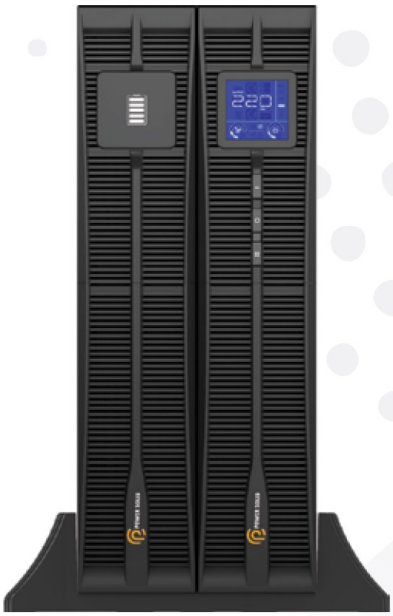
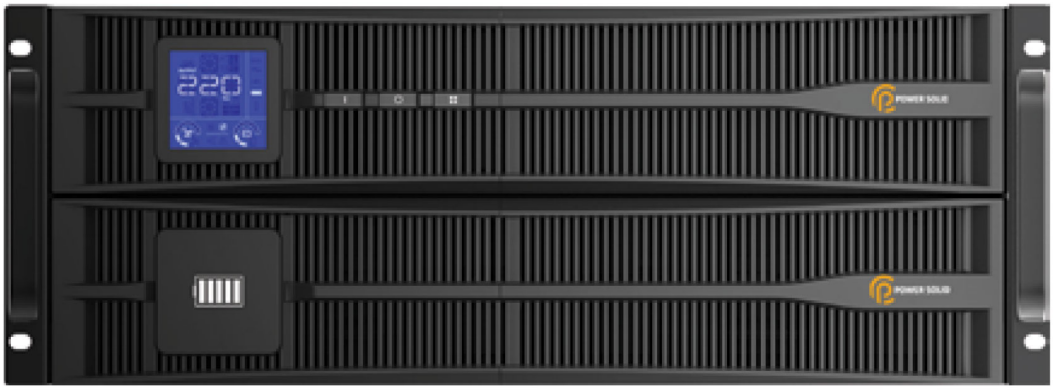
POWER SOLID



6-10 KVA
ONLINE UPS RT

PS-POU6KR#16BC9K
PS-POU10KR#16BC9K

USER MANUAL



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Foreword

Summaries

Thank you for choosing the uninterruptible power system(hereinafter referred to as "UPS")!

This document gives a description of the (6kVA-10kVA) UPS, including the features, performance, appearance, structure, working principles, installation, operation, maintenance, transportation and storage, etc.

Please save the manual after reading, in order to consult in the future.

NOTE
The figures in this manual are just for reference, for details please see the actual product.

Symbol Conventions

The manual quotes the safety symbols, these symbols used to prompt users to comply with safety matters during installation, operation and maintenance. Safety symbol meaning as follows.

Symbol	Description
DANGER	Alerts you to a high risk hazard that could, if not avoided, result in serious injury or death.
WARNING	Alerts you to a medium or low risk hazard that could, if not avoided, result in moderate or minor injury.
CAUTION	Alerts you to a potentially hazardous situation that could, if not avoided, result in equipment damage, data loss, performance deterioration, or unanticipated results.
	Anti-static prompting.
	Be care electric shock prompting.

Symbol	Description
TIP	Provides a tip that may help you solve a problem or save time.
NOTE	Provides additional information to emphasize or supplement important points in the main text.

Product standard: Q/ZZKJ 001

Contents

1 Safety Description

This chapter mainly describes the safety announcements. Prior to performing any work on the UPS, please read the user manual carefully, follow the operation and installation instructions and observe all danger, warning and safety information, which is to avoid human injury and device damage by irregular operations.

1.2 Safety Announcements

This section mainly describes the safety announcements when operation and maintenance. For details, please refer to safety description in the relevant chapters.

CAUTION

Before using the UPS, please read the announcements and operation instructions in this section carefully to avoid accident.

The promptings in the user manual, such as "Danger", "Warning", "Caution", etc. DO NOT include all safety announcements. They are just the supplement of safety announcements when operation.

NOTE

Any device damage caused by violating the general safety operation requirements or safety standards of design, production, and usage will be out of warranty range.

1.2.1 Use Announcements

DANGER

There exists high temperature and high voltage inside the UPS. When using UPS, please strictly comply with all warnings and operation instruments on the UPS and in the user manual.

CAUTION

No liquid or other object is allowed into the UPS.

CAUTION

The UPS is a class A product. When it is applied to residential building, additional measures should be taken to prevent wireless interference.

WARNING

Do not connect unbalance load, half-wave rectification load or inductive load to the output of the UPS, such as air-condition, blower, starter, electric drill, motor, daylight lamp, etc.

WARNING

In case of fire, use dry powder extinguisher to put out the fire. If you use liquid fire extinguisher, it may cause electric shock.

CAUTION

UPS must be well grounded.

1.2.2 Battery Announcements

WARNING

Only authorized professional can replace battery. When operation, take off conductive objects, such as watch, bracelet, bangle, ring, etc., wear rubber shoes and gloves and use tools with insulated handle.

- Don't put tools or other conductive objects on the battery.
- It's prohibited to connect the anode with the cathode of battery or connect them reversely, which is to avoid fire or electric shock.
- Before connecting or disconnecting the battery terminals, disconnect charging power first.
- Do not use the battery with different type, different model or different manufacturer together.
- Battery should be kept away from fire source or any electrical equipment that may easily cause spark to avoid human injury.
- Don't open or destroy the battery. The electrolyte in the battery includes some dangerous objects, such as strong acid, which will be harmful to skin and eyes. If touching the electrolyte by accident, please clean it by a lot of water immediately and then see the doctor.
- The waste battery should be disposed according to the local regulations.

1.3 Operation and Maintenance Requirements

CAUTION

Only authorized professionals are allowed to open the UPS chassis, or it may cause electric shock and the caused UPS fault is out of the guarantee range.

- If UPS needs to be moved, rewired or maintained, disconnect all electrical connection, such as AC power, battery power, etc. to isolate power input. Do not do any work on the UPS until it is powered off completely(≥10min). Otherwise, the output may have electricity, which may cause electric shock.
- When dismantling fan, do not put fingers or tools into the rotating fan to avoid device damage or human injury.

1.4 Working Environment Requirements

- Don't install the UPS where it would be exposed to direct sunlight, in rain or in moist environments.
- Don't install the UPS where it is with conductive metal dust or nearby heater.

- Generally, the working temperature of the UPS is -5℃～+40℃ and the relative humidity is 0%RH～95%RH with no condensation(The recommended working temperature is 20℃~25℃ and the recommended relative humidity is about 50%).
- Put the UPS in the flat floor without vibration and the vertical gradient is less than 5° . Keep good ventilation around the UPS. The clearance between the rear or the side of UPS and adjacent devices or wall should be at least 300mm～500mm. Poor ventilation will rise temperature inside the UPS, which will reduce the working life of inner components and then affect the working life of UPS.
- The recommended altitude is lower than 1000m. If exceeding 1000m, it needs to decrease the rated power according to GB3859.2-93 to use.

2 Overview

This chapter mainly describes the model meaning, features, structure and working principle, etc.

2.2 Product Intro

The (6kVA-10kVA) UPS are with all high frequency, pure online, double-conversion, intelligent features. They are the perfect power security for file server, enterprise server, center server, micro-computer, concentrator, telecom system, data center and others that require high quality power protection. They are widely applied to the many key business areas, such as post, finance, network, stock, railway, etc.

This series UPS includes 2 power models:6kVA, 10kVA. 6kVAand 10kVA both have long backup model and standard backup model, and 10kVA include single model and parallel model.

The product features is as follows.

Intelligent RS232 communication

By the RS232standard data port and UPS power management software, it can realize the three remote function between the computer and UPS, monitor the running and electrical data of the UPS on the computer, perform ON/OFF operation remotely and it also supports SNMP network adaptor, which makes UPS be a network new member.

High input power factor

Adopt advanced active PFC technology to ease the load to power grid. It is the new generation green power.

High cost performance

Adopt many kinds of power conversations and high frequency PWM technologies, which make the UPS with high efficiency, small volume, light weight, and improves the running reliability and reduces cost.

Perfect protection

With the protection for output over-voltage, battery under-voltage, input over-voltage triple over-current, etc. and solved the problems of bad adaptability for power grid and weak shock resistance.

Low mains input voltage

Adopt the independent rapid detection technology. When the mains input voltage is 120V, which is the lower limit, the battery still doesn't discharge. Therefore, in the mains mode, all output power gets from the power grid, which is to ensure the battery still in the 100% energy storage status,and at the same time, reduce the battery discharge times and prolong the working life.

2.3 Appearance and Structure

2.3.1 Appearance

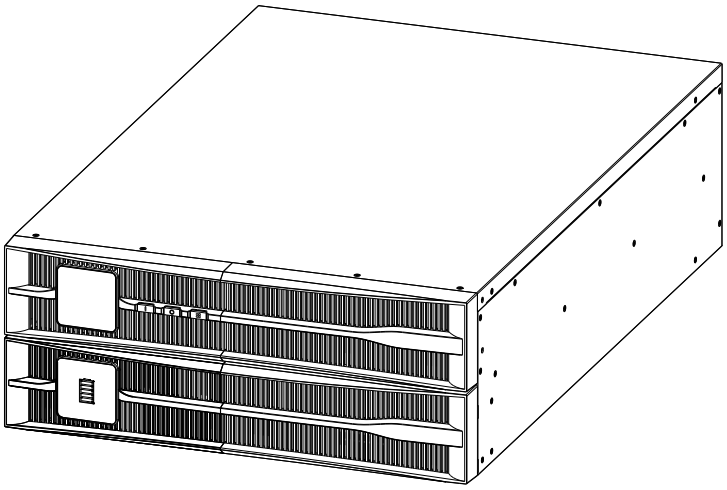


Figure2-1 UPS appearance

2.3.2 Operation Panel

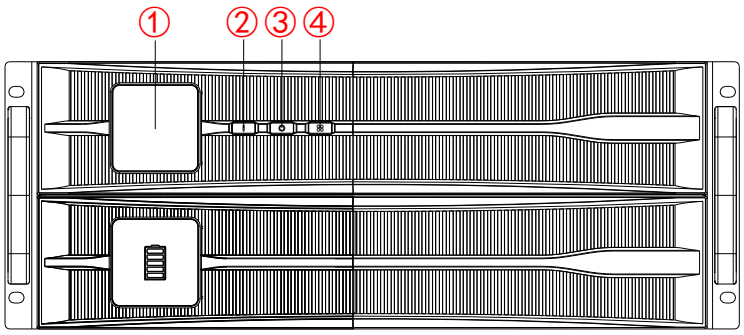


Figure2-2 Operation panel

Table2-1 The illustration of operation panel

No.	Icon	Name	Illustration
①	-	LCD	Shows the working status, battery backup capacity and fault alarm, alarm.
②	I	"ON" button	● When UPS off, long press " I " button for 1s, the UPS starts. ● When UPS on, at mains mode, long press " I " button for 3s, the UPS start to perform battery test. ● At battery mode, long press " I " button for 3s to mute the buzzer (cancel mains abnormal alarm).
③	O	"OFF" button	When UPS is on, press and hold "O" button for 1s to turn off UPS.
④	⊞	"SELECT" button	● Short press "⊞" button, the LCD shows the output voltage, output frequency, input voltage, input frequency, battery voltage, UPS temperature, output load percentage, fault information, etc. circularly. ● Long press "⊞" button for 5s, the LCD will enter setting page. Short press "⊞" to select the setting command, long press"⏻" button to confirm the command.

LCD panel

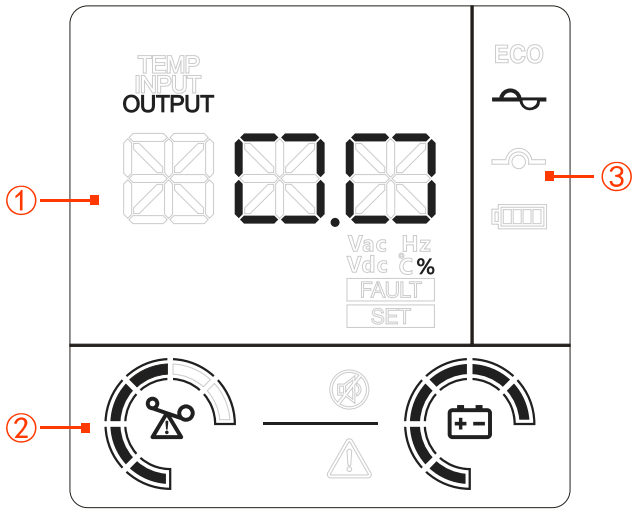


Figure2-3 LCDpanel

The illustration for the LCD panel is as shown in Table2-2.

Table2-2 The illustration of LCD panel

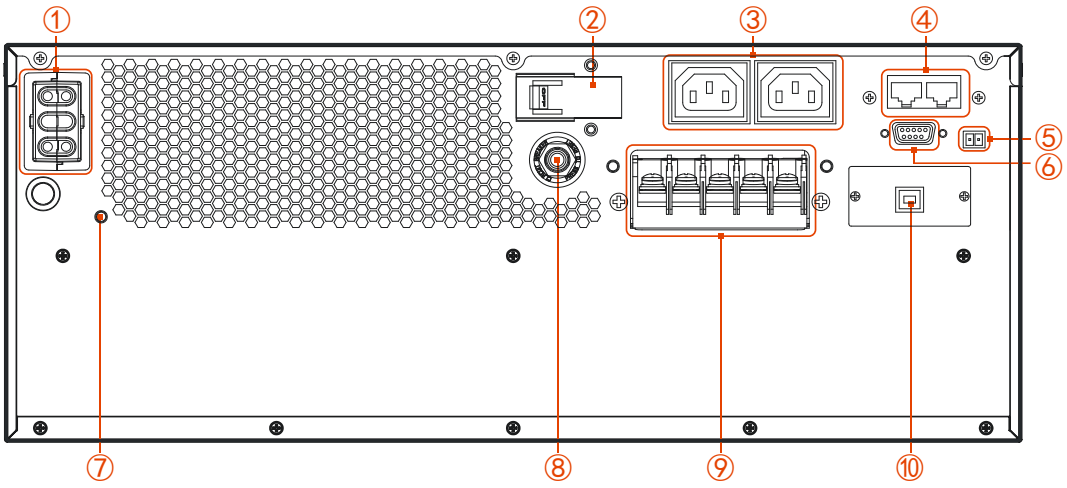
NO.	Name	Illustration
①	Running status display area	Shows the input, output, temperature, fault type and setting, etc. of the UPS.
②	Output status display area	Shows the load capacity, battery capacity, fault indication and buzzer silence, etc.
③	Work mode display area	Shows the UPS work status: mains inverter( ), bypass power supply( ), battery inverter( ), ECO (ECO)

NOTE

Fault model and corresponding dispose please seeTable4-2.

2.3.3 Rear Panel

6kVA,10kVA



① Battery expansion port ② Input breaker ③ Output socket
④ Parallel port (just for parallel model) ⑤ EPO
⑥ RS232 port ⑦ Surge protection grounding wire
⑧ Over-current protector ⑨ Wire terminal ⑩USB

Figure2-4 Rear panel of 6kVA,10kVA UPS

2.4 Communication

The (6kVA-10kVA) UPS adopt RS232 series port to communicate with PC. The corresponding pin relationship of RS232 port between UPS and PC is as shown in Table2-3.

Table2-3 The corresponding pin relationship of RS232 port between of UPS and PC

RS232 port of UPS	RS232 port of PC
9 (3)	2 (receiving end)
6 (2)	3 (transmitting end)
7 (5)	5 (grounding end)

2.5 Working Principles

When the mains is normal, the input of the UPS is converted into the ±360V steady DC voltage through PFC, which supplies power for DC/AC inverter to output steady 220V AC and charges battery at the same time. When the mains is abnormal, the battery will boost into the ±360V DC voltage for DC/AC inverter through DC/DC.

The working principles of (6kVA-10kVA) UPS is as shown inFigure2-5. The DC/AC inverter adopts half-bridge structure and the DC/DC boost adopts the quasi push-pull circuit or boost circuit. PFC is the active power factor correction circuit, CHARGER is completely isolated charger.

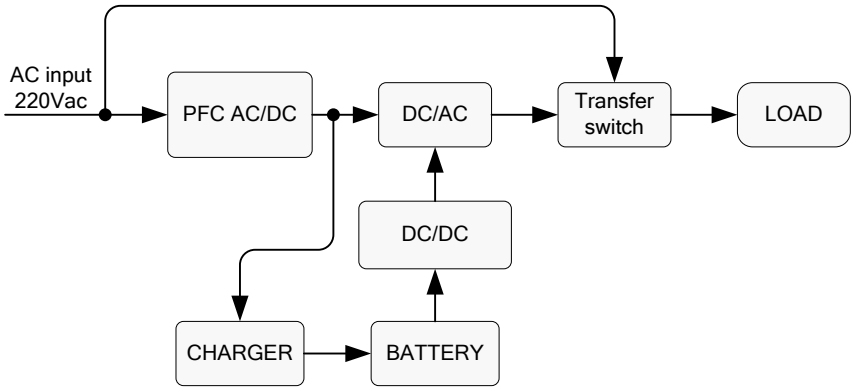


Figure2-5 Work principle of 6kVA,10kVA UPS

3 Installation

This chapter mainly describes the UPS installation, including unpacking and checking, installation preparation, electrical connection, etc.

3.2 Unpacking and Checking

Unpacking the UPS and check the following items:

- Inspect the UPS appearance and check if there is any shipping damage, if any damage is found, report it to the carrier immediately.
- Check the delivery list to see if the types of accessories are complete and correct. If there is any discrepancy, contact the distributor immediately.

3.3 Cable and Breaker Selection

3.3.1 Cable Selection

For the selection of the cross-sectional area of AC input wire, AC output wire and battery wire of the UPS, please refer to Table3-1 for the corresponding recommended value and choose upwards.

Table3-1 The recommended cross-sectional area of wire

Cross-sectional area (mm^2)		1	1.5	2.5	4	6	10	16	25
Current-carrying capacity (A)	Rubber (25℃)	8	12	20	28	42	70	96	125
	Plastic (25℃)	6	9	15	20	30	50	64	100

3.3.2 Input Breaker Selection

Add a breaker(It's recommended that the breaker is with feedback protection and bipolar disconnection function) or a power distribution box at the front of the input wire of the UPS, which matches with the UPS power, to isolate the mains. Considering the charging power of the UPS and the transient current impact when power on, the current of the selected breaker should be 1.5～2

times of the max. input current of UPS. Besides, the selected breaker cannot with the leakage protection to avoid mis-operation. The distribution box is better to be made by the professional company. The selection of input breaker refers to Table3-2.

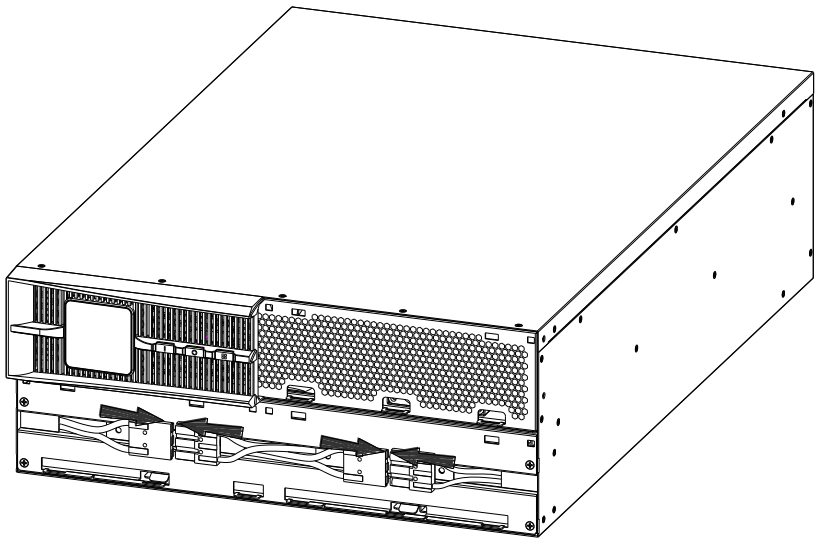
Table3-2 Recommended input breaker specification

	6kVA		10kVA	
	Max. cur.	Breaker	Max. cur.	Breaker
AC input (A)	36	50	60	100
DC input (for long backup model) (A)	39	50	65	100

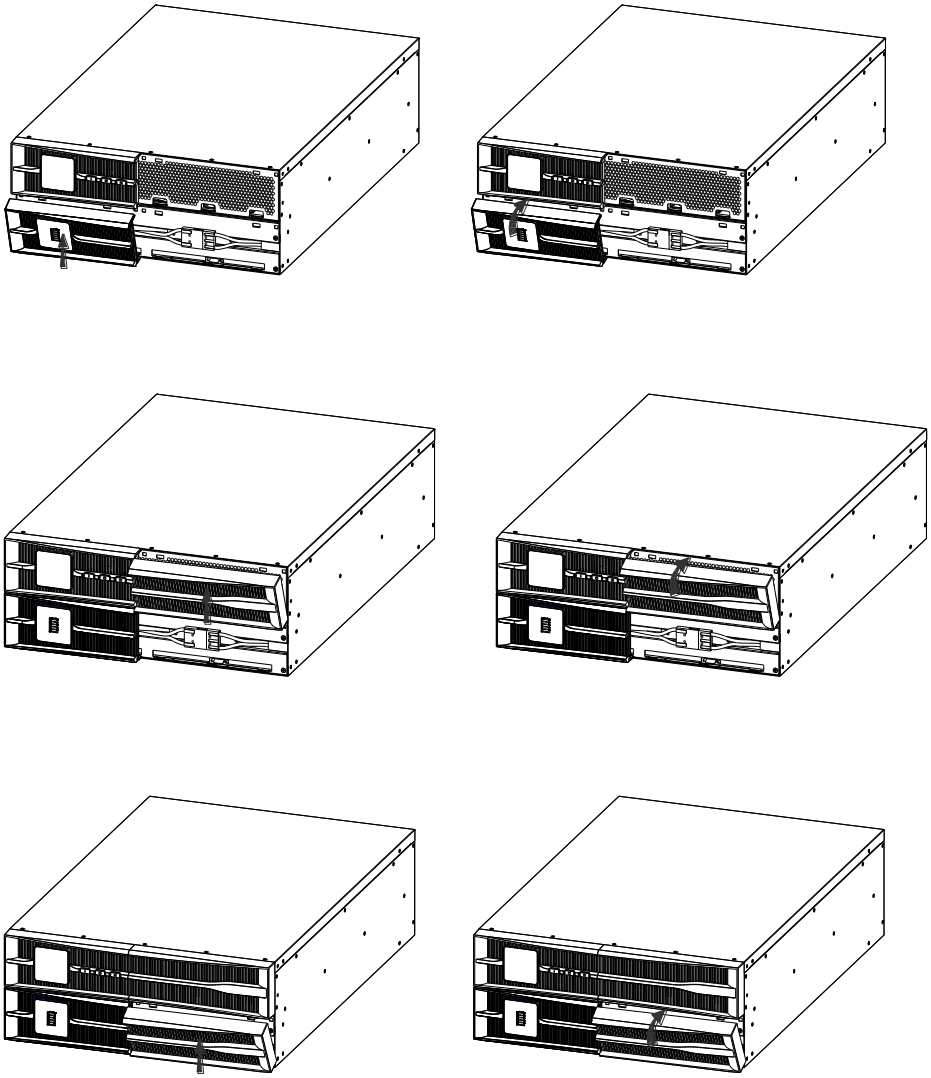
3.4 Install UPS

Rack-mounting

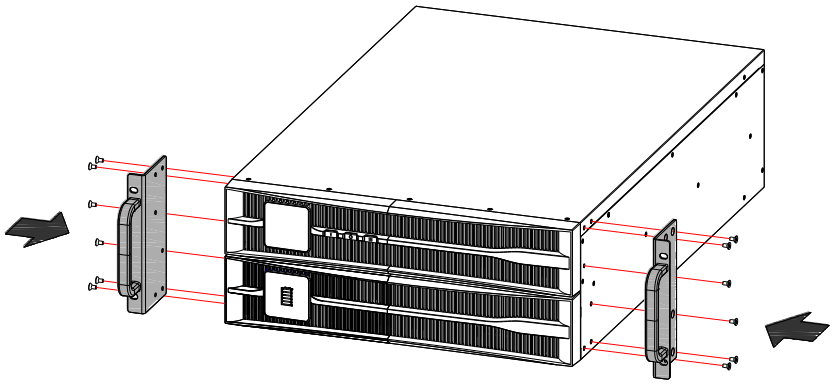
Step 1 Plug the battery wire.



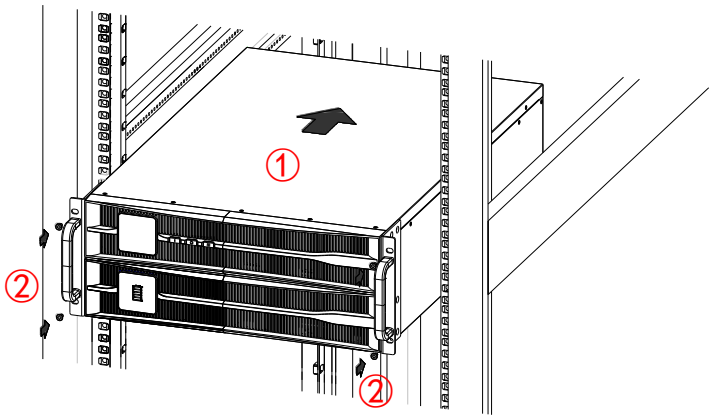
Step 2 Install the plastic panel.



Step 3 Fasten the two angle irons onto the two sides of the UPS by 6sunk screws.



Step 4 Push the UPS into the cabinet, and fasten it by screws.

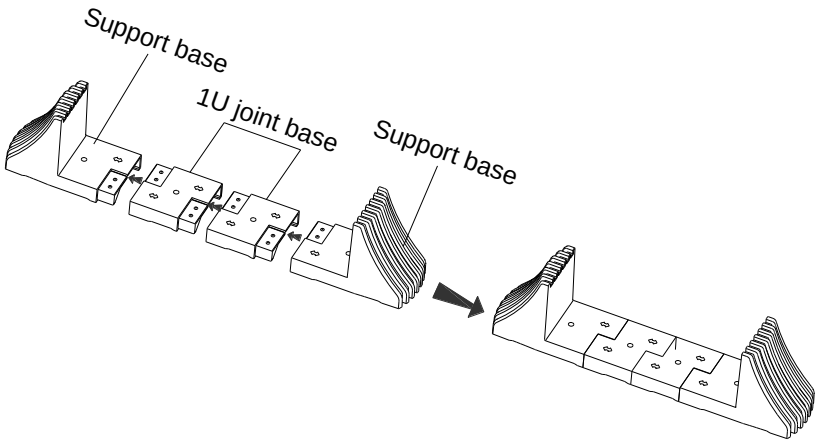


--End

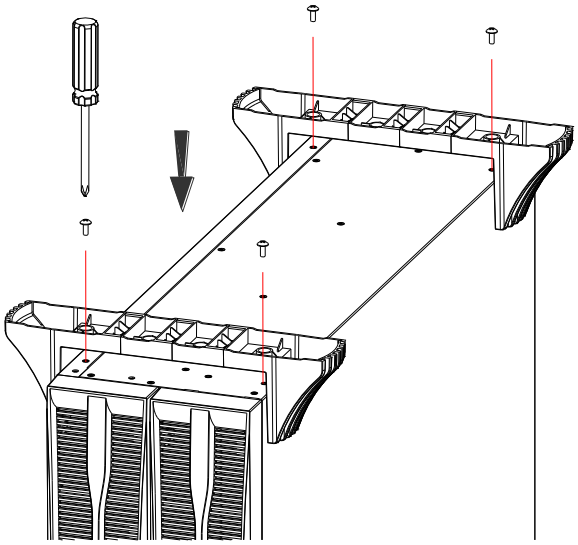
Tower-mounting

Single UPS installation

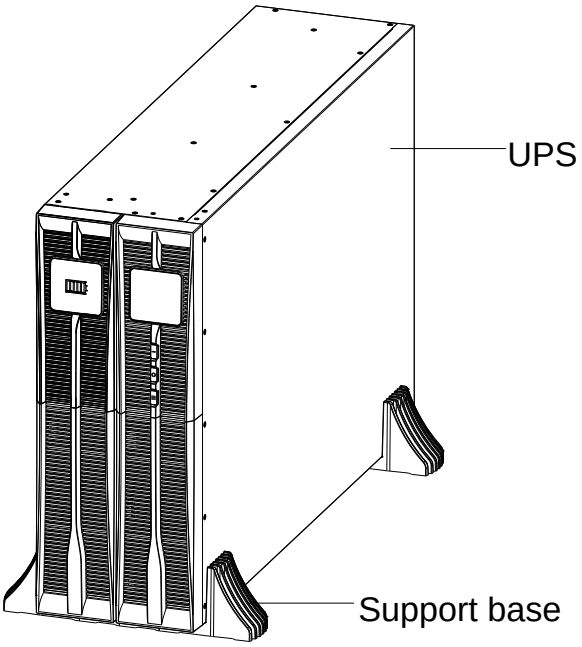
Step 1 Take out a pair of support base and 1U joint base, assemble them together, and lay them flat for the UPS tower base.



Step 2 Fix the assembled support base on UPS by screws.



Step 3 Put the UPS onto the assembled support base.



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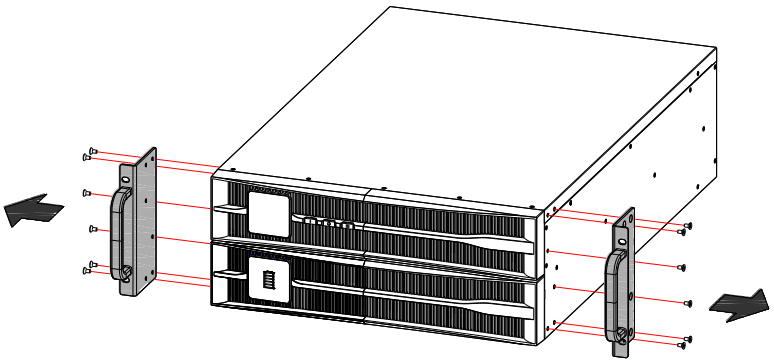
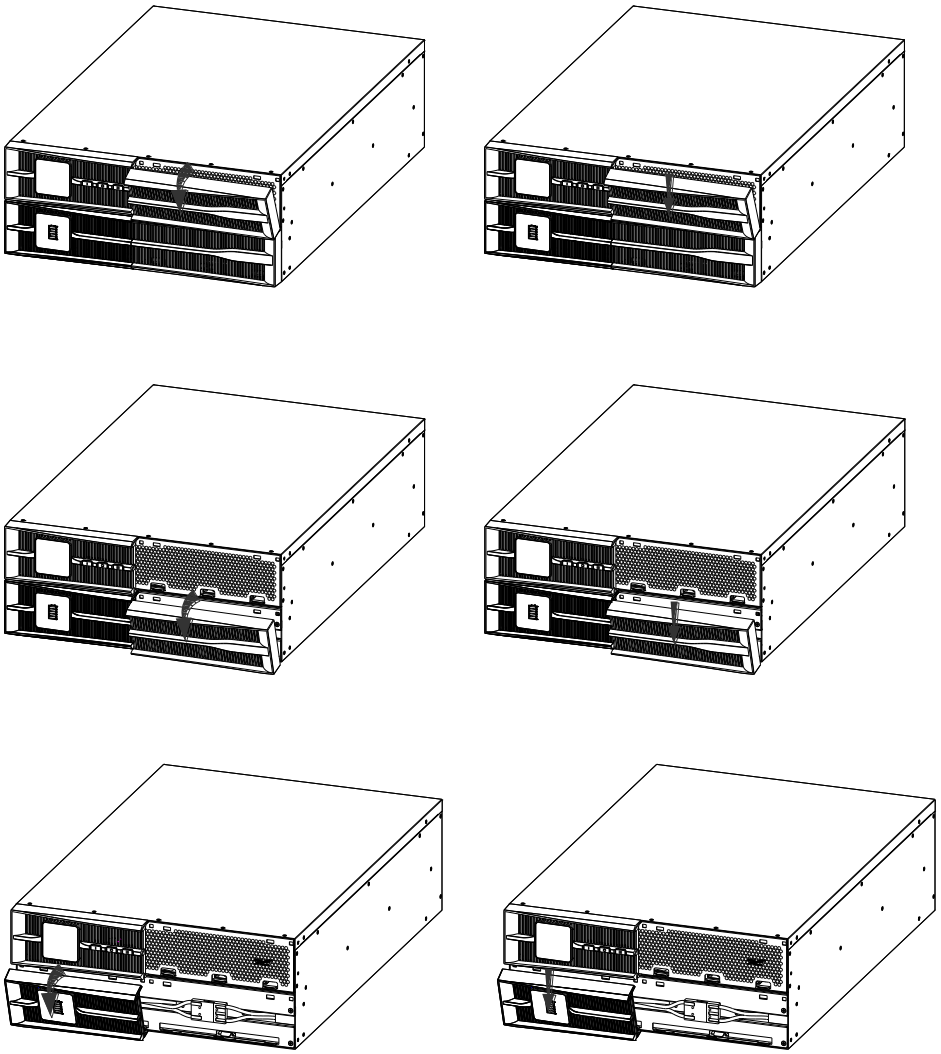
3.4.2 Battery Replacement

The battery of (6-10kVA) UPS is hot-pluggable.

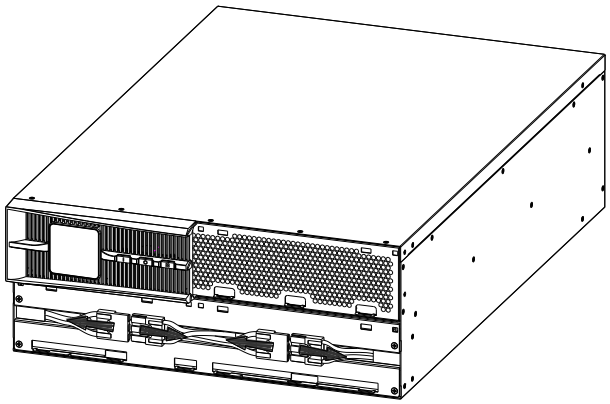
Step 1 Dismantle the two angle irons.



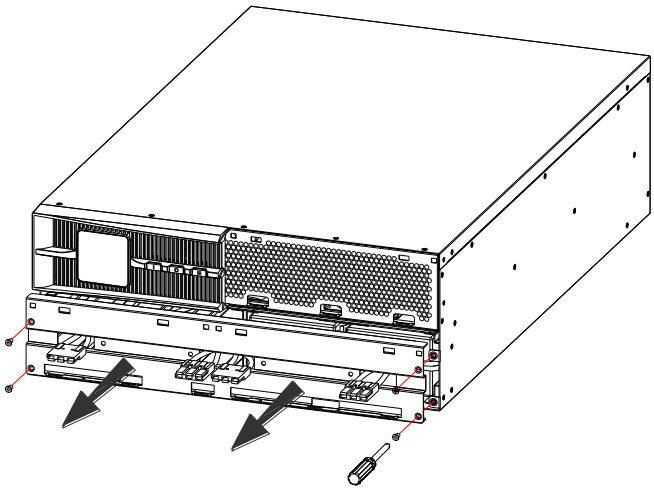
Step 2 Dismantle the plastic panel.



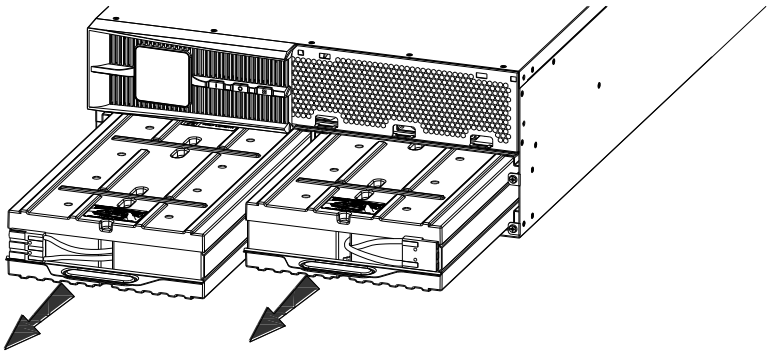
Step 3 Unplug the battery wire.



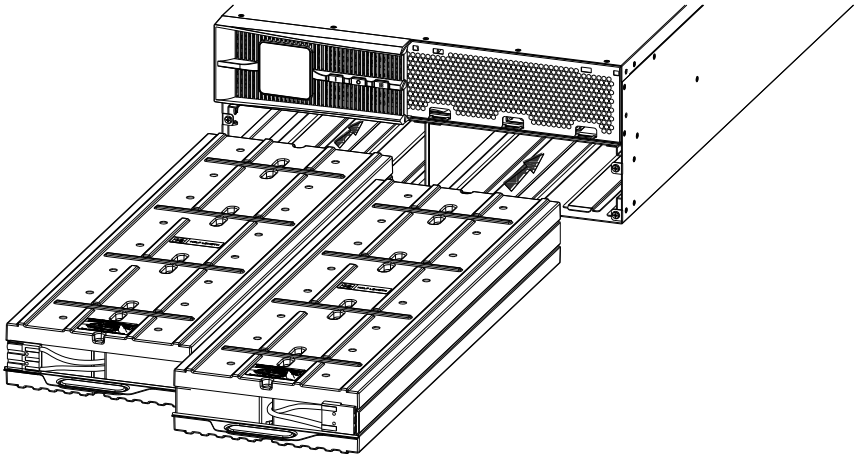
Step 4 Dismantle the battery baffle.



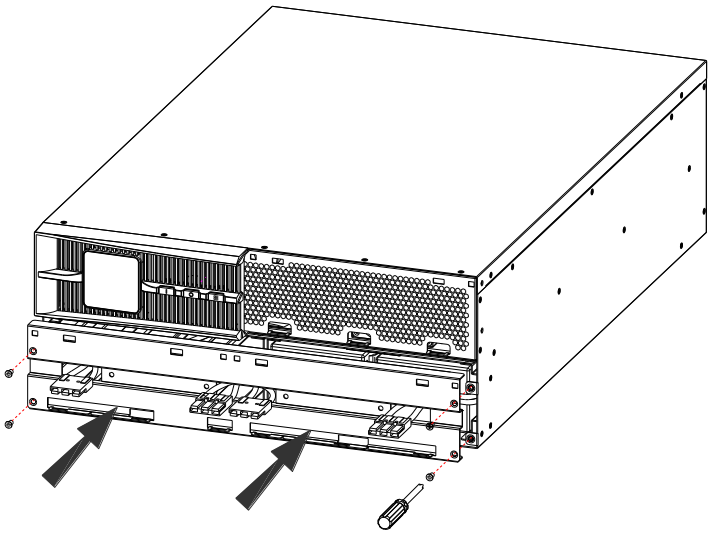
Step 5 Pull out the battery pack.



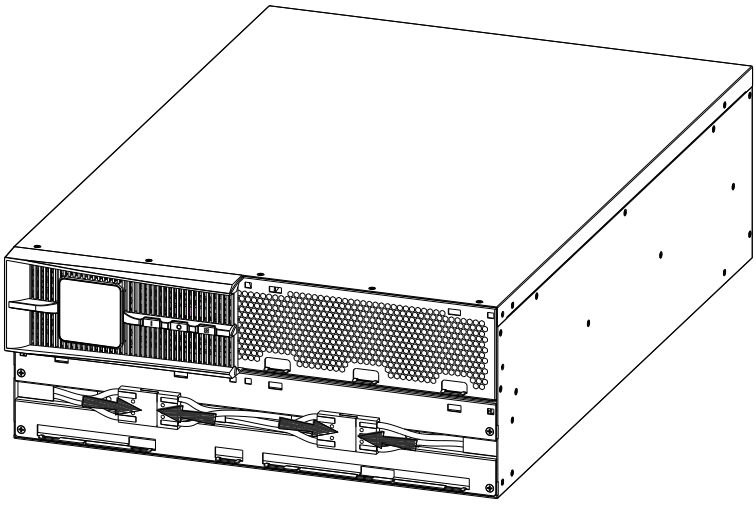
Step 6 Replace the battery pack and push the new battery pack into UPS.



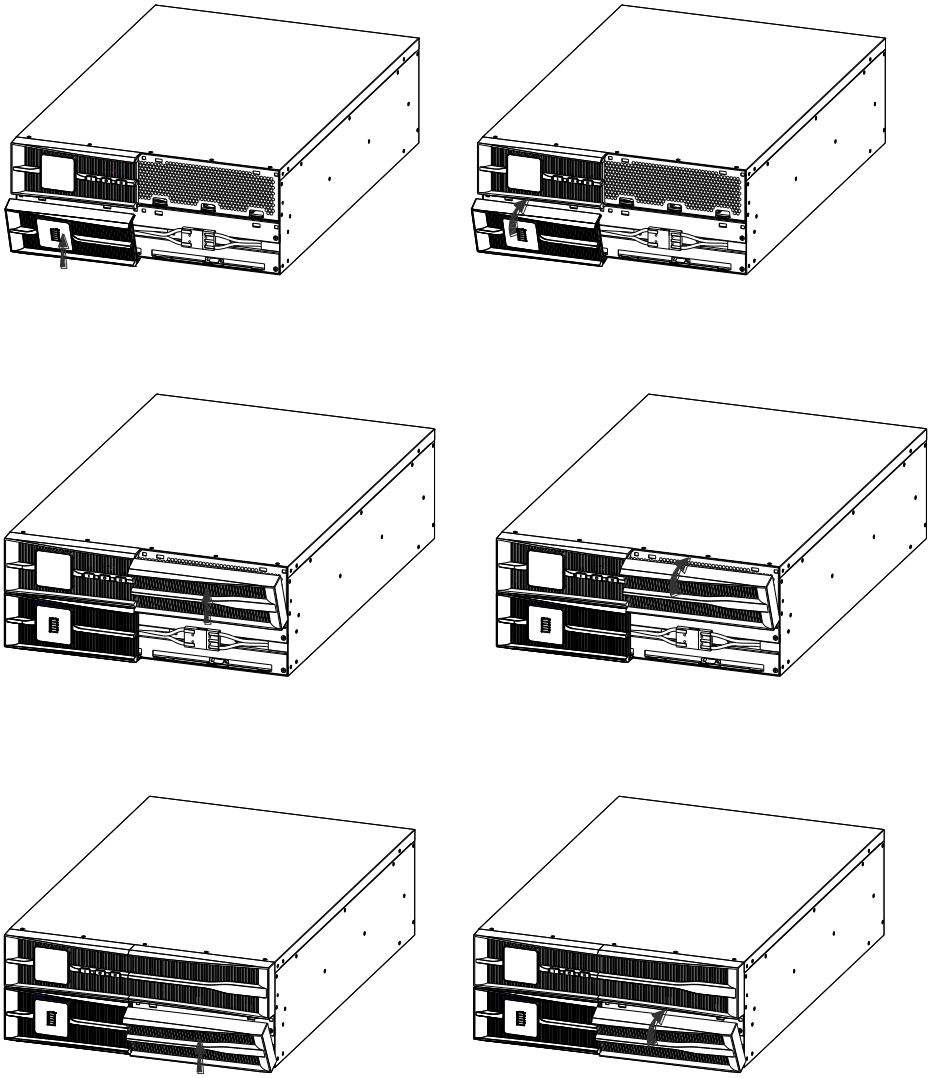
Step 7 Install the battery baffle and fasten the bolts firmly.



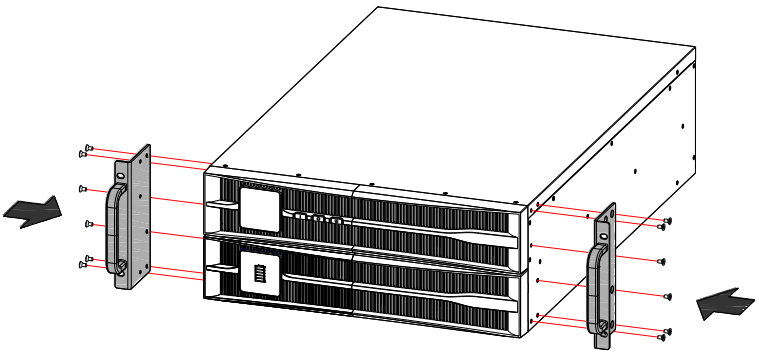
Step 8 Plug the battery wire.



Step 9 Install the plastic panel.



Step 10 Fasten the two angle irons onto the two sides of the UPS by 6sunk screws.



----End

3.5 Electrical Connection

The UPS is the rack DC power supply unit for 19inch cabinet, the battery is connected to the UPS via battery port.

WARNING

Ensure all the breakers that connect with the UPS are disconnected and after the UPS installed properly, the electrical connection can be done.

- For standard backup UPS, the backup time cannot be expanded, for long backup UPS, the backup time can be expanded on the basis of needs.
- The DC input voltage of the UPS must match the voltage of battery box.
- For long backup UPS, it also needs to connect with battery by battery expansion wire, that is to say, insert the battery plug of the battery box to the socket of the UPS.

The input and output connection of the UPS is as shown inFigure3-1.

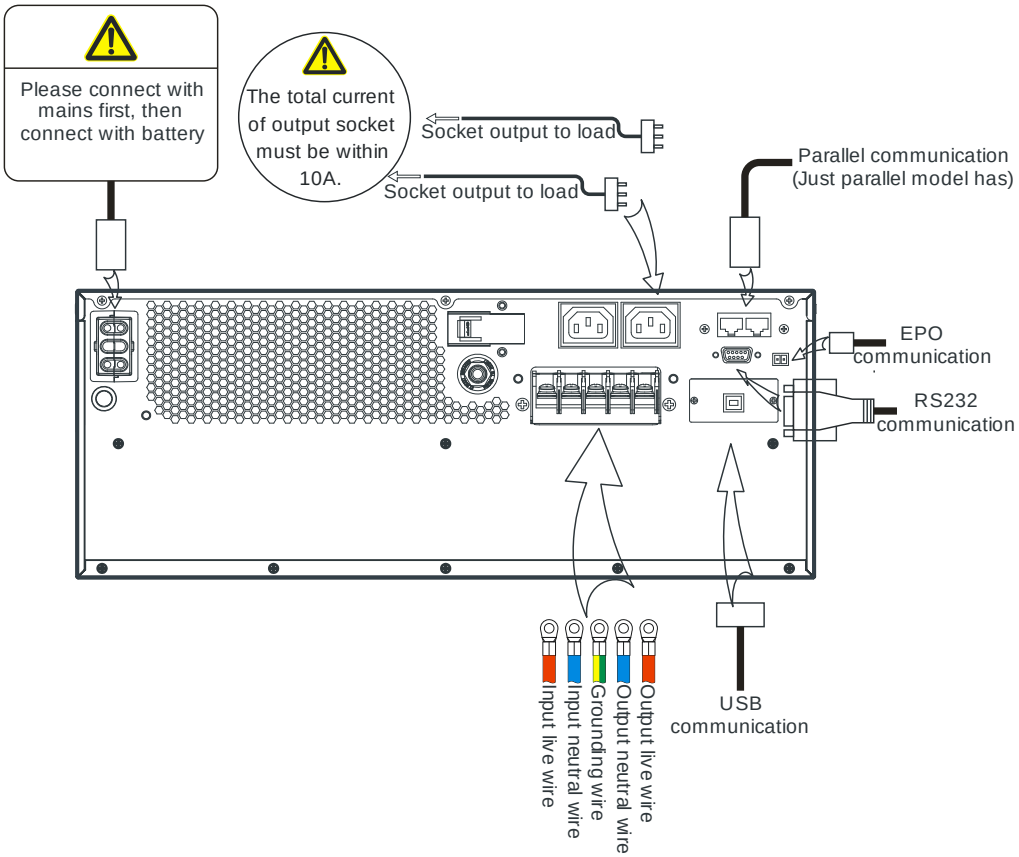


Figure3-1 Wiring diagram of 6kVA, 10kVA

CAUTION

- Mains socket should be near by the UPS and easy to operate.
- For long backup model, connect the UPS with mains first and then insert the battery expansion wire.
- Generally, the load current of each output socket should be not more than 10A.

4 Operation and Maintenance

This chapter mainly describes the operation process, operation method, daily maintenance and troubleshooting, etc.

4.1 Check Before Startup

- Check if the wire connection is firm and the color of AC wires is in accordance with the specification.
- Check if UPS is grounded reliably.
- Check if the voltage between the neutral wire and grounding wire is less than 5Vac.
- If the UPS equipped with remote monitoring device, check if the wiring of the RS232 port is correct.
- If it is long backup model, check if the wiring between UPS and battery box is correct and reliable.
- Check if the wiring is neat and the wire binding is in accordance with the specification.
- Check if the installation and wiring are good for transformation, expansion and maintenance in future.
- Check that there is no short-circuit in the output of the UPS and the load capacity isn't beyond the rated capacity of the UPS.

4.2 Startup Operation

Step 1 Insert the mains socket of the UPS or switch on the mains input breaker of the UPS.

Step 2 Press " ⏽ " button on the panel for 1s to start the UPS.

Step 3 About 10s later, if the UPS works steadily, start loads, such as PC, etc.

CAUTION

Start load according to "high power device→small power device", which is to avoid overload protection when starting high power device.

----End

4.3 Shutdown Operation

Step 1 Close load and keep the UPS running without load for about10min to exhaust heat.

Step 2 Press "⏻" button on the panel for 1s.

Step 3 Unplug mains socket or switch off the mains input breaker.

----End

4.4 Periodic Preventative Maintenance

To improve the efficiency and reliability of the UPS, perform the following maintenance regularly.

- Clean the UPS by dry cloth regularly. Don't use liquid or spray cleaner. Before cleaning, shut down the UPS.
- Check if the wiring of input and output is firmly and connect well.
- Check the working status of cooling fans regularly. Prevent sundries from blocking the air outlet. If damaged, please replace it in time.
- Check the battery voltage and the working status of UPS regularly.

4.5 Battery Maintenance

The working life of battery is based on the environment temperature and discharge times. Using battery in the high temperature for a long time or discharging battery deeply will reduce the working life of battery.

- Charging requirements of battery.

− When using battery for the first time, start UPS to charge battery for ten hours. During charging, you still can use UPS. If UPS and battery are power down simultaneously, the discharging time of battery may be lower than standard this time.

− Generally, charge and discharge battery once every four to six months. Discharging battery until 1/3 of battery capacity and charge battery. The charging time should be no less than ten hours.

− In high-temperature areas, charge and discharge battery once every two months. The charging time should be no less than ten hours.

− If battery have not been used for a long time, charge and discharge them once every three months. The charging time should be no less than ten hours.

- Clean battery shells by water-dipped cloth. Oil and organic solvents, such as petrol and diluents are prohibited.
- To avoid explosion, keep battery far away from fire sources and devices that easily generate sparks.
- When using the battery pack connected with UPS, check whether charger is OK regularly, which is to avoid battery on the overcharging status or incomplete charging status. It should avoid over discharging battery. After discharging, it should charge battery completely (The time should be less than 24h). It is prohibited that the incomplete charging battery discharges again, which will reduce the battery capacity, even damage battery.
- Press "O" button to shut down UPS which is to avoid battery discharging for a long time after mains powers down. If UPS stops working for a long time, it should charge and discharge battery periodically, which is to avoid battery damage for self-discharge.

4.6 Replacing Battery Announcements

- Don't put battery into fire to avoid explosion.
- Don't open or dismantle battery. The inner electrolyte is harmful to our skin and eyes.
- Recycle battery according to the instructions appropriately.
- Consult professionals for replacing battery.
- A new battery should be with the same capacity, model, and manufacturer as the replaced one.
- Check whether there exists dangerous voltage between battery terminals and ground before touching, which is to avoid human injury. It is prohibited to touch the battery’s two wire connectors or bare terminals for wiring simultaneously.

4.7 Troubleshooting

As shown inTable4-1, it only includes some common fault diagnosis. If any doubt, contact the local office or distributor for details.

Table4-1 Troubleshooting

Fault phenomenon	Possible reason
The mains normal. After starting the UPS, it outputs normally, but it works in the battery mode and the buzzer beeps intermittently.	1. Check if the contactors and sockets in the input circuit are in good condition; 2. Check if the displayed input voltage amplitude or frequency of mains on the LCD is beyond the allowable range of UPS; 3. Check if the over-current protector in the rear panel is sprung. If yes, press the over-current protector switch.
After installing UPS, connecting with power will fuse the fuse or cause tripping operation.	UPS output is short circuit.
After starting, the LCD display and output are normal. But once connecting with load, it will stop outputting immediately.	1. UPS is overload seriously or the output circuit is short-circuit. Please reduce load to proper capacity or find the short-circuit reason. The common reason is that the output changeover socket short-circuit or the input short-circuit after UPS damage. 2. The load is not started according to "high power device → small power device". Restart the UPS, and after the UPS works steadily, start high power load first, and then start small power ones successively.
Buzzer long beeps, fault indicator lights on, UPS works in bypass mode and inverter failure.	1. The output is overload. The load is too heavy and beyond the rated power of the UPS. Please reduce load or select a UPS with larger power capacity. If it is temporary bypass caused by impact of load start and recovers automatically ,it still is normal. 2. UPS over-temperature protection. Check if the air inlet and air outlet of UPS is blocked or the working temperature of UPS is beyond the allowable range.

Fault phenomenon	Possible reason
Usually, UPS works normally. When power failure, it doesn't transfer to battery mode or it transfers to battery mode and battery under-voltage protection soon.	1. Battery aging, the battery capacity loss. please replace battery. 2. Battery charger fault. At ordinary time, the battery cannot be charged. 3. Battery wire doesn't connect well or the terminals contact is bad.
When the load is PC, everything works normally. When power failure, UPS works normally, but the computer system halted.	The grounding connection is not so good. The floating voltage between the neutral wire and the grounding wire is too high.

Table4-2 The meaning of fault symbol and buzzer status

Fault symbol		Buzzer status	Meaning
Fault info. page (page up or page down by " ▪▪ " button)	EPO	Long beep	UPS has emergency protection(if equipped with EPO function), Bypass output and inverting output are all closed.
	BUS	Long beep	The inner bus bar voltage fault, the inverting output is closed.
	TMP	Long beep	UPS is over-temperature protected, the inverting output is closed. Please check if cooling fan is damaged or air vents are blocked.
	FAN	Rapid beep (Alarm once about every 0.5s)	Fan fault alarm prompting, the inverting output is going to protect. Please check if cooling fan is damaged or blocked.
		Long beep	Fan fault protection. The inverting output is closed.
	OUT	Long beep	Output fault, please check if output is short-circuit or the load is too large.
	BAT	Long beep	Battery fault, battery voltage too low or too high protection.

Fault symbol	Buzzer status	Meaning
Load energy bars “25% ～ 100%, overload”all flicker	Rapid beep (Alarm once about every 0.5s)	Output overload alarm. The output is going to close, please reduce load.
Load energy bars “overload” light on	Long beep	Output overload protection, the output has been closed.
Load energy bars “short circuit” light on	Long beep	Output short circuit, the output has been closed.
Battery energy bar “25% ～ 100%, over-voltage” all flicker	Slow beep (Alarm once about every 2.0s)	Battery voltage is too high. Please check if battery or charger failure.
Battery energy bars “under-voltage” flickers	Rapid beep (Alarm once about every 0.5s)	Battery is about to run out. Please pay attention to protect the load and save the data of the PC.

NOTE

The above information is for user to know about some common fault diagnosis when UPS failure. If it may be inner components failure, please contact the professional.

A Technical Specifications

A.1 6kVA, 10kVA

Index \ Model		6kVA	10kVA
Input	Voltage range(V)	When the voltage within the range of 176Vac～275Vac, the UPS can bear 100% full load; When the voltage within the range of80Vac~176Vac, the load carrying capacity linear decreases according to the input voltage amplitude.	
	Frequency range(Hz)	50/60±10%(50/60 self-adaption)	
	Input way	Sine-wave	
	Battery voltage(V)	192 (default) (can be set to 12~20 cells *12V by communication)	
Output	Capacity(VA/W)	6000/5400	10000/9000
	Voltage (V)	220±2% (default) (can be set to 208/220/230/240)	
	Frequency(Hz)	50/60±0.2%(battery mode)	
	Wave form	Sine-wave	
	Voltage distortion	THD <1%(linear load); THD<4%(non-linear load)	
	Power factor	0.9(at the room temperature, the power factor can be 1.0, and the UPS can carry load normally)	
	Transfer time(ms)	0	

Index \ Model			6kVA		10kVA	
	Overload capacity	Low overload for10min	6900VA/6210W＜ Load≤7800VA/7020W		11500VA/10350W＜ Load≤13000VA/11700W	
		Medium overloadfor30s	7800VA/7020W ＜ Load≤9000VA/8100W		13000VA/11700W ＜ Load≤15000VA/13500W	
		Heavy overload for 500ms	Load＞9000VA/8100W		Load＞15000VA/13500W	
Mechanical part	Size(W×D×H) (mm)		438×660×173			
	Weight(kg)		62		64	
Others	Backup time		5~20min(full load/ half load)	For long backup model, it can be configured any backup time according to needs	1~15min(full load/ half load)	For long backup model, it can be configured any backup time according to needs.
	Charge recovery time		For standard model, the charge recovery time is less than 10 hours. For long backup model, the charge recovery time is determined by the capacity of external battery pack.			
	Communication interface		RS232 port			
	Panel display		LCD shows the running status of the UPS.			
	Alarm function		Alarm for battery low-voltage, mains abnormal, UPS fault, output overload.			
	Protection function		Protect for battery under-voltage, overload, short-circuit, over-temperature, input over-voltage			
	Noise (dB)		<55			
	Work temperature(℃)		-5 ~40			
	Relative humidity		0 ~ 95%, non-condensation			

- Specifications are subject to change without prior notice.

B Acronyms and Abbreviations

A

AC	Alternating Current

D

DC	Direct Current

E

ECO	Energy Control Operation
EPO	Emergency Power Off

L

LCD	Liquid Crystal Display

R

RS232	Recommend Standard232
RS485	Recommend Standard485

S

SNMP	Simple Network Management Protocol

U

UPS	Uninterruptible Power System

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