THE POWER IS ON

Uninterruptible Power Supply UPS

COVER PS 10 - 40 kVA

User Manual

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Safety precautions

Handling safety

1. Before using the product, read the Safety Notes carefully to ensure correct and safe use. And please keep the instructions properly.
2. When operating, note all warning marks and operate as required.
3. Avoid this equipment use in direct sunlight, rain, or in wet environments.
4. This equipment cannot be installed in the area near the heat source, or near the electric heater, heat furnace, etc.
5. When placing the UPS, leave a safe distance around it to ensure ventilation. Refer to the instructions when installation.
6. When cleaning, please wipe them with the dry items.
7. In case of fire alarm, please use the dry powder fire extinguisher to extinguish the fire correctly. Use of a liquid fire extinguisher can cause an electric shock hazard.

Electrical safety

Non-professionals do not open the casing, please have the authorized maintenance personnel operation.

1. Before charging, verify that it is properly grounded and check that the wiring and battery polarity are correct.
2. When the UPS needs to be moved or rewired, all electrical connections to the UPS should be disconnected to ensure that the UPS is completely stopped, otherwise the output terminal may still be charged, and it is in danger of electric shock.
3. Use the additional devices and accessories specified by the company.
4. In order to meet the requirements of EMC, the length of UPS output line shall be within 10m.

Battery safety

1. Battery life decreases with increasing ambient temperature. Regular battery replacement ensures normal UPS operation and adequate backup time.
2. Battery maintenance can only be carried out by personnel with battery expertise.
3. Replace the battery, and its type, model and quantity shall be consistent with that of the primary battery.
4. The battery has a danger of electric shock and a short-circuit current. To avoid electric shock injuries, observe the following warnings when replacing the battery:

A. Do not wear watches, rings, or similar metal objects;

B. Use of insulated tools;

C. Wear rubber shoes and gloves;

D. Metal tools or similar metal parts cannot be placed on the battery.

E. Before removing the battery connection terminals, you must first disconnect the load attached to the battery.

5. Please do not expose the battery to fire to cause explosion and endanger personal safety.
6. Non-professionals do not open or damage the battery, because the electrolyte in the battery contains dangerous substances such as strong acid, which can cause harm to the skin and eyes. If you accidentally contact with the electrolyte, you should immediately clean it with a lot of clean water, and go to the hospital for examination.
7. Please do not short-circuit the positive and negative electrodes of the battery, which will cause an electric shock or a fire.

Maintenance

1. The use environment and storage method have a certain impact on the service life and reliability of this product. Therefore, please avoid using it in the following working environments:

A. High, low temperature and wet places exceeding the technical specifications (temperature 0~50 ℃, relative humidity 0~95%);

B. Places subject to vibration and impact;

C. Places with metal dust, corrosive substances, salt and combustible gas.

2. If it is not used for a long time, the UPS (without battery) must be stored in a dry environment. The storage temperature range is - 25 ℃~+60 ℃. Before the UPS is started, the ambient temperature must rise to above 0 ℃ for more than 2 hours.

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1. Introduction

High frequency 10-40K series UPS is a high-performance uninterruptible power supply system elaborately designed by our company. It adopts an advanced dual conversion pure online architecture, has powerful parallel redundancy functions, and has a wealth of options, highlighting the characteristics of this series of products, such as high efficiency, high reliability, intelligent management, and green environmental protection.

Different from the backup UPS, this series of UPS adopts an online architecture to continuously adjust and filter the input voltage, and will continue to be powered by the battery when the mains power is interrupted; In case of overload or inverter failure, UPS will switch to bypass mode and be powered by bypass. If the overload is eliminated, UPS will automatically switch to inverter power supply mode.

It can flexibly realize tower type and rack type installation, and is suitable for server, storage, network equipment, precision instrument and other application environments, providing high-quality and reliable AC power supply for key equipment.

10-40K Series Online UPS Model, Dimension, N.W. list:

UPS:

Model name	Size W*H*D(mm)	N.W.(kg)
10K	436*129 (3U) *590	23
20K	436*129 (3U) *590	25
30K	436*129*778	34
40K	436*129*778	34

Note:

1. Default mode: 3-3 (single source).
2. Dimension D(590mm) is not including front-panel.

External battery cabinet:

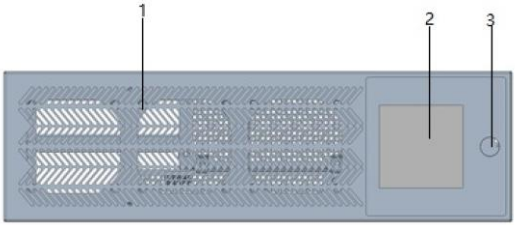
Model name	Size W*H*D(mm)	(kg)
Battery cabinet	440*130 (3U) *598	***)

Note:

1. 'Size' is for 1pcs size, N.W. with (***)) is total weight of 2pcs.
2. The dimension D(598mm) is not including rear terminal block.

2. Presentation

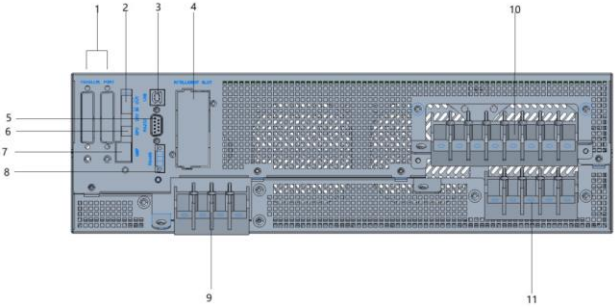
2.1 UPS Module:



Front view

Note:

1. Ventilation area
2. LCD Module, including operation and display panel
3. Power button

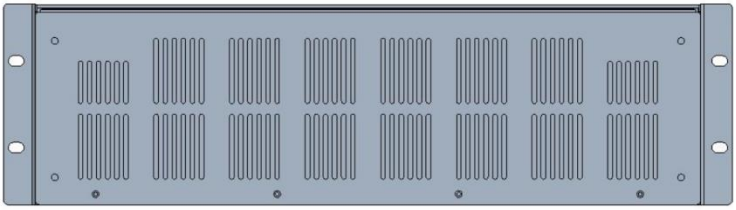


Rear view

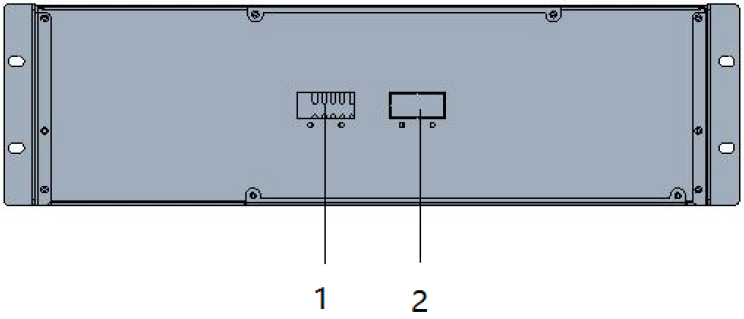
Note:

1. Parallel port
2. Dry in/out port
3. USB port
4. Intelligent slot
5. RS232
6. EPO
7. MBP
8. RS485
9. Battery terminal port
10. AC bypass input
11. AC input/output

2.2 External Battery Module:



Front view



Rear view

Note:

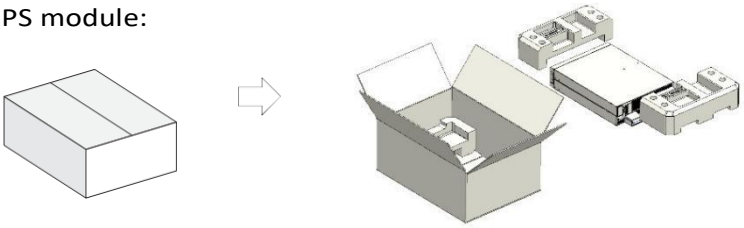
4. Battery port 1
5. Battery port 2

3. Mechanical installation

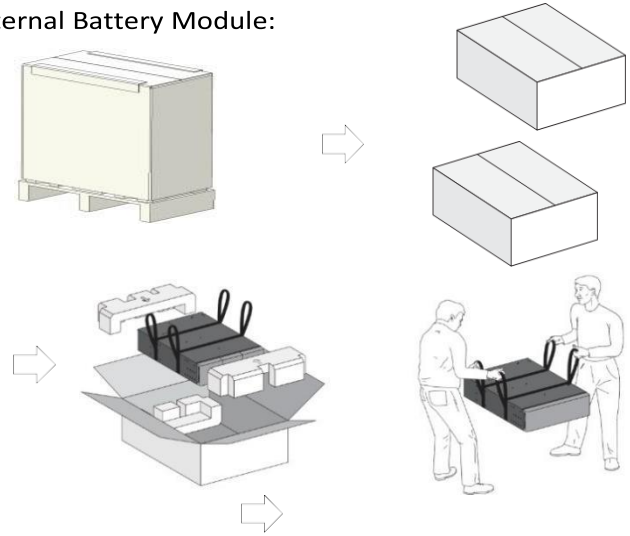
3.1 Unpacking and inspection

- Please carefully check the module for collision or damage during transportation. If any damage is found or the accessories is missing, please contact your carrier or dealer immediately.
- Forbidden to carry the front/rear panel of the module.

UPS module:



External Battery Module:



3.1.1 Inspecting accessories

- UPS module:

UPS accessories	10-40K
USB cable	√
RS232 cable	√
Intelligent-card cable (including card manual)	O
Parallel cable(including locker)	O
Copper bus-bar (including jumper cable)	O
Tower foot	√
Rack ear	√
Rack rail kit	O
End-user License Agreement	√
User manual	√

Note：√---Included;　O---Option, default is not configured

- External battery module:

Accessories	10-40K
Battery module connecting cable	√
Battery module expansion cable	√
Rack ear	√
Rack rail kit	O

Note：√---Included;　O--- Option, default is not configured

Recycling: Packaging materials are reusable, please keep the packaging materials for future use.

3.2 Mechanical installation

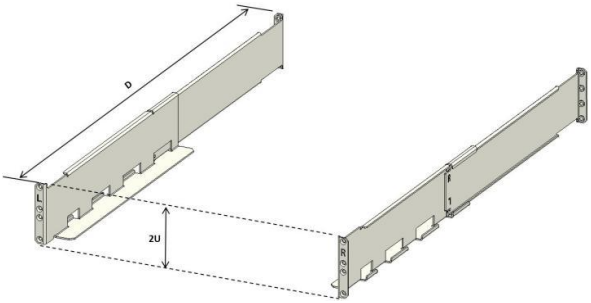
1. This series support two installation modes: Tower installation and rack installation.
2. To keep good ventilation, please keep a free-space (500mm at least) for front/ rear panels of the module.
3. Do not carry the front/rear panel of the module during installing.

3.2.1UPS module installation

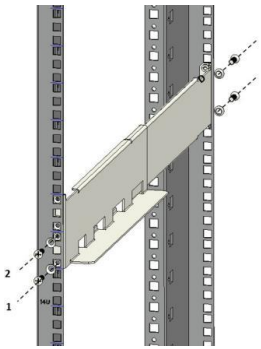
- Rack mount:

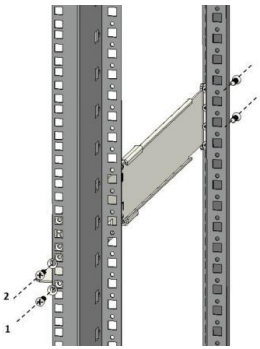
The UPS is suitable for installation in a 19-inch standard rack cabinet. It is recommended that the depth of the cabinet be no less than 800mm.

1. Install the rail kit(This is an optional configured). This rail kit is '2U & with screw holes (M5)', the depth of the rail kit is: 415-763mm.



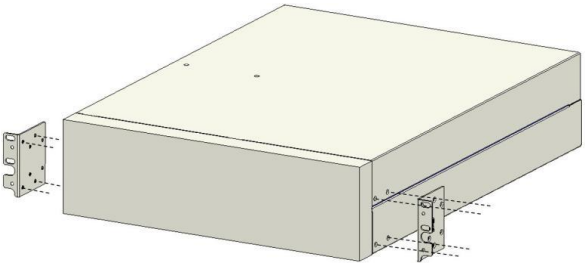
Fasten the rail kit to the cabinet with 8pcs M5 screws + washers



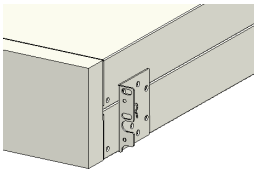


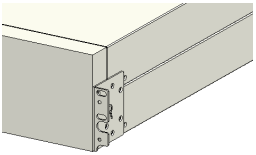
(as below):

2. Install the mounting ears. Lock the left/right mounting ears into the UPS with 8pcs M4 flat screws (make sure the correct-direction of the mounting ears as below)



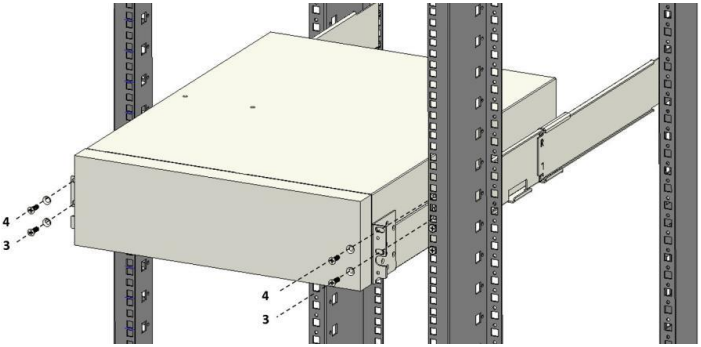
Note: This UPS provided another two fix-position for the mounting ears as to meet a special installation depth





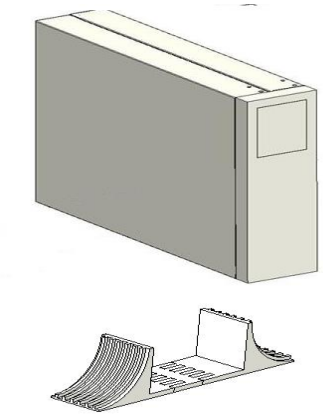
requirements(as below):

3. Take the UPS to the rail kit and push backwards; secure to the cabinet posts with 4pcs M5 screws + washers (as below).



- Tower mount:

Screw the tower foot to UPS; please pay attention to the installation, the LCD of the UPS module should be at the top (as below).
The LCD of the UPS module has gravity sensing, the vision window can automatically adjust the display direction.



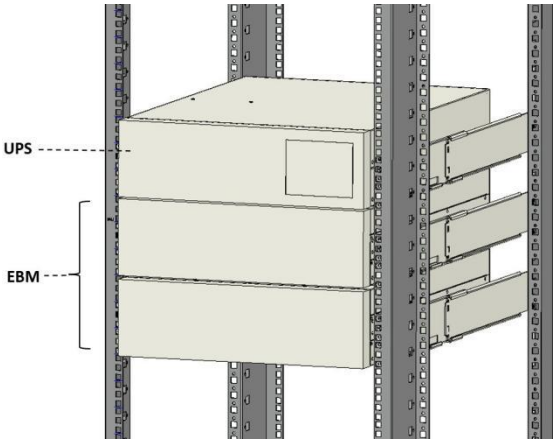
3.2.2 External battery module installation:

- Rack mount:

The installation steps are the same as UPS. Pay attention to this installation:

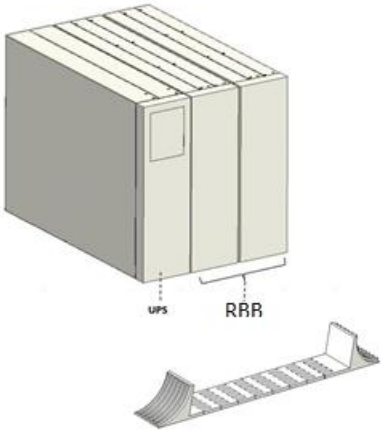
1. Battery module must be installed on the lower level of the UPS (as shown below)
2. Battery module contains 2 battery packs, each with a height of 3U; therefore, 6U installation space is required.

3. Battery module is heavy and requires more than two people to install.



- Tower mount:

1. Place the Battery module on the right side of the UPS and align with the front panel of the UPS module.
2. Screw the UPS's tower foot: one is to UPS's side, another one to Battery module's side (as below)



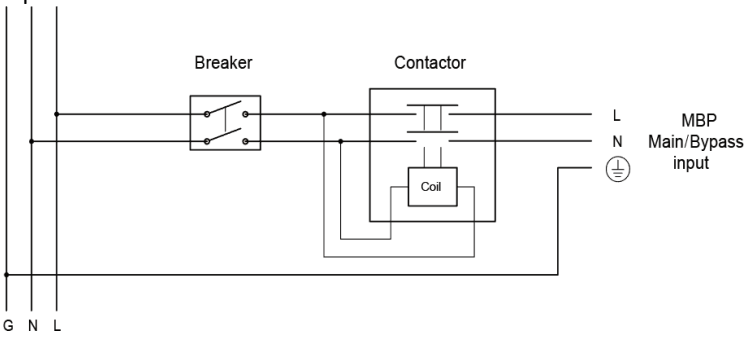
Pay attention to this installation:

1. Battery module must be installed on the right side of the UPS.
2. Battery module contains 2 battery pack, so the right side of the UPS needs to be reserved.
3. Battery module is heavy and requires more than two people to install.

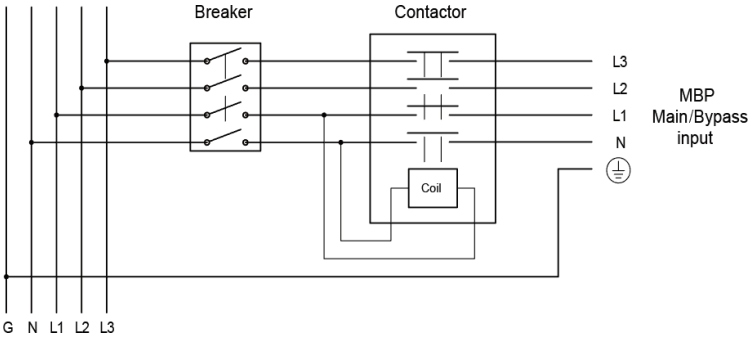
4. Wiring for AC Cable

This chapter is introduce how to wiring AC IN/OUT cable to UPS in difference modes, and UPS connecting with Battery module。

Before wring UPS, upstream breaker and back-feed contactor should be configured to avoid power back-feed to unity. And,“back-feed voltage danger” warning lable should be added in back-feed contactor or device. Before operating, UPS input should cut off, and check all terminals voltage to avoid voltage dangerous. Back-feed contactor rating current should be larger than UPS rating input current. Below figures show the wiring system of UPS input.



Single phase system



Three phase system

4.1 Input/Output wiring

Danger!

The rated current of the utility power switch must be greater than the UPS input current, otherwise the utility power switch may be burnt!

Please refer to the following table for the UPS wiring (cross-section of conductor, unit: mm²)

Model name	Input/ Output Mode	Input					Output			Battery	
		Main input		Bypass input		Ground wire					
		L wire	N wire	L wire	N wire		L wire	N wire	Ground wire	+/- wire	Ground wire
10k	3-1	4	4	10	10	10	10	10	10	6	6
	3-3	4	4	4	4	4	4	4	4	6	6
	1-1	25	25	10	10	25	10	10	10	6	6
	1-3	25	25	4	4	25	4	4	4	6	6
20k	3-1	10	10	25	25	25	25	25	25	10	10
	3-3	10	10	10	10	10	10	10	10	10	10
	1-1	50	50	25	25	50	25	25	25	10	10
	1-3	50	50	10	10	50	10	10	10	10	10
30k	3-1	16	16	50	50	50	50	50	50	25	25
	3-3	16	16	16	16	16	16	16	16	25	25
	1-1	50	50	50	50	50	50	50	50	25	25
	1-3	50	50	16	16	16	16	16	16	25	25

40kl	3-1	16	16	70	70	50	70	70	50	35	35
	3-3	16	16	16	16	16	16	16	16	35	35
	1-1	70	70	70	70	50	70	70	50	35	35
	1-3	70	70	16	16	16	16	16	16	35	35

Note:

1. Please select the large cross-section conductor for the UPS input cable in the single source application.
2. UPS output cable length is recommended not to exceed 10m.
3. This model provides 8 power distribution modes: three in and three out (same source for main and bypass)/three in and three out (different source for main and bypass)/three in and single out (same source for main and bypass)/three in and single out (different source for main and bypass)/single in and single out (different source for main and bypass)/single in and three out (same source for main and bypass)/single in and three out (different source for main and bypass). The default factory power distribution mode is set as' three in and three out (same source for main and side)'.
4. In the three-phase output mode, if the load is an unbalanced load, the L wire of the bypass and output may exceed the rated current, and the maximum rated current will be 1.732 times. The corresponding protection device and wiring cable must be determined according to the standards of the region and the actual situation of the user.

Please refer to the following table for conductor's terminal selection:

Conductor cross-section (Unit:mm²)	10-20K	30-40K
4	DRNB5-4	
6	DRNB5-6	
10	DRNB5-10	
16	DRNB6-16	DRNB6-16
25	DRNB6-25	DRNB6-25
35	DRNB6-35	DRNB6-35
50	DRNB6-50	DRNB6-50
70		DRNB6-70

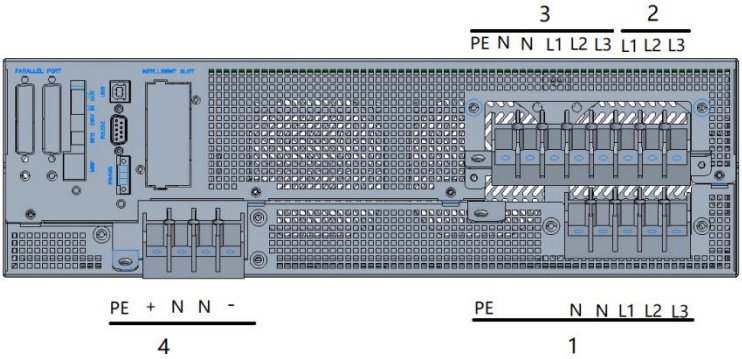
Recommended circuit breaker and contactor current specifications:

Model name	Input mode	Breaker	Contactor
10K	1 phase main input	D type 100A	≥100A
	3 phase main input	D type 50A	≥50A
	1 phase bypass input	D type 100A	≥100A
	3 phase bypass input	D type 32A	≥32A
20K	1 phase main input	D type 160A	≥160A
	3 phase main input	D type 63A	≥63A
	1 phase bypass input	D type 125A	≥125A
	3 phase bypass input	D type 63A	≥63A
30K	1 phase main input	D type 250A	≥250A
	3 phase main input	D type 100A	≥100A
	1 phase bypass input	D type 180A	≥180A
	3 phase bypass input	D type 80A	≥80A
40K	1 phase main input	D type 315A	≥315A
	3 phase main input	D type 125A	≥125A
	1 phase bypass input	D type 250A	≥250A
	3 phase bypass input	D type 100A	≥100A

Recommended output circuit breaker current specifications:

Model name	Output mode	Breaker current
10K	1 phase output	63A
	3 phase output	32A
20K	1 phase output	125A
	3 phase output	63A
30K	1 phase output	180A
	3 phase output	80A
40K	1 phase output	250A
	3 phase output	100A

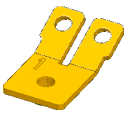
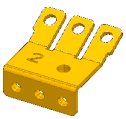
Layout of terminal block(TB) of the UPS:



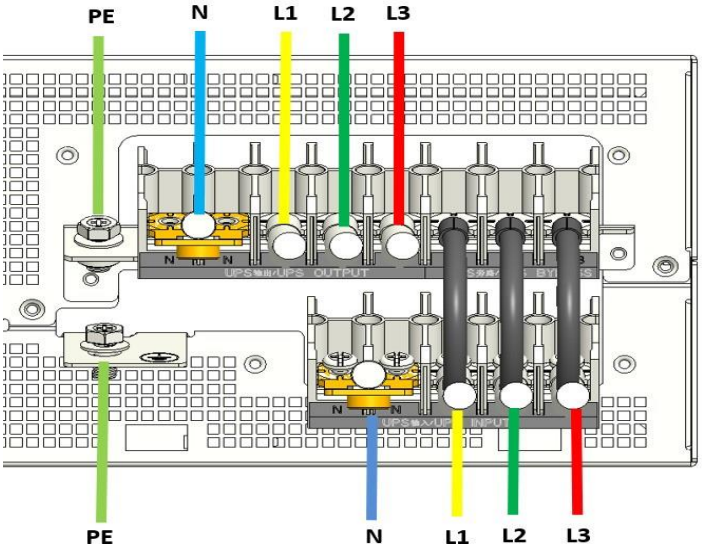
Note:

1. UPS input terminal block (PE/N/N/L1/L2/L3)
2. UPS bypass input terminal block(L1/L2/L3)
3. UPS output terminal block(PE/N/N/L1/L2/L3)
4. External battery terminal block(PE/+/N/N/-)

Below will introduce 8 modes of wiring application for UPS input/output. Please select one mode for your actual application with below accessories 'copper busbar (including jumper cable)'. During the wiring process, it is only necessary to remove the 'top cover of the terminal block' without removing 'terminal block box'.

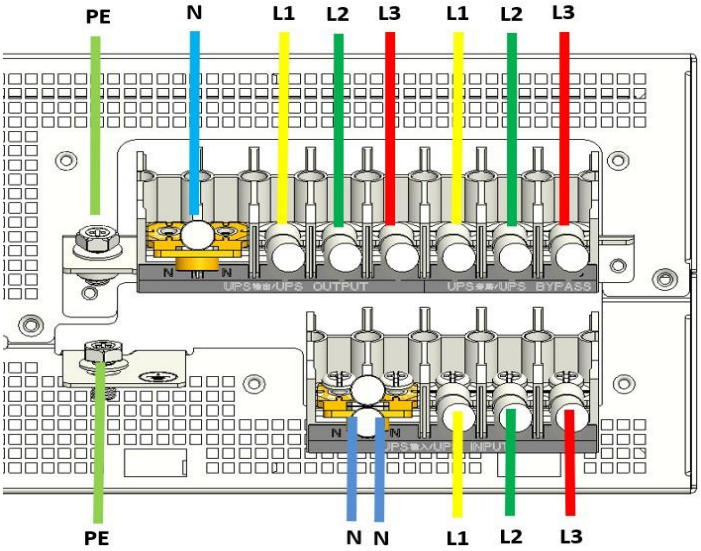
	Item	Quantity(PC)	Figure
Copper busbar	1	2	
	2	2	
Jumper	NA	3	

- Mode 3-3(single source) (Default UPS wiring mode)



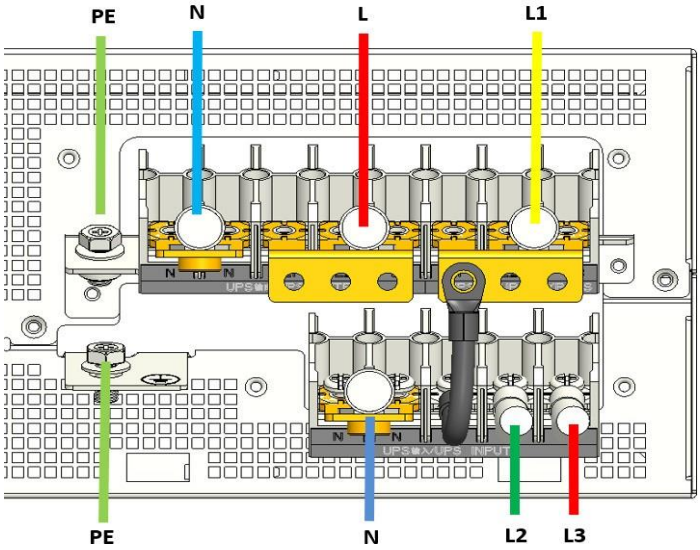
1. Input: connect main-ground cable (PE) to chassis first; short 'UPS input terminal N/N' with 'busbar #1', then connect AC cable(N); connect 'UPS input terminal L1/L2/L3' with AC cable(L1/L2/L3) and 'jumper cable' by back to back mounted; then fix 'jumper cable' to 'UPS bypass terminal L1/L2/L3'.
2. Output: connect ground cable (PE) to chassis first; short 'UPS output terminal N/N' with 'busbar #1', then connect AC cable(N); connect 'UPS output terminal L1/L2/L3' to AC cable(L1/L2/L3).

- Mode 3-3(dual source)



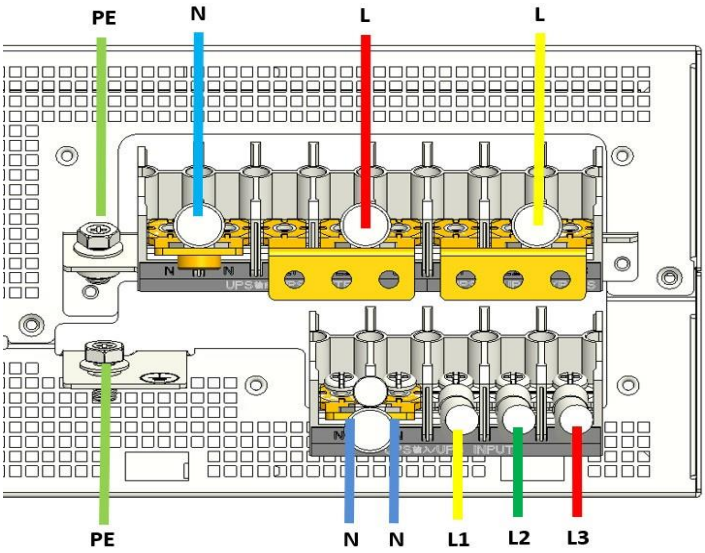
1. Input: connect main-ground cable (PE) to chassis first; short 'UPS input terminal N/N' with 'busbar #1', then connect AC main source cable(N) and bypass source cable(N) by back to back mounted; connect 'UPS input terminal L1/L2/L3' to main source cable(L1/L2/L3); connect 'UPS bypass terminal L1/L2/L3' to bypass source cable(L1/L2/L3).
2. Output: connect ground cable (PE) to chassis first; short 'UPS output terminal N/N' with 'busbar #1', then connect AC cable(N); connect 'UPS output terminal L1/L2/L3' to AC cable(L1/L2/L3).

- Mode 3-1(single source)



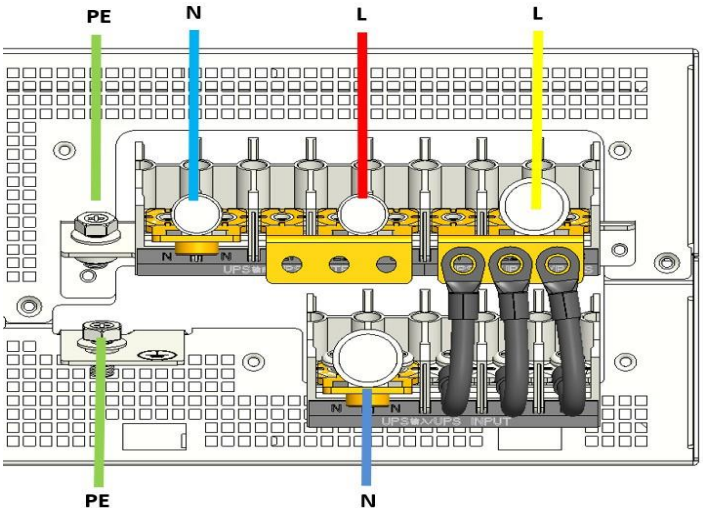
1. Input: connect main-ground cable (PE) to chassis first;
   short 'UPS input terminal N/N' with 'busbar #1', then connect AC cable(N); connect 'UPS input terminal L2/L3' to AC cable(L2/L3);
   Fix 'jumper cable' to 'UPS input terminal L1' and 'busbar #2', then short 'UPS bypass terminal L1/L2/L3' with this 'busbar #2' and connect AC cable(L1).
2. Output: connect ground cable (PE) to chassis first;
   short 'UPS output terminal N/N' with 'busbar #1', then connect AC cable(N);
   short 'UPS output terminal L1/L2/L3' with 'busbar #2', then connect AC cable(L)

- Mode 3-1(dual source)



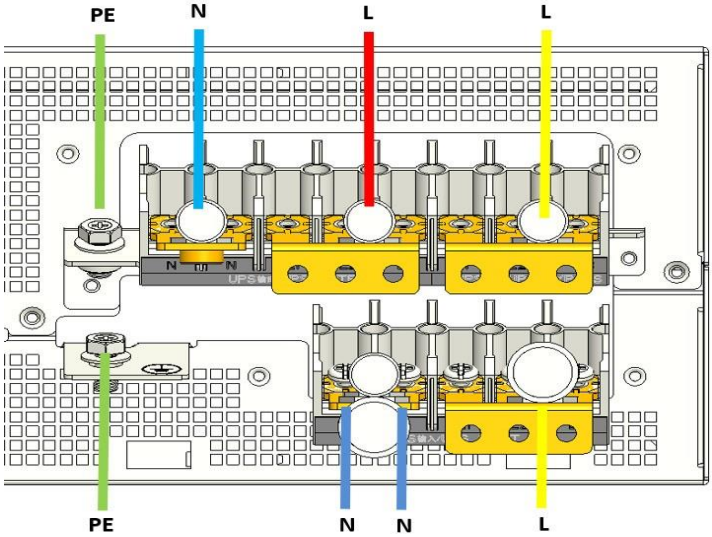
1. Input: connect main-ground cable (PE) to chassis first; short 'UPS input terminal N/N' with 'busbar #1', then connect AC main source cable(N) and bypass source cable(N) by back to back mounted; connect 'UPS input terminal L1/L2/L3' to main source cable(L1/L2/L3); short 'UPS bypass terminal L1/L2/L3' with 'busbar #2', then connect bypass source cable(L).
2. Output: connect ground cable (PE) to chassis first;
   short 'UPS output terminal N/N' with 'busbar #1', then connect AC cable(N);
   short 'UPS output terminal L1/L2/L3' with 'busbar #2', then connect AC cable(L)

- Mode 1-1(single source)



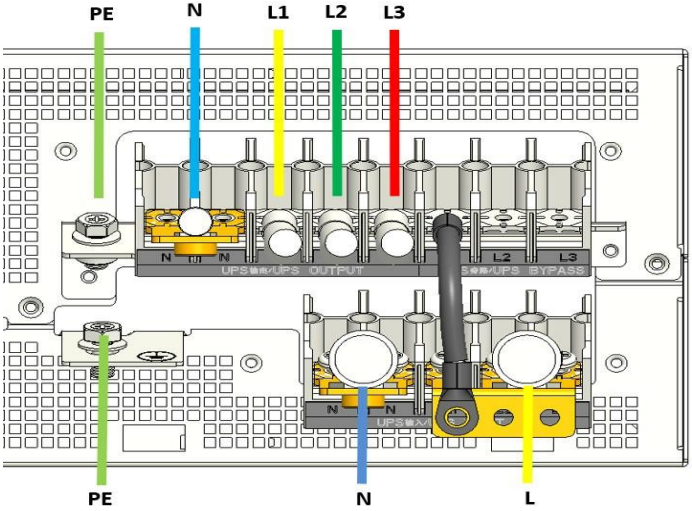
1. Input: connect main-ground cable (PE) to chassis first;
   short 'UPS input terminal N/N' with 'busbar #1', then connect AC cable(N); Fix 'jumper cable' to 'UPS input terminal L1/L2/L3' and 'busbar #2', then short 'UPS bypass terminal L1/L2/L3' with this 'busbar #2' and connect AC cable(L).
2. Output: connect ground cable (PE) to chassis first;
   short 'UPS output terminal N/N' with 'busbar #1', then connect AC cable(N);
   short 'UPS output terminal L1/L2/L3' with 'busbar #2', then connect AC cable(L)

- Mode 1-1(dual source)



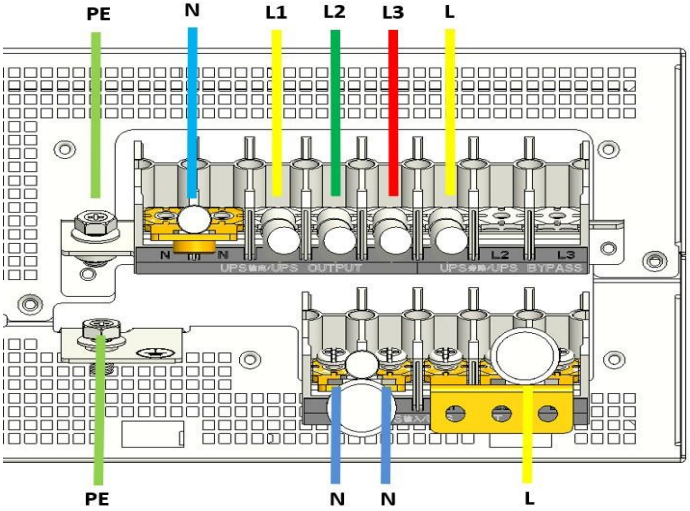
1. Input: connect main-ground cable (PE) to chassis first;
   short 'UPS input terminal N/N' with 'busbar #1', then connect AC main source cable(N) and bypass source cable(N) by back to back mounted; short 'UPS input terminal L1/L2/L3' with 'busbar #2', then connect main source cable(L).
   short 'UPS bypass terminal L1/L2/L3' with 'busbar #2', then connect bypass source cable(L).
2. Output: connect ground cable (PE) to chassis first;
   short 'UPS output terminal N/N' with 'busbar #1', then connect AC cable(N);
   short 'UPS output terminal L1/L2/L3' with 'busbar #2', then connect AC cable(L)

- Mode 1-3(single source)



1. Input: connect main-ground cable (PE) to chassis first;
   short 'UPS input terminal N/N' with 'busbar #1', then connect AC cable(N); Fix 'jumper cable' to 'busbar #2', then short 'UPS input terminal L1/L2/L3' with this 'busbar #2' and connect AC cable(L), connect this 'jumper cable' to 'UPS bypass terminal L1' finally.
2. Output: connect ground cable (PE) to chassis first;
   short 'UPS output terminal N/N' with 'busbar #1', then connect AC cable(N); connect 'UPS output terminal L1/L2/L3' to AC cable(L1/L2/L3).

- Mode 1-3(dual source)



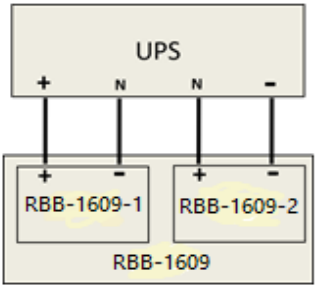
1. Input: connect main-ground cable (PE) to chassis first;
   short 'UPS input terminal N/N' with 'busbar #1', then connect AC main source cable(N) and bypass source cable(N) by back to back mounted; short 'UPS input terminal L1/L2/L3' with 'busbar #2', then connect main source cable(L).
   connect 'UPS bypass terminal L1' to bypass source cable(L).
2. Output: connect ground cable (PE) to chassis first;
   short 'UPS output terminal N/N' with 'busbar #1', then connect AC cable(N); connect 'UPS output terminal L1/L2/L3' to AC cable(L1/L2/L3).

4.2 Wiring with external battery module

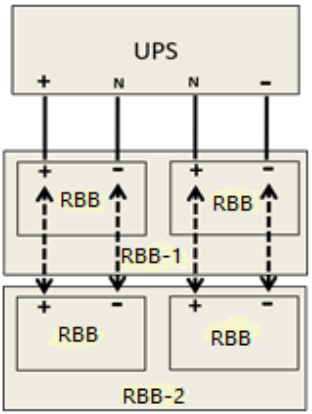
External battery module is UPS's optional modular, it can provide more DC power for UPS.

1. Be sure to disconnect the battery cable from the battery module before connecting the battery terminals of the UPS.
2. Make sure the UPS is completely off before connecting or disconnecting the battery module.
3. Before connecting the battery module, make sure that the number of battery sections and capacity are the same as LCD setting.
4. Do not reverse the polarity of the external battery.

External battery cabinet wiring schematic diagram is shown below:



Single battery pack



Multiple battery pack

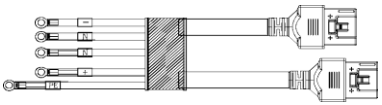
- Battery cable installation sequence: connect UPS first, then connect EBM!

  Default battery number of the UPS is set with 32pcs, 16 pcs for Battery+/Battery- ;

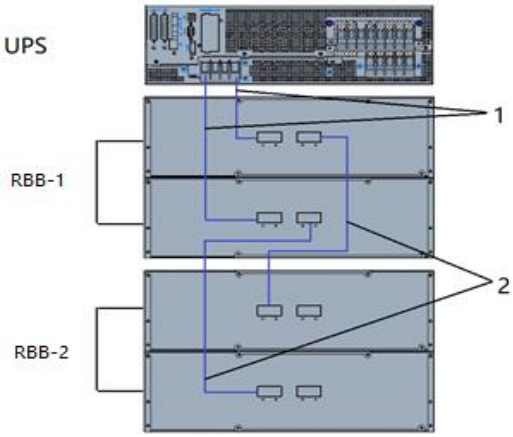
- The UPS can expand up to 6 strings battery pack, each string contains 2 battery pack.

- The external battery interface of the UPS only needs to remove the 'top cover of the terminal block' during the wiring, no need to remove the 'terminal block box'。

This external battery module accessories:

	Quantity (PC)	Note	Figure
Battery module to UPS cable	1	Connecting battery module to UPS	
Battery module to battery module cable	2	Connecting battery module to battery module	

The schematic diagram the battery module to USP wiring：



1: External battery module(RBB-1609) cable 2: External battery module(RBB-1609) cable

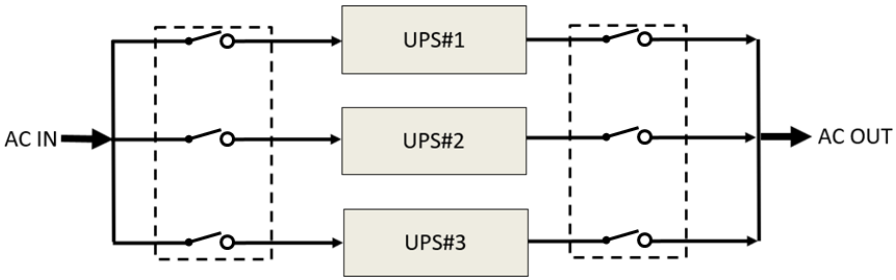
Note：

If the UPS wired with other type external battery module, please follow wiring-diagram as above and chapter 4.1 (table of UPS wiring) to select the cable size for battery-connect.

5. Parallel UPS install

This series of products is parallelized by up to three UPSs to meet redundant configuration or expansion requirements.

Parallel system AC cable connection diagram:



Caution:

Wiring length requirement:

When the distance between the load and the parallel UPS is less than 10 meters, the length difference between the input/output lines between the UPSs in the parallel system is less than 20%.

When the distance between the load and the parallel UPS is greater than 20 meters, the length difference between the input/output lines between the UPSs in the parallel system is less than 5%.

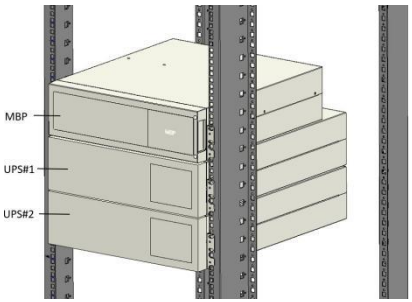
Professional installation is required, please set the parallel system in the restricted area!

5.1 Parallel UPS installation

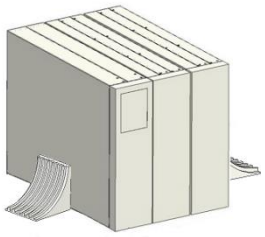
In the parallel system, the installation of the UPS modular is the same as single UPS. Please refer to Chapter €.

Note:

If you configured a '1+1 parallel MBP' modular of this series, it need to be placed to top layer of the parallel system for rack mounted; or left side for tower installed. This is for a better cable-connection(as shown below):



Rack mount for parallel system



Tower mount for parallel system

5.2 Wiring

Cable-select table for the parallel system AC IN and AC OUT :

Parallel system installed by 10KVA UPS (conductor cross-section, unit: mm²)											
UPS number	Mode	Main input		Bypass input		Ground wire	Output			Battery wire	Battery ground
		L wire	N wire	L wire	N wire		L wire	N wire	Ground		
2 UPS	3-1	10	10	35	35	35	35	35	35	16	16
	3-3	10	10	10	10	10	10	10	10	16	16
	1-1	70	70	35	35	70	35	35	35	16	16
	1-3	70	70	10	10	70	10	10	10	16	16
3 UPS	3-1	25	25	70	70	70	70	70	70	35	35
	3-3	25	25	10	10	25	16	16	16	35	35
	1-1	120	120	70	70	120	70	70	70	35	35
	1-3	120	120	10	10	120	16	16	16	35	35

Parallel system installed by 15KVA UPS (conductor cross-section, unit: mm²)											
UPS number	Mode	Main input		Bypass input		Ground wire	Output			Battery wire	Battery Ground
		L wire	N wire	L wire	N wire		L wire	N wire	Ground		
2 UPS	3-1	16	16	50	50	50	50	50	50	25	25
	3-3	16	16	10	10	16	10	10	10	25	25
	1-1	95	95	50	50	95	50	50	50	25	25
	1-3	95	95	10	10	95	10	10	10	25	25
3 UPS	3-1	35	35	95	95	95	95	95	95	50	50
	3-3	35	35	16	16	35	16	16	16	50	50
	1-1	185	185	95	95	185	95	95	95	50	50
	1-3	185	185	16	16	185	16	16	16	50	50

Parallel system installed by 20KVA UPS (conductor cross-section, unit: mm²)											
UPS number	Mode	Main input		Bypass input		Ground wire	Output			Battery wire	Battery Ground
		L wire	N wire	L wire	N wire		L wire	N wire	Ground		
2 UPS	3-1	25	25	70	70	70	70	70	70	35	35
	3-3	25	25	16	16	25	16	16	16	35	35
	1-1	120	120	70	70	120	70	70	70	35	35
	1-3	120	120	16	16	120	16	16	16	35	35
3 UPS	3-1	50	50	150	150	150	150	150	150	70	70
	3-3	50	50	25	25	50	25	25	25	70	70
	1-1	240	240	150	150	240	150	150	150	70	70
	1-3	240	240	25	25	240	25	25	25	70	70

Parallel system installed by 30KVA UPS (conductor cross-section, unit: mm²)											
UPS number	Mode	Main input		Bypass input		Ground wire	Output			Battery wire	Battery Ground
		L wire	N wire	L wire	N wire		L wire	N wire	Ground		
2 UPS	3-1	50	50	150	150	150	150	150	150	70	70
	3-3	50	50	50	50	50	50	50	50	70	70
	1-1	240	240	150	150	240	150	150	150	70	70
	1-3	240	240	50	50	240	50	50	50	70	70
3 UPS	3-1	95	95	240	240	240	240	240	240	120	120
	3-3	95	95	95	95	95	95	95	95	120	120
	1-1	150*2	150*2	150*2	150*2	150	150*2	150*2	150	120	120
	1-3	150*2	150*2	95	95	95	95	95	95	120	120

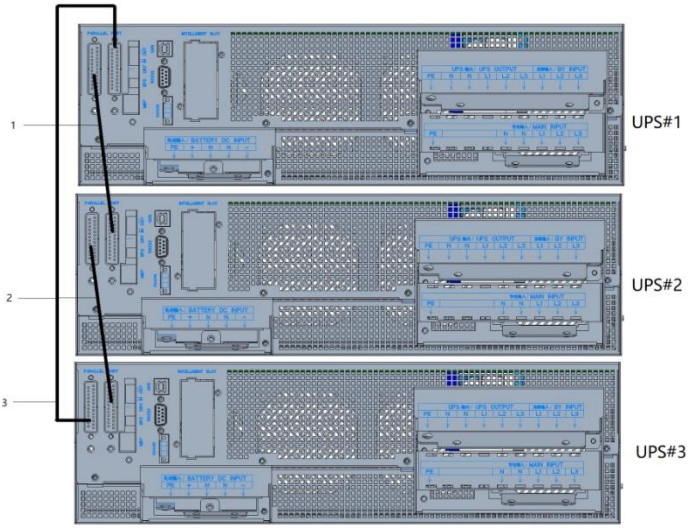
Parallel system installed by 40KVA UPS (conductor cross-section, unit: mm²)											
UPS number	Mode	Main input		Bypass input		Ground wire	Output			Battery wire	Battery Ground
		L wire	N wire	L wire	N wire		L wire	N wire	Ground		
2 UPS	3-1	95	95	240	240	240	240	240	240	120	120
	3-3	95	95	95	95	95	95	95	95	120	120
	1-1	150*2	150*2	150*2	150*2	150	150*2	150*2	150	120	120
	1-3	150*2	150*2	95	95	95	95	95	95	120	120
3 UPS	3-1	150	150	240*2	240*2	240	240*2	240*2	240	240	240
	3-3	150	150	150	150	150	150	150	150	240	240
	1-1	240*2	240*2	240*2	240*2	240	240*2	240*2	240	240	240
	1-3	240*2	240*2	150	150	150	150	150	150	240	240

Note:

1. Please select the large cross-section conductor for the parallel system ‘AC IN cable' in the single source application.
2. In the three-phase output mode, if the load is an unbalanced load, the L wire of the bypass and output may exceed the rated current, and the maximum rated current will be 1.732 times. The corresponding protection device and wiring cable must be determined according to the standards of the region and the actual situation of the user.

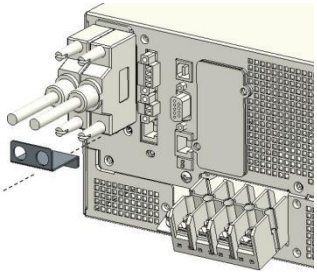
5.2.1 Basic parallel UPS wiring

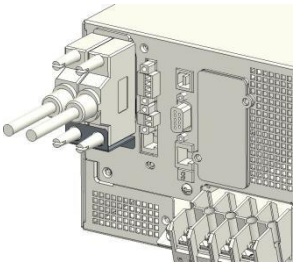
Assume that you already finished the AC cable connection for the parallel system. Remove the protective cover of the parallel ports, and then connect UPS one by one with ‘parallel cable' (25pin, as accessory) to be a close-loop (as shown below):



To reduce the risk of parallel system damage:

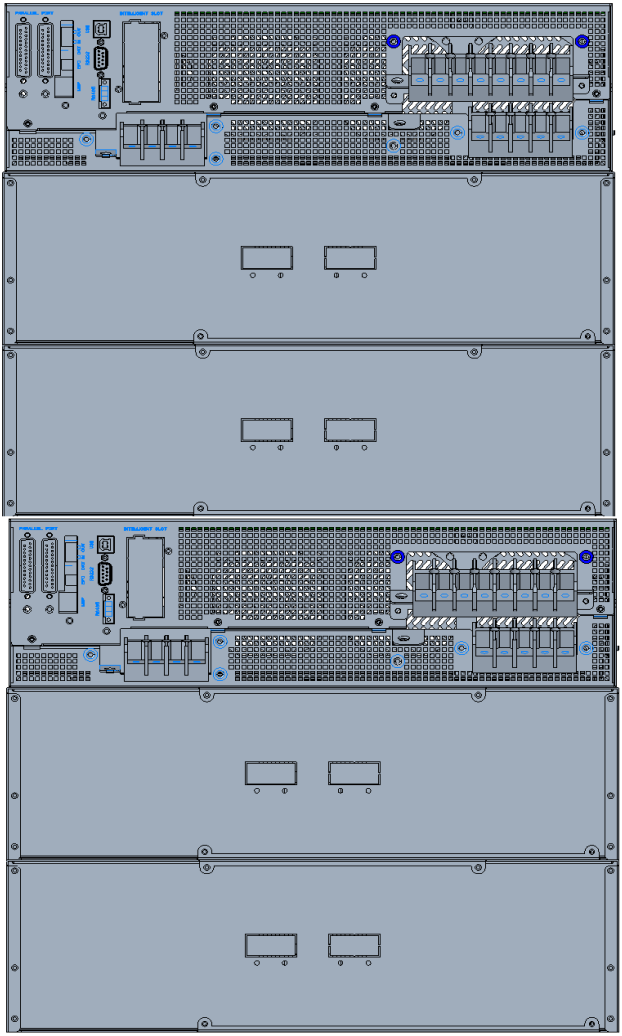
1. Please use the configured ‘parallel cable' which is accessoried in UPS!
2. After tightening ‘parallel cable', please lock with ‘parallel cable locker' (as shown below) to prevent the parallel ports suffering an unexpected pulling force and causing the parallel system fault.





5.2.2 Parallel UPS connection of independent battery

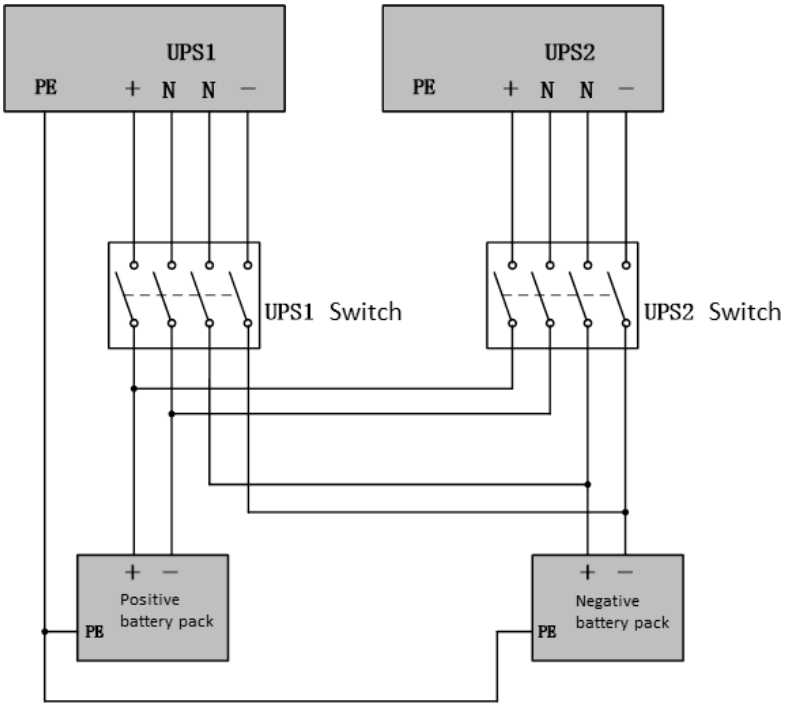
1. In the parallel system, if each UPS is configured with the external battery module of this series, please refer to the following illustration for installation and placement.
2. Please refer to chapter 4.2 for the wiring method of each UPS and its own external battery module.
3. Please refer to Chapter 5.2.1 for connection of parallel cables between UPS



5.2.3 Parallel UPS connection of the common battery

1. In the parallel system, you can also set up ‘common battery'(user's own battery) for all UPSs. Please refer to the following figure.

2. Please refer to Chapter 5.2.1 for connection of parallel cables between UPS



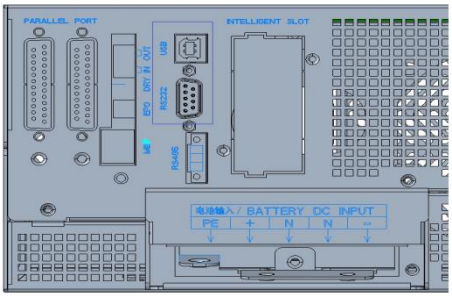
6. Communication ports

Computer ports

The UPS provides USB and RS232 communication ports. For practical applications, please use the communication cable provided by the accessory to connect to the corresponding communication port.

RS-232 port communication default parameters:2400, 8, 1, 0. (The baud rate is 2400, 8 data bits, 1 stop bit, no parity)

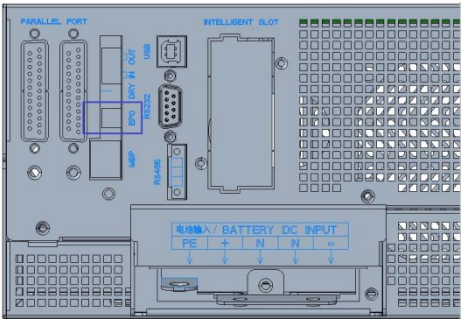
If USB and RS232 are connected at the same time, USB communication priority.



EPO (Emergency Power Off)

EPO on the rear panel of UPS, disconnecting the EPO can cut off the output of the UPS. Need to resume UPS work:

- Reconnect EPO
- Continuously press button to confirm UPS is shut down to bypass or no output.
- Continuously press button to restart.

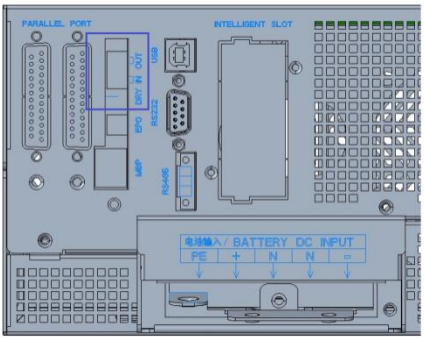


Dry in & Dry out

Dry in is optical coupling input interface, which is connected to an external switch. After custom setting the dry contact input function, it can perform operations such as power on and power off.

Dry out is relay output interface, which is normally open, can be used to indicate the UPS load overload, battery mode, battery low voltage, battery not connected, bypass output and other working conditions.

Reference 7.3.4 to setting Dry in & out details



RS485 port

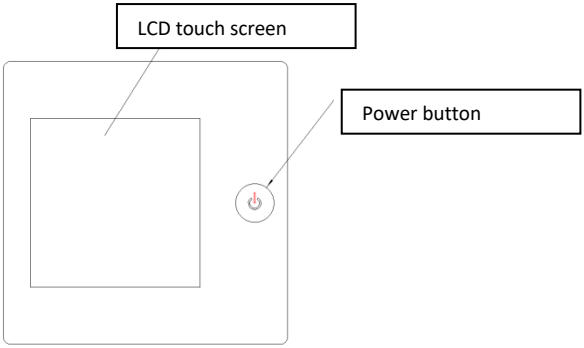
RS-232 port communication default parameters:2400, 8, 1, 0.(The baud rate is 2400, 8 data bits, 1 stop bit, no parity).

Intelligent slot(support hot swap)

Intelligent slot can be installed with SNMP card. If necessary, please contact your supplier.

7. Operation interface

7.1 Control panel



Note: The control panel has two display modes: horizontal and vertical.

The following is an example of using horizontal screen.

LED indicator	Status	Description
Blue LED	Bypass	Bypass power supply, LED is always on.
		Bypass abnormal, LED flashes for 2 seconds
		Bypass overload, LED flashes for 1 second
Yellow LED	Battery	Battery mode, LED is always on
		Battery or charger fault flashes for 2 seconds
Green LED	Inverter	Inverter normal LED is always on
Tricolor LED	Fault	Inverter overload flashes for 1 second
		The blue, yellow and green LEDs of the fault mode flash synchronously for 1 second

Power button	Function	Description
⏻	Power on Turn off	- Press to start the UPS when there is only battery power. - When the UPS is not started, press this button to start the UPS. - During normal operation, press it to shut down directly. - When UPS is in fault mode, press to pop up the clearing fault dialog box.

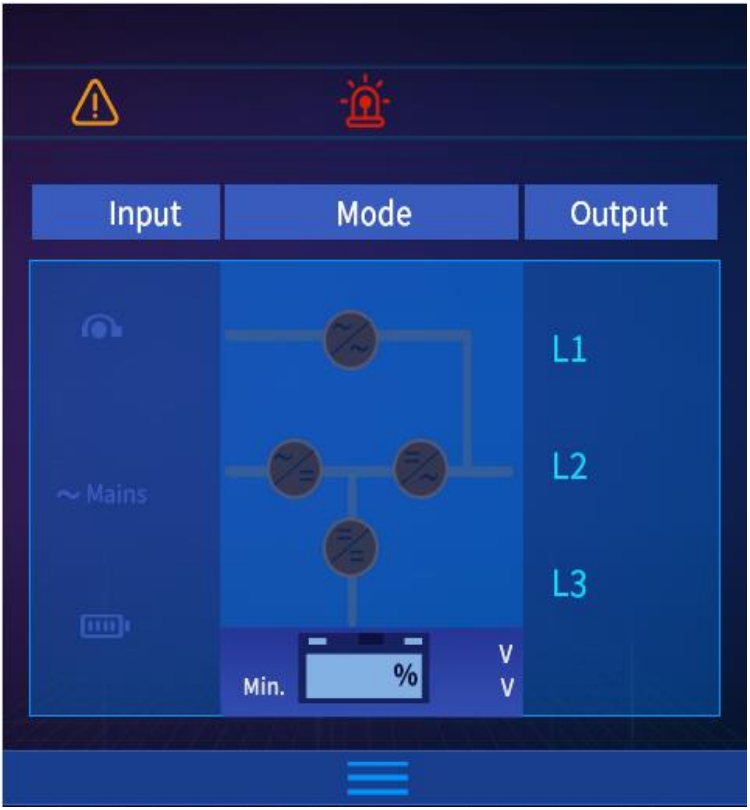
Buzzer	Description
No beep sound	UPS works normally
Only one beep	Power on tone

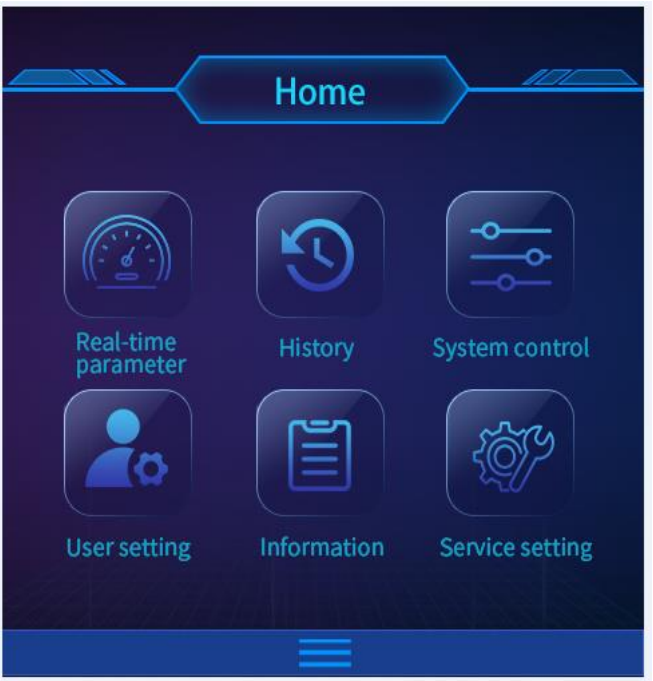
Beep every 0.5 seconds	Overload warning
Beep every 4 second s	UPS works in battery mode
Beep every second	Battery under-voltage, fan failure, uneven current in parallel
Continuous beep	UPS fault

7.2 Touch screen

High frequency 10-40K series products are equipped with 4-inch 16.5M color IPS capacitive touch screen, graphical menu and touch operation, which are very convenient and efficient to use.

7.2.1 User Interface overview

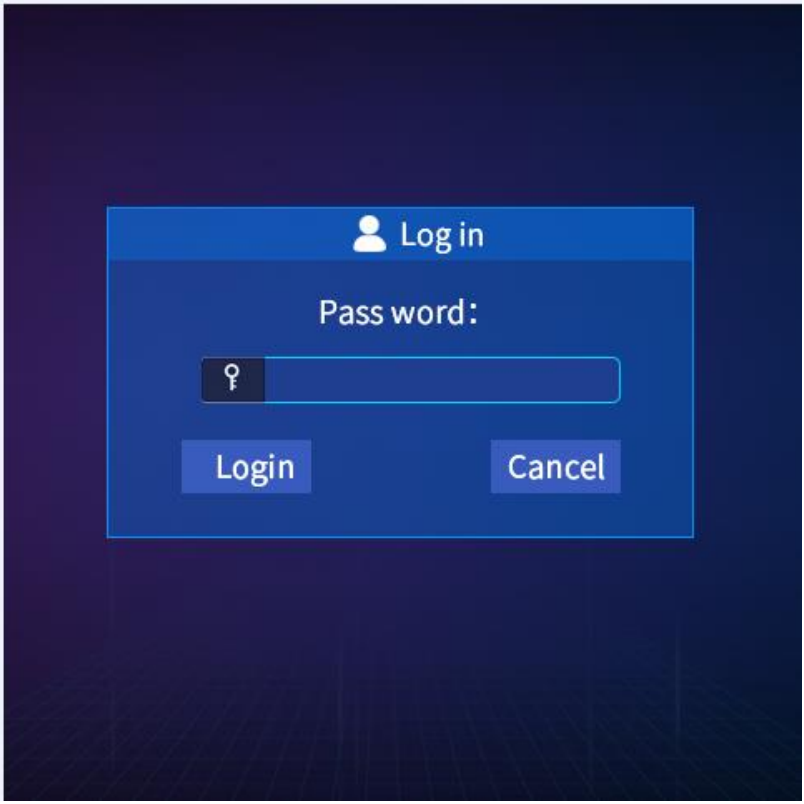




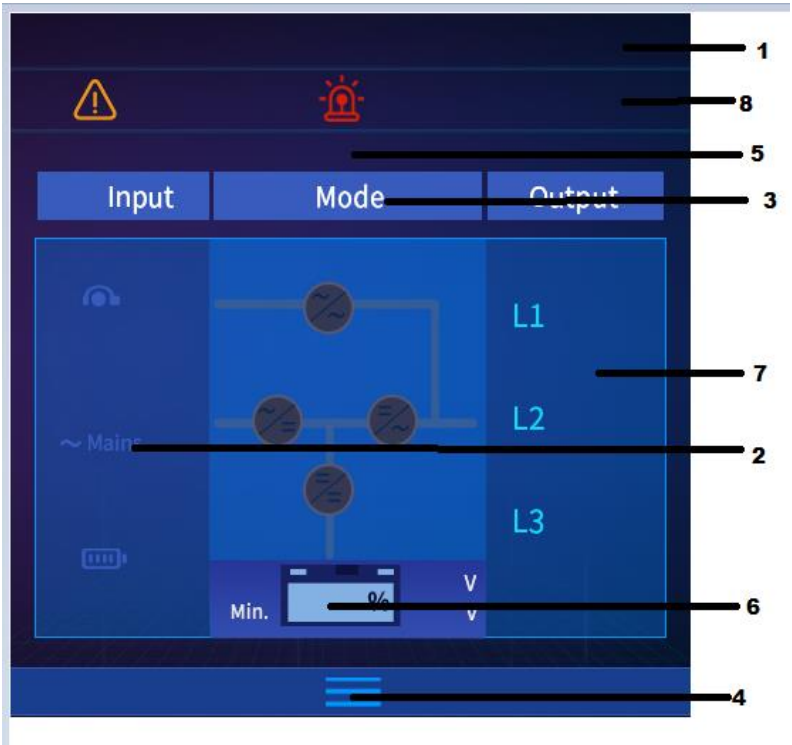
Menu and Sub-menu

7.2.2 Guide page

When the product is used for the first time and after the start animation ends, it will enter the password setting.



7.2.3 The main page and pop-up page

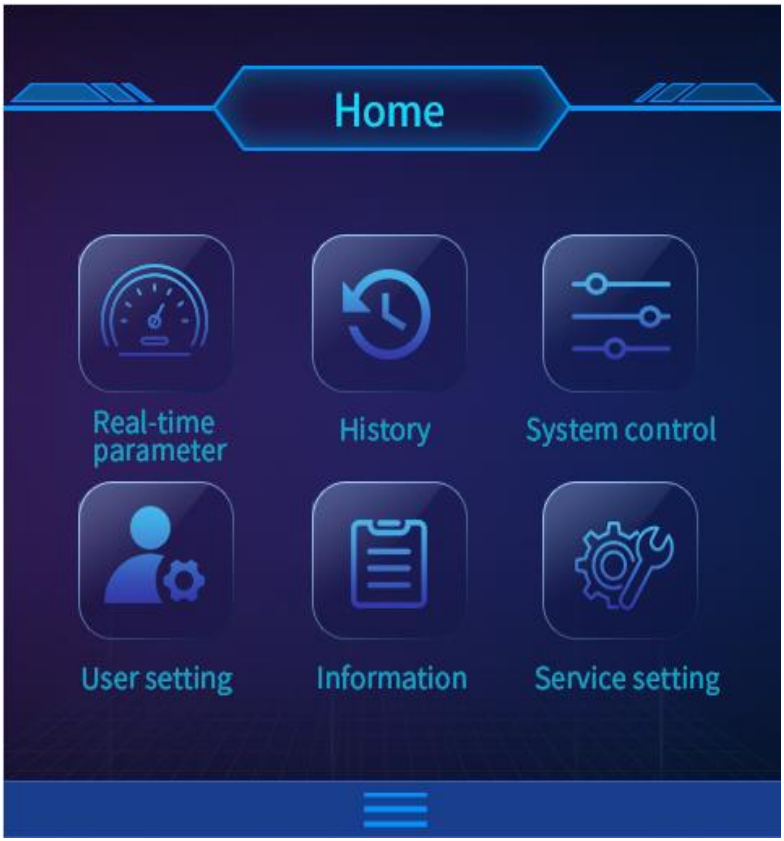


Number	Name	Description
①	Alarm or fault	Blank when there is no fault or alarm message. Display one by one at this position when there is a fault or alarm message.
②	Input information	There are three input status displays for bypass, mains and battery.Highlighted color represents the current input state.
③	System status	Middle text indicates the working mode of the system
④	Menu	Touch this icon to go to the main menu page.
⑤	UPS status	3/1; 3/3. 1/1; 1/3.

Number	Name	Description
⑥	Battery Status	Display battery information.
⑦	Output information	Display output information.
⑧	Time	The UPS system time is displayed here. If it does not match the actual, please modify it in Setting →General → System Time.

7.2.4. Menu

Under the main page, click on the menu icon in the lower left corner to enter the Menu page.



On the menu page, you can click the corresponding icon to operate.

Screen saver

- Under any page, when there is no operation within 10 minutes, the LCD will enter the screen saver mode. In this mode, touch the screen to re-light the LCD, and the LCD will return to the previous page.
- Under any page, when there is no operation within 10 minutes, the LCD will switch back to the main page.
- To cancel the screen saver function, operate in Setting.

7.3 Operation

7.3.1 Query UPS real-time parameters

On the Menu page, click the Meters icon to enter the real-time parameter page. Click the page flip icon to change the query for the following items:

-Line, Output, Bypass, Load real-time parameters;

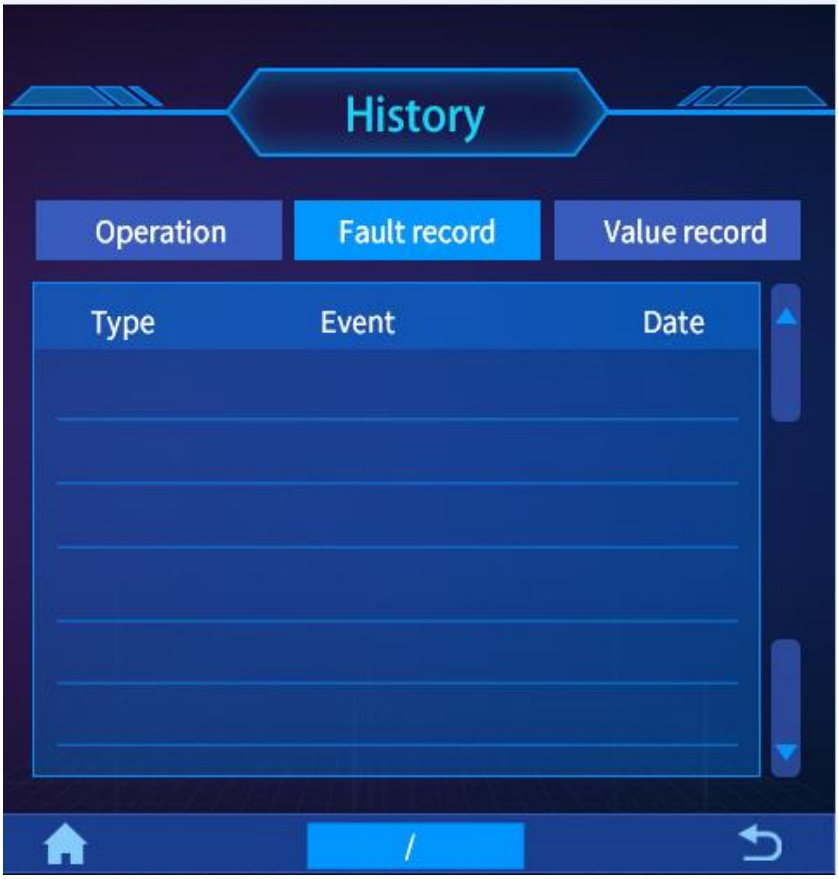
-Battery, BUS Voltage, Ambient temperature.





7.3.2 Query or clear UPS history

Click the history icon on the menu page to enter the history page:

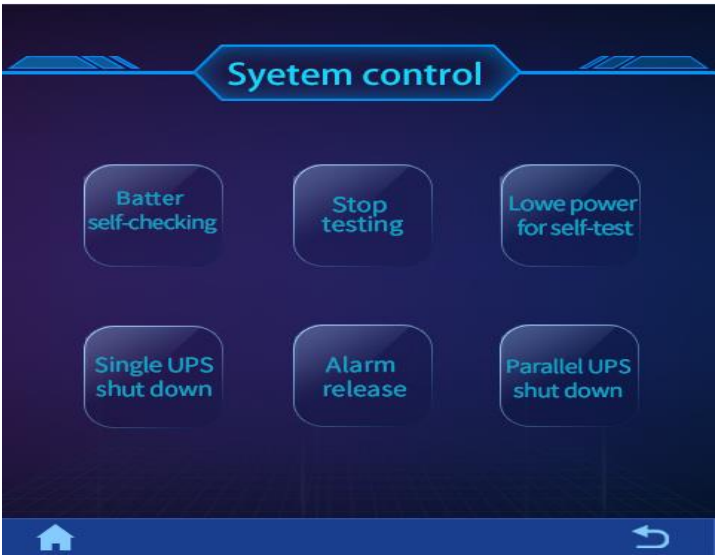


The event or alarm list can be distinguished according to the occurrence time, the icon color can distinguish the severity level. Records can record up to 100.

Click Clear to enter the following page. Press Clear to clear all records. Please choose clear operation carefully:

7.3.3 UPS operation control

Select Control in the main menu page to enter the control page, which requires the user password to be entered by default. The operation can only be performed if the password is correct., Please change the password in "Setting → Password Settings". Default password: 1234:



In the Parallel system, there 6 kinds of control operations through the panel operation, while in the Single system, only 45 kinds of control operations, as shown in the above figure.

Control function	Description
BatteryTest	Control UPS for manual battery test
Stop test	Stop the current test state when conditions permit
Single ups shut down	Control this UPS Shutdown
Reset alarm	When the UPS on fault mode and alarms, Control the UPS to cancel the fault and stop the alarm

Control function	Description
Self test until the power is lows	Control the UPS test until the battery voltage is lower than the set low voltage value, and then return to the state before the tes
Parallel shutdown	Control the shutdown of all UPS in the parallel system

7.3.4 UPS Setting

Select Setting in the main menu page to enter the setting page, which requires the user password to be entered by default. The operation can only be performed if the password is correct.

UPS Setting table ：

Sub-setting	Setting item	Setting content
General	Language	[English] [简体中文][Polish]
	Screen rotation	[Auto Rotate] [Horizontal] [Vertical]
	LCD brightness	[30,100%]
	Communication address	1 2 3
	Date/Time	YYYY-MM-DD HH:MM:SS
	Alarm	[Enabled][Disable]
	mode	[Enabled] [Disable]
LCD saving	Clear records	Clear all history]
Input	Input 3-1	[Enabled] [Disable]
	Input phase loss	[Enabled] [Disable]
	Bypass voltage range	+20% -20% （+20% -20%）
	ECO bypass voltage range	+10% -10% （+10% -10%）
	Bypass frequency range	2%~10% （+8% -8%）
	Mains frequency range	2%~10% （+8% -8%）
	Bypass overload	[Enabled] [Disable]
	Input reverse connection alarm	[Enabled] [Disable]

Sub-setting	Setting item	Setting
	UPS mode	[Online mode] [ECO mode]
Output	Output voltage	[208V] [220V] [230V] [240V]
	Output frequency	[Auto Detection] [50Hz] [60Hz]
	Output phase3-1	[Enabled] [Disable]
	Parallel setting	[Enabled] [Disable]
	Automatic restart	[Enabled] [Disable]
	Bus voltage	330、345、360、380V
	Output load	0: Normal 1: Motor 2: Capacitive 3: Inductive 4: Half wave 5: Remote
	Mains recovery time	0~240 seconds (0 seconds)
	Tracking frequency	0.5~2.0（1Hz/second）
	± BUS voltage	+or - 0~20 (0)
	Inverter R/S/T phase voltage	+or - 0~9 (0)
Battery	Battery pack sharing	[Enabled] [Disable]
	Automatic battery test	[Enabled] [Disable]
	Battery quantity	30、32、34、36、38、40
	Battery packs	1~10 (1)
	Charging current	1~13A（3）
	Battery type	~9 (see the table below) (4)
	Equalizing charging voltage	12V~14V (13.7V)
	Floating charging voltage	12V~14V (13.5V)
	Equalizing charging time	1~900 minutes (the time to maintain the equalizing charge voltage after the charging current is less than the floating charge conversion current) (60 minutes)
	Deep discharge protection time	0~9999 minutes (0)
Dry In/Out	Dry Contact Input Signal	[No Function] [Start Up] [Shut Down] [Maintainance]
	Dry Contact Output Signal	0: Output overload 1: Battery mode 2: Low battery voltage 3: Battery is not connected 4: Bypass output 5: UPS fault 6: UPS alarm

Password Default password 1234

Battery type No.	Model
0	12V32W
1	24AH
2	38AH
3	65AH
4	100AH
5	120AH
6	7AH
7	9AH
8	12AH
9	200AH

*When connecting external battery, please refer to the following table to reasonably set charging current and AH value.

Charging current setting table of standard battery pack			
Number of battery packs	Battery number/AH	Total AH	Setting charge current
1	1*2*16 PCS/9AH	9AH	2A
2	2*2*16 PCS/9AH	18AH	4A
3	3*2*16 PCS/9AH	27AH	6A
4	4*2*16 PCS/9AH	36AH	8A
5	5*2*16 PCS/9AH	45AH	10A
6	6*2*16 PCS/9AH	54AH	12A
*1 battery packs =2 external battery cabinet modules			

Self-configured battery charge current setting table			
Battery Unit AH	Battery number	Total AH	Setting charge current
18AH	2*16PCS	18AH	4A
26AH	2*16PCS	26AH	6A
38AH	2*16PCS	38AH	8A
65AH	2*16PCS	65AH	13A
100AH	2*16PCS	100AH	13A
120AH	2*16PCS	120AH	13A
150AH	2*16PCS	150AH	13A
200AH	2*16PCS	200AH	13A

7.4 UPS Operation

7.4.1 UPS Startup

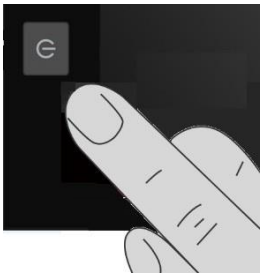
Startup preparation:

Before startup the UPS, please make sure that the wiring is securely connected to the terminal block, otherwise there is a danger of electric shock.

- Verify that the total UPS output load does not exceed the rated capacity of the UPS;
- Confirm that the UPS output device is not started;
- Make sure the UPS is reliably connected to the battery;
- Connect communication interfaces that need to be used;
- The wiring of the UPS input and output is correctly connected according to the required mode. Refer to 4.1 input/output wiring;
- The default input and output mode of the UPS is three in and three out. If it is inconsistent with the actual wiring, you need to change the parameters to the actual wiring mode;

Startup the UPS with utility power:

- Connect to the utility power;
- The fan starts to rotate, the LCD displays startup information, then enters the main page;
- UPS default bypass enable, the main page shows UPS working in bypass mode;
- Press the button for more than 1 second, the buzzer will beep and the UPS will start up. After a few seconds, the UPS enters the mains mode.



- If the utility power is abnormal, the UPS will transfer to battery mode.
- When the battery is not connected, the UPS can still be startup. After the startup, there is alarm of battery not connected. If the utility power is abnormal, the UPS load will not be protected.
- The load is powered by the UPS and the LCD shows a charging sign indicating that the battery is charging.
- Startup the output device.

Startup the UPS on battery mode (Without utility power)

When the UPS is connected to the battery, wait at least 10 seconds before pressing the power button.

The battery can be turned on or disabled. For details, see 7.3.4 Settings →Battery Setting.

Make sure all connections are correct.

- Press the button for more than 0.1 seconds. The UPS establishes the power, the fan starts to rotate, the LCD displays the startup information, and then enters the main page to display the standby mode.
- If there is no operation, the LCD is off out after 10 seconds and the UPS is powered down.
- Press the button for more than 1 second, the buzzer will beep and the UPS will startup. The UPS enters battery mode after a few seconds.

- If the utility power is connected at this time, the UPS will switch to the online mode and the output will be uninterrupted.
- UPS UPS works in battery mode, and the buzzer beep for 4 seconds to remind that the battery is discharged. To cancel the alarm, see 7.3.4 Setting →General
- Since there is no utility power input, the input abnormal alarm will be displayed on the LCD.

7.4.2 UPS Shutdown

Shutdown the UPS with utility power mode:

- UPS working with utility power, press the button for more than 0.5s, the UPS performs shutdown;
- After shutdown, the UPS works in bypass mode and the output remains powered;
- If there is no need the UPS output, disconnect the input utility power.

Shutdown the UPS with battery mode:

- Press the button for more than 0.5s, the UPS performs shutdown;
- The UPS output is interrupted and goes into standby mode. After a few seconds, the UPS automatically shuts down.

7.4.3 UPS function

- Working mode

Mode	Break time	Output frequency	PF correction
Online mode	0ms	follow the input within the allowed range	Yes
ECO mode	10ms	Fully follow the input	No

- Automatically restart/Restart battery

After the battery is exhausted, when the utility power is restored, the UPS will enter the bypass mode and charge the battery. When the user setting turns on the automatic restart function, and the

battery reaches the set restart battery power, The UPS will automatically restart.

- Short fault clearance function

This UPS has a short circuit clearing function. Once an output short circuit occurs, the UPS will maintain the rated current output for 3 seconds after 200ms. If the short circuit fault is removed within 3 seconds, it will automatically return to the normal working mode, otherwise it will switch to the fault mode. When the UPS supplies power to multiple loads, this function can be enabled to ensure the power supply of other loads by fusing the fuse through 3s high current output under single load short circuit.

- Overload warning function

Usually, the UPS will start to warn only after exceeding 105% of the rated power. However, when there is special requirements, the value can be reset. When the actual load of the UPS exceeds the set value, the UPS can send warning. To remind the user to confirm whether there is abnormal power.

7.4.4 Parallel UPS

1. General operation needs to follow the single UPS operation requirements
2. Parallel UPS startup

Startup the parallel UPS with utility power:

- After connecting to the utility power, press any UPS button in the parallel system for more than 0.5 second, all the UPS in the system will be powered on at the same time, then turn to the inverter state.
- where one UPS in the parallel system has been turned on to the inverter state, the remaining UPS is connected to the utility power, and the newly powered UPS will automatically turn to the inverter state.

Startup the parallel UPS on Battery:

- Press each UPS button to establish the working power, then just press any one of the UPS button for more than 0.5 second, other UPS will startup at the same time, all UPS will work in battery mode.
- In the case that one UPS in the system has been turned on to the inverter state, press the button to establish the working power to the other UPS, and the newly powered UPS will automatically turn to the inverter state.

3. Parallel shutdown

Single UPS shutdown:

- Press the UPS button to shut down for 0.5 seconds, and then release the button to shut down the UPS.

Parallel UPS shutdown:

- Press any UPS button for more than 4 seconds to turn all UPS of the system to bypass mode.

7.4.5 Parallel UPS Sharing battery

This product can be set to the sharing battery mode in the parallel mode, that is, multiple modules are connected in parallel, and use same battery. This operation requires professional service person to operate, please contact your supplier for service.

Under the sharing battery mode, ensure the battery capacity meets all the parallel UPS full load requirements:

- When 2 UPSs parallel sharing battery, the battery>18AH;
- When 3 UPSs parallel sharing battery, the battery>27AH.

When the battery capacity cannot meet the above conditions, please contact service person to reduce the UPS load accordingly!

8. Battery maintenance

Battery is an important part of the UPS system. The life of the battery depends on the ambient temperature and the number of discharges. Use at high temperatures or deep discharge will shorten battery life.

The UPS module does not contain battery. It is recommended to use the standard EBM in this product series. Standard EBM usage precautions:

1. The battery is a sealed maintenance-free lead-acid battery. Connect the UPS to the battery and the untility power, the battery is always charged regardless of whether the UPS is turned on or off, and the UPS provides the overcharge and over discharge protection function.
2. Battery ambient temperature should be maintained between 15-25 ° C.
3. If battery is not used for a long time, it is recommended to charge it every 3 months.
4. In normal use, the battery is charged and discharged once every 4 to 6 months, and discharged to the battery after shutdown. When used in high temperature areas, the battery is charged and discharged once every 2 months.
5. The continuous discharge time of the battery should not exceed 14 hours. Do not discharge at no load.
6. It is not advisable to replace individual batteries. Follow the instructions of the battery supplier when replacing. Follow the principle of consistent quantity and consistent model.
7. Under normal conditions of use, the battery life is 3 to 5 years. If it is found to be in poor condition, it must be replaced early. The battery must be replaced by a professional person.

9. Troubleshooting

If the UPS is not working properly, please read the fault description form and contact the supplier, and please provide the following information:

1. Product model, serial number;

Fault date; 3. Description of the fault

Fault display

Fault name	Possible cause	Solution
Bus soft start time out	Bus boost fault	Please contact your supplier
Bus high	Bus voltage high	Please contact your supplier
Bus low	Bus voltage low	Please contact your supplier
Bus imbalance	Positive and negative bus imbalance	Please contact your supplier
Bus short	Positive and negative bus short	Please contact your supplier
Inverter soft start time out	Inverter startup fault	Please contact your supplier
Phase R short Phase S short Phase T short RS short ST short TR short	Output short	Turn off the UPS, remove all loads, verify the load is not fault or short circuit. Press the button to clear the fault alarm and restart. If it fails, please contact your supplier
Phase R negative power Phase S negative power Phase T negative power	UPS detects negative power (output flow backward)	Turn off the UPS, remove all loads, and confirm that there is no fault with the load. Press the button to clear the fault alarm and restart the machine. If it fails, please contact your supplier.
Inverter overload fault Bypass overload fault	Load exceeds rated value	Redistribute the load, remove the non-critical load, and check if the load is fault
Inverter temperature high	Internal over temperature fault	Please contact your supplier

Inverter relay open	Inverter relay fault	Please contact your supplier
Inverter relay short		
Bypass SCR failure	Bypass SCR fault	Please contact your supplier
Parallel line fault	Parallel connection is abnormal	Please check if the connection is normal
Can line fault	Parallel connection is abnormal	Please check if the connection is normal
Parallel synchronous line fault	Parallel synchronization failure	Please check if the connection is normal
NTC open	Temperature sensor open	Please contact your supplier
EPO fault	EPO open	Resume EPO switch
Inverter capacitor disconnection	Inverter is damaged	Please contact your supplier
AD midpoint saturation	AD sampling offset too large	Please contact your supplier
1.65V fault	AD reference power failure	Please contact your supplier
Mains precharge timeout	Precharge fault	Please contact your supplier
Battery precharge timeout		
12V fault	12V drive voltage is lower than 10.5V	Please contact your supplier
Ambient temperature high	Ambient temperature exceed 50°C	Reduce ambient temperature
Bypass temperature high	Bypass temperature High fault	Check whether the bypass fan is normal, and remove the non critical load
Alarm display		
Mains loss	Mains input out of limit	Check the mains input wiring, switch and mains voltage frequency
N line loss	N line not connected	Confirm the N line connection
Mains phase sequence error	Abnormal mains phase sequence	Adjust the mains phase sequence
Input L N line reversed	Abnormal mains	Adjust the mains phase sequence
Bypass loss	Abnormal bypass	Check the bypass input wiring, switch and bypass voltage frequency
Bypass phase sequence error	Abnormal bypass	Adjust bypass phase sequence

Battery open	Abnormal battery	Check the battery cable
Battery under-voltage	Abnormal battery voltage	Charge the battery after the mains power is restored
Battery overcharge	Abnormal battery voltage	Please contact your supplier
Overload	The load exceeds the rated value	Remove non critical loads
Inverter fan failure	Inverter fan locked	Please contact your supplier
Maintenance switch closed	Maintenance switch closed	Resume maintenance switch
Charger fault	Abnormal charging	Please contact your supplier
Parallel address error	Abnormal parameter setting	Please set a different address for the UPS
Abnormal startup	1. The inverter soft start voltage exceeds 180V but does not meet the starting completion conditions. 2. The setting parameters of parallel system are not agreement.	Check the parallel setting parameters and restart
Parallel communication line lost	The parallel communication line is disconnected	Check the parallel communication line
Charger over-temperature	Charger over-temperature	Please contact your supplier
Bypass N loss	Abnormal bypass	Check bypass cable
Charging soft start timeout	Abnormal charging	Please contact your supplier
Bypass fan failure	Abnormal bypass fan	Please contact your supplier
Charger short	Abnormal charging	Please contact your supplier
Charge output relay stuck	Abnormal charging	Please contact your supplier
System power failure	Abnormal 12V main power supply	Please contact your supplier
Bypass power failure	Abnormal 12V auxiliary power supply	Please contact your supplier
Internal storage read/write failure	Abnormal EEPROM read/write	Please contact your supplier
Same address	Same parallel address	Assign different addresses to UPS
Uneven current in parallel	Abnormal current sharing	Please contact your supplier
Low output voltage	Abnormal output	Please contact your supplier
Inverter capacitor failure	Inverter capacitor failure warning	Please contact your supplier
UPS model is	Unknown UPS model	Please contact your supplier

abnormal		
PCF8563 failure	Abnormal RTC module	Please contact your supplier