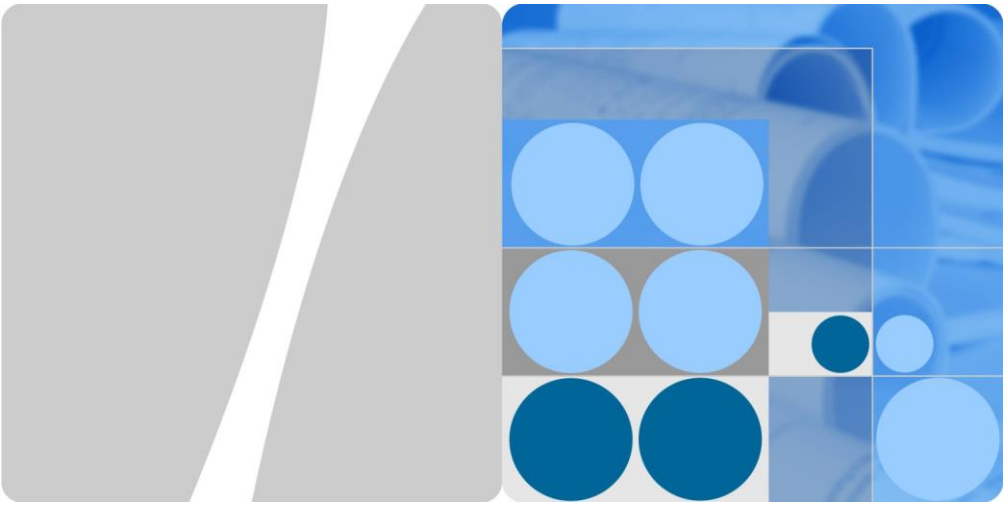


UPS2000-A-(6 kVA-10 kVA)-RTL
Quick Guide

Issue: 03
Part Number: 31507809
Date: 2018-03-12

HUAWEI TECHNOLOGIES CO., LTD.

Introduction

UPS Model	Weight (kg)	Dimensions (H x W x D)
UPS2000-A-6KRTL	11 kg	86 mm x 430 mm x 615 mm
UPS2000-A-10KRTL	11.5 kg	

Front View of 6 kVA/10 kVA

(1) Mains indicator

(2) Battery indicator

(3) Bypass indicator

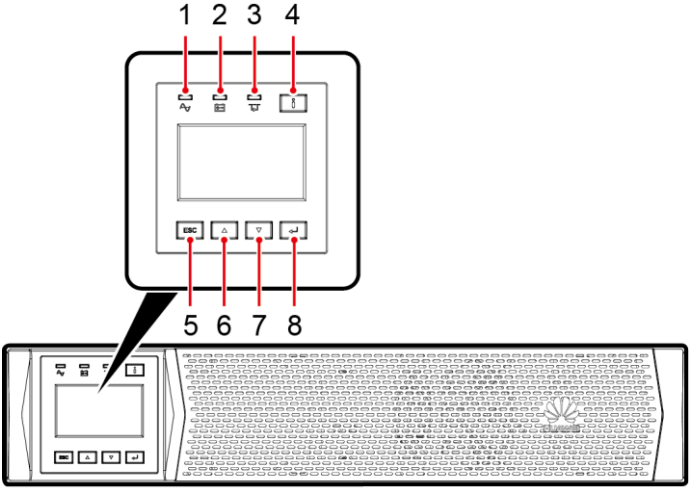
(4) Fault indicator

(5) ESC/Shutdown button

(6) Page Up key

(7) Page Down key

(8) Confirm/Start button



UG10W00001

Rear View of 6 kVA/10 kVA

(1) AC input circuit breaker

(2) Optional card slot (under the cover)

(3) Battery wiring terminal (under the cover)

(4) AC input terminal (under the cover)

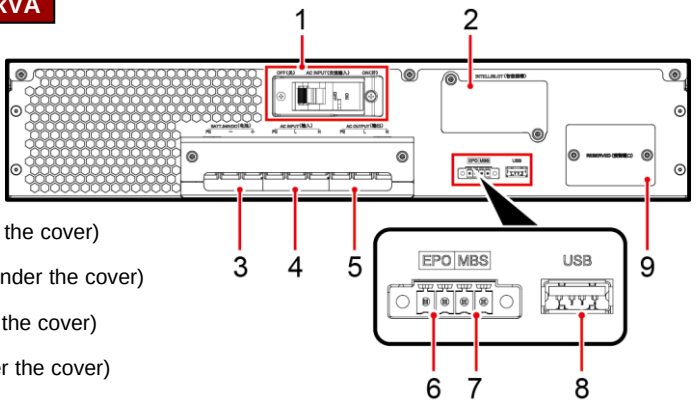
(5) AC output terminal (under the cover)

(6) EPO port

(7) Maintenance bypass port (MBS)

(8) USB port (security protection mechanism supported)

(9) Reserved



UG10W00002

Installing a Single UPS

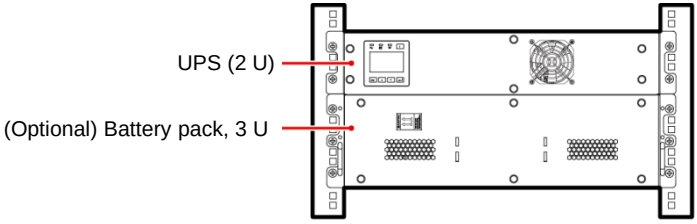
NOTICE

1. Use insulated tools when installing the UPS.
2. Only Huawei engineers or engineers certified by Huawei are allowed to commission and maintain the UPS. Otherwise, personal injury or equipment damage may occur, and the resulting UPS faults are beyond the warranty scope of Huawei.

1 Installing the UPS

Scenario 1 Rack-mounting

1. Determine installation dimensions.

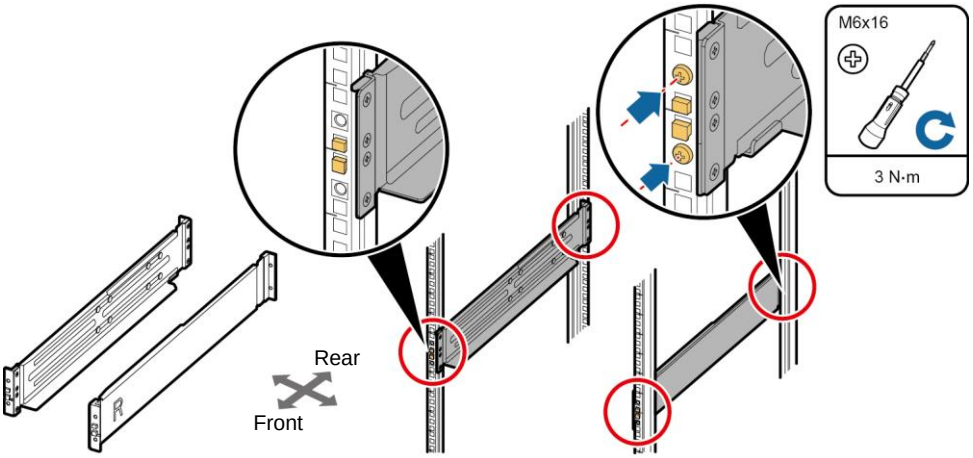


UG10W00003

2. If adjustable guide rails are required, install them. If no adjustable guide rail is required, install only four floating nuts.

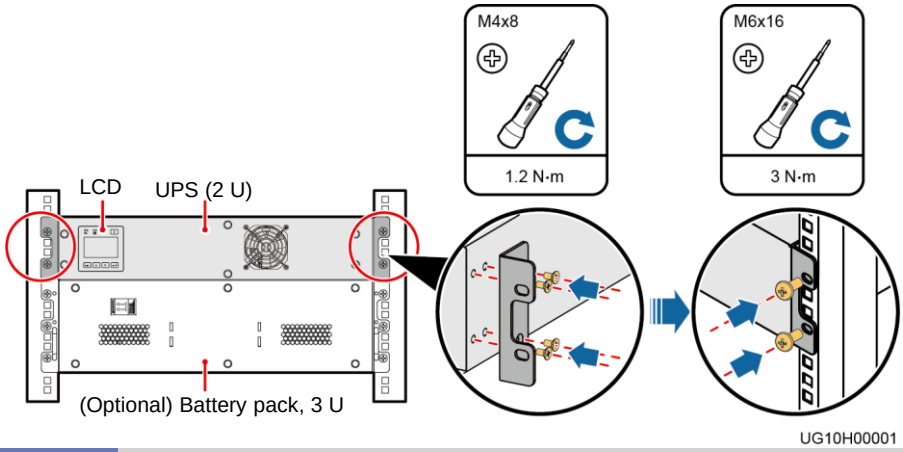
NOTICE

Do not push the guide rail out of the rack when putting the UPS into the rack, as the front end of the guide rail is not screwed.



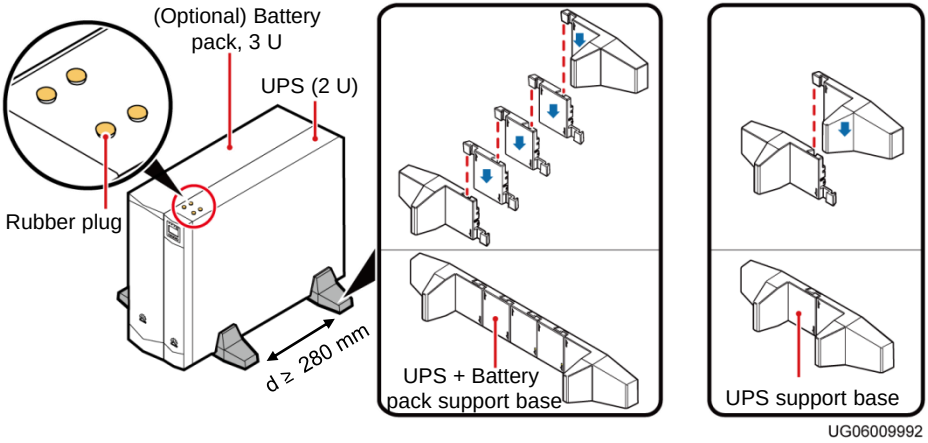
UG10H00002

3. Install mounting ears, and install devices from bottom to top, as shown in the following figure.



Scenario 2 (Optional) Rack-mounting

When you tower-mount the UPS, place devices including the UPS horizontally to facilitate cable installation. Stand the devices upright after cable installation.



NOTE

If the UPS is to be tower-mounted, purchase UPS support bases.

2 Installing AC Input and Output Power Cables

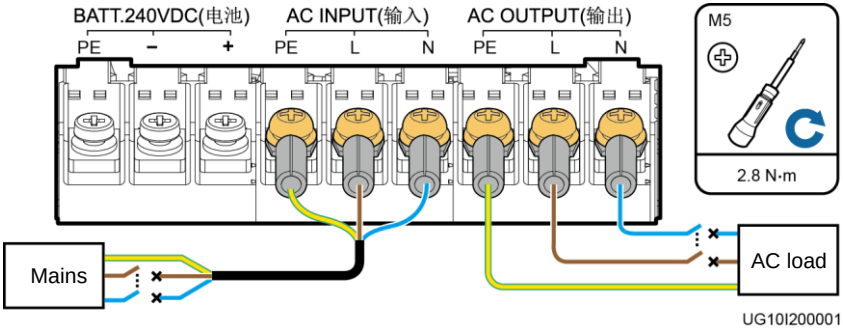
DANGER

1. Connect UPS AC input and output terminals L, N correctly. For a UPS with long backup time, connect the battery terminals correctly.
2. Before connecting cables, ensure that the breakers is OFF. For a UPS with long backup time, ensure that the battery circuit breakers are OFF. Perform all tasks with the power off.

NOTE

The UPS can generate high leakage current. A circuit breaker with leakage current protection is not recommended. If leakage current protection is required, use the recommended model.

Model	UPS2000-A-6KRTL		UPS2000-A-10KRTL	
Wiring Terminal	AC INPUT	AC OUTPUT	AC INPUT	AC OUTPUT
External Circuit Breaker	50 A/D		63 A/D	
Earth Leakage Circuit Breaker	100 mA	N/A	100 mA	N/A
Cable Cross-sectional Area	6 mm^2		10 mm^2	
Terminal Type	OT-10mm^2-M6 terminal		OT-10mm^2-M6 terminal	



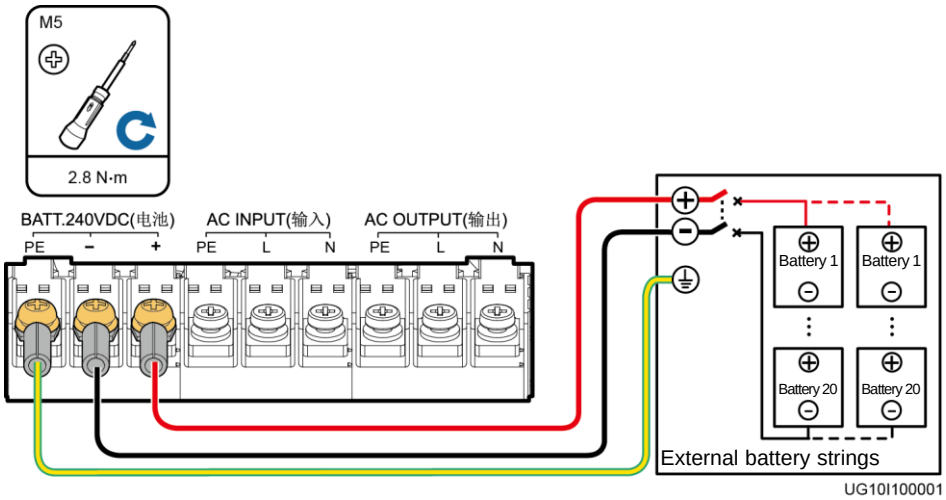
3 Installing Battery Cables

NOTE

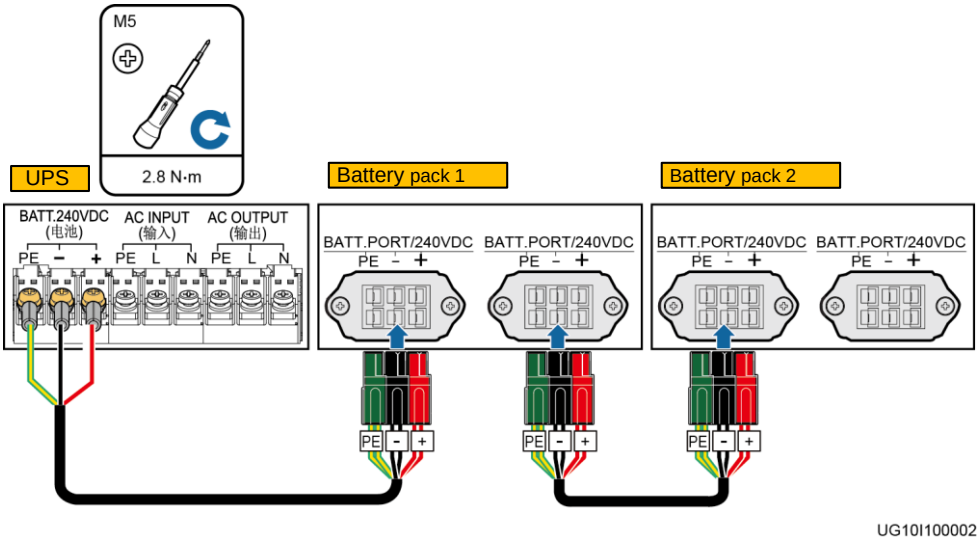
1. A UPS with long backup time is connected to external battery strings. Each battery string consists of 16 to 20 batteries (16 by default, configurable).
2. Install a DC circuit breaker between a battery string and the UPS with long backup time. Install a 50 A 300 V DC circuit breaker for the 6 kVA model, and a 63 A 300 V DC circuit breaker for the 10 kVA model.
3. One to four battery packs can be connected. For details, see the *ESS-240V12-9AhBPVBA, 7AhBPVBA Quick Installation Guide*. If longer backup time is required, choose a battery rack.

Connecting External Battery Strings

Model	UPS2000-A-6KRTL	UPS2000-A-10KRTL
Wiring Terminal	BATT.	BATT.
External Circuit Breaker	50 A, 300 V(DC)	63 A, 300 V(DC)
Cable Cross-sectional Area	6mm^2	10mm^2
Terminal Type	OT-10mm^2-M6 terminal	OT-10mm^2-M6 terminal



Connecting External Battery Packs



4 Verifying the Installation

No.	Item	Result
1	Input circuit breakers and load circuit breakers are OFF.	☐Passed☐Failed
2	Ground cables are firmly connected. The voltage difference between a neutral wire and a ground cable is less than 5 V AC. Measure the resistance between the UPS ground terminal and the equipment room ground bar, which must be less than 0.1 ohm.	☐Passed☐Failed
3	Cables and terminals are securely connected.	☐Passed☐Failed
4	Power cables and signal cables are correctly identified.	☐Passed☐Failed
5	The input terminals L and N are correctly connected. Use a multimeter to measure the input and output, which must be free from any short circuit.	☐Passed☐Failed
6	The mains supply voltage is 120–280 V AC during power-on (80–280 V AC after power-on). The battery voltage is greater than the number of batteries multiplied by 10.8 V DC.	☐Passed☐Failed
7	Battery cables and terminals are connected correctly, and voltages comply with industry standards.	☐Passed☐Failed
8	For a UPS with long backup time, the UPS is properly connected to battery strings.	☐Passed☐Failed

5 Powering On and Starting the UPS

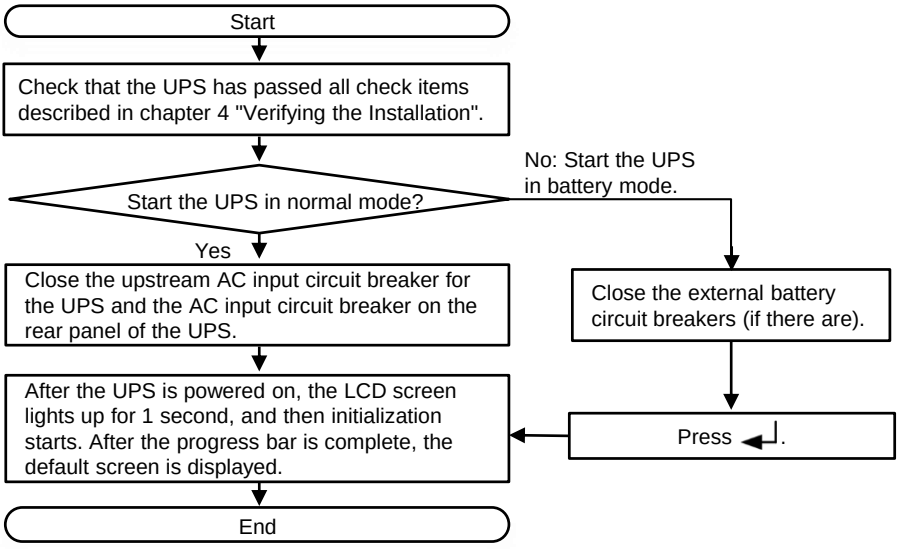
NOTE

1. User interface (UI) snapshots shown in this document correspond to V100 and are for reference only. If any UI changes are made, contact Huawei technical support to obtain the latest snapshots.
2. For details about the letter and LCD display mapping, and alarm handling, see the appendix.

Button	Meaning	Description
ESC	Shutdown/Back	• On the default screen in inverter mode, hold down ESC for more than 5 seconds. Release the button when you hear a beep tone. 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	
↵	Startup/Enter/Battery Self-Check/Mute	• On the default screen in bypass mode, hold down ↵ for more than 5 seconds. Release the button when you hear a beep tone. The UPS starts. • On the default screen, press ↵. The main menu is displayed. On any menu screen, press ↵. The lower-level menu is displayed. If the menu is the last level, an information screen is displayed. • On the default screen in normal mode, hold down ↵ for more than 5 seconds. Release the button when you hear a beep tone. The battery self-check starts. • When the buzzer buzzes, hold down ↵ for 2–5 seconds. The buzzer is muted when you release the button. After the buzzer is muted, the alarm tone is unrecoverable unless a new alarm is generated.

5.1 Powering On the UPS

The following figure shows the process of powering on the UPS:



After the LCD screen lights up for 1 second, the initialization screen is displayed. After the progress bar is complete, the default screen is displayed. The following figures show how the UPS is started in normal mode.

5.2 Setting Key UPS Parameters

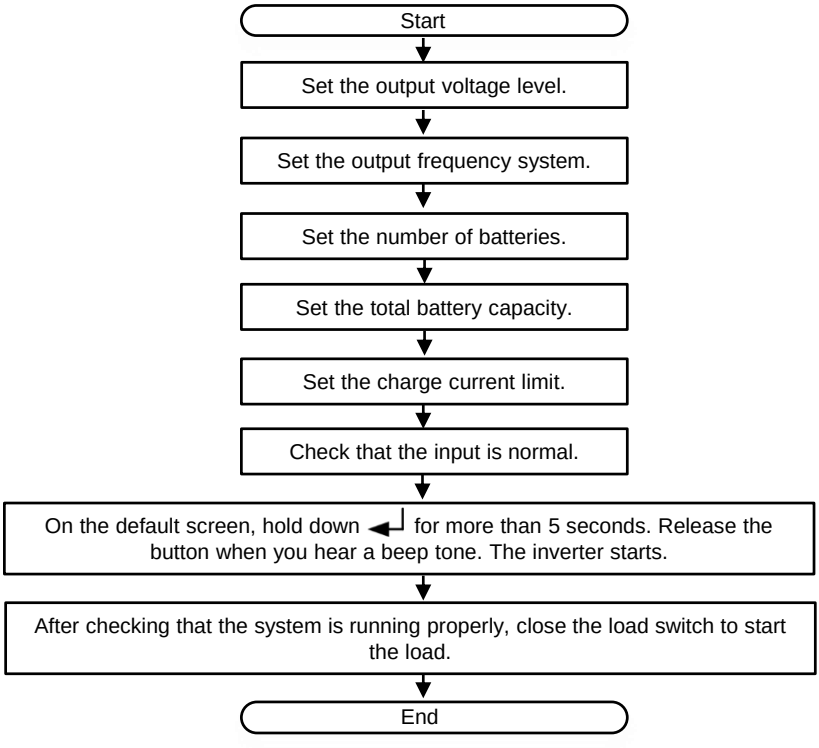
WARNING

1. Incorrectly setting battery parameters compromises battery safety and battery backup time.
2. Set system parameters with caution because the settings determine normal UPS operation.

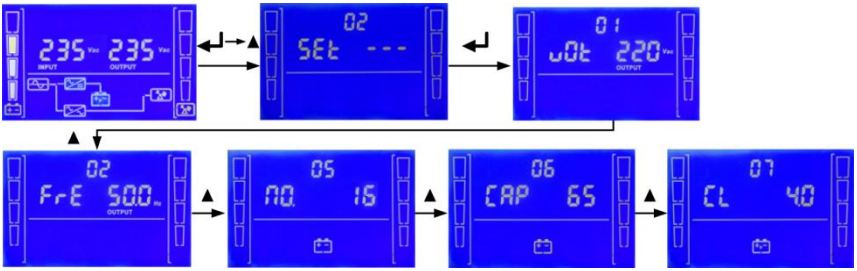
Parameter	UI Display	Remarks
Output voltage level	01 VOT	The optional values include 220 V, 230 V, and 240 V. The default value is 220 V. Set this parameter based on the actual output voltage.
Output frequency system	02 FRE	The optional values include 50 Hz, 60 Hz, and AUT (automatic). Set this parameter based on the actual output frequency. If the value is AUT, the power-on bypass frequency is in the range from 45 Hz to 55 Hz, and the system output frequency is 50 Hz; if the power-on bypass frequency is in the range from 55 Hz from (excluding 55 Hz) to 65 Hz, the system output frequency is 60 Hz.
Number of batteries	05 NO.	Set this parameter based on the actual number of batteries. The default value is 16 for a long backup time UPS. The parameter can be set to a value between 16 and 20.

Parameter	UI Display	Remarks
Total battery capacity	06 CAP	Battery capacity is the sum of each battery string. Set the battery capacity based on the actual value. The default value is 40 Ah for a 6 kVA UPS with long backup time. The default value is 65 Ah for a 10 kVA UPS with long backup time. The parameter can be set to a value between 7 Ah and 999 Ah.
Charge current limit	07 CL	Set this parameter to the maximum current in equalized charging mode based on actual conditions. The default value is 2 A for a 6 kVA/10 kVA UPS with long backup time. The parameter can be set to a value between 1 A and 12 A with an interval of 0.5 A.

The following figure shows the process of setting parameters:



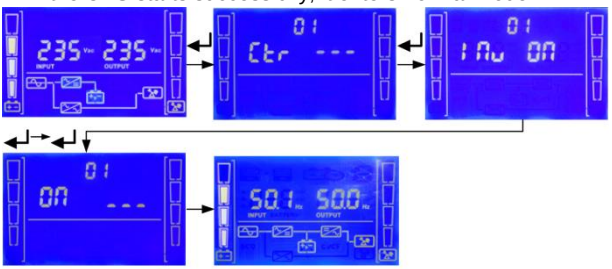
The following figures show the parameter setting screen for a 10 kVA UPS working in normal mode.



There are two methods to start the inverter, using normal mode as an example:

- On the default screen, hold down ↵ for more than 5 seconds. Release the button when you hear a beep tone. If the UPS starts successfully, it enters normal mode.

- On the default screen, hold down ↵ to enter the **CTR** menu. Select **INV ON** in the CTR menu. If the UPS starts successfully, it enters normal mode.



6 Shutting down the UPS

6.1 Shutting down the Inverter to Transfer a Single UPS to Bypass Mode

Perform "shutdown operations" to shut down the UPS. There are two methods to shut down the UPS:

- On the default screen, hold down **ESC** for more than 5 seconds. Release the button when you hear a beep tone. The inverter shuts down. If the bypass voltage is within the configured range, the UPS transfers to bypass mode. If the bypass voltage is beyond the configured range, the UPS has no output.
- On the default screen, press ↵ to enter the **CTR** menu. Choose **INV OFF** to shut down the inverter. The UPS transfers to bypass mode. If the bypass voltage is beyond the configured range, the UPS has no output.

6.2 Powering Off a Single UPS

1. Shut down loads.
2. Perform shutdown operation on the UPS. The inverter shuts down, and the UPS transfers to bypass mode. If the bypass voltage is beyond the configured range, the UPS has no output.
3. Open the upstream AC input circuit breaker for the UPS, the AC input circuit breakers on the rear panel of the UPS.
4. Open the external battery circuit breakers (if there are) or disconnect the battery cables (if there is no battery circuit breaker). After all indicators turn off and fans stop, the UPS shuts down and loads power off.

FAQ

1 Letter/Number and LCD Display Mapping

Letter /Number	A	B	C	D	E	F	G	H	I	L	N	O	P	R	S
LCD Display	A	b	C	d	E	F	G	H	I	L	n	O	P	r	S
Letter /Number	T	U	V	Y	0	1	2	3	4	5	6	7	8	9	-
LCD Display	t	U	v	y	0	1	2	3	4	5	6	7	8	9	-

2 LCD Menu Hierarchy

LCD Display No.	Acronym and Abbreviation	LCD Display No.	Acronym and Abbreviation	Meaning
01	CTR (Control menu)	01	INV ON	Starts the UPS
		02	INV OFF	Shuts down the UPS
		03	ALR CLR	Clears ADMC alarms
		04	BAT RPL	Replaces batteries
		05	DEF RST	Restores default settings
02	SET (Setting menu)	01	VOT	Output voltage level
		02	FRE	Output frequency system
		03	BVU	Maximum bypass voltage
		04	BVL	Minimum bypass voltage
		05	NO.	Number of batteries
		06	CAP	Total battery capacity
		07	CL	Charge current limit
		08	EOD	EOD mode
		09	DT	Discharge time protection setting
		10	ECO	ECO mode enabling
		11	VU	Maximum ECO voltage
		12	VL	Minimum ECO voltage
		13	FR	ECO frequency range
		14	DSP	DSP version number
		15	CPL	CPLD version number
03	ACT ALR (Active alarm display menu)			
04	HIS ALR (Historical alarm display menu)			

Routine Maintenance

This section describes the monthly maintenance for the UPS and batteries.

1 UPS Monthly Maintenance

Check Item	Expected Result	Troubleshooting
Operating environment	• Ambient temperature: 0–40ºC • Humidity: 0–95% RH (non-condensing) • Input voltage: 220 V AC, 230 V AC, or 240 V AC • Output voltage: 220 V AC, 230 V AC, or 240 V AC • Frequency: 45–65 Hz	• If the humidity and temperature are abnormal, check the air conditioner status. • If the input voltage is abnormal, check the power grid status and input cable connection. • If the output voltage is abnormal, check the UPS running status and check whether an alarm is present.

Check Item	Expected Result	Troubleshooting
Control panel	Check that all units are operating properly by observing the status icons on the LCD, all operating parameters are within their normal ranges, and no fault or alarm information is displayed.	If an alarm is present, rectify the fault by checking the device status and parameters.
Abnormal noise	No abnormal noise is generated.	Check where the abnormal noise comes from, especially fans, input and output transformer (if configured). If the problem is not resolved, contact Huawei technical support.
Cleanliness	Wipe the cabinet surface using a white paper and the paper does not turn black.	Clean the dust.
UPS parameters	N/A	Reset the parameters.
Cables	Cables are intact and do not deteriorate or damage.	If a cable is damaged, find the reason and apply protective measures such as rodent-proof measures.
Load change	N/A	Regularly check and record the adding and removal of loads.
UPS maintenance report	N/A	Categorize exceptions and alarms.
Exported alarm	N/A	Analyze and export alarm analysis report.

2 Battery Maintenance

Item	Expected Result	Measures
Charge current	≤ 12 A	If the charge current is incorrect, contact Huawei technical support.
Battery string charge voltage	Equalized voltage 14.1 V x Number of batteries (tolerance ±1%) Float voltage 13.5 V x Number of batteries (tolerance ±1%)	1. If the voltage drop between the battery string output terminals and the battery input terminals at the UPS host 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 host. 3. If the fault persists, contact Huawei technical support.
Battery appearance	1. The battery shell is intact, without acid leaks, deformation, or bulges. 2. The battery is free from dust or dirt.	1. Take photos of any deformed or faulty parts of batteries. 2. Check and record the charge voltage and current of the battery string as well as the voltage of each battery. 3. Check the battery surface temperature. 4. Keep deformed and bulged faulty batteries still for 30 minutes and then check and record open-circuit voltage of the faulty battery. 5. If the fault persists, contact Huawei technical support.

Item	Expected Result	Measures
Battery management parameters	Parameter settings meet requirements. The battery capacity is correctly set based on the actual configuration.	Set parameters correctly.
Battery alarm	No battery alarm is generated.	Identify the cause based on the alarm information.
Battery connection	Battery terminals and cables are in good contact.	Find poor contact points between battery terminals and cables.
Battery operating temperature	The service temperature of a working battery does not exceed 45ºC.	Identify the cause of the abnormal battery operating temperature.

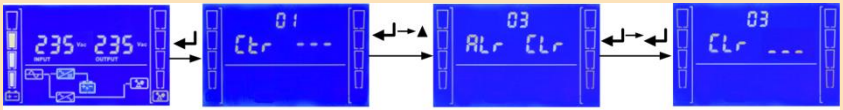
Troubleshooting

Symptom	Possible Cause	Measure
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. The input voltage exceeds the limit.	Check the input power cable connection. Use a multimeter to check that the UPS input voltage meets specifications.
The mains is normal, but the bypass indicator is off. The UPS runs in battery mode.	The mains switch is OFF. The input power cable is not securely connected.	Turn on the mains switch. Check the input power cable connection.
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.
The UPS does not start after you press ↵.	↵ is not pressed long enough. Overload occurs.	Press ↵ for more than 5 seconds until you hear a beep sound. Disconnect all loads, and restart the UPS.
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.
The battery discharge time is much less than the standard time.	Batteries are not fully charged. The battery performance deteriorates.	Charge batteries for more than 8 hours when the mains is normal. Test the discharge time again. Contact local Huawei technical support to replace batteries.
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.
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.	Save load data immediately and power off critical loads. Connect UPS input terminals to the backup AC power supply. Verify that the number of batteries and battery capacity are correctly set based on the actual configuration.

Alarm Handling

NOTE

Clear automatically detected and manually cleared (ADMC) alarms as shown in the figures below.



Alarm Name	Alarm ID	Alarm Cause ID	Repair Proposal
Abnormal mains volt	01	1	Possible cause: The mains voltage exceeds 280 V. Measure: Check the mains input voltage, If the voltage exceeds 272 V, wait for the mains to recover.
		2	• Possible cause: The mains voltage is less than 80 V. Measure: Check the mains input voltage, if the voltage is less than 88 V, wait for the mains to recover. • Possible cause: The input fuse is blown. Measure: Check the status of the input fuse.
		3	• Possible cause: The mains frequency is out of the 45–55 Hz (mapping to 50 Hz) or 55–65 Hz (mapping to 60 Hz) range. Measure: Check the mains input frequency. If the frequency is out of the normal range, wait for the mains to recover. • Possible cause: The input fuse is blown. Measure: Check the status of input fuses.
		4	Possible cause: The mains voltage is frequently abnormal. Measure: Check the mains input voltage. If the voltage is abnormal, wait for the mains voltage to become normal and manually clear the alarm.
Abnormal BPS volt	0A	1	Possible cause: The bypass input voltage is abnormal. Measure: Check whether the bypass input voltage is out of the specified range. If the voltage is out of the specified range, change the range setting or wait for the bypass input to recover.
		2	Possible cause: The bypass frequency is out of the 45–55 Hz (mapping to 50 Hz) or 55–65 Hz (mapping to 60 Hz) range. Measure: Check the bypass input frequency. If the frequency is out of the normal range, wait for the bypass power supply to recover.
Batt. reverse	14	1	Possible cause: The positive and negative battery terminals are reversely connected. Measure: Check the battery installation, and install batteries again.
No battery	16	1	• Possible cause: No batteries are connected. Measure: Connect batteries. • Possible cause: The batteries are in poor contact. Measure: Check the battery cable connection. If battery cables are loose, tighten the cables.

Alarm Name	Alarm ID	Alarm Cause ID	Repair Proposal
Bypass mode	9E	1	• Possible cause: The inverter is not started Measure: Check whether other alarms are generated. If other alarms are generated, handle these alarms according to the handling methods. • Possible cause: The load exceeds the rated loading capacity of the inverter. Measure: If other alarms are not generated, manually start the UPS. • Possible cause: The inverter is faulty. Measure: Contact Huawei technical support.
Battery mode	9F	1	• Possible cause: The mains input is abnormal. Measure: Check the mains input. If the mains input is abnormal, wait for the mains to recover. • Possible cause: The battery self-check is in progress. Measure: Check whether the battery self-check is in progress. • Possible cause: The mains loading capacity is insufficient. Measure: Lower the load or replace the UPS with a UPS with a larger capacity.
Battery overvoltage	19	1	• Possible cause: The battery voltage reaches the alarm threshold due to continuous charge. Measure: When batteries are in charge mode, wait for 2 minutes and check whether the alarm is cleared. • Possible cause: The number of batteries configured is less than the actual number of batteries. Measure: Check whether the number of batteries is correctly set.
Battery overvoltage protection	20	1	• Possible cause: The number of batteries configured is less than the actual number of batteries. Measure: Check that the configured number of batteries is consistent with the actual number. • Possible cause: The actual number of batteries does not meet requirements. Measure: Check that the actual number of batteries meets requirements. • Possible cause: The charger is abnormal. Measure: Check that the charger voltage is normal when the batteries are disconnected.
Battery low voltage	1A	1	Possible cause: The mains is abnormal, and the batteries are overdischarged. Measure: Connect to the mains in non-battery test state.
Battery maintenance required	1D	1	• Possible cause: The battery capacity is incorrectly configured. Measure: Check that the configured battery capacity is consistent with the actual battery capacity. • Possible cause: The battery loop cannot discharge currents. Measure: Check the battery cable connection and the status of each battery. • Possible cause: The battery capacity is lower than normal. Measure: Replace battery strings. If the alarm persists, manually clear the alarm.

Alarm Name	Alarm ID	Alarm Cause ID	Repair Proposal
Battery qty. wrong	31	1	Possible cause: The number of batteries is incorrectly set. Measure: Check whether the number of batteries is correctly set. Possible cause: Batteries are damaged. Measure: Check whether batteries are damaged. Possible cause: If batteries are fully charged, reconnect the batteries as soon as the system powers off. Measure: After ensuring that the number of batteries is correct, clear the alarm.
Maintenance circuit breaker ON	3B	1	Possible cause: The maintenance bypass switch is ON during UPS maintenance. Measure: Set the maintenance bypass switch to OFF after maintenance.
Internal fault	2A	11	• Possible cause: The mains has experienced a transient high voltage. Measure: Rectify the fault and restart the UPS. • Possible cause: The output supplies power to special loads such as the inductive and rectification loads. Measure: Check that the load types are supported by the UPS. • Possible cause: The hardware is damaged. Measure: Contact Huawei technical support.
Bypass backfeed	47	1	Possible cause: Bypass components are faulty. Measure: Contact Huawei technical support.
EPO	55	1	Possible cause: You have pressed the EPO switch. Measure: Restore the EPO switch status, clear the alarm, and restart the UPS.

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