

UPS2000-G-(6 kVA-20 kVA)

User Manual (Lead-Acid Battery)

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About This Document

Purpose

This document describes the UPS2000-G-(6 kVA-20 kVA)/UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01 in terms of the features, performance, appearance, structure, working principle, installation, operation, and maintenance. UPS is short for uninterruptible power system.

Intended Audience

This document is intended for:

- Technical support engineers
- Hardware installation engineers
- Commissioning engineers
- Maintenance engineers

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.

Symbol	Description
 NOTICE	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.
 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

Issue	Date	Description
24	2024-11-10	- Updated 2.4 Optional Components. - Updated 3.4 Bypass Input Electrical Specifications. - Updated 6.1 Check Before Power-On.
23	2024-03-15	- Deleted the content related to lithium batteries. - Optimized 5.6.3.4 Setting Battery Parameters. - Updated 7.2 SNMP Card application scenarios.
22	2022-12-30	The UPS2000-G-15KRTL-01 and UPS2000-G-20KRTL-01 models support lithium batteries.
21	2022-10-13	- Added the description about battery backup time. - Added the description about output load derating.
20	2022-06-30	- Updated the backup time description in section 4.6.1. - Added an example for calculating the battery capacity in section 4.6.3.4.
19	2022-01-18	Added descriptions about the ESS-240V12-7AhBPVBA04 and ESS-240V12-9AhBPVBA04 battery packs.

Issue	Date	Description
18	2021-07-16	- Added descriptions about the dual-live wire. - Added the UPS2000-G-15KRTL-01 and UPS2000-G-20KRTL-01 models.
17	2020-03-20	Optimized the SNMP Card section.
16	2019-12-20	Updated the safety information.
15	2019-11-22	Added descriptions about the USB port of the product.
14	2019-07-25	Added air filters for the 6 kVA and 10 kVA models.
13	2019-05-05	Updated the device running environment.
12	2018-01-16	Added descriptions about the device application scenarios.
11	2017-11-27	Updated the device running environment.
10	2017-01-19	- Added the DHCP feature. - Changed the default value of Max. current parameter of the long backup model to 2.0 A.
09	2016-10-10	Upgraded the software version.
08	2016-01-06	Upgraded the software version.
07	2015-03-30	Updated the content about alarm handling.
06	2014-10-09	Added the shutdown delay feature.
05	2014-07-31	Updated optional components.
04	2013-11-06	Updated descriptions about checking before power-on.
03	2013-08-24	Added three-phase input single-phase output and single-phase input single-phase output for the 15 kVA and 20 kVA models.
02	2013-06-10	Upgraded the software version.
01	2013-05-15	This issue is the first release.

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1 Safety Information

Statement

Before transporting, storing, installing, operating, using, and/or maintaining the equipment, read this document, strictly follow the instructions provided herein, and follow all the safety instructions on the equipment and in this document. In this document, "equipment" refers to the products, software, components, spare parts, and/or services related to this document; "the Company" refers to the manufacturer (producer), seller, and/or service provider of the equipment; "you" refers to the entity that transports, stores, installs, operates, uses, and/or maintains the equipment.

The **Danger, Warning, Caution, and Notice** statements described in this document do not cover all the safety precautions. You also need to comply with relevant international, national, or regional standards and industry practices. **The Company shall not be liable for any consequences that may arise due to violations of safety requirements or safety standards concerning the design, production, and usage of the equipment.**

The equipment shall be used in an environment that meets the design specifications. Otherwise, the equipment may be faulty, malfunctioning, or damaged, which is not covered under the warranty. The Company shall not be liable for any property loss, personal injury, or even death caused thereby.

Comply with applicable laws, regulations, standards, and specifications during transportation, storage, installation, operation, use, and maintenance.

Do not perform reverse engineering, decompilation, disassembly, adaptation, implantation, or other derivative operations on the equipment software. Do not study the internal implementation logic of the equipment, obtain the source code of the equipment software, violate intellectual property rights, or disclose any of the performance test results of the equipment software.

The Company shall not be liable for any of the following circumstances or their consequences:

- Equipment damage due to force majeure such as earthquakes, floods, volcanic eruptions, debris flows, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, and extreme weather conditions
- Operation beyond the conditions specified in this document

- Installation or use in environments that do not comply with international, national, or regional standards
- Installation or use by unqualified personnel
- Failure to follow the operation instructions and safety precautions on the product and in the document
- Unauthorized modifications to the product or software code or removal of the product
- Damage caused during transportation by you or a third party authorized by you
- Storage conditions that do not meet the requirements specified in the product document
- Failure to comply with local laws, regulations, or related standards due to the materials and tools prepared by you
- Damage caused by your or a third party's negligence, intentional breach, gross negligence, or improper operations or damage not caused by the Company

1.1 Personal Safety

DANGER

Do not work with power on during installation. Do not install or remove a cable with power on. Transient contact between the core of the cable and the conductor will generate electric arcs or sparks, which may cause a fire or personal injury.

DANGER

Non-standard and improper operations on the energized equipment may cause fire or electric shocks, resulting in property damage, personal injury, or even death.

DANGER

Before operations, remove conductive objects such as watches, bracelets, bangles, rings, and necklaces to prevent electric shocks.

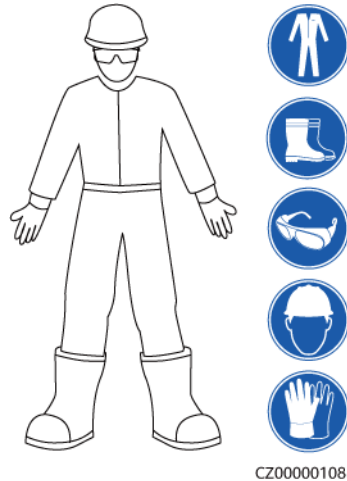
DANGER

During operations, use dedicated insulated tools to prevent electric shocks or short circuits. The insulation and voltage resistance must comply with local laws, regulations, standards, and specifications.

WARNING

During operations, wear personal protective equipment such as protective clothing, insulated shoes, goggles, safety helmets, and insulated gloves.

Figure 1-1 Personal protective equipment



General Requirements

- Do not stop protective devices. Pay attention to the warnings, cautions, and related precautionary measures in this document and on the equipment.
- If there is a likelihood of personal injury or equipment damage during operations, immediately stop, report the case to the supervisor, and take feasible protective measures.
- Do not power on the equipment before it is installed or confirmed by professionals.
- Do not touch the power supply equipment directly or with conductors such as damp objects. Before touching any conductor surface or terminal, measure the voltage at the contact point to ensure that there is no risk of electric shock.
- Do not touch a running fan with your hands, components, screws, tools, or boards. Otherwise, personal injury or equipment damage may occur.
- In the case of a fire, immediately leave the building or the equipment area and activate the fire alarm or call emergency services. Do not enter the affected building or equipment area under any circumstances.

Personnel Requirements

- Only professionals and trained personnel are allowed to operate the equipment.
 - Professionals: personnel who are familiar with the working principles and structure of the equipment, 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 trained in technology and safety, 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

- Personnel who plan to install or maintain the equipment must receive adequate training, be able to correctly perform all operations, and understand all necessary safety precautions and local relevant standards.
- 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 perform special tasks such as electrical operations, working at heights, and operations of special equipment must possess the required local qualifications.
- Only authorized professionals are allowed to replace the equipment or components (including software).
- Only personnel who need to work on the equipment are allowed to access the equipment.

1.2 Equipment Safety

1.2.1 UPS Safety

General Requirements

NOTICE

This is a category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

- 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, 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.
- The UPS operating environment must meet the requirements for the climate indicator, mechanically active substance indicator, and chemically active substance indicator specified by ETSI EN 300 019-1 class 3.6.
- The UPS shall not be located in non-confined environments within 0–3.7 km away from the ocean or indoor or semi-indoor environments where the temperature and humidity are not controllable, such as shelters, civil houses, garages, corridors, and direct ventilation cabinets near the ocean; or houses with only roofs, railway station platforms, gymnasiums, and aquariums.

- It is recommended that the UPS be powered on as soon as possible after it is unpacked.
- The UPS can be used to serve resistive-capacitive loads, resistive loads, and micro-inductive loads. It is recommended that the UPS not be used for pure capacitive loads, pure inductive loads, or half-wave rectification loads. The UPS does not apply to regeneration loads.
- 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, attach 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.
- The upstream power distribution of the UPS must meet the requirements of protection against electric shock specified in IEC 60364-4-41.
- For the equipment that uses a three-pin socket, ensure that the ground terminal in the socket is connected to the protective ground point.
- A circuit breaker equipped with a residual current device (RCD) is not recommended.
- If the root mean square (RMS) of a phase voltage of the utility power exceeds 320 V AC, the UPS may be damaged.
- To ensure power supply to loads during UPS upgrade, set the output to maintenance bypass mode. To avoid power failure or load damage, ensure that the bypass input is within the specified power supply range.
- Exercise caution when manually shutting down the UPS inverter for transferring to bypass mode, or when adjusting the UPS output voltage level or output frequency. Doing so may affect the power supply to equipment.

1.2.2 Battery Safety

DANGER

Do not connect the positive and negative poles of a battery or battery string together. Otherwise, the battery may be short-circuited. Battery short circuits can generate high instantaneous current and releases a large amount of energy, which may cause battery leakage, smoke, flammable gas release, thermal runaway, fire, or explosion. To avoid battery short circuits, do not maintain batteries with power on.

DANGER

Do not expose batteries at high temperatures or around heat sources, such as scorching sunlight, fire sources, transformers, and heaters. Battery overheating may cause leakage, smoke, flammable gas release, thermal runaway, fire, or explosion.

 DANGER

Protect batteries from mechanical vibration, falling, collision, punctures, and strong impact. Otherwise, the batteries may be damaged or catch fire.

 DANGER

To avoid leakage, smoke, flammable gas release, thermal runaway, fire, or explosion, do not disassemble, alter, or damage batteries, for example, insert foreign matter into batteries, squeeze batteries, or immerse batteries in water or other liquids.

 DANGER

There is a risk of fire or explosion if the model of the battery in use or used for replacement is incorrect. Use a battery of the model recommended by the vendor.

 DANGER

Battery electrolyte is toxic and volatile. Do not get contact with leaked liquids or gases in the case of battery leakage or emission of abnormal odor. In such cases, stay away from the battery and contact professionals immediately. Professionals shall wear safety goggles, rubber gloves, gas masks, and protective clothing, power off the equipment, remove the battery, and contact technical engineers.

 DANGER

The gases generated by a burning battery may irritate your eyes, skin, and throat. Take protective measures.

 WARNING

Install batteries in a dry area. Do not install them below areas prone to water leakage, such as air conditioner vents, ventilation vents, feeder windows of the equipment room, or water pipes. Ensure that no liquid enters the equipment to prevent faults or short circuits.

 WARNING

Before installing and commissioning batteries, prepare fire fighting facilities, such as fire sand and carbon dioxide fire extinguishers, according to construction standards and regulations. Before putting the battery room into operation, ensure that it is equipped with a fire extinguishing system that complies with local laws and regulations, has been constructed and commissioned, and can work in automatic or manual control mode.

 WARNING

Before unpacking, storage, and transportation, ensure that the packing cases are intact and correctly placed according to the labels on the packing cases. Do not place a battery upside down or vertically, lay it on one side, or tilt it. Stack the batteries according to the stacking requirements on the packing cases. Ensure that the batteries do not fall or get damaged. Otherwise, they will need to be scrapped.

 WARNING

After unpacking batteries, place them in the required direction. Do not place a battery with its front panel facing upwards, put it upside down, tilt it, or stack it. Ensure that the batteries do not fall or get damaged. Otherwise, they will need to be scrapped.

 WARNING

Tighten the screws on copper bars or cables to the torque specified in this document. Periodically confirm whether the screws are tightened, check for rust, corrosion, or other foreign objects, and clean them up if any. Loose screw connections will result in excessive voltage drops and batteries may catch fire when the current is high.

 WARNING

After batteries are discharged, charge them in time to avoid damage due to overdischarge.

 WARNING

If the electrolyte leaks, absorb and neutralize the electrolyte immediately. Exercise caution when moving or handling a lead-acid battery with electrolyte leakage to avoid electrolyte hazards.

 WARNING

Lead-acid batteries in use emit flammable gas. Ensure that batteries are installed in a well-ventilated area and fireproof measures are taken.

 WARNING

Do not use unsealed lead-acid batteries.

Statement

The Company shall not be liable for any battery damage, personal injury, death, property loss, and/or other consequences caused by the following reasons:

- Force majeure such as earthquakes, floods, volcanic eruptions, debris flows, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, and other extreme weather conditions
- The battery warranty period has expired.
- Actions that do not follow instructions in the user manual or direct advice from the Company, including but not limited to the following scenarios:
 - The onsite equipment operating environment or external power parameters do not meet the environment requirements for normal operation, for example, the actual operating temperature of batteries is too high or too low, or the power grid is unstable and experiences outages frequently.
 - Batteries are dropped or incorrectly operated or connected.
 - Batteries are overdischarged due to delayed acceptance or power-on after battery installation.
 - Battery running parameters are incorrectly set.
 - Different types of batteries, for example, batteries of different brands or rated capacities, are used together without prior approval from the Company.
 - Batteries are frequently overdischarged due to improper battery maintenance.
 - Battery use scenarios are changed without prior approval from the Company.
 - Battery maintenance is not performed according to the instructions in the user manual, for example, failing to check battery terminals regularly.
 - Batteries are not transported, stored, or charged according to the instructions in the user manual.
 - Instructions from the Company are not followed during battery relocation or reinstallation.

General Requirements

NOTICE

This is a category C2 battery product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

NOTICE

To ensure battery safety and battery management accuracy, use batteries provided by the Company. The Company is not responsible for any faults of batteries provided by other vendors.

- Before installing, operating, and maintaining batteries, read the battery vendor's instructions and comply with their requirements. The safety precautions specified in this document are highly important and require special attention. For additional safety precautions, see the instructions provided by the battery vendors.
- Use batteries within the specified temperature range. When the ambient temperature of the batteries is lower than the allowed range, do not charge the batteries to prevent internal short circuits caused during low-temperature charging.
- Do not reversely connect the positive and negative battery terminals. Otherwise, a battery alarm will be generated and batteries may be damaged.
- Before unpacking batteries, check whether the packaging is intact. Do not use batteries with damaged packaging. If any damage is found, notify the carrier and manufacturer immediately.
- In an indoor scenario, you are advised to power on a battery within seven days after unpacking. If the battery cannot be powered on in time, put it in the original packing case and place it in a dry indoor environment without corrosive gas.
- Do not use a damaged battery (such as damage caused when a battery is dropped, bumped, bulged, or dented on the enclosure), because the damage may cause electrolyte leakage or flammable gas release. In the case of electrolyte leakage or structural deformation, contact the installer or professional O&M personnel immediately to remove or replace the battery. Do not store the damaged battery near other devices or flammable materials and keep it away from non-professionals.
- Before working on a battery, ensure that there is no irritating or burning smell around the battery.
- When installing batteries, do not place installation tools, metal parts, or sundries on the batteries. After the installation is complete, clean up the objects on the batteries and the surrounding area.
- If a battery is accidentally exposed to water, do not install it. Move it to a safe place for isolation and contact technical engineers in a timely manner.
- Check whether the positive and negative battery terminals are grounded unexpectedly. If so, disconnect the battery terminals from the ground.

- Do not perform welding or grinding work around batteries to prevent fire caused by electric sparks or arcs.
- If batteries will not be used for a long period of time, store and charge them according to the battery requirements.
- Do not charge or discharge batteries by using a device that does not comply with local laws and regulations.
- Keep the battery loop disconnected during installation and maintenance.
- Monitor damaged batteries during storage for signs of smoke, flame, electrolyte leakage, or heat.
- If a battery is faulty, its surface temperature may be high. Do not touch the battery to avoid scalds.

Short-Circuit Protection

- When installing and maintaining batteries, wrap the exposed cable terminals on the batteries with insulation tape.
- Avoid foreign objects (such as conductive objects, screws, and liquids) from entering a battery, as this may cause short circuits.

Leakage Handling

NOTICE

Electrolyte overflow may damage the equipment. It will corrode metal parts and boards, and ultimately damage the boards.

Electrolyte is corrosive and can cause irritation and chemical burns. If you come into direct contact with the battery electrolyte, do as follows:

- Inhalation: Evacuate from contaminated areas, get fresh air immediately, and seek immediate medical attention.
- Eye contact: Immediately wash your eyes with water for at least 15 minutes, do not rub your eyes, and seek immediate medical attention.
- Skin contact: Wash the affected areas immediately with soap and water and seek immediate medical attention.
- Intake: Seek immediate medical attention.

Special requirements for lead-acid batteries:

NOTICE

When the battery temperature exceeds 60°C, check whether the electrolyte leaks. If the electrolyte leaks, take proper measures promptly.

NOTICE

If the electrolyte leaks, follow the instructions of the battery manufacturer or use sodium bicarbonate (NaHCO_3) or sodium carbonate (Na_2CO_3) to neutralize the electrolyte.

Recycling

- Dispose of waste batteries in accordance with local laws and regulations. Do not dispose of batteries as household waste. Improper disposal of batteries may result in environmental pollution or an explosion.
- If a battery leaks or is damaged, contact technical support or a battery recycling company for disposal.
- If batteries are out of service life, contact a battery recycling company for disposal.
- Do not expose waste batteries to high temperatures or direct sunlight.
- Do not place waste batteries in environments with high humidity or corrosive substances.
- Do not use faulty batteries. Contact a battery recycling company to scrap them as soon as possible to avoid environmental pollution.

1.3 Electrical Safety

DANGER

Before connecting cables, ensure that the equipment is intact. Otherwise, electric shocks or fires may occur.

DANGER

Non-standard and improper operations may result in fire or electric shocks.

DANGER

Prevent foreign matter from entering the equipment during operations. Otherwise, equipment short-circuits or damage, load power derating, power failure, or personal injury may occur.

WARNING

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.

 CAUTION

Do not route cables near the air intake or exhaust vents of the equipment.

 CAUTION

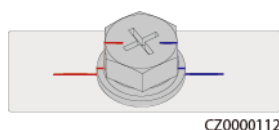
Do not directly connect aluminum cables to prevent electrochemical corrosion of copper and aluminum.

 CAUTION

Stay away from the equipment when preparing cables to prevent cable scraps from entering the equipment. Cable scraps may cause sparks and result in personal injury and equipment damage.

General Requirements

- Follow the procedures described in the document for installation, operation, and maintenance. Do not reconstruct or alter the equipment, add components, or change the installation sequence without permission.
- Install temporary fences or warning ropes and hang "No Entry" signs around the operation area to keep unauthorized personnel away from the area.
- Before installing or removing power cables, turn off the switches of the equipment and its upstream and downstream switches.
- If any liquid is detected inside the equipment, disconnect the power supply immediately and do not use the equipment.
- Before performing operations on the equipment, check that all tools meet the requirements and record the tools. After the operations are complete, collect all of the tools to prevent them from being left inside the equipment.
- Before installing power cables, check that cable labels are correct and cable terminals are insulated.
- When installing the equipment, use a torque tool of a proper measurement range to tighten the screws. When using a wrench to tighten the screws, ensure that the wrench does not tilt and the torque error does not exceed 10% of the specified value.
- Ensure that bolts are tightened with a torque tool and marked in red and blue after double-check. Installation personnel mark tightened bolts in blue. Quality inspection personnel confirm that the bolts are tightened and then mark them in red. (The marks must cross the edges of the bolts.)



- After the installation is complete, ensure that protective cases, insulation tubes, and other necessary items for all electrical components are in position to avoid electric shocks.

- If the equipment has multiple inputs, disconnect all the inputs before operating the equipment.
- Before maintaining a downstream electrical or power distribution device, turn off the output switch on the power supply equipment.
- During equipment maintenance, attach "Do not switch on" labels near the upstream and downstream switches or circuit breakers as well as warning signs to prevent accidental connection. The equipment can be powered on only after troubleshooting is complete.
- If fault diagnosis and troubleshooting need to be performed after power-off, take the following safety measures: Disconnect the power supply. Check whether the equipment is live. Install a ground cable. Hang warning signs and set up fences.
- Check equipment connections periodically, ensuring that all screws are securely tightened.
- Only qualified professionals can replace a damaged cable.
- Do not scrawl, damage, or block any labels or nameplates on the equipment. Promptly replace labels that have worn out.
- Do not use solvents such as water, alcohol, or oil to clean electrical components inside or outside of the equipment.
- Wear personal protective equipment and use dedicated insulated tools to avoid electric shocks or short circuits.
- Do not use wet cloth to clean exposed copper bars or other conductive parts.

Grounding

- Ensure that the grounding impedance of the equipment complies with local electrical standards.
- Ensure that the equipment is connected permanently to the protective ground. Before operating the equipment, check its electrical connection to ensure that it is reliably grounded.
- Ensure that the protective ground point of the equipment is reliably connected to the ground screw of the metal enclosure (connection resistance: ≤ 0.1 ohms).
- Ensure that the ground resistance of the system for lightning protection is less than or equal to 10 ohms.
- Do not operate the equipment in the absence of a properly installed ground conductor.
- Do not damage the ground conductor.
- If high touch current may occur on the equipment, ground the protective ground terminal on the equipment enclosure before connecting the power supply; otherwise, electric shock as a result of touch current may occur.

Cabling

- When selecting, installing, and routing cables, follow local safety regulations and rules.
- The flame spread rating of cables shall meet the UL 1581 VW-1 or IEC 60332-3-22 (ZB) or higher requirements.

- When routing power cables, ensure that there is no coiling or twisting. Do not join or weld power cables. If necessary, use a longer cable.
- Ensure that all cables are properly connected and insulated, and meet specifications.
- Ensure that the slots and holes for routing cables are free from sharp edges, and that the positions where cables are routed through pipes or cable holes are equipped with cushion materials to prevent the cables from being damaged by sharp edges or burrs.
- If a 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.
- Ensure that cables of the same type are bound together neatly and straight and that the cable sheath is intact. When routing cables of different types, ensure that they are at least 30 mm away from each other.
- If the external conditions (such as the cable layout or ambient temperature) change, verify the cable usage in accordance with the IEC-60364-5-52 or local laws and regulations. For example, check that the current-carrying capacity meets requirements.
- When routing cables, reserve at least 30 mm clearance between the cables and heat-generating components or areas. This prevents deterioration or damage to the cable insulation layer.
- 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 below 0°C must be stored at room temperature for more than 24 hours before they are laid out.
- Do not perform any improper operations, for example, dropping cables directly from a vehicle. Otherwise, the cable performance may deteriorate due to cable damage, which affects the current-carrying capacity and temperature rise.

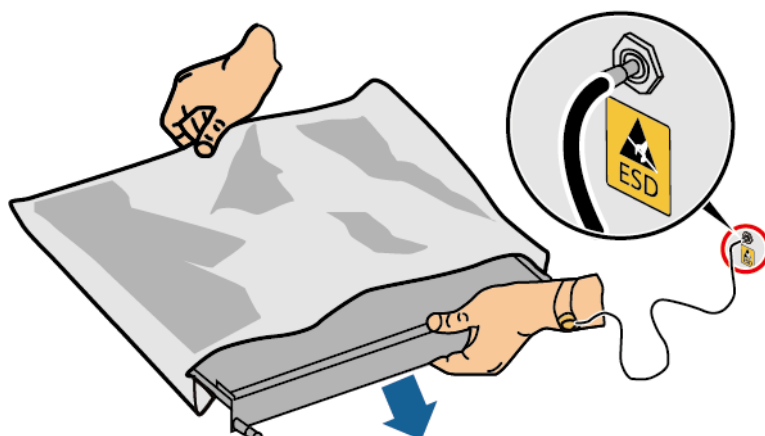
ESD

NOTICE

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

- When touching the equipment and handling boards, modules with exposed circuit boards, or application-specific integrated circuits (ASICs), observe ESD protection regulations and wear ESD clothing and ESD gloves or a well-grounded ESD wrist strap.

Figure 1-2 Wearing an ESD wrist strap



DC15000001

- When holding a board or a module with exposed circuit boards, hold its edge without touching any components. Do not touch the components with bare hands.
- Package boards or modules with ESD packaging materials before storing or transporting them.

1.4 Environmental Requirements

DANGER

Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.

DANGER

Do not store any flammable or explosive materials in the equipment area.

DANGER

Do not place the equipment near heat sources or fire sources, such as smoke, candles, heaters, or other heating devices. Overheat may damage the equipment or cause a fire.

WARNING

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.



WARNING

To prevent damage or fire due to high temperature, ensure that the ventilation vents or heat dissipation systems are not obstructed or covered by other objects while the equipment is running.

General Requirements

- Ensure that the equipment is stored in a clean, dry, and well ventilated area with proper temperature and humidity and is protected from dust and condensation.
- Keep the installation and operating environments of the equipment within the allowed ranges. Otherwise, its performance and safety will be compromised.
- 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, performing outdoor installation, and opening doors) in harsh weather conditions such as lightning, rain, snow, and level 6 or stronger wind.
- Do not install the equipment in an environment with direct sunlight, dust, smoke, volatile or corrosive gases, infrared and other radiations, organic solvents, or salty air.
- Do not install the equipment in an environment with conductive metal or magnetic dust.
- Do not install the equipment in an area conducive to the growth of microorganisms such as fungus or mildew.
- Do not install the equipment in an area with strong vibration, noise, or electromagnetic interference.
- Ensure that the site complies with local laws, regulations, and related standards.
- Ensure that the ground in the installation environment is solid, free from spongy or soft soil, and not prone to subsidence. The site must not be located in a low-lying land prone to water or snow accumulation, and the horizontal level of the site must be above the highest water level of that area in history.
- Before opening doors during the installation, operation, and maintenance of the equipment, clean up any water, ice, snow, or other foreign objects on the top of the equipment to prevent foreign objects from falling into the equipment.
- When installing the equipment, ensure that the installation surface is solid enough to bear the weight of the equipment.
- Ensure that the equipment room provides good heat insulation, and that the walls and floor are dampproof.
- Install protective devices at the door of the equipment room to prevent rodents and insects from entering the room.
- After installing the equipment, remove idle packing materials such as cartons, foam, plastics, and cable ties from the equipment area.
- Do not perform construction that will adversely affect the operating environment of the equipment during equipment operation, such as

construction that generates dust, scraps, water mist, strong vibration, and corrosive materials. If such construction cannot be avoided, power off the equipment and take protective measures before the construction. Power on the equipment after the construction is complete and the construction site is cleaned up.

1.5 Mechanical Safety

WARNING

Ensure that all necessary tools are ready and inspected by a professional organization. Do not use tools that have signs of scratches or fail to pass the inspection or whose inspection validity period has expired. Ensure that the tools are secure and not overloaded.

WARNING

Before installing equipment in a cabinet, ensure that the cabinet is securely fastened with a balanced center of gravity. Otherwise, tipping or falling cabinets may cause bodily injury and equipment damage.

WARNING

When pulling equipment out of a cabinet, be aware of unstable or heavy objects in the cabinet to prevent injury.

WARNING

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

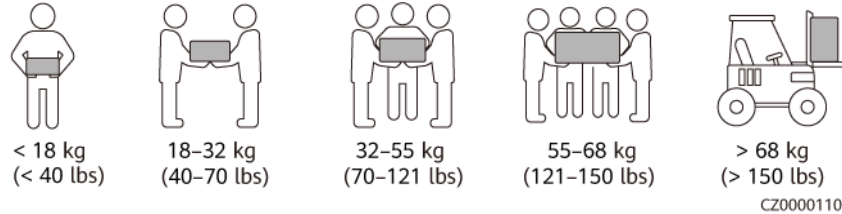
General Requirements

- Repaint any paint scratches caused during equipment transportation or installation in a timely manner. Equipment with scratches cannot be exposed for an extended period of time.
- Do not perform operations such as arc welding and cutting on the equipment without evaluation by the Company.
- Do not install other devices on the top of the equipment without evaluation by the Company.
- When performing operations above the equipment, take measures to protect the equipment against damage.

- Use correct tools and operate them in the correct way.

Moving Heavy Objects

- Be cautious to prevent injury when moving heavy objects.



- If multiple persons need to move a heavy object together, determine the manpower and work division with consideration of height and other conditions to ensure that the weight is evenly distributed.
- If two persons or more move a heavy object together, ensure that the object is lifted and landed simultaneously and moved at a uniform pace under the supervision of one person.
- Wear personal protective gears such as protective gloves and shoes when manually moving the equipment.
- To move an object by hand, approach the object, squat down, and then lift the object slowly and stably by the force of the legs instead of your back. Do not lift it suddenly or turn or twist your body.
- Move or lift the equipment by holding its handles or lower edges. Do not hold the handles of modules that are installed in the equipment.
- Slowly lift a heavy object above your waist. Place the object on a workbench that is half-waist high or any other appropriate place, adjust the positions of your palms, and then lift it.
- Move a heavy object stably with balanced force at an even and low speed. Put down the object stably and slowly to prevent any collision or drop that may cause scratches on the surface of the equipment or damage to the components and cables.
- When moving a heavy object, be aware of the workbench, slope, staircase, and slippery places. When moving a heavy object through a door, ensure that the door is wide enough to move the object and avoid bumping or injury.
- When transferring a heavy object, move your feet instead of twisting your waist. When lifting and transferring a heavy object, ensure that your feet point to the target direction of movement.
- When transporting the equipment using a forklift truck, ensure that the forks are properly positioned so 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 sea or roads in good conditions for transportation. Do not transport batteries by railway or air. Avoid tilt or jolt during transportation.

2 Product Overview

2.1 Model Description

This document describes the following UPS models.

Model	Represented By
UPS2000-G-6KRTS	6 kVA
UPS2000-G-6KRTL	
UPS2000-G-10KRTS	10 kVA
UPS2000-G-10KRTL	
UPS2000-G-15KRTL	15 kVA
UPS2000-G-20KRTL	20 kVA
UPS2000-G-15KRTL-01	15 kVA
UPS2000-G-20KRTL-01	20 kVA

Figure 2-1 UPS model number

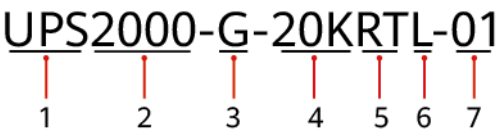


Table 2-1 Model number details

No.	Meaning	Description
1	Product category	UPS: uninterruptible power system
2	Product family	2000: Power ≤ 20 kVA

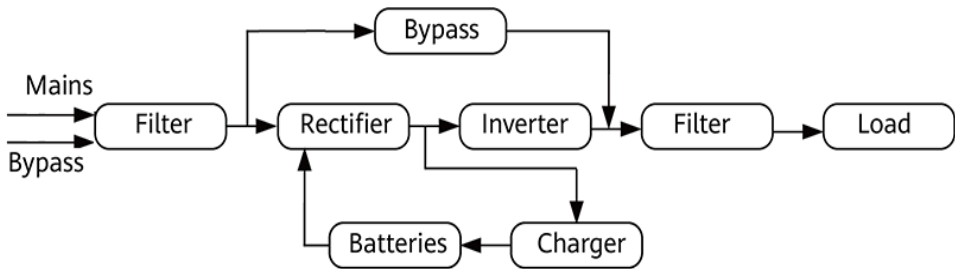
No.	Meaning	Description
3	Product subcategory	G: series name
4	Output capacity	• 6K: 6 kVA • 10K: 10 kVA • 15K: 15 kVA • 20K: 20 kVA
5	UPS type	• RT: rack-mounted or tower-mounted UPS • RR: rack-mounted UPS • TT: tower-mounted UPS • TM: tower-mounted modular UPS • RM: rack-mounted modular UPS
6	Built-in battery pack (optional)	• S: standard model, providing only a standard battery pack • L: long backup time model, using external large-capacity battery packs that provide long backup time
7	Model identifier	01

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. 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.

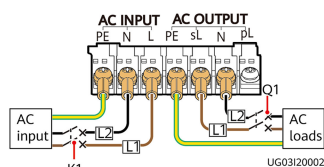
 NOTE

- The 15 kVA/20 kVA UPS supports battery ECO mode in the case of two power sources. 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.

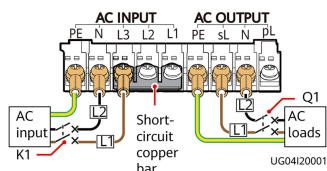
2.3 Appearance

NOTICE

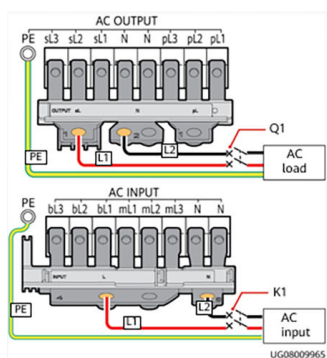
- For UPS2000-G-6 kVA and UPS2000-G-10 kVA, if the UPS input uses dual live wires (208 V/220 V system), all L and N wires change to L1 and L2 wires.



- If the AC input of the UPS2000-G-10 kVA uses dual 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.

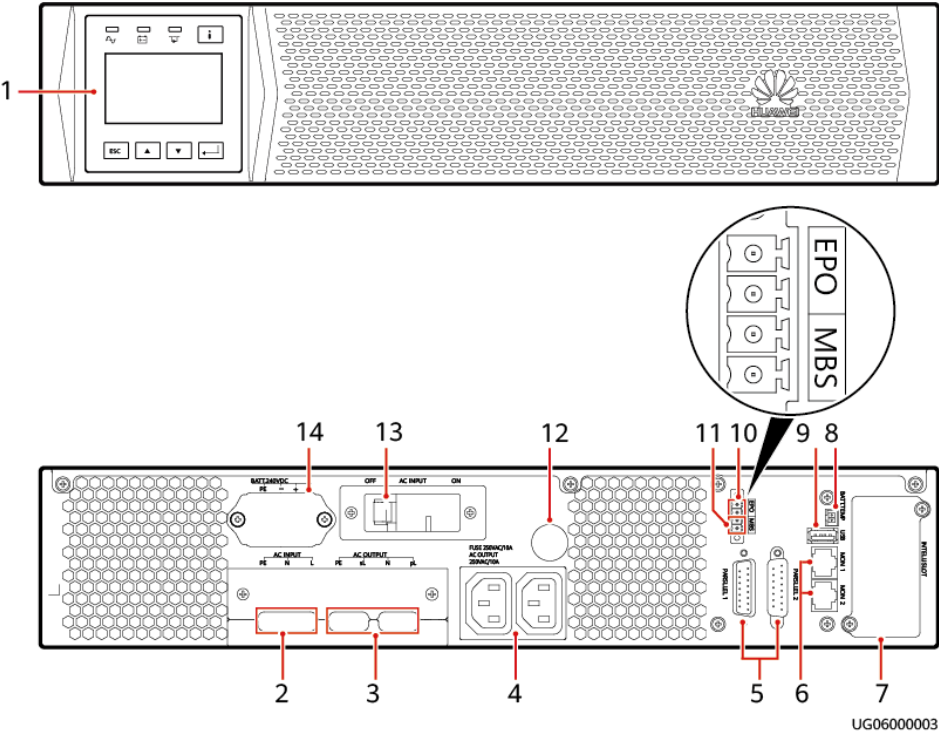


- If the AC input of the UPS2000-G-15 kVA/20 kVA uses dual live wires, connect bypass and mains input bL1, bL2, bL3, mL1, mL2, and mL3 that are short-circuited with a short-circuit busbar to live wire L1, and connect the input N and N with a short-circuit busbar to live wire L2.



- In addition, if the AC input and AC output use dual live wires, the input and output ends must connect to two-pole circuit breakers provided by the user.

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

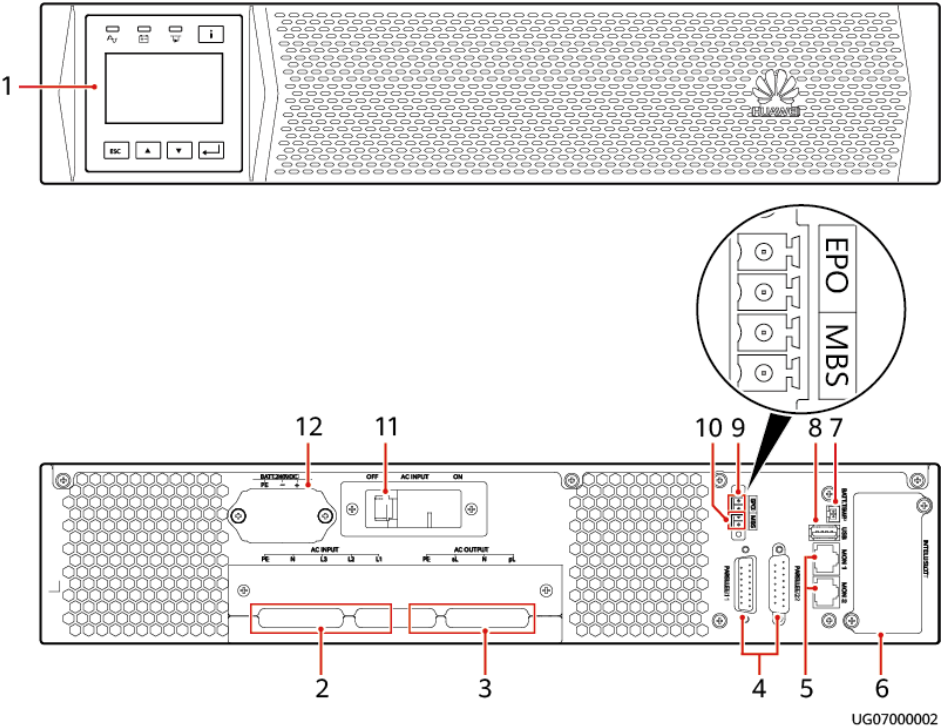


- | | | | |
|--|---|------------------------------------|-------------------------------------|
| (1) Control panel | (2) AC input port | (3) AC output ports (pL and sL) | (4) Output sockets |
| (5) Parallel ports | (6) Control area network (CAN) communications ports (MON1 and MON2) | (7) Optional card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

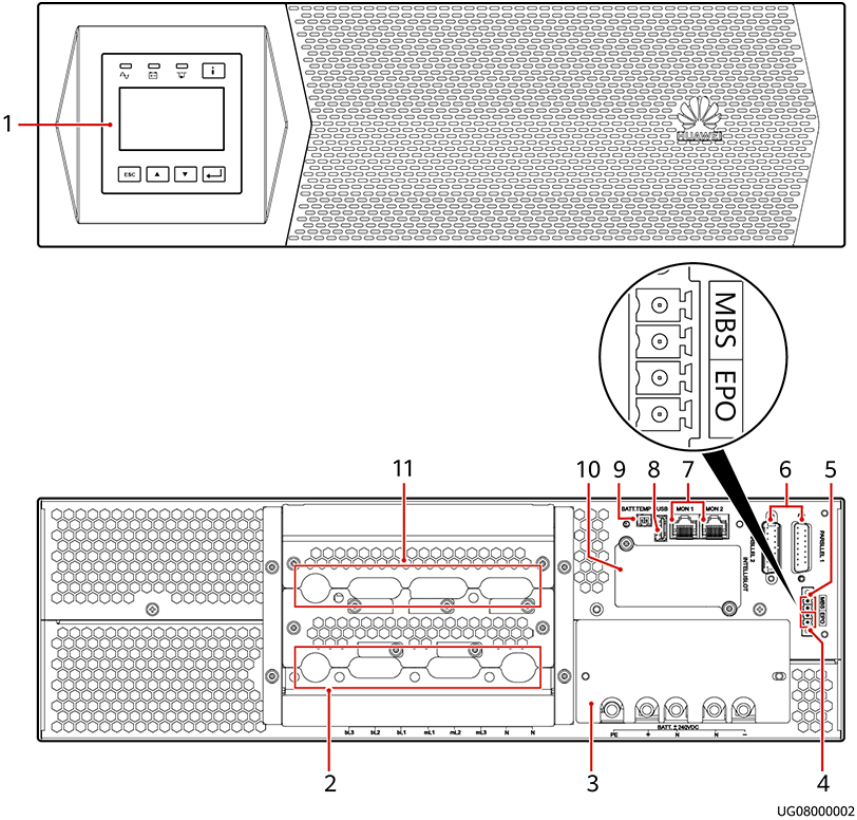
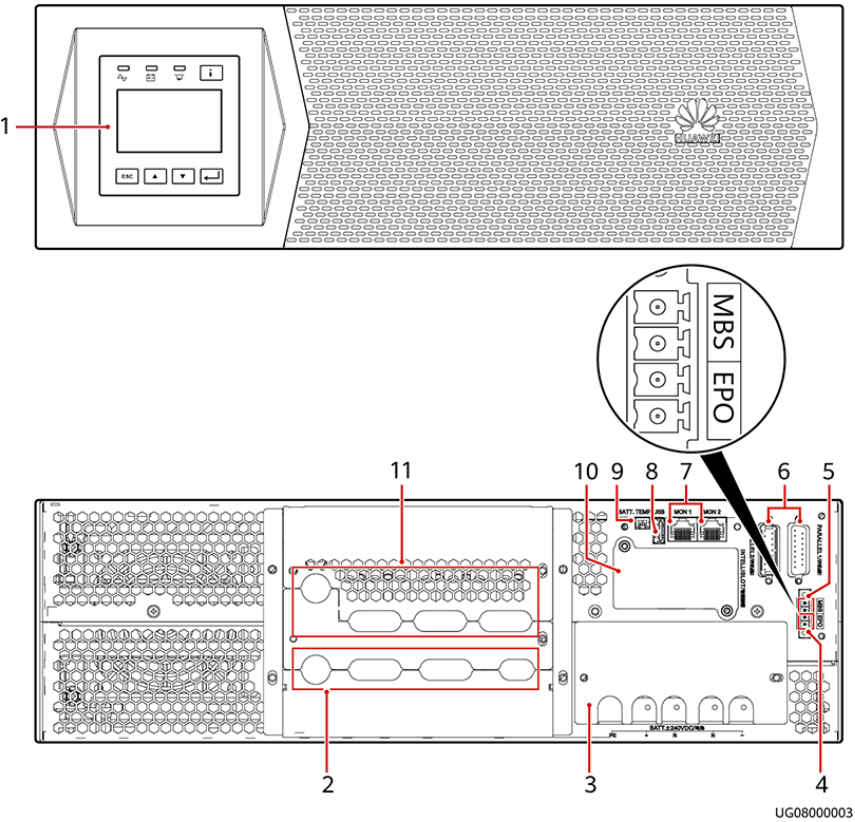


Figure 2-6 Front and rear views of the UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01



- | | | | |
|-------------------------------------|---------------------------------------|--|--|
| (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 (protected by a security mechanism) |
| (9) Battery temperature sensor port | (10) Optional card slot | (11) AC output ports (pL and sL) | |

NOTE

It is recommended that the length of the cable connected to the MBS port be less than or equal to 10 m.

2.4 Optional Components

NOTICE

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

Table 2-2 Optional components for the UPS2000

Optional Component	Model	Function	Remarks
Parallel cable	DB15M, CC8P0.48B(S), DB15F	Connect UPSs in parallel.	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°C to +80°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	-	Measures the ambient temperature (0–50°C) and humidity (0%–100% RH).	Used together with an SNMP card.
Simple Network Management Protocol (SNMP) card	RMS-SNMP01A	Monitors the UPS, provides the Ethernet networking solution, and enables ambient temperature and humidity detection.	- The UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL supports the SNMP cards with the BOM numbers 02350KCR and 02354GJL. - The UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01 supports the SNMP card with the BOM number 02354GJL.

Optional Component	Model	Function	Remarks
6 kVA output isolation transformer box	DGL-6/0.22	An output isolation transformer box provides an entire isolation solution for customer loads, which is different from the output transformer of transformer-based UPSs. 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.	The output isolation 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-240V12-7AhBPVBA01 ESS-240V12-7AhBPVBA02 ESS-240V12-7AhBPVBA04	Each battery pack consists of twenty 12 V, 7 Ah lead-acid 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.	- A 15 kVA/20 kVA UPS can use at least two battery packs. - If 15 kVA/20 kVA UPSs share batteries, different battery cables need to be configured. For details, see the <i>ESS-240V12-(9AhBPVBA04, 7AhBPVBA04) Battery Pack Quick Guide</i>.
Standard battery pack (9 Ah, 20 batteries)	ESS-240V12-9AhBPVBA01 ESS-240V12-9AhBPVBA02 ESS-240V12-9AhBPVBA04	Each battery pack consists of twenty 12 V, 9 Ah lead-acid 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.	

Optional Component	Model	Function	Remarks
Modbus card	RMS-MODBUS01A	Provides two cascaded RS485 ports to implement networking over the Modbus or YDN-23 protocol.	- The UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL supports the Modbus cards with the BOM numbers 02355639 and 02354GLU. - The UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01 supports the Modbus card with the BOM number 02354GLU.
Dry contact card	RMS-RELAY01A	Provides six dry contact outputs (normal mode, battery mode, bypass mode, low battery voltage, bypass backfeed, and UPS fault), as well as two dry contact control inputs (one is the shutdown signal input, and the other is reserved).	- The UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL supports the dry contact cards with BOM numbers 02355640 and 02354GJK. - The UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01 supports the dry contact card with the BOM number 02354GJK.

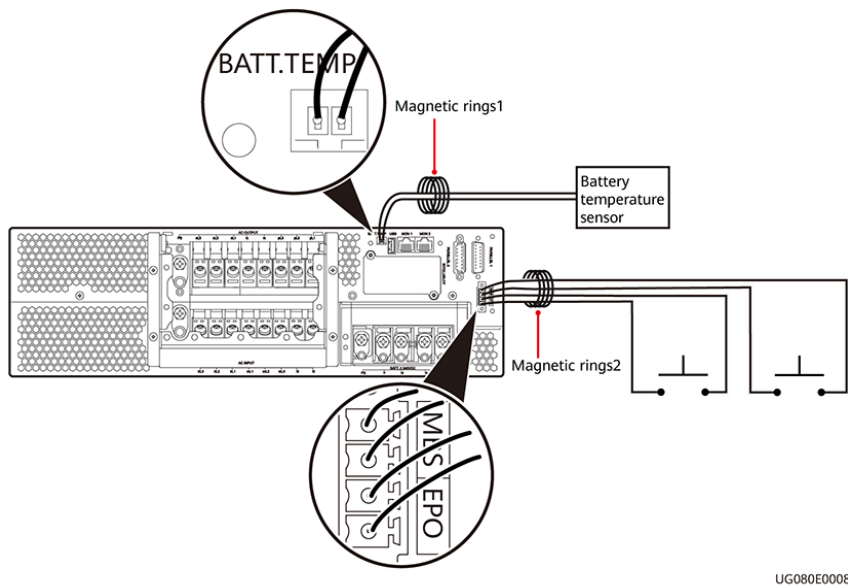
Optional Component	Model	Function	Remarks
Power distribution unit (PDU) (PDC-0038V4 ACIOA)	PDC-0038V4ACIOA	Controls and protects input and output power flow, increases output sockets, distributes input and output power of the 1+1 parallel system, and implements maintenance with power on.	The PDU can be used for a 1+1 parallel system of 15 kVA/20 kVA UPSs (three-phase input three-phase output).
PDU (PDC-0091V2 ACIOA)	PDC-0091V2ACIOA		- The PDU can be used for a 1+1 parallel system of 15 kVA/20 kVA UPSs (three-phase input single-phase output and single-phase input single-phase output). - It can be used for a 1+1 or 2+0 parallel system of 6 kVA/10 kVA UPSs.
PDU (PDC-0038V4 ACIOA-V2)	PDC-0038V4ACIOA-V2		The PDU works with the 6 kVA UPS (dual-live-wire input and dual-live-wire output) to provide the maintenance bypass and load expansion functions.

Optional Component	Model	Function	Remarks
Magnetic loop	DN85H, H38x22x15 (DMEGC) E2F, 38x22x15 (FENGYI)	Optimizes the performance of the TN-C power distribution system in a parallel system.	In a parallel system of 15 kVA/20 kVA UPSs using the TN-C power distribution system, install four magnetic rings at each PE cable 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.
- Check the upstream input power cable connection. If the PE wire and neutral wire are short-circuited, the system is a TN-C system. If the PE wire and neutral wire are connected separately, the system is a TN-S system.

Figure 2-7 Installing magnetic rings for the BATT.TEMP, MBS, and EPO ports



UG080E0008

 NOTE

If the 15 kVA/20 kVA UPS uses the BATT.TEMP, MBS, and EPO ports, ensure that the following operations are performed:

- The BATT.TEMP port is connected to a battery temperature sensor. The cable connected to the BATT.TEMP port is wrapped with magnetic ring 1 (at least five circles).
- The MBS and EPO ports are connected to circuit breakers. The cables connected to the MBS and EPO ports are wrapped with magnetic ring 2 (at least five circles).
- Model of magnetic rings 1 and 2: DN85H or E2F

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 2-8 Installing magnetic rings (numbered 1) on branch PE cables

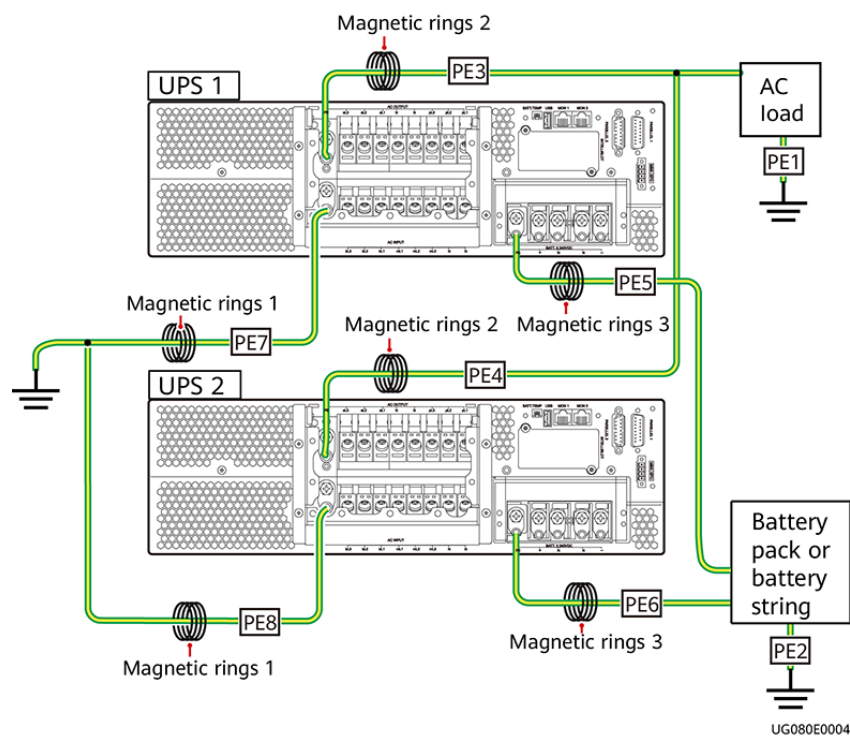
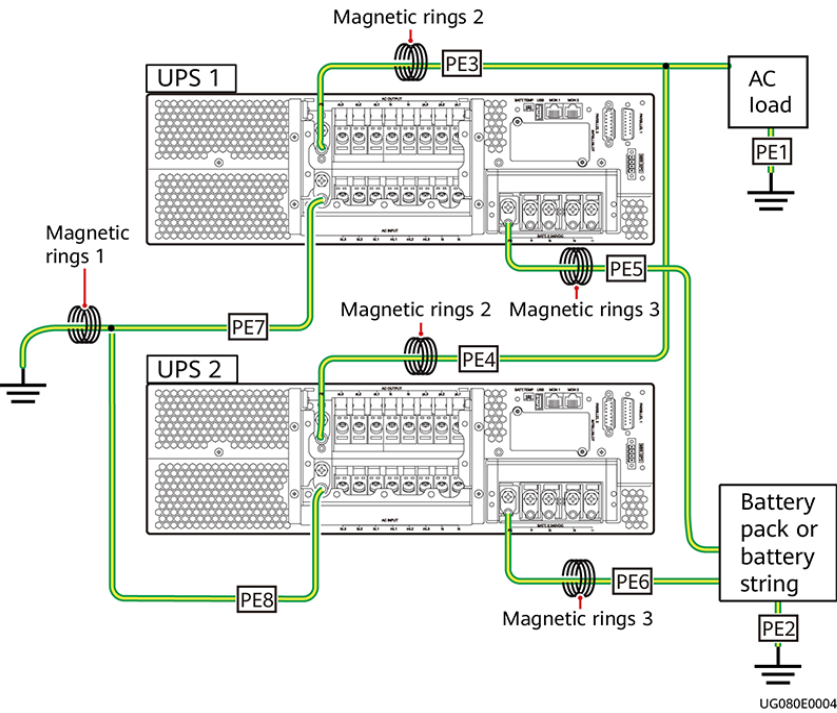


Figure 2-9 Installing a magnetic ring (numbered 1) on the general PE cable



NOTE

- Perform the following operations in a parallel system using the TN-C power distribution system:
- Short-circuit the input N and PE, and short-circuit the battery port N.
 - It is recommended that you connect AC loads and battery packs only to the UPS PE terminal.
 - 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 Technical Specifications

3.1 Physical Specifications

Table 3-1 Physical specifications (6 kVA/10 kVA)

Item	6 kVA	10 kVA
Dimensions (H x W x D)	430 mm x 86 mm x 615 mm	
Weight	14 kg	16 kg
IP rating	IP20	

Table 3-2 Physical specifications (15 kVA/20 kVA)

Item	15 kVA	20 kVA
Dimensions (H x W x D)	430 mm x 130 mm x 757 mm	
Weight	32 kg	
IP rating	IP20	

3.2 Environmental Specifications

Table 3-3 Environmental specifications

Item	6 kVA	10 kVA	15 kVA	20 kVA
Operating temperature	0–40°C			

Item	6 kVA	10 kVA	15 kVA	20 kVA
Humidity	0%–95% RH (non-condensing)			
Altitude	< 1000 m: not derated When the altitude ranges from 1000 m to 4000 m, the output power is derated by 1% for each additional 100 m.			
Storage and transportation temperatures	–40°C to +70°C			

 NOTE

- The ESS-240V12-7AhBPVBA01/ESS-240V12-7AhBPVBA02/ESS-240V12-9AhBPVBA01/ESS-240V12-9AhBPVBA02 battery packs can be stored and transported at a temperature ranging from –20°C to +40°C.
- The ESS-240V12-7AhBPVBA04/ESS-240V12-9AhBPVBA04 battery packs can be stored and transported at a temperature ranging from –15°C to +50°C.

3.3 Mains Input Electrical Specifications

NOTICE

- For 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 provided by the user.

Table 3-4 6 kVA/10 kVA mains input electrical specifications

Item	6 kVA	10 kVA
Input power cable	Single-phase (L/N) input + PE cable	• Single-phase (L/N) input + PE cable • Three-phase (L1/L2/L3/N) input + PE cable

Item	6 kVA	10 kVA
Rated input voltage	220 V AC/230 V AC/240 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 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%.) 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% resistive load)	> 0.99	> 0.99 (single-phase input) > 0.95 (three-phase input)
No-load loss	< 54 W	< 90 W
Double-power input	Disabled	Disabled
Startup voltage	120–280 V AC	
Diesel generator input capacity	Minimum 1.5 times the UPS rated capacity	
Overvoltage category	OVC II	

Table 3-5 15 kVA/20 kVA mains input electrical specifications

Item	15 kVA	20 kVA
Input power 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 (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)

Item	15 kVA	20 kVA
Input voltage	80–280 V AC, single-phase (When the voltage is 80–176 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%.)	80–280 V AC, single-phase (When the voltage is 80–176 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% resistive load)	> 0.99	
No-load loss	< 200 W	
Double-power input	Enabled	
Startup voltage	120–280 V AC	
Generator input capacity	Minimum 1.5 times the UPS rated capacity	
Oversvoltage category	OVC II	

3.4 Bypass Input Electrical Specifications

Table 3-6 Bypass input electrical specifications

Item	6 kVA	10 kVA	15 kVA	20 kVA
Bypass voltage	- Upper threshold: 10%, 15%, 20%, 25%, or 30% at 208 V AC - Upper threshold: 10%, 15%, 20%, or 25% at 220 V AC - Upper threshold: 10%, 15%, or 20% at 230 V AC - Upper threshold: 10% or 15% at 240 V AC - Lower threshold: 10%, 20%, 30%, 40%, 50%, or 60%			
Bypass frequency tolerance	Maximum ± 6 Hz (configurable on the LCD)			

Item	6 kVA	10 kVA	15 kVA	20 kVA
Bypass overload capability	- When the UPS works continuously at a load rate of less than 125%, the input switch may trip in advance. - When the load rate is within 125%–150%, the UPS disconnects the output after 1 minute, and the input switch may trip in advance. - When the load rate is greater than or equal to 150%, the UPS disconnects the output after 100 ms, and the input switch may trip in advance.			
Input mode	One power source		- One power source - Two power sources	

 NOTE

- The upper and lower thresholds are configurable on the LCD.
- For the 15 kVA and 20 kVA models, if the mains and bypass inputs use different power sources, ensure that the neutral wires of the mains and bypass input power sources are equipotential. For example, the mains and bypass inputs are from the same transformer.

3.5 Output Electrical Specifications

Table 3-7 Output electrical specifications

Item	6 kVA	10 kVA	15 kVA	20 kVA
Rated capacity	6 kVA	10 kVA	15 kVA	20 kVA
Output power factor (PF)	0.9			
Output short-circuit current	-	-	I _{peak} : 5 kA; I _{rms} : 3.5 kA (typical power supply duration: 4 ms)	
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	±1%			

Item	6 kVA	10 kVA	15 kVA	20 kVA
Total harmonic distortion of output voltage (THDv)	< 4% (non-linear load)			
	< 2% (resistive load)			
Crest factor	A maximum of 3:1			
Inverter overload capability	• 105% ≤ load < 125%: transfer to bypass mode after 5 minutes • 125% ≤ load < 150%: transfer to bypass mode after 1 minute • Load ≥ 150%: transfer to bypass mode after 100 milliseconds The UPS stops supplying power if the bypass is abnormal.			
Dynamic voltage tolerance	±5%			
Output voltage unbalance	-		• ±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 (supported only for a single UPS)	• If overloaded, the UPS disconnects the loads on pL and checks whether it is still overloaded. • In battery mode, when the battery voltage is less than the preset value, the UPS disconnects the loads on pL. • In battery mode, when the battery discharge time exceeds the preset value, the UPS disconnects the loads on pL.			

NOTE

In converter mode, the output load is derated to 60% of the rated capacity.

3.6 Battery Electrical Specifications

Table 3-8 Battery electrical specifications

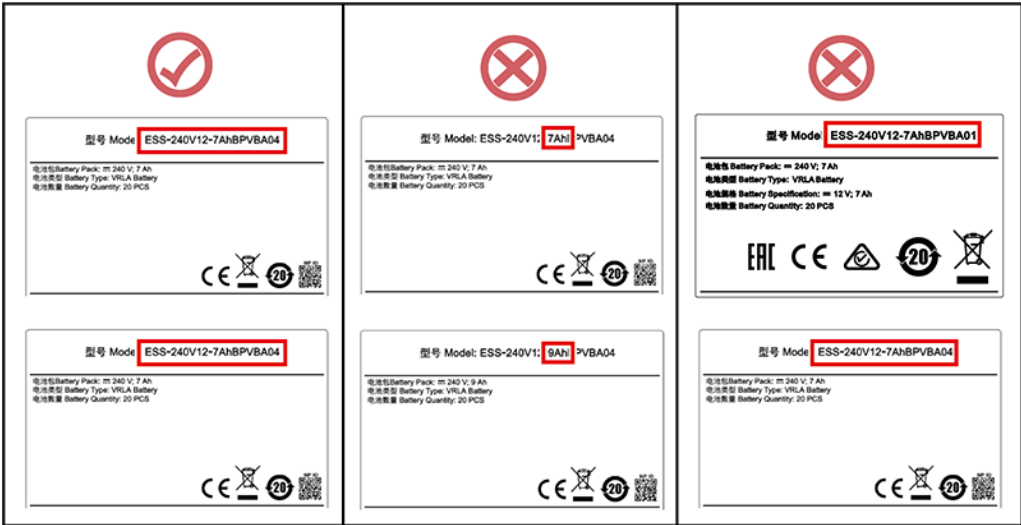
Item	6 kVA	10 kVA	15 kVA	20 kVA
Rated battery voltage	240 V DC		± 240 V DC	

Item	6 kVA	10 kVA	15 kVA	20 kVA
Number of batteries	16–20, each 12 V If the smaller value between the numbers of batteries, N , is less than 20, the battery power is derated to $N/20$.		16–20 batteries in each of positive and negative strings (The total number of batteries is 32–40.) The rated number of batteries in each string is 20. If the number of batteries is less than 20, the power is derated to $N/20$ (N is the smaller value between the numbers of batteries in positive and negative strings).	
Battery string sharing in a parallel system	Not supported	Not supported	Supported	Supported
Battery leakage current	$\leq 500 \mu\text{A}$			
Depth of discharge (DOD) protection	The discharge time is longer than 16 hours (can be set to 0–24 hours, 16 hours by default. If the time is set to 0 hours, battery discharge protection is not implemented).			
	The single-battery voltage drops below 10.8 V in normal mode.			
Standard-UPS battery type	12 V DC VRLA battery			
Standard-UPS battery capacity	7 Ah	9 Ah	-	-
Backup time	> 4 minutes, full rated load For details about the backup time curve of the battery pack, see Figure 3-1 , Figure 3-2 , Figure 3-3 , and Figure 3-4 .			
Parallel connection	Battery 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.			

Item	6 kVA	10 kVA	15 kVA	20 kVA
Charger rated charge current	2 A (tolerance ± 0.5) for standard models 4 A (tolerance ± 0.5) for long backup time models - When the ambient temperature is greater than or equal to 30°C and the load rate ranges from 85% to 100% (or higher), the maximum charge current is linearly derated in the range of 4 A to 1 A.		4 A ± 0.5 A	
Charger charge time	- Batteries are charged to more than 90% in 3 hours for UPS2000-G-6 kVA/10 kVA standard models. - It depends on battery capacity for UPS2000-G-6 kVA/10 kVA long backup time models and UPS2000-G-15 kVA/20 kVA.			
Charger rated charge voltage	Each cell has an equalized charge voltage of 2.35 V and a float charge voltage of 2.25 V. Both are configurable on the LCD.			

NOTICE

- The ESS-240V12-7AhBPVBA01 BOM number is 02310PFD.
- The ESS-240V12-9AhBPVBA01 BOM number is 02310MWN.
- The ESS-240V12-7AhBPVBA04 BOM number is 02313SBB.
- The ESS-240V12-9AhBPVBA04 BOM number is 02313SBA.
- When battery packs are connected in series or parallel, only battery packs of the same model and specifications can be installed or replaced. Do not use battery packs of different models or specifications together. For details, see the battery pack nameplate. The following figures are for reference only.



NOTICE

- The parameters listed in [Figure 3-1](#), [Figure 3-2](#), [Figure 3-3](#), and [Figure 3-4](#) and the battery pack backup time parameter tables apply to the new battery packs that are used for the first time.
- The following tables list the backup time upon factory delivery, which decreases with the battery capacity. The tables are for reference only.

Table 3-9 Backup time parameters for the ESS-240V12-7AhBPVBA01/ESS-240V12-7AhBPVBA04 battery pack (6 kVA, calculated based on 94% battery efficiency)

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

Load (%)	Load (W)	One Battery Pack (min)	Two Battery Packs (min)	Three Battery Packs (min)	Four Battery Packs (min)
30%	1620	36	77	120	174

Figure 3-1 Backup time curve for the ESS-240V12-7AhBPVBA01/ESS-240V12-7AhBPVBA04 battery pack (6 kVA, calculated based on 94% battery efficiency)

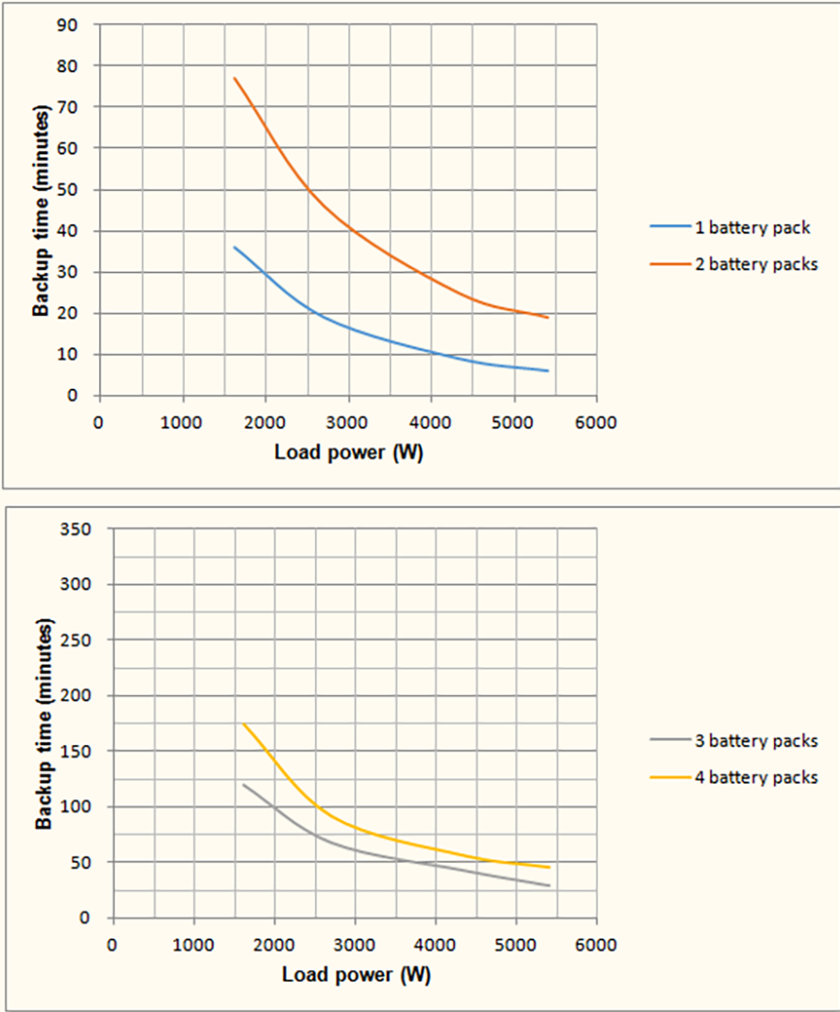


Table 3-10 Backup time parameters for the ESS-240V12-9AhBPVBA01/
ESS-240V12-9AhBPVBA04 battery pack (10 kVA, calculated based on 94% battery
efficiency)

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
50%	4500	12	32	53	70
30%	2700	26	57	88	125

Figure 3-2 Backup time curve for the ESS-240V12-9AhBPVBA01/
ESS-240V12-9AhBPVBA04 battery pack (10 kVA, calculated based on 94% battery
efficiency)

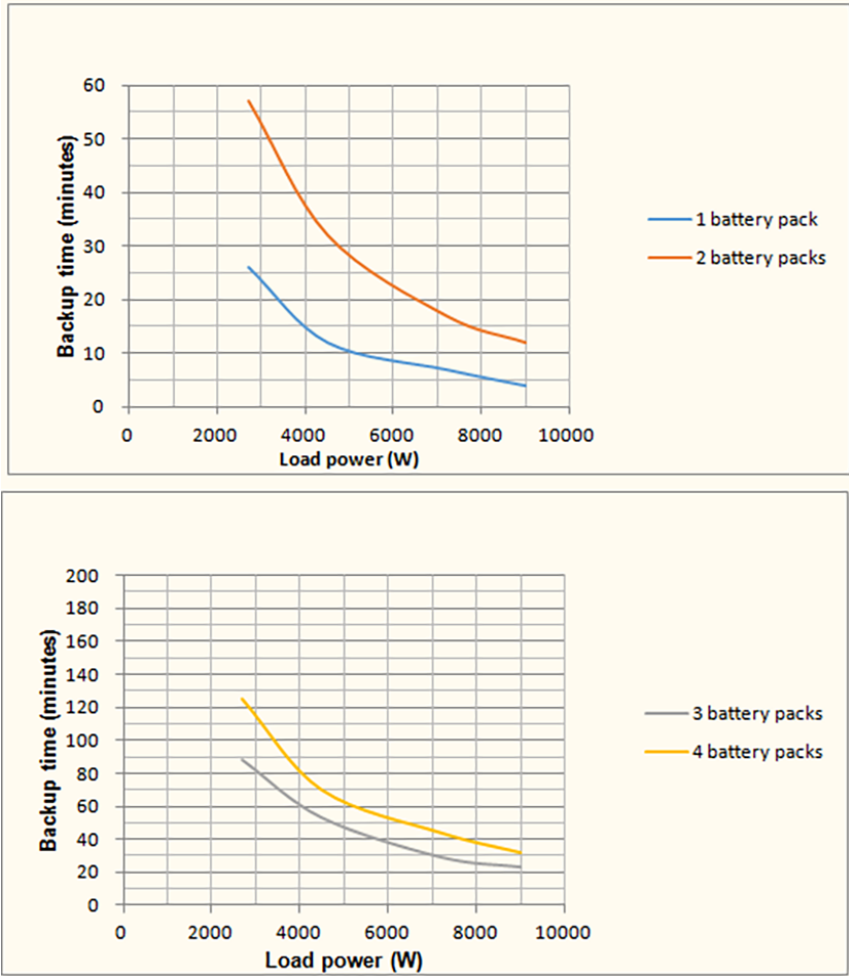


Table 3-11 Backup time parameters for the ESS-240V12-9AhBPVBA01/ESS-240V12-9AhBPVBA04 battery pack (15 kVA, calculated based on 94% battery efficiency)

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 3-3 Backup time curve for the ESS-240V12-9AhBPVBA01/ESS-240V12-9AhBPVBA04 battery pack (15 kVA, calculated based on 94% battery efficiency)

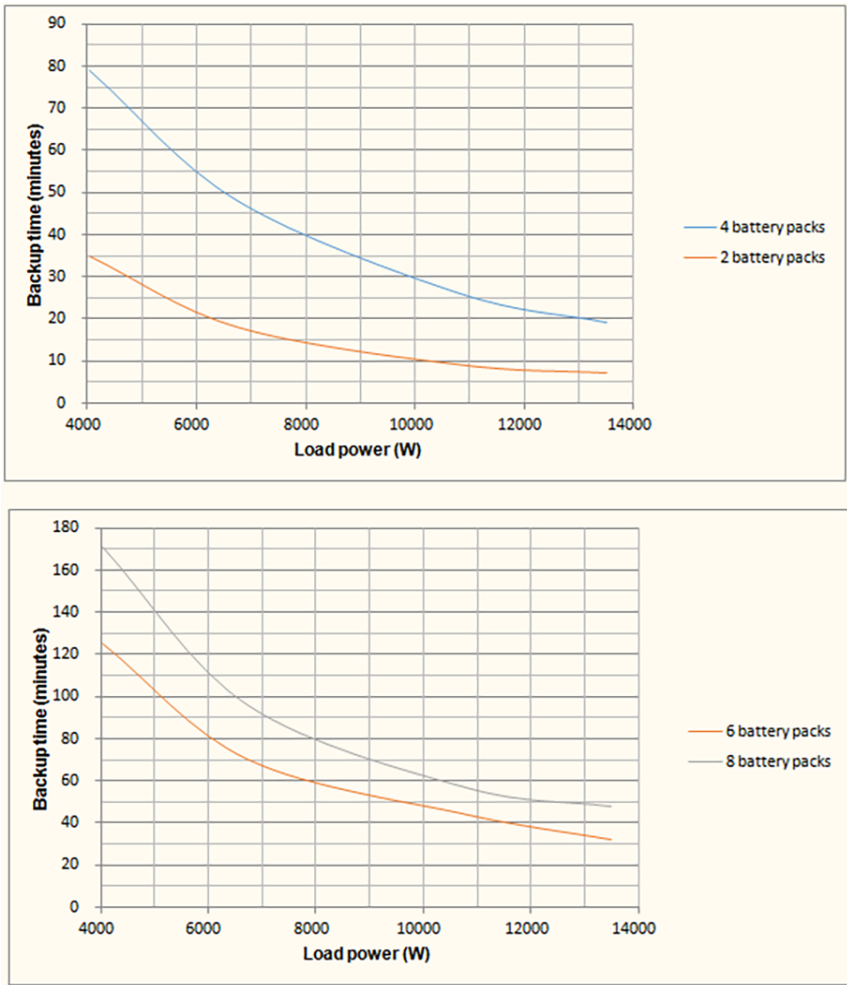
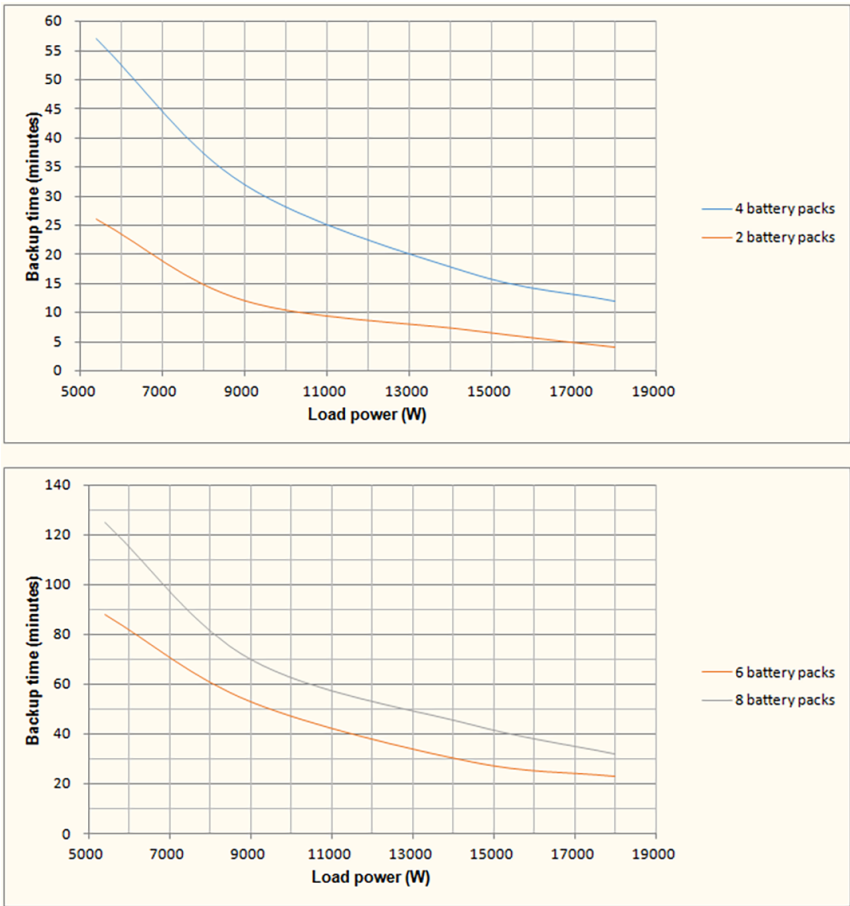


Table 3-12 Backup time parameters for the ESS-240V12-9AhBPVBA01/ESS-240V12-9AhBPVBA04 battery pack (20 kVA, calculated based on 94% battery efficiency)

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
50%	9000	12	32	53	70
30%	5400	26	57	88	125

Figure 3-4 Backup time curve for the ESS-240V12-9AhBPVBA01/ESS-240V12-9AhBPVBA04 battery pack (20 kVA, calculated based on 94% battery efficiency)



3.7 ECO Specifications

Table 3-13 ECO specifications

Item	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 10%			
ECO frequency tolerance	Default value: ± 2 Hz (configurable on the LCD) The range is ± 0.5 Hz to ± 3 Hz			

3.8 System Electrical Specifications

Table 3-14 Parallel system specifications

Item	6 kVA	10 kVA	15 kVA	20 kVA
Number of UPSs in parallel (dual live wires)	1+1			
Number of UPSs in parallel (other mode except dual live wires)	≤ 4			
Power distribution system	TN, TN-C, TN-C-S, TT			
Pollution degree	PD2			

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.

3.9 Safety Regulations and EMC

Table 3-15 Safety compliance

Safety Certification	Standard
CE	EN IEC 62040-1
CB	IEC 62040-1

Table 3-16 EMC

Item	Standards Compliance	Remarks
Electromag netic compatibili ty	IEC/EN62040-2	-
	IEC/EN61000-3-11	Voltage variation, fluctuation, and flicker
	IEC/EN61000-3-12	Harmonic current
Impact current (lightning protection)	YD/T944	The AC input side meets Level D lightning protection (differential mode and common mode: 5 kA and 8/20 μs).

 NOTE

The preceding test results are generated when the UPS works with Huawei battery packs.

4 Installation

4.1 Preparations

NOTICE

- A circuit breaker needs to be installed in the upstream of the UPS to facilitate maintenance.
- The UPS can generate large leakage currents. A circuit breaker equipped with a residual current device (RCD) is not recommended. If leakage protection is required, select a recommended circuit breaker.
- The leakage current of the 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/20 kVA UPS is less than or equal to 500 mA.
- When UPSs are connected in parallel, the output parallel power cables of each UPS must be at least 1 m long and the length deviation must be less than $\pm 10\%$. The four cables must be connected at the remote end.
- It is recommended that the length of battery cables and output cables be less than or equal to 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.
- If the AC input and output of the 10 kVA/15 kVA/20 kVA UPS use dual live wires, the PDC-0038V4ACIOA, PDC-0091V2ACIOA, and PDC-0038V4ACIOA-V2 cannot be used.

It is recommended that the length of the cable connected to the MBS port be less than or equal to 10 m.

4.1.1 Site

Floor Loading Capacity

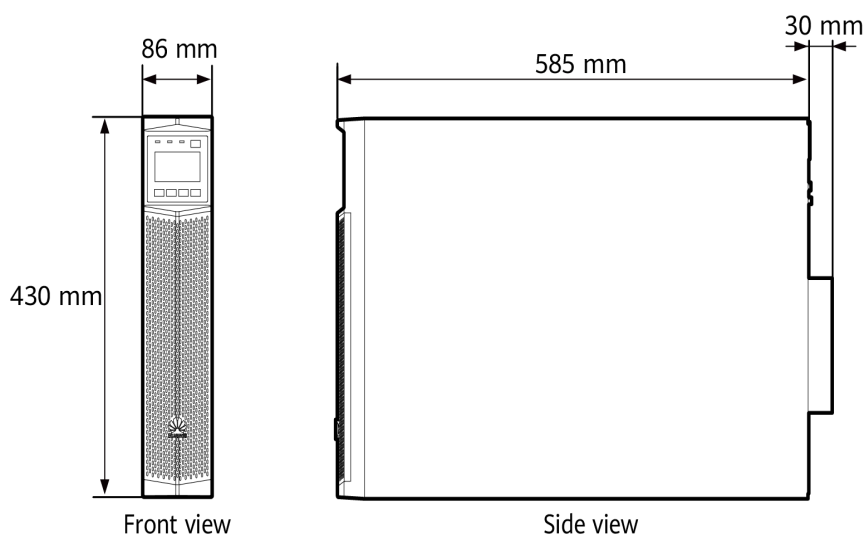
The floor must be able to bear the weight of the UPS and its optional components. In the case of rack-mounted installation, ensure that the floor can also bear the weight of the rack.

Installation Environment

- Do not install the UPS in a high-temperature, low-temperature, or damp place that is beyond the technical 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 optimal 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 battery backup time.

UPS2000-G-6 kVA/10 kVA Dimensions

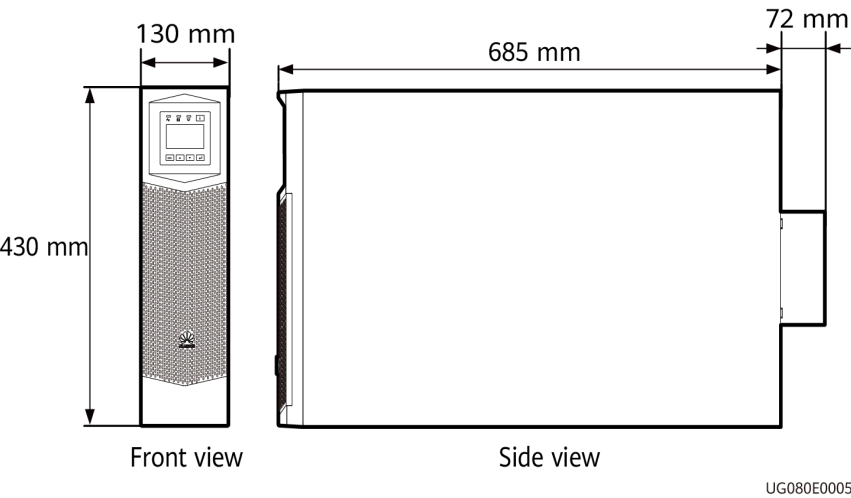
Figure 4-1 UPS2000-G-6 kVA/10 kVA installation dimensions



UG060E0004

UPS2000-G-15 kVA/20 kVA Dimensions

Figure 4-2 UPS2000-G-15 kVA/20 kVA installation dimensions



UPS Mounting Ear Dimensions

Figure 4-3 Dimensions of the mounting ears for the 6 kVA/10 kVA UPS

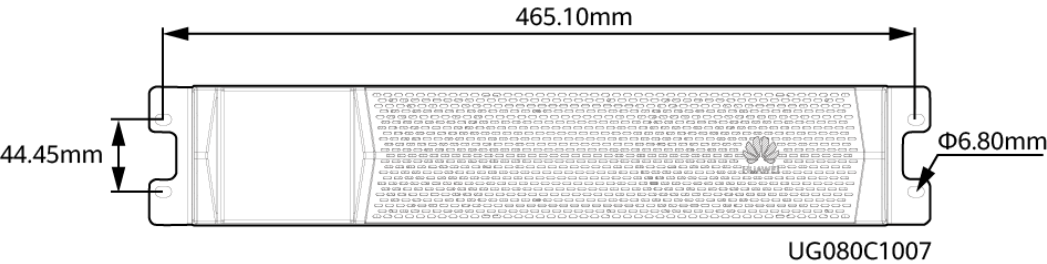
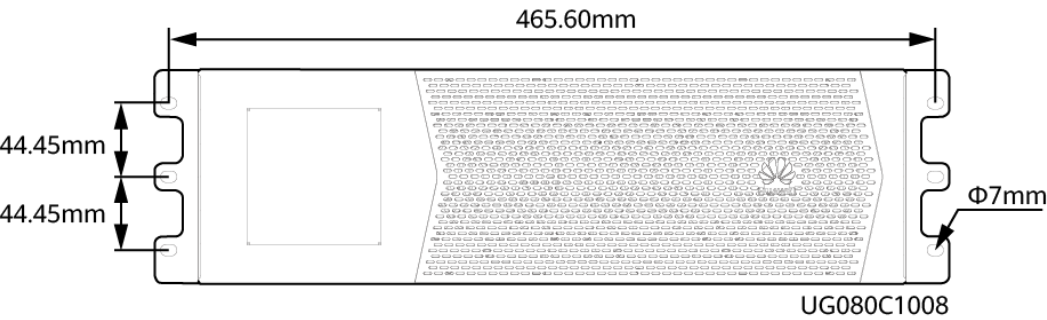


Figure 4-4 Dimensions of mounting ears for the 15 kVA/20 kVA UPS

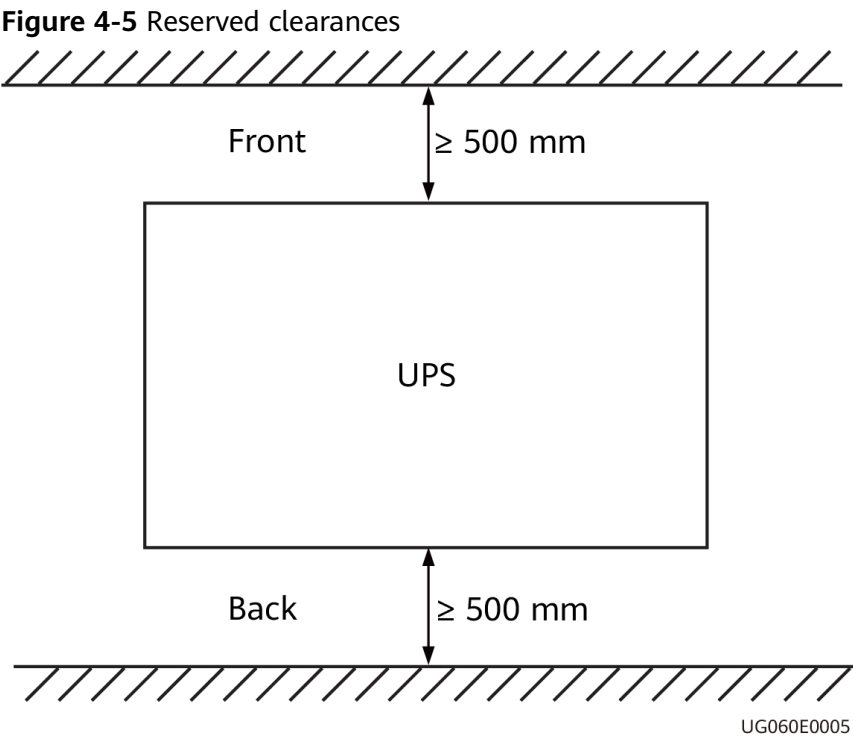


Clearances

NOTICE

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

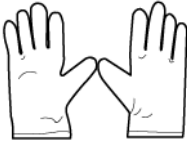
Reserve a clearance of at least 500 mm respectively from the front and rear panels of the UPS to the wall or adjacent equipment to facilitate ventilation and heat dissipation, as shown in [Figure 4-5](#).



4.1.2 Tools

The onsite operation personnel can select tools based on the site requirements.

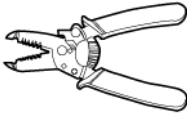
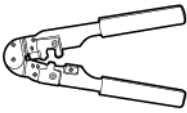
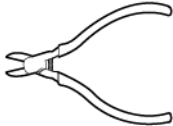
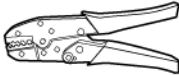
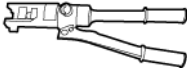
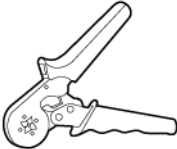
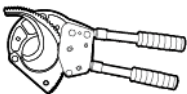
Personal protective equipment

			
Safety helmet	Goggles	Protective shoes	Reflective vest
			-
ESD gloves	Insulated gloves	Protective gloves	

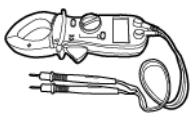
Hardware installation tools

 	 		
Flat-head insulated torque screwdriver (2 mm)	Phillips insulated torque screwdriver (M4/M6)	Utility knife	Marker

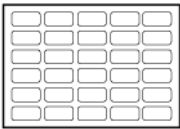
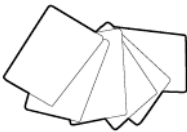
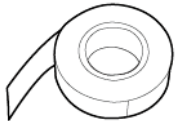
Cable installation tools

			
Wire stripper	RJ45 crimping tool	Electro-hydraulic pliers	Heat gun
			
Diagonal pliers	Crimping tool	Hydraulic pliers	Cord end terminal crimping tool
	-	-	-
Cable cutter			

Measurement instruments

			-
Clamp meter	Multimeter	Network tester	

Engineering auxiliary materials

			
Label	Cable tie	Cotton cloth	Heat-shrink tubing
	-	-	-
Insulation tape			

Other tools

			
Electrician's knife	Tweezers	Brush	Vacuum cleaner

4.1.3 Power Cables

NOTICE

- A circuit breaker needs to be installed in the upstream of the UPS to facilitate maintenance.
- When the UPS is used in an IT power distribution system, a four-pole disconnecter must be used for a three-phase system, or a two-pole disconnecter must be used for a single-phase system.
- The UPS can generate large leakage currents. A circuit breaker equipped with a residual current device (RCD) is not recommended. If leakage protection is required, select a recommended circuit breaker.
- The leakage current of the 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/20 kVA UPS is less than or equal to 500 mA.
- When selecting a residual current circuit breaker, consider the leakage current of the UPS and downstream loads.
- It is recommended that the length of battery cables and output cables be less than or equal to 10 m.
- Cable type: copper flexible cable whose conductor supports the maximum operating temperature of 90°C
- 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 the 15 kVA/20 kVA model, use AC 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 the 15 kVA/20 kVA model, use battery ground 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 the 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 the 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.
- Connect the 15 kVA/20 kVA UPS batteries to the UPS battery ports. One UPS battery port can have only one OT terminal installed. After connecting cables, install the UPS battery port cover.

Table 4-1 lists the recommended power cable specifications.

Table 4-1 Recommended power cable specifications

Model	Wiring Terminal	Number of Phases	Rated Voltage	External Circuit Breaker	Cable Cross-Sectional Area	Terminal Type	Torque for Tightening Bolts
6 kVA (dual-live-wire input dual-live-wire output)	Dual-live-wire input	2	208 V AC/220 V AC	50 A/2 P (characteristic D)	6 mm ²	6 mm ² M4 OT terminal	1.4 N·m
	Dual-live-wire output	2		50 A/2 P (characteristic D)			
	Battery	-	240 V DC	50 A/2 P	6 mm ²		-
6 kVA (single-phase input single-phase output)	Input	1	220 V AC/230 V AC/240 V AC	50 A/2 P (characteristic D)	6 mm ²	6 mm ² M4 OT terminal	1.4 N·m
	Output	1		50 A/2 P (characteristic D)			
	Battery	-	240 V DC	50 A/2 P	6 mm ²		-
10 kVA (dual-live-wire input dual-live-wire output)	Dual-live-wire input	2	208 V AC/220 V AC	63 A/2 P (characteristic D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N·m
	Dual-live-wire output	2		63 A/2 P (characteristic D)			
	Battery	-	240 V DC	63 A/2P	10 mm ²		-
10 kVA (single-phase input single-phase output)	Input	1	220 V AC/230 V AC/240 V AC	63 A/2 P (characteristic D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N·m
	Output	1		63 A/2 P (characteristic D)			
	Battery	-	240 V DC	63 A/2P	10 mm ²		-
10 kVA (three-phase input single-phase output)	Input	3	380 V AC/400 V AC/415 V AC	63 A/2 P (characteristic D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N·m
	Output	1	220 V AC/230 V AC/240 V AC	63 A/2 P (characteristic D)			
	Battery	-	240 V DC	63 A/2P	10 mm ²		-

Model	Wiring Terminal	Number of Phases	Rated Voltage	External Circuit Breaker	Cable Cross-Sectional Area	Terminal Type	Torque for Tightening Bolts
15 kVA (dual-live-wire input dual-live-wire output)	Dual-live-wire input	2	208 V AC/220 V AC	100 A/2 P (characteristic D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N·m
	Battery	-	± 240 V DC	63 A/4P	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/2 P (characteristic 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/240 V AC	100 A/2 P (characteristic D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N·m
	Battery	-	± 240 V DC	63 A/4P	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N·m
	Output	1	220 V AC/230 V AC/240 V AC	100 A/2 P (characteristic 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/240 V AC	100 A/2 P (characteristic D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N·m
	Mains input	3	380 V AC/400 V AC/415 V AC	50 A/4 P (characteristic D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N·m
	Battery	-	± 240 V DC	63 A/4P	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N·m
	Output	1	220 V AC/230 V AC/240 V AC	100 A/2 P (characteristic 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/415 V AC	50 A/4 P (characteristic D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N·m
	Mains input	3					

Model	Wiring Terminal	Number of Phases	Rated Voltage	External Circuit Breaker	Cable Cross-Sectional Area	Terminal Type	Torque for Tightening Bolts
	Battery	-	± 240 V DC	63 A/4P	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N·m
	Output	3	380 V AC/400 V AC/415 V AC	50 A/4 P (characteristic 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/2 P (characteristic D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N·m
	Battery	-	± 240 V DC	63 A/4P	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/2 P (characteristic D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N·m
20 kVA (single-phase input single-phase output)	Input	1	220 V AC/230 V AC/240 V AC	125 A/2 P (characteristic D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N·m
	Battery	-	± 240 V DC	63 A/4P	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N·m
	Output	1	220 V AC/230 V AC/240 V AC	125 A/2 P (characteristic 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/240 V AC	125 A/2 P (characteristic D)	25 mm ²	25 mm ² M6 OT terminal	4.8 N·m
	Mains input	3	380 V AC/400 V AC/415 V AC	63 A/4 P (characteristic D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N·m
	Battery	-	± 240 V DC	63 A/4P	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	Cable Cross-Sectional Area	Terminal Type	Torque for Tightening Bolts
	Output	1	220 V AC/230 V AC/240 V AC	125 A/2 P (characteristic 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/415 V AC	63 A/4 P (characteristic D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N·m
	Mains input	3					
	Battery	-	± 240 V DC	63 A/4P	16 mm ²	16 mm ² M6 90° OT terminal	4.8 N·m
	Output	3	380 V AC/400 V AC/415 V AC	63 A/4 P (characteristic D)	10 mm ²	10 mm ² M6 OT terminal	2.8 N·m

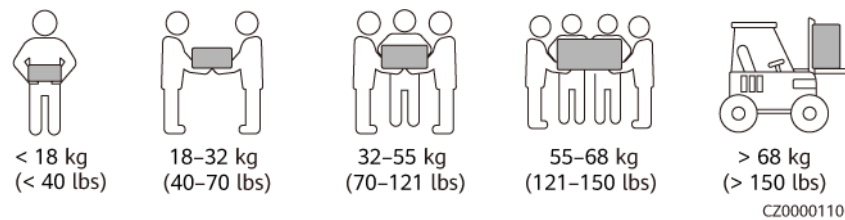
 NOTE

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

4.1.4 Unpacking and Checking

Figure 4-6 shows the transportation safety requirements.

Figure 4-6 Transportation safety requirements



NOTICE

- Only trained personnel are allowed to move the equipment.
- Do not move the equipment by holding its mounting ears, front panel, wiring terminal cover, or control panel.
- 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.
- Move the chassis with caution. Any bumping or falling may damage the equipment. After placing the equipment, unpack it carefully to prevent scratches.
- If the installation environment is poor, take dustproof and anti-condensation measures after unpacking the equipment to prevent condensation and dust buildup, which may corrode the equipment.

1. Visually inspect the UPS appearance for shipping damage. If any shipping damage is found, report it to the carrier immediately.
2. Move the UPS to the installation position.
3. Remove the packing materials. Check whether the UPS exterior is in good condition and free of collision marks or scratches. If any damage is found, contact the shipping company immediately.
4. Check whether the fastening components and removable components are loose. If they are loose, notify the carrier and manufacturer immediately.
5. Check the type and quantity of fittings against the packing list. If some fittings are missing or do not match the models in the packing list, record the information and contact the supplier immediately.

4.2 Installation Procedure

UPS installation includes mechanical installation and cable connection. Rack- and tower-mounted installation modes are supported. You can select an installation mode based on the site requirements. For details about how to install a UPS and connect cables, see the *UPS2000-G-(6 kVA-10 kVA) Quick Guide* and *UPS2000-G-(15 kVA-20 kVA) Quick Guide*.

4.3 Installing a Backfeed Protection Card

4.3.1 Backfeed Protection Device Specifications

NOTICE

This equipment does not have a built-in backfeed protection device. You can add a backfeed protection device for the input. The protection solution is as follows: If you do not install a backfeed protection device for the input, add a warning label on the main power disconnection device that supplies power to the UPS to warn electrical maintenance personnel. The warning label contains information similar to the following: "This circuit supplies power to the UPS. Disconnect the UPS before cable connection." In addition, check whether dangerous voltages exist on all main power connection terminals.

When battery mode is unavailable or the mains fails, certain voltage or energy in the UPS may flow back directly, or through a leakage path, to an input terminal. To minimize the risk of electric shocks caused by reverse feeding, install a backfeed protection device for the UPS input.

Table 4-2 Rated voltage and current of the backfeed protection contactor

Model	Single-Phase/Three-Phase		Dual-Live Wire	
	Rated Voltage and Rated Current	Recommended Backfeed Protection Device Model (Schneider Contactor)	Rated Voltage and Rated Current	Recommended Backfeed Protection Device Model (ABB Contactor)
UPS2000-G-6KRTL (dual-live-wire input dual-live-wire output)	220 V AC/230 V AC/240 V AC, 40 A	Contactor LC1-D40A	208 V AC/220 V AC, 40 A	Contactor AF50-30-11* 70
UPS2000-G-10KRTL (dual-live-wire input dual-live-wire output)	220 V AC/230 V AC/240 V AC, 65 A	- Single-phase input: LC1-D50A contactor - Three-phase input: contactor LC1-DT60A	208 V AC/220 V AC, 65 A	Contactor AF50-30-11* 70

Model	Single-Phase/Three-Phase		Dual-Live Wire	
	Rated Voltage and Rated Current	Recommended Backfeed Protection Device Model (Schneider Contactor)	Rated Voltage and Rated Current	Recommended Backfeed Protection Device Model (ABB Contactor)
UPS2000-G-15KRTL (three-phase input)	220 V AC/230 V AC/240 V AC, 32 A	Three-phase input: contactor LC1-DT60A	-	-
UPS2000-G-20KRTL (three-phase input)	220 V AC/230 V AC/240 V AC, 40 A		-	-
UPS2000-G-15KRTL (single-phase input) UPS2000-G-20KRTL (single-phase input)	220 V AC/230 V AC/240 V AC, 125 A	Single-phase input: LC1-D80 contactor	208 V AC/220 V AC, 125 A	Contactor AF110-30-11 *70
UPS2000-G-15KRTL-01 (three-phase input)	220 V AC/230 V AC/240 V AC, 32 A	Three-phase input: contactor LC1-DT60A	-	-
UPS2000-G-20KRTL-01 (three-phase input)	220 V AC/230 V AC/240 V AC, 40 A		-	-

Model	Single-Phase/Three-Phase		Dual-Live Wire	
	Rated Voltage and Rated Current	Recommended Backfeed Protection Device Model (Schneider Contactor)	Rated Voltage and Rated Current	Recommended Backfeed Protection Device Model (ABB Contactor)
UPS2000-G-15KRTL-01 (single-phase input) UPS2000-G-20KRTL-01 (single-phase input)	220 V AC/230 V AC/240 V AC, 125 A	Single-phase input: LC1-D80 contactor	208 V AC/220 V AC, 125 A	Contactor AF110-30-11 *70

Table 4-3 Control relay parameters

Recommended Model	Requirements
HONGFA: HF18FF/012	Contact type: normally closed (NC) Breaking capacity: 250 V AC, 5 A Coil specifications: 12 V, rated current < 1 A
OMRON: MY2N-J DC12V	
Panasonic: HJ2-L-DC12V	

4.3.2 Feedback Prevention Connections (With Dry Contact Control)

Figure 4-7 Bypass backfeed protection connections for the UPS2000-G-6 kVA/10 kVA/15 kVA/20 kVA (single-phase input single-phase output)

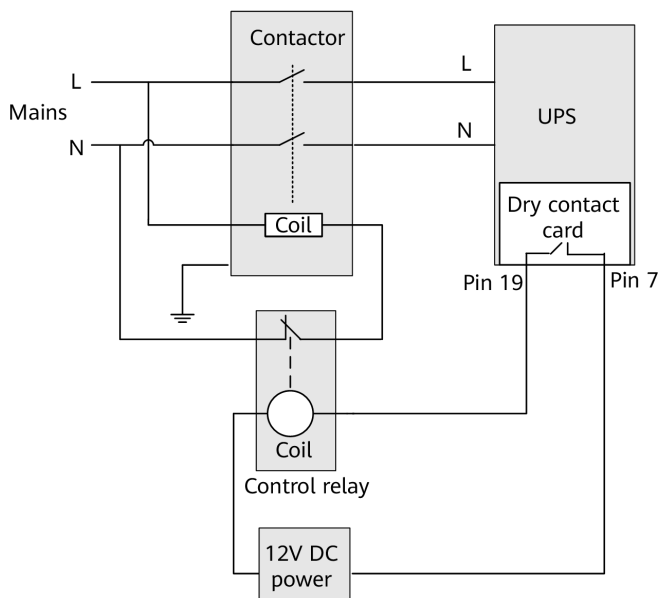


Figure 4-8 Bypass backfeed protection connections for the UPS2000-G-10 kVA (three-phase input single-phase output)

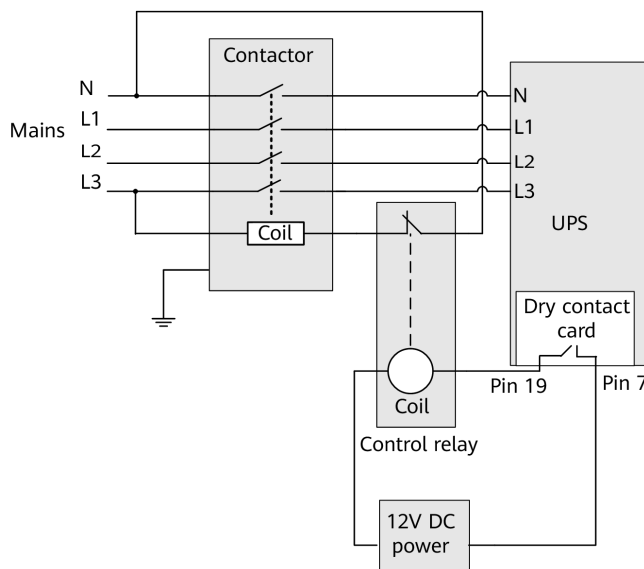


Figure 4-9 Bypass backfeed protection connections for the UPS2000-G-15 kVA/20 kVA (three-phase input three-phase output)

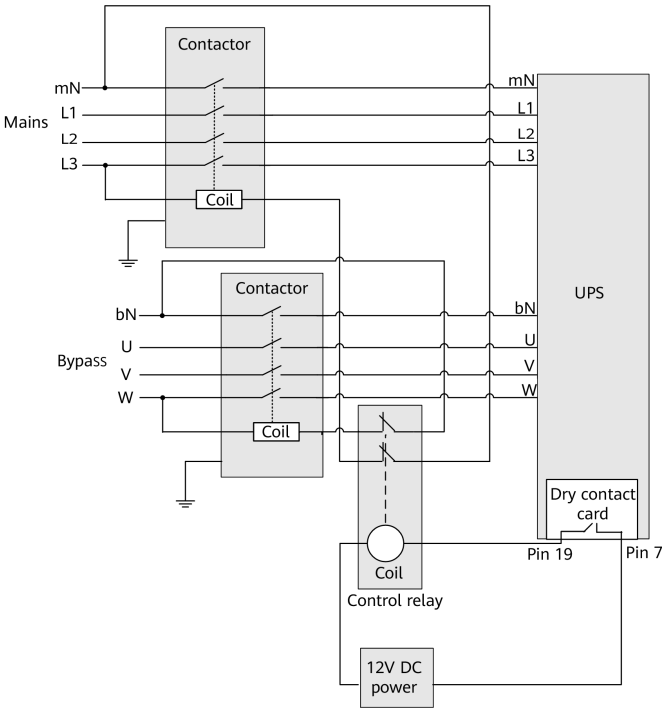


Figure 4-10 Bypass backfeed protection connections for the UPS2000-G-15 kVA/20 kVA (three-phase input single-phase output)

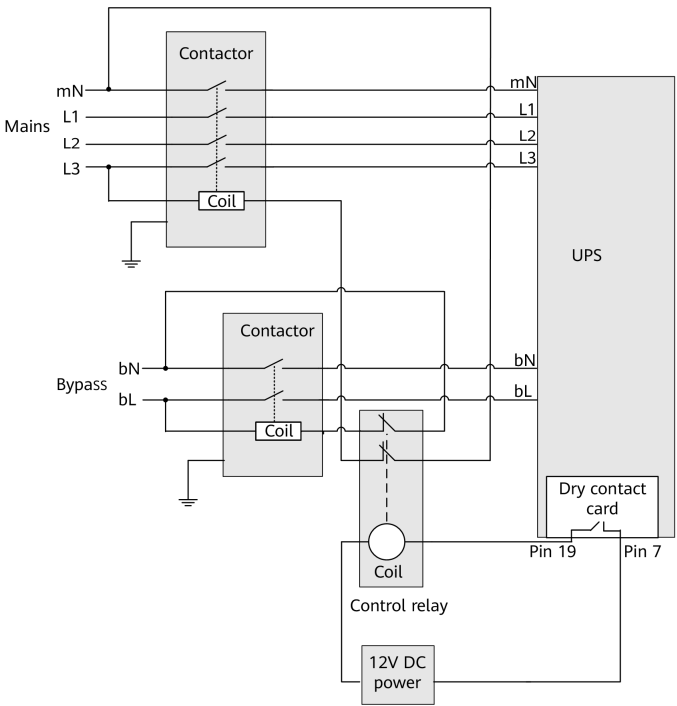
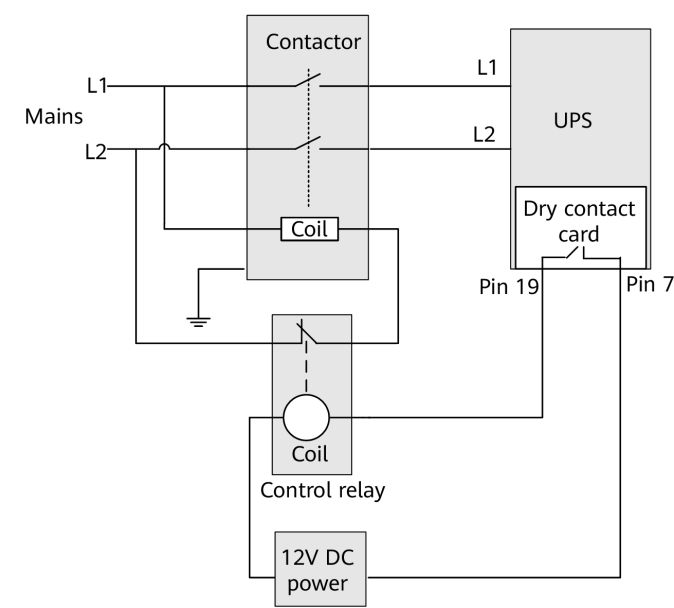


Figure 4-11 Bypass backfeed protection connections for the UPS2000-G-6 kVA/10 kVA/15 kVA/20 kVA (two live wires)



4.4 Verifying the Installation

The following table lists the check items.

Table 4-4 Post-installation check items

No.	Item	Expected Result
1	Cable routing	Cables are routed properly according to engineering requirements.
2	Cable connections	All cables are tightened to specified torques using a torque wrench, connected correctly, and free of damage.
3	Cable connections for USB ports and network ports	Cables to USB ports and network ports are connected correctly and securely.
4	Labels	Labels are neatly attached to both ends of each cable, and the information on the labels is concise and understandable.
5	Ground cable connections	The UPS ground cable is securely connected to the ground bar in the equipment room. Check that the resistance between the UPS ground cable and the equipment room ground bar is less than 0.1 ohm using a multimeter.

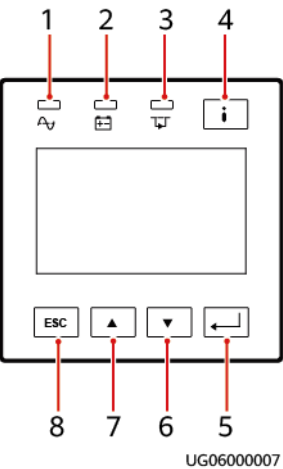
No.	Item	Expected Result
6	Distances between cable ties	Distances between cable ties are the same, and no burr exists.
7	Operating environment	The inside and outside of the cabinet are free from conductive dust or other sundries.
8	Cables short circuit	Check that cables are open-circuited using a multimeter or an insulation resistance tester.
9	Circuit breaker specifications	AC input circuit breaker specifications of the equipment room $\geq$ Circuit breaker specifications of the AC PDB $\geq$ AC input circuit breaker specifications of the UPS
10	Battery voltage range	6 kVA/10 kVA: Use a multimeter to measure the voltage between the positive and negative battery terminals. Voltage range: $9.6 \text{ V} \times \text{Number of batteries}$ to $14.4 \text{ V} \times \text{Number of batteries}$. For example, if 20 batteries are installed, the voltage between the positive and negative battery terminals should range from 192 V ($20 \times 9.6 \text{ V}$) to 288 V ($20 \times 14.4 \text{ V}$). 15 kVA/20 kVA: Use a multimeter to measure the voltages of the positive and negative battery strings. Voltage range: $9.6 \text{ V} \times \text{Number of batteries}$ to $14.4 \text{ V} \times \text{Number of batteries}$. For example, if both the positive and negative battery strings contain 20 batteries, the voltage of each battery string should range from 192 V ($20 \times 9.6 \text{ V}$) to 288 V ($20 \times 14.4 \text{ V}$).

5 Control Panel

5.1 Introduction

The UPS control panel is located on the front panel of the chassis. The control panel allows you to control and operate the UPS, view the running status, set parameters, and view alarms. [Figure 5-1](#) shows the control panel.

Figure 5-1 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 |

5.2 Indicators

[Table 5-1](#) describes the indicators on the control panel.

Table 5-1 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.

5.3 Buttons

Five buttons are provided for you to start and shut down the UPS, and view and set parameters. Table 5-2 describes the five buttons.

Table 5-2 Button description

Butt on	Function	Description
ESC	Back/Shutdown	- 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 upper-level screen for the main menu list is the default screen.)
▲	Up	Press ▲ or ▼ to scroll upward or downward. You can set a value by using the list or step increase or decrease.
▼	Down	

Butt on	Function	Description
	Startup/Enter/Battery Self-Check/Mute	- 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. - 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 the button for 2–5 seconds. The buzzer is muted when you release the button.
i	Fault indicator/INFO button	- When an alarm is generated, press i to view the active alarm information. The buzzer is muted. - When no alarm is generated, press i to return to the default screen.

 NOTE

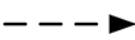
- Battery self-check: After the UPS starts in normal mode, it transfers to battery mode for 10 seconds to check the battery status (if no battery is connected, **No battery** is displayed) and that the UPS can work in battery mode. This is to prevent power backup failure when the UPS needs to transfer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

5.4 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.

5.5 LCD Startup Screen

Table 5-3 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 screenshots in this document correspond to the following software versions:
The UPS2000-G-15KRTL/UPS2000-G-20KRTL software version is V100R001C10SPC802.
The UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01 software version is V100R001C34SPC600.
The screenshots may be updated without notice. Contact technical support to obtain the latest screenshots if necessary.
- The menus of the UPS2000-G-15KRTL/UPS2000-G-20KRTL/UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01 are used as an example. The information in the menu screenshots is for reference only. For details about the parameters, see the actual LCD display of the UPS.

Figure 5-2 describes the LCD startup screen.

Figure 5-2 Description of the startup screen

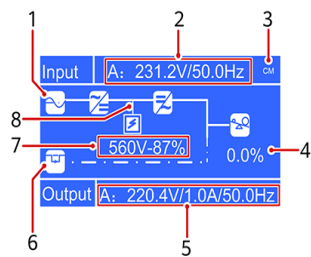
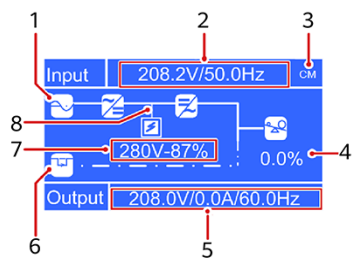


Figure 5-3 Description of the startup screen (two live wires)



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

(2) Input voltage and frequency
- (3) Working mode^a

(4) Load power
- (5) Output voltage, current, and frequency

(6) Bypass mode (The solid line indicates bypass mode. The dotted line indicates non-bypass mode.)
- (7) Battery voltage and capacity displayed during charge; Battery discharge time and capacity displayed during discharge.

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

NOTE

- UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01 If multiple working modes coexist, the priority is as follows: converter mode (CM) > ECO mode > self-load mode (SM) > normal mode (NM).
- a: indicates that only the UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01 is supported.

Table 5-4 describes the icons on the menu screen.

Table 5-4 Icons on the screen

Icon	Meaning	Icon	Meaning
	Mains input		Rectifier/Power factor correction (PFC) working
	Inverter working		Bypass mode
	Load power		Battery charging

Icon	Meaning	Icon	Meaning
	Battery discharging	-	-

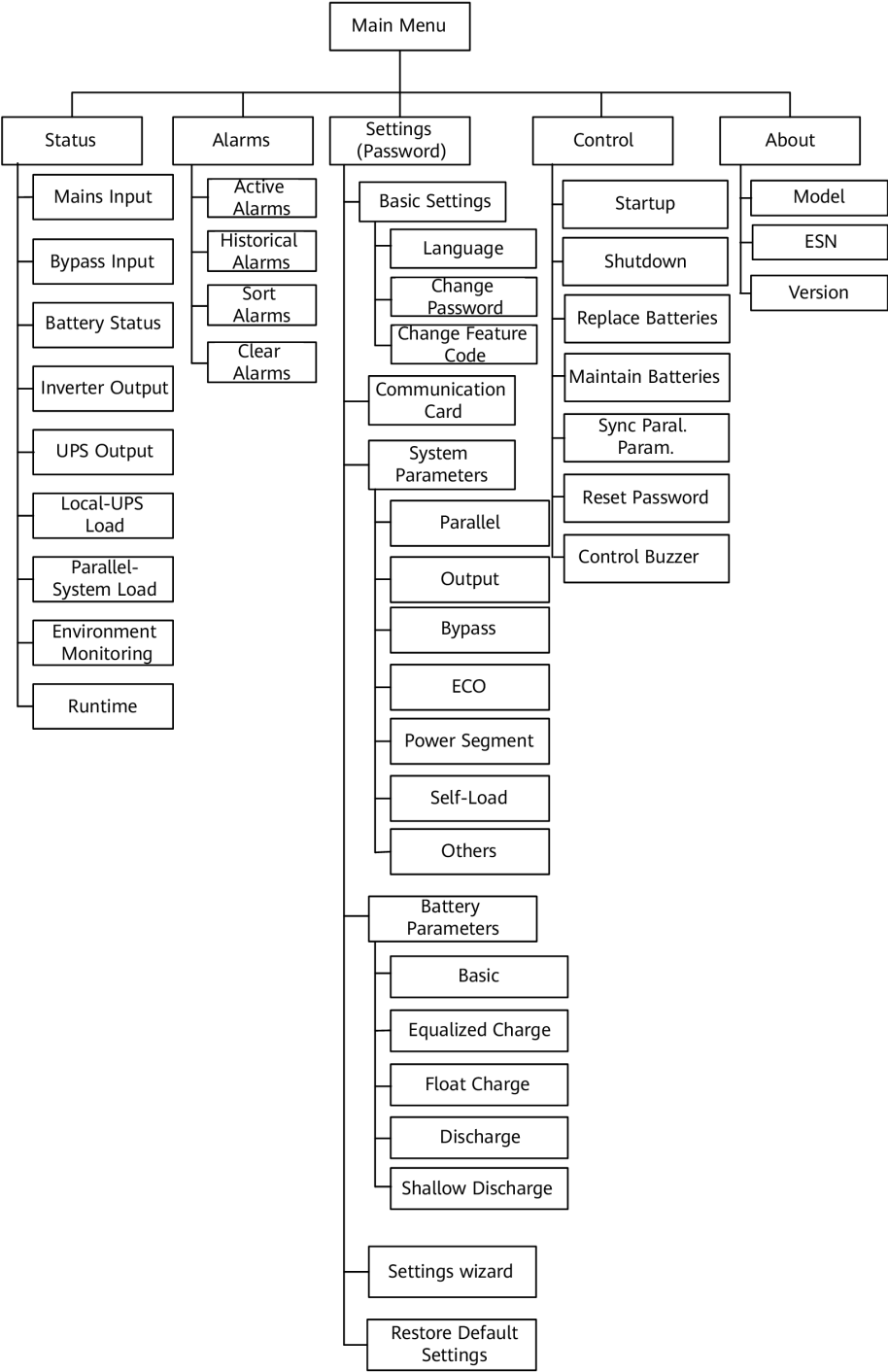
5.6 LCD Menu Hierarchy

Figure 5-4 Main Menu screen



Figure 5-5 shows the LCD menu hierarchy.

Figure 5-5 LCD menu hierarchy



5.6.1 Status

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

Mains Input

Figure 5-6 Mains Input screen

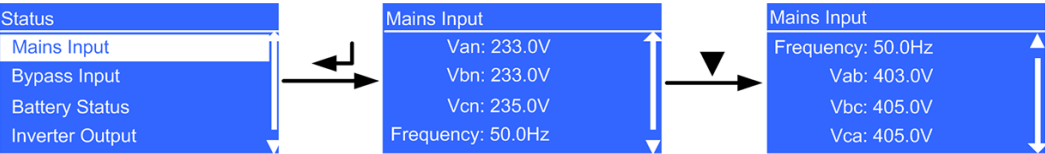


Table 5-5 Mains Input

Item	Description
Van/Vbn/Vcn	Mains input phase voltage (Voltage is displayed when single-phase output mode is set.)
Frequency	Mains input frequency
Vab/Vbc/Vca	Mains input line voltage (The parameters are not displayed in the case of single-phase input.)

Bypass Input

Figure 5-7 Bypass Input screen

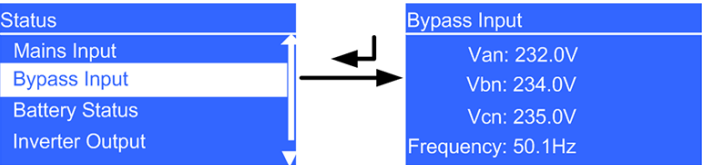


Table 5-6 Bypass Input

Item	Description
Van/Vbn/Vcn	Bypass input phase voltage (Voltage is displayed when single-phase output mode is set.)
Frequency	Bypass input frequency

Battery Status

Figure 5-8 Battery Status screen

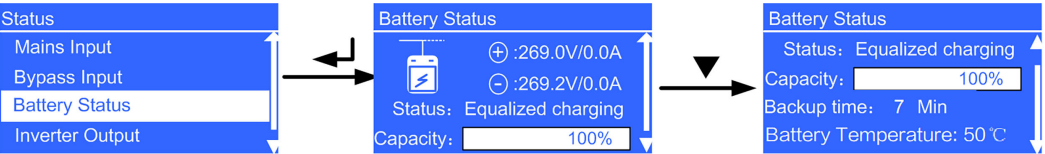


Table 5-7 Battery Status

Item	Description
Voltage	Battery string voltage (positive and negative battery string voltages in the case of the 15 kVA/20 kVA models)
Current	Battery string current (positive and negative battery string currents in the case of the 15 kVA/20 kVA models). + is displayed during battery charge, and – is displayed during battery discharge.
Status	The battery status is N/A (battery not connected or reversely connected), Equalized charging , Float charging , Hibernating , or Discharging .
Capacity	Remaining battery capacity
Backup time	- UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01: estimated battery discharge time when the batteries are being charged or discharged - UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL: estimated battery discharge time when the batteries are being discharged. N/A is displayed when the batteries are being charged.
Battery Temperature	If the NTC is not connected, N/A is displayed. If the NTC is connected, the battery temperature is displayed.

Inverter Output

Figure 5-9 Inverter Output screen

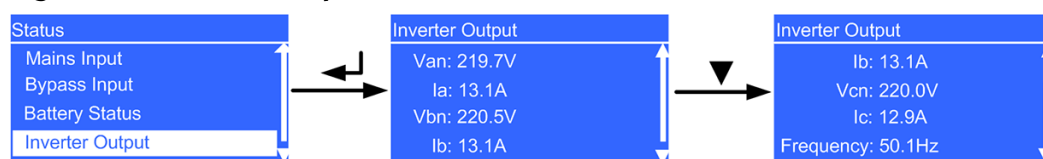


Figure 5-10 Inverter Output screen (dual-live wire)

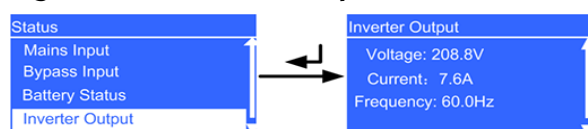


Table 5-8 Inverter Output

Item	Description
Van/Vbn/Vcn	Inverter output phase voltage (Voltage is displayed when single-phase output mode is set.)
Ia/Ib/Ic	Inverter output phase current (Current is displayed when single-phase output mode is set.)
Frequency	Inverter output frequency

UPS Output

Figure 5-11 UPS Output screen

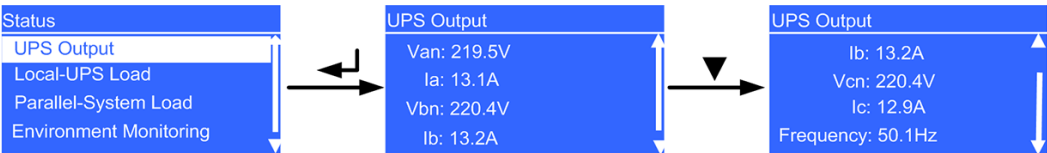


Figure 5-12 UPS Output screen (dual-live wire)

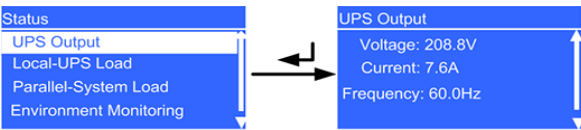


Table 5-9 UPS Output

Item	Description
Van/Vbn/Vcn	UPS output phase voltage (Voltage is displayed when single-phase output mode is set.)
Ia/Ib/Ic	UPS output phase current (Current is displayed when single-phase output mode is set.)
Frequency	UPS output frequency

Local-UPS Load

Figure 5-13 Local-UPS Load screen

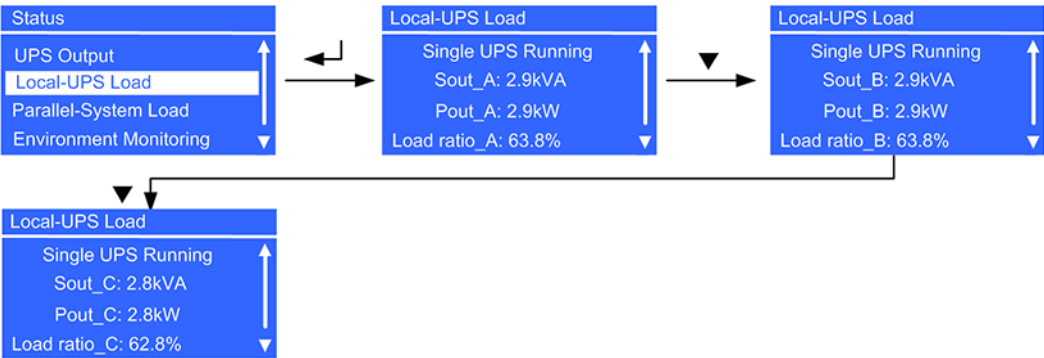


Figure 5-14 Local-UPS Load screen (dual-live wire)

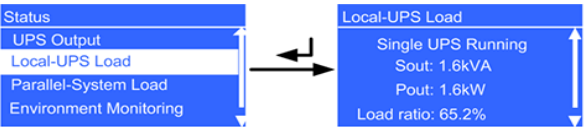


Table 5-10 Local-UPS Load

Item	Description
Single UPS Running	A single UPS is running.
Sout_A/Sout_ B/Sout_C	Output apparent power of each phase (Sout is displayed when single-phase output mode is set.)
Pout_A/Pout_ B/Pout_C	Output active power of each phase (Pout is displayed when single-phase output mode is set.)
Load ratio_A/Load ratio_B/Load ratio_C	Load ratio of each phase (Load ratio is displayed when single-phase output mode is set.)

Parallel-System Load

Figure 5-15 Parallel-System Load screen

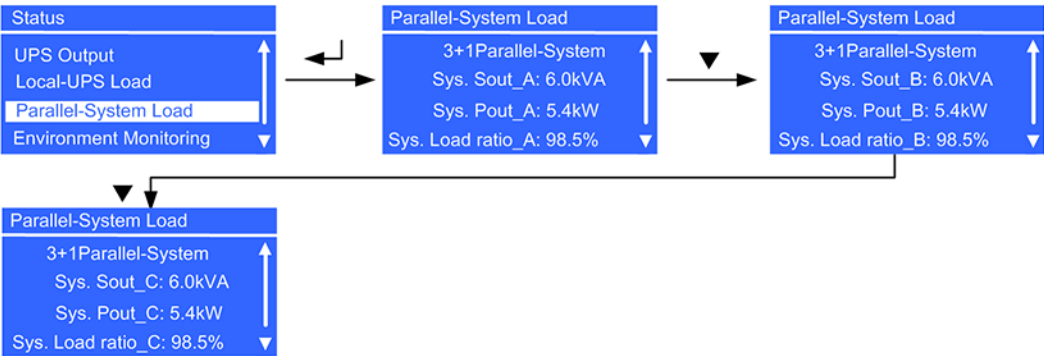


Table 5-11 Parallel-System Load

Item	Description
N+X Parallel-System	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_A/Sys. Sout_ B/ Sys. Sout_C	Output apparent power of each phase in the parallel system (Sys. Sout is displayed when single-phase output mode is set. The parameters are not displayed in single UPS mode.)
Sys. Pout_A/Sys. Pout_ B/ Sys. Pout_C	Output active power of each phase in the parallel system (Sys. Pout is displayed when single-phase output mode is set. The parameters are not displayed in single UPS mode.)
Sys. Load ratio_A/Sys. Load ratio_B/Sys. Load ratio_C	Load ratio of each phase in the parallel system (Sys. Load ratio is displayed when single-phase output mode is set. The parameters are not displayed in single UPS mode.)

NOTE

System information is not displayed in single UPS mode.

Environment Monitoring

Figure 5-16 Environment Monitoring screen

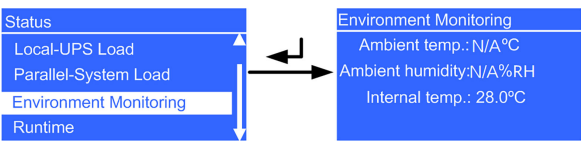


Table 5-12 Environment Monitoring

Item	Description
Ambient temp.	Temperature detected by the ambient temperature and humidity (T/H) sensor (used together with an SNMP card; if the sensor is not connected, N/A is displayed.)

Item	Description
Ambient humidity	Humidity detected by the ambient T/H sensor (used together with an SNMP card; if the sensor is not connected, N/A is displayed.)
Internal temp.	Temperature of the air near the air intake vent of the UPS

Runtime

Figure 5-17 Runtime screen

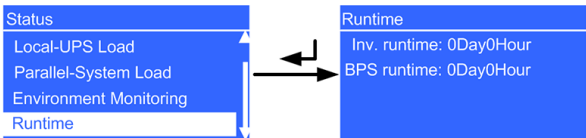


Table 5-13 Runtime

Item	Description
Inv. runtime	Total time during which the UPS runs in inverter mode
BPS runtime	Total time during which the UPS runs in bypass mode

5.6.2 Alarms

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

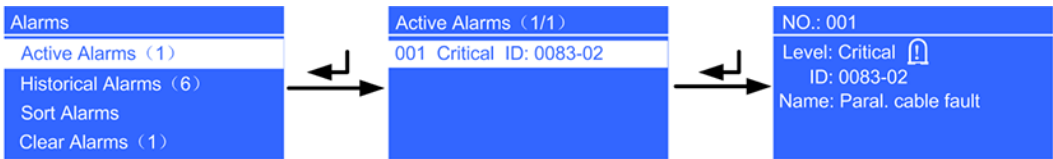
NOTE

When the buzzer buzzes, hold down for 2–5 seconds. The buzzer is muted when you release the button. After the buzzer is muted, the alarm sound cannot be restored until a new alarm is generated.

Active Alarms

This screen displays the active alarm information, such as the alarm serial number, severity, ID, and name, as shown in [Figure 5-18](#).

Figure 5-18 Active Alarms screen



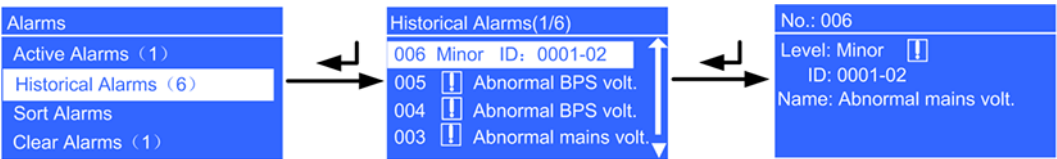
 NOTE

If an alarm is generated on the default screen, press the INFO button to enter the alarm menu and view active alarms.

Historical Alarms

This screen displays the historical alarm information, such as the alarm serial number, severity, ID, and name, as shown in [Figure 5-19](#).

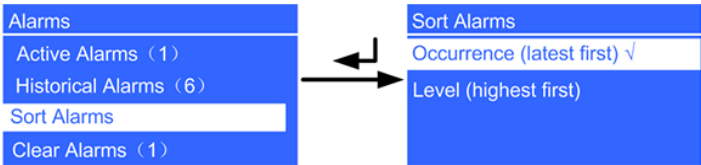
Figure 5-19 History Alarms screen



Sort Alarms

This screen allows you to view alarms by occurrence time or severity, as shown in [Figure 5-20](#).

Figure 5-20 Sort Alarms screen



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

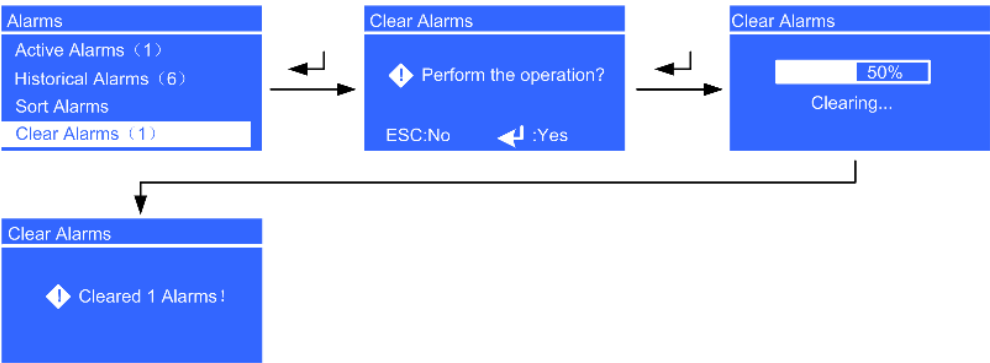
 NOTE

✓ is displayed next to the selected sorting mode.

Clear Alarms

This screen allows you to clear alarms that can be cleared manually, as shown in [Figure 5-21](#).

Figure 5-21 Clear Alarms screen



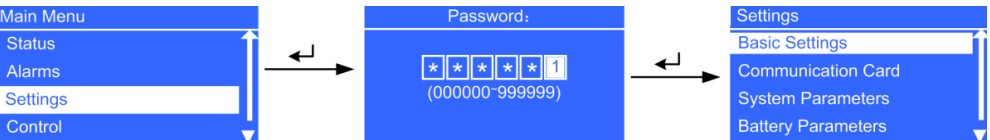
5.6.3 Settings

NOTE

- To ensure system security, change the LCD and WebUI passwords after the first login.
- The UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01 prompts users to change the initial password. If an incorrect password is entered five consecutive times, the account will be logged out for 5 minutes.

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 5-22](#).

Figure 5-22 Settings screen



5.6.3.1 Basic Settings Screen

Figure 5-23 Basic Settings screen

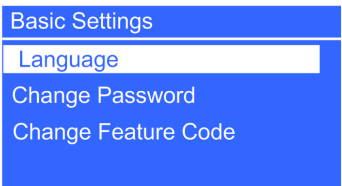


Table 5-14 Basic Settings

Item	Description	Default Value	Value Range
Language	-	English	Chinese, English, Turkish, French, Russian
Change Password	To change the preset password, choose Settings > Basic Settings > Change Password . The password allows you to enter the Settings screen.	000001	-
Change Feature Code	You can change the feature code by choosing Settings > Basic Settings > Change Feature Code . The feature code is used to restore the preset password.	999999	-

5.6.3.2 Communication Card Screen

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

Figure 5-24 SNMP card settings



Table 5-15 SNMP card settings

Item	Description	Default Value	Value Range
IP alloc.	Specifies the DHCP address allocating mode. After the allocating mode is set to Automatic , an Allocating dialog box is displayed on the screen. If allocation succeeds, the new IP address is displayed. If allocation fails, the IP address restores to the default one: 192.168.0.10 . If the allocating mode is set to Automatic , you can only query the IP address but cannot set the IP address manually. NOTE If the optional card does not support the DHCP function, the allocating mode cannot be set to Automatic on the UPS monitoring module. You are advised to upgrade the SNMP card.	Manual	Manual, Automatic
IP address	Set an IP address for the SNMP card.	192.168.0.10	1.0.0.0–223.255.255.255
Subn. mask	Set a subnet mask for the SNMP card.	255.255.255.0	-
Gateway	Set a gateway address for the SNMP card	192.168.0.1	1.0.0.0–223.255.255.255

2. If a Modbus card is connected, the following parameters are displayed:

Figure 5-25 Modbus card settings

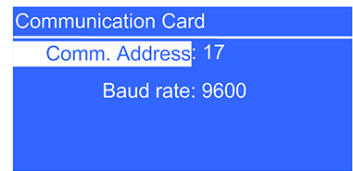
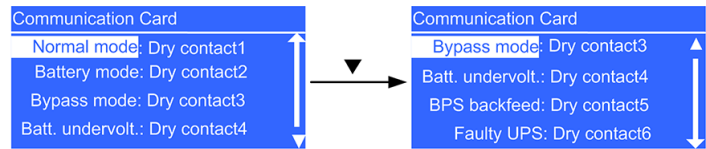


Table 5-16 Modbus card settings

Item	Description
Comm. address	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	Set a baud rate for the Modbus card over the DIP switch on the Modbus card. The value cannot be changed on the LCD.

3. If a dry contact card is connected, set the following parameters:

Figure 5-26 Dry contact card settings



NOTE

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

Table 5-17 Dry contact card settings

Item	Description	Default Value	Value Range
Normal mode	Set the output dry contact associated with normal mode. When the UPS is in normal or ECO mode, this dry contact is enabled.	Dry contact 1	Dry contacts 1–6
Battery mode	Set the output dry contact associated with battery mode. When the UPS is in battery or ECO mode, this dry contact is enabled.	Dry contact 2	Dry contacts 1–6
Bypass mode	Set the output dry contact associated with bypass mode. When the UPS is in bypass or ECO mode, this dry contact is enabled.	Dry contact 3	Dry contacts 1–6
Batt. undervolt	Set the output dry contact associated with low battery voltages. When the system battery voltage is low, this dry contact is enabled.	Dry contact 4	Dry contacts 1–6

Item	Description	Default Value	Value Range
BPS backfeed	Set the output dry contact associated with bypass backfeed. When a bypass backfeed alarm is generated, this dry contact is enabled.	Dry contact 5	Dry contacts 1–6
Faulty UPS	Set the output dry contact associated with UPS faults. When a critical alarm is generated, this dry contact is enabled.	Dry contact 6	Dry contacts 1–6

5.6.3.3 System Parameters Screen

- Parallel screen

Figure 5-27 Parallel screen

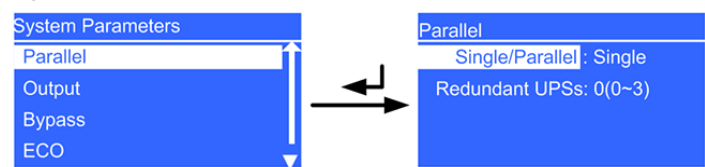
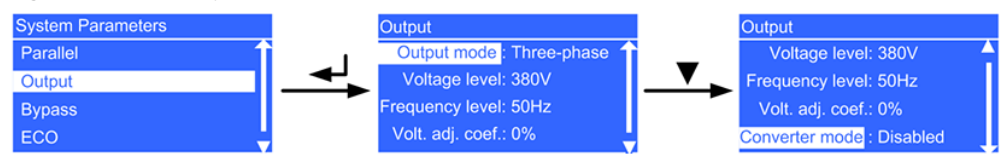


Table 5-18 Parallel settings

Item	Description	Default Value	Value Range
Single/Parallel	Specifies whether the UPS works in single mode or parallel mode. This parameter is configurable only after the inverter is shut down.	Single	Single, Parallel
Redundant UPSs	Set the number of redundant UPSs. This parameter is configurable only after the inverter is shut down.	0	0–3

- Output screen

Figure 5-28 Output screen



 NOTE

The UPS supports 208 V output. In the case of 208 V output, the power is derated to 90%. The cable connections and cable connections for 208 V and 200 V are similar.

Table 5-19 Output settings

Item	Description	Default Value	Value Range
Output mode	Set the system output mode. The input mode is identified automatically by the system. This parameter is configurable only after the inverter is shut down.	This parameter is not configurable for the 6 kVA/10 kVA models. The default value is Single-phase . 15 kVA/20 kVA: Three-phase	Single-phase, Three-phase
Voltage level	Indicates the system output voltage level. After you change the voltage level, the upper threshold for bypass voltage is restored to the default value (15% or 20%). This parameter is configurable only after the inverter is shut down.	6 kVA/10 kVA: 220 V 15 kVA/20 kVA single-phase output: 220 V 15 kVA/20 kVA three-phase output: 380 V	6 kVA/10 kVA: 208 V, 220 V, 230 V, 240 V 15 kVA/20 kVA single-phase output: 208 V, 220 V, 230 V, 240 V 15 kVA/20 kVA three-phase output: 380 V, 400 V, 415 V

Item	Description	Default Value	Value Range
Frequency level	Set the system output frequency level. If this parameter is set to Automatic , the system output frequency is 50 Hz when the power-on bypass frequency ranges from 40 Hz to 55 Hz, and the system output frequency is 60 Hz when the power-on bypass frequency ranges from 55 Hz to 70 Hz (excluding 55 Hz). This parameter is configurable only after the inverter is shut down.	50 Hz	50 Hz, 60 Hz, Automatic
Volt. adj. coef.	You can adjust the inverter rated output voltage. Press <cf id="Bold">+</cf> or <cf id="Bold">-</cf> to increase or decrease the output voltage.	0%	±5%, ±4%, ±3%, ±2%, ±1%, 0%
Converter mode	Specifies whether to enable converter mode. In converter mode, the output voltage and frequency are fixed to the preset values. This parameter is configurable only after the inverter is shut down. NOTICE In converter mode, the bypass output and the maintenance bypass are unavailable. If you shut down the inverter, the UPS stops supplying power to loads.	Disabled	Disabled, Enabled

- **Bypass** screen

Figure 5-29 Bypass screen

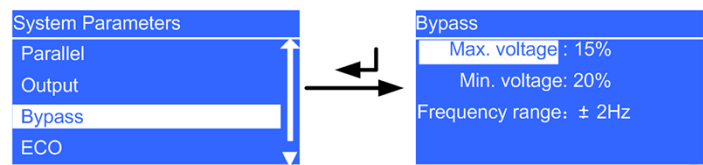


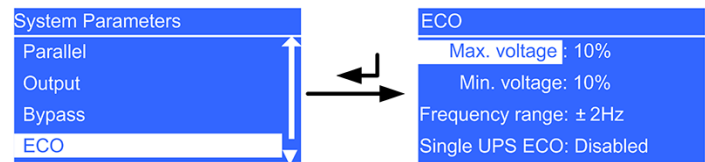
Table 5-20 Bypass settings

Item	Description	Default Value	Value Range
Max. voltage	Upper threshold for the bypass voltage. When 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. This parameter is configurable only after the inverter is shut down.	15%	208 V: 10%, 15%, 20%, 25%, 30% 220 V (380 V in the case of three-phase output): 10%, 15%, 20%, 25% 230 V (400 V in the case of three-phase output): 10%, 15%, 20% 240 V (415 V in the case of three-phase output): 10%, 15%
Min. voltage	Lower threshold for the bypass voltage. When the difference between the bypass voltage and the rated output voltage is greater than this value, the system determines that the bypass voltage is abnormal and that the bypass is unavailable. This parameter is configurable only after the inverter is shut down.	20%	10%, 20%, 30%, 40%, 50%, 60%

Item	Description	Default Value	Value Range
Frequency range	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 parameter is associated with the ECO frequency range and must be greater than the current ECO frequency range. This parameter is configurable only after the inverter is shut down.	±2 Hz	±0.5 Hz, ±1 Hz, ±2 Hz, ±3 Hz, ±4 Hz, ±5 Hz, ±6 Hz

- ECO screen

Figure 5-30 ECO screen



 NOTE

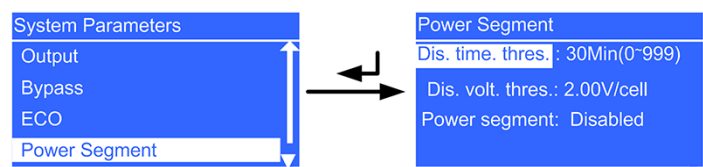
You can use the ECO function only if power grid conditions are good and the voltage and frequency fluctuation is within the specified ECO voltage and frequency range.

Table 5-21 ECO settings

Item	Description	Default Value	Value Range
Max. voltage	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. This parameter is configurable only after the inverter is shut down.	10%	5%, 6%, 7%, 8%, 9%, 10%
Min. voltage	Lower threshold for the ECO voltage. In ECO mode, when the difference between the bypass voltage and the rated voltage is lower than this value, the system determines that the ECO voltage is abnormal and transfers to normal mode. This parameter is configurable only after the inverter is shut down.	10%	5%, 6%, 7%, 8%, 9%, 10%
Frequency range	ECO frequency range. In ECO mode, when the difference between the bypass frequency and the rated frequency is beyond this range, the system determines that the ECO frequency is abnormal and transfers to normal mode. The Frequency range parameter is associated with the bypass frequency range and must be less than the current bypass frequency range. This parameter is configurable only after the inverter is shut down.	±2 Hz	±0.5 Hz, ±1 Hz, ±2 Hz, ±3 Hz
Single UPS ECO	Determine whether to support ECO mode on a single UPS (ECO mode is not supported in a parallel system).	Disabled	Disabled, Enabled

- **Power Segment** screen

Figure 5-31 Power Segment screen



NOTE

- In single UPS mode, sL connects to primary loads and pL connects to secondary loads.
- In single UPS mode, if the power segment function is enabled, pL is disconnected and sL continues to supply power when an overload occurs.
- In a parallel system, connect loads to the AC OUTPUT pL terminal.

Table 5-22 Power segment settings

Item	Description	Default Value	Value Range
Dis. time. thres.	pL terminal loading time in battery mode when power segment is enabled. In battery mode, if the discharge time exceeds this value, the system disconnects the loads connected to the pL terminal. (This function is not supported in a parallel system.) The parameter is configurable in non-battery mode or non-battery ECO mode. NOTE The 15 kVA/20 kVA UPS supports battery ECO mode only in the case of two power sources. 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.	30 min	0–999 min
Dis. volt. thres.	Lower threshold of the battery voltage when pL is allowed to carry loads in battery mode when the power segment function is enabled. In battery mode, if the battery voltage is less than this value, the system powers off the loads connected to the pL terminal. (This function is not supported in a parallel system.) The parameter is configurable in non-battery mode or non-battery ECO mode.	2.00 V/cell	1.90–2.25 V/cell

Item	Description	Default Value	Value Range
Power segment	Determine whether to enable the power segment function for a single UPS. (This function is not supported in a parallel system). This parameter is configurable only after the inverter is shut down.	Disabled	Disabled, Enabled

• Self-Load screen

Figure 5-32 Self-Load screen

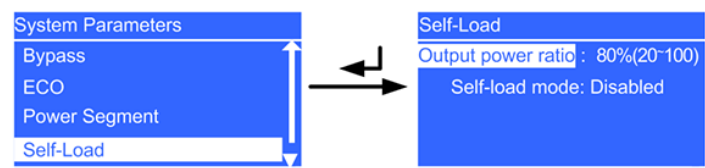
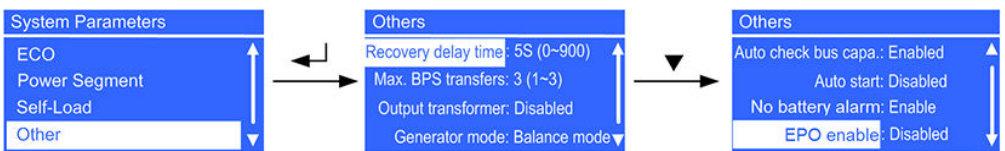


Table 5-23 Self-load settings

Item	Description	Default Value	Value Range
Output power ratio	This parameter is used only during the tests before shipment. This parameter is configurable only after the inverter is shut down.	80%	20%–100%
Self-load mode	This parameter is used only during the tests before shipment. This parameter is configurable only after the inverter is shut down.	Disabled	Disabled, Enabled

• Others screen

Figure 5-33 Others screen



NOTE

The EPO enable setting is available only for the UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01. EPO is enabled for the UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL by default.

Table 5-24 Other settings

Item	Description	Default Value	Value Range
Recovery delay time	Delay time that the UPS takes in transferring from battery mode to normal mode when the mains recovers This parameter is configurable only after the inverter is shut down. NOTE If Recovery delay time(s) is set to 0S, the actual recovery delay time is 1 second.	5s	0-900s
Maximum bypass transfer times	Maximum number of bypass transfers within 30 minutes When the number of bypass transfers exceeds this value, the UPS keeps running in bypass mode (in ECO mode, the UPS keeps running in inverter mode). This parameter is configurable only after the inverter is shut down. NOTICE Do not set the UPS to ECO mode when the UPS connects to an isolated transformer.	3	1-3
Output transformer	If an output transformer is connected, set the parameter to Enabled; otherwise, set it to Disabled. This parameter is configurable only after the inverter is shut down. NOTE When connecting an isolation transformer to the system output, connect the UPS output load to the pL terminal and disable the power segment function.	Disabled	Disabled, Enabled
Generator mode	If the mains input voltage quality is good, Weak adaptability mode is recommended. If the mains input voltage is of average quality (for example, a high-performance generator or a common power grid is connected), Balance mode is recommended. If the mains input voltage quality is poor (for example, a common generator is connected), Strong adaptability mode is recommended. This parameter is configurable only after the inverter is shut down.	Balance mode	Weak adaptability mode, Balance mode, Strong adaptability mode

Item	Description	Default Value	Value Range
Auto check bus capa.	Specifies whether to automatically check the bus capacitance upon power-on and generate capacitance failure warnings. If the value is set to Enabled , the UPS startup time takes additional 30 seconds to 180 seconds. This parameter is configurable only after the inverter is shut down. Note: This parameter is configurable only for the 15 kVA/20 kVA UPS.	Enabled	Disabled, Enabled
Auto start	Specifies whether to automatically start normal mode after the UPS connects to the mains. This parameter is configurable only after the inverter is shut down.	Disabled	Disabled, Enabled
No battery alarm	If this parameter is set to Disable , the No battery alarm is not reported. This parameter automatically changes to Enable after batteries are connected. This parameter is configurable only when batteries are not connected. NOTE If batteries are connected and you try to set this parameter, the system displays a message indicating that batteries are connected and this parameter cannot be set.	Enabled	Disabled, Enabled
EPO enable	Specifies whether to enable EPO. EPO is performed only when this parameter is set to Enable and the EPO switch is triggered. This parameter is configurable only for the UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01.	Disabled	Disabled, Enabled

5.6.3.4 Setting Battery Parameters

CAUTION

The configured number of batteries on the LCD must match the actual number. When the actual number changes, update 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 6 kVA/10 kVA UPSs cannot share battery strings.
- When a 15 kVA/20 kVA UPS parallel system shares a battery string, set the same battery string capacity and charge current for each UPS.
- Battery capacity setting (Ah) = (Capacity of a single battery string x Number of parallel battery strings)/Number of parallel UPSs sharing the battery strings
Capacity of a single battery string refers to the capacity of a single battery pack in the battery pack scenario, and the capacity of a single battery in the external battery scenario. Number of parallel battery strings is the number of battery strings connected in parallel. For example, if three strings containing a total of six 9 Ah battery packs are connected in parallel to two 20 kVA UPSs, the battery capacity is 13 Ah (rounded value): $13.5 \text{ Ah} = (9 \text{ Ah} \times 3)/2$.
- If battery packs are used for power backup, the charge current can be set in the range of 0C to 0.1C. Maximum charge current setting (A) of parallel battery packs = $(0.1 \times \text{Capacity of a single battery string} \times \text{Number of parallel battery strings})/\text{Number of parallel UPSs sharing the battery strings}$. If the calculated maximum charge current is less than 1 A, set it to 1 A. If the maximum charge current calculated is greater than 4 A, set it to 4 A.
- If external batteries connected in series instead of battery packs are used, the charge current can be set in the range of 0C to 0.15C. Use two UPSs sharing a 65 Ah battery string as an example. If the calculated battery capacity is $(65 \times 1)/2 = 32.5$, set it to 32 Ah (rounded value). If the calculated maximum current is $(0.1 \times 65 \times 1)/2 = 3.25$, set it to 3.2 A.
- When a single 6 kVA /10 kVA UPS contains one battery pack, the maximum charge current must be less than or equal to 1.0 A.
- When a single 15 kVA/20 kVA UPS contains two battery packs, the maximum charge current must be less than or equal to 1.0 A.

- **Basic screen**

Figure 5-34 Basic screen (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)

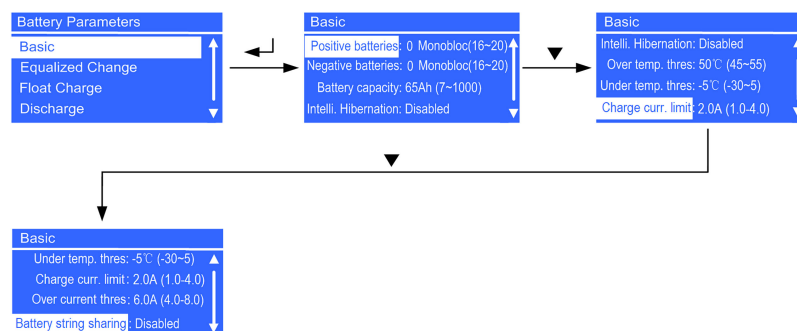


Table 5-25 Basic screen (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)

Item	Description	Default Value	Value Range
Positive (Negative) batteries	Set the number of batteries. When the number of batteries N is less than 20, the system output power is derated by $N/20$ in battery mode. The parameter is configurable in non-battery mode or non-battery ECO mode.	0	16–20
Battery capacity	Set the battery capacity. This parameter indicates 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.	65 Ah	7–1000 Ah
Intelli. Hibernation	When it is set to Enabled , the intelligent battery hibernation function is enabled. The parameter is configurable in any mode.	Disabled	Disabled, Enabled
Over temp. thres.	Specifies an alarm threshold for battery overtemperature. The parameter is configurable in any mode.	50°C	45–55°C
Under temp. thres.	Specifies an alarm threshold for battery undertemperature. The parameter is configurable in any mode.	–5°C	–30°C to +5°C
Charge curr. limit	Specifies the charge current limit. The parameter is configurable in any mode.	2.0 A	1.0–4.0 A
Over current thres.	Set an alarm threshold for battery overcurrent. The parameter is configurable in any mode.	6.0 A	4.0–8.0 A
Battery string sharing	Specify whether battery string sharing is supported in a parallel system.	Disabled	Disabled, Enabled

 NOTE

The battery sharing setting is available only for the UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01. Battery sharing is enabled for the UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL by default.

Figure 5-35 Basic screen (UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL)

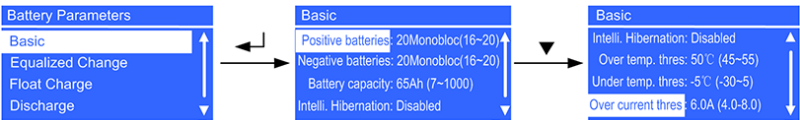


Table 5-26 Basic screen (UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL)

Item	Description	Default Value	Value Range
Positive (Negative) batteries	Set the number of batteries. When the number of batteries <i>N</i> is less than 20, the system output power is derated by <i>N</i> /20 in battery mode. The parameter is configurable in non-battery mode or non-battery ECO mode. You need to set the number of batteries on the UPS2000-G-6 kVA/10 kVA, and set two battery strings (positive and negative) on the UPS2000-G-15 kVA/20 kVA.	0	16~20
Battery capacity	Set the battery capacity. This parameter indicates 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.	6 kVA standard backup time model: 7 Ah 6 kVA long backup time model: 40 Ah 10 kVA standard backup time model: 9 Ah 10 kVA long backup time model: 65 Ah 15 kVA/20 kVA long backup time model: 65 Ah	7~1000 Ah

Item	Description	Default Value	Value Range
Intelli. Hibernatio n	When it is set to Enabled , the intelligent battery hibernation function is enabled. The parameter is configurable in any mode.	Disabled	Disabled, Enabled
Over temp. thres.	Specifies an alarm threshold for battery overtemperature. The parameter is configurable in any mode.	50°C	45–55°C
Under temp. thres.	Specifies an alarm threshold for battery undertemperature. The parameter is configurable in any mode.	–5°C	–30°C to +5°C
Over current thres.	Set an alarm threshold for battery overcurrent. The parameter is configurable in any mode. Note: The overcurrent alarm threshold can be set only for the UPS2000-G-15 kVA/20 kVA.	Standard backup time model: 3.0 A Long backup time model: 6.0 A	Standard backup time model: 2.0–4.0 A Long backup time model: 4.0–8.0 A

- Equalized Charge

Figure 5-36 Equalized Charge screen (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)

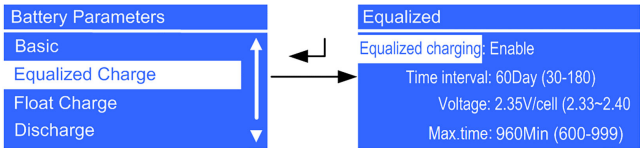


Table 5-27 Equalized Charge screen (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)

Item	Description	Default Value	Value Range
Equalized charging	Specifies whether to enable battery equalized charging. The parameter is configurable in any mode.	Enabled	Disabled, Enabled
Time interval	Set the interval for equalized charging. The parameter is configurable in any mode.	60 days	30–180 days

Item	Description	Default Value	Value Range
Voltage	Specifies the battery equalized charging voltage. The parameter is configurable in any mode.	2.35 V/cell	2.33–2.40 V/cell
Max. time	Specifies the maximum equalized charging time. The parameter is configurable in any mode.	960 minutes	600–999 minutes

Figure 5-37 Equalized Charge screen (UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL)

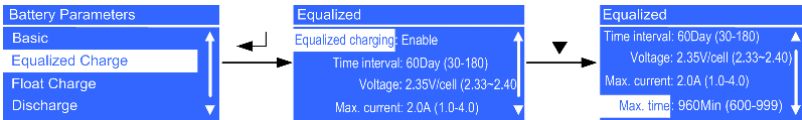


Table 5-28 Equalized Charge screen (UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL)

Item	Description	Default Value	Value Range
Equalized charging	Specifies whether to enable battery equalized charging. The parameter is configurable in any mode.	Enabled	Disabled, Enabled
Time interval	Set the interval for equalized charging. The parameter is configurable in any mode.	60 days	30–180 days
Voltage	Specifies the battery equalized charging voltage. The parameter is configurable in any mode.	2.35 V/cell	2.33–2.40 V/cell
Max. current	Set the maximum equalized charging current. The parameter is configurable in any mode.	2.0 A	Standard backup time model: 1.0–2.0 A Long backup time model: 1.0–4.0 A
Max. time	Specifies the maximum equalized charging time. The parameter is configurable in any mode.	960 minutes	600–999 minutes

- Float Charge

Figure 5-38 Float Charge screen

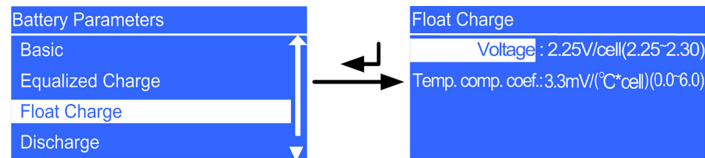


Table 5-29 Float Charge screen

Item	Description	Default Value	Value Range
Voltage	Specifies the battery float charging voltage. The parameter is configurable in any mode.	2.25 V/cell	2.25–2.30 V/cell
Temp. comp. coef.	Specifies the coefficient for correcting the float charging voltage based on the battery temperature when a battery temperature sensor is connected. The parameter is configurable in any mode.	3.3 mV/(°C x cell)	0.0–6.0 mV/(°C x cell)

- Discharge screen

Figure 5-39 Discharge screen (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)

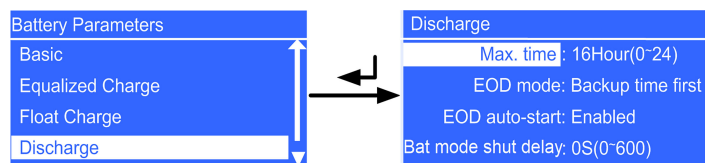


Table 5-30 Discharge screen (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)

Item	Description	Default Value	Value Range
Max. time	Specifies the maximum discharge time. When the discharge time reaches this value, the system powers off. If this parameter is set to 0, 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 the parameter to 0Hour. Otherwise, the system may power off. - If you set the parameter to 0Hour, the battery may remain in the small-current discharge state according to the proportion of the battery capacity to the load power, which affects the battery lifespan.	16 hours	0–24 hours
EOD mode	Determine the power backup time. The parameter is configurable in non-battery mode or non-battery ECO mode. Backup time first: The system runtime is preferentially ensured to prolong the running of key services and the backup time is long. Batt. protect first: Batteries are protected first to prolong the battery lifespan.	Backup time first	Backup power first, Batt. protect first, Balance mode
EOD auto-start	Determine whether to automatically start inverter output after the mains becomes normal after EOD. This parameter is configurable only after the inverter is shut down.	Enabled	Disabled, Enabled

Item	Description	Default Value	Value Range
Bat mode shut delay	After the UPS transfers to battery mode, the UPS shuts down when the time reaches the value of this parameter. If this parameter 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 of battery mode. Otherwise, the power supply to loads may be disconnected. The parameter is configurable in non-battery mode or non-battery ECO mode. NOTE • If the mains input and bypass input use the same power source, the system powers off when the shutdown delay in battery mode reaches the preset value. If the mains input and bypass input use different power sources, the system transfers to bypass mode when the shutdown delay in battery mode reaches the preset value. • The Bat mode shut delay parameter is not synchronized in a parallel system. In a parallel system, set this parameter to the same value for different UPSs.	0s	0–600s The value interval is 30s. For example, the value can be 0s, 30s, 60s, and 90s.

Figure 5-40 Discharge Parameters screen (UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL)

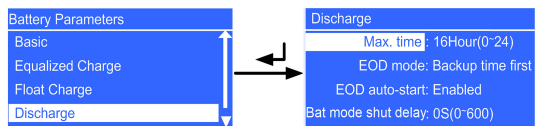


Table 5-31 Discharge Parameters screen (UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL)

Item	Description	Default Value	Value Range
Max. time	Specifies the maximum discharge time. When the discharge time reaches this value, the system powers off. If this parameter is set to 0, 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 the parameter to <cf id="Bold">0Hour</cf>. Otherwise, the system may power off. - If you set the parameter to 0Hour, the battery may remain in the small-current discharge state according to the proportion of the battery capacity to the load power, which affects the battery lifespan.	16 hours	0–24 hours
EOD mode	Determine the power backup time. The parameter is configurable in non-battery mode or non-battery ECO mode. Backup time first: The system runtime is preferentially ensured to prolong the running of key services and the backup time is long. Batt. protect first: Batteries are protected first to prolong the battery lifespan.	Backup time first	Backup power first, Batt. protect first, Balance mode

Item	Description	Default Value	Value Range
EOD auto - start	Determine whether to automatically start inverter output after the mains becomes normal after EOD. This parameter is configurable only after the inverter is shut down.	Enabled	Disabled, Enabled
Shut down delay	After the UPS transfers to battery mode, the UPS shuts down when the time reaches the value of this parameter. If this parameter 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 of battery mode. Otherwise, the power supply to loads may be disconnected. The parameter is configurable in non-battery mode or non-battery ECO mode. NOTE - If the mains input and bypass input use the same power source, the system powers off when the shutdown delay in battery mode reaches the preset value. If the mains input and bypass input use different power sources, the system transfers to bypass mode when the shutdown delay in battery mode reaches the preset value. - The Bat mode shut delay parameter is not synchronized in a parallel system. In a parallel system, set this parameter to the same value for different UPSs.	0s	0–600s The value interval is 30s. For example, the value can be 0s, 30s, 60s, and 90s.

Table 5-32 EOD settings – backup time first

Expected Backup Time	≤ 0.1 CA	0.1CA–0.5CA	0.5CA–1CA	1CA–3CA	> 3 CA
Low voltage warning threshold (V/cell)	1.85	1.85	1.85	1.85	1.85
EOD threshold (V/cell)	1.75	1.67	1.60	1.60	1.60

Table 5-33 EOD settings – batt. protect first

Expected Backup Time	≤ 0.1 CA	0.1CA–0.5CA	0.5CA–1CA	1CA–3CA	> 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 5-34 EOD settings – balanced mode

Expected Backup Time	≤ 0.1 CA	0.1CA–0.5CA	0.5CA–1CA	1CA–3CA	> 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

- **Shallow Discharge** screen

Figure 5-41 Shallow Discharge screen (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)

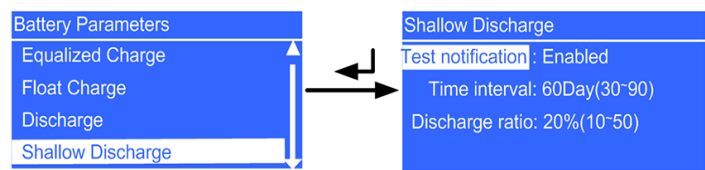


Table 5-35 Shallow Discharge screen (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)

Item	Description	Default Value	Value Range
Timed shallow discharge test	Specifies whether to enable the scheduled shallow discharge test. If this parameter is set to Enable , the system automatically performs a shallow discharge test when the test interval arrives and the system meets the shallow discharge conditions. The parameter is configurable in any mode.	Disabled	Disabled, Enabled
Time interval	Set the interval for shallow discharge tests. The parameter is configurable in any mode.	60 days	30–90 days
Discharge ratio	Specifies the proportion of the discharge capacity to the total discharge capacity. The parameter is configurable in any mode.	20%	10%–50%

Figure 5-42 Shallow Discharge screen (UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL)

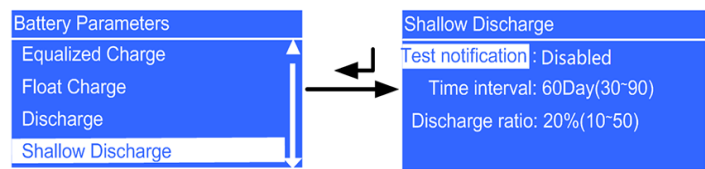


Table 5-36 Shallow Discharge screen (UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL)

Item	Description	Default Value	Value Range
Test notification	Specifies whether to periodically send shallow discharge notifications. The options are Disabled and Enabled . The default value is Disabled . If the value is set to Enabled , the system sends shallow discharge test notifications at specified intervals. The parameter is configurable in any mode.	Disabled	Disabled, Enabled
Time interval	Specifies the time interval for shallow discharge tests. The parameter is configurable in any mode.	60 days	30–90 days
Discharge ratio	Specifies the proportion of the discharge capacity to the total discharge capacity. The parameter is configurable in any mode.	20%	10%–50%

5.6.3.5 Restoring Factory Settings

You can restore factory settings after the inverter shuts down.

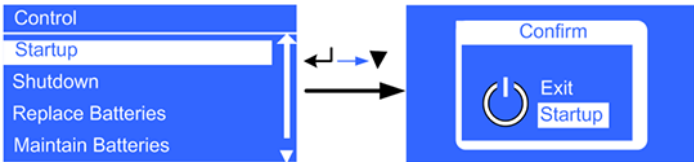
5.6.4 Control

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

Startup

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

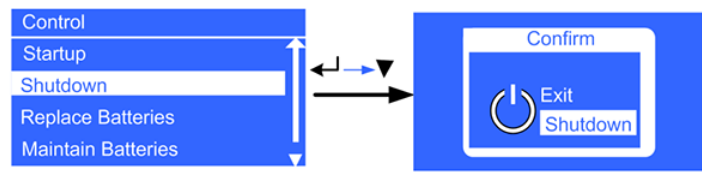
Figure 5-43 Startup screen



Shutdown

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

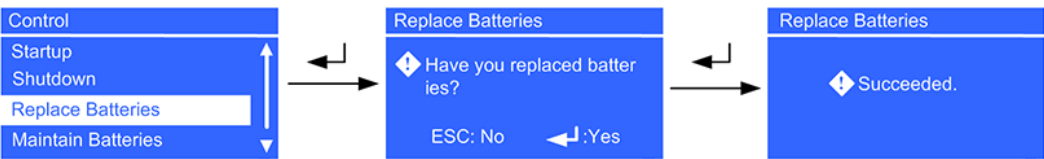
Figure 5-44 Shutdown screen



Replace Batteries

If the batteries have been replaced for the system, set this parameter. The parameter is configurable in non-battery inverter mode or non-battery ECO mode.

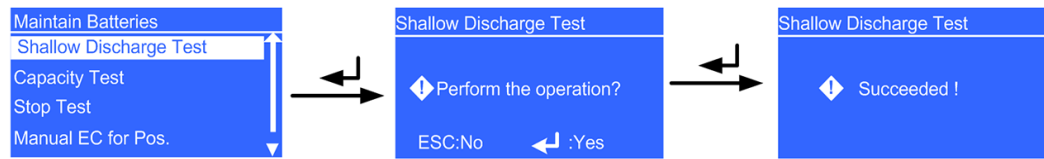
Figure 5-45 Replace Batteries screen



Maintain Batteries

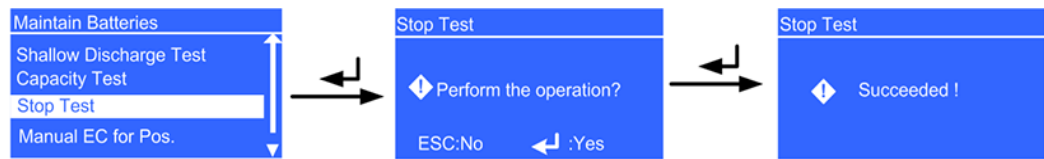
- Shallow Discharge Test

Figure 5-46 Shallow Discharge Test screen



- Capacity Test
After you completely discharge batteries, the load rate must be in the range of 0%–100%.
- Stop Test

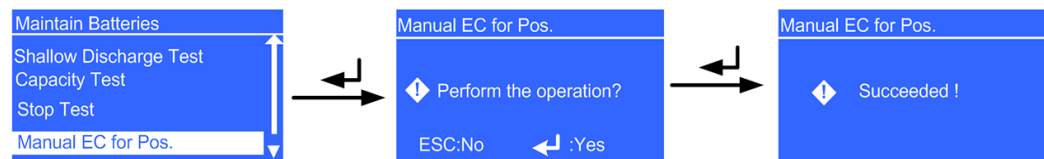
Figure 5-47 Stop Test screen



This item allows you to stop the shallow discharge test or capacity test.

- Manual EC for Pos.

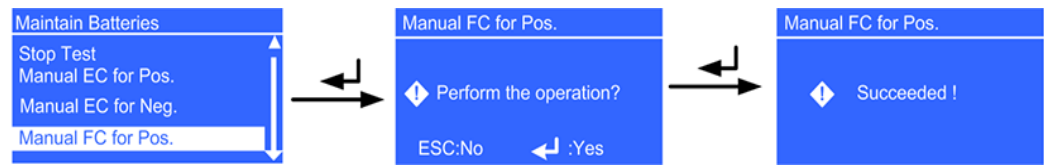
Figure 5-48 Manual EC for Pos. screen



This item allows you to perform equalized charging on batteries forcibly. For the 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.

Figure 5-49 Manual FC for Pos. screen

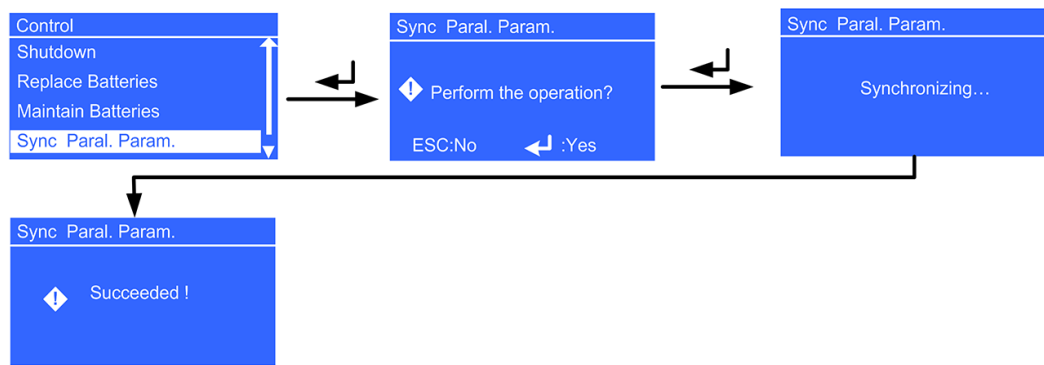


This item allows you to perform float charging on batteries forcibly. For the 6 kVA and 10 kVA UPSs, perform manual float charging. For the 15 kVA and 20 kVA UPSs, batteries in positive and negative groups are manually switched to float charging respectively.

Sync Paral. Param.

Synchronize parallel parameters. This item allows you to synchronize parameters of the local UPS to the other UPS in the parallel system. The UPS running in inverter output state cannot be synchronized.

Figure 5-50 Sync Paral. Param. screen



Resetting the Password

Enter a feature code to restore the preset password.

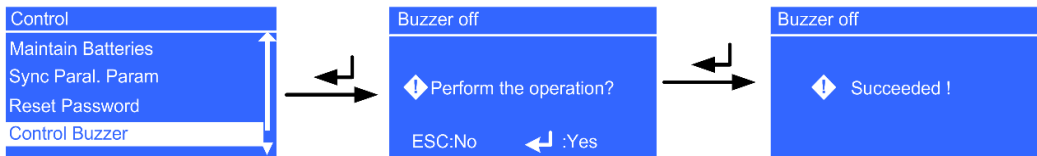
Figure 5-51 Resetting the password



Control Buzzer

If the buzzer is on, you can tap **Control Buzzer** and confirm **Buzzer off** to turn it off.

Figure 5-52 Buzzer off screen

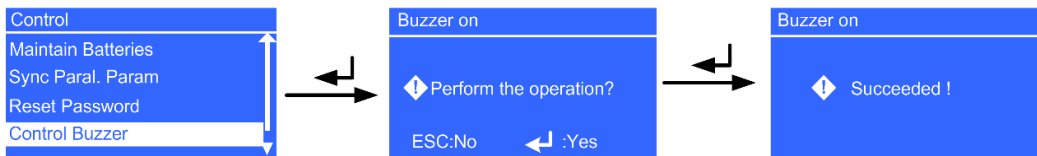


NOTE

If **Control Buzzer** is used to mute the alarm sound, use it to enable the alarm sound later. Otherwise, if a new alarm is generated, there is no alarm sound. If the UPS is shut down and powered on again, the buzzer is turned on again.

If the buzzer is off, you can tap **Control Buzzer** and confirm **Buzzer on** to turn it on.

Figure 5-53 Buzzer on screen



5.6.5 About

On the **Main Menu** screen, select **About**, and press . The **About** screen is displayed, as shown in [Figure 5-54](#).

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

Figure 5-54 About screen



NOTE

MU1MSW1, PU1RSW1, PU1RSW2, PU1ISW1, and PU1ISW2 are the software versions for the component. When the component does not exist, **N/A** is displayed. PU1ISW1 and PU1ISW2 are not available for the 6 kVA and 10 kVA models.

Table 5-37 About screen

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

6 Operations

6.1 Check Before Power-On

- AC power cable colors comply with local regulations.
- The input and output are not short-circuited.
- Cables and terminals are securely connected.
- Battery cables and terminals are correctly connected, and voltages comply with industry standards.
- The UPSs are properly connected to battery strings.
- Input circuit breakers and load circuit breakers are OFF.
- Power cables and signal cables are correctly identified.
- The phase sequence of the input power is correct.
- Cables are neatly routed and securely bound according to requirements.
- The equipment is installed and cables are routed in ways that facilitate modification, capacity expansion, and maintenance.
- Parallel cables in a parallel system are properly connected.
- Devices are properly grounded.
- The environment complies with the requirements. The torque of the installation tool is correct.
- The voltage difference between the neutral wire and the ground cable is less than 5 V AC.
- The mains input voltage ranges from 120 V AC to 280 V AC (after the UPS is powered on, the mains input voltage ranges from 80 V AC to 280 V AC). The battery voltage range is as follows: (Number of batteries x 10.8 V DC) to 280 V DC.

6.2 Lead-Acid Battery Scenario

6.2.1 Single UPS Operations

This section describes operations on a single 15 kVA/20 kVA UPS.

6.2.1.1 Installing Cables

6.2.1.1.1 Installing Cables

Context

This section describes operations on a single 15 kVA/20 kVA UPS.

Procedure

Step 1 Connect the power cables to the corresponding ports on the UPS.

Figure 6-1 Three-phase input, three-phase output, one power source (factory settings)

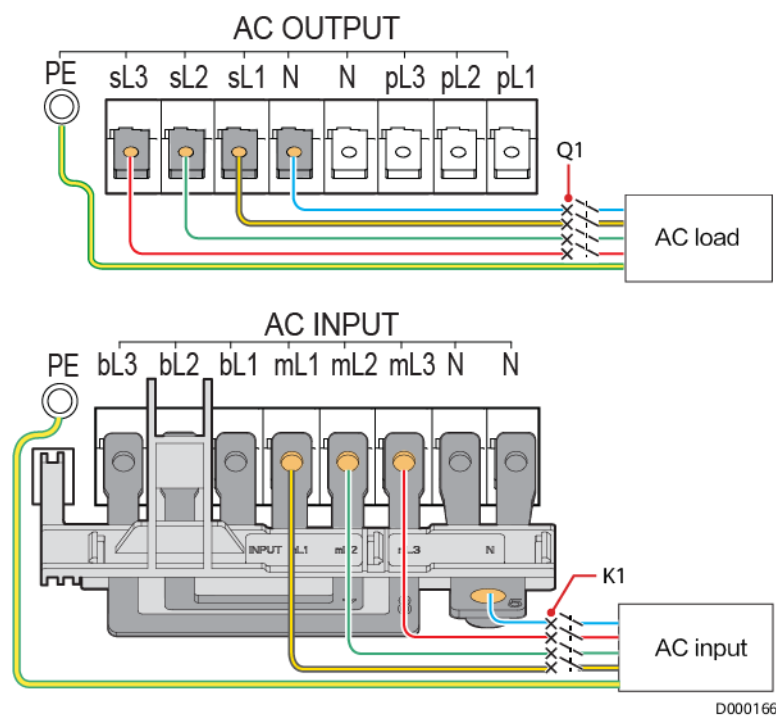
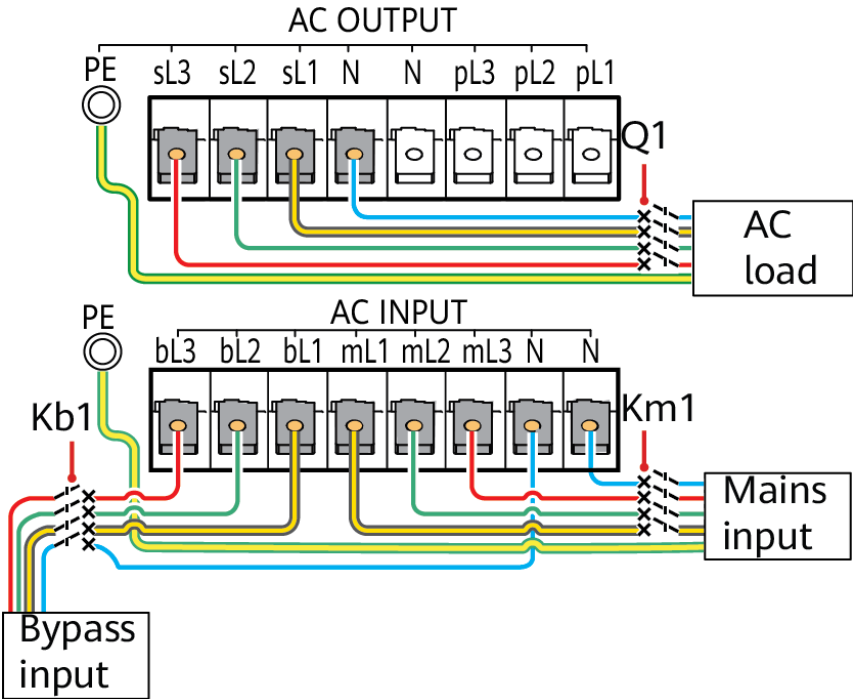


Figure 6-2 Three-phase input, three-phase output, two power sources



UG080E9971

Figure 6-3 Three-phase input, single-phase output, one power source

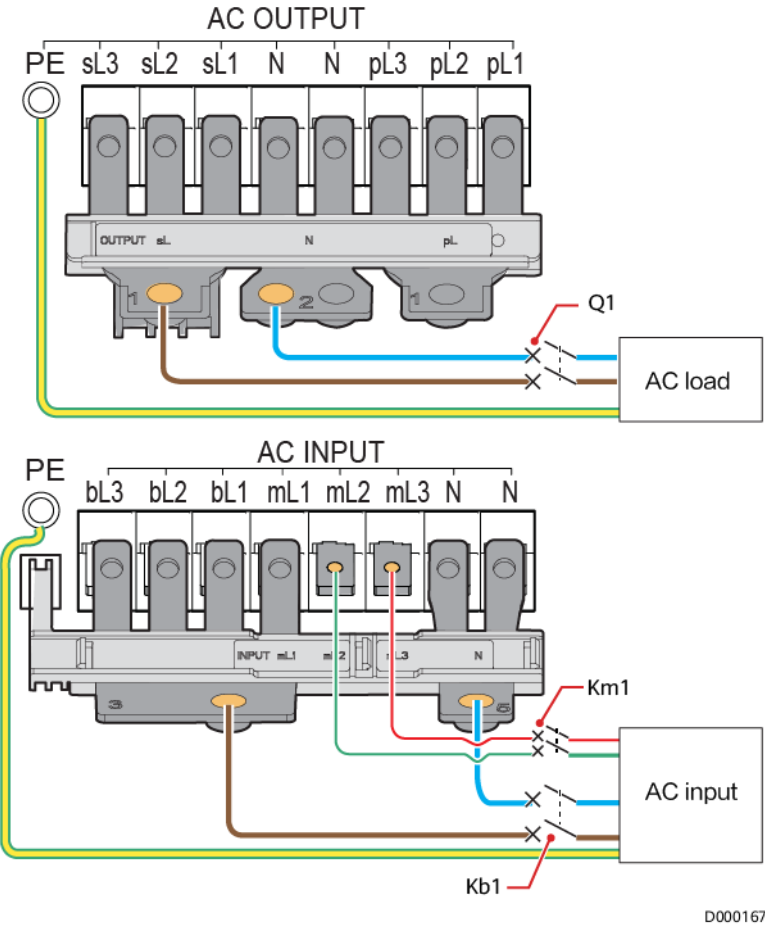
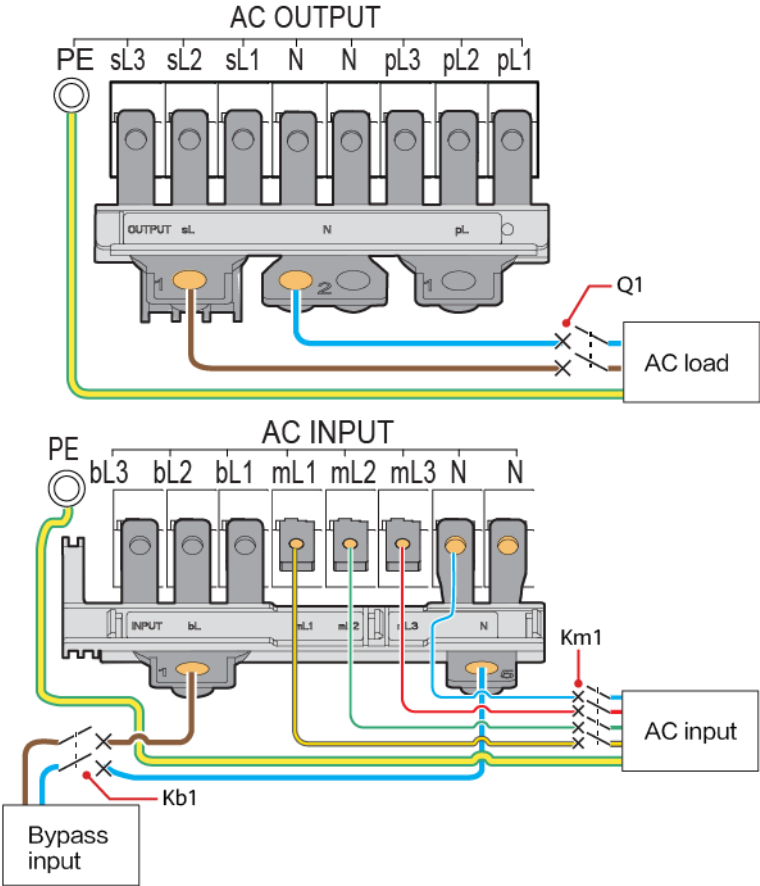


Figure 6-4 Three-phase input, single-phase output, two power sources



D000164

Figure 6-5 Single-phase input, single-phase output, one power source

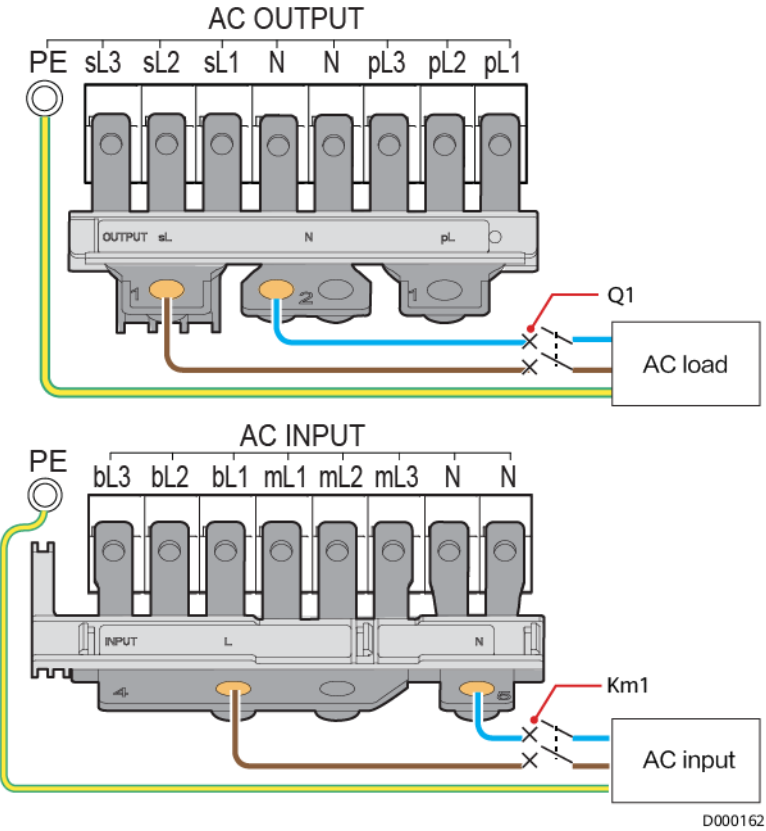
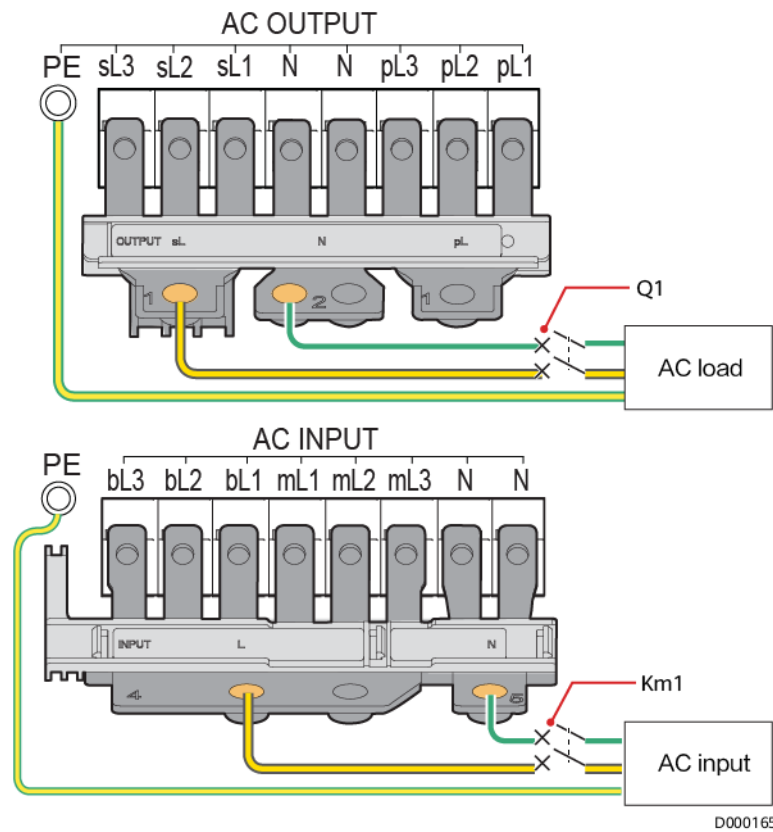


Figure 6-6 Dual-live-wire input, dual-live-wire output, one power source



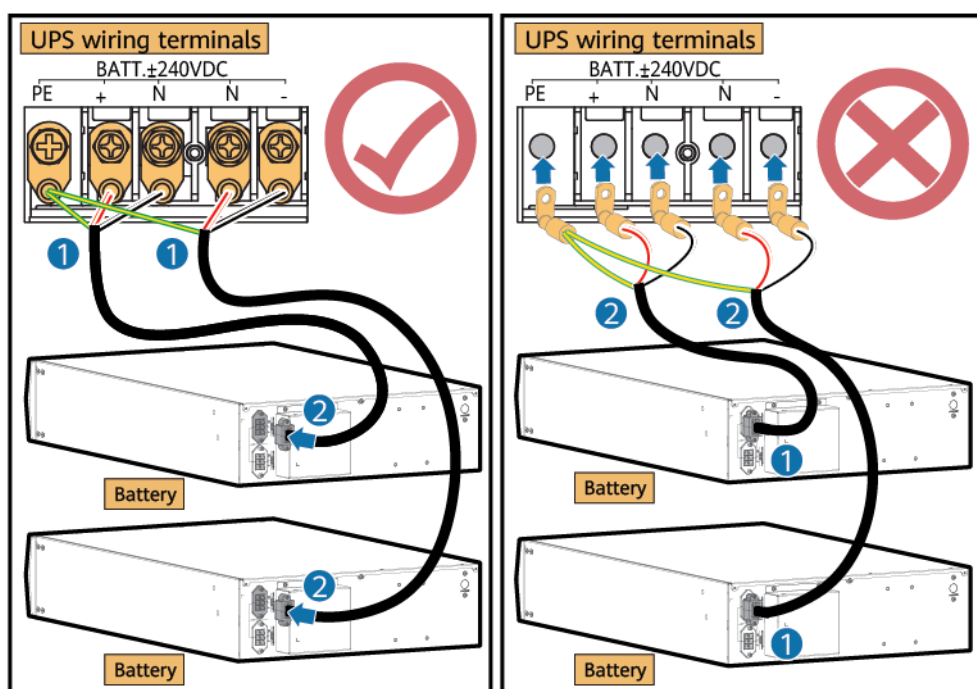
----End

6.2.1.1.2 Installing DC Power Cables

Precautions

NOTICE

- It is recommended that switches be installed for battery cables. Customers need to purchase switches by themselves. For details about the battery circuit breaker specifications, see [4.1.3 Power Cables](#).
- Install battery cables in the following sequence: 1. Install cables at the battery terminals on the UPS side. 2. Install cables at the battery terminals on the battery side.



UG13W10003

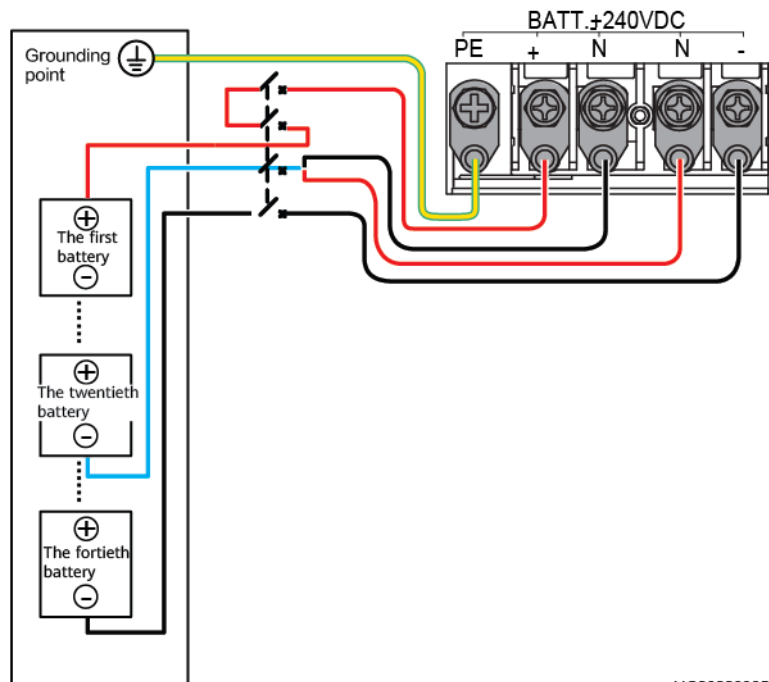
Procedure

1. Install battery cables.
 - External battery strings

NOTICE

1. The UPS2000-G-15KRTL/20KRTL can connect to an external battery string (40 batteries in the standard configuration, and an even number of 32 to 40 batteries are supported). The neutral wire is connected to the middle point of the battery string. For example, if there are 40 batteries, the neutral wire is connected to the negative terminal of the twentieth battery.
2. When an external battery string is connected, install a DC circuit breaker (63 A, 600 V DC) between the battery string and the UPS.
3. When an external battery string is connected, connect positive terminals in series by using the two poles of the DC circuit breaker.
4. Connect the 15 kVA/20 kVA UPS batteries to the UPS battery ports. One UPS battery port can have only one OT terminal installed. After connecting cables, install the UPS battery port cover.

Figure 6-7 Installing battery cables



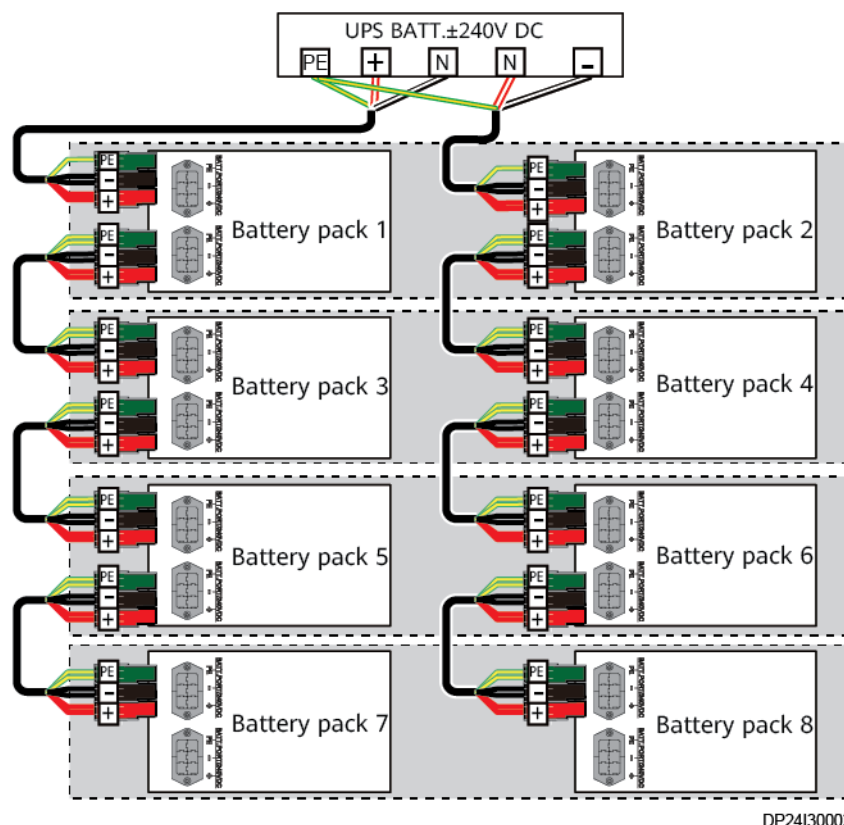
UG08009985

- External battery packs

NOTICE

1. A 15 kVA/20 kVA long backup time UPS requires serial connection of two battery packs in each group. A maximum of four groups with eight battery packs can be connected in parallel. If more than two battery packs need to be connected to the 15 kVA/20 kVA UPS with long backup time, the battery packs should be connected in parallel and then connected to the battery input ports of the UPS, as shown in the following figure. Connect battery packs 1 and 2 in series, battery packs 3 and 4 in series, battery packs 5 and 6 in series, and battery packs 7 and 8 in series. Connect battery packs 1, 3, 5, and 7 in parallel and battery packs 2, 4, 6, and 8 in parallel.
 2. When battery packs are connected in series or parallel, only battery packs of the same model and specifications can be installed or replaced. Do not use battery packs of different models or specifications together. For details, see the battery pack nameplate.
 3. Connect the 15 kVA/20 kVA UPS batteries to the UPS battery ports. One UPS battery port can have only one OT terminal installed. After connecting cables, install the UPS battery port cover.
 4. For more information, see *ESS-240V12-(9AhBPVBA, 7AhBPVBA) Quick Installation Guide* and *ESS-240V12-(9AhBPVBA04, 7AhBPVBA04) Battery Pack Quick Guide*.
-

Figure 6-8 Installing battery cables



DP24I30002

6.2.1.2 Starting the UPS

CAUTION

The configured number of batteries on the LCD 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 occur and cause a fire.

NOTICE

- If the system uses three-phase input three-phase output, set **Output mode** to **Three-phase**. If the system uses three-phase input single-phase output or single-phase input single-phase output, set **Output mode** to **Single-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 inverter mode or non-battery ECO mode.
- Set **Positive batteries** and **Negative batteries**. The value ranges from 16 to 20. The default value is 0.
- 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.
- 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.

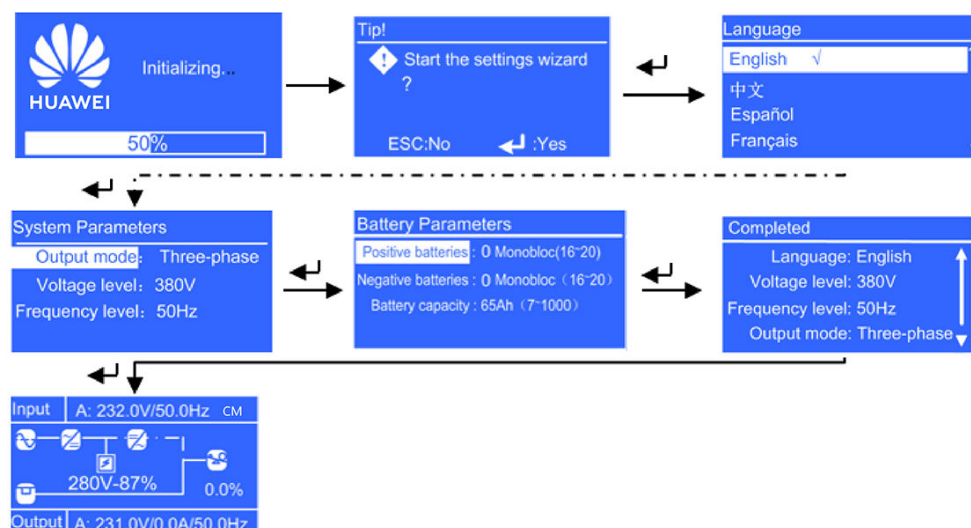
Starting the UPS in Normal Mode

- Step 1** Before powering on the UPS, ensure that the UPS has passed all check items in [6.1 Check Before Power-On](#).
- Step 2** Switch on the external battery circuit breaker (if any) or connect battery cables.
- Step 3** Switch on the UPS mains and bypass AC input circuit breakers K_m1 and K_b1 . The initialization screen is displayed.

NOTE

The operations in [Step 3](#) are performed when the mains input and bypass input use different power sources. When they use the same power source, you only need to switch on the UPS AC input circuit breaker.

- Step 4** 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. After you complete the settings, press . The standby screen is displayed.



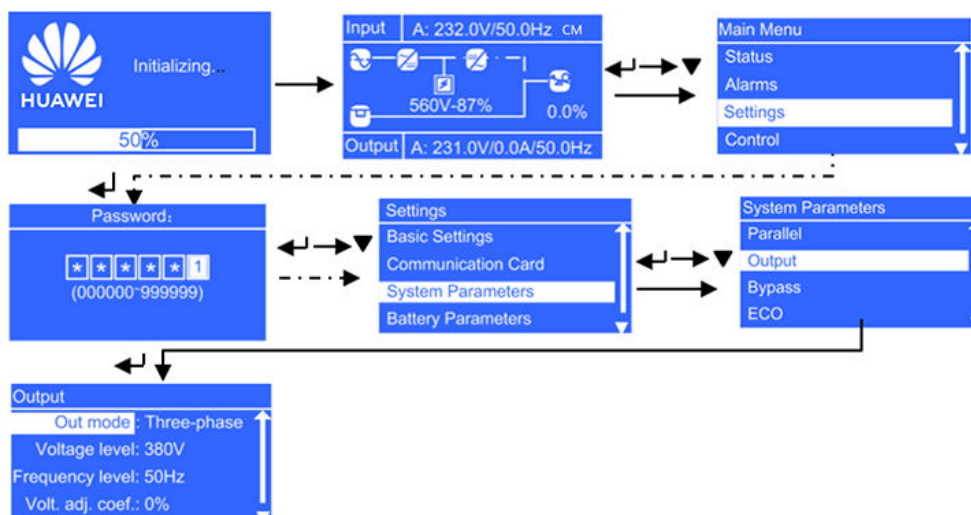
NOTE

Complete the quick settings based on the actual situation. If the quick settings are not complete, the quick settings dialog box will be displayed in subsequent startup.

• 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 three-phase output, set **Output mode** to **Three-phase**; if the system uses three-phase input single-phase output or single-phase input single-phase output, set **Output mode** to **Single-phase**. Set **Voltage level** and **Frequency level** based on the rated voltage and frequency. Press **ESC** to return to the standby screen.

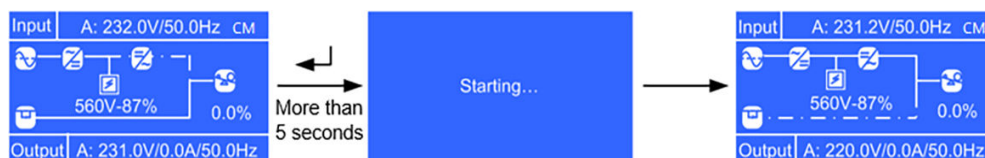
Figure 6-9 Non-initial startup



Step 5 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.

Figure 6-10 Startup operations



- 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 5](#) are called "startup operations" in this section.

- Step 6** After you ensure that the UPS runs properly, switch on the AC output circuit breaker Q1 of the UPS to start loads.

 NOTE

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

----End

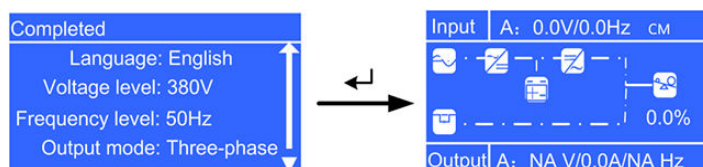
Starting the UPS in Battery Mode

- Step 1** Switch on the external battery circuit breaker (if any) or connect battery cables.

- Step 2** Press  on the control panel. The LCD starts. The initialization screen is displayed.

- Initial startup**
On the **Settings wizard** screen, set the language (the preset language is English), system parameters, and battery parameters. After you complete the settings, press . The standby screen is displayed.

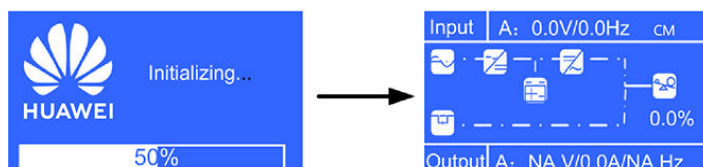
Figure 6-11 Standby screen displayed after initial startup



- 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 three-phase output, set **Output mode** to

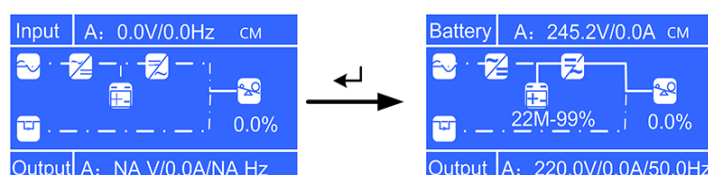
Three-phase; if the system uses three-phase input single-phase output or single-phase input single-phase output, set **Output mode** to **Single-phase**. Set **Voltage level** and **Frequency level** based on the rated voltage and frequency. Press **ESC** to return to the standby screen.

Figure 6-12 Standby screen displayed after non-initial startup



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

Figure 6-13 Battery mode



Step 4 After you ensure that the UPS runs properly, switch on the AC output circuit breaker Q1 of the UPS to start loads.

NOTE

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

----End

6.2.1.3 Shutting Down the UPS

Shutting Down the Inverter to Transfer the UPS to Bypass Mode

Shut down the UPS using either of the following methods:

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

NOTE

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

Shutting Down the Inverter to Transfer the UPS to the No Output State

Step 1 Shut down loads.

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

Step 3 Switch off the mains AC input circuit breaker K_m1 , bypass AC input circuit breaker K_b1 , and output circuit breaker $Q1$ of the UPS. After all indicators turn off and fans stop, the UPS shuts down, and the loads power off.

 NOTE

The operation in **Step 3** is performed when the mains input and bypass input use different power sources. When they use the same power source, you only need to switch off the UPS AC input circuit breaker.

Step 4 Switch off the external battery circuit breaker (if any) or disconnect battery cables.

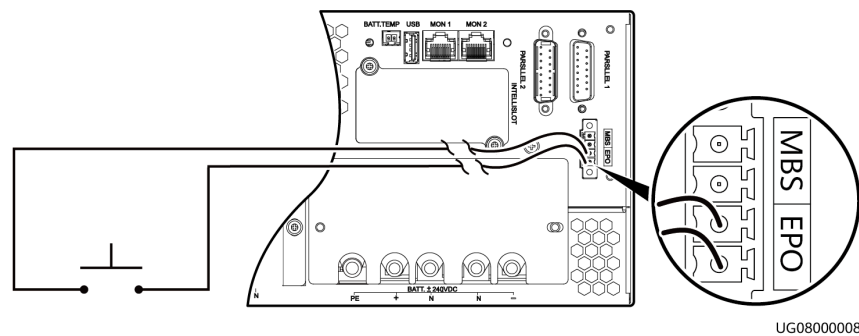
-----End

6.2.1.4 Performing EPO

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

Figure 6-14 shows the EPO cable connection on a single UPS.

Figure 6-14 EPO cable connection on a single UPS



 NOTE

- For UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01, choose **Settings > System Parameters > Other Settings** and set **EPO Enable** to **Enable**.
- 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.

6.2.2 Parallel System Operations

6.2.2.1 Installing Cables

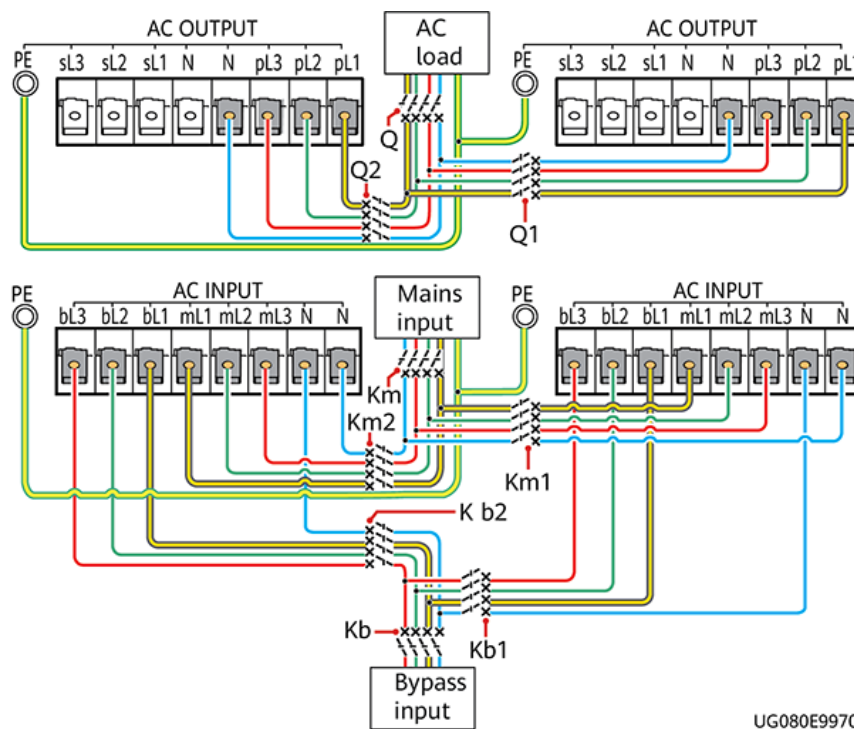
Context

This section uses 15 kVA/20 kVA UPSs (three-phase input three-phase output, two power sources, without a PDU) as an example to describe how to connect two UPSs in parallel.

Procedure

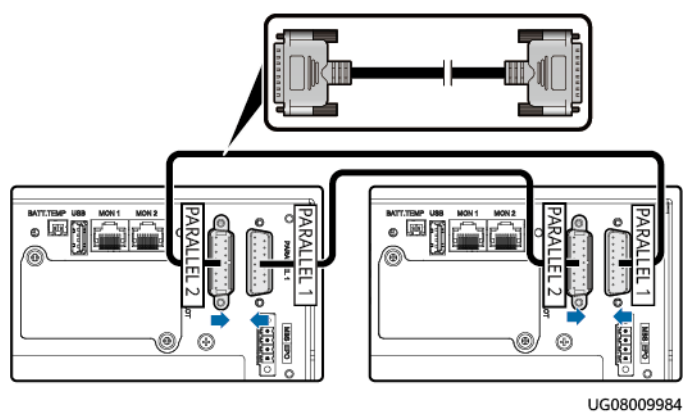
Step 1 Install power cables.

Figure 6-15 Parallel system wiring diagram of 15 kVA/20 kVA UPSs (three-phase input three-phase output, two power sources, without a PDU)



Step 2 Install parallel communications cables.

Figure 6-16 Parallel communications cables



NOTE

For details about how to install cables for the parallel system, see the *UPS2000-G-(15 kVA-20 kVA) Quick Guide*.

----End

6.2.2.2 Starting the Parallel System

CAUTION

- The configured number of batteries on the LCD 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.
 - Only UPSs of the same model can be connected in parallel.
-

NOTICE

- Before you start a parallel system, ensure that UPS output circuit breakers are both ON.
 - When a 15 kVA/20 kVA UPS parallel system shares a battery string, set the same battery string capacity and charge current for each UPS.
 - Check that parallel parameters have been synchronized.
 - When UPSs are connected in parallel, the output parallel power cables of each UPS must be at least 1 m long and the length deviation must be less than $\pm 10\%$. The four cables must be connected at the remote end.
 - In a 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

Before powering on the UPS, ensure that the UPS has passed all check items in [6.1 Check Before Power-On](#)

Perform the following steps to start the parallel system for the UPSs to work in normal mode.

- Step 1** Switch on the external battery circuit breaker (if any) or connect battery cables.
- Step 2** Check that the input voltage is normal.
- Step 3** Switch on the following circuit breakers of the UPS: mains AC input circuit breakers K_m1 and K_m2 , general mains AC input circuit breaker K_m , bypass AC input circuit breakers K_b1 and K_b2 , and general bypass AC input circuit breaker K_b .

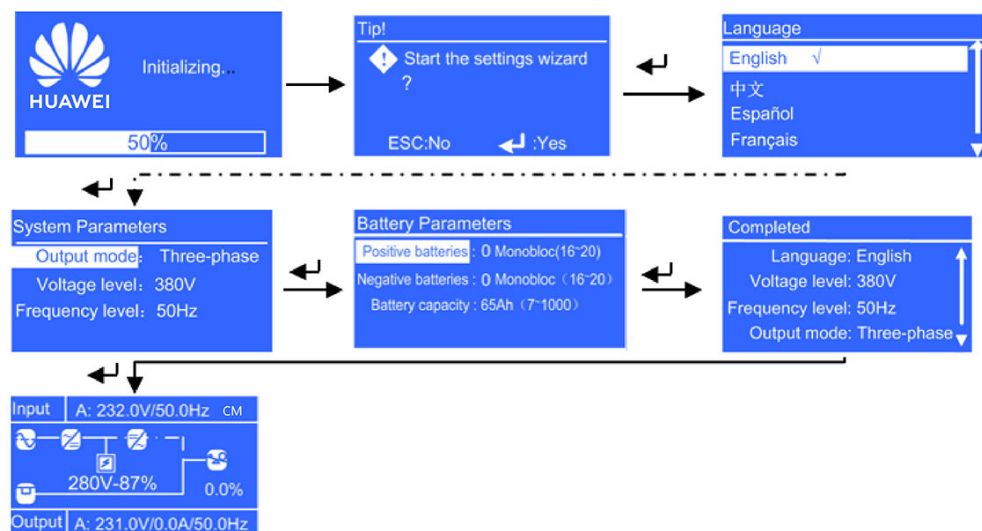
NOTE

- The preceding operation is performed when the mains input and bypass input use different power sources. When they use the same power source, you need only to switch on the UPS AC input circuit breaker and general AC input circuit breaker.
- If a PDU is configured, switch on 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 4 Perform the following operations on each UPS:

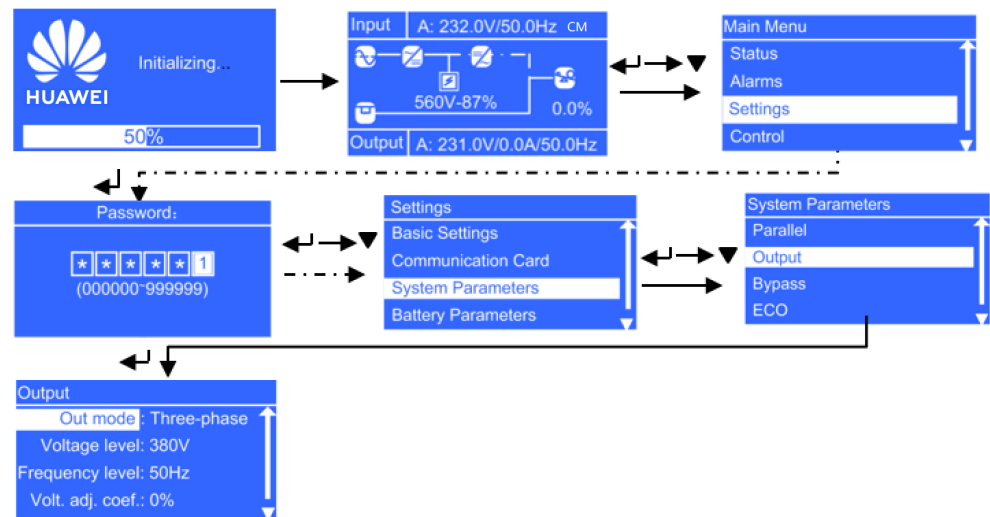
- Initial startup

On the **Settings wizard** screen, set the language (the preset language is English), system parameters, and battery parameters. After you complete the settings, 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 three-phase output, set **Output mode** to **Three-phase**; if the system uses three-phase input single-phase output or single-phase input single-phase output, set **Output mode** to **Single-phase**. Set **Voltage level** and **Frequency level** based on the rated voltage and frequency. Press **ESC** to return to the standby screen.



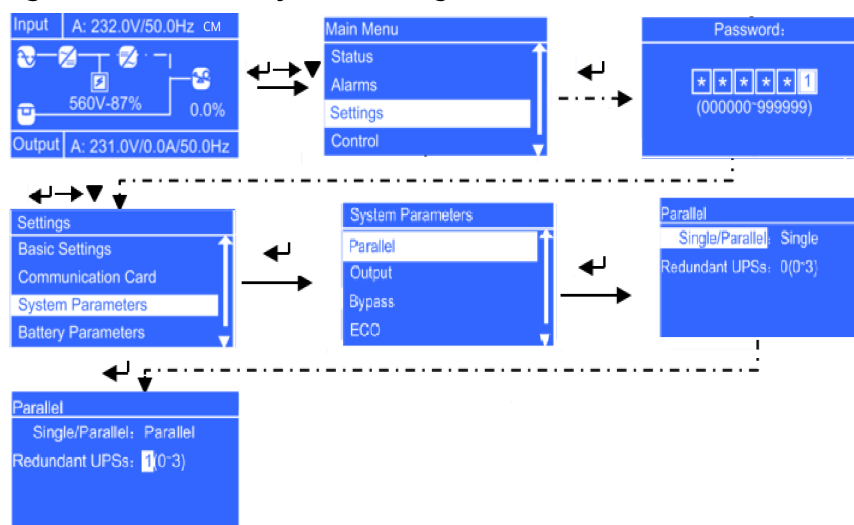
- Step 5** On the main menu screen, choose **About** and press to enter the **About** screen. Ensure that the software versions of all UPSs are the same.
- Step 6** Start the UPS one by one and shut down the inverters. The output PL terminal has voltage output.
- Step 7** Switch on output circuit breaker Q1 (provided by the customer), switch off output circuit breaker Q2 (provided by the customer), and check that the voltage difference between the two ends of output circuit breaker Q2 does not exceed 2 V.

NOTE

If the voltage difference between the two ends of the output circuit breaker Q2 exceeds 2 V, the input or output wire sequence is incorrect.

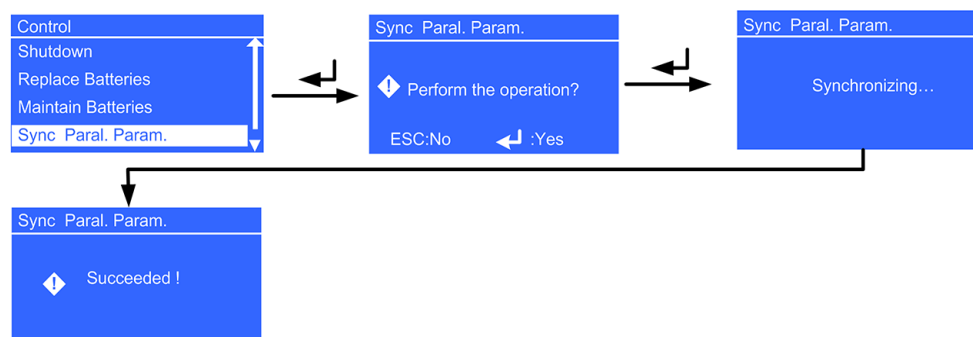
- Step 8** Switch on the output circuit breaker Q2.
- Step 9** On the standby screen, press to access the main menu. Choose **Main Menu** > **Settings** > **System Parameters** > **Parallel Settings** > **Single/Parallel** and change the value from **Single** to **Parallel**. Press **ESC** to return to the standby screen.

Figure 6-17 Parallel system settings



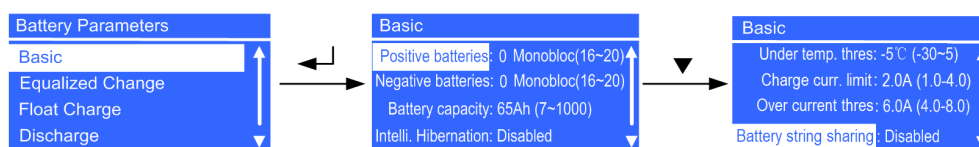
- Step 10** Check that parameters of the current UPS are automatically synchronized to the other UPSs in the parallel system.

Figure 6-18 Synchronizing parallel parameters



- Step 11** Set battery sharing for each UPS based on site requirements.

Figure 6-19 Setting battery sharing



NOTE

This step applies only to the UPS2000-G-15KRTL-01 and UPS2000-G-20KRTL-01.

- Step 12** After you perform "startup operations" on each UPS in the parallel system, all UPSs transfer 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 13** When the parallel system runs properly, switch on the general output circuit breaker Q (provided by the customer), and start loads one by one.

----End

6.2.2.3 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 (for example, UPS 1 in the parallel system wiring diagram) in the parallel system. The UPS shuts 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** Switch off the AC input circuit breakers K_{m1} and K_{b1} and the AC output circuit breaker Q1 for the UPS. After all indicators turn off and fans stop, the UPS shuts down.
- Step 3** Switch off the external battery circuit breaker (if any), or disconnect battery power cables for the UPS. 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.

Transferring the Parallel System to No Output Mode

- 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** Switch off the following circuit breakers of the UPS system: mains AC input circuit breakers K_{m1} and K_{m2} , general mains AC input circuit breaker K_m , bypass AC input circuit breakers K_{b1} and K_{b2} , general bypass input circuit breaker K_b , 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 the mains input and bypass input use different power sources. If they share a power source, you need only to switch off the UPS AC input circuit breakers, general AC input circuit breaker, then the UPS AC output circuit breakers, and general AC output circuit breaker.

- Step 4** Switch off 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.

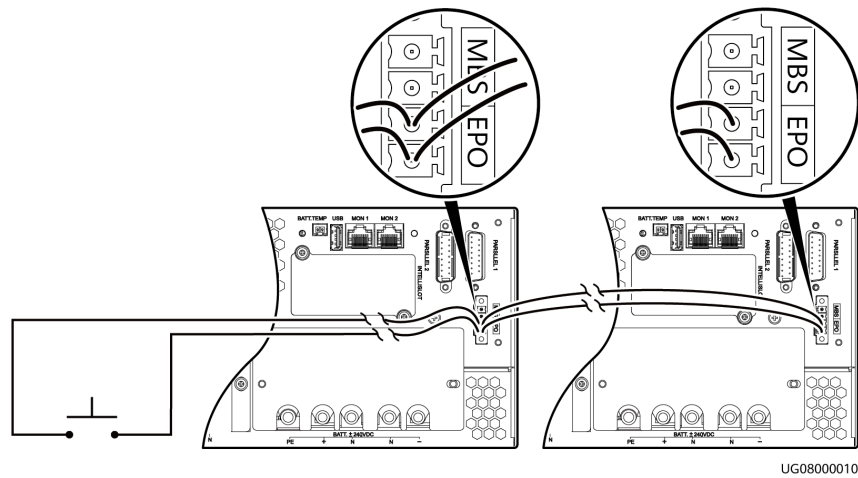
----End

6.2.2.4 Performing EPO

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

[Figure 6-20](#) shows the EPO cable connection in a parallel system.

Figure 6-20 EPO cable connection in a parallel system



NOTE

- For UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01, choose **Settings > System Parameters > Other Settings** and set **EPO Enable** to **Enable**.
- 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.

7 Communications

7.1 Optional Communications Components

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

7.2 SNMP Card

NOTE

- The standard protocols SNMP v1 and SNMP v2 have security risks. You are advised to use the secure protocol SNMP v3.
- A CAN communications port on the UPS can be connected only to a single device that communicates over CAN, including in a parallel system. The UPS communicates with the SNMP card over CAN. The SNMP card and CAN communications ports (MON1 and MON2) cannot be used at the same time.

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. The web user interface (WebUI) supports a maximum of two concurrent online users.

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.

- Supports remote management on Windows or Linux using a web browser. The supported web browsers include Edge 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 module.
- Works with NetShutdown, a computer and server security shutdown program developed by the Company, to automatically and safely 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 clients where the RCCMD is installed to protect customer data and reduce loss.
- Sends alarm information to a specified email address (for example, 163 email address) at scheduled time.

7.3 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:

- Provides a DIP switch for selecting the RS485 communications protocol. The Modbus and YDN-23 protocols are supported.
- 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.

7.4 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 contract control inputs (one is the shutdown signal input, and the other is reserved).

8

Routine Maintenance

8.1 UPS Maintenance

NOTICE

- Only trained personnel are allowed to perform maintenance tasks. Before performing operations on devices, wear ESD clothes, ESD gloves, and an ESD wrist strap. Remove conductive objects such as jewelry and watches to avoid electric shocks or burns.
- Use insulated tools when maintaining components inside 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 8-1 UPS routine maintenance

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Operating environment	• Ambient temperature: 0–40°C • Humidity: 0-95% RH (non-condensing)	• If the temperature or humidity is abnormal, check the air conditioner status. • If the input voltage is abnormal, check the power grid and input cable connection.	Monthly

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Power grid environment	- Input voltage: 380 V AC/400 V AC/415 V AC (line voltage) - Output voltage: 380 V AC/400 V AC/415 V AC (line voltage)	- If the input voltage is abnormal, check the power grid and input cable connection. - If the output voltage is abnormal, check the UPS running status and check whether an alarm is generated.	Monthly
LCD	According to the status icons on the LCD, all units are operating properly. No fault or alarm information is found in the active and historical alarm records.	If an alarm is present, rectify the fault by checking the device status and parameters.	Monthly
Cleanliness	Wipe the cabinet surface using a white paper and the paper does not turn black.	Remove the dust, especially from the front panel.	Quarterly
Parameter settings	The configuration of the output voltage grade, frequency, number of batteries, and battery capacity meets requirements.	Reset the parameters.	Quarterly

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Power cables and terminals (between the UPS and the PDF).	The insulation layers of cables are intact and terminals are free from signs of sparks.	- Replace cables. - Secure all output terminals.	Quarterly
Grounding	Ground cables are connected securely.	Tighten the screws.	Yearly
EPO (if configured)	The EPO signal cable is connected reliably.	Secure all wiring terminals.	Yearly
Through-current capacity of cables and circuit breakers	The circuit breakers and cables meet load requirements. The actual cable through-current capacity is greater than the circuit breaker specifications.	- Replace the circuit breakers. - Replace the cables.	Yearly

8.2 Battery Maintenance

NOTICE

Before operating batteries, read through the battery user manual, safety precautions, and correct connection methods provided by the battery manufacturer.

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

- Wrap tools with insulation tape to prevent electric shock.
- Wear protective goggles and take other necessary protective measures.
- Wear rubber gloves and protective clothing to prevent skin contact with electrolyte in the case of electrolyte overflow.
- When moving batteries, do not place batteries upside down. Handle them gently, and pay attention to personal safety.
- Keep the battery switch off during installation and maintenance.

Battery Maintenance Precautions

- Before battery maintenance, insulate tools such as wrenches. Do not place any objects on the top of batteries.
- Do not use any organic solvent to clean batteries.
- Do not remove the safety valve or fill anything into a battery.
- Do not smoke or use an open flame around batteries.
- After battery discharge, charge the battery in time to maintain a good service life.
- Only professionals are allowed to perform the maintenance tasks.
- If batteries have not been discharged for a long time, 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 four hours.
- In high-temperature areas, discharge and charge batteries once every two months. Each charge should last at least four hours.
- Do not overdischarge batteries. After discharging batteries, fully charge them immediately (within 24 hours) to avoid affecting the battery capacity.
- The maximum battery discharge duration can be set to 0 hours to 24 hours. The default value is **16Hour**. If you set the value to **0Hour**, the discharge duration is not limited.

Battery Routine Maintenance

Table 8-2 Battery routine maintenance

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Battery management alarm	No battery management alarm is generated.	Find the alarm cause based on the alarm information.	Monthly

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Battery appearance	1. The surface is clean and tidy without stains. 2. The battery terminals are intact. 3. Batteries are free from damage and cracks. 4. Batteries are free from acid leakage. 5. Batteries are not deformed or bulged.	If an exception occurs, contact technical support.	Monthly
Battery operating temperature	1. The battery ambient temperature is $25\pm5^{\circ}\text{C}$. 2. The battery operating temperature ranges from 0°C to 40°C. 3. Battery charge and discharge conditions meet the requirements specified in the battery specifications.	1. Identify the cause of an abnormal battery operating temperature. 2. If the fault persists, contact technical support.	Monthly

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Battery string charge voltage	- Equalized charge voltage: 14.1 V x Number of batteries (tolerance $\pm 1\%$) - Float charge voltage: 13.5 V x Number of batteries (tolerance $\pm 1\%$)	- If the voltage drop between the battery string output terminals and the battery input terminals at the UPS side is greater than 1% of the battery string voltage, check whether the cable between the battery string and the UPS is excessively long, or the cable diameter is excessively small. - Check whether the equalized charge voltage and float charge voltage are correctly set for the UPS. - If the fault persists, contact technical support.	Monthly
Battery temperature sensor measurement accuracy	The deviation between the detected temperature and the displayed temperature must be less than 3°C.	- Install the battery temperature sensor in the correct position. - Replace the battery temperature sensor.	Quarterly
Battery management parameter settings	Check that the settings of battery management parameters meet the requirements in the user manual.	Set parameters correctly.	Quarterly

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Tightness of battery screws	The location of the signs marked on battery terminal screws indicating tight connections does not change.	Take photos from multiple angles and contact technical support in a timely manner.	Quarterly
Cables between batteries	No cable deteriorates and the insulation layer does not crack.	Replace the faulty cable.	Quarterly
Battery voltage	- Equalized charge voltage: 14.1 V (tolerance: ± 0.1 V) - Float charge voltage: 13.5 V (tolerance: ± 0.1 V)	1. Check whether the equalized charge voltage and float charge voltage of a battery are normal. 2. If the charging voltage of a battery exceeds the specifications requirement, perform a complete forcible equalized charging for the battery, and check again whether the voltage is normal. 3. If the fault persists, contact 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 properly.	1. Identify the cause when an exception occurs. 2. If the fault persists, contact technical support.	Quarterly

Check Item	Expected Result	Troubleshooting	Maintenance Interval
Capacity test (recommended)	When the UPS is backed up, discharge a battery to the undervoltage alarm threshold to refresh the capacity of the battery.	1. Identify the cause when an exception occurs. 2. If the fault persists, contact technical support.	Yearly
Battery connection reliability	1. When battery strings are powered off, check the reliability of each connection point from positive terminals to negative terminals. All points must be connected reliably. 2. Use a torque wrench to check the tightening torque for each battery screw. The torque must meet the requirements of the battery manufacturer . After checking that the battery screws meet the requirements, mark the screws for later check.	1. Rectify any abnormal connection. 2. If the fault persists, contact technical support.	Yearly

9 Troubleshooting

 CAUTION

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

Table 9-1 Common faults and troubleshooting

No.	Symptom	Possible Cause	Measure
1	The mains switch is ON. The LCD displays nothing. The system does not perform self-tests.	The input power supply is not connected.	Check the UPS input power cable connection.
		The input voltage is less than the lower threshold or greater than the upper threshold.	Use a voltmeter to check whether the UPS input voltage meets requirements.
2	The mains is normal, but the AC input indicator is off. The UPS works in battery mode.	The UPS mains switch is OFF.	Turn on the UPS mains switch.
		The input cable is not properly connected.	Check the UPS input power cable connection.
3	The UPS does not report a fault but has no output voltage.	The output cable is not properly 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.

No.	Symptom	Possible Cause	Measure
		The UPS is overloaded.	Shut down all loads, and restart the UPS.
5	The mains indicator is off.	The mains voltage or frequency exceeds the UPS input range.	Use a multimeter to verify that the input voltage and frequency meet specifications.
6	The battery discharge time is obviously shorter 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 technical support to replace batteries.
7	Abnormal noise or smell is generated in the UPS cabinet.	The UPS is faulty.	Shut down the UPS and cut off the power input immediately. Contact local technical support.
8	The battery indicator blinks. The buzzer buzzes for 1 second and then stops for 1 second. The battery reserve is insufficient. The UPS is about to shut down.	- The UPS will soon shut down due to insufficient battery reserve, and loads will be powered off. - The number of batteries and battery capacity are incorrectly set.	- Save load data immediately and shut down primary loads to avoid data loss or damage. - Connect the UPS input to the backup AC power supply immediately. - Verify that the number of batteries and battery capacity are correctly set based on the actual configuration.
9	The user forgot the password.	-	- If the user forgot 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 the user forgot the LCD password and feature code, contact local technical support.

A Parallel Parameter List

Parallel Parameter	Synchronizat ion	Parallel Parameter	Synchronizati on
Parallel system redundant UPSs	Yes	ECO frequency range	Yes
Voltage level	Yes	ECO max. voltage	Yes
Volt. adj. coef.	Yes	ECO min. voltage	Yes
Output transformer	Yes	Output mode	Yes
Frequency level	Yes	Auto check bus capa.	Yes
ECO enabled	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
Battery capacity	Yes	Charge current	Yes

 NOTE

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

B

UPS Differences

Table B-1 UPS differences

Item	UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL	UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01	Remarks
Display difference of the LCD home screen	If the load rate is less than 4%, 0% is displayed on the LCD.	If the load rate is less than 4%, < 4% is displayed on the LCD.	-
	-	There is a message asking you to change the initial password.	If you enter incorrect passwords for five consecutive times, your account will be locked out for 5 minutes.
	-	The working mode is displayed in the upper right corner of the LCD home screen.	Converter mode (CM), self-load mode (SM), and normal mode (NM)

Item	UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL	UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01	Remarks
Battery parameter difference	-	Battery string sharing	For details about the function, see the section about battery parameters.
	Test notification	Timed shallow discharge test	For details about the function, see the section about battery parameters.
	Max. current	Charge curr. limit	The function does not change.
	Shutdown delay	Bat mode shut delay	The function does not change.
System parameter difference	-	EPO enable	For details about the function, see the section about system parameters.
Difference of battery capacity test conditions	The load rate ranges from 20% to 80%, and the load fluctuation does not exceed 10%.	The load rate ranges from 5% to 100%, and the load fluctuation does not exceed 10%.	-

Item	UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL	UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01	Remarks
Difference of the logic after the mains input of a UPS fails in a parallel system	All UPSs transfer to battery mode.	When the mains input of a UPS fails, the UPS transfers to battery mode and the other UPSs remain in normal mode.	-

 NOTE

The UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01 and UPS2000-G-15KRTL/UPS2000-G-20KRTL does not support parallel connection.

C LCD Menus and Parameters

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
Status	Mains Input	Van	-	-	-
		Vbn			
		Vcn			
		Frequency			
		Vab			
		Vbc			
		Vca			
	Bypass Input	Van			
		Vbn			
		Vcn			
		Frequency			
	Battery Status	Battery voltage/ Battery current			
		Status			
		Capacity			
		Backup time			
	Inverter Output	Van			
		Ia			

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		Vbn			
		Ib			
		Vcn			
		Ic			
		Frequency			
	UPS Output	Van			
		Ia			
		Vbn			
		Ib			
		Vcn			
		Ic			
		Frequency			
	Local-UPS Load	Single UPS Running/N +X Parallel-System			
		Sout_A			
		Pout_A			
		Load ratio_A			
		Sout_B			
		Pout_B			
		Load ratio_B			
		Sout_C			
		Pout_C			
		Load ratio_C			
	Parallel-System Load	Single UPS Running/N +X Parallel-System			
		Sys. Sout_A			

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		Sys. Pout_A			
		Sys. Load ratio_A			
		Sys. Sout_B			
		Sys. Pout_B			
		Sys. Load ratio_B			
		Sys. Sout_C			
		Sys. Pout_C			
		Sys. Load ratio_C			
	Environm ent Monitori ng	Ambient temp.			
		Ambient humidity			
		Internal temp.			
	Runtime	Inv. runtime			
		BPS runtime			
Alar ms	Active Alarms	Active alarms	Details	-	-
	Historical Alarms	Historical alarms	Details		
	Sort Alarms	Occurrence (latest first)	-		
		Level (highest first)			
	Clear Alarms	-			
Setti ngs	Basic Settings	Language	-	English, Chinese, Turkish, French, and Russian	English

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		Change Password	-	000000-999999	000001
		Change Feature Code	-	000000-999999	999999
	Communication Card	IP address (SNMP Card)	-	1.0.0.0-253.255.255.255	192.168.0.10
		Subn. mask (SNMP Card)	-	0.0.0.0-255.255.255.255	255.255.255.0
		Gateway (SNMP Card)	-	1.0.0.0-253.255.255.255	192.168.0.1
		Communication address (Modbus Card)	-	-	-
		Baud rate (Modbus Card)	-	-	-
		Normal mode (Dry contact)	-	Dry contacts 1-6	Dry contact 1
		Battery mode (Dry contact)	-	Dry contacts 1-6	Dry contact 2
		Bypass mode (Dry contact)	-	Dry contacts 1-6	Dry contact 3
		Batt. undervolt (Dry contact)	-	Dry contacts 1-6	Dry contact 4
		BPS backfeed (Dry contact)	-	Dry contacts 1-6	Dry contact 5

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		Faulty UPS (Dry contact)	-	Dry contacts 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	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)	220 V (on the UPS2000-G-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
			Converter mode	Enabled and Disabled	Disabled
		Output (configurable in any mode)	Volt. adj. coef.	±5%, ±4%, ±3%, ±2%, ±1%, 0%	0%
		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%

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
			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	Output power ratio	20%-100%	80%
			Self-load mode	Enabled and Disabled	Disabled
		Others (configurable after the inverter shuts down)	Recovery delay time	0-900s	5s
			Max. BPS transfers	1-3	3
			Output transformer	Enabled and Disabled	Disabled

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
			Generator mode	Weak adaptability mode, Balanced mode, and Strong adaptability mode	Balanced mode
			Auto check capa. (configurable only for the UPS2000-G-15 kVA/20 kVA)	Enabled and Disabled	Enabled
			Auto start	Enabled and Disabled	Disabled
			No battery alarm (configurable only when batteries are not connected)	Enabled and Disabled	Enabled
	Battery Parameters	Basic	Batteries / Positive batteries/ Negative batteries (configurable in non-battery mode)	16–20 monoblocs	0 monobloc

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
			Battery capacity (configurable in non-battery mode)	7–1000 Ah	- For the UPS2000-G-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.
			Intelli. Hibernation	Enabled and Disabled	Disabled
			Overtmp. thres.	45–55°C	50°C
			Undertemp. thres.	–30°C to +5°C	–5°C
			Charge curr. limit (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)	1.0–2.0 A (standard model) 1.0–4.0 A (long backup time model)	2.0 A
			Overcurrent thres. (configurable only for the UPS2000-G-15 kVA/20 kVA)	2.0–4.0 A (standard model) 4.0–8.0 A (long backup time model)	3.0 A (standard model) 6.0 A (long backup time model)
			Battery string sharing	Enabled and Disabled	Disabled
		Equalized Charge	Equalized charging	Enabled and Disabled	Enabled

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
			Time interval	30–180 days	60 days
			Voltage	2.33–2.40 V/cell	2.35 V/cell
			Max. current (UPS2000-G-6KRTS/ UPS2000-G-10KRTS/ UPS2000-G-15KRTL/ UPS2000-G-20KRTL)	1.0–2.0 A (standard model) 1.0–4.0 A (long backup time model)	2.0 A
			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 x cell)
		Discharge	Max. time (configurable in non-battery mode)	0–24 hours	16 hours
			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
			Bat mode shut delay	0–600 seconds	0s
		Shallow Discharge	Timed shallow discharge test (UPS2000-G-15KRTL-01/ UPS2000-G-20KRTL-01)	Enabled and Disabled	Disabled

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
			Test notification (UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL)	Enabled and Disabled	Disabled
			Time interval	30-90 days	60 days
			Discharge ratio	10%-50%	20%
	Settings wizard (configurable after the inverter shuts down)	Language	-	English, Chinese, Spanish, French, and Russian	English
		System Parameters	Voltage level	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)	220 V (on the UPS2000-G-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
			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	0 monobloc

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
			Battery capacity	7-1000 Ah	- For the UPS2000-G-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 (configurable after the inverter shuts down)	-	-	-	-
Control	Startup	-	-	-	-
	Shutdown				
	Replace Batteries				
	Maintain Batteries	Shallow Discharge Test			
		Capacity Test			
		Stop Test			

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		Manual Equalized Charging/ Manual EC for Pos./ Manual EC for Neg.			
		Manual Float Charging/ Manual FC for Pos./ Manual FC for Neg.			
	Sync Paral. Param.	-			
	Reset Password				
About	Model	-	-	-	-
	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).

D Cleaning or Replacing the Air Filter (6 kVA and 10 kVA)

Prerequisites

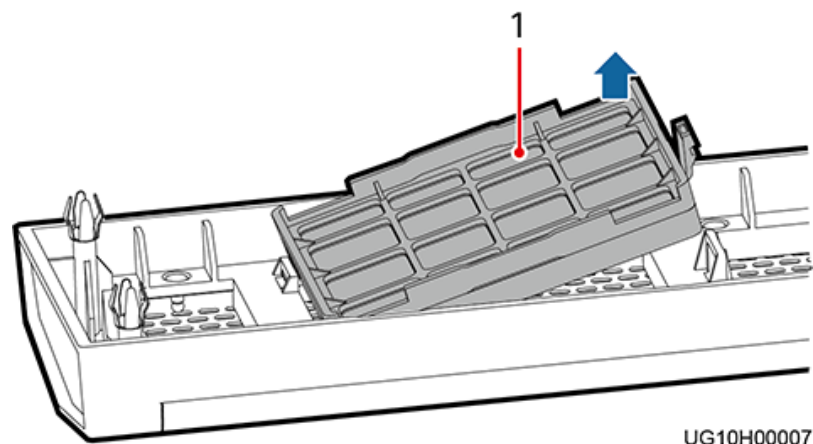
If the model is UPS2000-G-6KRTS, UPS2000-G-6KRTL, UPS2000-G-10KRTS, or UPS2000-G-10KRTL, perform the following steps to clean or replace the air filter.

Procedure

Step 1 Remove the front panel.

Step 2 Remove the air filter.

Figure D-1 Removing the air filter

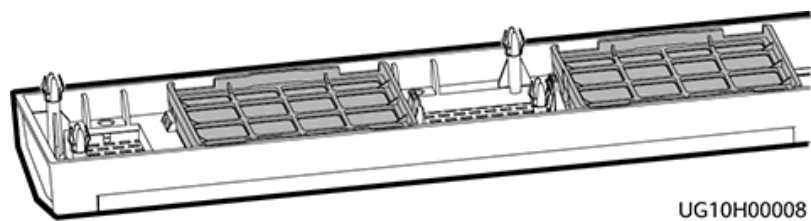


(1) Air filter

Step 3 Clean the air filter or prepare a new air filter.

Step 4 Install the cleaned or new air filter to the front panel.

Figure D-2 Installing the air filter



Step 5 Reinstall the front panel.

-----End

E Alarm Handling of Battery Maintenance Notification

Context

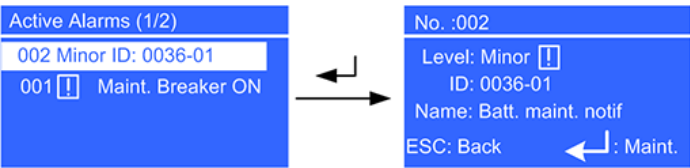
If no battery shallow discharge test is performed within 60 days after a UPS2000-G is installed and the maintenance notification time has arrived, the mains indicator is on, the battery and bypass indicators are off, the fault indicator on the INFO button is blinking red, and alarms are generated intermittently.

Procedure

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

1. Press the i button on the UPS control panel to display the **Active Alarms** page. If multiple active alarms exist, use the ▲ or ▼ button 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 E-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 E-2 Maintain Batteries screen

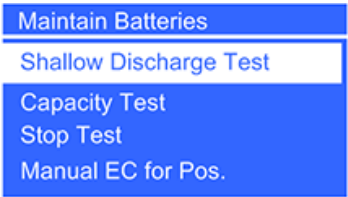


Figure E-3 Active Alarms screen



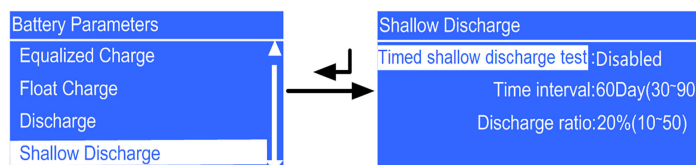
Step 2 Cancel the battery maintenance notification function.

NOTE

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

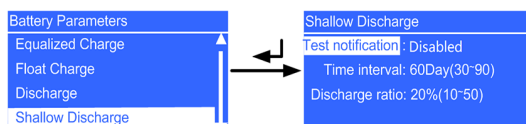
1. On the **Main Menu** screen, select **Settings** and press . The **Settings** login screen is displayed. The preset password is 000001. After you enter the correct password and press , the **Settings** screen is displayed.
2. UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01: Choose **Battery Parameters** and **Shallow Discharge**, and then change the value of **Scheduled test** from **Enable** to **Disable** (configurable when the UPS works in any mode).

Figure E-4 Shallow Discharge screen (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)



UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL: Choose **Battery Parameters** and **Shallow Discharge**, and then change the value of **Test notification** from **Enabled** to **Disabled** (configurable when the UPS works in any mode).

Figure E-5 Shallow Discharge screen (UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL)



----End

F 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).

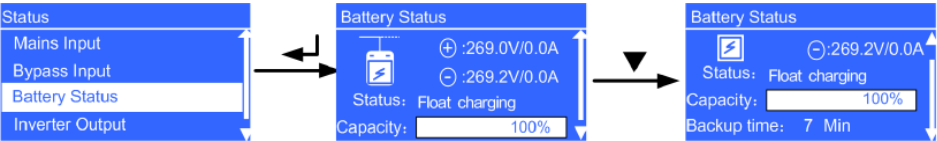
NOTICE

Before a shallow discharge test, ensure that the load rate is 0%–100% and the load fluctuation does not exceed 10%.

Procedure

- Step 1** Check the battery status for test start conditions.
- On the **Main Menu** screen, choose **Status** and press . On the **Status** screen, locate **Battery Status**.

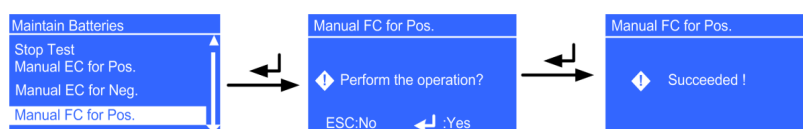
Figure F-1 Battery Status screen



NOTE

- **Status:** The battery status is **N/A** (battery not connected or reversely connected), **Equalized charging**, **Float charging**, **Hibernating**, or **Discharging**.
 - **Capacity:** indicates the remaining battery capacity.
 - Backup time:
 - UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01: estimated battery discharge time when the batteries are being charged or discharged
 - UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL: estimated battery discharge time when the batteries are being discharged. **N/A** is displayed when the batteries are being charged.
2. Batteries in **Hibernating** state cannot start a shallow discharge test. Choose **Control** and **Maintain Batteries**, and then press **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 F-2 Manual FC for Pos. screen



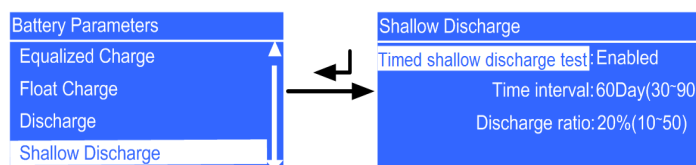
NOTE

For the 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.

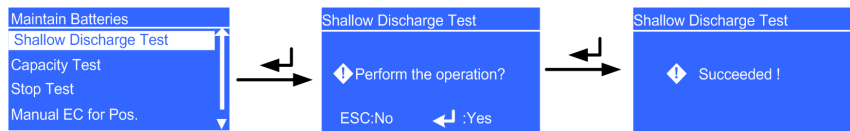
Figure F-3 Shallow Discharge screen



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.

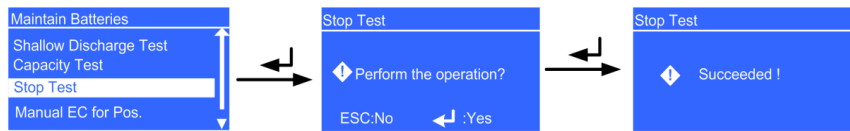
Figure F-4 Shallow Discharge Test screen



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 Tap **Stop Test** to forcibly stop the battery shallow discharge test.

Figure F-5 Stop Test screen



----End

G Battery 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.

NOTICE

Before a capacity test, ensure that:

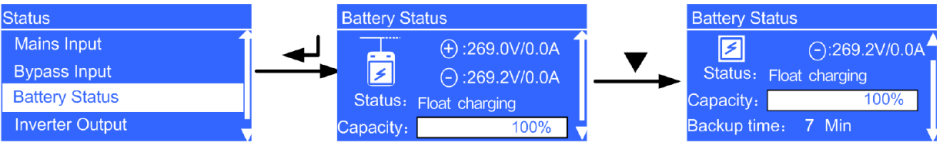
- The UPS is working in normal mode; float charging or hibernation has lasted for 2 hours after the state of charge (SOC) reaches 100%.
- The UPS has generated no battery overtemperature, overvoltage, or overcurrent alarm. No generator is connected to the UPS.
- The mains, batteries, charger, and discharger are normal. No overload alarm is generated.
- UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01: The load rate ranges from 5% to 100% and the load fluctuation does not exceed 10%.
- UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL: The load rate is 20%–80% and the load fluctuation does not exceed 10%.

Procedure

Step 1 Check the battery status for test start conditions.

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

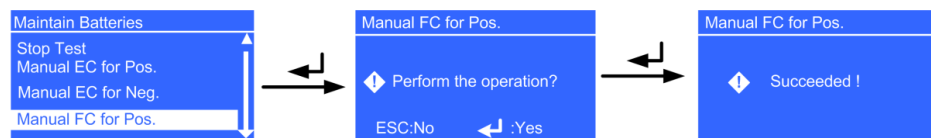
Figure G-1 Battery Status screen



NOTE

- **Status:** The battery status is **N/A** (battery not connected or reversely connected), **Equalized charging**, **Float charging**, **Hibernating**, or **Discharging**.
 - **Capacity:** indicates the remaining battery capacity.
 - Backup time:
 - UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01: estimated battery discharge time when the batteries are being charged or discharged
 - UPS2000-G-6KRTS/UPS2000-G-10KRTS/UPS2000-G-15KRTL/UPS2000-G-20KRTL: estimated battery discharge time when the batteries are being discharged. **N/A** is displayed when the batteries are being charged.
2. Batteries in **Hibernating** state cannot start a capacity test. Choose **Control** and **Maintain Batteries**, and then press **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 G-2 Manual FC for Pos. screen

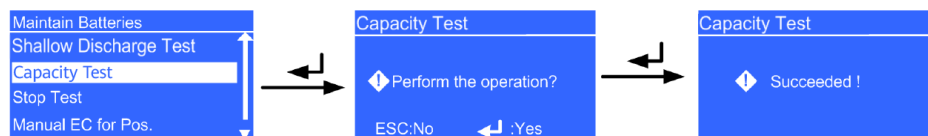


NOTE

For the 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** Start the capacity 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 G-3 Capacity Test screen

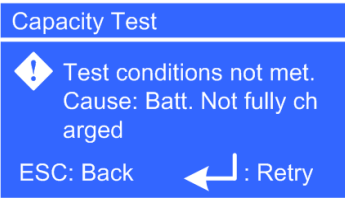


NOTE

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

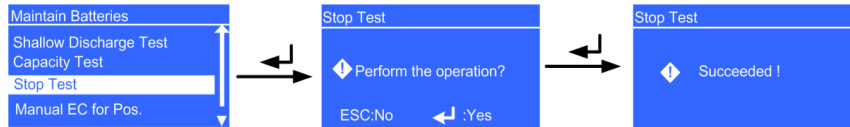
If the capacity test command is successfully executed, the charger disables its output and the system is in battery mode. You can view the battery information on the default screen (energy flow diagram). The normal mode indicator (green) turns off, and the battery mode indicator (yellow) turns on.

Figure G-4 Batt. not fully charged



Step 3 Tap **Stop Test** to forcibly stop the capacity test.

Figure G-5 Stop Test screen



----End

H Transferring the UPS That Has Generated an Alarm to Normal Mode and Clearing the Alarm Tone

Procedure

- Step 1** Press the INFO button to confirm that the alarm is generated for the bypass power supply.
 - Step 2** Press the OK button for 5 seconds or enter the control screen to start the inverter.
 - Step 3** Verify that the alarm is cleared and the alarm tone disappears.
- End

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	
THDv	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