

UPS2000-G-(6 kVA-20 kVA)

User Manual

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About This Document

Purpose

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

Intended Audience

This document is intended for:

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

Symbol Conventions

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

Symbol	Description
	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.

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

Change History

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

Issue 13 (2019-05-05)

Updated the section "Operating Environment."

Issue 12 (2018-01-16)

Added the description of device application scenarios.

Issue 11 (2017-11-27)

Updated the section "Operating Environment."

Issue 10 (2017-01-19)

- Added the DHCP feature.
- Added an external dry contact card.
- The default value of **Max. current** parameter changed to 2.0 A.

Issue 09 (2016-10-10)

The software is upgraded.

Issue 08 (2016-01-06)

The software is upgraded.

Issue 07 (2015-03-30)

The alarm handling is upgraded.

Issue 06 (2014-10-09)

Added the shutdown delay parameter.

Issue 05 (2014-07-31)

Upgraded the Optional Components.

Issue 04 (2013-11-06)

Added the description of Checking Before Powering On the UPS.

Issue 03 (2013-08-24)

Added the description of the UPS2000-G-15 kVA/20 kVA three-phase input single-phase output and single-phase input single-phase output.

Issue 02 (2013-06-10)

The software is upgraded.

Issue 01 (2013-05-15)

This is the first release.

Contents

About This Document.....	ii
1 Safety Precautions.....	1
1.1 General Safety	1
1.2 Electrical Safety.....	3
1.3 Operating Environment.....	5
1.4 Battery Safety	6
1.5 Mechanical Safety	8
1.6 Laying Out Cables	9
2 Quick Introduction	10
2.1 Model Description	10
2.2 Working Principle	11
2.2.1 Conceptual Diagram	11
2.2.2 Working Modes.....	11
2.3 Appearance	12
2.4 Optional Components	15
3 Installation.....	21
3.1 Preparations	21
3.1.1 Site.....	21
3.1.2 Tools	23
3.1.3 Power Cables	24
3.1.4 Unpacking and Checking.....	28
3.2 Installation Procedure	29
3.3 Installing a Backfeed Protection Device	29
3.3.1 Backfeed Protection Device Specifications	29
3.3.2 Feedback Prevention Connections (With Dry Contact Control).....	31
3.4 Check After Installation	34
4 Control Panel	36
4.1 Introduction	36
4.2 Indicators	36
4.3 Functional Buttons.....	37
4.4 LCD	38

4.5 LCD Startup Screens	38
4.5.1 Starting the UPS in Normal Mode	40
4.5.2 Starting the UPS in Battery Mode	41
4.6 LCD Menu Hierarchy	42
4.6.1 Status Screen.....	44
4.6.2 Alarms Screen.....	48
4.6.3 Settings Screen.....	50
4.6.4 Control Screen	63
4.6.5 About Screen.....	66
5 Operations	68
5.1 Checking Before Powering On the UPS	68
5.2 Single UPS Operations	68
5.2.1 Starting the UPS.....	68
5.2.2 Shutting down the UPS.....	71
5.2.3 Performing EPO.....	71
5.3 Parallel System Operations.....	72
5.3.1 Starting the Parallel System	73
5.3.2 Shutting down the Parallel System	76
5.3.3 Performing EPO.....	77
6 Communications	78
6.1 Optional Communications Components	78
6.2 SNMP Card.....	78
6.3 Modbus Card	79
6.4 Dry Contact Card.....	79
6.5 External Dry Contact Card	79
7 Routine Maintenance	80
7.1 UPS Maintenance	80
7.2 Battery Maintenance	81
8 Troubleshooting.....	86
9 Technical Specifications	88
9.1 Physical Specifications	88
9.2 Environmental Specifications	88
9.3 Mains Input Electrical Specifications	89
9.4 Bypass Input Electrical Specifications.....	90
9.5 Output Electrical Specifications	90
9.6 Battery Specifications	91
9.7 ECO Feature	99
9.8 Parallel Feature	99
9.9 Safety Regulations and EMC.....	99

A Parallel Parameter List	100
B LCD Menus and Parameters.....	101
C Alarm Handling.....	111
D Alarm Handling of Battery Maintenance Notification.....	131
E Battery Shallow Discharge Test.....	133
F Capacity Test.....	136
G Acronyms and Abbreviations.....	139

1 Safety Precautions

1.1 General Safety

This section describes safety precautions to consider before installing, maintaining, and operating the UPS.

NOTICE

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

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

Declaration

Huawei does not take responsibilities for the following situations:

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

Power Grid Requirements

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

Local Laws and Regulations

Equipment operations must comply with local laws and regulations. The safety instructions in this document are only supplemental to local safety regulations.

Personal Requirements



Only Huawei engineers or engineers certified by Huawei are allowed to perform UPS commissioning and maintenance. Otherwise, human injury or equipment damage may occur, and any resulting UPS faults will be beyond warranty scope.

Personnel who plan to install or maintain Huawei equipment must receive thorough training, understand all necessary safety precautions, and master the correct operation methods. Trained and qualified personnel, or personnel certified or authorized by Huawei are:

- Allowed to install, operate, and maintain the equipment.
- Allowed to remove safety facilities and inspect the equipment.
- Allowed to replace or change the devices or components (including software).
- Operation personnel must report faults or errors that might cause serious safety issues to related owners.
- This product should be installed and used according to the installation and technical, specification requirements found in this manual. Otherwise, the product may be damaged, and the resulting product exceptions or component damage will be beyond the warranty scope.

Grounding Requirements

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

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

Personal Safety

- Do not operate the product, or handle cables, during thunderstorms.
- To avoid electric shocks, do not connect safety extra-low voltage (SELV) circuits to telecommunication network voltage (TNV) circuits.
- Before operating a device, wear electrostatic discharge (ESD) clothes, ESD gloves, and an ESD wrist strap. Remove any conductors (such as jewelry or watches) before the operation to avoid electric shocks or burns.

- In the case of fire, leave the building or the equipment room immediately, and turn on the fire alarm bell or make an emergency call. Never enter the building on fire in any case.
- If the cabinet provides an ESD jack, wear an ESD wrist strap and insert the ground terminal of the ESD wrist strap into the jack.
- Ensure all switches are turned to OFF during device installation.
- Power on the UPS only after authorized engineers arrive at the site.
- If a C2 UPS is used in residential areas, additional measures must be taken to prevent radio frequency interferences.
- If the UPS is used for life-supporting medical apparatus and facilities such as lifts where adequate care has to be taken to ensure personal safety, discuss with the manufacturer in advance about the applicability, settings, management, and maintenance of the UPS, which require special considerations during design.

Device Safety

- Before operation, ensure that the device is firmly anchored to the floor or other solid objects, such as a wall or an installation rack.
- Ensure ventilation vents are unblocked while the system is operating.
- Before powering on the device, ensure that all the screws inside it are securely tightened and will not fall off during operation.
- After the installation, remove packing materials from the equipment area.
- Replace danger signs that have worn out or are unreadable.
- A UPS can be used to serve resistive-capacitive loads, resistive loads, and micro-inductive loads. It is recommended that a UPS not be used for pure capacitive loads, pure inductive loads, and half-wave rectification loads. It does not apply to energy feedback loads.
- Do not alter the UPS internal structure or installation procedure unless consent from the manufacturer is given.
- Never use water to clean electrical components inside or outside the UPS.
- Do not drill holes into a cabinet.

1.2 Electrical Safety

High Voltage

** DANGER**

- The high voltage power supply provides power for the device operation. Direct or indirect contact with high voltage power sources may result in fatal injury.
 - Non-standard or incorrect high voltage operations may result in fire and electric shocks.
-
- The personnel who install the AC facility must be qualified to perform high voltage and AC operations.
 - When selecting, connecting, and routing power cables, ensure compliance with local laws and regulations.

- When operating the AC power supply facility, ensure compliance with local laws and regulations.
- Before connecting cables to the UPS, ensure that the input power and mains power distribution switches and output power distribution switch are turned off.
- Use only dedicated tools during high voltage and AC operations.
- If the operation is performed in a damp environment, ensure that the device is dry. When water is found in the rack or the rack is damp, switch off the power supply immediately.

High Leakage Current

DANGER

- Ground a device before powering it on. Otherwise, personal injury or device damage may occur.
 - If a "high leakage current" tag is attached to the panel of the device, ground the protective ground terminal on the device enclosure before connecting the AC power supply to prevent electric shocks.
 - The UPS can generate high leakage currents. Using a circuit breaker that has the leakage current protection function is not recommended.
 - 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 or 20 kVA UPS is less than or equal to 500 mA.
 - When selecting the earth leakage circuit breaker (ELCB), consider the leakage current of the UPS and downstream loads.
-

Power Cable

DANGER

Do not install or remove power cables when the device is on. Transient contact between the core of the power cable and the conductor may generate electric arcs or sparks, which may cause fire or damage eyesight.

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

Fuse

NOTICE

If a fuse needs replacing, ensure the new fuse is of the same type and specifications so that the system runs safely.

Electrostatic Discharge

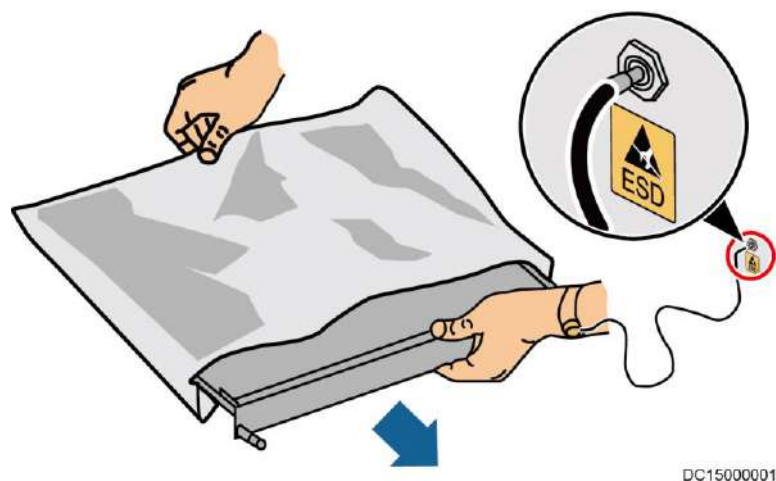
NOTICE

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

- Wear a pair of ESD gloves or a well-grounded ESD wrist strap when touching the device or handling boards or application-specific integrated circuits (ASICs).
- When holding a board, hold its edge without touching any components, especially chips.
- Package boards with ESD packaging materials before storing or transporting them.

Figure 1-1 shows how to wear an ESD wrist strap.

Figure 1-1 Wearing an ESD wrist strap



Liquid Prevention

- Do not place the product under areas prone to water leakage, such as near air conditioner vents, ventilation vents, or feeder windows of the equipment room. Ensure that there is no condensation inside the product or equipment room. Ensure that no liquid enters the product. Otherwise, short circuits will occur and may result in serious injury or death.
- If any liquid is detected inside the product, immediately disconnect the power supply and contact the administrator.

1.3 Operating Environment

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

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

air traffic control center, airport command center, financial clearing center, and transaction center.

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

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

NOTICE

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

DANGER

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

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

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

Do not place the UPS in the following environments:

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

1.4 Battery Safety

This section describes precautions for operating batteries.

 DANGER

Before operating batteries, carefully read the safety precautions to ensure correct battery handling and connection is performed, and personal safety is managed.

NOTICE

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

Preventative Measures

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

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

Battery Short Circuit

 DANGER

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

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

Harmful Gas

DANGER

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

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

Battery Temperature

DANGER

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

- Install or store batteries far away from fire sources and heating devices such as transformers. Never burn batteries.
- If the battery temperature exceeds 60°C, check the battery for electrolyte overflow. If electrolyte overflows, handle the leakage immediately.

Electrolyte Leakage

DANGER

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

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

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

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

If any personnel are exposed to battery electrolyte, wash the exposed area with clean water immediately and seek medical advice if the situation is serious.

1.5 Mechanical Safety

Moving Sharp Objects

CAUTION

Wear protective gloves when moving sharp objects.

Moving Heavy Objects

DANGER

- Perform operations in accordance with all instructional symbols on the device.
 - Take caution to avoid injury when moving heavy objects.
-
- When moving or lifting a device, hold the handle or bottom of the device.
 - Move the cabinet with caution. Any bumping or falling may damage the device.

Handling Fans

Do not insert fingers or boards into the operating fans until the fans are switched off, and have stopped running.

1.6 Laying Out Cables

Binding Signal Cables

NOTICE

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

Laying Out Cables

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

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

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

2 Quick Introduction

2.1 Model Description

This document describes the following UPS models:

Model	Represented By	Remarks
UPS2000-G-6KRTS	UPS2000-G-6 kVA standard model	The two models are represented by UPS2000-G-6 kVA in the description of their common features and parameters.
UPS2000-G-6KRTL	UPS2000-G-6 kVA long backup time model	
UPS2000-G-10KRTS	UPS2000-G-10 kVA standard model	The two models are represented by UPS2000-G-10 kVA in the description of their common features and parameters.
UPS2000-G-10KRTL	UPS2000-G-10 kVA long backup time model	
UPS2000-G-15KRTL	UPS2000-G-15 kVA	The UPS2000-G-15KRTL has only a long backup time model.
UPS2000-G-20KRTL	UPS2000-G-20 kVA	The UPS2000-G-20KRTL has only a long backup time model.

Figure 2-1 shows a UPS model number.

Figure 2-1 Model number

UPS 2000 - G - 6K RT S
 1 2 3 4 5 6

Table 2-1 describes the model number.

Table 2-1 Model number details

No.	Item	Description
-----	------	-------------

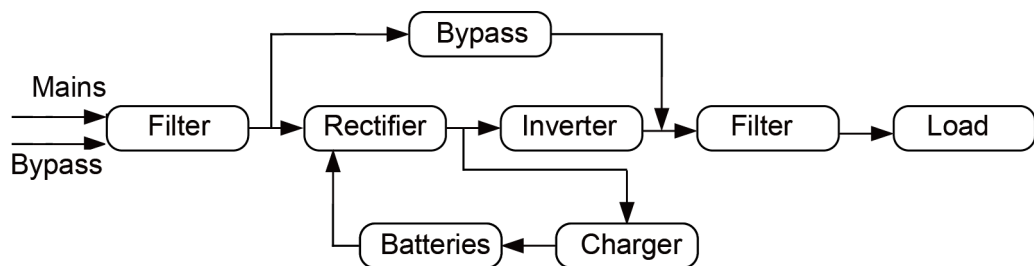
No.	Item	Description
1	Product category	UPS
2	Product family	2000: Power $\leq$ 20 kVA
3	UPS subcategory	G: series name
4	Output capacity	6K: 6 kVA 10K: 10 kVA 15K: 15 kVA 20K: 20 kVA
5	UPS type	RT: rack- and tower-mounted unit RR: rack-mounted unit TT: tower-mounted unit TM: modular tower-mounted unit RM: modular rack-mounted unit
6	Built-in battery (optional)	S: standard model, which provides only a standard battery pack. L: long backup time model. You need to use an external large-capacity battery pack.

2.2 Working Principle

2.2.1 Conceptual Diagram

Figure 2-2 shows the UPS conceptual diagram.

Figure 2-2 Conceptual diagram



2.2.2 Working Modes

The UPS has the following working modes:

- Normal mode

When the mains is normal, the rectifier boosts the mains input voltage and converts the AC power into stable DC power for the inverter, and the mains charges batteries over a charger. Then the inverter converts the DC power into stable AC power, which is supplied to loads.

- Battery mode

When the mains is abnormal or disconnected, the DC-DC step-up transformer boosts the DC power supplied from batteries. Then the inverter converts the DC power into stable AC power for powering loads.

- Bypass mode

The mains supplies power directly to loads after filtering. The UPS transfers to bypass mode when overload, overtemperature, or faults occur. This mode does not provide battery backup capability.

- Economy control operation (ECO) mode

If the bypass voltage and frequency are in the specified range, the UPS supplies power to loads over the bypass. If the bypass voltage and frequency are outside the range, the UPS transfers to normal or battery mode. ECO is short for economy control operation.

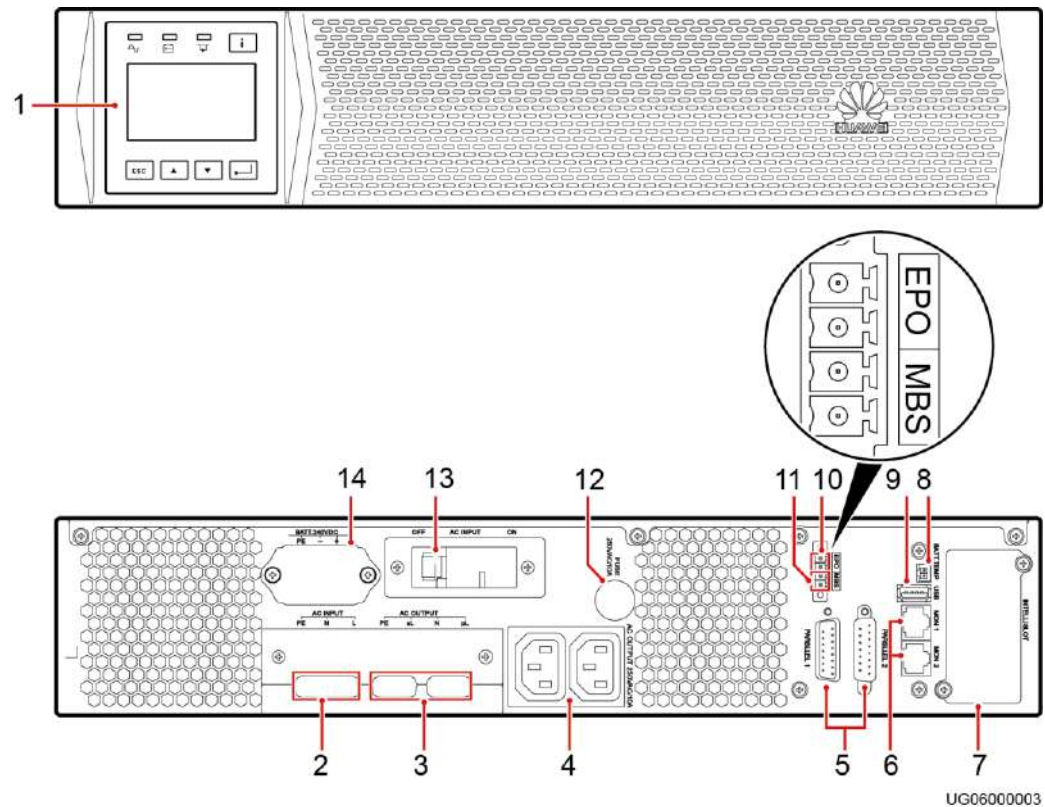
 NOTE

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

2.3 Appearance

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

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



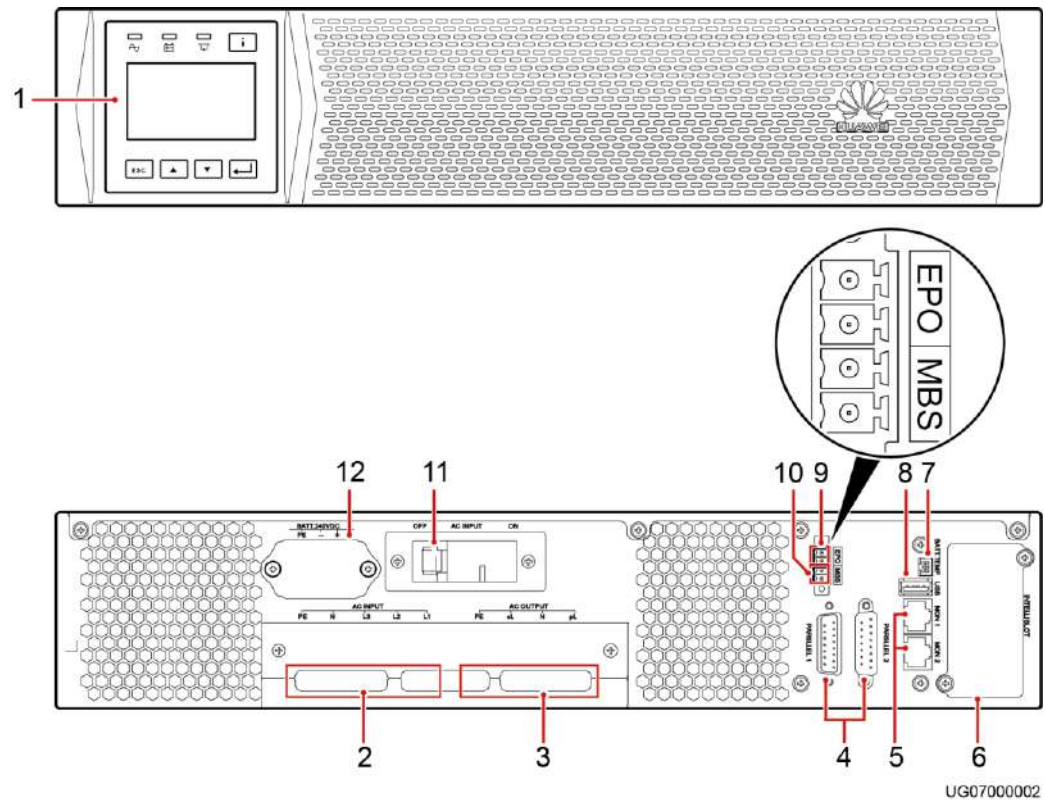
- | | | | |
|-------------------------------------|---|------------------------------------|-------------------------------------|
| (1) Control panel | (2) AC input port | (3) AC output ports (pL and sL) | (4) Output sockets |
| (5) Parallel ports | (6) Control area network (CAN) communications ports (MON1 and MON2) | (7) Optional card slot | (8) Battery temperature sensor port |
| (9) Universal Serial Bus (USB) port | (10) Emergency power-off (EPO) port | (11) Maintenance bypass port (MBS) | (12) Fuse base |
| (13) Input circuit breaker | (14) Battery port | | |



NOTE

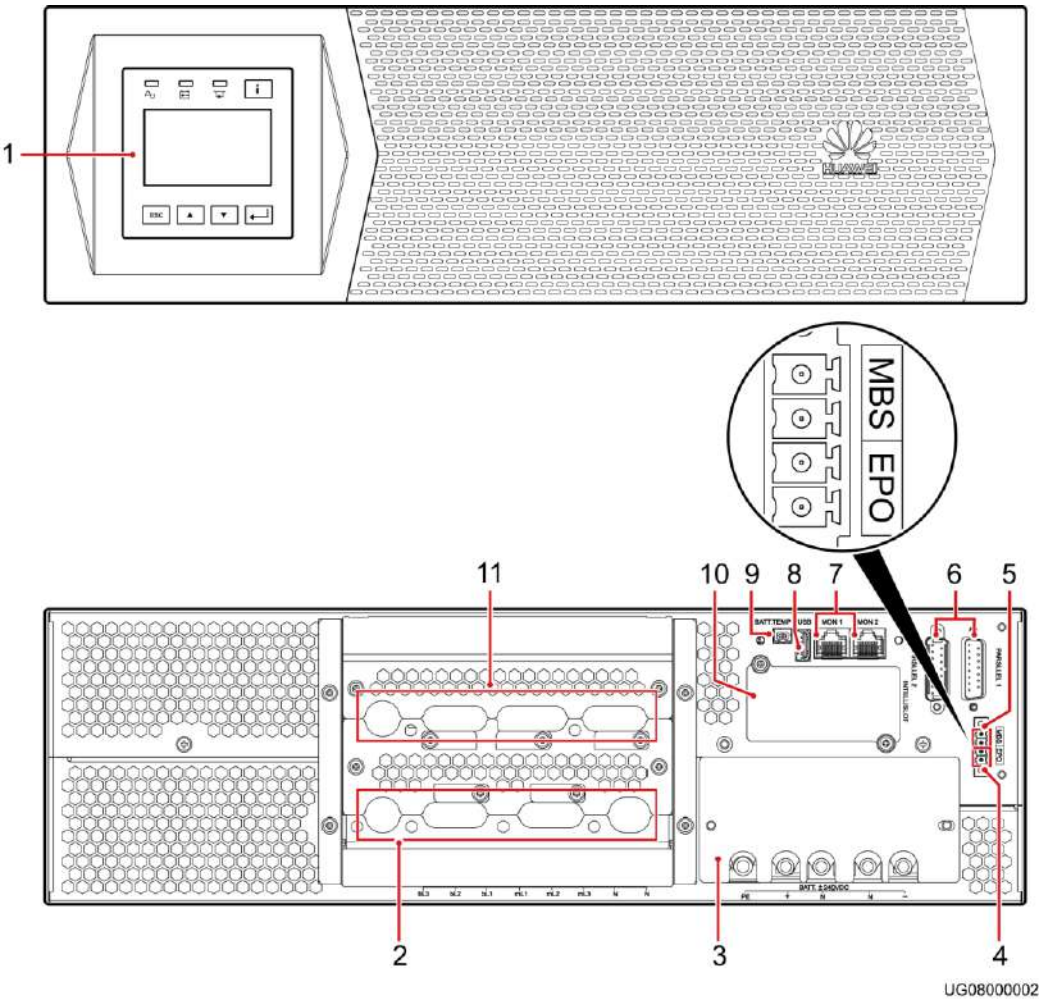
- The total load current supported by the two output sockets (C13) cannot exceed 10 A.
- The fuse used on the UPS2000-G-6 kVA meets the 250V-10A-IEC specifications.

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 |
| (9) EPO port | (10) Maintenance bypass port (MBS) | (11) Input circuit breaker | (12) Battery port |

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



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

2.4 Optional Components

Table 2-2 Optional components

Component	Model	Function	Remarks
-----------	-------	----------	---------

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 $+80^{\circ}\text{C}$. The standard cable is 2 meters long. To increase the length, install a magnetic ring at the sensor plug.
Ambient temperature and humidity sensor	WS302M2A-5 ENR1DETA MODULE	Measures the UPS ambient temperature and humidity. The ambient temperature ranges from $0-50^{\circ}\text{C}$. The ambient humidity ranges from 0%–100% RH.	It is used together with a Simple Network Management Protocol (SNMP) card.
SNMP card	RMS-SNMP01A	Monitors the UPS and the ambient temperatures and humidity (if required) and allows for Ethernet networking.	N/A
6 kVA output isolation transformer box	DGL-6/0.22	Provides isolation solutions for customer equipment. Compared with the output transformer on an industrial frequency UPS, the output transformer box provides isolation functions even in bypass mode. The isolation transformer is a 2:1:1 industrial-frequency transformer. It converts one 220 V output voltage into two isolated 110 V outputs.	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	ESS-240V12-7AhBPVBA01 ESS-240V12-7AhBPVBA02	Each battery pack consists of twenty 12 V, 7 Ah VRLA batteries	The UPS2000-G-15 kVA/20 kVA

Component	Model	Function	Remarks
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.	uses at least two battery packs.
Standard battery pack (9 Ah, 20 batteries)	ESS-240V12-9AhBPVBA01 ESS-240V12-9AhBPVBA02	Each battery pack consists of twenty 12 V, 9 Ah VRLA batteries connected in series. It is a standard configuration for the UPS2000-G-10 kVA. A maximum of four battery packs are connected in parallel.	
Modbus card	RMS-MODBUS01A	Provides two cascaded RJ45 ports to implement networking over the Modbus or YDN-23 protocol.	N/A
Dry contact card	RMS-RELAY01A	Provides six alarm dry contact outputs (normal mode, battery mode, bypass mode, low battery voltage, bypass backfeed, and UPS faults) and two dry contract control inputs (one is the shutdown signal input, and the other is reserved).	N/A
External dry contact card	RMS-RELAY02B	Provides four dry contact outputs (critical alarm, minor alarm, mains mode, battery mode, bypass mode, inverter on, battery undervolt., bypass backfeed, high ambient tempreature, or UPS fault.) and two dry contract inputs (startup, shutdown).	Used together with an SNMP card.
iBAT 2.0	N/A	Consists of the communication interface module (CIM) and battery interface module (BIM). The CIM is an intelligent	Used together with an SNMP card.

Component	Model	Function	Remarks
		battery management module which collects wireless communication data of battery status from the downstream BIM groups, and uploads data to the SNMP card through the COM port.	
Power distribution unit (PDU) (PDC-0038 V4ACIOA)	PDC-0038V4ACIOA	Controls and protects input and output power, increases output sockets, and distributes power for 1+1 parallel systems, and implements online maintenance.	The PDU is designed for a 1+1 UPS2000-G-15 kVA/20 kVA parallel system (three-phase input three-phase output).
PDU (PDC-0091 V2ACIOA)	PDC-0091V2ACIOA		- The PDU is designed for a 1+1 UPS2000-G-15 kVA/20 kVA parallel system (three-phase input single-phase output and single-phase input single-phase output). - It can also be used in a UPS2000-G-6 kVA/10 kVA 1+1 parallel system and 2+0 parallel system.
Magnetic loop	DN85H, H38x22x15 (DMEGC) E2F, 38x22x15 (FENGYI)	Optimizes the performance of the TN-C power distribution system in the parallel system scenario.	In a UPS2000-G-15 kVA/20 kVA parallel system using the TN-C power distribution system, install

Component	Model	Function	Remarks
			four magnetic rings on the PE cables on each UPS, bind the four magnetic rings together using binding tape, and secure them to the nearest place.



NOTE

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

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

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

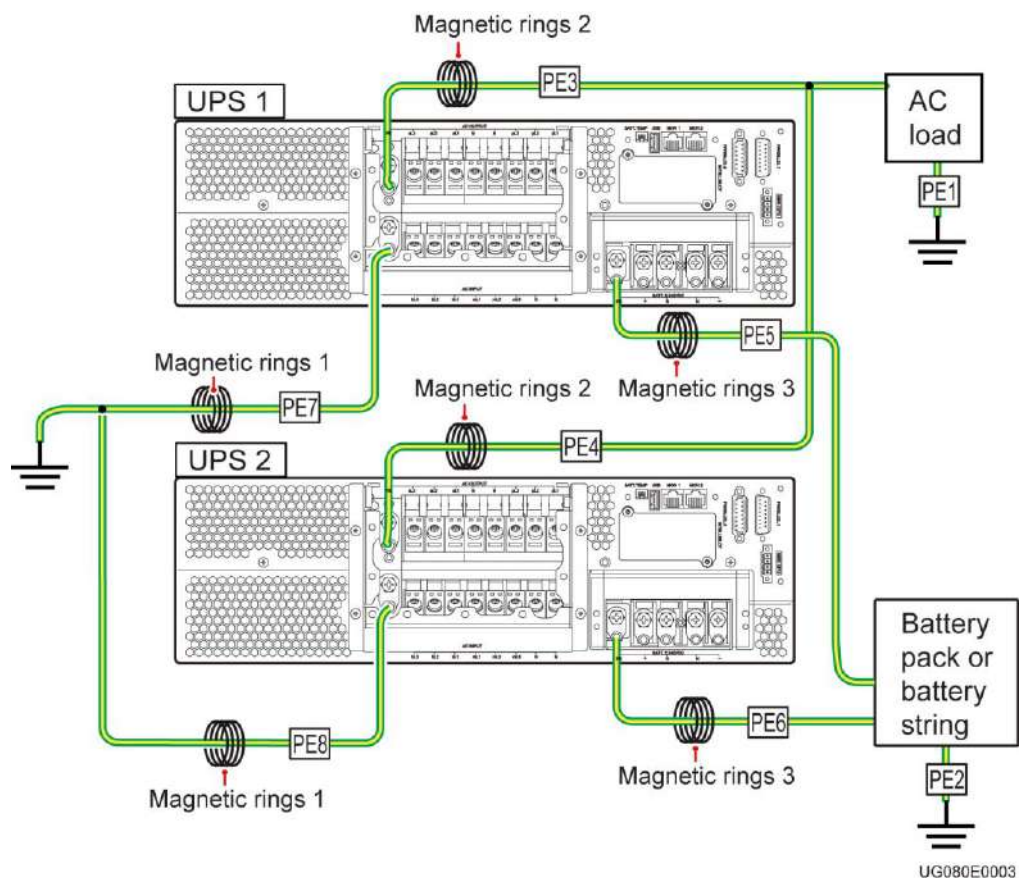
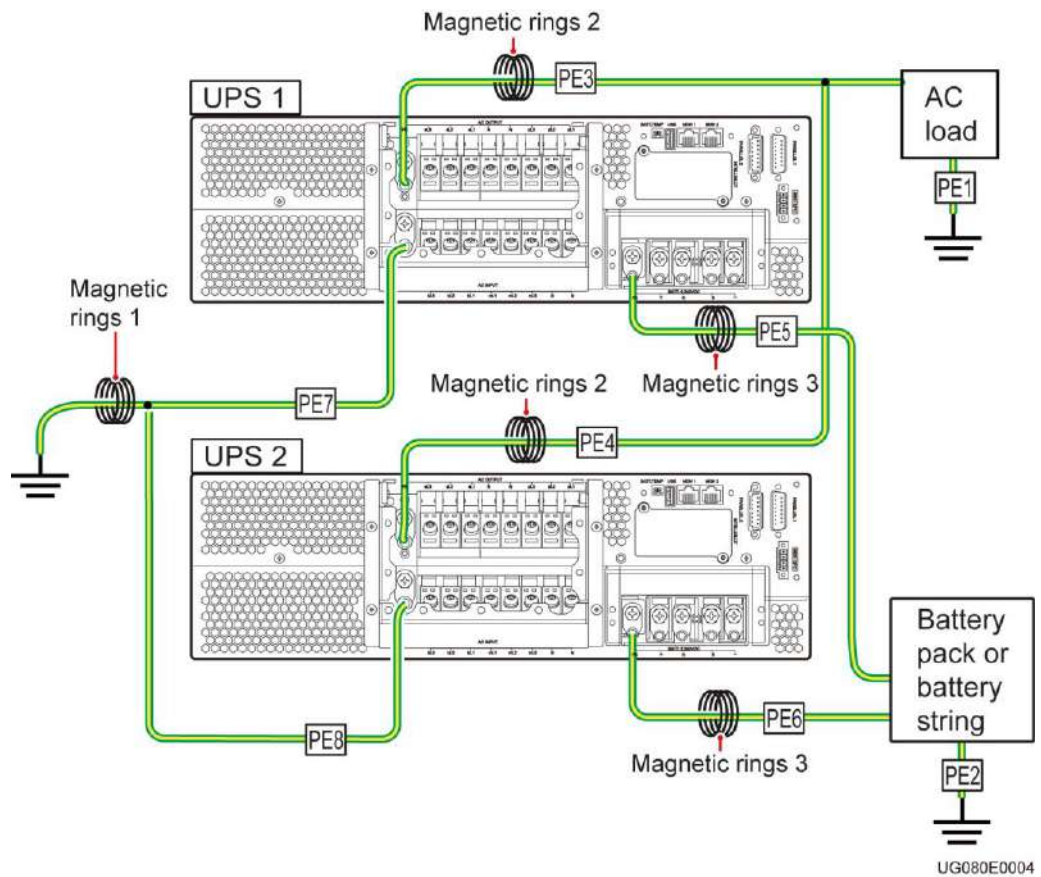


Figure 2-7 Installing a magnetic ring (numbered 1) on the general PE cable



NOTE

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

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

Table 2-3 Specifications of magnetic rings from three vendors

Vendor	Magnetic Ring
DMEGC	R10K
TDK	HS10
TDG	TS10

NOTE

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

3 Installation

3.1 Preparations

3.1.1 Site

Floor Bearing

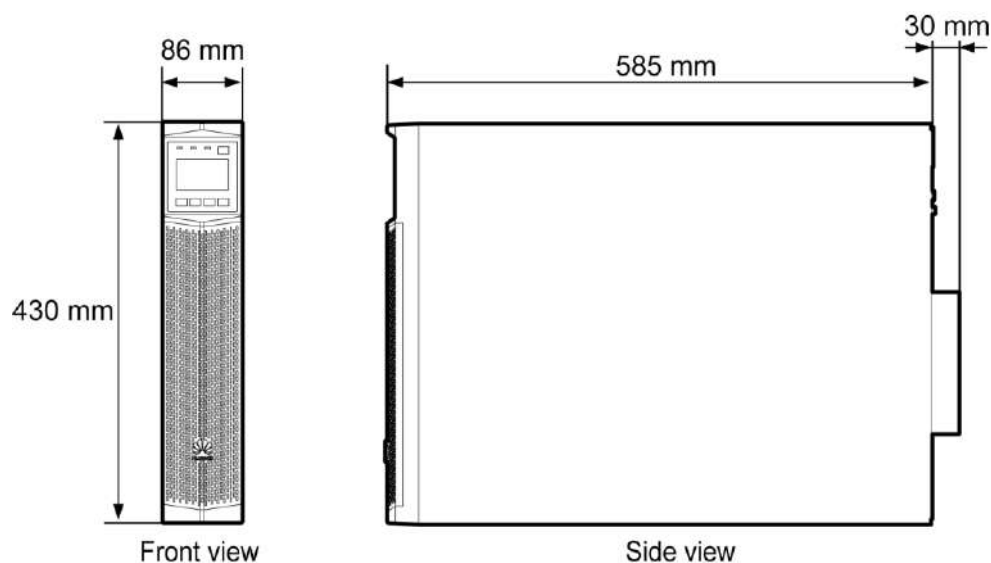
The floor can bear the weight of the UPS and its optional components. In the case of rack installation, ensure that the floor can also bear the weight of the rack.

Environment

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

UPS2000-G-6 kVA/10 kVA Dimensions

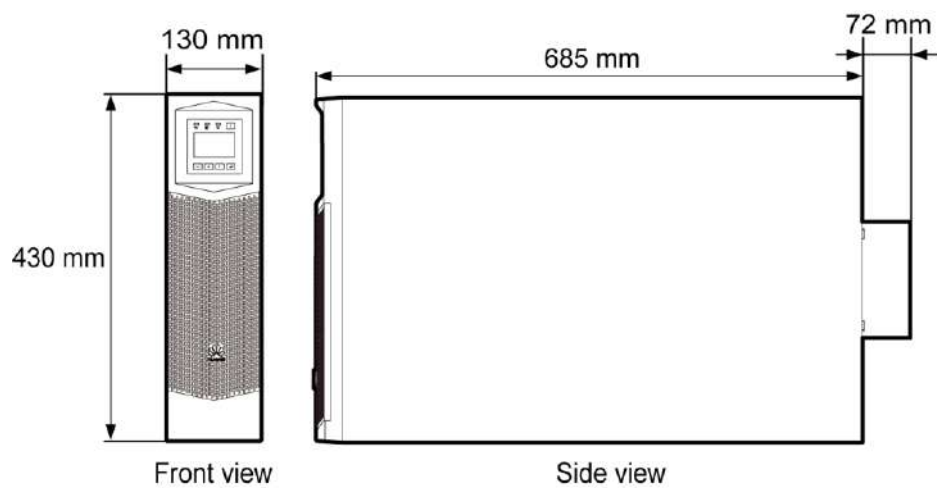
Figure 3-1 UPS2000-G-6 kVA/10 kVA installation dimensions



UG060E0004

UPS2000-G-15 kVA/20 kVA Dimensions

Figure 3-2 UPS2000-G-15 kVA/20 kVA installation dimensions



UG080E0005

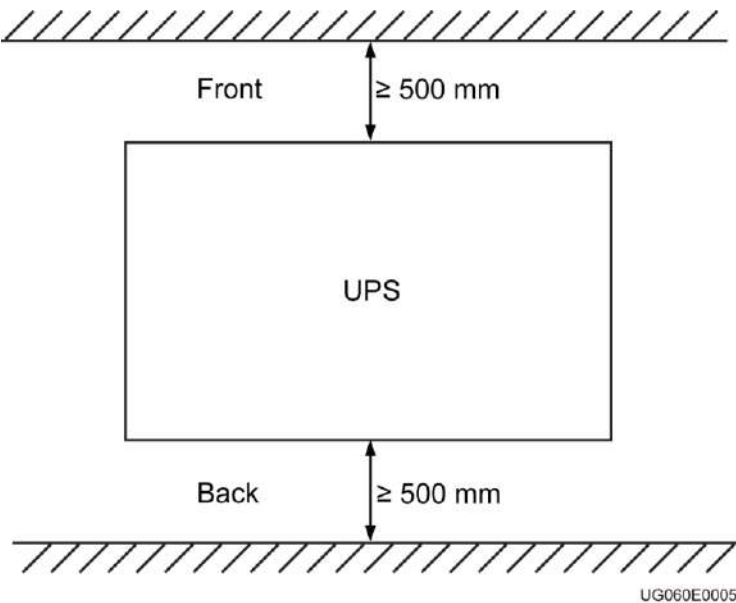
Clearances

NOTICE

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

Reserve a clearance of at least 500 mm respectively from the front and rear panels of the UPS to the wall or adjacent equipment to facilitate ventilation and heat dissipation, as shown in [Figure 3-3](#).

Figure 3-3 Reserved clearances



3.1.2 Tools

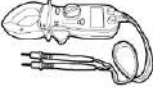
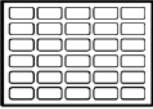
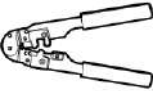
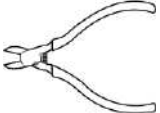
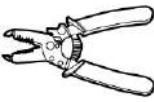
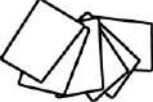
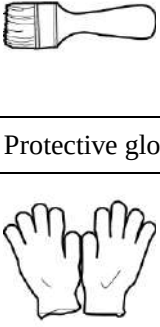
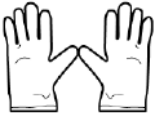
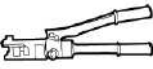
NOTICE

Get installation tools insulated to prevent electric shocks.

[Table 3-1](#) lists the installation tools.

Table 3-1 Tools

Tools			
Clamp meter	Multimeter	Label	Phillips screwdriver (PH 2 x 150 mm or PH 3 x 250 mm)

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

3.1.3 Power Cables

NOTICE

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

Table 3-2 lists the recommended power cable specifications.

Table 3-2 Recommended power cable specifications

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

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

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

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



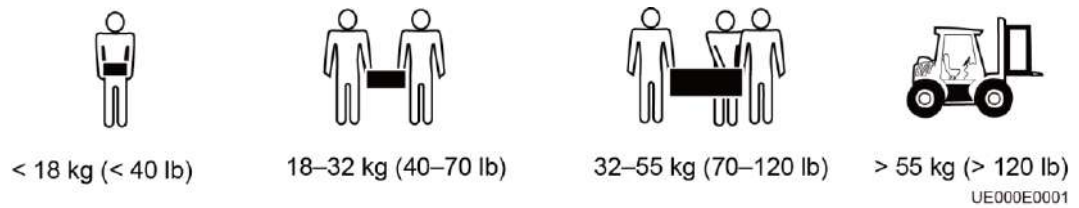
NOTE

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

3.1.4 Unpacking and Checking

Figure 3-4 shows the transportation safety requirements.

Figure 3-4 Transportation safety requirements



NOTICE

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

Procedure

- Step 1** Visually inspect the UPS appearance for shipping damage. If any shipping damage is found, report it to the carrier immediately.
- Step 2** Move the UPS to the installation position.
- Step 3** Unpack the case.
- Step 4** Check the UPS packing.
1. Check the UPS bar code (which is at the rear panel of the UPS, near the air exhaust vent), and ensure that it complies with the order.
 2. If there is any discrepancy, contact your local Huawei office immediately.
- End

3.2 Installation Procedure

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

3.3 Installing a Backfeed Protection Device

3.3.1 Backfeed Protection Device Specifications

NOTICE

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

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

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

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

Model	Rated Voltage and Current	Recommended Contactor Models (Schneider contactors)
UPS2000-G-6KRTS	220/230/240 V AC, 40 A	LC1-D40A
UPS2000-G-6KRTL		
UPS2000-G-10KRTS	220/230/240 V AC, 65 A	- LC1-D50A for single-phase input - LC1-DT60A for three-phase input
UPS2000-G-10KRTL		
UPS2000-G-15KRTL (three-phase input)	220/230/240 V AC, 32 A	- LC1-D80 for single-phase input - LC1-DT60A for three-phase input
UPS2000-G-20KRTL (three-phase input)	220/230/240 V AC, 40 A	
UPS2000-G-15KRTL (single-phase input) UPS2000-G-20KRTL (single-phase input)	220/230/240 V AC, 125 A	

Table 3-4 Control relay parameters

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

3.3.2 Feedback Prevention Connections (With Dry Contract Control)

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

Figure 3-5 Bypass backfeed protection connections for the UPS2000-G-6 kVA/10 kVA/15 kVA/20 kVA (single-phase input single-phase output)

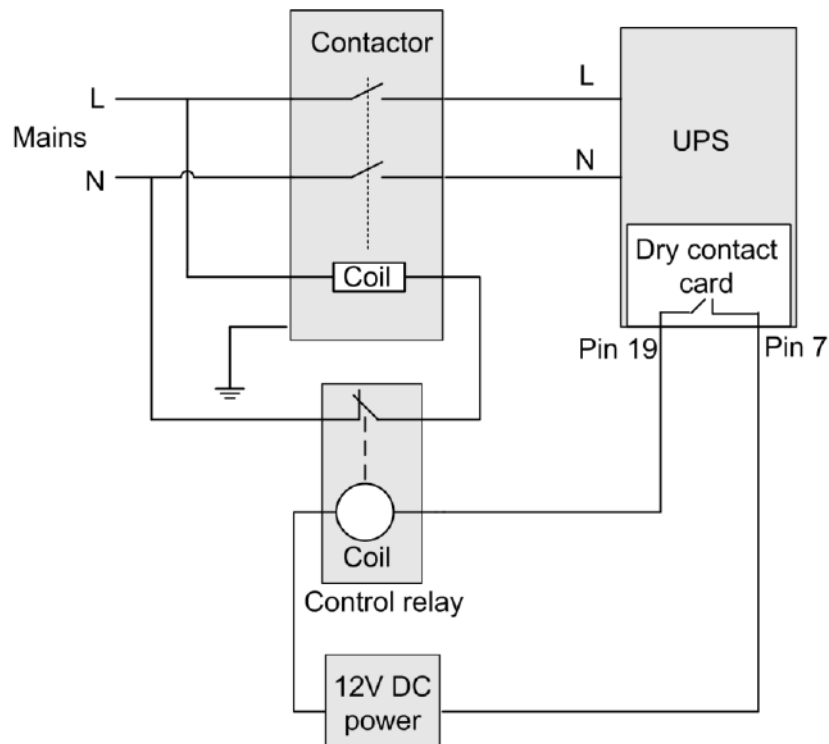


Figure 3-6 Bypass backfeed protection connections for the UPS2000-G-10 kVA (three-phase input single-phase output)

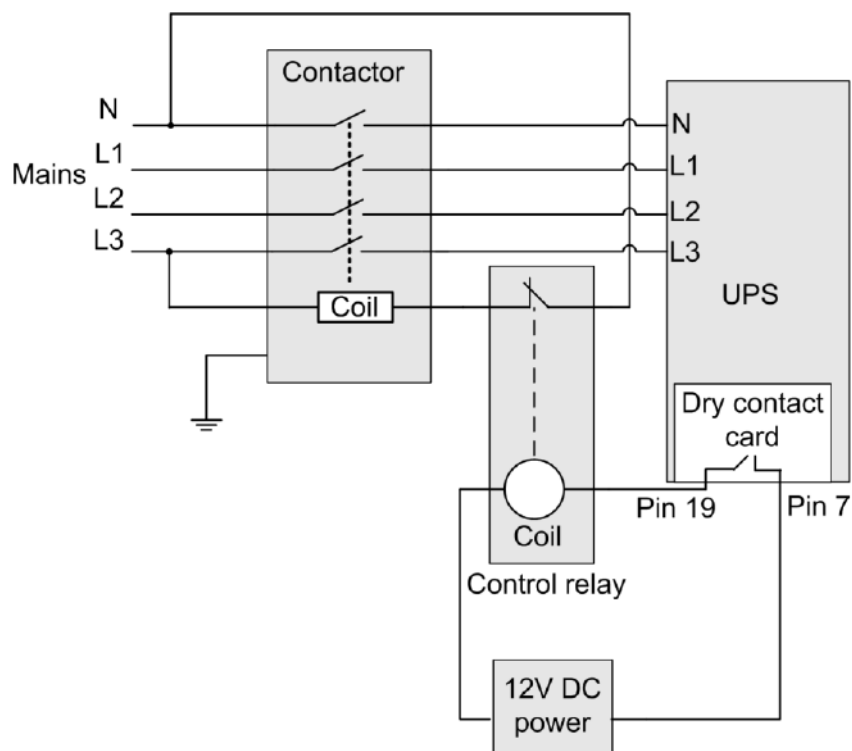


Figure 3-7 Bypass backfeed protection connections for the UPS2000-G-15 kVA/20 kVA
(three-phase input three-phase output)

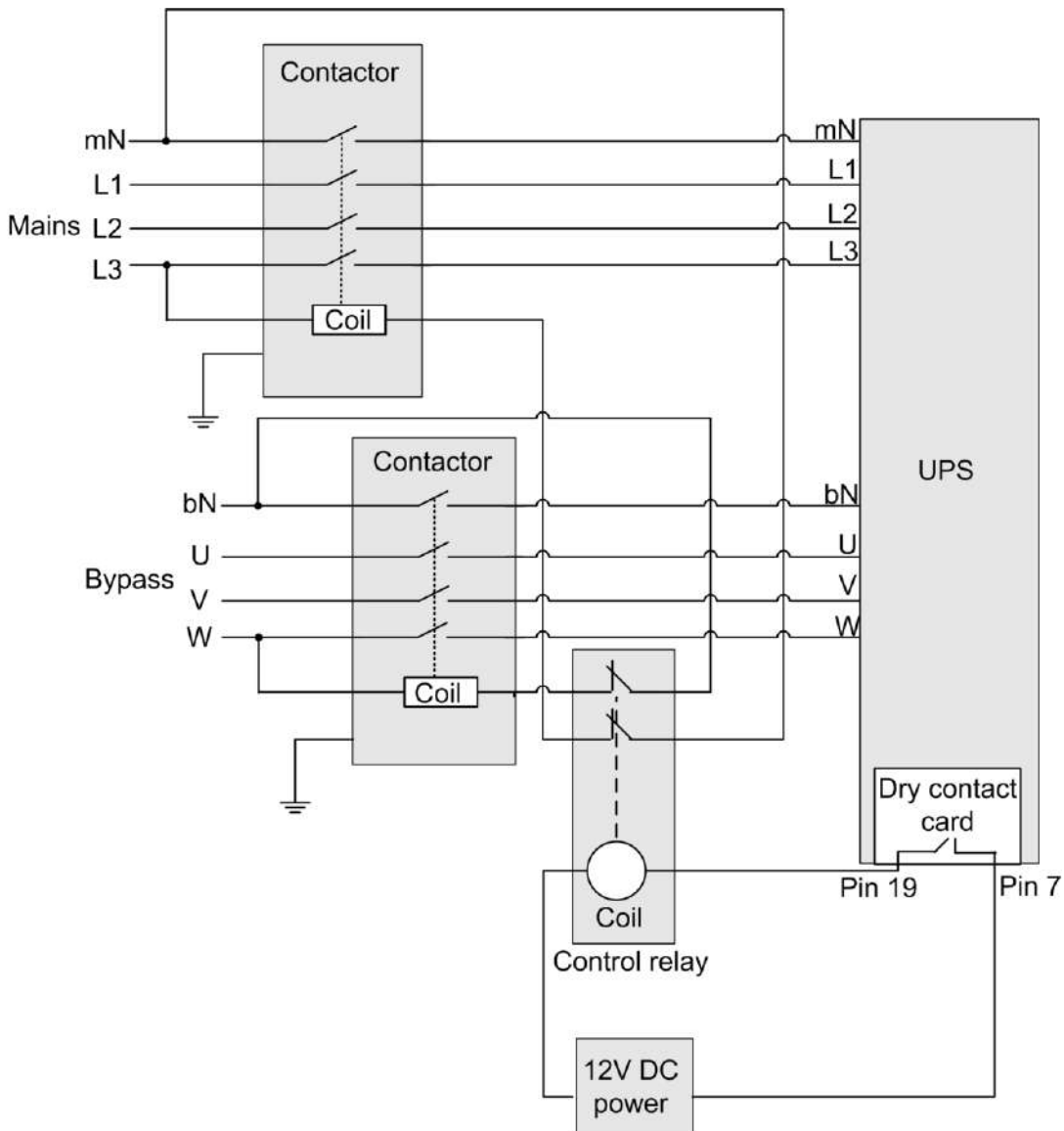
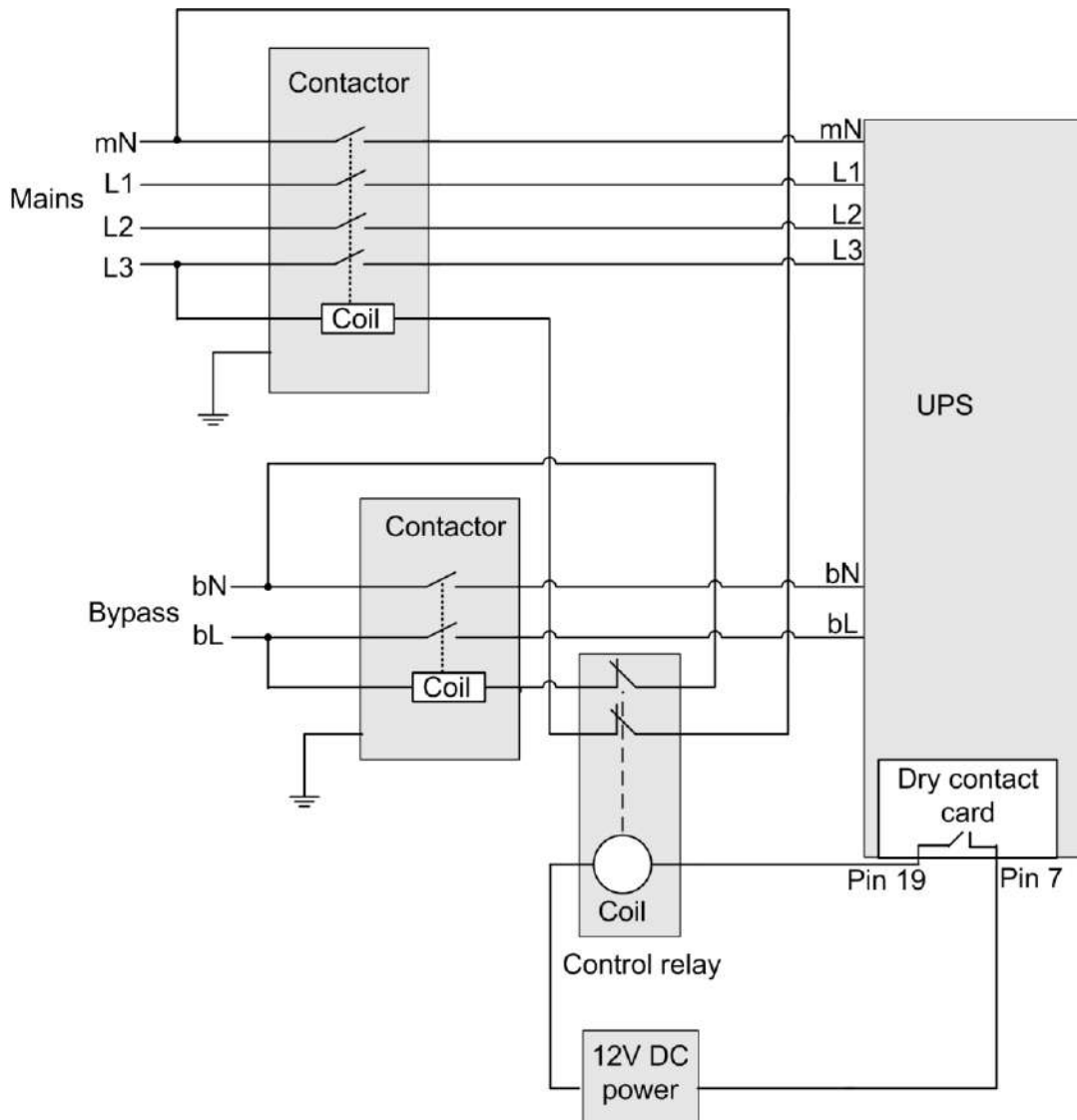


Figure 3-8 Bypass backfeed protection connections for the UPS2000-G-15 kVA/20 kVA (three-phase input single-phase output)



3.4 Check After Installation

Table 3-5 lists the check items.

Table 3-5 Post-installation check items

No.	Item	Expected Result
1	Cable routing	Cable routing meets engineering requirements.
2	Cable connections	Input cables, output cables, and battery cables are tightened to specified torques using a torque wrench, connected correctly, and free of damage.

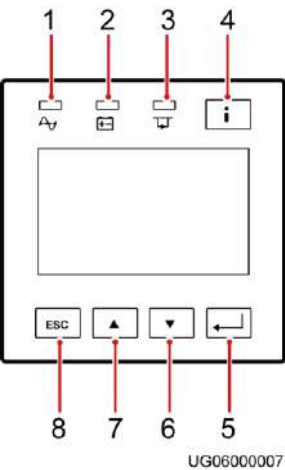
No.	Item	Expected Result
3	Cable connections for USB ports and network ports	Cables to USB ports and network ports are connected correctly and securely.
4	Labels	Labels are neatly attached to both ends of each cable, and the information on the labels is concise and understandable.
5	Ground cable connection	The ground cable is securely connected to the equipment room ground bar. Measure the resistance between the UPS ground cable and the equipment room ground bar, which must be less than 0.1 ohm.
6	Distances between cable ties	Distances between cable ties are the same, and no burr exists.
7	Operating environment	Clean the conductive air and other sundries.

4 Control Panel

4.1 Introduction

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

Figure 4-1 Control panel



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

4.2 Indicators

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

Table 4-1 Indicator description

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



NOTE

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

4.3 Functional Buttons

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

Table 4-2 Button description

Button	Meaning	Description
ESC	Shutdown/Back	- On the default screen, press ESC for more than 5 seconds. Release the button when you hear a beep sound. The inverter shuts down. - On any other screen, press ESC to return to the upper-level menu (the default screen is the upper-level screen for the main menu screen).
▲	Up	Press ▲ or ▼ to scroll upward or downward. You can set a value by using the list or step increase or decrease.
▼	Down	
⬅	Enter/Startup/Battery Self-Check/Mute	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.

Butt on	Meaning	Description
		- On the default screen, press . The main menu is displayed. - On any menu screen, press . The lower-level menu is displayed. If the menu is the last level, an information screen is displayed. - On the default screen in normal mode, hold down  for more than 5 seconds. Release the button when you hear a beep sound. The battery test starts. - When the buzzer buzzes, hold down  for 2–5 seconds. The buzzer is muted when you release the button.
i	Fault indicator/INFO button	- When an alarm is generated, press i to view the active alarm information. - When no alarm is generated, press i to return to the default screen.



NOTE

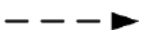
- Battery self-check: After the UPS starts in normal mode, it transfers to battery mode for 10 seconds to check that the battery status (if no battery is connected, **No battery** is displayed) and that the UPS can transfer to battery mode. The purpose is to prevent power backup failure when the UPS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

4.4 LCD

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

4.5 LCD Startup Screens

Table 4-3 Symbol conventions

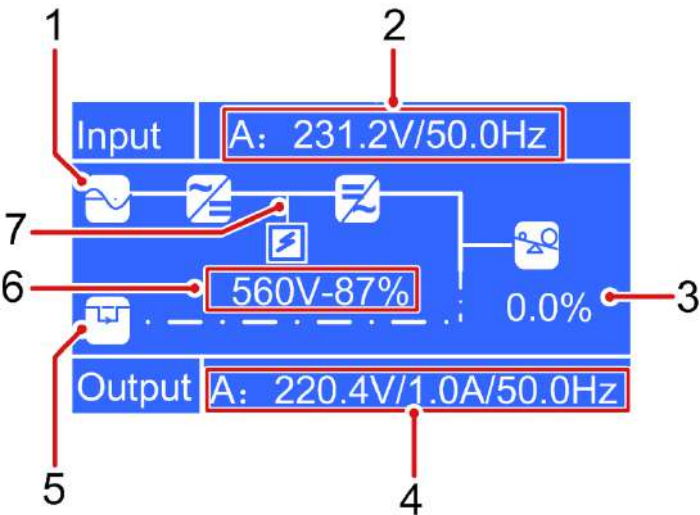
Symbol	Description
	Press A.
	Press B after you press A.
	Indicates omitted screens.

 **NOTE**
The symbol conventions apply to all chapters in this document.

- NOTICE**
- The LCD figures in this document correspond to V100R001C10SPC802. The LCD updated without notice. If the LCD is updated, contact Huawei for the latest LCD figures.
 - The screen in this document based on the UPS2000-G-15 kVA/20 kVA. The parameter values in the menu pictures in this document are for reference only.

Figure 4-2 shows a startup screen.

Figure 4-2 Description of the startup screen



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

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

(7) Battery mode (The solid line indicates battery in charge or discharge mode. The dotted line indicates non-battery mode.)
- (2) Input voltage and frequency

(3) Load power

(4) Output voltage, current, and frequency

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

Table 4-4 describes the icons on the screen.

Table 4-4 Icons on the screen

Icon	Meaning	Icon	Meaning
------	---------	------	---------

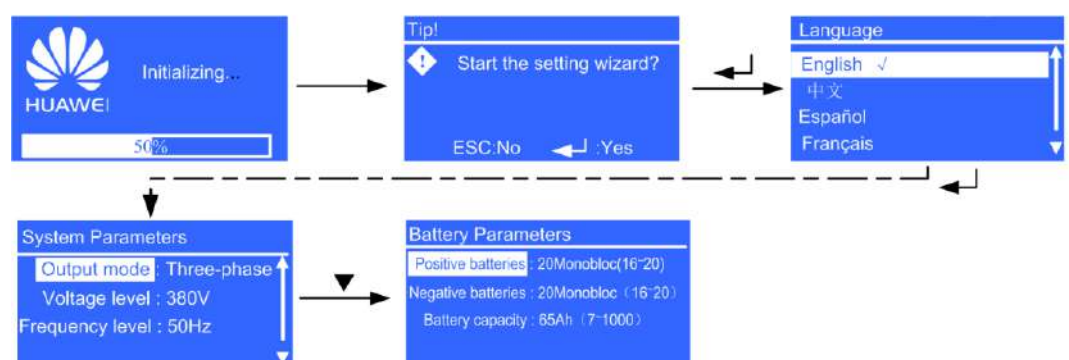
Icon	Meaning	Icon	Meaning
	Mains input		Rectifier/Power factor correction (PFC) working
	Inverter working		Bypass mode
	Load power		Battery charging
	Battery discharging	N/A	N/A

4.5.1 Starting the UPS in Normal Mode

Initial Startup

The settings wizard starts automatically when you start the UPS for the first time or when you restart the UPS after restoring factory settings, as shown in [Figure 4-3](#). The settings wizard provides the **Language**, **System Parameters**, and **Battery Parameters** screens.

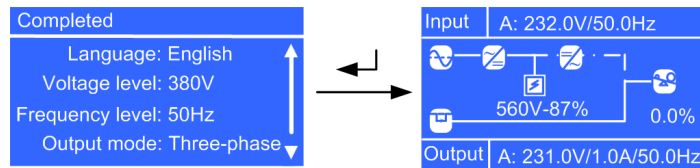
Figure 4-3 Settings wizard



UG06C00004

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

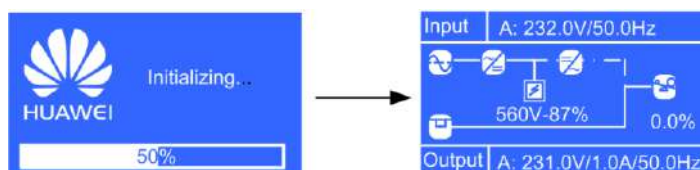
Figure 4-4 Standby screen displayed after initial startup



Non-initial Startup

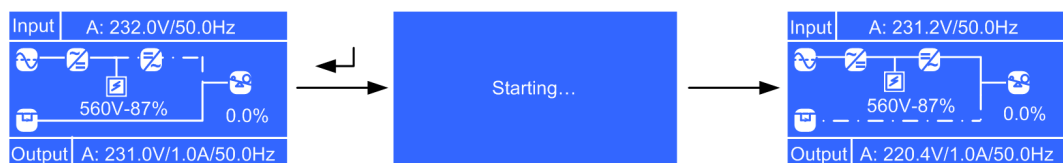
When the initialization is complete, the standby screen is displayed.

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



After the UPS starts, it enters normal mode.

Figure 4-6 Normal mode



Press . The main menu screen is displayed.

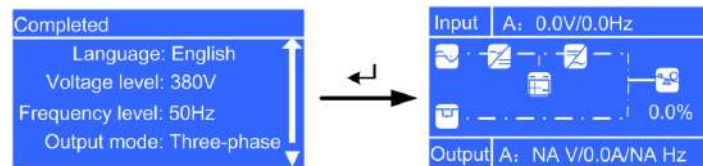
4.5.2 Starting the UPS in Battery Mode

Initial Startup

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

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

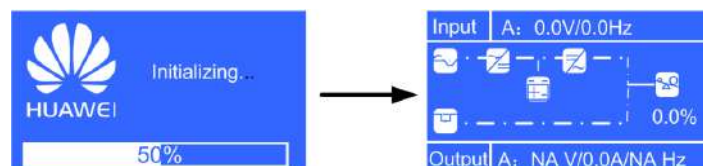
Figure 4-7 Standby screen displayed after initial startup



Non-initial Startup

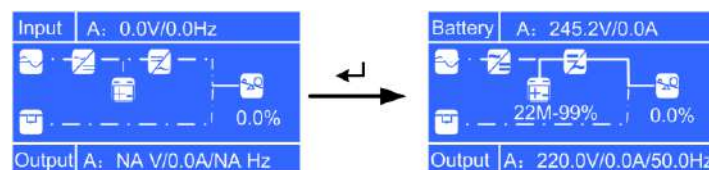
When the initialization is complete, the standby screen is displayed.

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



After the UPS starts, it enters battery mode.

Figure 4-9 Battery mode



Press . The main menu screen is displayed.

4.6 LCD Menu Hierarchy

Figure 4-10 Main Menu screen

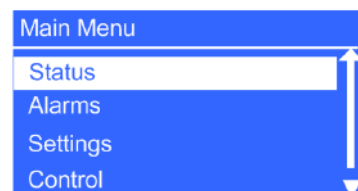
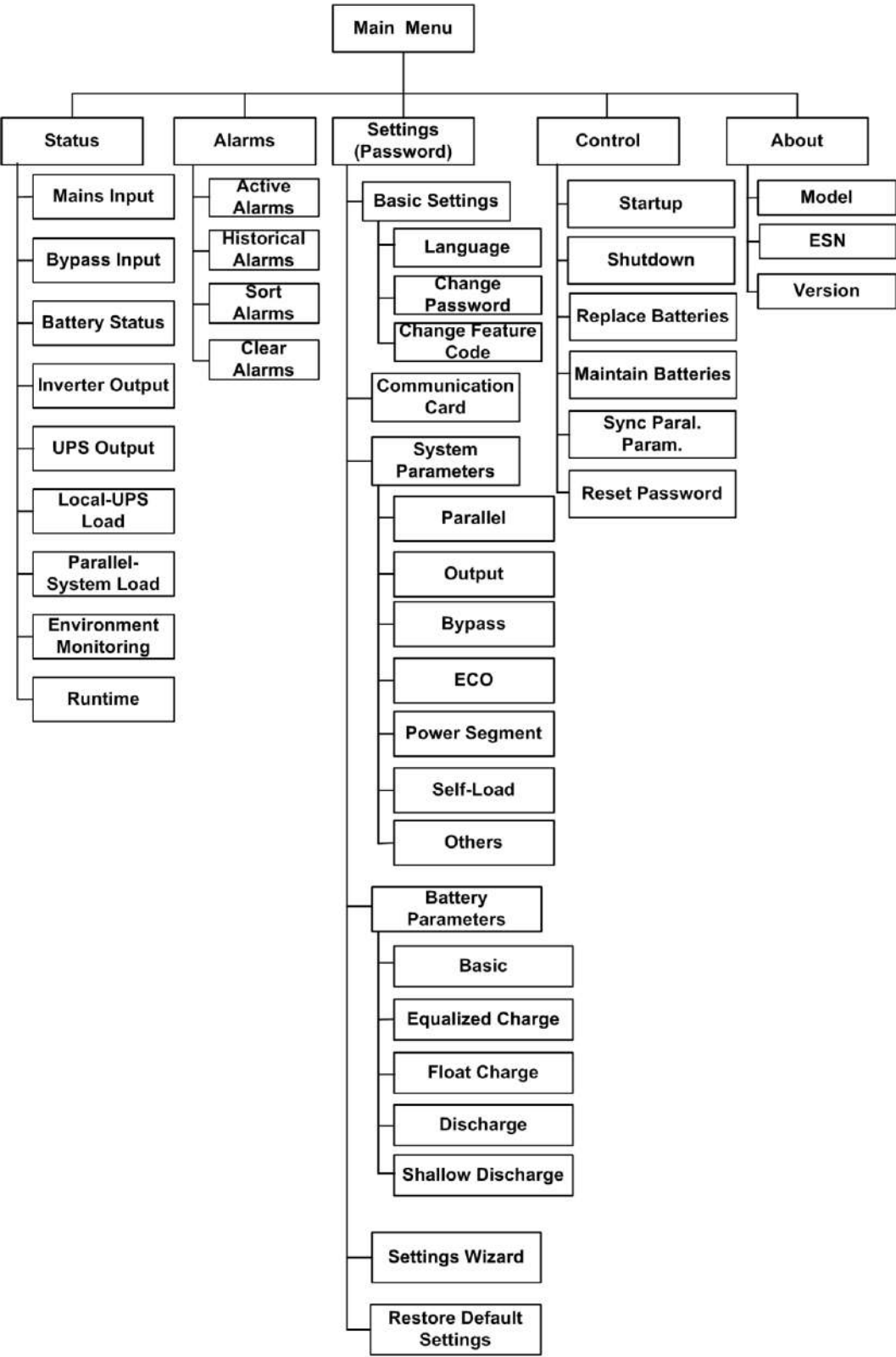


Figure 4-11 shows the LCD menu hierarchy.

Figure 4-11 LCD menu hierarchy



UG06C00020

4.6.1 Status Screen

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

Mains Input Screen

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

Figure 4-12 Mains Input screen

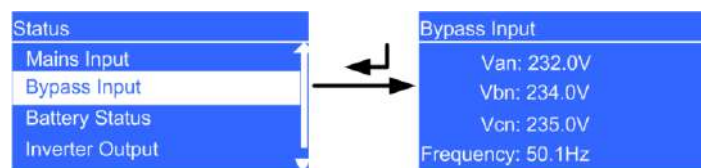


- **Van, Vbn, and Vcn** parameters
Phase voltages displayed on the **Mains Input** screen (The parameter is **Voltage** in the case of single-phase input.)
- **Frequency** parameter
Frequency displayed on the **Mains Input** screen.
- **Vab, Vbc, and Vca** parameters
Line voltages displayed on the **Mains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

Bypass Input Screen

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

Figure 4-13 Bypass Input screen



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

Battery Status Screen

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

Figure 4-14 Battery Status screen

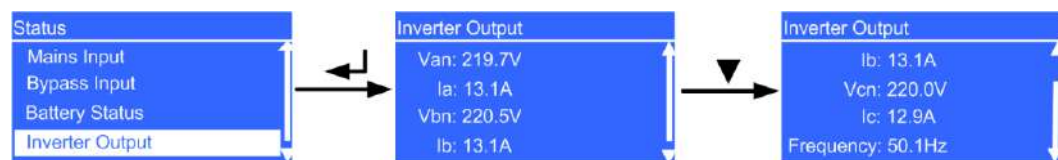


- **Battery voltage** parameter
Battery string voltage (positive and negative battery string voltages in the case of the UPS2000-G-15 kVA/20 kVA)
- **Battery current** parameter
Battery string current (positive and negative battery string currents in the case of the UPS2000-G-15 kVA/20 kVA). + is displayed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

Inverter Output Screen

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

Figure 4-15 Inverter Output screen

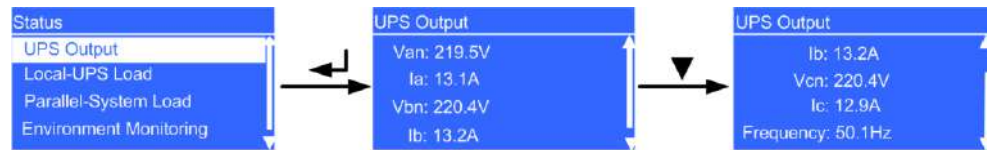


- **Van, Vbn, and Vcn** parameters
Phase voltages displayed on the **Inverter Output** screen (The parameter is **Voltage** in the case of single-phase input.)
- **Ia, Ib, and Ic** parameters
Phase currents displayed on the **Inverter Output** screen (The parameter is **Current** in the case of single-phase input.)
- **Frequency** parameter
Frequency displayed on the **Inverter Output** screen.

UPS Output Screen

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

Figure 4-16 UPS Output screen

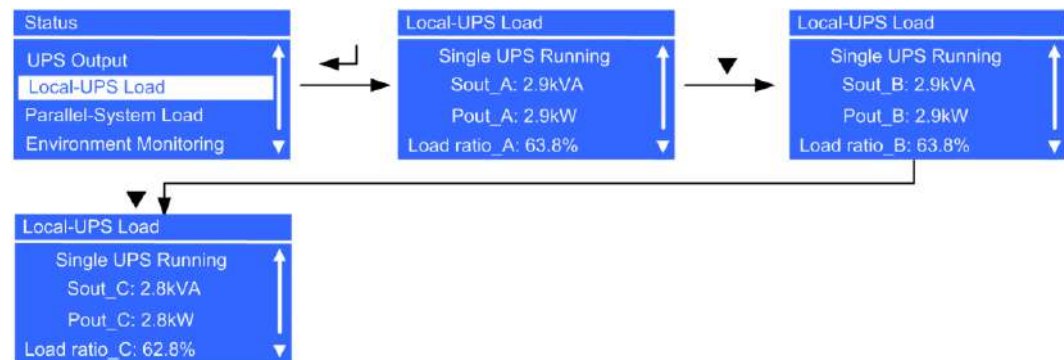


- **Van, Vbn, and Vcn** parameters
Phase voltages displayed on the **UPS Output** screen (The parameter is **Voltage** in the case of single-phase input.)
- **Ia, Ib, and Ic** parameters
Phase currents displayed on the **UPS Output** screen (The parameter is **Current** in the case of single-phase input.)
- **Frequency** parameter
Frequency on displayed the **UPS Output** screen.

Local-UPS Load Screen

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

Figure 4-17 Local-UPS Load screen

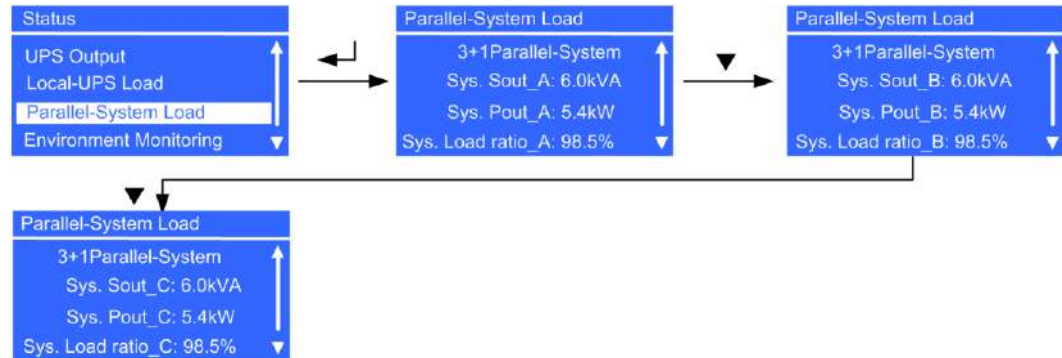


- **Single UPS Running** screen
A single UPS is running.
- **Sout_A, Sout_B, and Sout_C** parameters
Phase A, B, and C apparent power displayed on the **Local-UPS Load** screen (The parameter is **Sout** in the case of single-phase input.)
- **Pout_A, Pout_B, and Pout_C** parameters
Phase A, B, and C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

Parallel-System Load Screen

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

Figure 4-18 Parallel-System Load screen



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



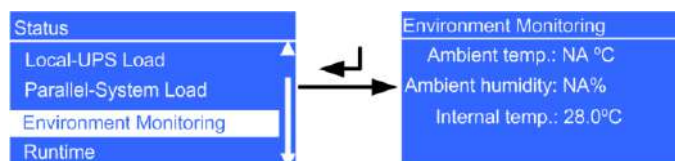
NOTE

System information is not displayed in single UPS mode.

Environment Monitoring Screen

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

Figure 4-19 Environment Monitoring screen

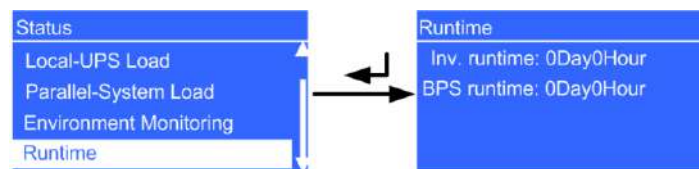


- **Ambient temp.** parameter
Temperature detected by the ambient temperature and humidity sensor (used together with an SNMP card; if the sensor is not connected, **NA** is displayed.)
- **Ambient humidity** parameter
Temperature and humidity sensor humidity (Install an SNMP card and a temperature and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

Runtime Screen

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

Figure 4-20 Runtime screen



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

4.6.2 Alarms Screen

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

NOTE

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

Active Alarms Screen

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

Figure 4-21 Active Alarms screen





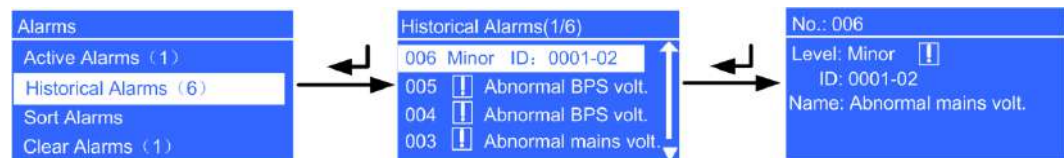
NOTE

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

Historical Alarms Screen

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

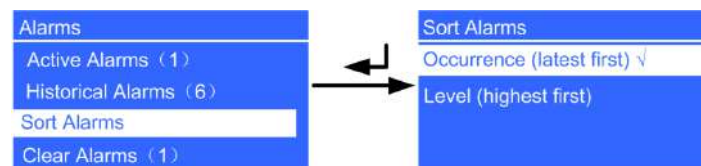
Figure 4-22 Historical Alarms screen



Sort Alarms Screen

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

Figure 4-23 Sort Alarms screen



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



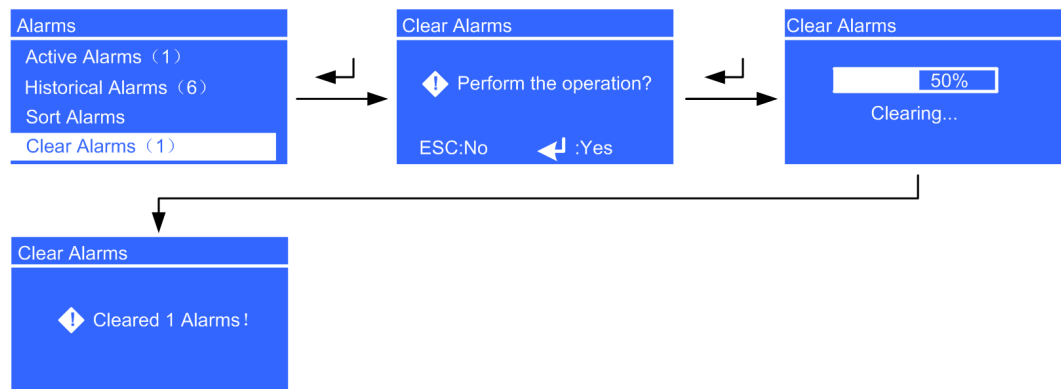
NOTE

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

Clear Alarms Screen

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

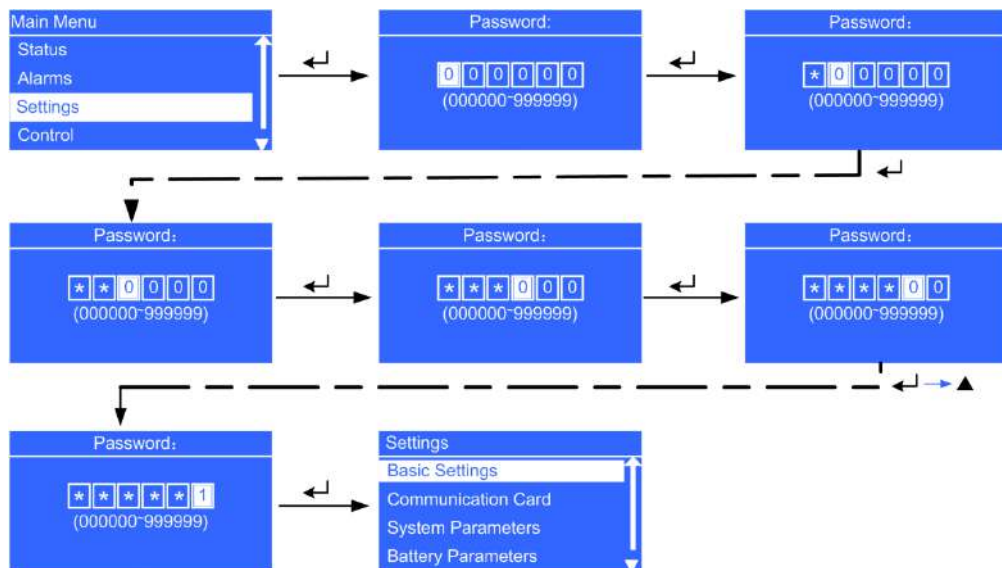
Figure 4-24 Clear Alarms screen



4.6.3 Settings Screen

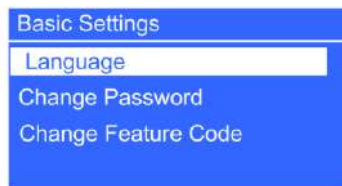
On the **Main Menu** screen, select **Settings**, and press . The Settings login screen is displayed. The preset password is **000001**. After you enter a password, press . The **Settings** screen is displayed, as shown in [Figure 4-25](#).

Figure 4-25 Settings screen



Basic Settings Screen

Figure 4-26 Basic Settings screen

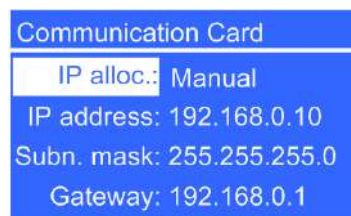


- **Language** parameter
You can select **Chinese**, **English** (preset), **Turkish**, **French**, and **Russian**.
- **Change Password** parameter
You can change the password by choosing **Settings** > **Basic Settings** > **Change Password**. The preset password is **000001**. The password allows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

Communication Card Screen

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

Figure 4-27 SNMP card settings



- **IP alloc.** parameter
Specifies the DHCP address allocating mode. The options include **Manual** and **Automatic**. The default value is **Manual**. 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.



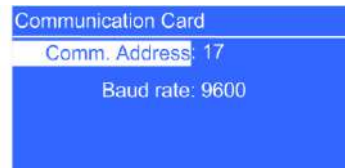
NOTE

If the UPS monitor does not support the DHCP function, after the DHCP is selected for the SNMP card, you cannot set the IP address of the SNMP card on the UPS monitor. You are advised to update the version of the UPS monitor.

- **IP address** parameter
Set an IP address for the SNMP card. The value ranges from **1.0.0.0** to **223.255.255.255**. The default value is **192.168.0.10**.

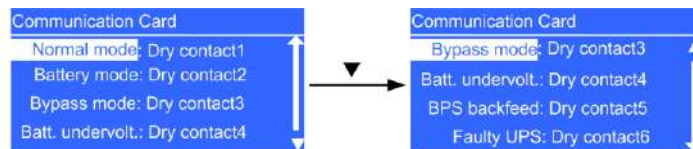
- **Subn. mask** parameter
Set a subnet mask for the SNMP card. The value ranges from **0.0.0.0** to **255.255.255.255**. The default value is **255.255.255.0**.
 - **Gateway** parameter
Set a gateway address for the SNMP card. The value ranges from **1.0.0.0** to **223.255.255.255**. The default value is **192.168.0.1**.
2. If a Modbus card is connected, the following parameters are displayed:

Figure 4-28 Modbus card settings



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

Figure 4-29 Dry contact card settings



NOTE

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

- **Normal mode** parameter
Set the output dry contact associated with normal mode. When the UPS is in normal or ECO mode, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact1**.
- **Battery mode** parameter
Set the output dry contact associated with battery mode. When the UPS is in battery or ECO mode, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact2**.
- **Bypass mode** parameter
Set the output dry contact associated with bypass mode. When the UPS is in bypass or ECO mode, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact3**.
- **Batt. undervolt** parameter

Set the output dry contact associated with low battery voltages. When the system battery voltage is low, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact4**.

- **BPS backfeed** parameter

Set the output dry contact associated with bypass backfeed. When a bypass backfeed alarm is generated, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact5**.

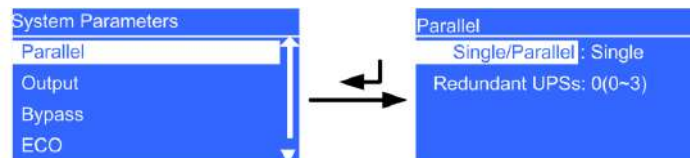
- **Faulty UPS** parameter

Set the output dry contact associated with UPS faults. When a critical alarm is generated, this dry contact is enabled. The value ranges from **Dry contact1** to **Dry contact6**. The default value is **Dry contact6**.

System Parameters Screen

- **Parallel** screen

Figure 4-30 Parallel screen



- **Single/Parallel** parameter

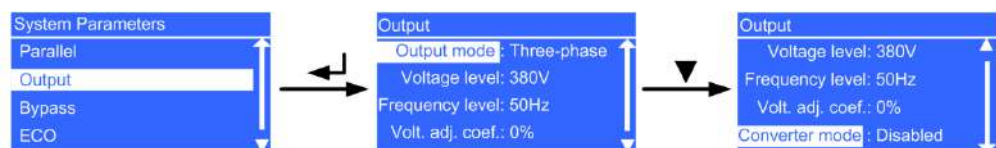
The values include **Single** and **Parallel**. The default value is **Single**. The parameter is configurable after the inverter shuts down.

- **Redundant UPSs** parameter

Set the number of redundant UPSs. The value ranges from 0 to 3. The default value is 0. The parameter is configurable after the inverter shuts down.

- **Output** screen

Figure 4-31 Output screen



NOTE

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

- **Output mode** parameter

Set the system output mode. The value is not configurable on the UPS2000-G-6 kVA/10 kVA. The default value is **Single-phase**. The parameter is configurable on the UPS2000-G-15 kVA/20 kVA. The values include **Single-phase** and **Three-phase**. The default value is **Three-phase**. The input mode is identified automatically by the system. The parameter is configurable after the inverter shuts down.

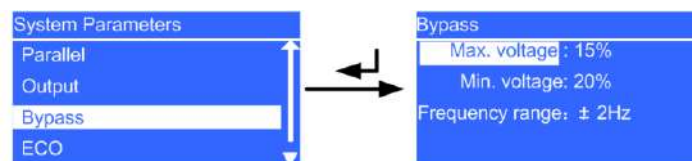
- **Voltage level** parameter
Set the system output voltage level. The values include 220 V (default), 230 V, and 240 V on the UPS2000-G-6 kVA/10 kVA. The values include 220 V (default), 230 V, and 240 V on the UPS2000-G-15 kVA/20 kVA (single-phase output). The values include 380 V (default), 400 V, and 415 V on the UPS2000-G-15 kVA/20 kVA (three-phase output). After you change the voltage level, the upper thresholds for bypass voltages restore to default values 15%. The parameter is configurable after the inverter shuts down.
- **Frequency level** parameter
Set the system output frequency level. The values include 50 Hz (default), 60 Hz, and **Automatic**. If the value is **Automatic**, the power-on bypass frequency ranges from 40 Hz to 55 Hz, and the system output frequency is 50 Hz; if the power-on bypass frequency ranges from 55 Hz to 70 Hz (excluding 55 Hz), and the system output frequency is 60 Hz. The parameter is configurable after the inverter shuts down.
- **Volt. adj. coef.** parameter
You can adjust the inverter rated output voltage. The values include $\pm 5\%$, $\pm 4\%$, $\pm 3\%$, $\pm 2\%$, $\pm 1\%$, and 0% (default). Press + or – to increase or decrease the output voltage. The parameter is configurable after the inverter shuts down.

NOTICE

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

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

Figure 4-32 Bypass screen



- **Max. voltage** parameter
Upper threshold for the bypass voltage. If the difference between the bypass voltage and the rated output voltage exceeds this value, the system determines that the bypass voltage is abnormal and that the bypass is unavailable.
The **Max. voltage** parameter is associated with the system voltage level. The default value is 15%.
If the voltage system is 220 V (380 V in the case of three-phase outputs), the values include 10%, 15%, 20%, and 25%.

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

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

The parameter is configurable after the inverter shuts down.

- **Min. voltage** parameter

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

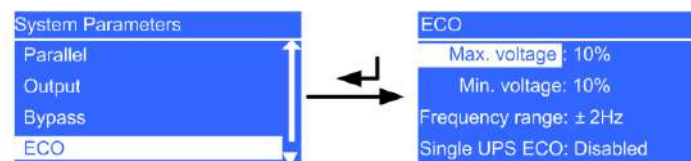
- **Frequency range** parameter

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

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

- **ECO screen**

Figure 4-33 ECO screen



 NOTE

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

- **Max. voltage** parameter

Upper threshold for the ECO voltage. In ECO mode, when the difference between the bypass voltage and the rated voltage is greater than this value, the system determines that the ECO voltage is abnormal and transfers to normal mode. The values include 5%, 6%, 7%, 8%, 9%, and 10% (default). The parameter is configurable after the inverter shuts down.

- **Min. voltage** parameter

Lower threshold for the ECO voltage. In ECO mode, when the difference between the bypass voltage and the rated voltage is greater than this value, the system determines that the ECO voltage is abnormal and transfers to normal mode. The values include 5%, 6%, 7%, 8%, 9%, and 10% (default). The parameter is configurable after the inverter shuts down.

- **Frequency range** parameter

ECO frequency range. In ECO mode, when the difference between the bypass frequency and the rated frequency is greater than this range, the system determines that the ECO frequency is abnormal and transfers to normal mode.

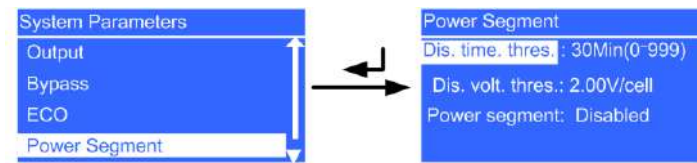
The frequency range must be less than the current bypass frequency range. The values include ± 0.5 Hz, ± 1 Hz, ± 2 Hz (default), and ± 3 Hz. The parameter is configurable after the inverter shuts down.

- **Single UPS ECO** parameter

Determine whether to support ECO mode on a single UPS (ECO mode is not supported in a parallel system). The values include **Disabled** and **Enabled**. The default value is **Disabled**. The parameter is configurable after the inverter shuts down.

- **Power Segment** screen

Figure 4-34 Power Segment screen



 NOTE

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

 NOTE

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

- **Dis. volt. thres.** parameter

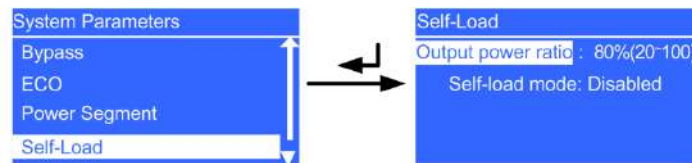
Set the lower threshold for the battery voltage when pL loading is allowed in battery mode when power segment (not supported in a parallel system) is enabled. In battery mode, if the battery voltage is less than this value, the UPS disconnects from secondary loads. The value ranges from 1.90 V/cell to 2.25 V/cell. The default value is 2.00 V/cell. The parameter is configurable in non-battery mode or non-battery ECO mode

- **Power segment** parameter

Determine whether to enable power segment in single UPS mode (power segment is not supported in a parallel system). The values include **Disabled** and **Enabled**. The default value is **Disabled**. The parameter is configurable after the inverter shuts down.

- **Self-Load** screen

Figure 4-35 Self-Load screen



- **Output power ratio** parameter

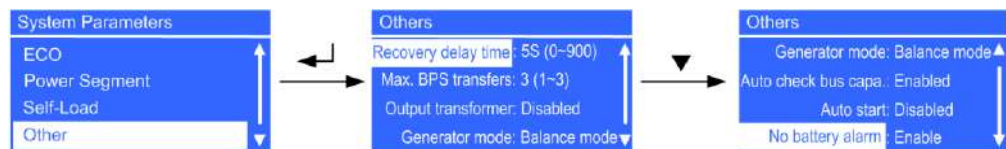
This parameter is used during the tests before shipment. The value ranges from 20% to 100%. The default value is 80%. The parameter is configurable after the inverter shuts down.

- **Self-load** mode parameter

This parameter is used during the tests before shipment. The values include **Disabled** and **Enabled**. The default value is **Disabled**. The parameter is configurable after the inverter shuts down.

- **Others** screen

Figure 4-36 Others screen



- **Recovery delay time** parameter

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

 NOTE

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

- **Max. BPS transfers** parameter

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

NOTICE

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

- **Output transformer** parameter

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



NOTE

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

- **Generator mode** parameter

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

- **Auto check bus capa.** parameter

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

- **Auto start** parameter

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

- No battery alarm

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



NOTE

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

Battery Parameters Screen

CAUTION

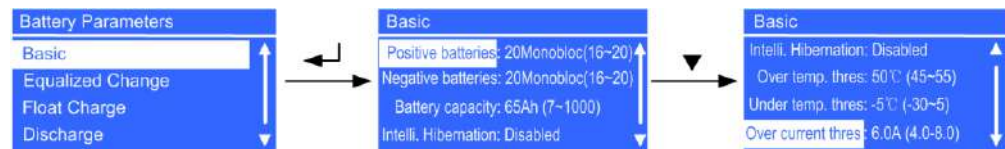
The configured number of batteries must match the actual number. When the actual number changes, change the configured number. If the configured number is less than the actual number, the battery lifespan is shortened. If the configured number is greater than the actual number, battery leakage may cause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

NOTICE

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

- **Basic screen**

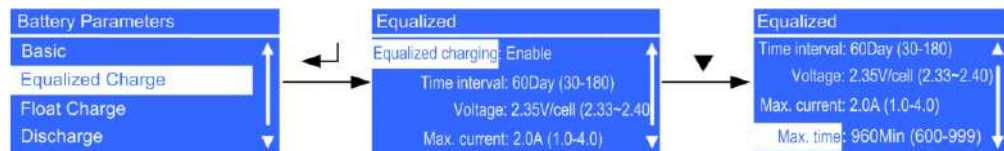
Figure 4-37 Basic screen



- **Number of batteries/Positive batteries and Negative batteries** parameters
Set the number of batteries. The value ranges from 16 to 20. The default value is 20. When the number of batteries N is less than 20, the system output power is derated to N/20 in battery mode. The parameter is configurable in non-battery mode or non-battery ECO mode. You need to set Number of batteries on the UPS2000-G-6 kVA/10 kVA, and set two battery strings (positive and negative) on the UPS2000-G-15 kVA/20 kVA.
- **Battery capacity** parameter
Set the battery string capacity. The value ranges from 7 Ah to 1000 Ah. For the UPS2000-G-6 kVA, the default value is 7 Ah on a standard model and 40 Ah on a long backup time model; for the UPS2000-G-10 kVA, the default value is 9 Ah on a standard model and 65 Ah on a long backup time model; for the UPS2000-G-15 kVA/20 kVA, the default value is 65 Ah on a long backup time model. Battery capacity is the sum of all battery capacities, set the parameters based on the actual battery capacity. The parameter is configurable in non-battery mode or non-battery ECO mode.
- **Intelli. Hibernation**
This parameter is set to disabled by default. When it is set to enabled, the intelligent battery hibernation function is enabled. The parameter is configurable in any mode.
- **Overtemp. thres.** parameter
Set an alarm threshold for high battery temperatures. The value ranges from 45°C to 55°C. The default value is 50°C. The parameter is configurable in any mode.
- **Undertemp. thres.** parameter
Set an alarm threshold for low battery temperatures. The value ranges from –30°C to +5°C. The default value is –5°C. The parameter is configurable in any mode.

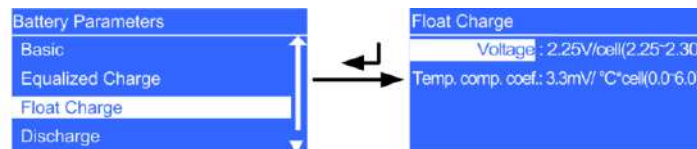
- **Overcurrent thres.** parameter
Set an alarm threshold for battery overcurrent. On a standard model, the value ranges from 2.0 A to 4.0 A, and the default value is 3.0 A. On a long backup time model, the value ranges from 4.0 A to 8.0 A, and the default value is 6.0 A. The parameter is configurable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

Figure 4-38 Equalized Charge screen



- **Equalized charging** parameter
Determine whether to enable equalized charging. The values include **Disabled** and **Enabled**. The default value is **Enabled**. The parameter is configurable in any mode.
- **Time interval** parameter
Set the time interval for equalized charging. The value ranges from **30Day** to **180Day**. The default value is **60Day**. The parameter is configurable in any mode.
- **Voltage** parameter
Set the battery equalized voltage. The value ranges from 2.33 V/cell to 2.40 V/cell. The default value is 2.35 V/cell. The parameter is configurable in any mode.
- **Max. current** parameter
Set the maximum equalized current. On a standard model, the value ranges from 1.0 A to 2.0 A, and the default value is 2.0 A. On a long backup time model, the value ranges from 1.0 A to 4.0 A, and the default value is 2.0 A. The parameter is configurable in any mode.
- **Max. time** parameter
Set the maximum equalized charge time. The value ranges from **600Min** to **999Min**. The default value is **960Min**. The parameter is configurable in any mode.
- **Float Charge** screen

Figure 4-39 Float Charge screen

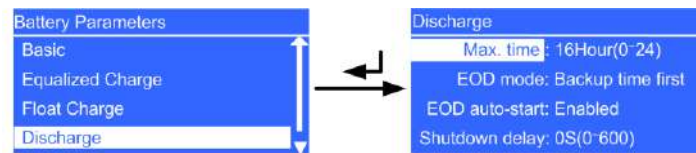


- **Voltage** parameter
Set the battery float voltage. The value ranges from 2.25 V/cell to 2.30 V/cell. The default value is 2.25 V/cell. The parameter is configurable in any mode.
- **Temp. comp. coef.** parameter
Set a float voltage correction coefficient based on the battery temperature when a battery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

6.0 mV/°C*cell. The default value is 3.3 mV/°C*cell. The parameter is configurable in any mode.

- **Discharge** screen

Figure 4-40 Discharge screen



- **Max. time** parameter

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

 NOTE

- If you expect the battery discharge time to be greater than 24 hours, set **Max. time** to 0 hour. Otherwise, the system may power off.
- If you set **Max. time** to 0 hour, the battery string may remain in the small-current discharge state according to the proportion of the battery capacity to the load power, which affects the battery lifecycle.

- **EOD mode** parameter

Determine the power backup time. The values include **Backup time first** (ensures system running and has a long backup time, [Table 4-5](#) shows the EOD setting values), **Batt. protect first** (protects batteries and extends the battery lifespan, [Table 4-6](#) shows the EOD setting values), and **Balanced mode** ([Table 4-7](#) shows the EOD setting values). The default value is **Backup time first**. The parameter is configurable in non-battery mode or non-battery ECO mode. EOD is short for end of discharge.

Table 4-5 Backup time first EOD setting values

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

Table 4-6 Batt. protect first EOD setting values

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

Table 4-7 Balanced mode EOD setting values

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

- **EOD auto-start** parameter

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

- **Shutdown delay** parameter

When the delay time reaches the value after UPS transfers to battery mode, the UPS powers off. The value ranges from 0S to 600S. The default value is 0S. The value interval is 30S. For example, the value can be 0S, 30S, 60S, and 90S. If the delay time is set to 0S, the shutdown delay function is disabled. If the delay time is set to other values, ensure that backup time is greater than shutdown delay time. Otherwise, the power supply to loads may be disconnected. The parameter is configurable in non-battery mode or non-battery ECO mode.

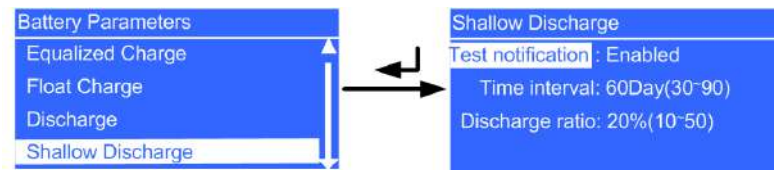


NOTE

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

- **Shallow Discharge** screen

Figure 4-41 Shallow Discharge screen



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

Restoring Factory Settings

You can restore factory settings after the inverter shuts down.

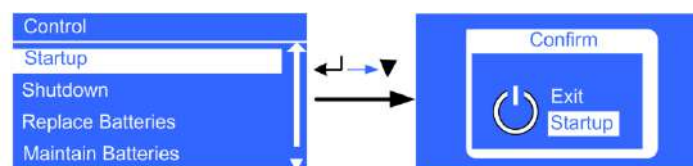
4.6.4 Control Screen

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

Startup Menu

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

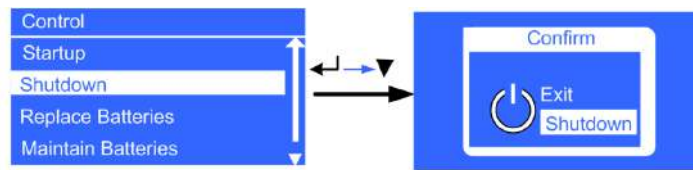
Figure 4-42 Startup screen



Shutdown Menu

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

Figure 4-43 Shutdown screen



Replace Batteries Menu

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

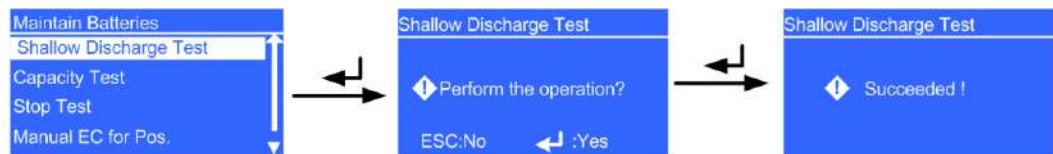
Figure 4-44 Replace Batteries screen



Maintain Batteries Menu

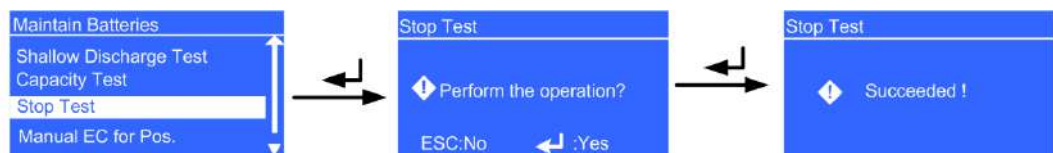
- **Shallow Discharge Test** menu

Figure 4-45 Shallow Discharge Test screen



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

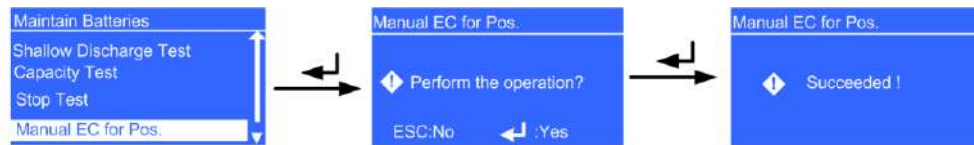
Figure 4-46 Stop Test screen



Stop the shallow discharge test or capacity test.

- **Manual EC for Pos.** menu

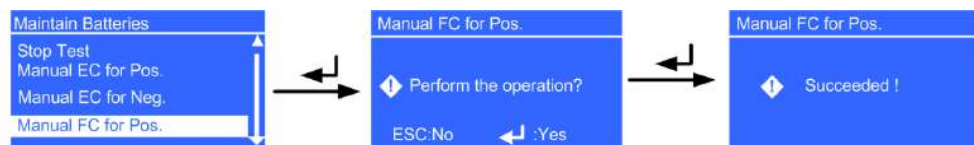
Figure 4-47 Manual EC for Pos. screen



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

- **Manual FC for Pos. menu**

Figure 4-48 Manual FC for Pos. screen

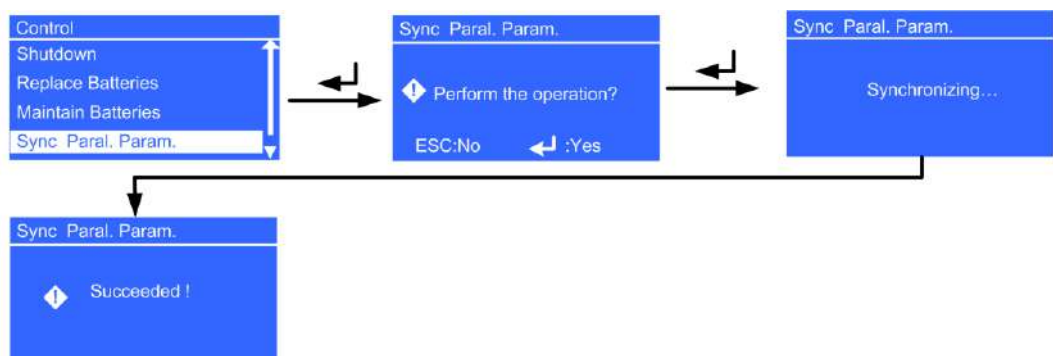


Perform float charging on batteries forcibly. For the 6 kVA and 10 kVA UPSs, perform manual float charging. For the 15 kVA and 20 kVA UPSs, batteries in positive and negative groups are manually switched to float charging respectively.

Sync Paral. Param. Menu

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

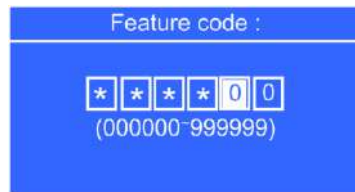
Figure 4-49 Sync Paral. Param. screen



Resetting the Password

Enter a feature code to restore the preset password.

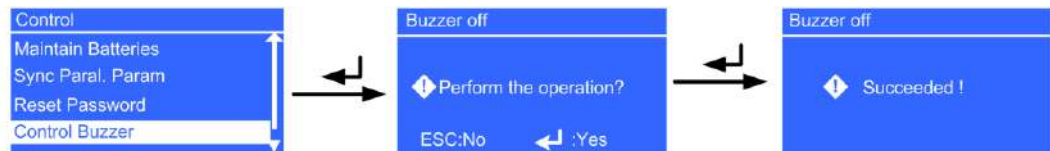
Figure 4-50 Resetting the password



Control Buzzer

Control Buzzer control the buzzer on/off. If the buzzer on, click **Control Buzzer** transfer to **Buzzer off**.

Figure 4-51 Buzzer off screen

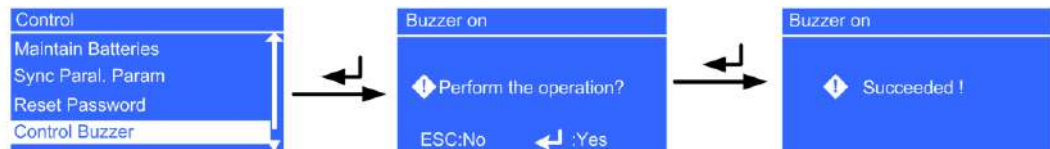


NOTE

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

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

Figure 4-52 Buzzer on screen



4.6.5 About Screen

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

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

Figure 4-53 About screen





NOTE

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

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

5 Operations

5.1 Checking Before Powering On the UPS

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

5.2 Single UPS Operations

5.2.1 Starting the UPS

CAUTION

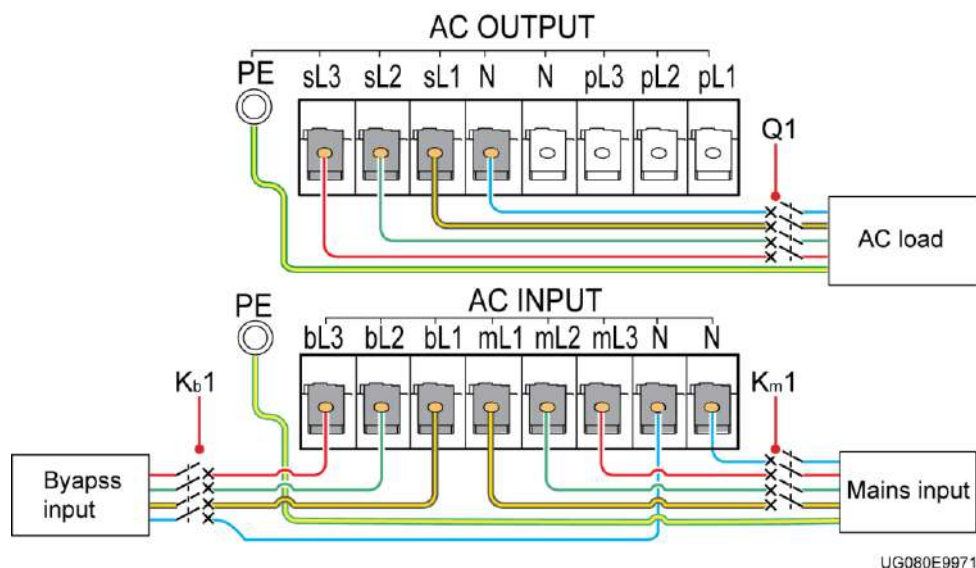
The configured number of batteries must match the actual number. When the actual number changes, change the configured number. If the configured number is less than the actual number, the battery lifespan is shortened. If the configured number is greater than the actual number, battery leakage may cause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

NOTICE

- If the system uses 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 220 V (default), 230 V, or 240 V; in the case of three-phase output, set **Voltage level** to 380 V (default), 400 V, or 415 V.
- Battery parameters are configurable in non-battery mode or non-battery ECO mode.
- Set **Positive batteries** and **Negative batteries**. The value ranges from 16 to 20. The default value is 20.
- Set **Battery capacity** to the total capacity of all batteries actually connected. The value ranges from 7 Ah to 1000 Ah. The default value is 65 Ah.

This section describes how to start the UPS2000-G-15 kVA/20 kVA.

Figure 5-1 Connecting cables to the UPS2000-G-15 kVA/20 kVA (three-phase input three-phase output, dual mains)



Starting the UPS in Normal Mode

- Step 1** Close the external battery circuit breaker (if there is), or connect battery cables.
- Step 2** Close the UPS mains input circuit breaker **K_m1** and bypass input circuit breaker **K_b1**.

The initialization screen is displayed.



NOTE

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

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

- Initial startup

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

- Non-initial startup

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

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

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



NOTE

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

Step 5 When the UPS runs properly, close the UPS AC output circuit breaker Q1, and start the loads.



NOTE

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

----End

Starting the UPS in Battery Mode

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

Step 2 Press on the control panel.

The LCD starts. The initialization screen is displayed.

- Initial startup

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

- Non-initial startup

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

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

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

Step 4 When the UPS runs properly, close the UPS AC output circuit breaker Q1, and start the loads.



NOTE

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

----End

5.2.2 Shutting down the UPS

Shutting down the Inverter

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

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



NOTE

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

Shutting down the UPS

Step 1 Shut down the loads.

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

Step 3 Open the UPS mains input circuit breaker K_m1 , bypass input circuit breaker K_b1 , and output circuit breaker Q1.



NOTE

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

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

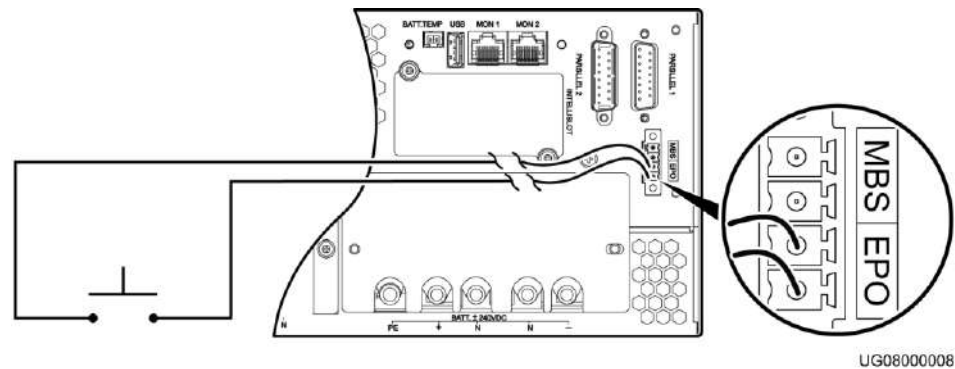
----End

5.2.3 Performing EPO

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

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

Figure 5-2 EPO cable connection on a single UPS



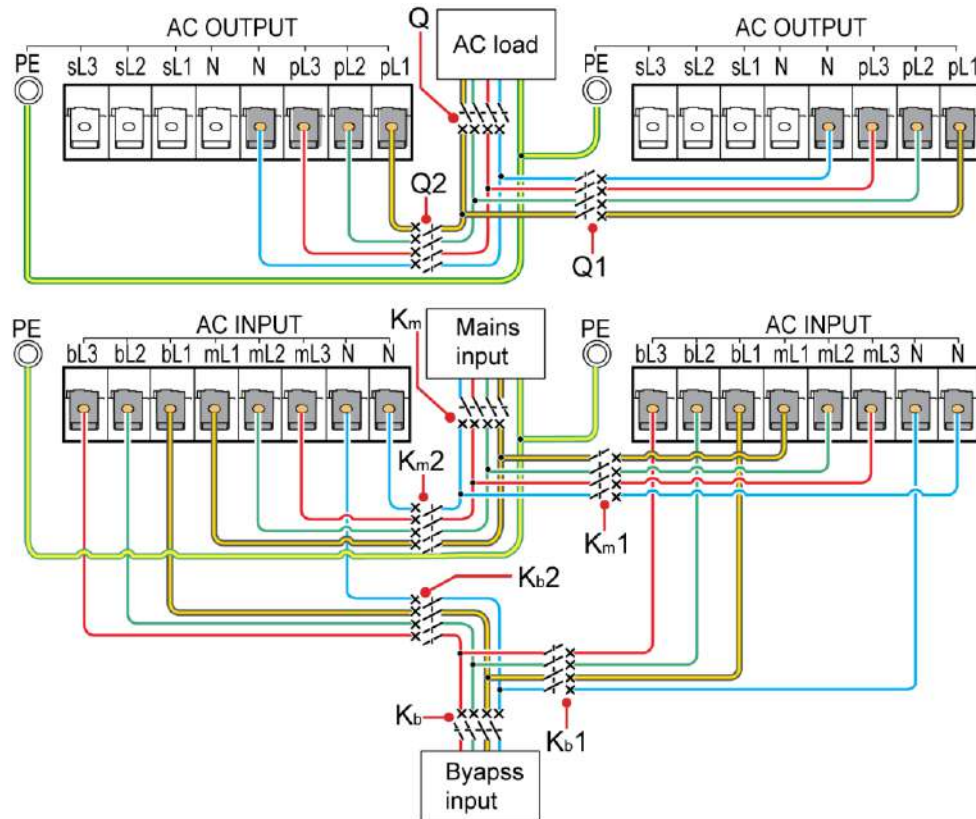
NOTE

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

5.3 Parallel System Operations

This section describes operations on a UPS2000-G-15 kVA/20 kVA parallel system.

Figure 5-3 Connecting cables to the UPS2000-G-15 kVA/20 kVA parallel system (three-phase input three-phase output, dual mains) equipped with no PDU



UG080E9970

5.3.1 Starting the Parallel System

⚠ CAUTION

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

NOTICE

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

Starting the Parallel System in Normal Mode

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

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

Step 2 Close the following circuit breakers in sequence: UPS mains input circuit breakers K_{m1} and K_{m2} , general mains input circuit breaker K_m , bypass input circuit breakers K_{b1} and K_{b2} , general bypass input circuit breaker K_b , and UPS AC output circuit breakers Q1 and Q2.

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

NOTE

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

Step 3 Perform the following operations on each UPS:

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

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

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

The parallel system transfers to normal mode.



NOTE

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

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

----End

Starting the Parallel System in Battery Mode

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

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

Step 3 Press  on each control panel.

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

Step 4 Perform the following operations on each UPS:

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

Step 5 Perform "startup operations" on each UPS.

The parallel system transfers to battery mode.



NOTE

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

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

----End

5.3.2 Shutting down the Parallel System

Shutting down a Single UPS in the Parallel System

- Step 1** Perform "shutdown operations" twice on a single UPS within 30 seconds (for example, UPS 1 shown in [Figure 5-3](#)) in the parallel system. The UPS is shutting down. The other UPSs continue working.



NOTE

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

- Step 2** Open the UPS mains input circuit breaker K_m1 , bypass input circuit breaker K_b1 , and the AC output circuit breaker Q1. After all indicators turn off and fans stop, the UPS shuts down.

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



NOTE

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

----End

Transferring the Parallel System to Bypass Mode

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

Shutting down the Parallel System

- Step 1** Shut down the loads.
- Step 2** Perform "shutdown operations" on each UPS in the parallel system. All inverters shut down at the same time. The parallel system transfers to bypass mode.
- Step 3** Open the following circuit breakers in sequence for each UPS: UPS mains input circuit breakers K_m1 and K_m2 , general mains input circuit breaker K_m , bypass input circuit breakers K_b1 and K_b2 , general bypass input circuit breaker K_b , UPS AC output circuit breakers Q1 and Q2, and general AC output circuit breaker Q. After all indicators turn off and fans stop, the UPSs shut down, and the loads power off.



NOTE

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

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

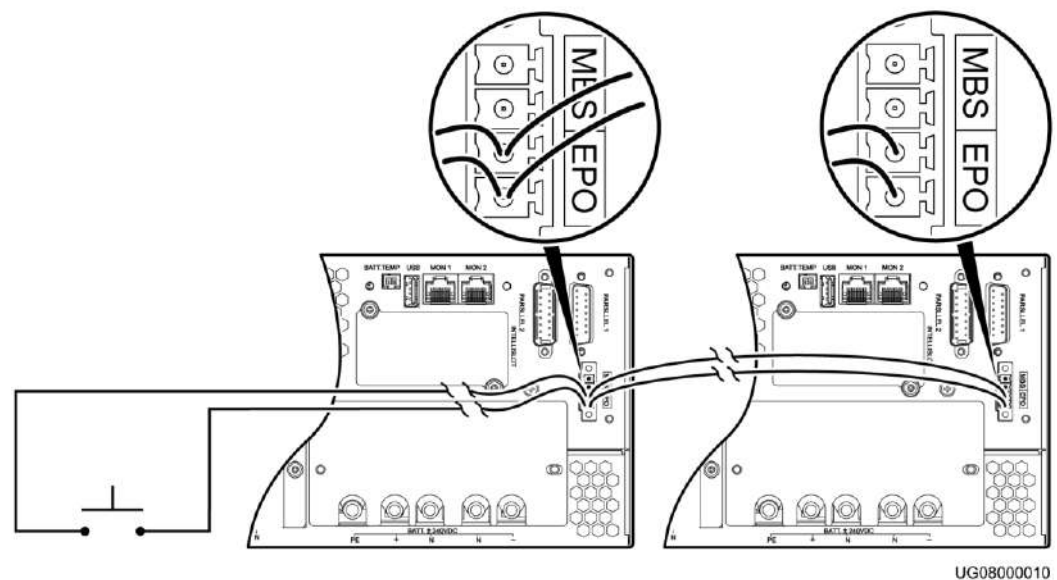
----End

5.3.3 Performing EPO

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

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

Figure 5-4 EPO cable connection in a parallel system



NOTE

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

6 Communications

6.1 Optional Communications Components

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

6.2 SNMP Card

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

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

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

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

6.3 Modbus Card

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

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

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

6.4 Dry Contact Card

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

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

6.5 External Dry Contact Card

The RMS-RELAY02B is connected to UPS together with SNMP card.

The external dry contact card provides four dry contact outputs (critical alarm, minor alarm, mains mode, battery mode, bypass mode, inverter on, battery undervolt., bypass backfeed, high ambient temperature, or UPS fault.) and two dry contact inputs (startup, shutdown).



NOTE

The SNMP card, Modbus card, dry contact card, and external dry contact card are optional components for communication. If these optional components are selected, their manuals are delivered with the optional components.

7 Routine Maintenance

7.1 UPS Maintenance

NOTICE

- Only trained personnel are allowed to perform maintenance. Before performing operations on a device, wear electrostatic discharge (ESD) clothes, ESD gloves, and an ESD wrist strap. Do not wear jewelry or watches during the operation to avoid electric shocks or burns.
- Use insulated tools when maintaining internal devices. Only trained personnel are allowed to perform maintenance.
- Maintain UPSs regularly based on the following requirements. Otherwise, the UPSs may fail to operate properly and the lifespan may be shortened.

Table 7-1 Routine maintenance items for UPSs

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

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

7.2 Battery Maintenance

NOTICE

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

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

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

Precautions

- Before battery maintenance, get the tools, such as handles, insulated. Do not place metal tools on exposed battery terminals.
- Never use any organic solvent to clean batteries.
- Never try to remove the safety valve or fill anything into batteries.
- Never smoke or use fire around batteries.
- After battery discharge, charge batteries to ensure a required battery capacity.
- Only professionals are allowed to perform maintenance tasks.
- If batteries have not been discharged for a long time, discharge and charge them in equalized mode at least once every three months to activate them. Each charge should last at least 4 hours.
- Normally, discharge and charge batteries once every four to six months. Each charge should last at least 4 hours.
- In high-temperature areas, discharge and charge batteries once every two months. Each charge should last at least 4 hours.
- Do not overdischarge batteries. After discharging batteries, fully charge them within 24 hours.
- Ensure that the battery discharge duration is 24 hours at most and 16 hours by default. If you set the value to 0 hour, the discharge time is not limited.

Routine maintenance items for batteries

Table 7-2 Routine maintenance items for batteries

Item	Expected Result	Measures	Maintenance Interval
Battery alarm	No battery alarm is generated.	Identify the cause based on the alarm information.	Monthly
Battery appearance	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.	If the battery appearance is abnormal, contact Huawei technical support.	Monthly

Item	Expected Result	Measures	Maintenance Interval
	5. Batteries are not deformed or bulged.		
Battery operating temperature	1. The ambient battery temperature is $25\pm5^{\circ}\text{C}$. 2. The battery operating temperature is lower than battery temperature + 20°C. 3. Battery charge and discharge conditions meet the requirements specified in the battery specifications.	1. Identify the cause of the abnormal battery operating temperature. 2. If the fault persists, contact Huawei technical support.	Monthly
Charge voltage of battery string	• Equalized voltage $14.1\text{ V} \times \text{Number of batteries}$ (tolerance $\pm 1\%$) • Float voltage $13.5\text{ V} \times \text{Number of batteries}$ (tolerance $\pm 1\%$)	1. If the voltage drop between the battery string output terminals and the battery input terminals at the UPS side is greater than 1% of the battery string voltage, check whether the cable between the battery string and the UPS is excessively long, or the cable diameter is excessively small. 2. Check whether the equalized charging voltage and float charging voltage are correctly set for the UPS. 3. If the fault persists, contact Huawei technical support.	Monthly
Battery temperature sensor measurement accuracy	The difference between the temperature measured by the temperature sensor and the	1. Install the temperature sensor in the correct position. 2. Replace the battery temperature sensor.	Quarterly

Item	Expected Result	Measures	Maintenance Interval
	temperature displayed on the LCD is less than 3°C.		
Battery specifications	The settings of battery management parameters meet the requirements in the user manual.	Set parameters correctly.	Quarterly
Tightness of bolts on battery terminals	The location of the signs marked on battery terminals indicating tight connections does not change.	Take photos from multiple angles and contact Huawei technical support.	Quarterly
Cables between batteries	No cable deteriorates and the insulation layer does not crack.	Replace the faulty cable.	Quarterly
Battery voltage	- Equalized charging voltage: 14.1 V $\pm$ 0.1 V - Float charging voltage: 13.5 V $\pm$ 0.1 V	1. Check whether the equalized charging voltage and float charging voltage of a battery are normal. 2. If the charging voltage of a battery exceeds the specifications requirement, perform a complete forcible equalized charging for the battery, and check again whether the voltage is normal. 3. If the fault persists, contact Huawei technical support.	Quarterly
Shallow discharge test (recommended)	Conduct a shallow discharge test when the UPS is backed up to verify that the batteries can discharge normally.	1. Locate the cause when an exception is identified. 2. If the fault persists, contact Huawei technical support.	Quarterly
Capacity Test	When the UPS is backed up,	1. Locate the cause when an exception is	Yearly

Item	Expected Result	Measures	Maintenance Interval
(recommended)	discharge a battery to the undervoltage alarm threshold, to refresh the capacity of the battery.	identified. 2. If the fault persists, contact Huawei technical support.	
Battery connection reliability	- Each battery terminal is connected reliably. (When battery strings are powered off, check the reliability of each terminal in the order from positive terminals to negative terminals.) - The tightening torque of each battery screw meets the requirements of the battery manufacturer. (A torque wrench is used for checking the torque. After checking that the battery screws meet the requirements, mark the screws for later check.)	- Rectify any abnormal connection. - If the fault persists, contact Huawei technical support.	Yearly

8 Troubleshooting

⚠ CAUTION

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

Table 8-1 Solutions to common faults

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

No.	Symptom	Possible Cause	Measure
5	The Mains indicator is off.	The mains voltage or frequency exceeds the UPS input range.	Use a multimeter to check that the input voltage and frequency meet specifications.
6	The battery discharge time is much less than the standard time.	Batteries are not fully charged.	Charge batteries for more than 8 hours when the mains is normal. Test the discharge time again.
		The battery performance deteriorates.	Contact local Huawei technical support to replace batteries.
7	Abnormal noises or smell is generated in the UPS cabinet.	The UPS is faulty.	Shut down the UPS immediately and cut off the input power supply. Contact local Huawei technical support.
8	The battery indicator is blinking yellow. The buzzer buzzes 1 second and then stops 1 second. The battery capacity is insufficient. The UPS is shutting down.	- The remaining battery capacity is insufficient. The UPS is shutting down, and the loads are powering off. - Parameters settings of battery number or battery capacity is not correct.	- Save load data immediately and power off critical loads. - Connect UPS input terminals to the backup AC power supply. - Set parameters of battery number and battery capacity correctly.
9	You forget the password.	N/A	- If you forget only the LCD password (the preset password is 000001), use the feature code (the preset feature code is 999999) to activate the LCD password. - If you forget both the password and the feature code, contact local Huawei technical support.

9 Technical Specifications

9.1 Physical Specifications

Table 9-1 Physical specifications

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

9.2 Environmental Specifications

Table 9-2 Environmental specifications

Item	6 kVA	10 kVA	15 kVA	20 kVA
Operating temperature	0–40°C			
Humidity	0%–95% RH (non-condensing)			
Altitude	< 1000 meters When the altitude is 1000–4000 meters, see IEC62040-3 to check how the UPS power is derated. (The output power derating by 1% for each additional 100 m.)			
Storage and transportation temperature	–40°C to +70°C (battery pack: –20°C to +40°C)			

9.3 Mains Input Electrical Specifications

Table 9-3 Mains input electrical specifications

Item	6 kVA	10 kVA	15 kVA	20 kVA
Input power cable	Single-phase (L/N) input + PE cable	- Single-phase (L/N) input + PE cable - Three-phase (L1/L2/L3/N) input + PE cable	- Single-phase (L/N) input + PE cable - Three-phase (L1/L2/L3/N) input + PE cable	- Single-phase (L/N) input + PE cable - Three-phase (L1/L2/L3/N) input + PE cable
Rated input voltage	220 V AC, 230 V AC, or 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)	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)	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%.)	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	> 0.99 (single-phase input) > 0.95 (three-phase input)	> 0.99	> 0.99
No-load loss	< 54 W	< 90 W	< 180 W	

Item	6 kVA	10 kVA	15 kVA	20 kVA
Double-power input	Disabled	Disabled	Enabled	Enabled
Startup voltage	120–280 V AC			
Diesel generator input capacity	Minimum 1.5 times the UPS rated capacity			

9.4 Bypass Input Electrical Specifications

Table 9-4 Bypass input electrical specifications

Item	6 kVA	10 kVA	15 kVA	20 kVA
Bypass voltage	- Upper threshold: 10%/15%/20%/25%@220 V AC - Upper threshold: 10%/15%/20%@230 V AC - Upper threshold: 10%/15%@240 V AC - Lower threshold: 10%/20%/30%/40%/50%/60%			
Bypass frequency tolerance	Maximum ± 6 Hz (configurable on the LCD)			
Bypass overload capability	- Load < 125%: continuous in bypass mode $125\% \leq \text{load} < 150\%$: 1 minute in bypass mode - Load $\geq 150\%$: 100 milliseconds in bypass mode The input switch may trip in advance.			
Input mode	One mains input		- One mains input - Two mains inputs	



NOTE

The upper and lower thresholds are configurable on the LCD.

9.5 Output Electrical Specifications

Table 9-5 Output electrical specifications

Item	6 kVA	10 kVA	15 kVA	20 kVA
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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			
Rated output voltage	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.)		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%			
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	N/A		• ±1% (balanced load) • ±3% (unbalanced load)	
Average frequency tracking rate	0.5–2 Hz/s (single UPS) or 0.5–1 Hz/s (parallel system)			
Power segment (only in single UPS mode)	• If overloaded, the UPS disconnects from secondary loads and checks whether it is still overloaded. • In battery mode, the UPS disconnects from secondary loads if the battery voltage is less than the specified value. • In battery mode, the UPS disconnects from secondary loads if the discharge time is more than the specified value.			

9.6 Battery Specifications

Table 9-6 Battery specifications

Item	6 kVA	10 kVA	15 kVA	20 kVA
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Item	6 kVA	10 kVA	15 kVA	20 kVA
Rated battery voltage	240 V DC		± 240 V DC	
Number of batteries	16–20, each 12 V DC. If the smaller value between the numbers of batteries, N , is less than 20, the battery power is derated to $N/20$.		16–20, respectively in the positive and negative battery strings. The rated number is 20. If the smaller value between the numbers of batteries in the positive and negative battery strings, N , is less than 20, the battery power is derated to $N/20$.	
Battery string sharing in a parallel system	Disabled	Disabled	Enabled	Enabled
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	N/A	N/A
Backup time	> 4 minutes (at full rated load), Figure 9-1 , Figure 9-2 , Figure 9-3 , and Figure 9-4 show the battery pack backup time.			
Parallel feature	Batter strings can be connected in parallel. If the user prepares batteries, the maximum number of battery strings in parallel is specified by the battery manufacturer. A maximum of four battery strings are recommended.			
Charger rated charge current	2 A (tolerance ± 0.5) for standard models 4 A (tolerance ± 0.5) for long backup time models			
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 voltage of 2.35 V and a float voltage of 2.25 V. Both are configurable on the LCD.			

NOTICE

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

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

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

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

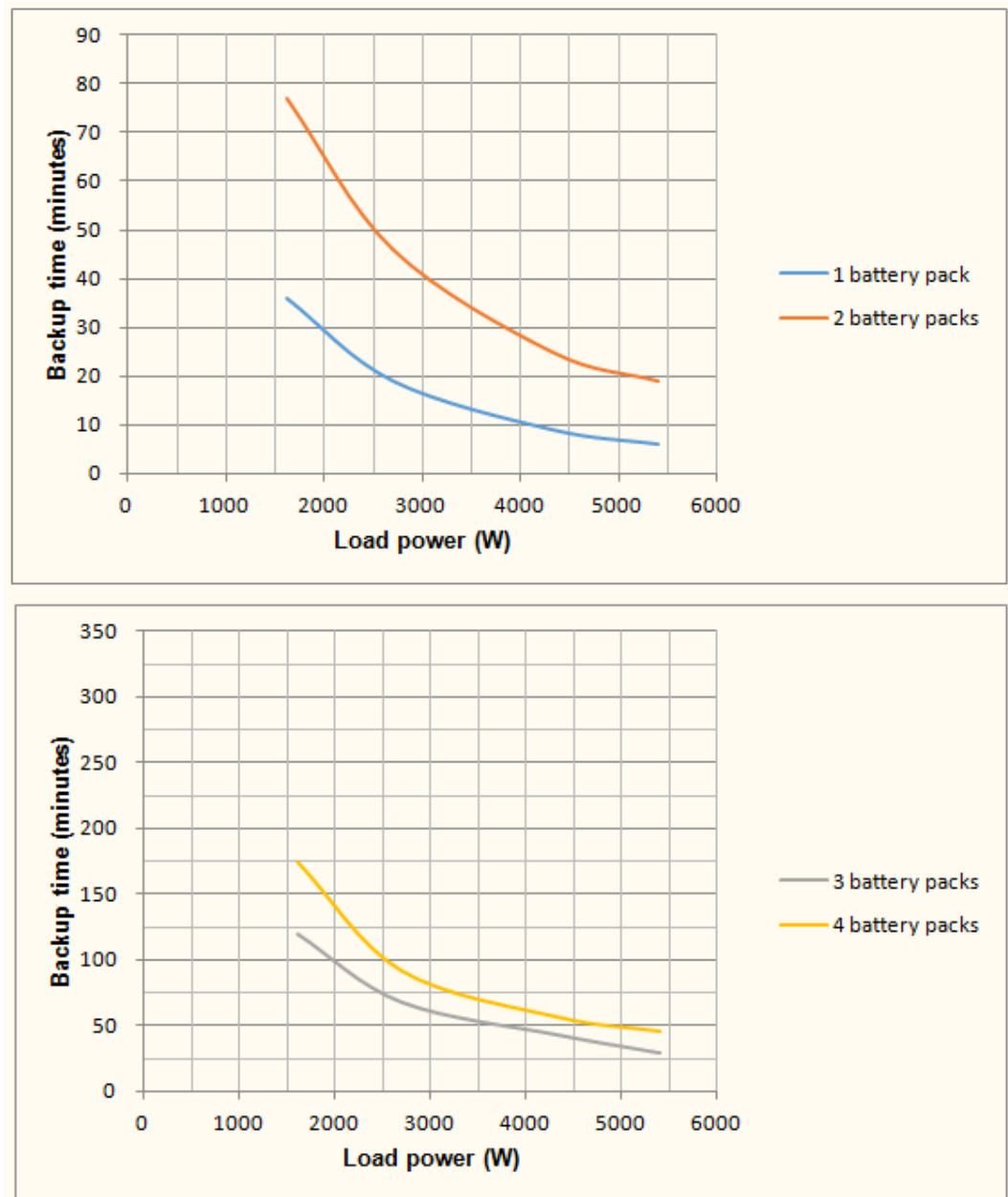


Table 9-8 Backup time parameters for the ESS-240V12-9AhBPVBA01 battery pack (10 kVA, battery efficiency assumed as 94%)

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

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

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

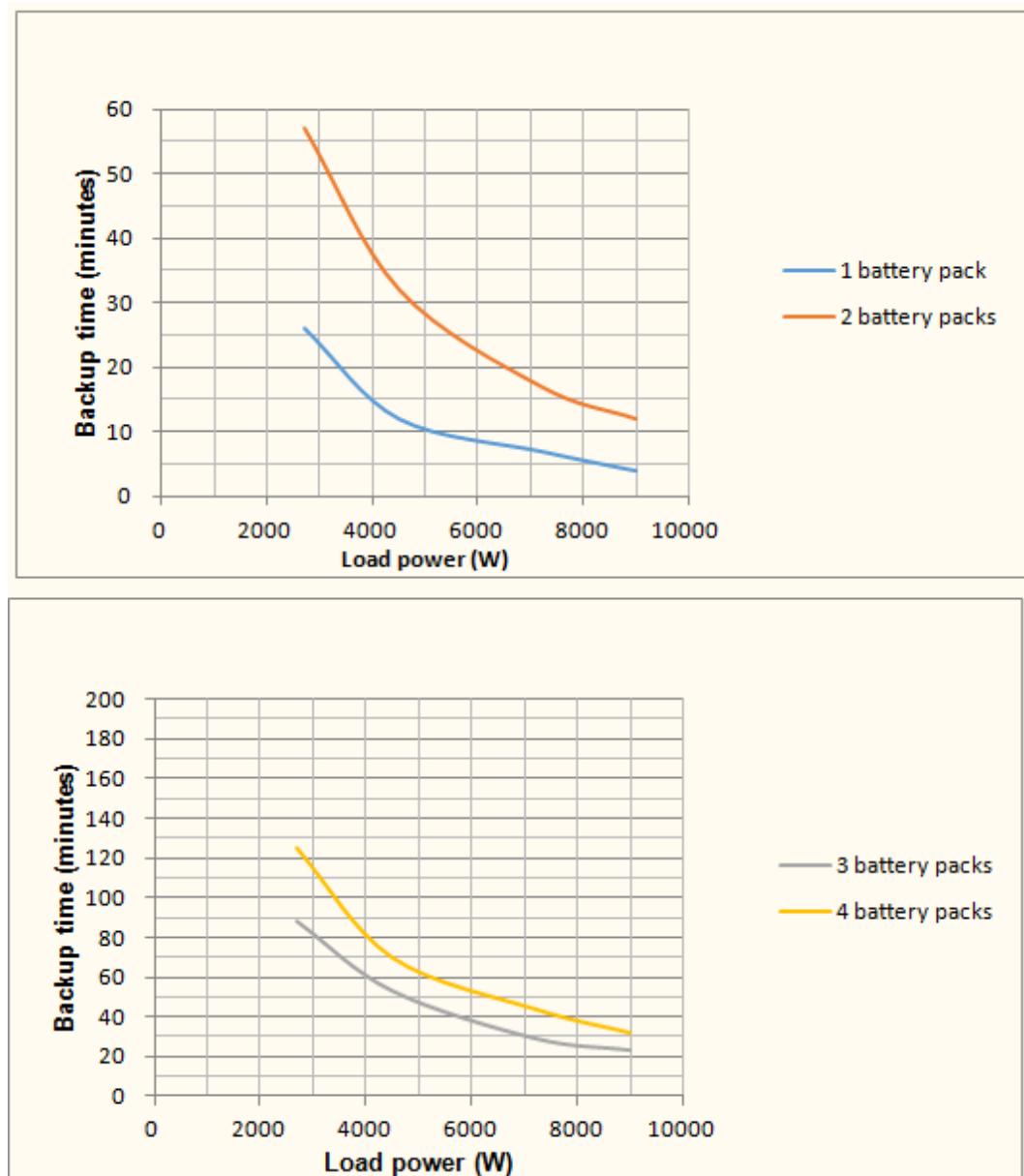


Table 9-9 Backup time parameters for the ESS-240V12-9AhBPVBA01 battery pack (15 kVA, battery efficiency assumed as 94%)

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

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

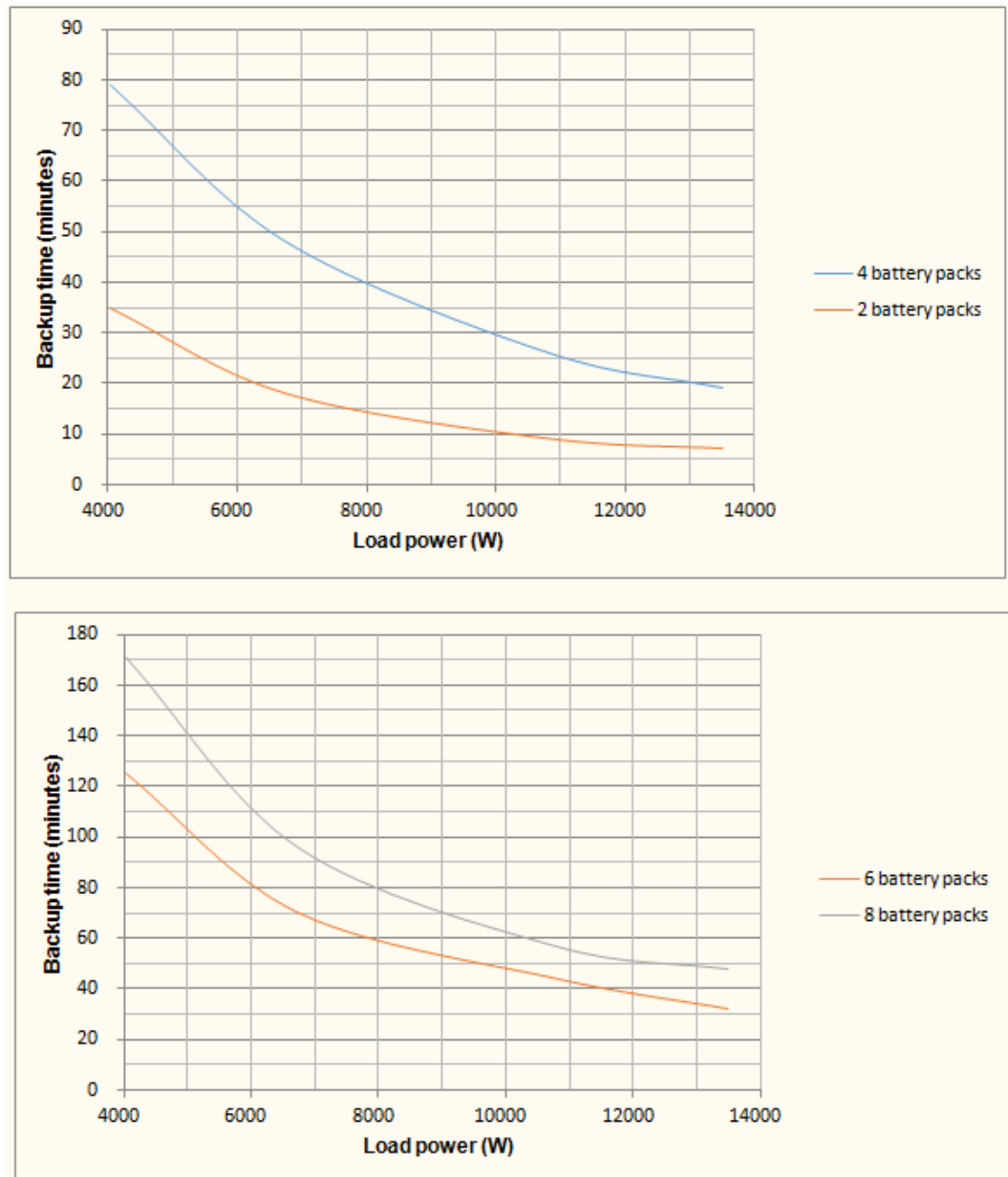
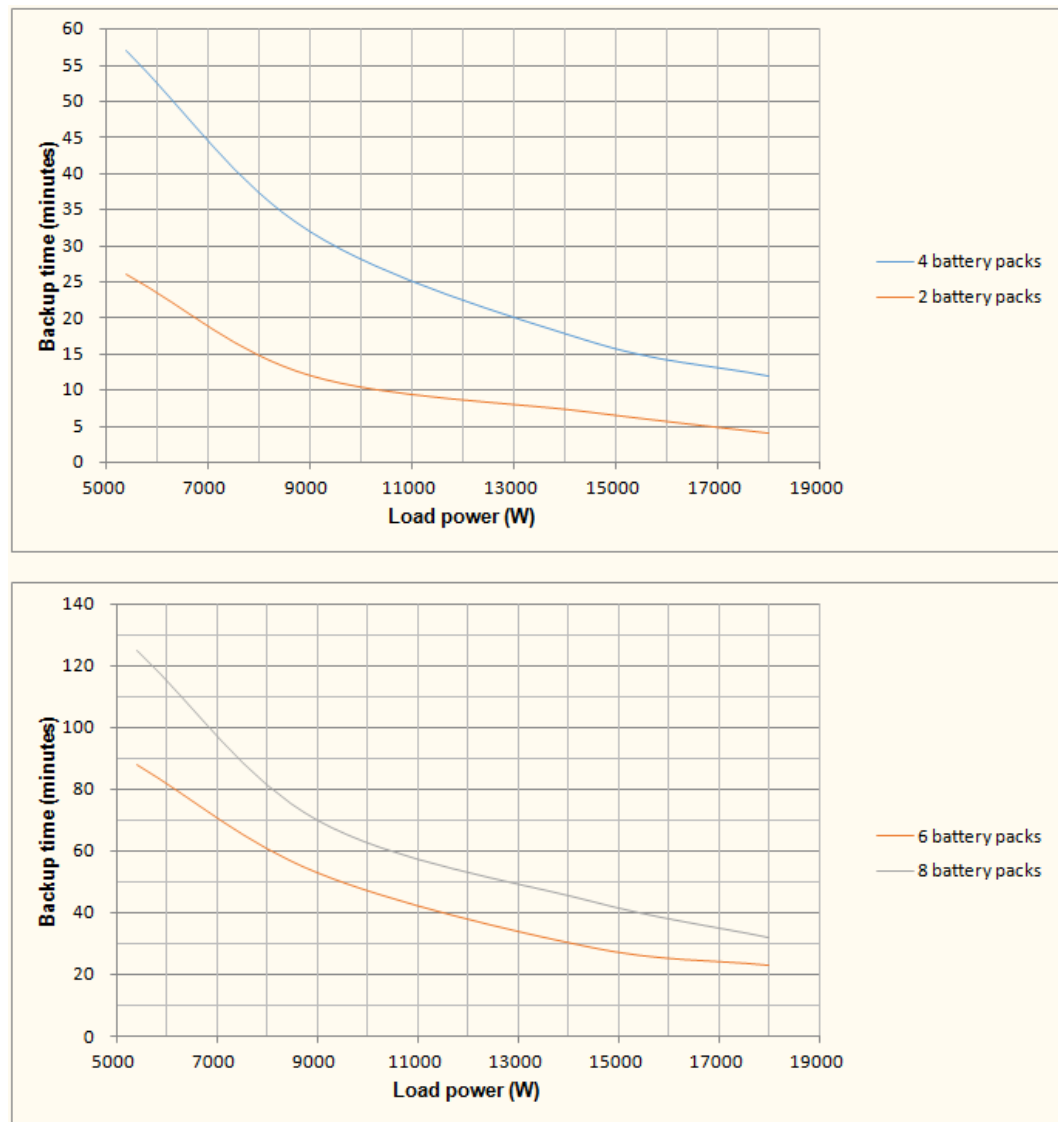


Table 9-10 Backup time parameters for the ESS-240V12-9AhBPVBA01 battery pack (20 kVA, battery efficiency assumed as 94%)

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

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

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



9.7 ECO Feature

Table 9-11 ECO feature

Item	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			

9.8 Parallel Feature

Table 9-12 Parallel feature

Item	6 kVA	10 kVA	15 kVA	20 kVA
Number of UPSs in parallel	≤ 4			



NOTE

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

9.9 Safety Regulations and EMC

Table 9-13 Safety regulations and EMC

Item	Standards Compliance	Remarks
Electromagnetic compatibility	Conducted radiation: IEC/EN62040-2	N/A
	Voltage change, fluctuations, and flicker $I \leq 16$ A, IEC/EN61000-3-3; $16 \text{ A} < I \leq 75$ A, IEC/EN61000-3-11	N/A
	Harmonic interference: $16 \text{ A} < I \leq 75$ A, IEC/EN61000-3-12	N/A
Impact current (lightning protection)	IEC/EN60240-2 IEC/EN61000-4-5 YD/T1095-2000 YD/T944-2007	The AC input side meets Level D lightning protection (differential mode and common mode: 5 kA and 8/20 μs).

A Parallel Parameter List

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



NOTE

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

B LCD Menus and Parameters

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
Status	Mains Input	Van	N/A	N/A	N/A
		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			
		Vbn			
		Ib			

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		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			
		Sys. Pout_A			
		Sys. Load ratio_A			

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		Sys. Sout_B			
		Sys. Pout_B			
		Sys. Load ratio_B			
		Sys. Sout_C			
		Sys. Pout_C			
		Sys. Load ratio_C			
	Environ- ment Monitori- ng	Ambient temp.			
		Ambient humidity			
		Internal temp.			
	Runtime	Inv. runtime			
BPS runtime					
Alarms	Active Alarms	Active alarms	Details	N/A	N/A
	Historical Alarms	Historical alarms	Details		
	Sort Alarms	Occurrence (latest first)	N/A		
		Level (highest first)			
	Clear Alarms	N/A			
Settings	Basic Settings	Language	N/A	English, Chinese, Turkish, French, and Russian	English
		Change Password	N/A	000000–999999	000001
		Change Feature Code	N/A	000000–999999	999999
	Communication Card	IP address (SNMP Card)	N/A	1.0.0.0–253.255.255.255	192.168.0.10

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		Subn. mask (SNMP Card)	N/A	0.0.0.0–255.255.255.255	255.255.255.0
		Gateway (SNMP Card)	N/A	1.0.0.0–253.255.255.255	192.168.0.1
		Communication address (Modbus Card)	N/A	N/A	N/A
		Baud rate (Modbus Card)	N/A	N/A	N/A
		Normal mode (Dry contact)	N/A	Dry contact 1–6	Dry contact 1
		Battery mode (Dry contact)	N/A	Dry contact 1–6	Dry contact 2
		Bypass mode (Dry contact)	N/A	Dry contact 1–6	Dry contact 3
		Batt. undervolt (Dry contact)	N/A	Dry contact 1–6	Dry contact 4
		BPS backfeed (Dry contact)	N/A	Dry contact 1–6	Dry contact 5
		Faulty UPS (Dry contact)	N/A	Dry contact 1–6	Dry contact 6
	System Parameters	Parallel (configurable after the inverter shuts down)	Single/Parallel	Single and Parallel	Single
			Redundant UPSs	0–3	0
		Output (configurable after the inverter shuts down)	Output mode (configurable only on the UPS2000-G-15 kVA/20 kVA)	Single-phase/Three-phase	Three-phase (on the UPS2000-G-15 kVA/20 kVA)
			Voltage level	220 V, 230 V, and 240 V (on the UPS2000-G-6 kVA/10 kVA)	220 V (on the UPS2000-G-6 kVA/10 kVA) 220 V, single-phase

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
				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)	(on the UPS2000-G-15 kVA/20 kVA) 380 V, three-phase (on the UPS2000-G-15 kVA/20 kVA)
			Frequency level	50 Hz, 60 Hz, and Automatic	50 Hz
			Volt. adj. coef.	±5%, ±4%, ±3%, ±2%, ±1%, and 0%	0%
			Converter mode	Enabled and Disabled	Disabled
		Bypass (configurable after the inverter shuts down)	Max. voltage	10%, 15%, 20%, 25%, and 30%	15%
			Min. voltage	10%, 20%, 30%, 40%, 50%, and 60%	20%
			Frequency range	±0.5 Hz, ±1 Hz, ±2 Hz, ±3 Hz, ±4 Hz, ±5 Hz, and ±6 Hz	±2 Hz
		ECO (configurable after the inverter shuts down)	Max. voltage	5%, 6%, 7%, 8%, 9%, and 10%	10%
			Min. voltage	5%, 6%, 7%, 8%, 9%, and 10%	10%
			Frequency range	±0.5 Hz, ±1 Hz, ±2 Hz, and ±3 Hz	±2 Hz
			Single UPS ECO	Enabled and Disabled	Disabled
		Power segment	Dis. time thres. (configurable in non-battery mode)	0–999 minutes	30 Min
			Dis. volt. thres. (configurable in non-battery mode)	1.90–2.25 V/cell	2.00 V/cell
			Power Segment (configurable	Enabled and Disabled	Disabled

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
			after the inverter shuts down)		
		Self-Load (configurable after the inverter shuts down)	Output power ratio	20%–100%	80%
			Self-load mode	Enabled and Disabled	Disabled
		Others (configurable after the inverter shuts down)	Recovery delay time	0–900 seconds	5S
			Max. BPS transfers	1–3	3
			Output transformer	Enabled and Disabled	Disabled
			Generator mode	Weak adaptability mode, Balanced mode, and Strong adaptability mode	Balanced mode
			Auto check capa.	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	20 Monobloc
			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

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
					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
			Overtemp. thres.	45–55°C	50°C
			Undertemp. thres.	–30°C to +5°C	–5°C
			Overcurrent thres.	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)
		Equalized Charge	Equalized charging	Enabled and Disabled	Enabled
			Time interval	30–180 days	60 Day
			Voltage	2.33–2.40 V/cell	2.35 V/cell
			Max. current	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*cell
		Discharge	Max. time (configurable in non-battery mode)	0–24 hours	16 Hour
			EOD mode (configurable in non-battery mode)	Batt. protect first, Backup time first, and Balanced mode	Backup time first
			EOD auto-start (configurable)	Enabled and Disabled	Enabled

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
			after the inverter shuts down)		
			Shutdown delay	0–600 seconds	0S
		Shallow Discharge	Test notification	Enabled and Disabled	Disabled
			Time interval	30–90 days	60 Day
			Discharge ratio	10%–50%	20%
	Settings wizard (configurable after the inverter shuts down)	Language	N/A	English, Chinese, Spanish, French, and Russian	English
		System Parameters	Voltage level	220 V, 230 V, and 240 V (on the UPS2000-G-6 kVA/10 kVA) 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	20 Monobloc
			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.

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
					- 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)	N/A	N/A	N/A	N/A
Control	Startup	N/A	N/A	N/A	N/A
	Shutdown				
	Replace Batteries				
	Maintain Batteries	Shallow Discharge Test			
		Capacity Test			
		Stop Test			
		Manual Equalized Charging/Manual EC for Pos. /ManualEC for Pos.			
		Manual Float Charging/Manual FC for Neg.			

Main Menu	Second-Level Menu	Third-Level Menu	Fourth-Level Menu	Value Range	Preset Value
		/Manual FC for Neg.			
	Sync Paral. Param.	N/A			
	Reset Password				
About	Model	N/A	N/A	N/A	N/A
	ESN				
	Version				



NOTE

- The bypass frequency range is associated with the ECO frequency range (the bypass frequency range is ± 0.5 Hz, ± 1 Hz, ± 2 Hz, ± 3 Hz, ± 4 Hz, ± 5 Hz, or ± 6 Hz; the ECO frequency range is ± 0.5 Hz, ± 1 Hz, ± 2 Hz, or ± 3 Hz).
The bypass frequency range must be greater than or equal to the current ECO frequency range (if the ECO frequency range is ± 3 Hz, the bypass frequency range is ± 3 Hz, ± 4 Hz, ± 5 Hz, or ± 6 Hz).
The ECO frequency range must be less than or equal to the current bypass frequency range (if the bypass frequency range is ± 1 Hz, the ECO frequency range is ± 0.5 Hz or ± 1 Hz).
- The voltage level is associated with the upper threshold for bypass voltages (10%, 15%, 20%, 25%, or 30%).
If the voltage level is 220 V (line voltage: 380 V), the upper threshold for bypass voltages is 10%, 15% (default), 20%, or 25%.
If the voltage level is 230 V (line voltage: 400 V), the upper threshold for bypass voltages is 10%, 15% (default), or 20%.
If the voltage level is 240 V (line voltage: 415 V), the upper threshold for bypass voltages is 10% or 15% (default).

C Alarm Handling

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
0001-01	Abnormal mains volt.	Minor	Automatic clear	- The UPS transfers to battery mode. - If no battery is equipped, the UPS shuts down.	Possible causes: - The mains voltage exceeds 280 V. - The mains voltage is less than 80 V. - The mains frequency is not in the range of 40 Hz to 70 Hz. Measures: - Check whether the mains input voltage is less than 272 V. If not, wait until the mains recovers. - Check whether the mains input voltage is greater than 88 V. If not, wait until the mains recovers. - Check the mains input frequency. If the mains input frequency is abnormal, wait until the mains input recovers.
0001-02	Abnormal mains volt.	Minor			
0001-03	Abnormal mains volt.	Minor			
0004-01	Mains phase reverse	Minor	Automatic clear	- The rectifier transfers to battery mode, without affecting the power supply. - If no batteries are installed, the UPS shuts down. - The UPS may transfer	Possible cause: The mains input three-phase sequence is incorrect. Measure: Check that mains input power cables are correctly connected.

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

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
0011-01	BPS phase reverse	Minor	Automatic clear	- If the inverter has not started, the system has no output, and inverter startup is prohibited. - If the inverter has started, the inverter still works properly, but the system cannot transfer to bypass mode.	Possible cause: The bypass input three-phase sequence is incorrect. Measure: Check that bypass input power cables are correctly connected.
0012-01	BPS neutral loss	Minor	Automatic clear	If the inverter has not started, the system has no output, and inverter startup is prohibited. If the inverter has started, the inverter still works properly, but the system cannot transfer to bypass mode.	Possible cause: The bypass input neutral wire is not connected. Measures: Check that bypass input power cables are correctly connected.
0014-01	Start timeout	Critical	Manual clear/Power-off clear	The UPS cannot start.	Possible causes: - The bypass load exceeds the rated inverter load. - An internal fault occurs in the UPS. Measures: - Reduce the output load, manually clear the alarm, and restart the UPS. - Contact Huawei technical support for repair.
0020-01	Batt. reverse	Critical	Automatic clear	The power supply from the UPS and system is not affected.	Possible cause: Batteries are reversely connected. Measure: Check the battery installation, and reinstall the batteries.
0022-01	No battery	Minor	Automatic clear	The power supply from the UPS and system is not affected.	Possible causes: - Batteries are not connected. - Batteries are not securely connected. Measures: - Connect batteries.

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					Check that batteries are securely connected.
0023-01	Batt. overtemp.	Minor	Automatic clear	An alarm is generated, and the battery lifespan is affected.	Possible causes: - The ambient temperature exceeds the battery high temperature alarm threshold (default value: 50°C) - The battery charge/discharge current exceeds the upper threshold. Measures: - Install more cooling equipment such as air conditioners. - Control the battery charge/discharge current by reducing loads.
0025-01	Batt. overvolt.	Minor	Automatic clear	An alarm is generated, and the battery lifespan is affected.	Possible causes: - The configured number of batteries is less than the actual number. - The battery string charge voltage exceeds the upper threshold. Measures: - Check battery parameter settings. - Disconnected the external battery charger, check whether the alarm is cleared. If not, contact Huawei technical support for repair.
0026-01	Batt. undervolt.	Minor	Automatic clear	An alarm is generated, and the system may shut down due to EOD.	Possible cause: The mains input is abnormal. Battery discharge results in a low battery voltage. Measure: If possible, connect to the mains power when the UPS is in non-battery test state.
0027-01	Batt. overcurrent	Minor	Automatic clear	An alarm is generated, and the battery lifespan is affected.	Possible causes: The charger is abnormal. Measure: Contact Huawei

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					technical support for repair.
0028-01	Breaker OFF	Critical	Automatic clear	N/A	Possible causes: - The mains input power cables are incorrectly connected. - The mains input circuit breaker is OFF. Measure: Check whether mains input power cables are correctly connected. If yes, switch on the mains input circuit breaker.
0028-02	Breaker OFF	Critical	Automatic clear	N/A	Possible causes: - The bypass is short-circuited or the bypass input experiences overcurrent. - The bypass input circuit breaker is OFF. Measures: - Check whether the bypass output load is short-circuited using a multimeter. - Check whether cable connections are correct. If yes, switch on the bypass input circuit breaker.
0028-03	Breaker OFF	Critical	Automatic clear	N/A	Possible causes: - The bypass is short-circuited or the bypass input experiences overcurrent. - The bypass input circuit breaker is OFF. Measures: - Check whether the circuit breaker downstream load is short-circuited using a multimeter. - Check whether cable connections are correct. If yes, switch on the output circuit breaker.
0029-01	Maintain	Minor	Automatic	The battery backup time is	Possible causes:

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
	batt.		c clear	affected.	- The battery capacity is incorrectly set. - The battery loop cannot be discharged. - The battery capacity is low. Measures: - Check whether the configured battery capacity matches the connected battery capacity. - Check battery connections and the status of each battery. - Contact Huawei technical support for repair.
0030-01	UPS inter overtemp	Minor	Automatic clear	The power supply from the UPS and system is not affected.	Possible causes: - The ambient temperature exceeds 40°C. - The air channel is blocked. - The fan is abnormal. Measures: - Decrease the ambient temperature. - Keep the air intake and exhaust vents of the UPS unobstructed. - Clean off the foreign objects around the fan. If the alarm persists, contact Huawei technical support for repair.
0032-01	Batt. OVP	Critical	Automatic clear	An alarm is generated, and the battery lifespan is affected.	Possible causes: - The configured number of batteries is less than the actual number. - The actual number of batteries does not meet specifications. - The charger is abnormal. Measures: - Check that the configured number of batteries matches the actual number. - Check that the actual number

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					of batteries meets requirements. Disconnected the external battery charger, check whether the alarm is cleared. If not, contact Huawei technical support for repair.
0034-01	Remaining cap. warning	Minor	Automatic clear	If no action is taken, continued discharge will result in system shutdown due to EOD.	Possible cause: - The battery discharge lasts too long. - The mains input is abnormal. - The number of batteries or battery capacity is incorrectly set. Measure: - Check the mains, and charge batteries in a timely manner. - Check the configured battery capacity.
0036-01	Batt. maint. notif	Minor	Automatic clear	An alarm is generated. If the shallow discharge test is not performed for a long time, the battery power backup function may be affected.	Possible cause: The battery does not experience shallow discharge, and the maintenance period expires. Measure: Perform the following steps: Click the alarm. The battery maintenance menu is displayed. Perform a shallow discharge test. The alarm will be automatically cleared no matter whether test conditions are met.
0040-01	Rectifier fault	Critical	Manual clear/Power-off clear	The UPS shuts down. The UPS transfers to another working mode or shuts down.	Possible cause: The soft-start resistor is damaged. Measure: Contact Huawei technical support for repair.
0040-02	Rectifier fault	Critical	Manual clear/Power-off clear	The UPS cannot be started.	Possible causes: - The mains input harmonic is large. - The rectifier startup circuit is damaged.

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					Measures: - After you rectify the fault, restart the UPS. - Contact Huawei technical support for repair.
0040-04	Rectifier fault	Critical	Manual clear/Power-off clear/Automatic clear	The UPS shuts down. The UPS transfers to another working mode or shuts down.	Possible causes: - The mains experiences instantaneous high-voltage impact. - The output has special loads such as inductive loads and rectification loads. - The output has transformer loads but the transformer mode is not set. - The hardware is damaged. Measures: - After you rectify the fault, restart the UPS. - Check whether the load type is supported by the UPS. - Enable the transformer mode. - Contact Huawei technical support for repair.
0040-05	Rectifier fault	Critical	Manual clear/Power-off clear/Automatic clear	The UPS shuts down. The UPS transfers to another working mode or shuts down.	Possible cause: The hardware is damaged. Measure: Contact Huawei technical support for repair.
0040-06	Rectifier fault	Critical	Power-off clear	The UPS shuts down. The UPS transfers to another working mode or shuts down.	Possible cause: The hardware is damaged. Measure: Contact Huawei technical support for repair.
0040-07	Rectifier fault	Critical	Automatic clear	The UPS shuts down. The UPS transfers to another working mode or shuts down. The charger stops working.	Possible causes: - The ambient temperature exceeds 40°C. - The air channel is blocked. - The fan is abnormal.

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					Measures: - Decrease the ambient temperature. - Keep the air intake and exhaust vents of the UPS unobstructed. - Clean off the foreign objects around the fan. If the alarm persists, contact Huawei technical support for repair.
0040-09	Rectifier fault	Critical	Power-off clear	The rectifier transfers to battery mode, and the power supply is not affected. If no battery is installed, the UPS shuts down. The UPS transfers to another working mode or shuts down.	Possible cause: The rectifier is faulty. Measure: Contact Huawei technical support for repair.
0040-10	Rectifier fault	Critical	Manual clear/Power-off clear	The UPS shuts down.	Possible cause: The digital signal processing (DSP) or complex programmable logical device (CPLD) chip is faulty. Measure: Contact Huawei technical support for repair.
0041-01	Rectifier alarm	Minor	Manual clear/Power-off clear	N/A	Possible cause: The EEPROM chip is faulty. Measure: Contact Huawei technical support for repair.
0041-02	Rectifier alarm	Minor	Automatic clear	The UPS shuts down. The UPS may transfer to another working mode or shut down.	Possible cause: The single-side bus capacitor is faulty. Measure: Contact Huawei technical support for repair.
0041-03	Rectifier alarm	Minor	Manual clear/Power-off clear	The power supply from the UPS and system is not affected.	Possible cause: The bus capacitor is faulty. Measure: Contact Huawei technical support for repair.
0041-10	Rectifier alarm	Minor	Automatic clear	N/A	Possible cause: The load power exceeds the loading capacity of the batteries.

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

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
				output because bypass cables for the newly added UPS are incorrectly connected.	
0042-12	Internal fault	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: The three-phase power cable lengths vary greatly. Measure: Ensure that the lengths of three-phase power cables vary within a difference of 5%.
0042-13	Internal fault	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: The inverter is faulty. Measure: Contact Huawei technical support for repair.
0043-01	Fan fault	Critical	Automatic clear	The power supply from the UPS and system is not affected.	Possible cause: The fan is abnormal. Measure: Clean off the foreign objects around the fan. If the alarm persists, contact Huawei technical support for repair.
0043-06	Fan fault	Critical	Automatic clear	The power supply from the UPS and system is not affected.	Possible cause: The fan is abnormal. Measure: Clean off the foreign objects around the fan. If the alarm persists, contact Huawei technical support for repair.
0044-01	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: An error occurred during software loading. Measure: Contact the manufacturer to load software.
0044-02	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: Software and hardware versions do not match. Measure: Contact the manufacturer to load software.
0044-03	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: Software and hardware versions do not match. Measure: Contact the manufacturer to load software.
0044-04	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: An error occurred during software loading. Measure: Contact the

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
			clear		manufacturer to load software.
0044-05	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: Software and hardware versions do not match. Measure: Contact the manufacturer to load software.
0044-06	Incompatible ver.	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: Software and hardware versions do not match. Measure: Contact the manufacturer to load software.
0045-03	Charger alarm	Critical	Manual clear/Power-off clear	The charger in the UPS stops.	Possible cause: The charger capacitor is faulty. Measure: Contact Huawei technical support for repair.
0045-04	Charger alarm	Critical			Possible cause: The charger output is short-circuited. Measure: Rectify battery port short circuits. After you clear the alarm, restart the UPS. If the alarm persists, contact Huawei technical support for repair.
0045-06	Charger alarm	Critical			Possible cause: The charger is faulty. Measure: Contact Huawei technical support for repair.
0045-07	Charger alarm	Critical	Manual clear/Power-off clear	The charger in the UPS stops. (The 20 kVA has no action.)	Possible cause: The charger is faulty. Measure: Contact Huawei technical support for repair.
0045-08	Charger alarm	Critical	Manual clear/Power-off clear/Automatic clear	The charger in the UPS stops.	
0045-09	Charger alarm	Critical	Manual clear/Power-off clear		
0045-10	Charger alarm	Critical			

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
0049-01	Battery qty. wrong	Minor	Manual clear/Power-off clear/Automatic clear	An alarm is displayed, and the battery service life may be shortened.	Possible causes: - The number of batteries is incorrectly set. - Batteries are damaged. - If batteries are fully charged, reconnect the batteries as soon as the system powers off. Measures: - Check whether the number of batteries is correctly set. - Check whether batteries are damaged. - After ensuring that the number of batteries is correct, clear the alarm.
0060-01	Inverter fault	Critical	Power-off clear	The inverter shuts down. The UPS transfers to bypass mode or has no output based on the transfer logic.	Possible cause: The inverter is faulty. Measure: Contact Huawei technical support for repair.
0060-02	Inverter fault	Critical	Power-off clear	The UPS shuts down. The UPS may transfer to another working mode or shut down.	Possible cause: The inverter relay is faulty. Measure: Contact Huawei technical support for repair.
0060-03	Inverter fault	Critical	Power-off clear		Possible cause: The inverter output is short-circuited. Measure: Rectify output port short circuits. After you clear the alarm, restart the UPS. If the alarm persists, contact Huawei technical support for repair.
0060-04	Inverter fault	Critical	Power-off clear		Possible cause: The inverter output is short-circuited. Measure: Rectify output port short circuits. After you clear the alarm, restart the UPS. If the alarm persists, contact Huawei technical support for repair.
0060-05	Inverter fault	Critical	Automatic clear		Possible causes: - The mains experiences instantaneous high-voltage impact. - The output has special loads such as sensitive loads and rectification loads. - The output has transformer loads but the transformer

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					mode is not set. - The hardware is faulty. Measures: - After you rectify the fault, restart the UPS. - Check whether the load type is supported by the UPS. - Enable the transformer mode. - Contact Huawei technical support for repair.
0060-07	Inverter fault	Critical	Automatic clear	The UPS starts upon shutdown. The UPS may transfer to another working mode or shut down.	Possible causes: - The ambient temperature exceeds 40°C. - The air channel is blocked. - The fan is abnormal. Measures: - Decrease the ambient temperature. - Keep the air intake and exhaust vents of the UPS unobstructed. - Clean off the foreign objects around the fan. If the alarm persists, contact Huawei technical support for repair.
0060-08	Inverter fault	Critical	Manual clear/Power-off clear	The UPS shuts down.	Possible cause: The DSP or CPLD chip is faulty. Measure: Contact Huawei technical support for repair.
0061-01	Inverter alarm	Minor	Manual clear/Power-off clear/Automatic clear	The UPS shuts down. The UPS may transfer to another working mode or shut down.	Possible causes: - Parallel cables are incorrectly connected. - The lengths of parallel cables vary greatly. Measures: - Reconnect cables. - The lengths of parallel cables vary within a range of 5%.

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
0061-02	Inverter alarm	Minor	Manual clear/Power-off clear	N/A	Possible cause: The EEPROM chip is faulty. Measure: Contact Huawei technical support for repair.
0064-01	OL timeout	Critical	Automatic clear	The UPS automatically starts after shutdown. The UPS transfers to another working mode or shuts down.	Possible cause: The load exceeds the rated inverter loading capacity. Measure: Reduce the load or replace the UPS with a larger-capacity UPS.
0064-02	OL timeout	Critical	Manual clear/Power-off clear	The UPS startup is not allowed.	Possible cause: The load exceeds the rated bypass loading capacity. Measure: Reduce the load or replace the UPS with a larger-capacity UPS.
0065-01	Power segment	Minor	Manual clear/Power-off clear	In single UPS mode, the loads connected to pL power off.	Possible cause: The load exceeds the rated loading capacity. Measure: Reduce the load or replace the UPS with a larger-capacity UPS.
0065-02	Power segment	Minor	Automatic clear/Manual clear		Possible causes: - The battery voltage is below the battery protection voltage. - The battery discharge time exceeds the battery protection time. Measures: - Check the battery voltage. - Modify the power segment settings on the LCD.
0066-01	Output overload	Minor	Automatic clear	Continuous overload causes the UPS to transfer to bypass mode or supply no power.	Possible cause: The load exceeds the rated loading capacity. Measure: Reduce the load or replace the UPS with a larger-capacity UPS.
0066-02	Output overload	Minor	Automatic clear	Continuous overload causes the UPS to supply no power.	Possible cause: The load exceeds the rated bypass loading capacity. Measure: Reduce the load or replace the UPS with a

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					larger-capacity UPS.
0067-01	Paral. set failure	Minor	Automatic clear	UPS startup is not allowed.	Possible cause: The single UPS and parallel system settings do not match cable connections. Measures: - Check the single UPS and parallel system settings. - Check that parallel cable connections match the settings.
0071-01	BPS backfeed	Critical	Power-off clear	The bypass input circuit breaker in the PDU is OFF.	Possible cause: The bypass component is faulty. Measure: Contact Huawei technical support for repair.
0083-01	Paral. cable fault	Critical	Manual clear/Power-off clear	The UPS shuts down. The parallel system shuts down.	Possible causes: - The parallel cable is loose. - The parallel cable is damaged. Measures: - Check that the parallel cable is securely connected. - Replace the parallel cable. - Contact Huawei technical support for repair.
0083-02	Paral. cable fault	Critical			
0083-04	Paral. cable fault	Critical	Manual clear/Power-off clear/Automatic clear	The UPS shuts down. The parallel system transfers to another working mode.	
0083-05	Paral. cable fault	Critical			
0084-02	Paral. cable alarm	Minor	Automatic clear	N/A	Possible causes: - The parallel cable is loose. - The parallel cable is damaged. Measures: - Check that the parallel cable is securely connected. - Replace the parallel cable. - Contact Huawei technical support for repair.
0084-03		Minor			
0085-01	EPO	Critical	Manual clear/Power-off clear	The UPS shuts down.	Possible cause: The EPO button is pressed. Measure: Restore the EPO button status. Start the UPS after the

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					alarm is cleared.
0086-01	BPS trans. overlimit	Minor	Manual clear/Power-off clear	Transfer to an unstable side is not allowed.	Possible cause: The output transfer times within 30 minutes exceed the configured value (3 by default). Measure: Restart the UPS after the alarm is cleared.
0094-01	Redundancy failure	Minor	Automatic clear	N/A	Possible causes: - The configured number of redundant UPSs exceeds the maximum allowed value. - The load exceeds the rated loading capacity of the requisite UPSs in the parallel system. Measures: - Reduce the number of redundant UPSs or set the system to be non-redundant. - Reduce the load or replace the UPS with a larger-capacity UPS.
0096-01	Abnormal ECO volt.	Minor	Automatic clear	Transfer to bypass mode is prohibited. If the bypass is supplying power, the UPS transfers to another working mode.	Possible cause: The ECO input is abnormal. Measure: Check whether the ECO input voltage or frequency exceeds the configured range. If yes, change the range or wait until the bypass input recovers.
0105-05	Comm. failed.	Minor	Automatic clear	The monitoring module cannot monitor the digital signal processor (DSP) of the power module.	Possible causes: - The communications cable is faulty. - An internal fault occurs in the UPS. Measures: - Check the communications cable. - Contact Huawei technical support for repair.
0125-01	Incon.	Critical	Automatic	An alarm is generated, and	Possible cause: The parallel

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
	paral. param.		c clear	all the UPSs in the parallel system cannot start inverters.	parameters are not set consistently on the UPSs. Measure: Set the parallel parameters consistently, or perform parallel parameter synchronization. NOTE After you perform parallel parameter synchronization, contact Huawei technical support if some parallel parameters are still inconsistent.
0131-01	Ambient overtemperature	Minor	Automatic clear	An alarm is generated.	Possible causes: - The ambient temperature in the UPS equipment room exceeds the alarm threshold (default value: 40°C). - The temperature and humidity transducer is faulty. Measures: - Check the ambient temperature in the UPS equipment room. - Replace the temperature and humidity transducer.
0133-01	Ambient undertemperature	Minor			Possible causes: - The ambient temperature in the UPS equipment room is below the alarm threshold (default value: 0°C). - The temperature and humidity transducer is faulty. Measures: - Check the ambient temperature in the UPS equipment room. - Replace the temperature and humidity transducer.
0134-01	Ambient overhumidity	Minor			Possible causes: The ambient humidity in the UPS equipment room exceeds the alarm threshold (default value: 90%).

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					- The temperature and humidity transducer is faulty. Measures: - Check the ambient humidity of the UPS equipment room. - Replace the temperature and humidity transducer.
0135-01	Ambient underhumidity	Minor			Possible causes: - The ambient humidity in the UPS equipment room is below the alarm threshold (default value: 10%). - The temperature and humidity transducer is faulty. Measures: - Check the ambient humidity of the UPS equipment room. - Replace the temperature and humidity transducer.
0136-01	Faulty temperature and humidity module	Minor			Possible causes: The temperature and humidity module is faulty. Measures: - Check parameter settings of the temperature and humidity transducer. - Replace the temperature and humidity transducer.
0158-01	On bypass	Minor	Automatic clear	If the bypass is abnormal, the UPS may power off.	Possible causes: - The inverter is not started. - The load exceeds the rated inverter loading capacity. - The inverter is faulty. Measures: - Check whether other alarms are generated. If yes, see the other handling methods. - If no, start the UPS manually.
0159-01	On battery	Minor	Automatic clear	The UPS may power off if batteries are abnormal.	Possible causes: The mains input is abnormal.

Alarm ID (Alarm ID-Alarm Cause)	Alarm Name	Alarm Level	Alarm Clear Mode	Impact on the System	Repair Proposal
					- The UPS is in battery self-check state. - The mains loading capability is insufficient. Measures: - Check the mains input. If the mains input is abnormal, wait until the mains input recovers. - Check whether the UPS is in battery self-check state. - Reduce the load or replace the UPS with a larger-capacity UPS.
0340-01	Maint. breaker ON	Minor	Automatic clear	The UPS transfers to bypass mode.	Possible cause: The maintenance circuit breaker is ON during UPS maintenance. Measure: Switch off the maintenance circuit breaker after maintenance.
61440-01	Flash fault	Critical	Automatic clear	Files may be damaged.	Possible cause: The flash memory cannot be properly read or written. Measure: Contact Huawei technical support for repair.

D Alarm Handling of Battery Maintenance Notification

Context

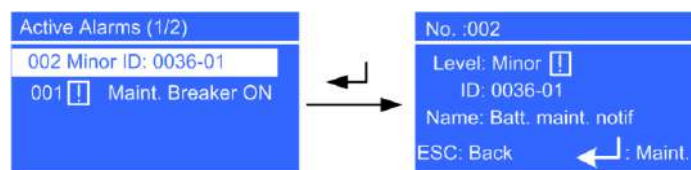
If no battery shallow discharge test is performed within 60 days after a UPS2000-G is installed and the maintenance notification time has arrived, the mains indicator is on, the battery and bypass indicators are off, the fault indicator on the info key are blinking red, and alarms are generated intermittently.

Procedure

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

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

Figure D-1 Viewing alarms



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

Figure D-2 Maintain Batteries screen

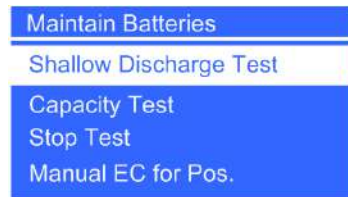


Figure D-3 Active Alarms screen



Step 2 Cancel the battery maintenance notification function.

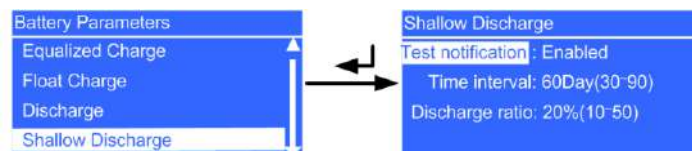


NOTE

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

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

Figure D-4 Shallow Discharge screen



----End

E Battery Shallow Discharge Test

Context

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

Procedure

Step 1 Check the battery status for test start conditions.

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

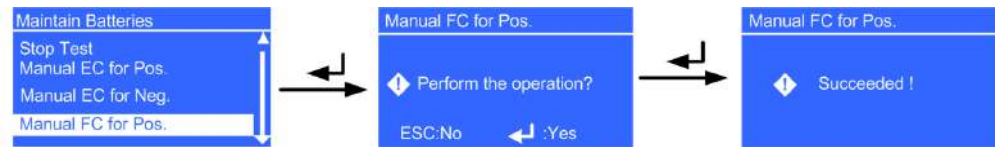
Figure E-1 Battery Status menu



NOTE

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

Figure E-2 Manual FC for Pos. screen



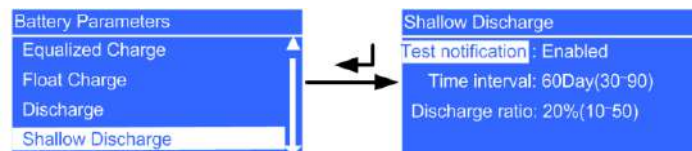
NOTE

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

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

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

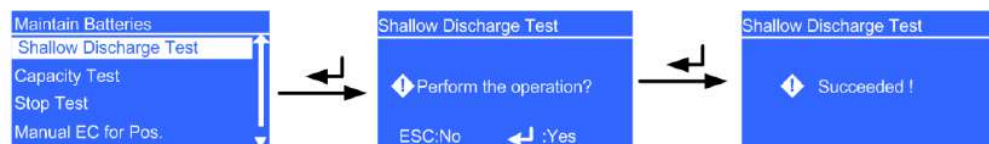
Figure E-3 Shallow Discharge screen



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

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

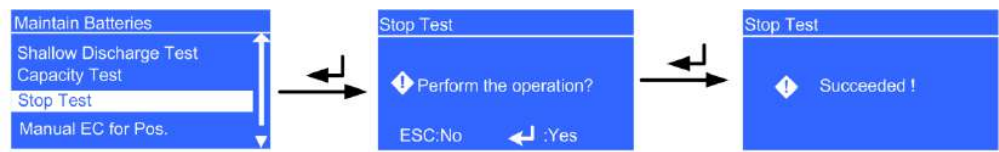
Figure E-4 Shallow Discharge screen



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

Step 4 Stop the shallow discharge test forcibly.

Figure E-5 Stop Test screen



----End

F Capacity Test

Context

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

Procedure

Step 1 Check the battery status for test start conditions.

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

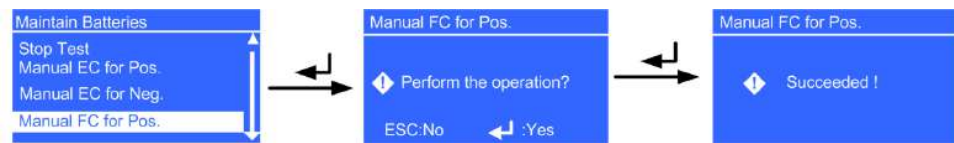
Figure F-1 Battery Status menu



NOTE

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

Figure F-2 Manual FC for Pos. screen

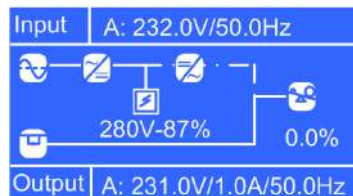


NOTE

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

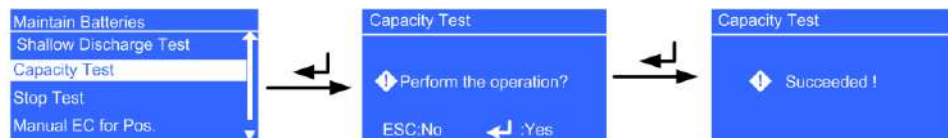
- Step 2** Adjust the load rate of the local UPS to a value between 20% and 80%. The actual load rate can be viewed in the energy flow diagram. If the actual load rate is below 20%, you cannot perform a test. If so, add some IT equipment to increase the load to above the lower limit.

Figure F-3 Viewing the load rate



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

Figure F-4 Shallow Discharge screen



NOTE

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

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

Figure F-5 Load not met

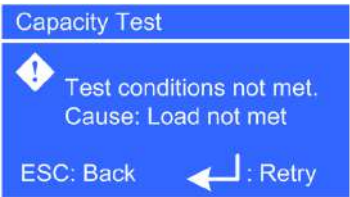
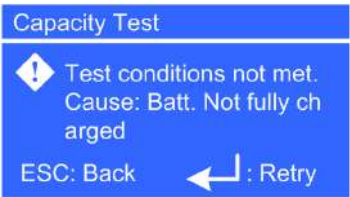
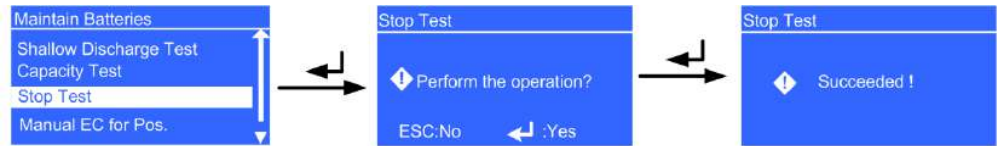


Figure F-6 Batt. not fully charged



Step 4 Stop the capacity Test forcibly.

Figure F-7 Stop Test screen



----End

G Acronyms and Abbreviations

A

ASIC application-specific integrated circuit

C

CAN control area network

CPLD complex programmable logical device

D

DIP dual in-line package

DOD depth of discharge

DSP digital signal processing

E

EPO emergency power-off

ECO economy control operation

EOD end of discharge

ESD electrostatic discharge

ESN equipment serial number

H

HTTPS Hypertext Transfer Protocol Secure

L

LCD liquid crystal display

LSI large-scale integrated

M

MIB management information base

N

NMS network management system

P

PFC power factor correction

PE protective earthing

PL parallel load

PVC polyvinyl chloride

R

RS232 Recommend Standard 232

RS485 Recommend Standard 485

S

SELV safety extra-low voltage

SNMP Simple Network Management Protocol

T

THD_v total harmonic distortion of output voltage

TNV telecommunication network voltage

U

UPS uninterruptible power system

USB Universal Serial Bus

V

VRLA valve regulated lead acid