

# UPS2000-G-(15 kVA–20 kVA) Quick Guide

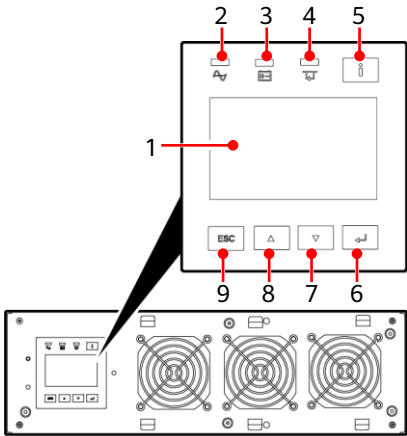
Issue: 08  
Part Number: 31507443  
Date: 2021-07-16



## Overview

UPS Model	Represented By	Weight	Dimensions (H x W x D)
UPS2000-G-15KRTL	15 kVA	32 kg	430 mm x 130 mm x 757 mm
UPS2000-G-15KRTL-01			
UPS2000-G-20KRTL	20 kVA		
UPS2000-G-20KRTL-01			

### Front View (15 kVA/20 kVA)



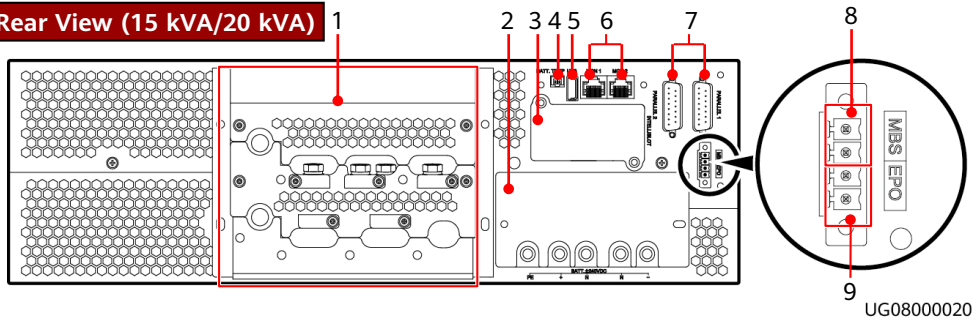
UG08000006

#### NOTE

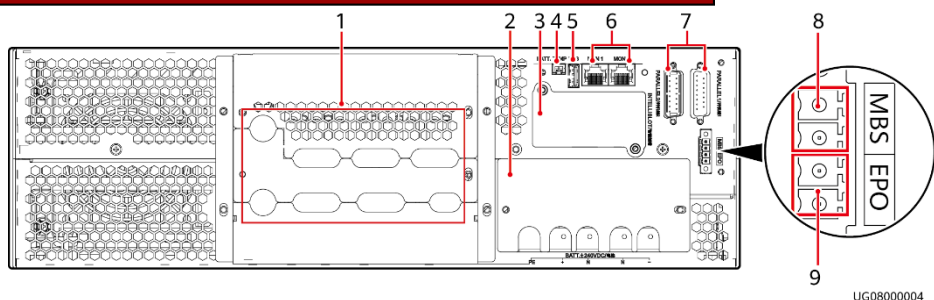
The UPS is working in ECO mode only if the mains indicator and bypass indicator are both on.

No.	Name	Description
1	LCD	-
2	Mains indicator	<ul style="list-style-type: none"><li>On: The UPS is working in normal mode.</li><li>Off: The UPS is not working in normal mode.</li></ul>
3	Battery indicator	<ul style="list-style-type: none"><li>On: The UPS is working in battery mode.</li><li>Off: The UPS is not working in battery mode.</li><li>Blinking: The battery capacity is less than 25%.</li></ul>
4	Bypass indicator	<ul style="list-style-type: none"><li>On: The UPS is working in bypass mode.</li><li>Off: The UPS is not working in bypass mode.</li></ul>
5	Fault indicator/ INFO button	<ul style="list-style-type: none"><li>Steady red: The UPS is faulty.</li><li>Blinking red: The UPS has generated an alarm.</li><li>Green: The UPS is normal.</li></ul>
6	Confirm/ Start button	Confirms settings, starts the UPS, mutes the buzzer, or performs a battery self-check.
7	Page Down button	-
8	Page Up button	-
9	ESC/Shut down button	Returns to an upper-level menu, or shuts down the UPS.

## Rear View (15 kVA/20 kVA)



## Rear View (UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01)



- (1) Cover for AC input and AC output wiring terminals
- (2) Battery terminal cover
- (3) Cover for the optional card slot
- (4) Battery temperature sensor port
- (5) USB port (protected by a security mechanism)
- (6) CAN communications ports
- (7) Parallel ports
- (8) Maintenance bypass port
- (9) EPO port

## Installing a Single UPS

### NOTICE

1. Carefully read the *UPS2000-G-(6 kVA–20 kVA) User Manual* prior to installation to get familiar with product information and safety precautions.
2. Use insulated tools during installation.
3. Only engineers certified by the manufacturer or its agent are allowed to install, 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 Devices

## Scena Rack-Mounted Installation

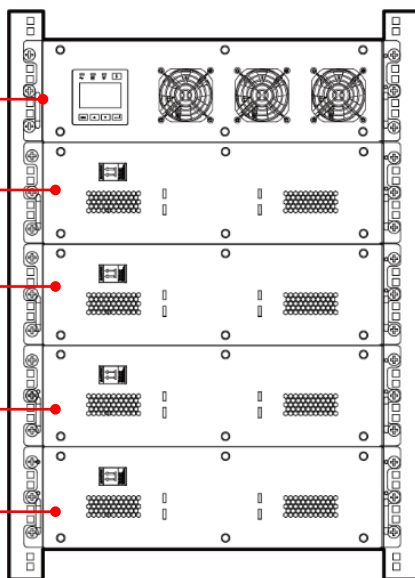
1. Determine the installation dimensions.

UPS (3U)

### NOTE

Install devices from bottom to top, as shown in the figure.

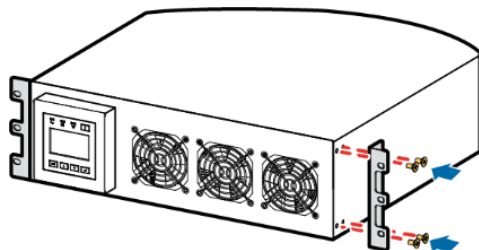
Battery pack (optional, 3U)



UG08009999

2. Install mounting ears.

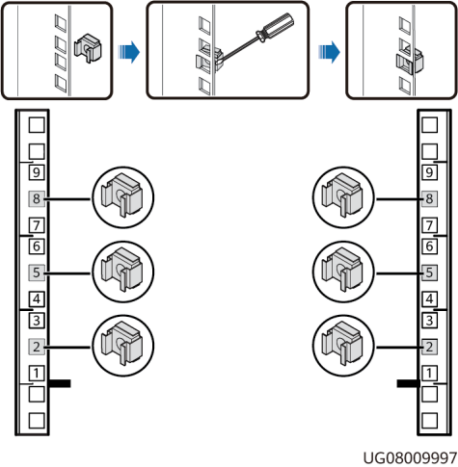
M4x8 (8 PCS)  
1.2 N•m



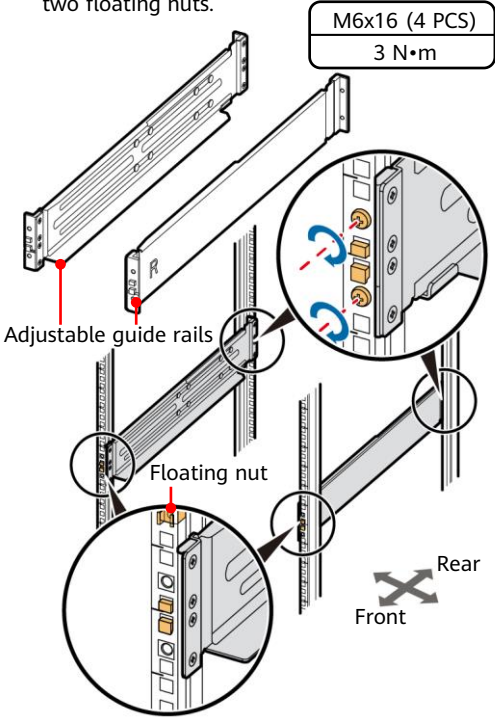
UG09009999

3. Install guide rails using either of the methods.

Method 1: If there are no adjustable guide rails, install six floating nuts.



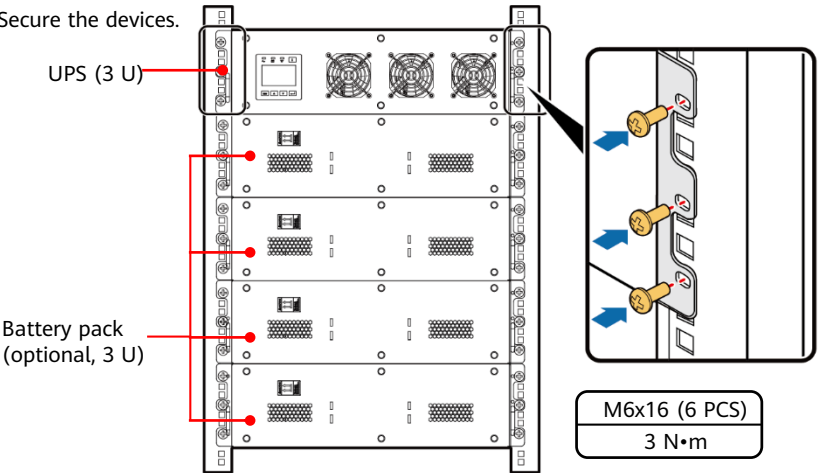
Method 2: If there are adjustable guide rails, install two adjustable guide rails and two floating nuts.



**NOTICE**

Avoid pushing guide rails out of the rack when placing the battery pack, power distribution unit (PDU), and UPS on the rack because the front ends of the guide rails are not screwed. The length of guide rails ranges from 592.37 mm to 807.37 mm, the width is 30 mm, and the height is 87 mm. The guide rails are scalable and support Huawei M-type cabinets.

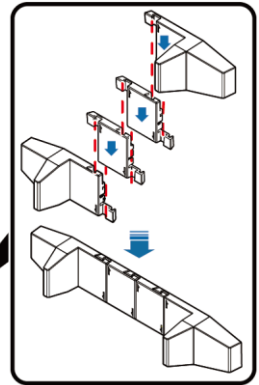
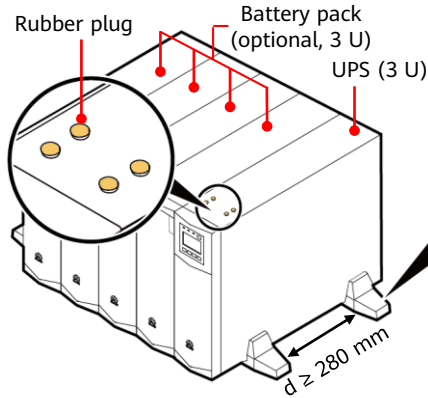
4. Secure the devices.



## Scenario 2 Tower-Mounted Installation

### NOTICE

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



UG08009994

## 2 Installing AC Input and Output Power Cables

### ⚠ DANGER

1. bL indicates the bypass input, and mL indicates the mains input.
2. Connect UPS AC input and output power cables in the same phase sequence. Connect battery terminals correctly.
3. Before connecting cables to the UPS, ensure that the input circuit breaker, output circuit breaker, and battery circuit breaker are OFF to prevent operations with power on.
4. If the input or output wiring has to be changed, contact Huawei technical support if you are not familiar with the operation. Do not power on the UPS directly.
5. If the input or output system is changed, ensure that the short-circuit copper bar status and cable connections at input and output ports are correct.
6. The copper bar and ground screws are M6. Tighten them to 4.8 N·m. The chassis screws are M5. Tighten them to 2.8 N·m.
7. In a single UPS system, connect loads to AC OUTPUT sL and pL terminals. Connect primary loads to the sL terminal and secondary loads to the pL terminal. For a parallel system, connect loads to the AC OUTPUT pL terminal, instead of the sL terminal.
8. The UPS can generate large leakage currents. A circuit breaker equipped with a residual current device (RCD) is not recommended. If leakage protection is required, select a recommended circuit breaker.
9. When installing short-circuit bars, install the AC INPUT short-circuit bar and cables, and then install the AC OUTPUT short-circuit bar and cables.
10. The cable colors in the figures are for reference only.

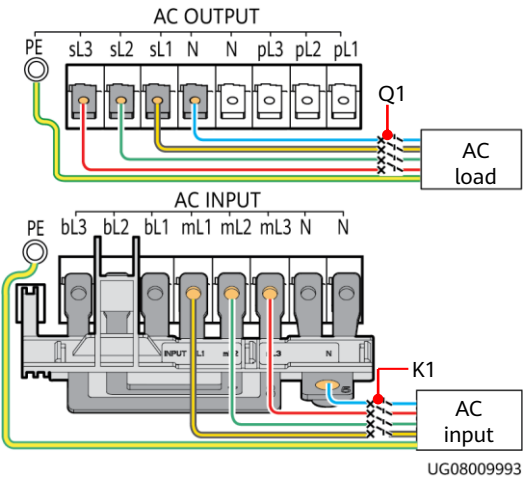
### NOTICE

1. If the AC input of the 15 kVA/20 kVA UPS uses two live wires, connect bypass and mains inputs bL1, bL2, bL3, mL1, mL2, and mL3 that are short-circuited with a short-circuit bar to live wire L1, and connect the input N and N with a short-circuit bar to live wire L2.
2. If the AC input and AC output uses two live wires, the input and output must be connected to two-pole circuit breakers provided by the customer.

Connect cables based on the actual situation.

Three-Phase Input, Three-Phase Output, One Power Source (Factory Settings)

Wiring Terminal	AC OUTPUT	AC INPUT	PE
External Circuit Breaker	Q1	K1	-
	15 kVA: 50 A (D feature); 20 kVA: 63 A (D feature)	15 kVA: 50 A (D feature); 20 kVA: 63 A (D feature)	
Residual Current Circuit Breaker	-	300 mA	-
Cable Cross-Sectional Area	10 mm <sup>2</sup>	10 mm <sup>2</sup>	25 mm <sup>2</sup>
Terminal Type	OT-10 mm <sup>2</sup> -M6 terminal	OT-10 mm <sup>2</sup> -M6 terminal	OT-25 mm <sup>2</sup> -M6-90° terminal



NOTE

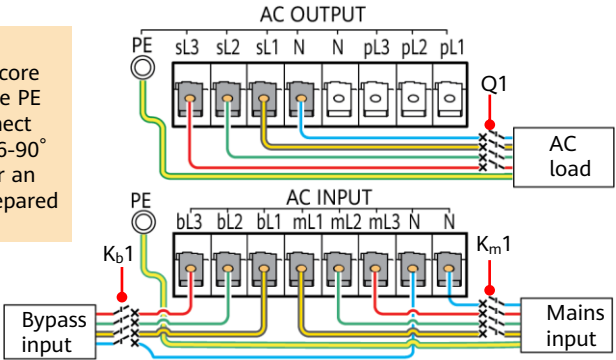
If the customer uses 10 mm<sup>2</sup> five-core cables for AC input and output, the PE cable is 10 mm<sup>2</sup>. In this case, connect the cable using an OT-16 mm<sup>2</sup>-M6-90° terminal delivered with the UPS or an OT-10 mm<sup>2</sup>-M6-90° terminal prepared by the customer.

Three-Phase Input, Three-Phase Output, Two Power Sources

Wiring Terminal	AC OUTPUT	AC INPUT	PE
External Circuit Breaker	Q1	Mains K <sub>m</sub> 1   Bypass K <sub>b</sub> 1	-
	15 kVA: 50 A (D feature); 20 kVA: 63 A (D feature)	15 kVA: 50 A (D feature); 20 kVA: 63 A (D feature)	
Residual Current Circuit Breaker	-	300 mA	-
Cable Cross-Sectional Area	10 mm <sup>2</sup>	10 mm <sup>2</sup>	25 mm <sup>2</sup>
Terminal Type	OT-10 mm <sup>2</sup> -M6 terminal	OT-10 mm <sup>2</sup> -M6 terminal	OT-25 mm <sup>2</sup> -M6-90° terminal

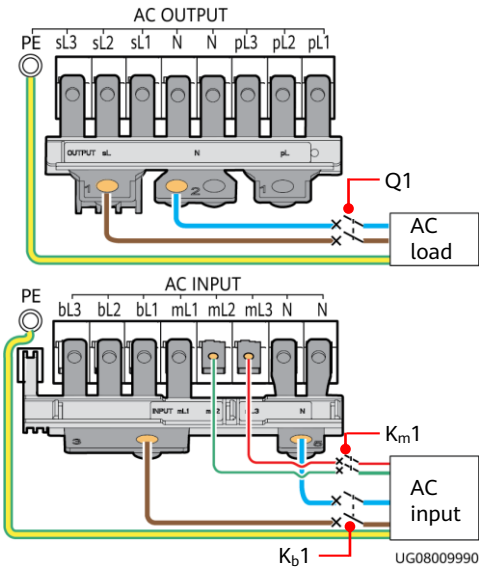
NOTE

If the customer uses 10 mm<sup>2</sup> five-core cables for AC input and output, the PE cable is 10 mm<sup>2</sup>. In this case, connect the cable using an OT-16 mm<sup>2</sup>-M6-90° terminal delivered with the UPS or an OT-10 mm<sup>2</sup>-M6-90° terminal prepared by the customer.



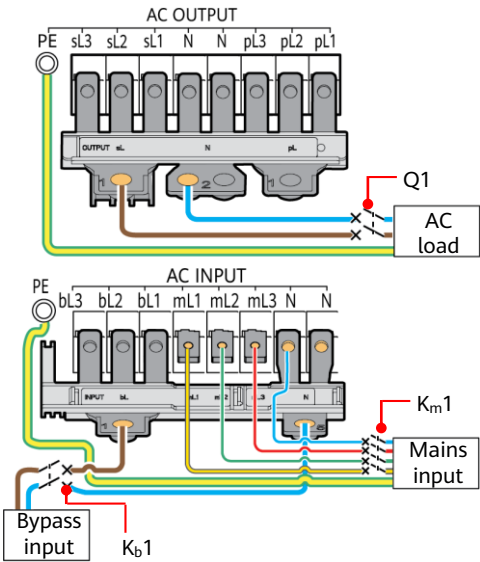
# Three-Phase Input, Single-Phase Output, One Power Source

zWiring Terminal	AC OUTPUT	AC INPUT		PE
External Circuit Breaker	Q1	Mains $K_m1$	Bypass $K_b1$	
	15 kVA: 100 A (D feature); 20 kVA: 125 A (D feature)	15 kVA: 50 A (D feature); 20 kVA: 63 A (D feature)	15 kVA: 100 A (D feature); 20 kVA: 125 A (D feature)	-
Residual Current Circuit Breaker	-	15 kVA: 300 mA; 20 kVA: 300 mA	15 kVA: 300 mA; 20 kVA: adjustable from 500 mA to 1000 mA	-
Cable Cross-Sectional Area	25 mm <sup>2</sup>	10 mm <sup>2</sup>	25 mm <sup>2</sup>	25 mm <sup>2</sup>
Terminal Type	OT-25 mm <sup>2</sup> -M6 terminal	OT-10 mm <sup>2</sup> -M6 terminal	OT-25 mm <sup>2</sup> -M6 terminal	OT-25 mm <sup>2</sup> -M6-90° terminal



Three-Phase Input, Single-Phase Output, Two Power Sources

Wiring Terminal	AC OUTPUT	AC INPUT		PE
External Circuit Breaker	Q1	Mains K <sub>m</sub> 1	Bypass K <sub>b</sub> 1	
	15 kVA: 100 A (D feature); 20 kVA: 125 A (D feature)	15 kVA: 50 A (D feature); 20 kVA: 63 A (D feature)	15 kVA: 100 A (D feature); 20 kVA: 125 A (D feature)	-
Residual Current Circuit Breaker	-	15 kVA: 300 mA; 20 kVA: 300 mA	15 kVA: 300 mA; 20 kVA: adjustable from 500 mA to 1000 mA	-
Cable Cross-Sectional Area	25 mm <sup>2</sup>	10 mm <sup>2</sup>	25 mm <sup>2</sup>	25 mm <sup>2</sup>
Terminal Type	OT-25 mm <sup>2</sup> -M6 terminal	OT-10 mm <sup>2</sup> -M6 terminal	OT-25 mm <sup>2</sup> -M6 terminal	OT-25 mm <sup>2</sup> -M6-90° terminal

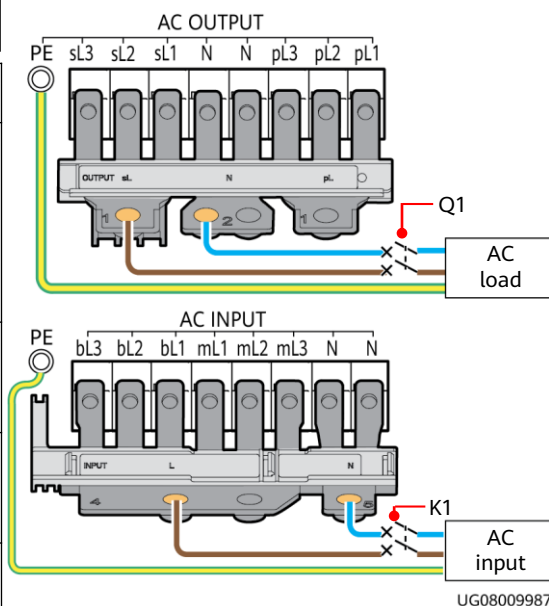


UG08009989



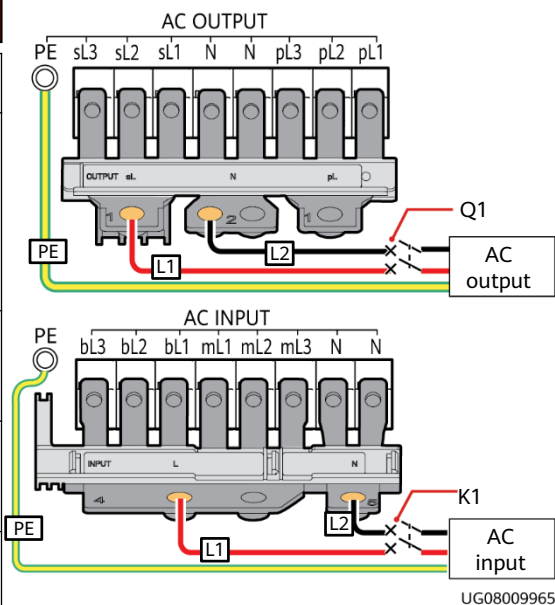
### Single-Phase Input, Single-Phase Output, One Power Source

Wiring Terminal	AC OUTPUT	AC INPUT	PE
<b>External Circuit Breaker</b>	Q1	K1	-
	15 kVA: 100 A (D feature); 20 kVA: 125 A (D feature)	15 kVA: 100 A (D feature); 20 kVA: 125 A (D feature)	
<b>Residual Current Circuit Breaker</b>	-	300 mA	-
<b>Cable Cross-Sectional Area</b>	25 mm <sup>2</sup>	25 mm <sup>2</sup>	25 mm <sup>2</sup>
<b>Terminal Type</b>	OT-25 mm <sup>2</sup> -M6 terminal	OT-25 mm <sup>2</sup> -M6 terminal	OT-25 mm <sup>2</sup> -M6-90° terminal



### Dual-Live-Wire Input, Dual-Live-Wire Output, One Power Source

Wiring Terminal	AC OUTPUT	AC INPUT	PE
<b>External Circuit Breaker</b>	Q1	K1	-
	15 kVA: 100 A (D feature); 20 kVA: 125 A (D feature)	15 kVA: 100 A (D feature); 20 kVA: 125 A (D feature)	
<b>Residual Current Circuit Breaker</b>	-	300 mA	-
<b>Cable Cross-Sectional Area</b>	25 mm <sup>2</sup>	25 mm <sup>2</sup>	25 mm <sup>2</sup>
<b>Terminal Type</b>	OT-25 mm <sup>2</sup> -M6 terminal	OT-25 mm <sup>2</sup> -M6 terminal	OT-25 mm <sup>2</sup> -M6-90° terminal

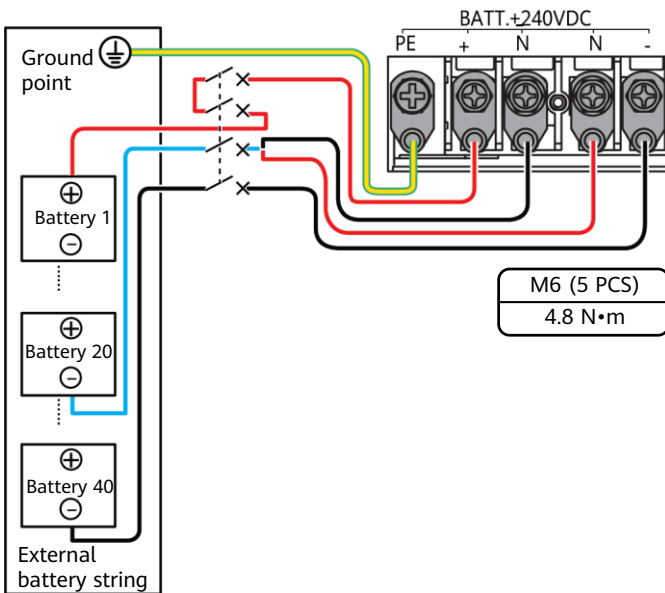


### 3 Installing Battery Cables

#### Scenario 1 External Battery Strings

##### NOTICE

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



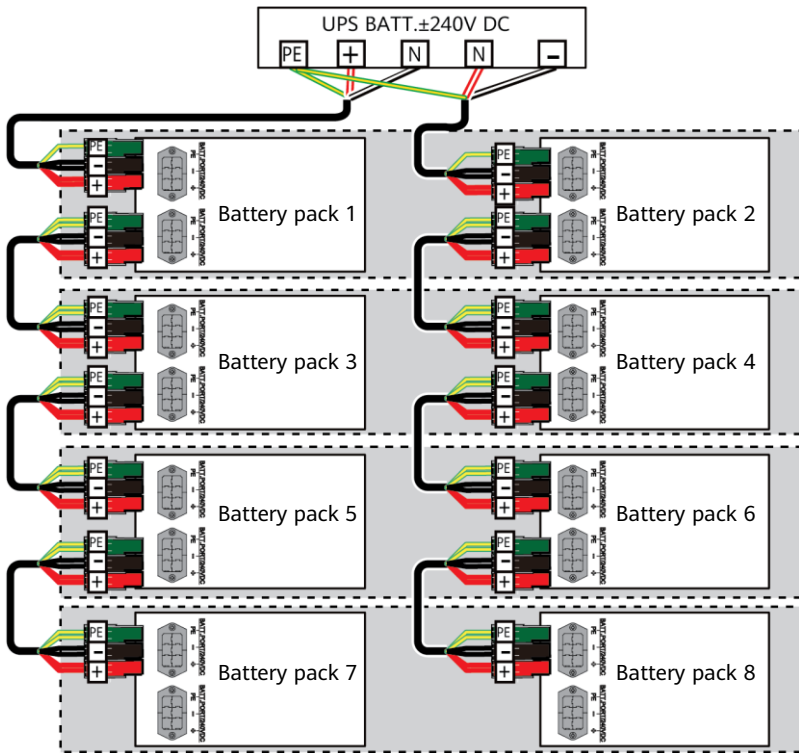
<b>Wiring Terminal</b>	BATT. $\pm 240$ V DC
<b>External Circuit Breaker</b>	63 A
<b>Cable Cross-Sectional Area</b>	16 mm <sup>2</sup>
<b>Terminal Type</b>	OT-16 mm <sup>2</sup> -M6-90° terminal

UG08009985

#### Scenario 2 External Battery Packs

##### NOTE

1. A 15 kVA/20 kVA UPS with long backup time requires serial connection of two battery packs in each group. A maximum of four groups with eight battery packs can be connected in parallel. If more than two battery packs need to be connected to the 15 kVA/20 kVA UPS with long backup time, the battery packs should be connected in parallel and then connected to the battery input ports of the UPS, as shown in the following figure. Connect battery packs 1 and 2 in series, battery packs 3 and 4 in series, battery packs 5 and 6 in series, and battery packs 7 and 8 in series. Connect battery packs 1, 3, 5, and 7 in parallel and battery packs 2, 4, 6, and 8 in parallel.
2. For more information, see the *ESS-240V12-(9AhBPVBA, 7AhBPVBA) Quick Installation Guide*.



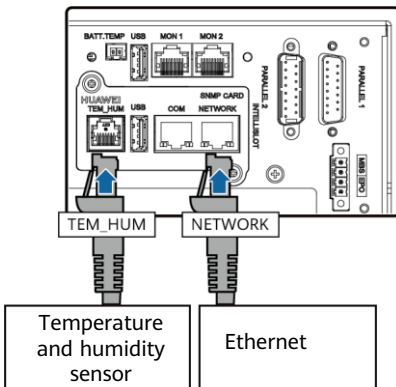
DP24I30002

## 4 (Optional) Connecting Cables to Optional Cards

### NOTE

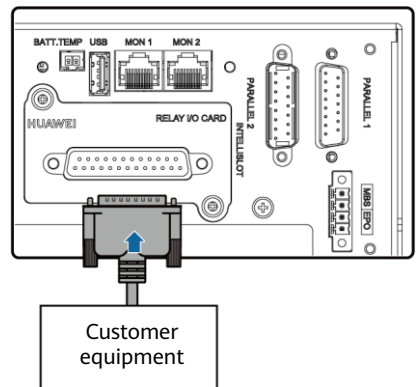
For details about how to install the SNMP card, dry contact card, and Modbus card, see the *RMS-SNMP01A V100R001 Installation Guide*, *RMS-MODBUS01A User Manual*, and *RMS-RELAY01A User Manual*.

### SNMP Card



UG11000018

### Dry Contact Card

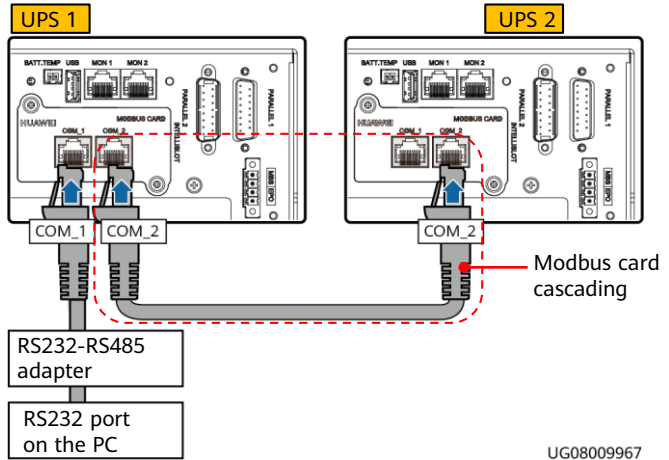


UG11000020

## Modbus Card

### NOTE

In the figure, the two UPSs represent two standalone UPS systems.

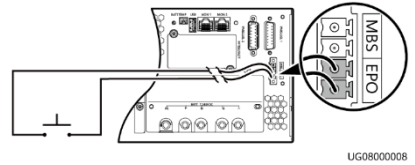


UG08009967

## 5 (Optional) Connecting an EPO Switch

### NOTE

- For UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01, choose **Settings > System Parameters > Other Settings** and set **EPO Enable to Enable**.
- Connect an external switch to the EPO ports of the UPS. After you turn on the switch in the case of emergency, the inverter stops and the UPS does not transfer to bypass mode. In this way, the UPS stops supplying power immediately.
- The customer provides the external switch (it can be a common switch) that connects to the EPO ports.



UG08000008




## 6 Verifying the Installation

No.	Item	Result
1	If the input or output system is changed, ensure that the short-circuit copper bar status and cable connections at input and output ports are correct.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
2	The phase sequence of the input power is correct. Use a multimeter to check that the input and output are not short-circuited.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
3	Cables and terminals are securely connected.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
4	Battery cables and terminals are connected correctly, and voltages comply with industry standards.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
5	The UPS is properly connected to battery strings.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
6	Input circuit breakers and load circuit breakers are OFF.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
7	Power cables and signal cables are correctly identified.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
8	The ground cable is reliably connected. The voltage difference between the neutral wire and the ground cable is less than 5 V AC.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
9	The mains input voltage is 120–280 V AC during power-on (80–280 V AC after power-on).	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
10	The positive and negative battery voltages range from 200 V DC to 280 V DC (measured using a multimeter).	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

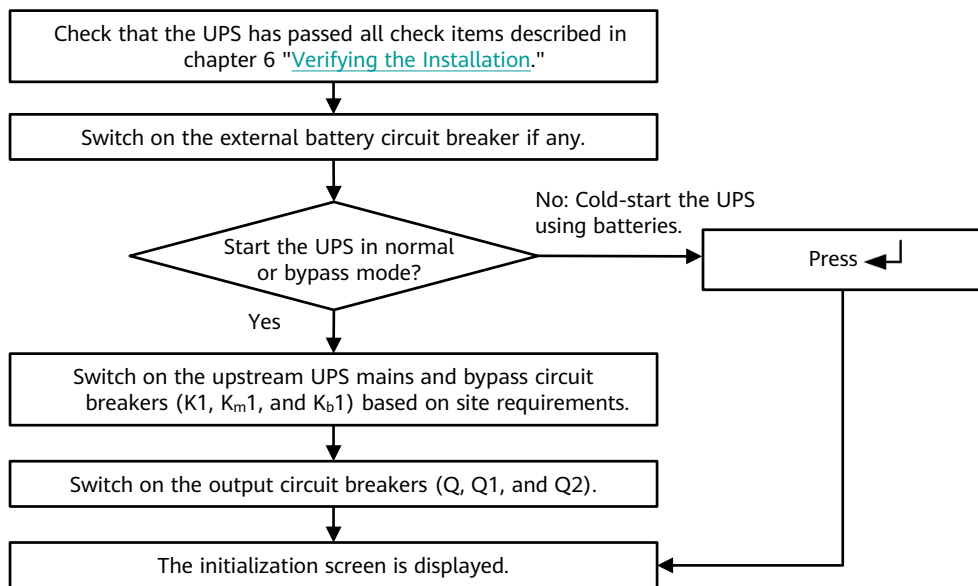
## 7 Powering On and Starting the UPS

### NOTE

User interface (UI) snapshots shown in this document correspond to V100R001C10SPC700 and are for reference only. If any UI changes are made, contact Huawei technical support to obtain the latest snapshots.

Symbol	Description	Remarks
	Press A.	A and B indicate the operation symbols on the UPS control panel.
	Press A and then B.	
	Indicates omitted screens.	-

### 7.1 Powering On the UPS



## 7.2 Setting Key Parameters and Starting Inverters

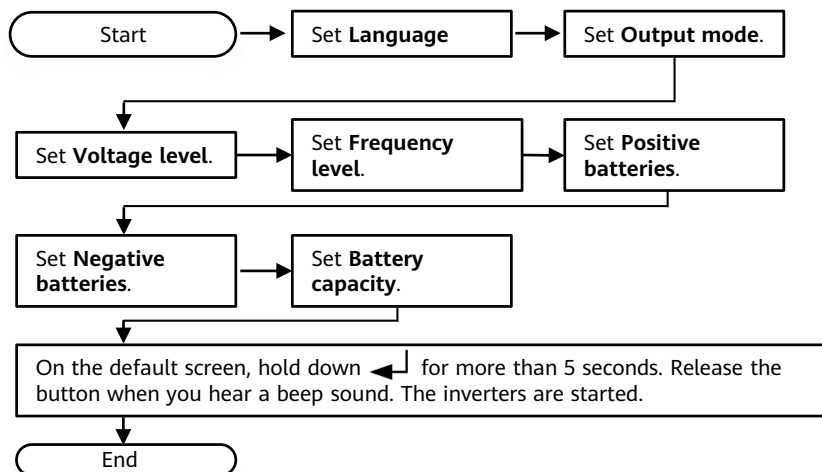
### WARNING

1. Incorrectly setting battery parameters compromises battery safety and battery backup time. For details about parameter settings, see the *UPS2000-G-(6 kVA–20 kVA) User Manual*.
2. Set system parameters with caution because the settings determine whether the UPS can operate normally.

### NOTICE

When a single 15 kVA/20 kVA UPS contains two battery strings, the maximum charge current must be less than or equal to 2.0 A.

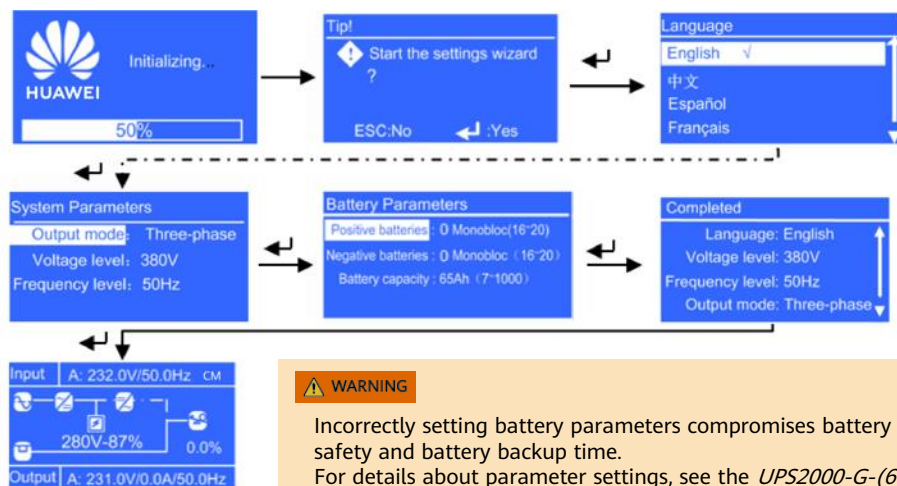
Parameter	Description
Language	You can select Chinese, English (default), Spanish, French, or Russian. Set it based on site requirements.
Output mode	The values include <b>Single-phase</b> and <b>Three-phase</b> (default). Set it based on site requirements. If the system uses three-phase input three-phase output, set <b>Output mode</b> to <b>Three-phase</b> . If the system uses three-phase input single-phase output or single-phase input single-phase output, set <b>Output mode</b> to <b>Single-phase</b> .
Voltage level	The values include <b>208 V</b> , <b>220 V</b> (default), <b>230 V</b> , and <b>240 V</b> for single-phase output, or <b>380 V</b> (default), <b>400 V</b> , and <b>415 V</b> for three-phase output. Set it based on site requirements.
Frequency level	The values include <b>50 Hz</b> (default), <b>60 Hz</b> , and <b>Automatic</b> . Set it based on site requirements. If the value is <b>Automatic</b> , the power-on bypass frequency ranges from 45 Hz to 55 Hz (excluding 55 Hz), and the system output frequency is 50 Hz; if the power-on bypass frequency ranges from 55 Hz to 65 Hz, the system output frequency is 60 Hz.
Positive batteries	The value ranges from <b>16</b> to <b>20</b> . The default value is <b>0</b> .
Negative batteries	The value ranges from <b>16</b> to <b>20</b> . The default value is <b>0</b> .
Battery capacity	Battery capacity is the sum of all battery capacities, set the parameters based on the actual battery capacity. The value ranges from <b>7 Ah</b> to <b>1000 Ah</b> . The default value is <b>65 Ah</b> .



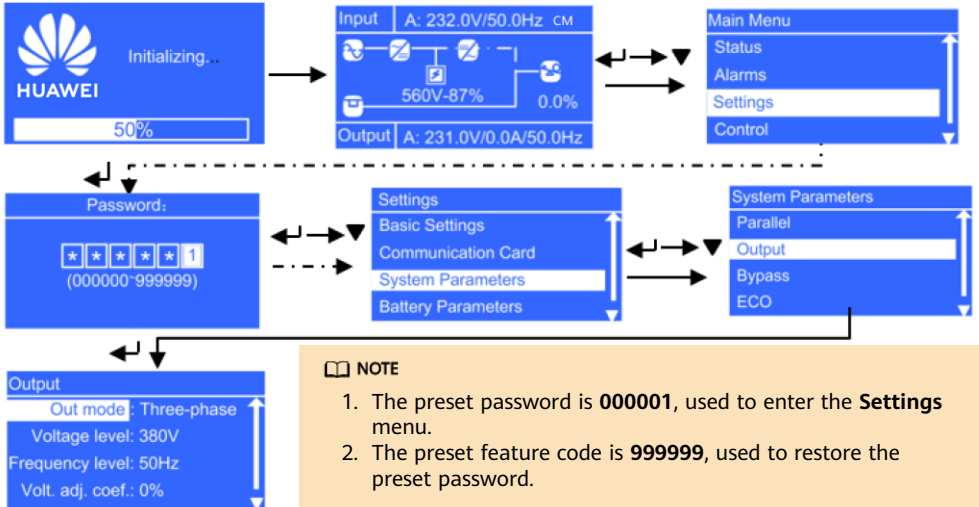
The following uses three-phase input and three-phase output of the UPS in normal mode as an example.  
The parameter setting screens are shown as follows.


### Scenario 1: Initial Startup

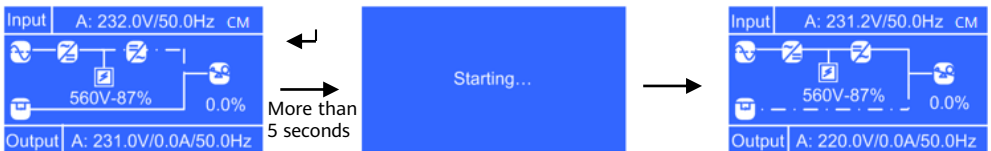
Set **Language** (default: English), **System Parameters**, and **Battery Parameters**.



## Scenario 2: Non-initial Startup



Perform "startup operations": On the standby screen, hold down  for more than 5 seconds. Release the button when you hear a beep sound. The startup screen is displayed. After the UPS starts successfully, it enters normal mode. After you ensure that the UPS runs properly, switch on the AC output circuit breaker Q1 of the UPS to start loads.



## 8 Shutdown

### 8.1 Shutting Down the Inverter to Transfer a Single UPS to Bypass Mode

Perform "shutdown operations" 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 sound. 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.

### 8.2 Powering Off a Single UPS

1. Shut down loads.
2. Perform "shutdown operations" 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. Switch off the AC input circuit breakers (K1, Km1, and Kb1) and output circuit breaker Q1 of the UPS based on site requirements.
4. Switch off the external battery circuit breaker (if any), or disconnect battery cables (if there is no battery circuit breaker). After all indicators turn off and fans stop, the UPS shuts down and stops supplying power to loads.



# Parallel System

## NOTE

- This section describes how to install a 1+1 parallel system.
- Only UPSs of the same model can be connected in parallel.

## 1 Installing Devices

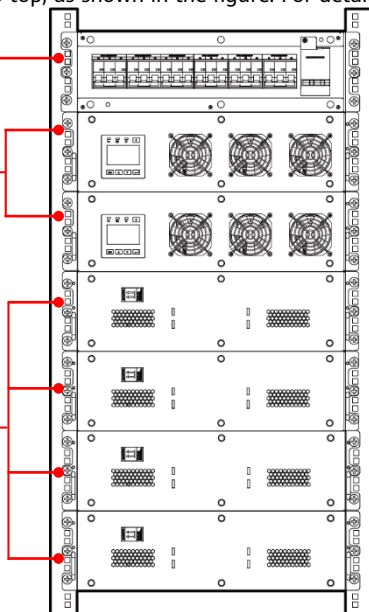
### Scenario 1 Rack-Mounted Installation

Install devices from bottom to top, as shown in the figure. For details, see the method for installing a single UPS.

PDU (optional, 3 U)

UPS (3 U)

Battery pack  
(optional, 3 U)



### Scenario 2 Tower-Mounted Installation

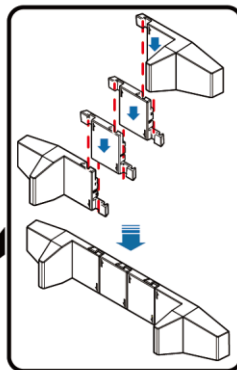
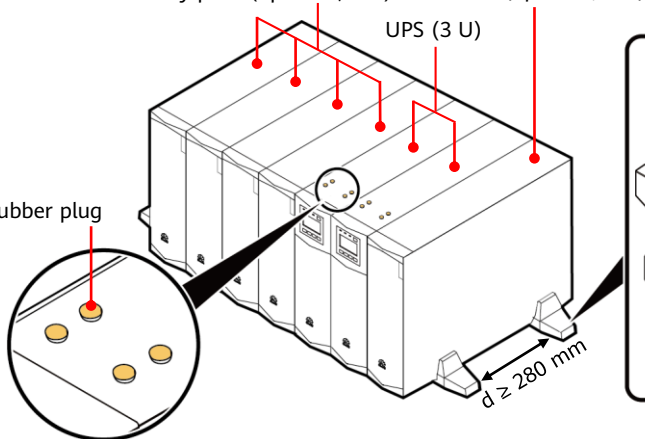
When you tower-mount the UPS, place devices including the UPS horizontally to facilitate cable installation. Stand the devices upright after cable installation.

Battery pack (optional, 3 U)

PDU (optional, 3 U)

UPS (3 U)

Rubber plug



UG08009991

## 2 Installing AC Input and Output Power Cables

### DANGER

1. Ensure that the AC input and output power cables on each UPS are connected in the same phase sequence, battery terminals are connected correctly, and the bypass power cables are connected in the same phase sequence.
2. Before cable connection, switch off all circuit breakers in the parallel system.
3. If the input or output wiring has to be changed, contact Huawei technical support if you are not familiar with the operation. Do not power on the UPS directly.

### NOTICE

1. When installing short-circuit bars, install the AC INPUT short-circuit bar and cables, and then install the AC OUTPUT short-circuit bar and cables.
2. If the input or output system is changed, ensure that the short-circuit copper bar status and cable connections at input and output ports are correct.
3. The UPS can generate large leakage currents. A circuit breaker equipped with a residual current device (RCD) is not recommended. If leakage protection is required, select a recommended circuit breaker.
4. Circuit breakers used for cable connection need to be provided by the customer.
5. When UPSs are connected in parallel, the output parallel power cables of each UPS must be at least 1 m long and the length deviation must be less than  $\pm 10\%$ . The four cables must be connected at the remote end.
6. If the parallel system uses the TN-C power distribution system, install magnetic rings around the PE cables on each UPS, bind the magnetic rings together using cable ties, and secure the magnetic rings nearby. Magnetic rings are optional. For details about the model and usage, see the *UPS2000-G-(6 kVA-20 kVA) User Manual*.

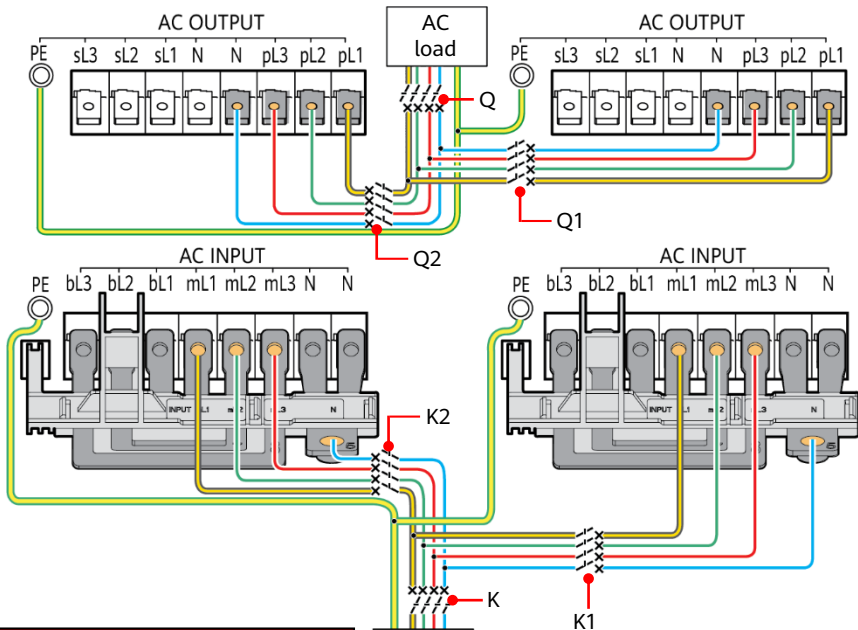
### NOTE

1. bL indicates the bypass input, and mL indicates the mains input.
2. K indicates the general AC input circuit breaker,  $K_m$  indicates the general mains input circuit breaker, and  $K_b$  indicates the general bypass input circuit breaker.  $K_1$ ,  $K_{m1}$ , and  $K_{b1}$  indicate UPS 1 input circuit breakers.  $K_2$ ,  $K_{m2}$ , and  $K_{b2}$  indicate UPS 2 input circuit breakers. Q indicates the general AC output circuit breaker. Q1 indicates the UPS 1 output circuit breaker. Q2 indicates the UPS 2 output circuit breaker.

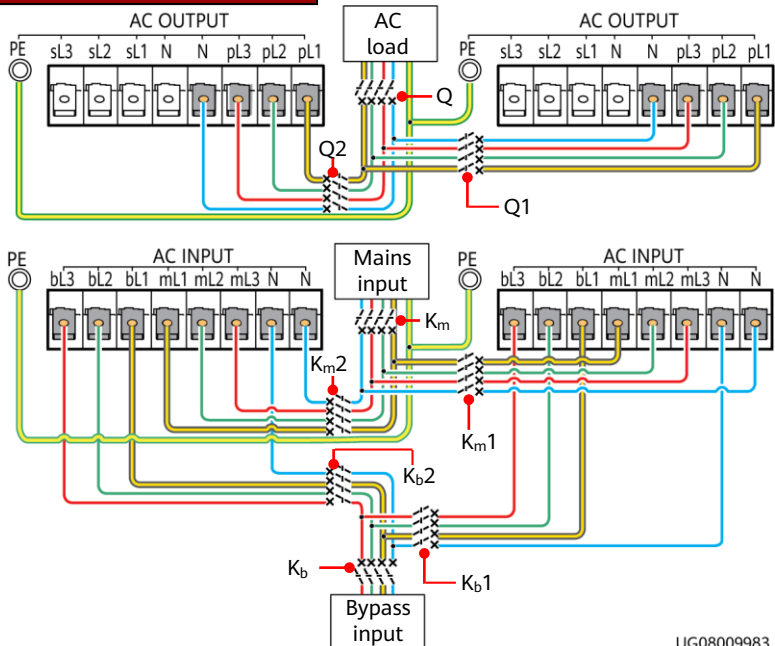
Connect cables based on site requirements. For details about the wiring terminals, external circuit breakers, leakage current breakers, distribution cross-sectional areas, and terminal types, see the method for a single UPS system.

## Scenario 1 Equipped with No PDU

### Three-Phase Input, Three-Phase Output, One Power Source (Factory Settings)



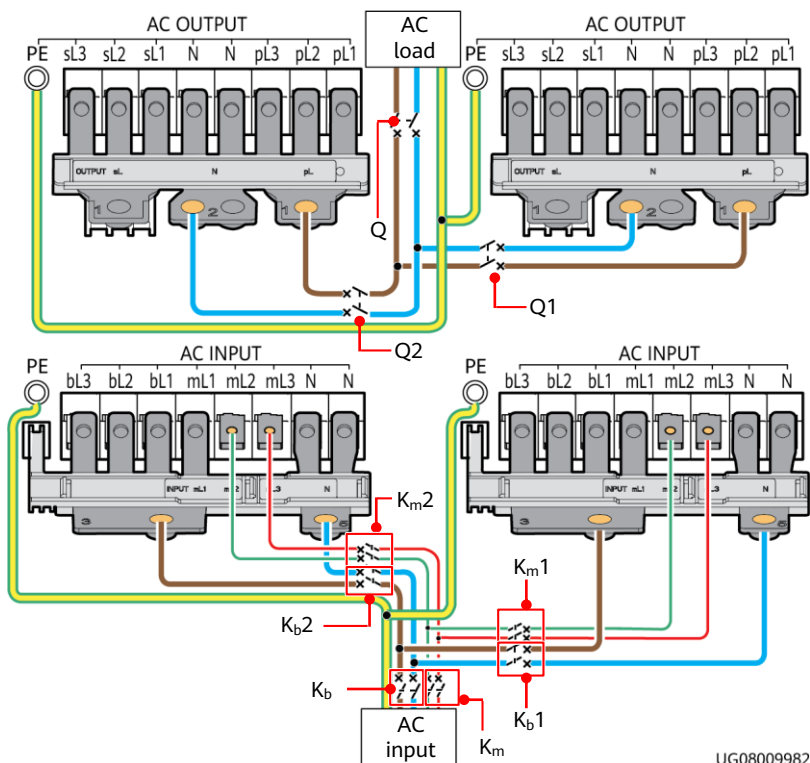
### Three-Phase Input, Three-Phase Output, Two Power Sources



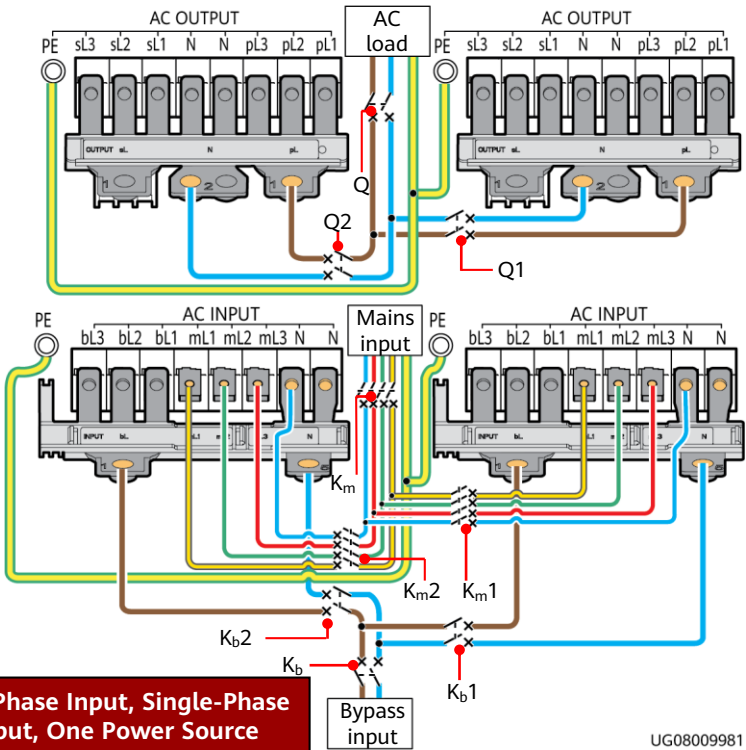
UG08009986

UG08009983

## Three-Phase Input, Single-Phase Output, One Power Source

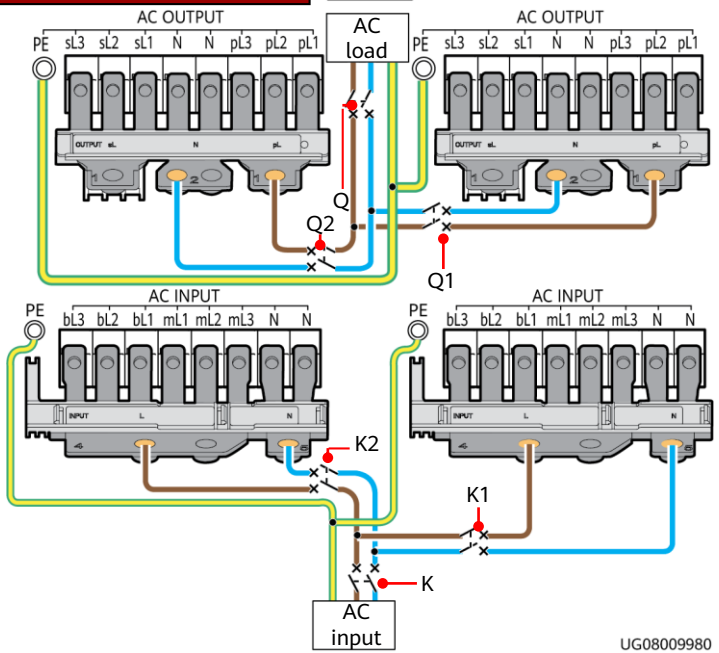


# Three-Phase Input, Single-Phase Output, Two Power Sources



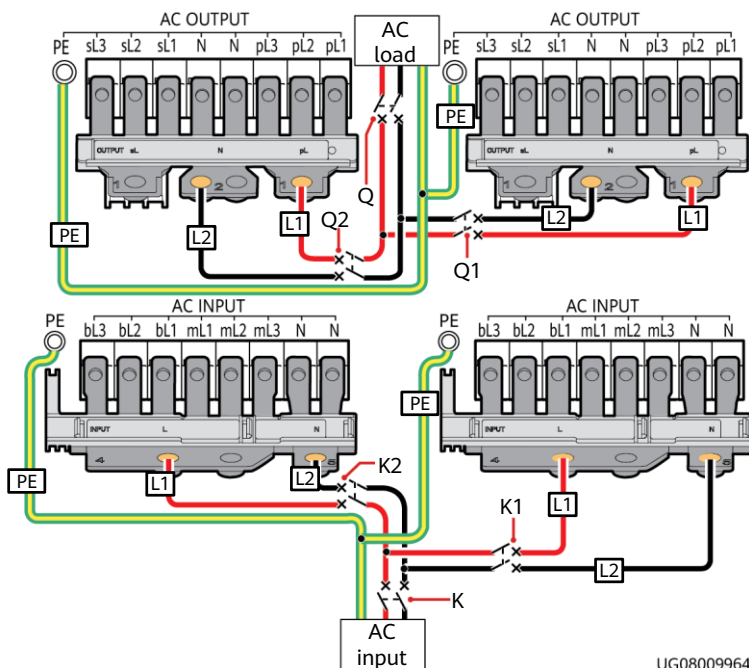
UG08009981

# Single-Phase Input, Single-Phase Output, One Power Source



UG08009980

## Dual-Live-Wire Input, Dual-Live-Wire Output, One Power Source



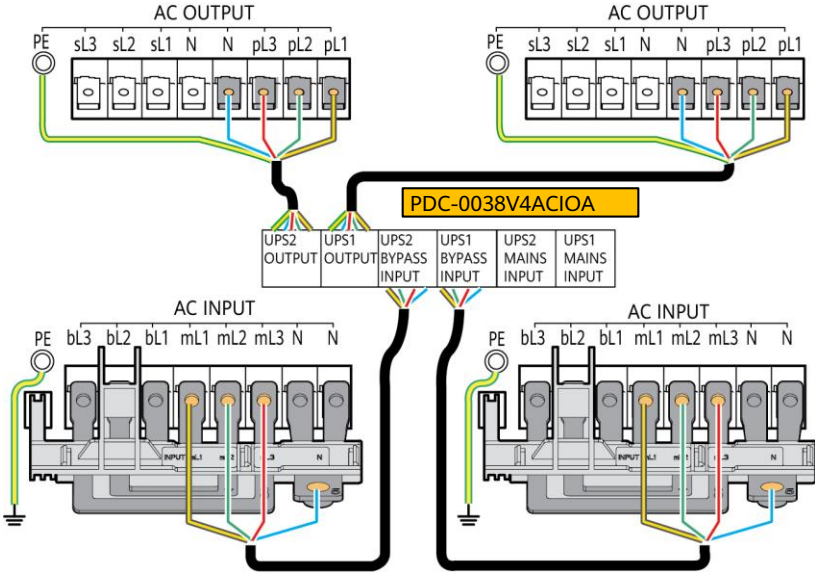
UG08009964

## Scenario 2 Equipped with a PDU

### NOTE

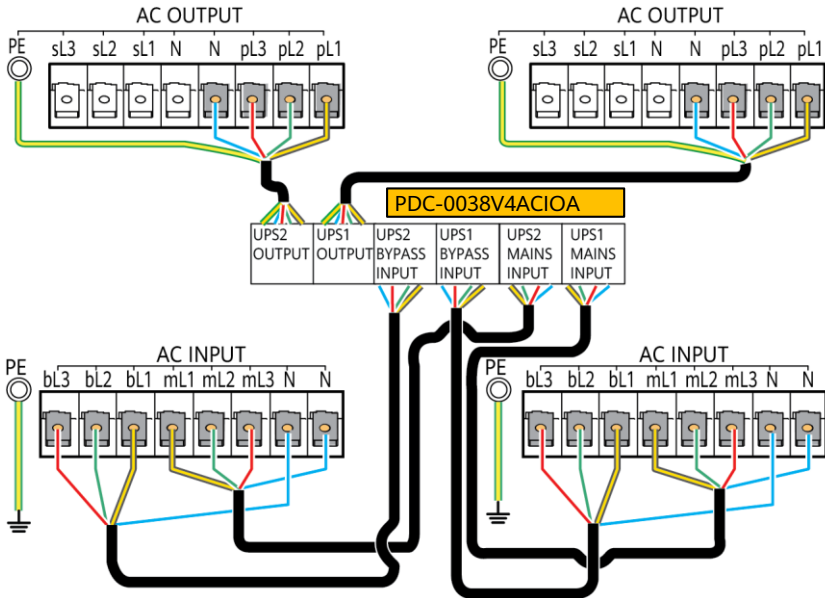
For details about the PDU, see the *PDC-0038V4ACIOA Quick Installation Guide* or *PDC-0091V2ACIOA Quick Installation Guide*.

### Three-Phase Input, Three-Phase Output, One Power Source (Factory Settings)



UG08009977

### Three-Phase Input, Three-Phase Output, Two Power Sources

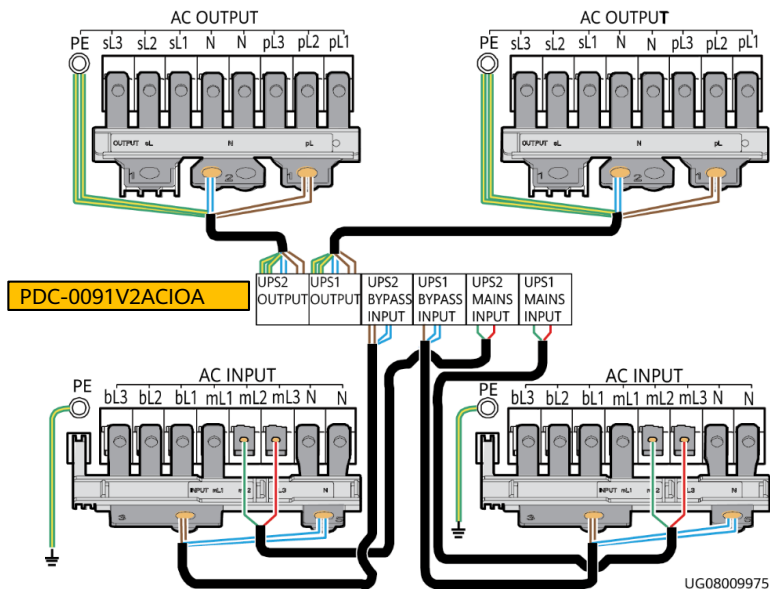


UG08009976

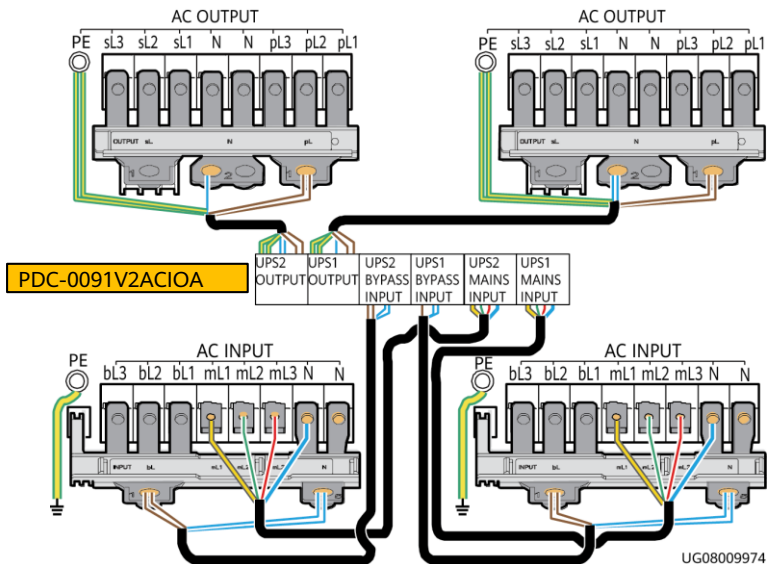
## Three-Phase Input, Single-Phase Output, One Power Source

### NOTE

When connecting cables between PDUs and the mains input of the UPS 1 and UPS 2, connect only L2 and L3. As L1 and N wires do not connect to the UPS, wrap them with insulation tape.

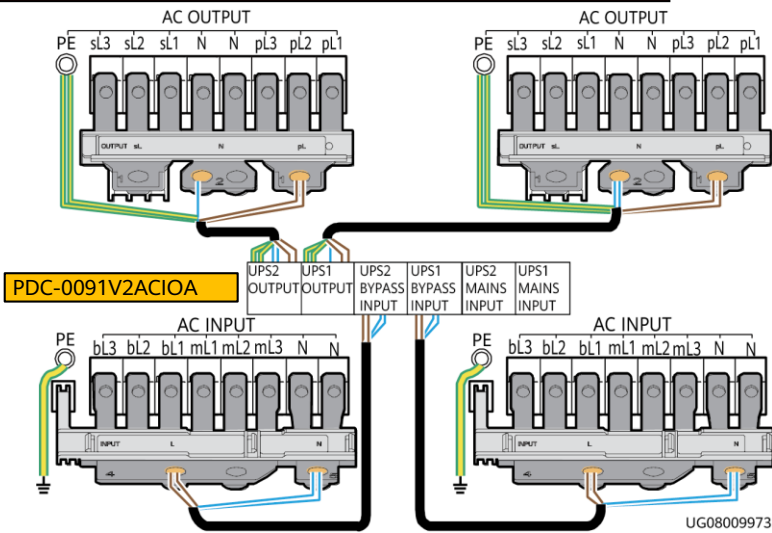


## Three-Phase Input, Single-Phase Output, Two Power Sources





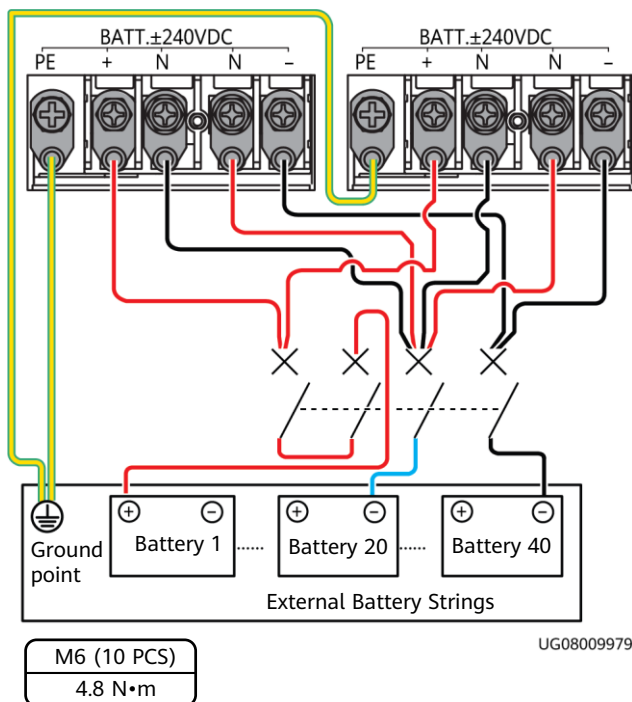
Single-Phase Input, Single-Phase Output, One Power Source



### 3 Installing Battery Cables

#### Scenario 1 External Battery Strings

Connect cables based on site requirements. For details about the wiring terminals, external circuit breakers, cable cross-sectional areas, and terminal types, see the method for a single UPS system.



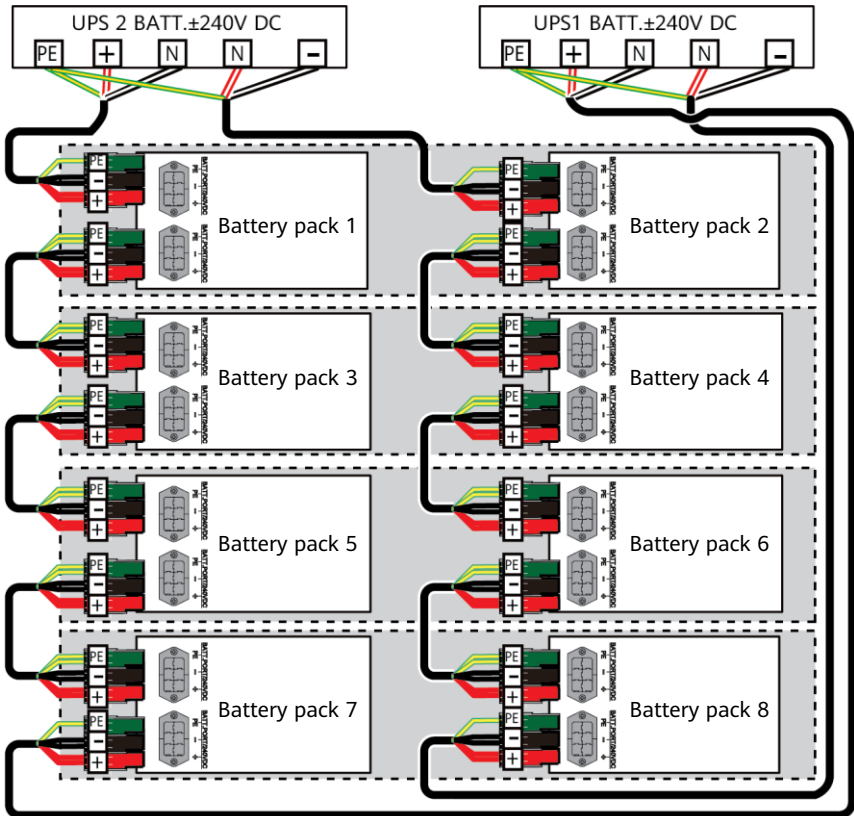
#### NOTICE

1. The UPS2000-G-15KRTL/20KRTL can connect to an external battery string (40 batteries in the standard configuration, and an even number of 32 to 40 batteries are supported). The neutral wire is connected to the middle point of the battery string. For example, if there are 40 batteries, the neutral wire is connected to the negative terminal of the twentieth battery.
2. When an external battery string is connected, install a DC circuit breaker (63 A, 600 V DC) between the battery string and the UPS. If a 2+0 or higher parallel system shares a battery string, use a larger-capacity battery circuit breaker accordingly.
3. When an external battery string is connected, connect positive terminals in series by using the two poles of the DC circuit breaker.

## Scenario 2 External Battery Packs

### NOTE

1. If the 15 kVA/20 kVA UPS parallel system does not share battery packs, the cable connection methods for each UPS and battery pack in the parallel system are the same as those in a single 15 kVA/20 kVA UPS system.
2. If the 15 kVA/20 kVA UPS parallel system shares battery packs, refer to the cable connection methods shown in the following figure. A 15 kVA/20 kVA UPS with long backup time requires serial connection of two battery packs in each group. A maximum of four groups with eight battery packs can be connected in parallel. If the 15 kVA/20 kVA UPS with long backup time connects to more than two battery packs, connect the battery packs in parallel and then to the UPS battery input port. Connect battery packs 1 and 2 in series, battery packs 3 and 4 in series, battery packs 5 and 6 in series, and battery packs 7 and 8 in series. Connect battery packs 1, 3, 5, and 7 in parallel and battery packs 2, 4, 6, and 8 in parallel.
3. For more information, see the *ESS-240V12-(9AhBPVBA, 7AhBPVBA) Quick Installation Guide*.



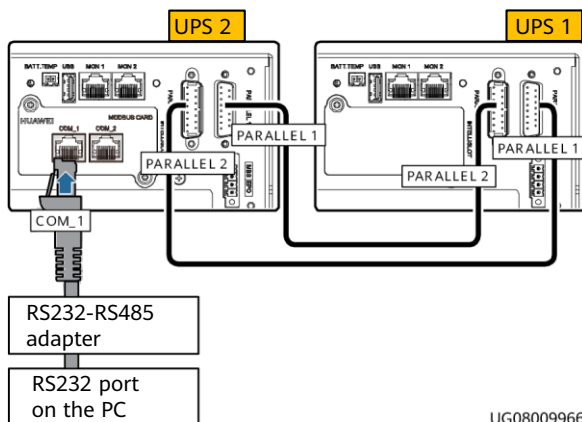
DP24130001

## 4 (Optional) Connecting Cables to Optional Cards

### NOTE

For details about how to install the SNMP card, dry contact card, and Modbus card, see the *RMS-SNMP01A V100R001 Installation Guide*, *RMS-MODBUS01A User Manual*, and *RMS-RELAY01A User Manual*.

The methods for installing the SNMP card and dry contact card are the same in a parallel system and a single UPS. See the installation method for a single UPS. The following shows how to install cables for the Modbus card.

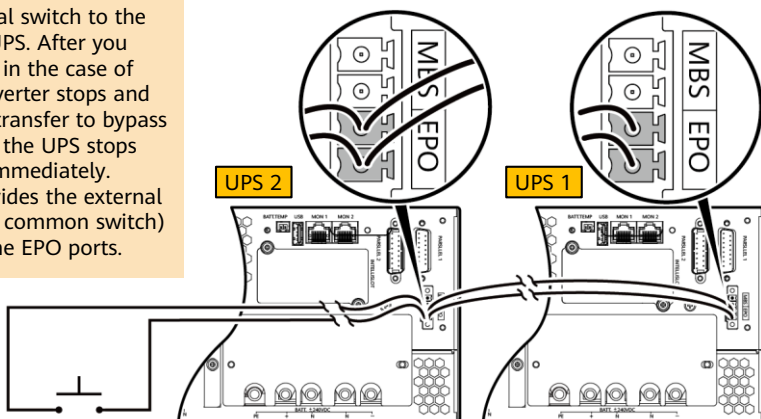


UG08009966

## 5 (Optional) Connecting an EPO Switch

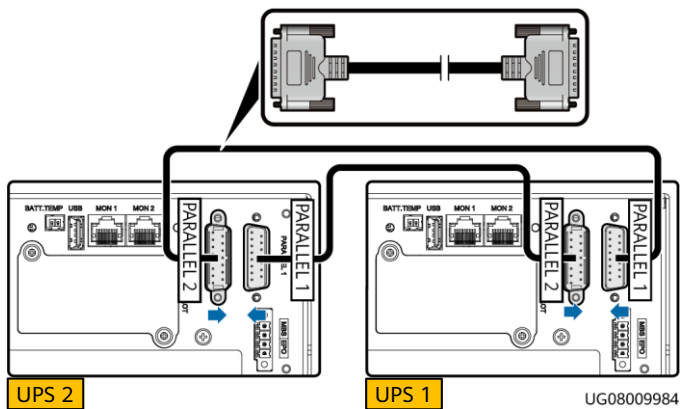
### NOTE

1. For UPS2000-G-15KRTL-01/UPS2000-G-20KRTL-01, choose **Settings > System Parameters > Other Settings** and set **EPO Enable** to **Enable**.
2. Connect an external switch to the EPO ports of the UPS. After you turn on the switch in the case of emergency, the inverter stops and the UPS does not transfer to bypass mode. In this way, the UPS stops supplying power immediately.
3. The customer provides the external switch (it can be a common switch) that connects to the EPO ports.



UG08000010

## 6 Installing Parallel Cables



## 7 Verifying the Installation

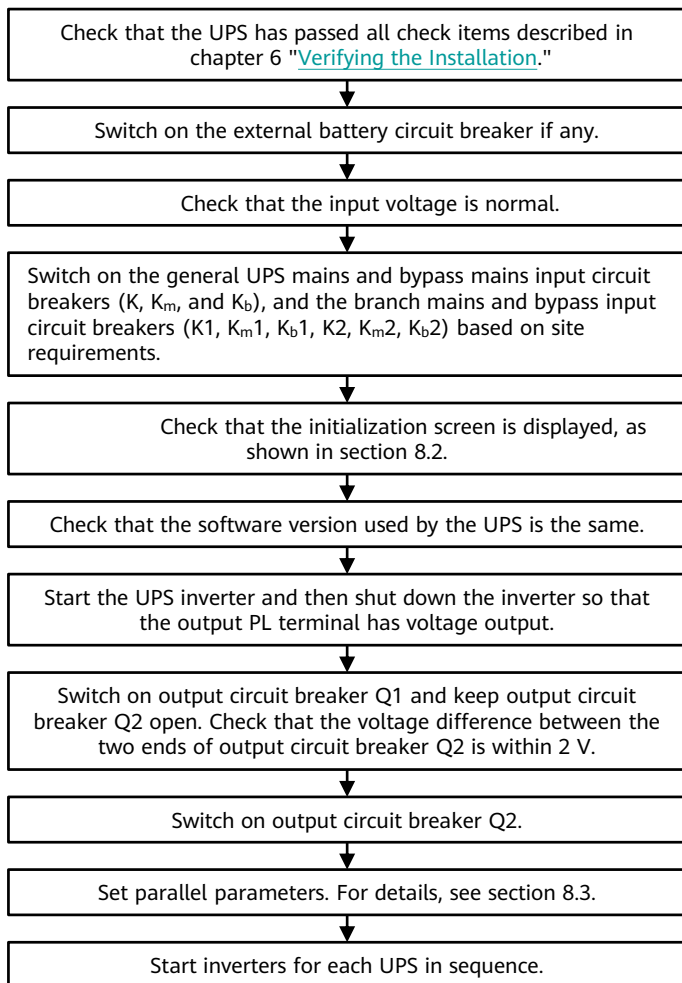
1. Check each UPS in the parallel system by following instructions in chapter 6 "[Verifying the Installation](#)."
2. Check that parallel cables are properly connected and that the output voltages of all UPSs in the parallel system are consistent.
3. Ensure that the output phases of all UPSs in the parallel system are the same.

## 8 Powering On and Starting the UPS

### NOTICE

Do not start loads before the parallel system is started.

### 8.1 Powering On and Starting the UPS



## 8.2 UPS Initialization and Parameter Settings

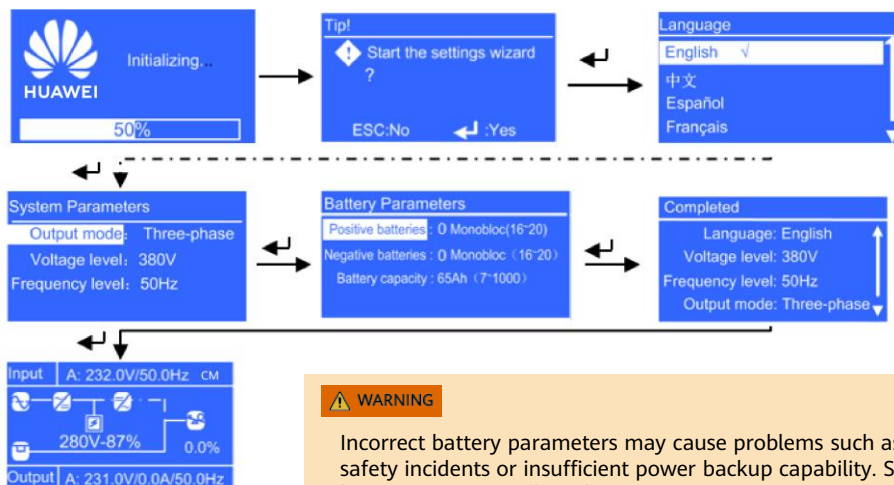
The following uses three-phase input and three-phase output of the UPS in normal mode as an example.

The parameter setting screens are shown as follows.

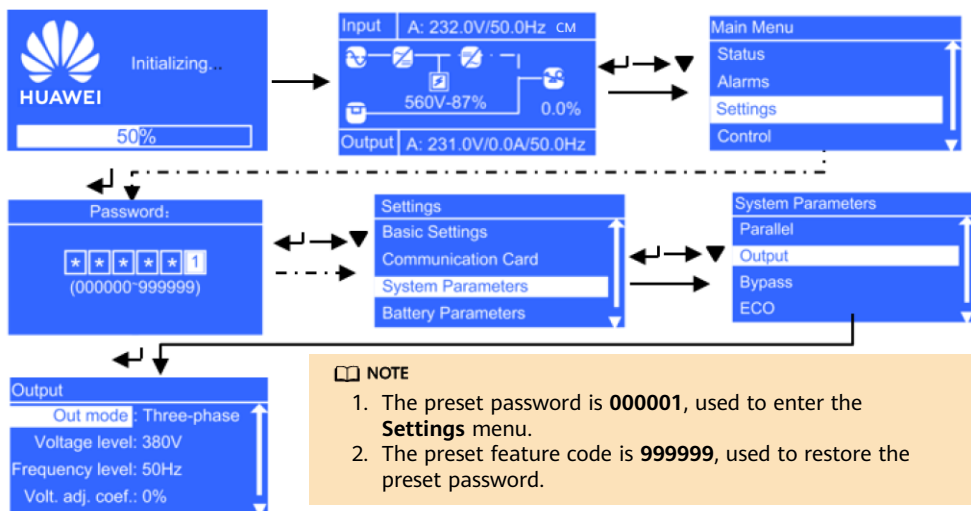
1. Set **Language** (default: English), **System Parameters**, and **Battery Parameters** for each UPS.

### Scenario 1: Initial Startup

Set **Language** (default: English), **System Parameters**, and **Battery Parameters**.

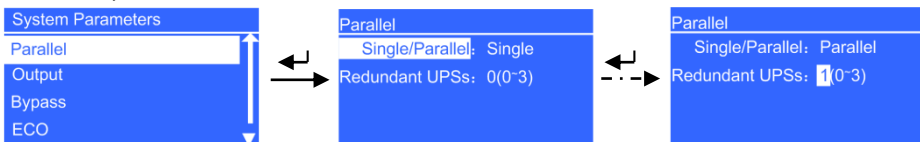


### Scenario 2: Non-initial Startup

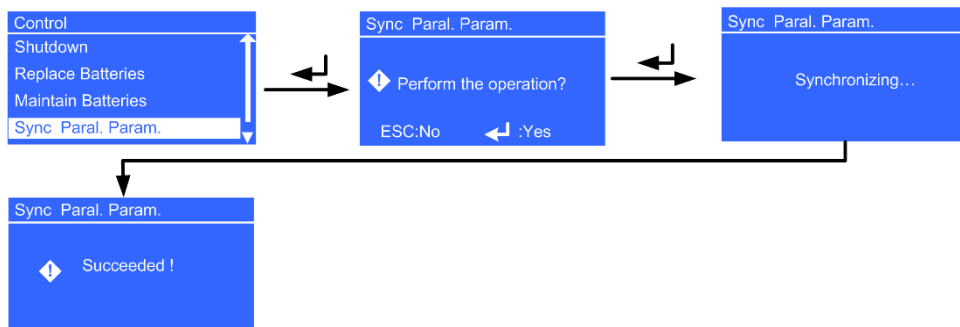


## 8.3 Setting Parallel Parameters

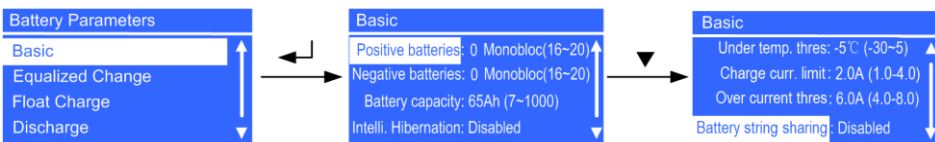
1. Set the parallel mode and the number of redundant UPSs.



2. The UPS automatically synchronizes its settings to other UPSs in the parallel system.



3. Set battery string sharing for each UPS based on site requirements.



### NOTE

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

4. If no alarm is displayed on the monitoring screen, continue with the subsequent operations. If an alarm is displayed, clear the alarm.

## 8.4 Starting the Inverters

1. Check that the bypass input is normal and the UPS has transferred to bypass mode by viewing the system running status on the LCD.

### NOTICE

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.

2. Perform "startup operations" on each UPS in the parallel system: On the standby screen, hold down for more than 5 seconds. Release the button when you hear a beep sound. The startup screen is displayed. After the UPS starts successfully, it enters normal mode.
3. After the parallel system runs properly, switch on the general AC output circuit breaker Q for the UPSs and start each load. To prevent triggering overload protection, start the loads with higher power and then loads with lower power.



## 9 Shutdown

### 9.1 Shutting Down a Single UPS in the Parallel System

#### NOTE

Perform "shutdown operations" 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 sound. 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.

1. Perform "shutdown operations" twice on a UPS in the parallel system within 30 seconds. The UPS shuts down and enters the non-output state (the mains, bypass, and battery indicators are off). The other UPSs keep working.
2. Switch off the AC input circuit breakers (K1, K<sub>m</sub>1, K<sub>b</sub>1 or K2, K<sub>m</sub>2, K<sub>b</sub>2) and AC output circuit breaker (Q1 or Q2) of the UPS based on site requirements.
3. Turn off the external battery circuit breakers (if there are), or disconnect battery power cables (if there is no battery circuit breaker). The UPS exits the parallel system. After all indicators turn off and fans stop, the UPS shuts down.

### 9.2 Transferring a Parallel System to Bypass Mode

Perform "shutdown operations" on each UPS in the parallel system. The inverters shut 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.

### 9.3 Powering Off a Parallel System

1. Shut down loads.
2. Perform "shutdown operations" on each UPS in the parallel system. The inverters shut 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.
3. Switch off the AC input circuit breakers (K1, K<sub>m</sub>1, K<sub>b</sub>1, K2, K<sub>m</sub>2, K<sub>b</sub>2) of each UPS, general input circuit breakers (K, K<sub>m</sub>, and K<sub>b</sub>) of the UPS system, AC output circuit breakers (Q1 and Q2) of each UPS, and general AC output circuit breaker Q of the UPS system based on site requirements.
4. Switch off the external battery circuit breaker for each UPS or the general battery circuit breaker (when all UPSs share a battery string). If no external battery circuit breaker is configured, disconnect battery cables from each UPS. After all indicators turn off and fans stop, the UPS shuts down, and the loads power off.

## Typical Alarm Handling

### NOTE

For more parameters and alarm information, see *UPS2000-G-(6 kVA-20 kVA) User Manual*.

Alarm Name	Alarm ID-Cause ID	Alarm Severity	Clearance Mode	Impact on the System	Handling Suggestion
Abnormal mains volt.	0001-01	Minor	Automatic	<ul style="list-style-type: none"> <li>The rectifier transfers to battery mode, which does not affect the power supply to loads.</li> <li>If no battery is installed, the UPS shuts down.</li> </ul>	<p>Possible causes:</p> <ul style="list-style-type: none"> <li>The mains voltage exceeds 280 V.</li> <li>The mains voltage is less than 80 V.</li> <li>The mains frequency is not in the range of 40 Hz to 70 Hz.</li> <li>The mains fuse is abnormal.</li> </ul> <p>Measures:</p> <ul style="list-style-type: none"> <li>Check whether the mains input voltage is less than 272 V. If not, wait until the mains recovers.</li> <li>Check whether the mains input voltage is greater than 88 V. If yes, the mains fuse may be abnormal. Replace the faulty device. If no, wait until the mains recovers.</li> <li>Check the mains input frequency. If it is abnormal, wait until the mains input recovers.</li> </ul>
	0001-02	Minor			
	0001-03	Minor			
Abnormal BPS volt.	0010-01	Minor	Automatic	The UPS cannot transfer to bypass mode. If the UPS is working in bypass mode, it transfers to another working mode.	<p>Possible causes:</p> <ul style="list-style-type: none"> <li>The bypass input voltage is abnormal.</li> <li>The bypass input frequency is abnormal.</li> </ul> <p>Measures:</p> <ul style="list-style-type: none"> <li>Check whether the bypass input voltage exceeds the configured range. If yes, change the range or wait until the bypass input recovers.</li> <li>Check whether the bypass input frequency exceeds the configured range. If yes, change the range or wait until the bypass input recovers.</li> </ul>
	0010-02	Minor			

Alarm Name	Alarm ID-Cause ID	Alarm Severity	Clearance Mode	Impact on the System	Handling Suggestion
Mains phase reverse	0004-01	Minor	Automatic	<ul style="list-style-type: none"> <li>The rectifier transfers to battery mode, which does not affect the system power supply.</li> <li>If no battery is installed, the UPS shuts down.</li> <li>The UPS transfers to another working mode or shuts down.</li> </ul>	<p>Possible cause: The mains input three-phase sequence is incorrect.</p> <p>Measure: Check that mains input power cables are correctly connected.</p>
BPS phase reverse	0011-01	Minor	Automatic	<ul style="list-style-type: none"> <li>If the inverter has not started, the output keeps disconnected and the inverter is not allowed to start.</li> <li>If the inverter has started, the UPS can work in inverter mode properly, but the UPS cannot transfer to bypass mode.</li> </ul>	<p>Possible cause: The bypass input three-phase sequence is incorrect.</p> <p>Measure: Check that bypass input power cables are correctly connected.</p>
Batt. overvolt.	0025-01	Minor	Automatic	An alarm is displayed, and the battery service life may be shortened.	<p>Possible causes:</p> <ul style="list-style-type: none"> <li>The configured number of batteries is less than the actual number.</li> <li>The battery voltage reaches the alarm threshold due to continuous charge.</li> </ul> <p>Measures:</p> <ul style="list-style-type: none"> <li>Check battery parameter settings.</li> <li>Wait for 2 minutes in battery charging state. Check whether the alarm is cleared.</li> </ul>

Alarm Name	Alarm ID-Cause ID	Alarm Severity	Clearance Mode	Impact on the System	Handling Suggestion
Batt. undervolt.	0026-01	Minor	Automatic	An alarm is displayed, and the system may shut down due to EOD.	Possible cause: The mains is abnormal, and the batteries are overdischarged. Measure: Connect to the mains supply in non-battery test state.
Rectifier fault	0040-04	Critical	Manual/Power-off/Automatic	The UPS shuts down. The UPS transfers to another working mode or shuts down.	Possible causes: <ul style="list-style-type: none"> <li>• The mains has experienced a transient high voltage.</li> <li>• The output carries special loads such as inductive and rectification loads.</li> <li>• The output carries transformer loads but the transformer mode is not enabled.</li> <li>• The hardware is damaged.</li> </ul> Measures: <ul style="list-style-type: none"> <li>• Rectify the fault and power on the UPS again.</li> <li>• Check that the loads are supported by the UPS.</li> <li>• Enable the transformer mode.</li> <li>• Contact Huawei technical support.</li> </ul>
Internal fault	0042-10	Critical	Automatic	If the inverter has not started, disable inverter startup. If the inverter has started, the UPS can work in inverter mode properly, but the UPS cannot transfer to bypass mode.	Possible cause: The bypass input cable connection is inconsistent with the output system setting. Measure: Ensure that the bypass input cable connection is consistent with the output system setting.
Fan fault	0043-01	Critical	Automatic	This alarm does not affect the UPS or the power supply.	Possible cause: The fan is abnormal. Measure: Clean up foreign objects around the fan. If the alarm persists, contact Huawei technical support.

Alarm Name	Alarm ID-Cause ID	Alarm Severity	Clearance Mode	Impact on the System	Handling Suggestion
Inverter fault	0060-04	Critical	Power-off	The UPS shuts down. The UPS may transfer to another working mode or shut down.	Possible cause: The inverter output is short-circuited. Measure: Rectify output port short circuits. Power on and restart the UPS. If the alarm persists, contact Huawei technical support.
On bypass	0158-01	Minor	Automatic	If the bypass is abnormal, the UPS may power off.	Possible causes: <ul style="list-style-type: none"> <li>• The inverter is not started.</li> <li>• The load power exceeds the rated inverter loading capability.</li> <li>• The inverter is faulty.</li> </ul> Measures: <ul style="list-style-type: none"> <li>• Check whether other alarms are raised. If other alarms are raised, clear them.</li> <li>• If no alarm is raised, start the UPS manually.</li> </ul>
On battery	0159-01	Minor	Automatic	The UPS may power off if batteries are abnormal.	Possible causes: <ul style="list-style-type: none"> <li>• The mains input is abnormal.</li> <li>• The UPS is in battery self-check state.</li> <li>• The mains loading capability is insufficient.</li> </ul> Measures: <ul style="list-style-type: none"> <li>• Check the mains input. If it is abnormal, wait until the mains input recovers.</li> <li>• Check whether the UPS is in battery self-check state.</li> <li>• Reduce the load or replace the UPS with a larger-capacity UPS.</li> </ul>
No battery	0022-01	Minor	Automatic	This alarm does not affect the power supply.	Possible causes: <ul style="list-style-type: none"> <li>• Batteries are not connected.</li> <li>• Batteries are not securely connected.</li> </ul> Measures: <ul style="list-style-type: none"> <li>• Connect batteries.</li> <li>• Check that batteries are securely connected.</li> </ul>

**Scan here for technical support (enterprise):**

HUAWEI AppGallery



**Scan here for technical support (carrier):**

HUAWEI AppGallery



**Scan here for more documents:**

Support-E



Support



WeChat



**You can also log in to Huawei technical support website:**

**<https://support.huawei.com/enterprise>**  
**<https://support.huawei.com>**

**Huawei Technologies Co., Ltd.**

Huawei Industrial Base, Bantian, Longgang  
Shenzhen 518129 People's Republic of China  
[www.huawei.com](http://www.huawei.com)