtemperature	Minor	Automatic clear	An alarm is generated.	Possible causes: <ul style="list-style-type: none"> The ambient temperature in the UPS equipment room exceeds the alarm threshold (default value: 40 °C). The temperature and humidity transducer is faulty. Measures: <ul style="list-style-type: none"> Check the ambient temperature in the UPS equipment room. Replace the temperature and humidity transducer.
0133-01	Ambient undertemperature	Minor			Possible causes: <ul style="list-style-type: none"> The ambient temperature in the UPS equipment room is below the alarm threshold (default value: 0 °C). The temperature and humidity transducer is faulty. Measures: <ul style="list-style-type: none"> Check the ambient temperature in the UPS equipment room. Replace the temperature and humidity transducer.
0134-01	Ambient overhumidity	Minor			Possible causes: <ul style="list-style-type: none"> The ambient humidity in the UPS equipment room exceeds the alarm threshold (default value:

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					<p>90%).</p> <ul style="list-style-type: none"> The temperature and humidity transducer is faulty. <p>Measures:</p> <ul style="list-style-type: none"> Check the ambient humidity of the UPS equipment room. Replace the temperature and humidity transducer.
0135-01	Ambient underhumidity	Minor			<p>Possible causes:</p> <ul style="list-style-type: none"> The ambient humidity in the UPS equipment room is below the alarm threshold (default value: 10%). The temperature and humidity transducer is faulty. <p>Measures:</p> <ul style="list-style-type: none"> Check the ambient humidity of the UPS equipment room. Replace the temperature and humidity transducer.
0136-01	Faulty temperature and humidity module	Minor			<p>Possible causes: The temperature and humidity module is faulty.</p> <p>Measures:</p> <ul style="list-style-type: none"> Check parameter settings of the temperature and humidity transducer. Replace the temperature and humidity transducer.
0158-01	On bypass	Minor	Automatic clear	If the bypass is abnormal, the UPS may power off.	<p>Possible causes:</p> <ul style="list-style-type: none"> The inverter is not started. The load exceeds the rated inverter loading capacity. The inverter is faulty. <p>Measures:</p>

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					<ul style="list-style-type: none"> • Check whether other alarms are generated. If yes, see the other handling methods. • If no, start the UPS manually.
0159-01	On battery	Minor	Automatic clear	The UPS may power off if batteries are abnormal.	<p>Possible causes:</p> <ul style="list-style-type: none"> • The mains input is abnormal. • The UPS is in battery self-check state. • The mains loading capability is insufficient. <p>Measures:</p> <ul style="list-style-type: none"> • Check the mains input. If the mains input is abnormal, wait until the mains input recovers. • Check whether the UPS is in battery self-check state. • Reduce the load or replace the UPS with a larger-capacity UPS.
0340-01	Maint. breaker ON	Minor	Automatic clear	The UPS transfers to bypass mode.	<p>Possible cause: The maintenance circuit breaker is ON during UPS maintenance.</p> <p>Measure: Switch off the maintenance circuit breaker after maintenance.</p>
61440-01	Flash fault	Critical	Automatic clear	Files may be damaged.	<p>Possible cause: The flash memory cannot be properly read or written.</p> <p>Measure: Contact Huawei technical support for repair.</p>

D Alarm Handling of Battery Maintenance Notification

Context

If no battery shallow discharge test is performed within 60 days after a UPS2000-G is installed and the maintenance notification time has arrived, the mains indicator is on, the battery and bypass indicators are off, the fault indicator on the info key are blinking red, and alarms are generated intermittently.

Procedure

Step 1 Clear the **Batt. maint. notif** alarm.


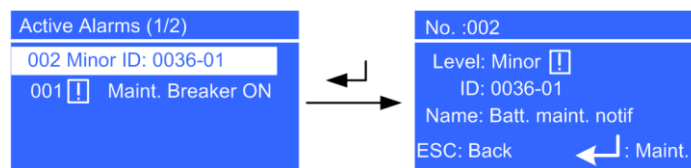
1. Press the **i** key on the UPS control panel to display the **Active Alarms** page. If multiple active alarms exist, use the **▲** or **▼** key to select the alarm record on the top (the latest alarm is on the top by default). Press  to view the alarm ID and name.

Figure D-1 Viewing alarms




2. Press  to display the **Maintain Batteries** screen. Then the **Batt. maint. notif** alarm disappears and timing for the next notification starts, regardless of whether you perform a discharge test. The battery maintenance notification 0036-01 in the active alarm menu will disappear.

Figure D-2 Maintain Batteries screen

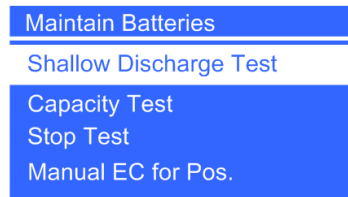
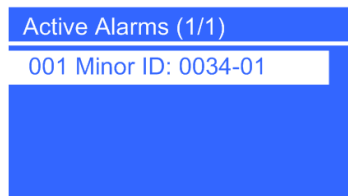


Figure D-3 Active Alarms screen



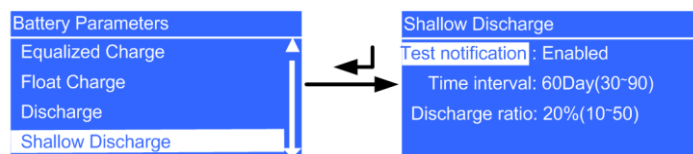
Step 2 Cancel the battery maintenance notification function.

NOTE

If you do not want the battery maintenance notification 0036-01 to appear again, perform the following steps:

1. On the **Main Menu** screen, select **Settings** and press . The **Settings** login screen is displayed. The preset password is 000001. After you enter the correct password and press , the **Settings** screen is displayed.
2. Choose **Battery Parameters** and **Shallow Discharge**, and then change the value of **Test notification** from **Enable** to **Disable** (configurable when the UPS works in any mode).

Figure D-4 Shallow Discharge screen



----End

E Battery Shallow Discharge Test

Context

A shallow discharge test method that tests the battery loop reliability and short-time backup capacity after batteries are charged for a long time (60 days by default, 30 days to 90 days configurable).

Procedure

Step 1 Check the battery status for test start conditions.


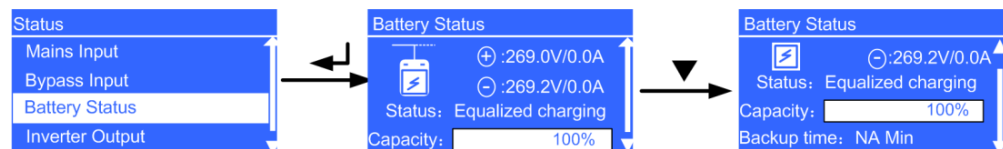
1. On the **Main Menu** screen, choose **Status** and click . On the **Status** screen, locate **Battery Status**.

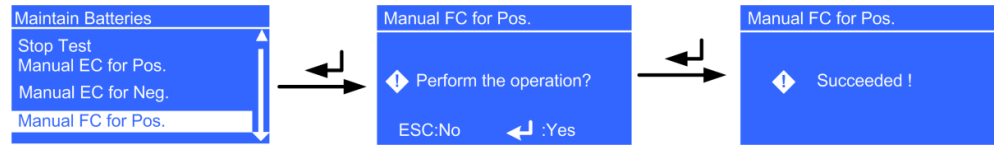
Figure E-1 Battery Status menu



NOTE

- **Status:** The battery status is **NA** (battery not connected or reversely connected), **Equalized charging**, **Float charging**, **Hibernating**, or **Discharging**.
 - **Capacity:** indicates the remaining battery capacity.
 - **Backup time:** indicates the estimated discharge duration. The value is **NA** during battery charging.
2. Batteries in **Hibernating** state cannot start a shallow discharge test. Choose **Control** and **Maintain Batteries**, and then click **Manual Float Charging** to switch the batteries to the float charging state. If the batteries hibernate due to a charger alarm, the batteries can switch between float charging and equalized charging only after the alarm is cleared.

Figure E-2 Manual FC for Pos. screen



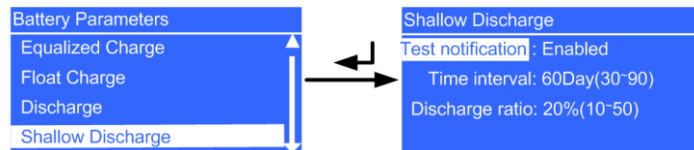
NOTE

For the 3 kVA, 6 kVA and 10 kVA UPSs, perform manual float charging, for the 15 kVA and 20 kVA UPSs, batteries in positive and negative groups are manually switched to float charging respectively.

Step 2 Adjust the discharge ratio for the shallow discharge test.

1. On the **Main Menu** screen, select **Settings** and press . The **Settings** login screen is displayed. The preset password is 000001. After you enter the correct password and press , the **Settings** screen is displayed.
2. Choose **Battery Parameters** and **Shallow Discharge**, and adjust the parameters to fit actual requirements.

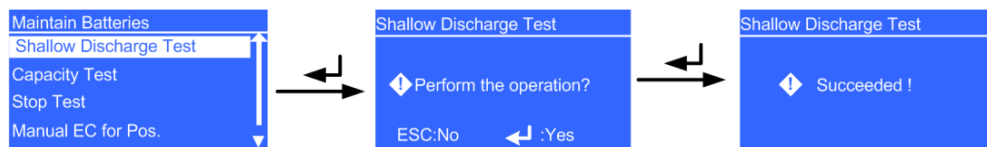
Figure E-3 Shallow Discharge screen



Discharge ratio: indicates the percentage of discharge capacity to the total dischargeable capacity. The parameter can be set to a value between 10% and 50%, and the default value is 20%. The parameter is configurable in any mode. It is recommended that the value of **Discharge ratio** not exceed 20% with the load is light. For example, the value can be 10% or 15%.

Step 3 Start the shallow discharge test: Partially discharge the batteries. After all required conditions are met, the test command is successfully delivered and the LCD displays a **Succeeded** message.

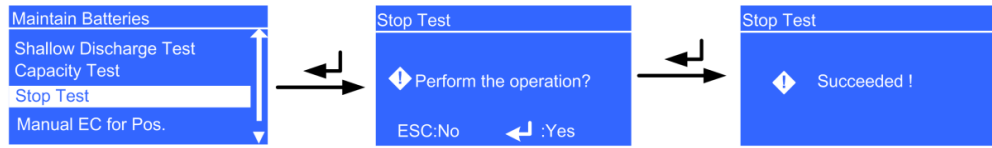
Figure E-4 Shallow Discharge screen



If the shallow discharge test command is successfully executed, the charger disables its output and the system is in battery mode. You can view the battery information on the default screen (energy flow diagram). The normal mode indicator (green) turns off, and the battery mode indicator (yellow) turns on.

Step 4 Stop the shallow discharge test forcibly.

Figure E-5 Stop Test screen



----End

F Capacity Test

Context

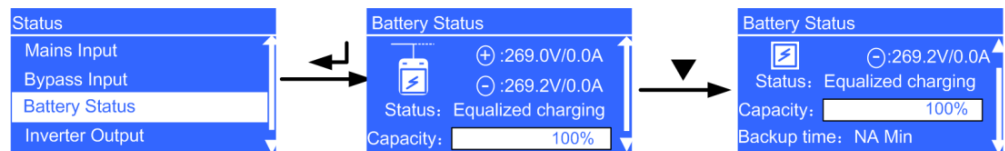
A deep discharge test method that tests the battery real-time capability and long-time backup capability after batteries have not experienced deep discharging for a long time.

Procedure

Step 1 Check the battery status for test start conditions.

1. On the **Main Menu** screen, choose **Status** and click . On the **Status** screen, locate **Battery Status**.

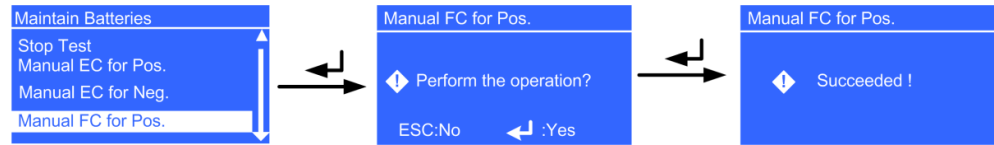
Figure F-1 Battery Status menu



NOTE

- **Status:** The battery status is **NA** (battery not connected or reversely connected), **Equalized charging**, **Float charging**, **Hibernating**, or **Discharging**.
 - **Capacity:** indicates the remaining battery capacity.
 - **Backup time:** indicates the estimated discharge duration. The value is **NA** during battery charging.
2. Batteries in **Hibernating** state cannot start a capacity test. Choose **Control** and **Maintain Batteries**, and then click **Manual Float Charging** to switch the batteries to the float charging state. Charge the batteries until the battery capacity reaches 100%. If the batteries hibernate due to a charger alarm, the batteries can switch between float charging and equalized charging only after the alarm is cleared.

Figure F-2 Manual FC for Pos. screen

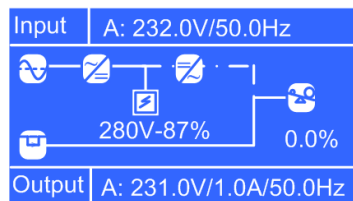


NOTE

For the 3 kVA, 6 kVA and 10 kVA UPSs, perform manual float charging, for the 15 kVA and 20 kVA UPSs, batteries in positive and negative groups are manually switched to float charging respectively.

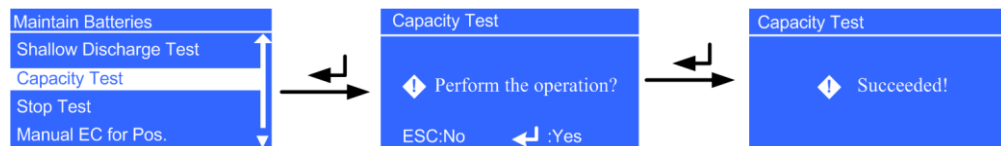
Step 2 Adjust the load rate of the local UPS to a value between 20% and 80%. The actual load rate can be viewed in the energy flow diagram. If the actual load rate is below 20%, you cannot perform a test. If so, add some IT equipment to increase the load to above the lower limit.

Figure F-3 Viewing the load rate



Step 3 Start the capacity Test: Partially discharge the batteries and ensure that the load rate is between 20% and 80%. After all required conditions are met, the test command is successfully delivered and the LCD displays a **Succeeded** message.

Figure F-4 Shallow Discharge screen



NOTE

If the load rate and battery capacity do not meet the requirements, the system displays a message indicating **load not met** and **Batt. not fully charged**. In this case, you need to reset the load rate and battery capacity.

If the capacity Test command is successfully executed, the charger disables its output and the system is in battery mode. You can view the battery information on the default screen (energy flow diagram). The normal mode indicator (green) turns off, and the battery mode indicator (yellow) turns on.

Figure F-5 Load not met

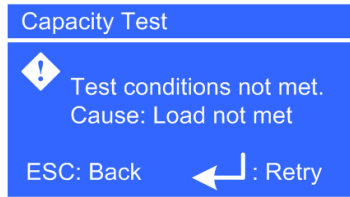
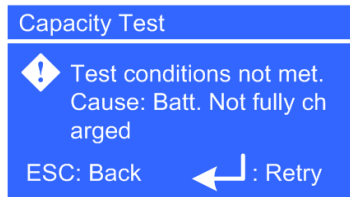
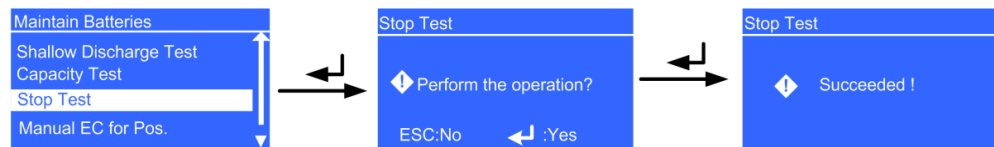


Figure F-6 Batt. not fully charged



Step 4 Stop the capacity Test forcibly.

Figure F-7 Stop Test screen



----End

G Acronyms and Abbreviations

A	
ASIC	application-specific integrated circuit
C	
CAN	control area network
CPLD	complex programmable logical device
D	
DIP	dual in-line package
DOD	depth of discharge
DSP	digital signal processing
E	
EPO	emergency power-off
ECO	economy control operation
EOD	end of discharge
ESD	electrostatic discharge
ESN	equipment serial number
H	
HTTPS	Hypertext Transfer Protocol Secure
L	
LCD	liquid crystal display
LSI	large-scale integrated
M	
MIB	management information base
N	
NMS	network management system

P

PFC power factor correction

PE protective earthing

PL parallel load

PVC polyvinyl chloride

R

RS232 Recommend Standard 232

RS485 Recommend Standard 485

S

SELV safety extra-low voltage

SNMP Simple Network Management Protocol

T

THD_v total harmonic distortion of output voltage

TNV telecommunication network voltage

U

UPS uninterruptible power system

USB Universal Serial Bus

V

VRLA valve regulated lead acid