

# UPS IST3-J

(1-3kVA) Series

*User Manual*





# Foreword

## Summaries

Thank you for choosing UPS of AEC International!

This document gives a description of the 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.

## Suitable Model

- IST3-J | 1 kVA
- IST3-J | 2 kVA
- IST3-J | 3 kVA

## 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.

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Symbol	Description
	Alerts you to a high risk hazard that will, if not avoided, result in serious injury or death.
	Alerts you to a medium low risk hazard that could, if not avoided, result in moderate or minor injury.

Symbol	Description
	Alerts you to a low risk hazard that could, if not avoided, result in minor injury.
	Anti-static prompting.
	Be care electric shock prompting.
	Provides a tip that may help you solve a problem or save time.
	Provides additional information to emphasize or supplement important points in the main text.

Product standard: IEC 62040

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# 1 Safety Description

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

## 1.1 Safety Announcements

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



Before attempting to operate device, please read safety announcements and operation instructions in this section carefully to avoid accident.

The promptings in the user manual, such as "Danger", "Warning", "Caution", etc. don't include all safety announcements. They are just only the supplement of safety announcements during operation.

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 **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.

### 1.1.1 UPS Announcements

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** CAUTION**

The input voltage and output voltage of device are dangerous high voltage. Touching high voltage will endanger human life. Before attempting to install or operate device, carefully read this manual and pay attention to all warning signs in the device. Only authorized professionals are allowed to dismantle power device.

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** DANGER**

Device damage or device failure may cause electric shock or fire!

- Before attempting to operate device, check that there is no damage or other potential danger in the device visually.
  - Check that other external devices or circuit connection is safe.
- 

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** DANGER**

During a thunderstorm, don't perform high voltage operation, AC power operation or operations in the tower or mast. Besides, in order to avoid device struck by lightning, for the atmosphere will generate a strong electromagnetic field during a thunderstorm, it should prepare lightning protection and grounding system in time.

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** WARNING**

Don't connect with unbalance load, half-wave rectification load or inductive load in the output of UPS, such as air-condition, blower, starter, electric drill, motor, daylight lamp, etc.

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 **WARNING**

Don't connect ground wire and neutral wire, live wire and neutral wire reversely to avoid short circuit.

Device should be grounded well and the voltage between ground wire and neutral wire should be less than 5V.

---

 **WARNING**

Don't put finger or tool into rotating fans to avoid human injury or device damage.

---

 **WARNING**

In case of fire, please use dry power fire extinguisher. If using liquid fire extinguisher, it may cause electric shock.

---

 **CAUTION**

Make sure that there is no object in the air inlet, air outlet, as well as in the front of fans to keep device with good ventilation.

---

 **CAUTION**

No liquid or other objects are allowed to enter device.

---

 **CAUTION**

The device is level A UPS! When it applies to residential building, additional measures should be took to inhibit the harassment.

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## 1.1.2 Battery Announcements

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** CAUTION**

It should use specified battery! Non-specified battery will damage UPS.

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The required charging voltage of different brands and different types of battery are different. Before using battery, ensure that the charging voltage of UPS is suitable for battery. If any doubt, please consult manufacturer for support.

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** WARNING**

Battery operation must be performed in accordance with battery instructions, especially battery wiring. Irregular operation will cause battery damage, even human injury.

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- It is prohibited to connect battery+ with battery-. The wiring for battery must be tightened. It is prohibited to touch any two wiring terminals of battery or the bare terminals for wiring simultaneously, or it may cause battery damage or human injury.
- Prevent electrolyte leaking from battery, or the metal objects and circuit board will be corroded by overflowing electrolyte, which will cause device damage and circuit board short circuit.
- Battery should be placed far away from fire and all electrical equipments which easily cause sparks to avoid human injury or unnecessary loss.

## 1.1.3 ESD Protection

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** CAUTION**

To prevent human electrostatic damaging sensitive components on the circuit board, before touching sensitive components, please wear a anti-static ring, and well connect the other end of the anti-static ring to ground.

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## 1.1.4 Grounding Requirements



High leakage risk! Before performing electrical connection, device must be grounded. The grounding terminal must be connected to ground.

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- When installing device, it must be grounded first. When dismantling device, the grounding wire must be dismantled at last.
- Don't damage the grounding conductor.
- Device should be connected to the protective earth permanently. Before attempting to operate device, check the electrical connection to ensure that device has been grounded reliably.

## 1.1.5 Measurement When Power On



There has dangerous high voltage in the device. If touching device accidentally, it may cause electric shock. So, when performing measurement when power on, it must take protection measures(such as wear insulated gloves, etc.)

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The measuring device must meet following requirements:

- The range and operation requirements of measuring device meets site requirements.
- The connections for measuring device should be correct and standard to avoid arcing.

## 1.2 Operation Announcements

There exists high temperature and high voltage inside UPS. During installation, operation and maintenance, please comply with the relevant safety regulations and operation procedures to avoid human injury or device damage. The safety announcements mentioned in the user manual is only as a supplement to the local safety regulations.

 **CAUTION**

The operation and wiring for UPS should be performed by qualified person, which is to ensure that the electrical connection meets the related standards.

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The installer should be trained strictly, know all kinds of safety announcements and get right operation methods before performing installation, operation or maintenance.

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 **DANGER**

Don't mount and dismantle power wires before switching off power switch. Besides, ensure that wires, wire labels are in accordance with the practical installation before performing wiring.

---

 **WARNING**

Touching high voltage or line directly or through damp objects will lead to lethal risk.

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- Only authorized professionals are allowed to open UPS! The input and output of UPS are dangerous high voltage. Touching high voltage will lead to lethal risk.
  - Before maintenance, please disconnect AC power and battery to isolate power input and measure the output terminal bars by a voltmeter to ensure that the input power is disconnected and in a safe condition.
  - Even if all external power are disconnected, there still exists residual charge inside UPS, and the output terminal bars may exist high voltage which may endanger human life. It is necessary to set UPS aside for enough time ( $\geq 10$  min) to release all charge before dismantling UPS.
  - As the battery doesn't isolate with AC input, there may exist dangerous voltage between battery terminal and ground terminal. The battery pack should be insulated when installing or using it for high voltage hazard concern.
  - Do not wear conductive objects, such as watches, bracelets and rings during operation.
  - The installer should have the operation qualification of high voltage and AC power. Maintenance and repair for power system only can be done by qualified persons.
-

- High leakage risk! Before performing electrical connection, device must be grounded. The grounding terminal must be connected to ground.



Don't drill holes in the device! Inappropriate drilling will damage components inside device. Metal debris generated by drilling entering device will lead to circuit board short circuit.

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Any change of system configuration, structure or components will affect UPS performance. If the user wants to make any change, please consult manufacturer in advance.

## 1.3 Operation Environment Requirements

Operation environment makes a certain difference in the life span and reliability of device. So, please avoid using device in following environment:

- The place where the operating temperature and relative humidity are beyond technical specifications (Generally, the operating temperature is  $-5^{\circ}\text{C}\sim 50^{\circ}\text{C}$  and the relative humidity is 0%-95%).
- The place where it is exposed to direct sunshine or in rain.
- The place where it is with vibration or impact.
- The place where it is dust, corrosive material, salt or burnable gas.
- The place where it is in the poor ventilation or closed place.

## 2 Overview

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

### 2.1 Product Intro

The IST3-J series (1K-3K) 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, mirco-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.

The AEC IST3-J series (1K-3K) UPS are with the single-phase AC input and single-phase AC output.

#### 2.1.1 Model Meaning

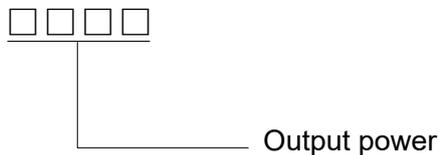


Figure2-1 Model meaning

The model meaning of AEC IST3-J series (1K-3K) UPS is as shown in Figure2-1. "□□□□" means the output power. When "□□□□" is "1000", it means the output power is 1kVA. When "□□□□" is "3000", it means the output power is 3kVA.

#### 2.1.2 Features

##### Intelligent RS232 and USB communication

Through RS232 or USB standard 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 UPS on

the computer, perform ON/OFF operation remotely and support SNMP network adaptor (external, connect with UPS through RS232 port), which makes UPS be a network new member.

### High input power factor

Adopt the advanced active PFC technology, which eases load in the power grid. It is the new generation green power.

### High cost performance

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

### Perfect protection

Equipped with the functions, such as output over-voltage protection, battery under-voltage protection, input over-voltage protection, triple over-current protection, etc. and solve the problems of the high frequency UPS, such as poor adaptability in the power grid and weak anti-impact ability.

### 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 is still in the 100% energy storage status, reduce the battery discharge times and prolong the working life.

## 2.2 Appearance

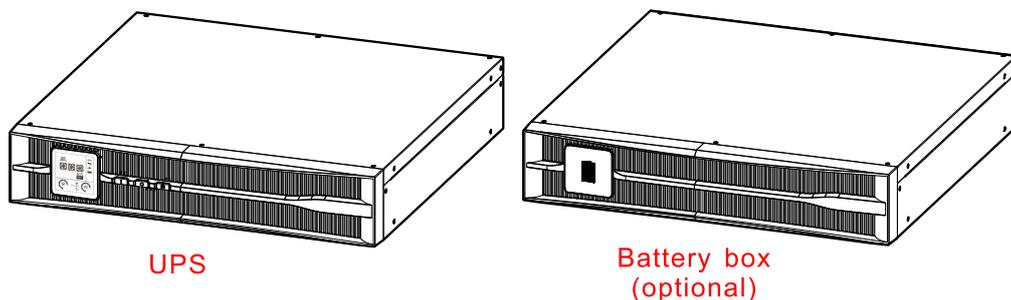


Figure2-2 Appearance of IST3-J 1kVA

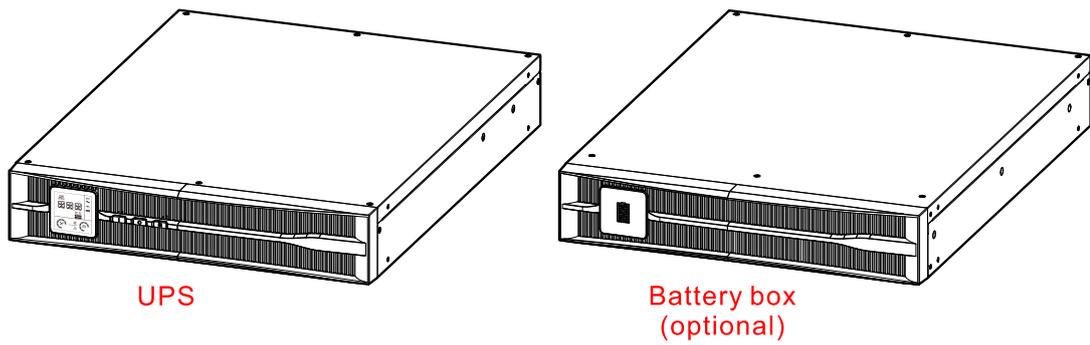


Figure2-3 Appearance of IST3-J 2kVA/ IST3-J 3kVA

### 2.2.1 Operation Panel

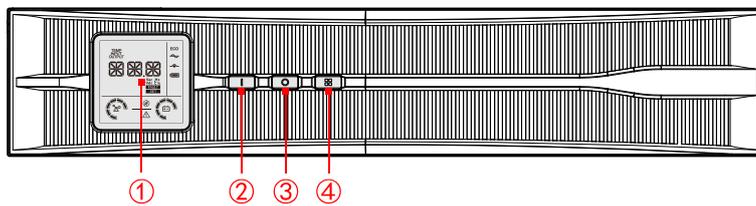


Figure2-4 Operation panel of AEC IST3-J series (1K-3K)

UPS Table2-1 The illustration of operation panel

No.	Icon	Name	Illustration
○,1	-	LCD	Display the working status and setting of UPS.
○,2	⏻	"ON" button	<ul style="list-style-type: none"> <li>When UPS is off, press and hold "⏻" button for 1s to turn on UPS.</li> <li>When UPS is on and works in the mains mode, press and hold "⏻" button for 3s to do the battery test.</li> <li>When UPS is on and works in the battery mode, press and hold "⏻" button for 3s to silence the buzzer(cancel the mains abnormal alarm). Then press and hold "⏻" button for 3s again to cancel silence.</li> <li>When UPS is on and works in the battery mode and with battery low-voltage alarm, press and hold "⏻" button for 3s to silence the buzzer. Then press and hold "⏻" button for 3s again to cancel silence..</li> </ul>
○,3	⏻	"OFF" button	When UPS is on, press and hold "⏻" button for 1s to turn off UPS.

No.	Icon	Name	Illustration
○,4	■ ■	"SELECT" button	<ul style="list-style-type: none"> <li>● Press "■ ■" button to transfer the display information, such as output voltage, output frequency, input voltage, input frequency, battery voltage, inner temperature, load percentage, fault information, etc.</li> <li>● Press and hold "■ ■" button for 5s to enter the set page. Then press "■ ■" button to transfer the setting information, such as ECO/INV mode, TWR/RCK(TWR: tower-mounting; RCK: rack-mounting) mode (the default setting is RCK mode), the charging current that is 1A/2A/3A/4A/5A/6A/7A/8A (the default setting is 1A) or the inverting output voltage that is 208V/220V/230V/240V (the default setting is 220V), and press "   " button to confirm the setting.</li> </ul>

LCD panel

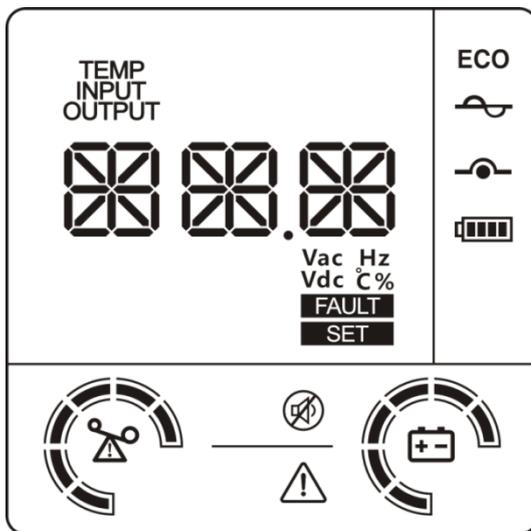
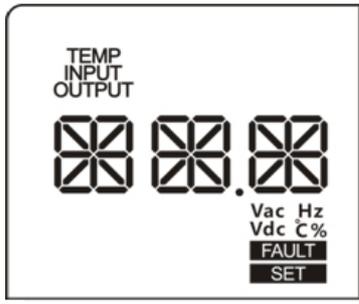


Figure2-5 LCD panel (rack-mounting display way)

Table2-2 The illustration of LCD panel

No.	Icon	Illustration
1		It shows input voltage, input frequency, output voltage, output frequency, load percent, temperature, fault code, parameters or working mode, etc.
2		UPS works in the mains mode
3		UPS works in the bypass mode
4		UPS works in the battery mode
5	<b>ECO</b>	UPS works in the ECO mode
6		Buzzer is in the silence status
7		UPS failure

### 2.2.2 Rear Panel View

IEC type (eight IEC outlets)

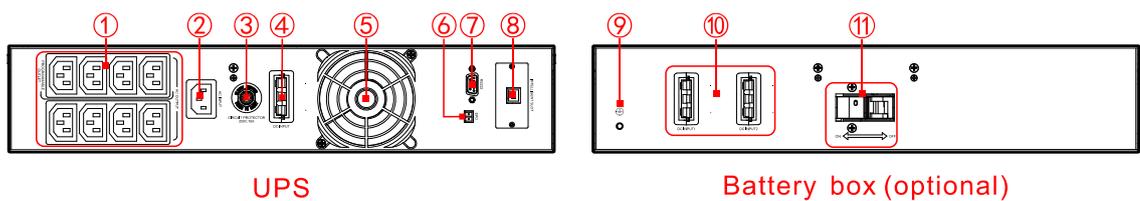


Figure2-6 Rear panel of IST3-J 1kVA

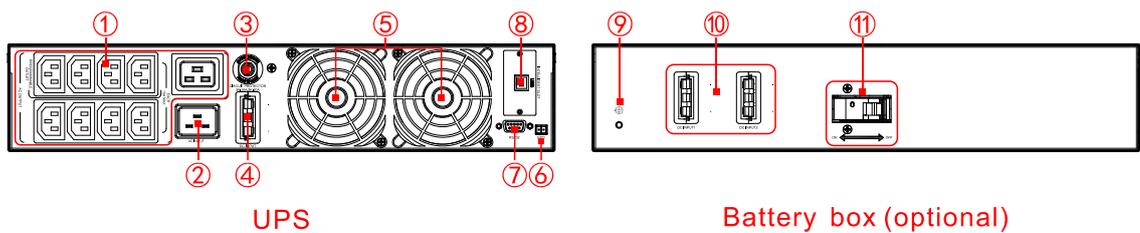


Figure2-7 Rear panel of IST3-J 2kVA / IST3-J 3kVA

IEC type (six IEC outlets)

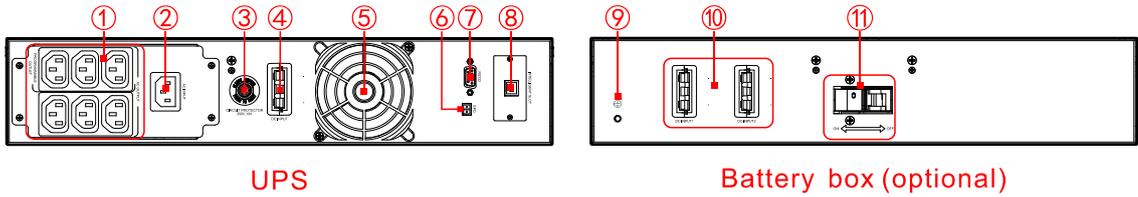


Figure2-8 Rear panel of IST3-J 1kVA

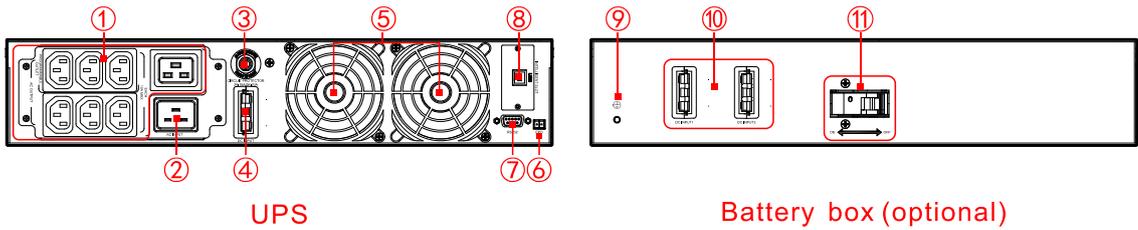


Figure2-9 Rear panel of IST3-J 2kVA / IST3-J 3kVA

Schuko type

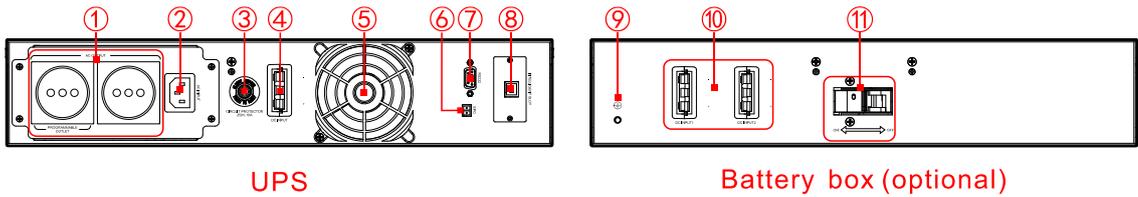


Figure2-10 Rear panel of IST3-J 1kVA

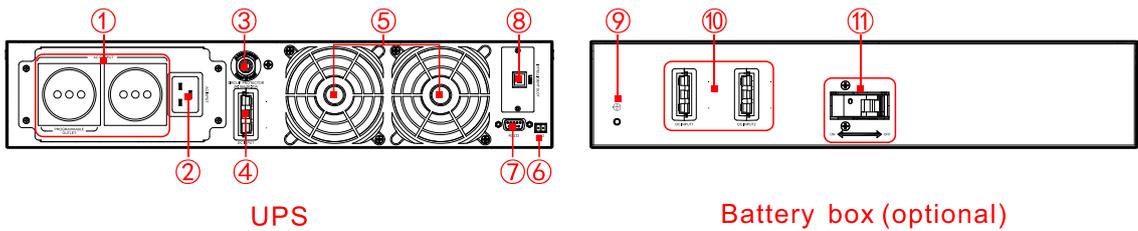


Figure2-11 Rear panel of IST3-J 2kVA / IST3-J 3kVA

UK type

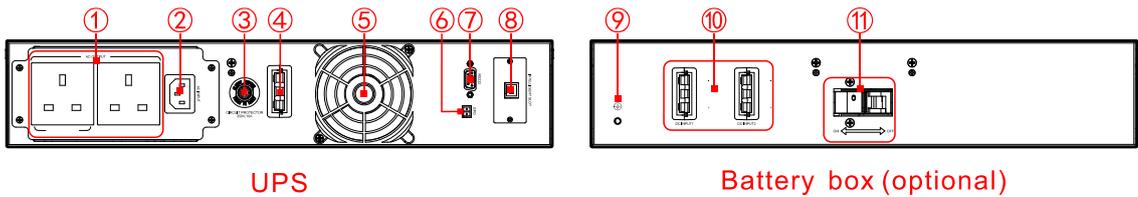


Figure2-12 Rear panel of IST3-J 1kVA

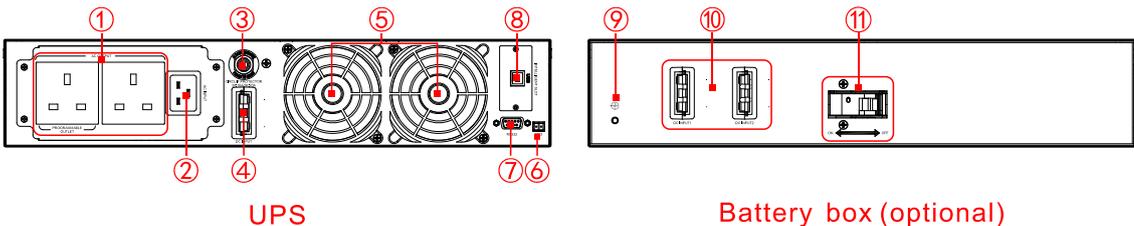


Figure2-13 Rear panel of IST3-J 2kVA / IST3-J 3kVA

Universal type

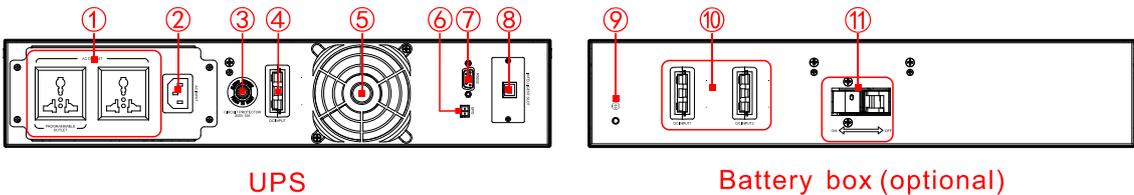


Figure2-14 Rear panel of IST3-J 1kVA

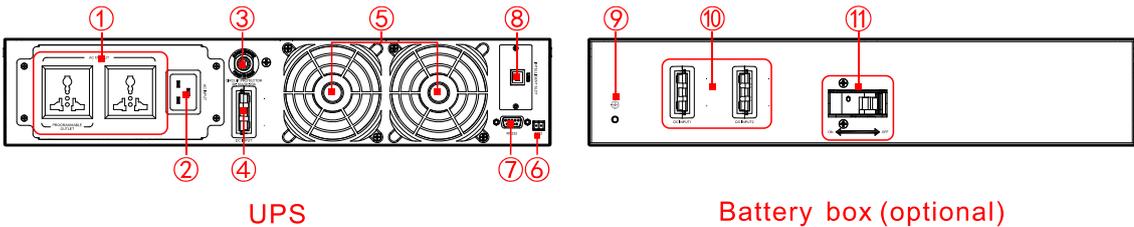


Figure2-15 Rear panel of IST3-J 2kVA/ IST3-J 3kVA

Table2-3 The illustration of rear panel

No.	Illustration
○,1	Output outlet <ul style="list-style-type: none"> <li>● General outlets: connect to critical loads.</li> <li>● Programmable outlets (optional) :connect to non-critical loads.</li> </ul>
○,2	Input outlet
○,3	Over-current protector
○,4	External battery port
○,5	Cooling fan
○,6	EPO connector

No.	Illustration
○,7	RS232 communication port
○,8	Intelligent slot <ul style="list-style-type: none"> <li>● Standard: USB.</li> <li>● Optional: RS485+dry contact, protocol transfer card, SNMP card, and cover.</li> </ul>
○,9	Battery grounding port
○,10	Battery input
○,11	Battery breaker

### 2.2.3 Intelligent Slot

#### RS485 and dry contact(optional)

The pin sequence and pin definition of RS485 and dry contact is as shown in Figure2-16 and Figure2-17.

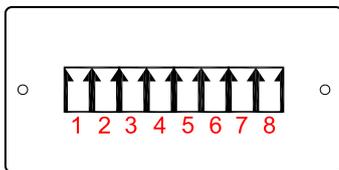


Figure2-16 RS485 and dry contact

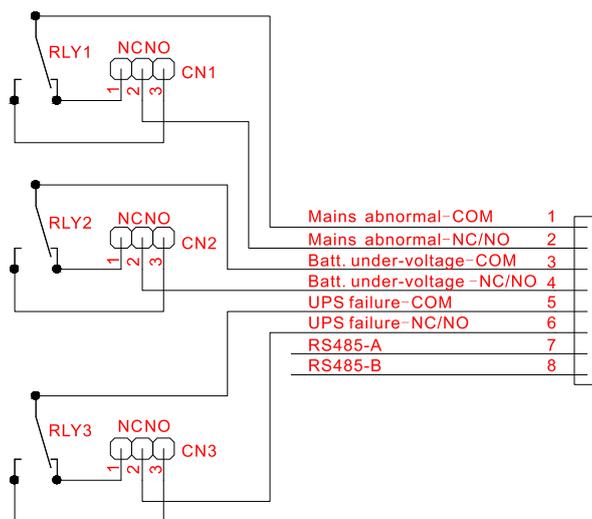


Figure2-17 Pin definition of RS485 and dry contact

The illustration of dry contact is as below:

1. CN1, CN2, CN3 determine that dry contact output signal is normal open or normal close. In default, dry contact output signal is normal close, that is PIN1 connects with PIN2. If one route signal needs to set to normal open, connect PIN2 with PIN3.
2. The requirements for input signal of dry contact: the voltage should be less than 60Vdc or 42Vac RMS and the current should be less than 1.25A.

### Protocol transfer card (optional)

The pin definition of protocol transfer card is as shown in Figure2-18 and Table2-4.

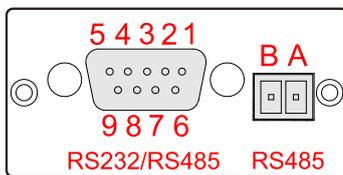


Figure2-18 Protocol transfer card

Table2-4 The pin definition of protocol transfer card

Pin	Definition	Pin	Definition
9	RS232_RX	3	RS232_TX
8	/	2	RS232_RX
7	GND	1	RS485A1
6	RS232_TX	A	RS485_A2
5	GND	B	RS485_B2
4	RS485B1	/	/

#### NOTE

1. The user can choose the RS232 and RS485 of DB9 port according to the requirements. Do not use the RS232 and RS485 of DB9 port at the same times.
2. The RS485 port is reserved for lithium battery communication.

### SNMP card (optional)

SNMP card is installed in the UPS to realize the UPS remote management, as shown in Figure2-19.

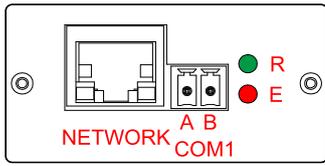


Figure2-19 SNMP card

Table2-5 The illustration of SNMP card

Name	Remark
NETWORK port	NETWORK port adopts RJ45 plug. The pin definition of the NETWORK port is shown in Figure2-20.
COM1 port	Connect with humidity module(RS485)
Indicator	Show working status

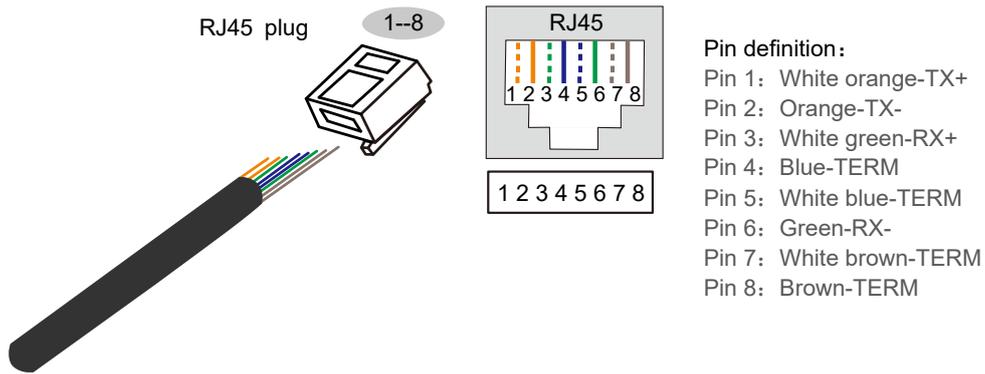


Figure2-20 The pin definition of the NETWORK port

Table2-6 The illustration of indicator of SNMP card

Green indicator (R)	Red indicator (E)	Status description
ON	ON	Start
Flicker	*	Running.
OFF/ON	*	Crash, keep final status
*	OFF	NO alarm
*	Flicker	Alarm

**NOTE**

\* means the indicator is in any status.

## 2.2.4 EPO Connector

When disconnecting two ports in the EPO connector together, UPS will close output. If it needs to recover output, connect two ports in the EPO connector and power UPS off, and then restart UPS.

## 2.2.5 RS232 Communication

The corresponding pin relationship between RS232 port of UPS and RS232 port of PC is as shown in Table2-7.

Table2-7 The corresponding pin relationship between RS232 port of UPS and RS232 port of PC

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

## 2.3 Working Principles

When the mains is normal, the input of AEC IST3-J series (1K-3K) UPS converts into the  $\pm 360\text{V}$  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  $\pm 360\text{V}$  DC voltage for DC/AC inverter through DC/DC.

The working principles of AEC IST3-J series (1K-3K) UPS is as shown in Figure2-21. The DC/AC inverter adopts half bridge structure and the DC/DC boost adopts the push-pull circuit or boost circuit. PFC is the correction circuit for active power factor.

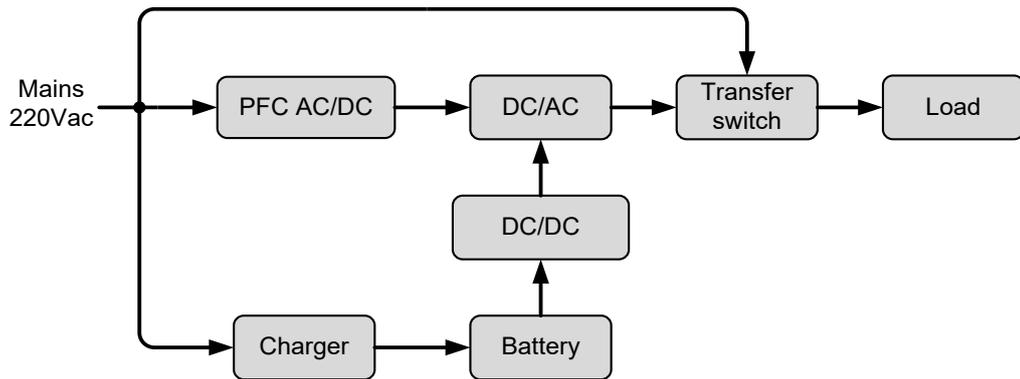


Figure2-21 Working principle

### 2.3.1 Fault Status

UPS faults include: EPO protection, busbar voltage fault, IGBT over-temperature fault, fan fault (including fan blocked, fan damage, etc.) , output fault (including output overload protection, output short-circuit, etc.) , battery fault (including battery over-voltage protection, battery under-voltage protection, etc.) , etc. The corresponding fault status displayed in the LCD (rack-mounting display way) is as shown in Figure2-22 to Figure2-27

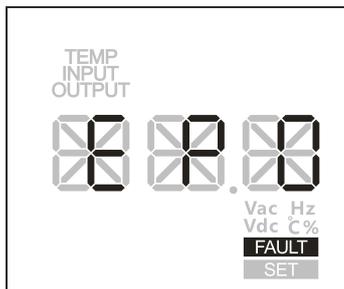


Figure2-22 EPO protection

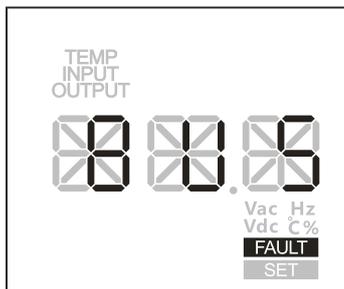


Figure2-23 Busbar voltage fault

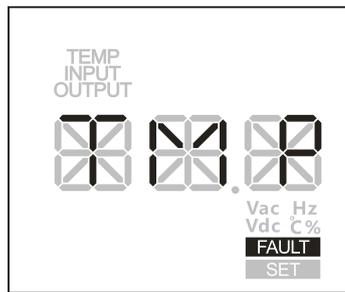


Figure2-24 IGBT over-temperature fault

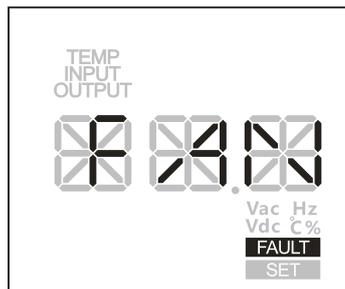


Figure2-25 Fan fault

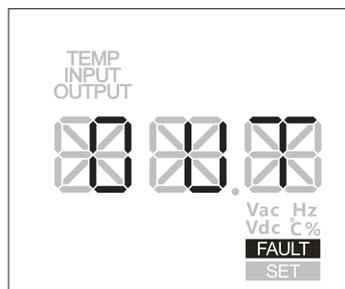


Figure2-26 Output fault

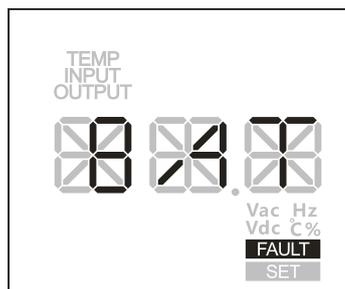


Figure2-27 Battery fault

### 2.3.2 UPS Parameters Setting (LCD)

Press and hold "■" button for 5s to enter the set page. Then press "■" button to transfer the setting information, such as ECO/INV mode, TWR/RCK (TWR: tower-mounting; RCK: rack-mounting)

mode(the default setting is RCK mode) , the charging current that is 1A/2A/3A/4A/5A/6A/7A/8A (the default setting is 1A) or the inverting output voltage that is 208V/220V/230V/240V (the default setting is 220V) and press " | " button to confirm the setting.

### ECO mode

"ECO" set page: In the set page, three characters "ECO" flicker. If you confirm the selection, press and hold " | " button more than 1s to quit the set page, the setting is successful. If you aren't sure the selection, it will quit the set page 20s later automatically. In the ECO mode, the LCD display is as shown Figure2-28.

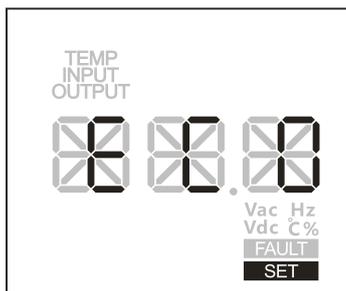


Figure2-28 ECO mode

### INV mode

"INV" set page: In the set page, three characters "INV" flicker. If you confirm the selection, press and hold " | " button more than 1s to quit the set page, the setting is successful. If you aren't sure the selection, it will quit the set page 20s later automatically. In the INV mode, the LCD display is as shown Figure2-29.

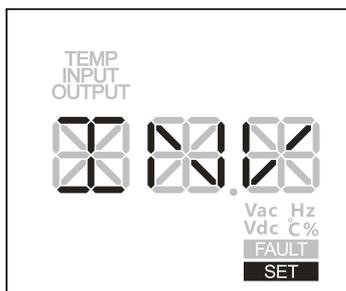


Figure2-29 INV mode

### RCK mode

The default setting is RCK mode. When LCD displays TWR mode and it has to set to RCK mode, in the set page, three characters "RCK" flicker. If you confirm the selection, press and hold " | " button

more than 1s to quit the set page, the setting is successful. In the RCK mode, the LCD display is as shown Figure2-30.

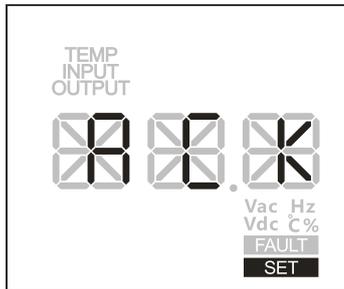


Figure2-30 RCK mode

## TWR mode

When LCD displays RCK mode and it has to set to TWR mode, in the set page, three characters "TWR" flicker. If you confirm the selection, press and hold "↓" button more than 1s to quit the set page, the setting is successful. In the TWR mode, the LCD display is as shown Figure2-31.

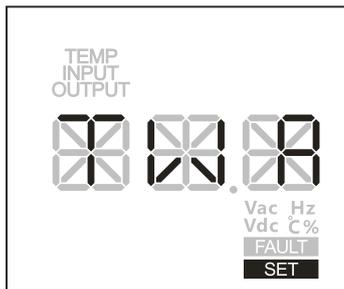


Figure2-31 TWR mode

## Charging current (optional)

If the UPS is equipped with a charging module, the charging current can be set that is 1A/2A/3A/4A/5A/6A/7A/8A (the default setting is 1A). If you want to modify the charging current, select the charging current (the recommended current is 0.1C~0.2C) based on the UPS battery amperage configuration C. If you confirm the selection, press and hold "↓" button more than 1s to quit the set page, the setting is successful. The LCD display is as shown Figure2-32.

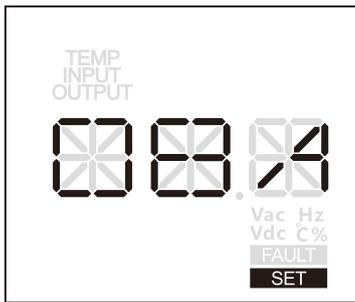


Figure2-32 Charging current

### Inverting output voltage

The inverting output voltage can be set that is 208V/220V/230V/240V (the default setting is 220V). If you want to modify the inverting output voltage, select the inverting output voltage. If you confirm the selection, press and hold " | " button more than 1s to quit the set page, the setting is successful. The LCD display is as shown Figure2-33.

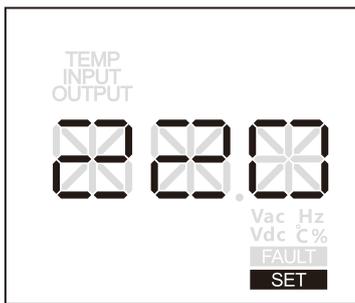


Figure2-33 Inverting output voltage

## 2.3.3 UPS Parameters Setting (PC)

### Programmable outlets backup time limits setting

Set the backup time limits through PC in minutes from 0-999 (default: 999) for programmable outlets which connect to non-critical devices on battery mode and overload condition.

### Converter mode setting

Set the converter mode to enable or disable (default) . If the converter mode is enable, set the output frequency to 50Hz or 60Hz.

## 2.4 Optional Component

AEC IST3-J series (1K-3K) UPS can be optionally equipped with battery box & programmable outlets & charging module as required.

### 2.4.1 Battery Box

- Battery box for IST3-J 1kVA: 2 groups of 3\*7AH12V battery
- Battery box for IST3-J 2kVA: 2 groups of 4\*9AH12V battery
- Battery box for IST3-J 3kVA: 2 groups of 6\*9AH12V battery

### 2.4.2 Programmable Outlets

There are two kinds of outputs: programmable outlets and general outlets. Please connect non-critical devices to the programmable outlets and critical devices to the general outlets. During power failure, you may extend the backup time to critical devices by setting shorter backup time for non-critical devices.

### 2.4.3 Charging Module (7A)

AEC IST3-J series (1K-3K) UPS can be equipped with a charging module with 7A to enhance the charging capacity of UPS, which can match battery with different amperages to ensure fast charging and prolong battery service life.

## 3 Installation

This chapter mainly describes installation, including installation announcements, installation preparation, unpacking and checking, installation procedures, electrical connection, electrical connection checking, etc.

### 3.1 Installation Announcements

As the AEC IST3-J series (1K-3K) UPS is small, it can put UPS on the flat surface directly without other fixed or installation. Keep a clearance at least 300mm~500mm around UPS and 500mm on the top of UPS, which is good for operation or maintenance or heat dissipation. Keep UPS with good ventilation. In the room temperature(20℃), the working life of battery is the longest. Therefore, if conditions allow, it is recommended to install air-condition. The installation announcements for UPS is as shown in Figure3-1.

- Put UPS on the flat floor (do not put it on the tilted or uneven floor) .
- Don't put objects on the top of UPS or around UPS to avoid blocking air vent. People can't sit on the top of UPS.
- Avoid putting UPS in the direct sunshine, rain or damp place.
- Don't put UPS in the place with corrosive gas.
- Don't put UPS near fire or all electrical equipments which easily cause sparks to avoid human injury or unnecessary loss.

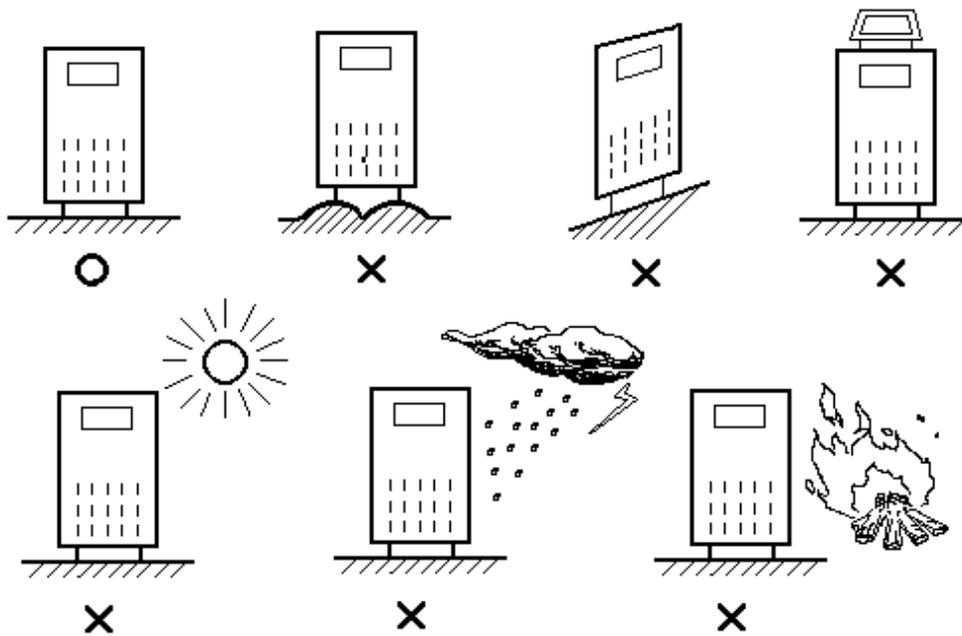


Figure3-1 Installation announcements

## 3.2 Installation Preparation

### 3.2.1 Installation Place and Environment Requirements

#### CAUTION

Before attempting to install UPS, the installation place and environment should meet the basic condition for safety and normal running. If not, please do the corresponding change. If the basic conditions are all met, install UPS.

#### Installation place requirements

- The installation place must be equipped with fire fighting equipments.
- The mains supplying power for UPS should be equipped with specified breaker or multi-functional outlets.
- It is prohibited to put flammable and explosive objects in the installation place.
- Before attempting to install UPS, it should do the grounding preparation. The Neutral-to- Ground voltage in the mains should be less than 5V.
- The construction of installation place should have been finished and the floor has been hardened. The installation place should be clean and without dust.

### Installation environment requirements

- Operating temperature: -5°C ~ +50°C.
- Relative humidity: 0%RH ~ 95%RH, with no condensation.
- Cooling way: air-cooling.
- Operating altitude: meet IEC62040-3 requirements.
- Verticality: without vibration and the vertical gradient should be not more than 5°.
- Pollution grade: grade II .

UPS should be installed in the place where is with good ventilation, proper temperature and humidity, and without dust. The recommend environment temperature is 20~25°C and humidity is about 50%.



Don't install UPS in the place with metal conductive dust. UPS is only suitable to use in the non-tropical climate conditions.

### 3.2.2 Input Breaker Selection

Add a breaker or a power distribution box in the input wire of UPS, which matches with the power of UPS, to isolate the mains. Consider the charging power of 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 should be without the power 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 Table3-1.

Table3-1 The recommended input breaker of AEC IST3-J series (1K-3K) UPS

Model	IST3-J 1kVA		IST3-J 2kVA		IST3-J 3kVA	
	Max. current	Recommended breaker	Max. current	Recommended breaker	Max. current	Recommended breaker
AC input(A)	6	10	12	20	18	32

### 3.2.3 Selection of the Cross-sectional Area of Wire

For the selection of the cross-sectional area of AC input wire, AC output wire and battery wire of AEC IST3-J series (1K-3K) UPS, please refer to Table3-2 for the corresponding recommended value.

Item		Model	IST3-J 1kVA	IST3-J 2kVA	IST3-J 3kVA
AC input (Neutral/live)	Rated current (A)		4.8	9.2	13.6
	Cross-sectional area of wire (mm <sup>2</sup> )		0.75	1.5	2.5
AC output (Neutral/live)	Rated current (A)		4.5	9.1	13.6
	Cross-sectional area of wire (mm <sup>2</sup> )		0.75	1.5	2.5
DC input	Rated current (A)		29.1	42.6	42.6
	Cross-sectional area of wire (mm <sup>2</sup> )		6	6	6
Ground	Cross-sectional area of wire (mm <sup>2</sup> )		0.75	1.5	2.5

#### NOTE

The equipped wires are with good quality and meet safety requirements, which pass international authentication and UL authentication. If user prepares wires by themselves, please refers to the recommended cross-sectional area of wire that is about 5m length listed in Table3-2. Longer wires require larger cross-sectional areas.

## 3.3 Transporting, Unpacking and Checking

### 3.3.1 Transporting



If the device weight is more than 18kg, it's recommended that carry the device by at least 2 people and wear protective equipment such as smash-proof shoes and gloves.

### 3.3.2 Unpacking and Checking

Unpacking UPS and conduct the following items:

- Inspect the appearance for shipping damage. If any shipping 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.

## 3.4 Installation Procedures

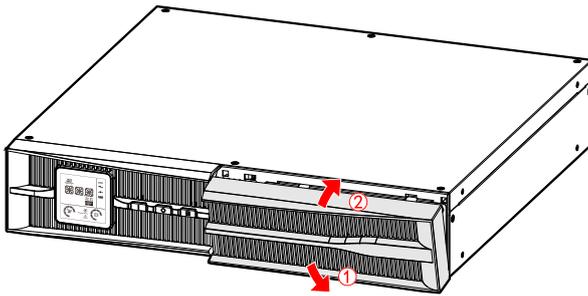
### NOTE

The UPS installation and battery box (optional) installation for IST3-J 1kVA, IST3-J 2kVA, IST3-J 3kVA UPS are similar, the following take IST3-J 1kVA for an example.

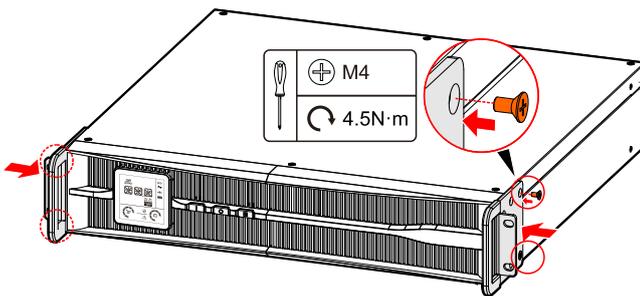
### 3.4.1 Rack-mounting

#### UPS Installation

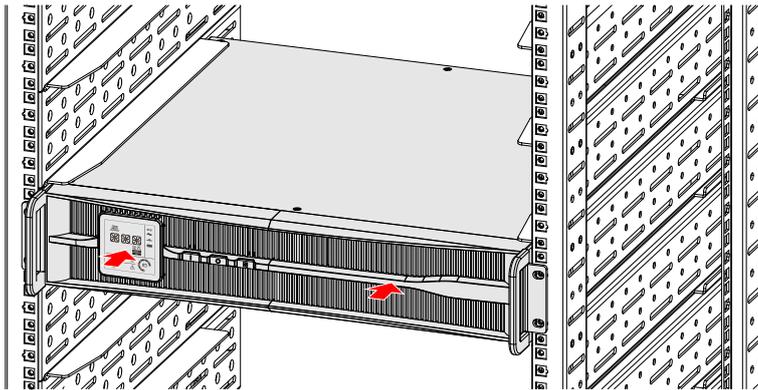
Step 1 Install the right plastic panel.



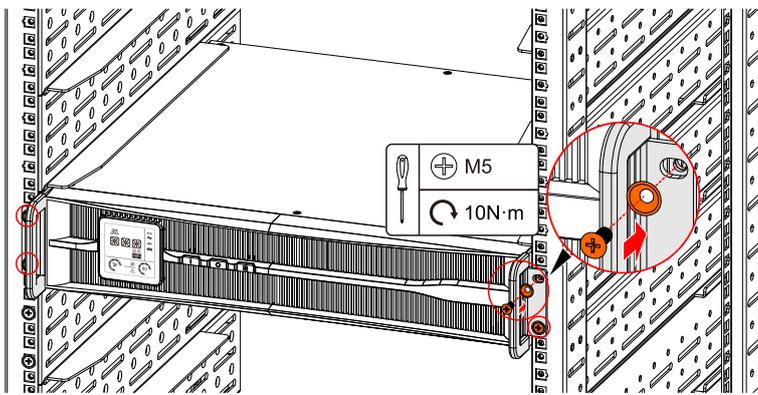
Step 2 Install two angle irons on UPS.



Step 3 Push UPS into rack.



Step 4 Fix UPS on the rack.



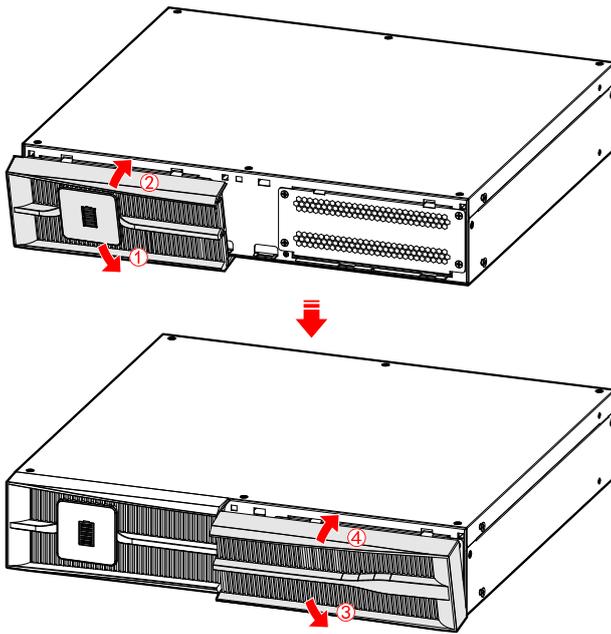
---End

### Battery box (optional) installation

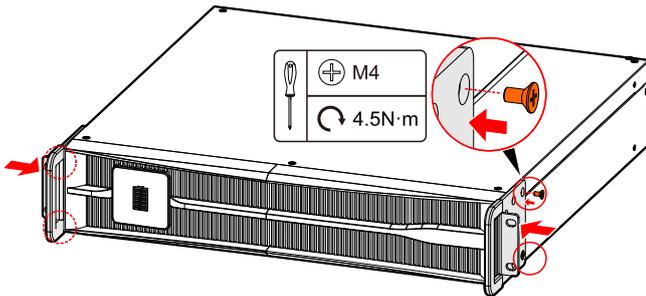
#### NOTE

When the battery box is selected, the installation procedures are the same. In this section, we take the one battery box as an example.

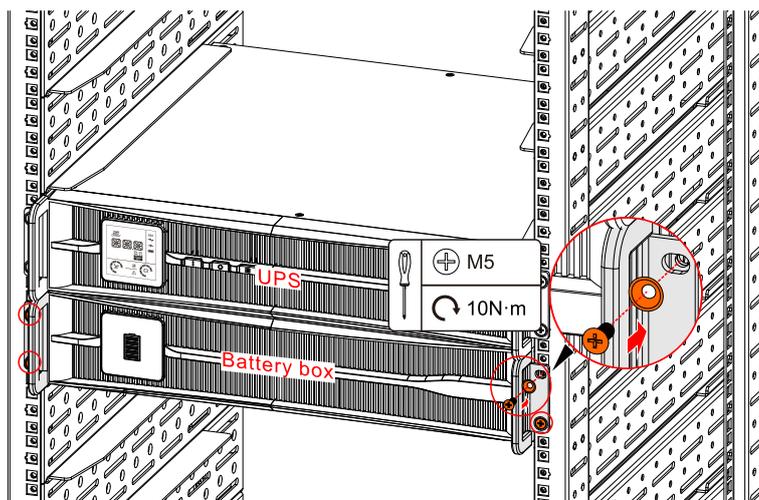
Step 1 Install the left and right plastic panel.



Step 2 Install two angle irons on battery box.



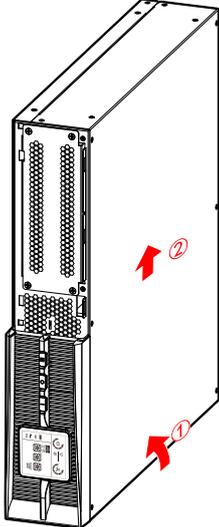
Step 3 Fix battery box (optional) on the rack.



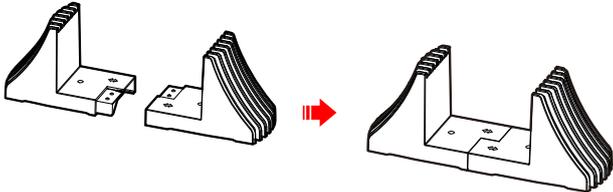
### 3.4.2 Tower-mounting

#### UPS Installation

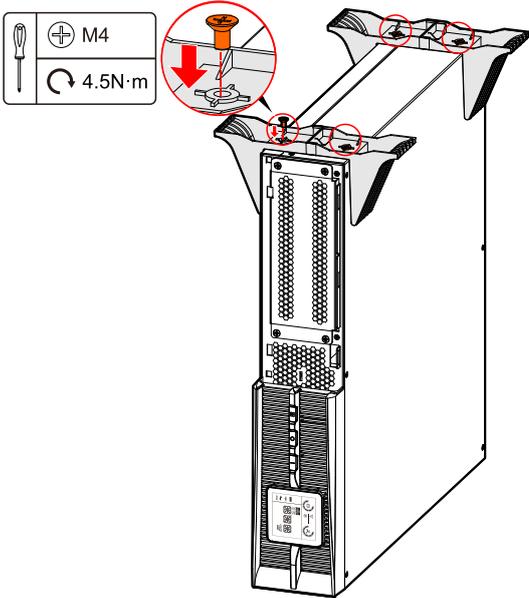
Step 1 Keep UPS upright, the side with battery should be up.



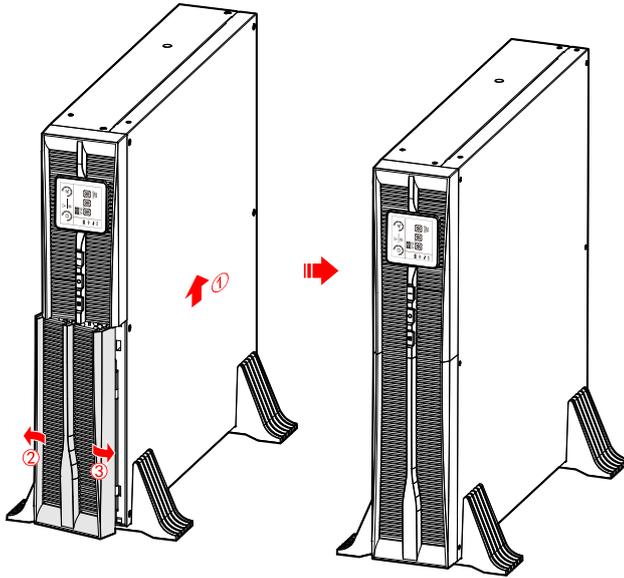
Step 2 Install support bases together.



Step 3 Fix the support bases on UPS.



Step 4 Place UPS with support bases, and then install the plastic panel.



Step 5 Set the display ways as tower-mounting, the detail refers to 2.2.1 .

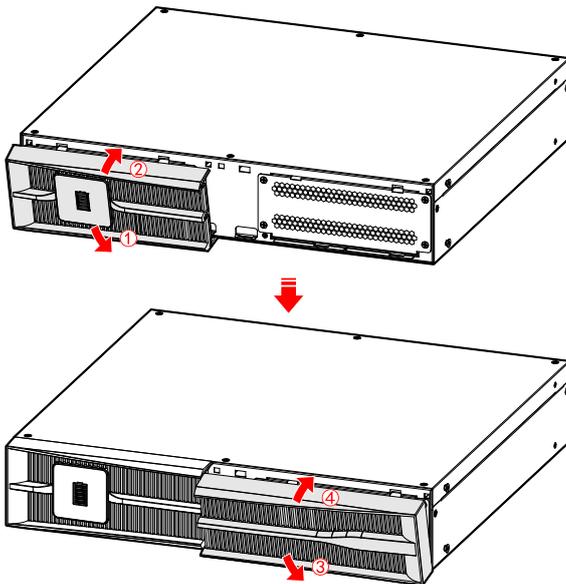
---End

### Battery box (optional) installation

 **NOTE**

When the battery box is selected, the installation procedures are the same. In this section, we take the one battery box as an example.

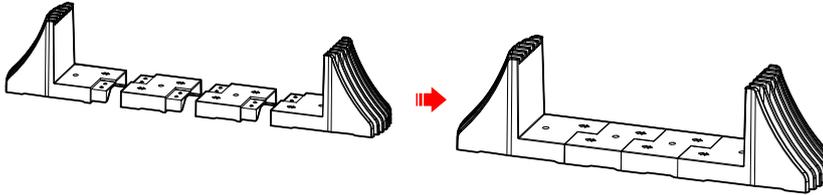
Step 1 Install the left and right plastic panel.



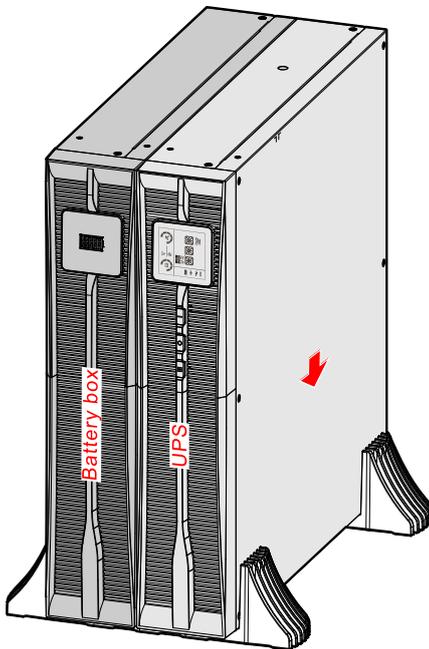
Step 2 Take out support bases and two 1U joint bases, assemble them together.

 **NOTE**

When one battery box added, add 2 pieces of 1U joint bases, the assemble way is the same.



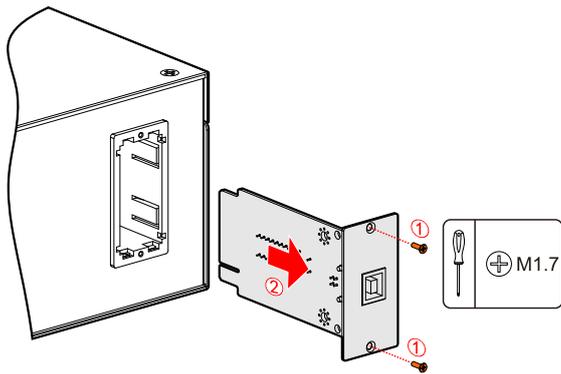
Step 3 Put the UPS and battery box onto the assembled support bases.



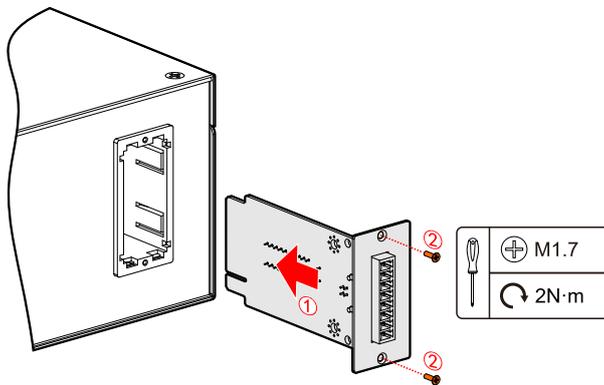
---End

### 3.4.3 Intelligent Slot Replacement

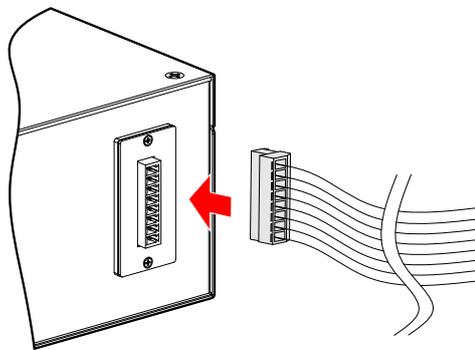
Step 1 Dismantle standard intelligent slot.



Step 2 Install optional intelligent slot and fix it.



Step 3 Connect the communication cable.



---End

### 3.5 Electrical Connection

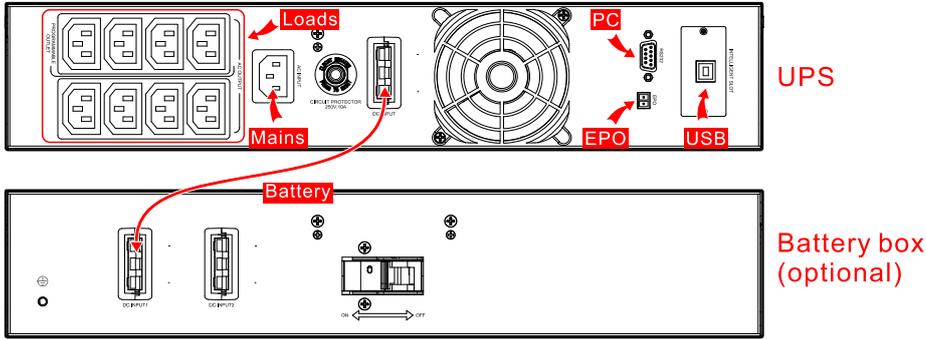


Figure3-2 Wiring diagram of IST3-J 1kVA

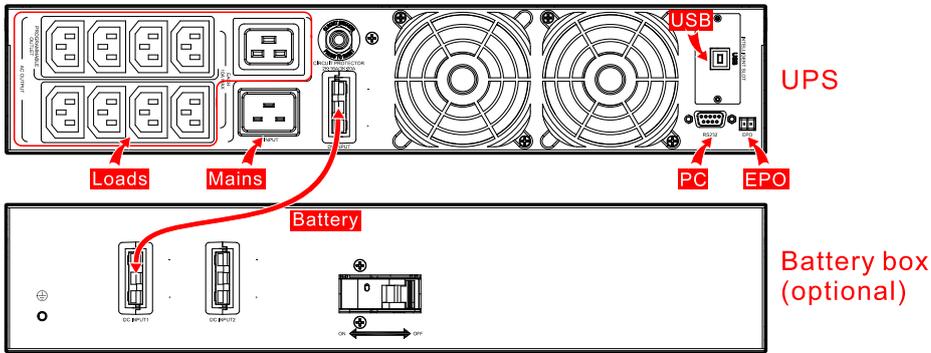


Figure3-3 Wiring diagram of IST3-J 2kVA/IST3-J 3kVA



Mains outlet should be installed near UPS and it is convenient to operate.

Generally, the load current of each output outlet with 10A should be not more than 5A.

### 3.6 Check the Installation

Table3-3 Installation checking

No.	Check items	Result
1	Check whether the AC input wire is connected firmly.	Yes <input type="checkbox"/> No <input type="checkbox"/>

No.	Check items	Result
2	Check the AC output wire: whether the color of AC output wire is in accordance with the specification, whether the cross-sectional area of AC output wire is suitable, whether the connection of the live wire(L), the neutral wire(N), the grounding wire(PE) is correct, whether the AC output wire is connected firmly.	Yes <input type="checkbox"/> No <input type="checkbox"/>
3	Check the grounding wire: whether the grounding wire of UPS connects with the grounding terminal bar of the device room reliably.	Yes <input type="checkbox"/> No <input type="checkbox"/>
4	Check whether the Neutral-to Ground voltage is less than 5Vac.	Yes <input type="checkbox"/> No <input type="checkbox"/>
5	If it is long backup model, check whether the battery wire between UPS and battery box is connected correctly and reliably.	Yes <input type="checkbox"/> No <input type="checkbox"/>
6	If UPS installs the remote monitoring device, check whether the RS232 port is connected correctly.	Yes <input type="checkbox"/> No <input type="checkbox"/>
7	Check whether the wiring is neat and the wire binding is in accordance with process specification.	Yes <input type="checkbox"/> No <input type="checkbox"/>
8	Check whether the installation and wiring are good for system reformation, expansion and maintenance in future.	Yes <input type="checkbox"/> No <input type="checkbox"/>

## 4 Operation Guide

This chapter mainly describes the checking before startup, startup and shutdown operation, etc.

### 4.1 Checking Before Startup

Before using UPS, check the following items to ensure that UPS works normally.

- The installation of input and output are correct.
- The input power connects with the rated input power.
- There is no short-circuit in the output and the load capacity is not beyond the UPS capacity.
- Whether computer or other equipments are switched off.
- Whether the battery voltage is normal.
- It isn't recommended to connect with the inductive load in the output. Generally, grid supplies power for the inductive load directly.

### 4.2 Startup Operation

- Step 1 Connect UPS with mains outlet.
- Step 2 Press "  " button on the panel for 1s to start UPS.
- Step 3 About 10s later, if the UPS works steadily, start loads, such as PC, etc.



Start load with the sequence that "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 UPS running without load for about 10 minutes to exhaust heat.

Step 2 Press "O" button on the panel for 1s to shut down UPS.

Step 3 Unplug mains outlet.

**----End**

## 5 Maintenance and Troubleshooting

This chapter mainly describes maintenance guide, daily battery maintenance, battery replacement and troubleshooting.

### 5.1 Maintenance Guide

Proper maintenance is the key that the device works on the best status and with a longer service life.

#### 5.1.1 Safety Precautions

To ensure human safety and device security, observe the following precautions.

- Remember that even though UPS doesn't work, there may still exist dangerous voltage inside UPS. Before maintenance, use a multi-meter to check the voltage and make sure that UPS is completely shut down and stay in safe status.
- The operator should be familiar with UPS and user manual.
- Before operating UPS, take off conductive objects, such as rings, watches.
- Observe safety regulations strictly. If any doubt, consult professionals.
- Before maintenance, use a voltmeter to check the power is turned off and in a safety condition.

#### 5.1.2 Preventive Maintenance

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

- Keep operation environment free from dust and chemical pollutant.
- Check whether the wiring terminals in the input and output are connected well every half an year.
- Check whether fans work properly and air vents are not blocked. If some fans stop working, replace them in time.
- Check whether battery voltage is normal.
- Check whether UPS works normally.

## 5.2 Daily Battery Maintenance

- 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 "○" 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.

## 5.3 Battery Replacement

### 5.3.1 Battery Replacement 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.

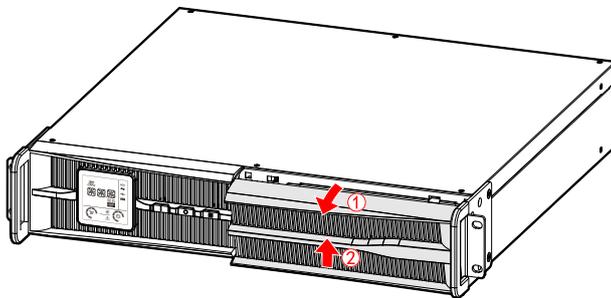
- A new battery should be with the same capacity, model, and manufacturer as the replaced one.
- Check whether there exists dangerous voltage between battery terminals and ground before touching, which is to avoid human injury. It is prohibited to touch the battery's two wire connectors or bare terminals for wiring simultaneously.

### 5.3.2 Battery Pack of UPS Replacement

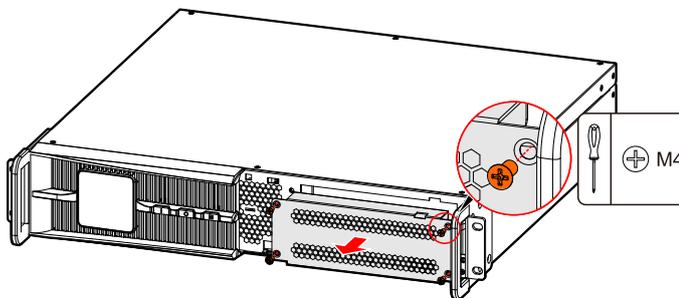
#### NOTE

The battery pack of IST3-J 1kVA, IST3-J 2kVA, IST3-J 3kVA UPS replacement are similar, the following take IST3-J 1kVA for an example. The battery pack is hot-pluggable.

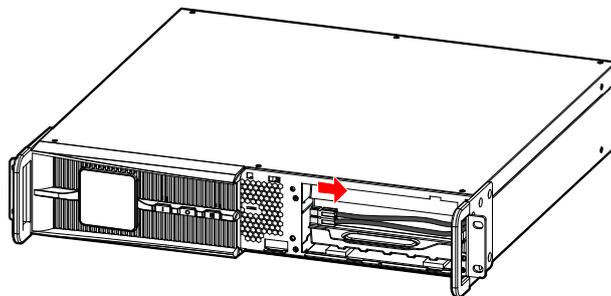
Step 1 Dismantle the right plastic panel.



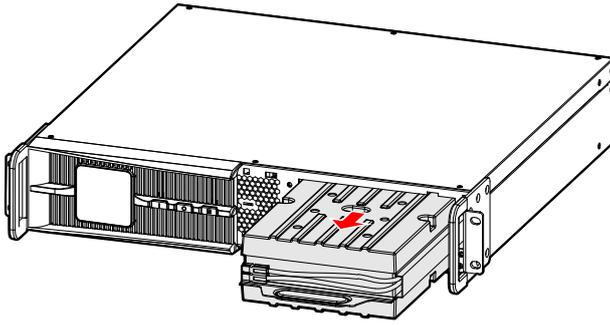
Step 2 Dismantle the battery plate.



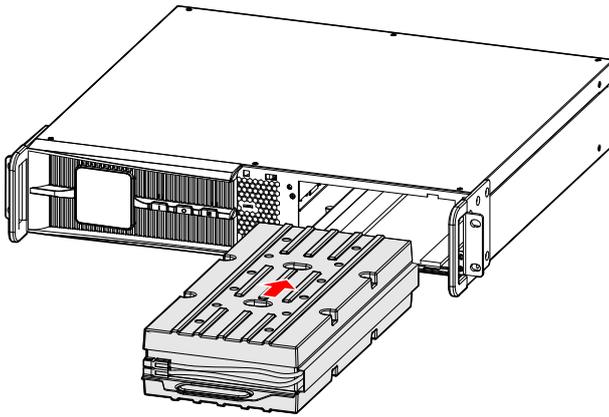
Step 3 Unplug the battery wire.



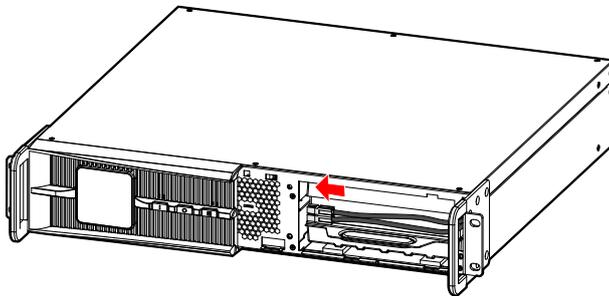
Step 4 Pull out the battery pack.



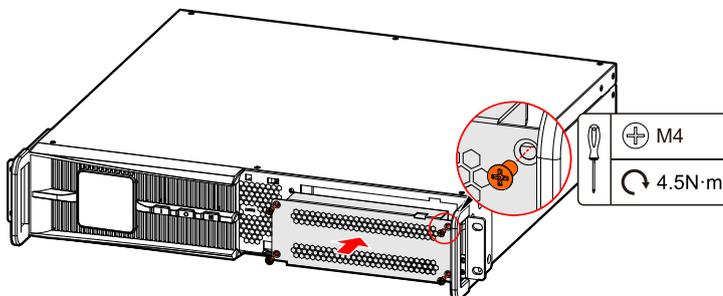
Step 5 Push the new battery pack into UPS.



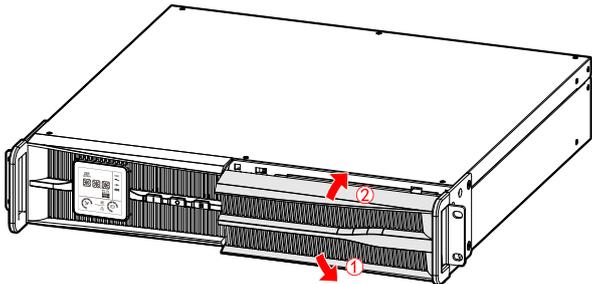
Step 6 Plug the battery wire.



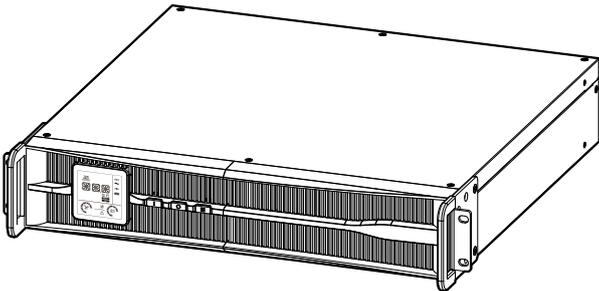
Step 7 Install the battery plate.



Step 8 Install the right plastic panel.



Step 9 Finish battery pack installation.



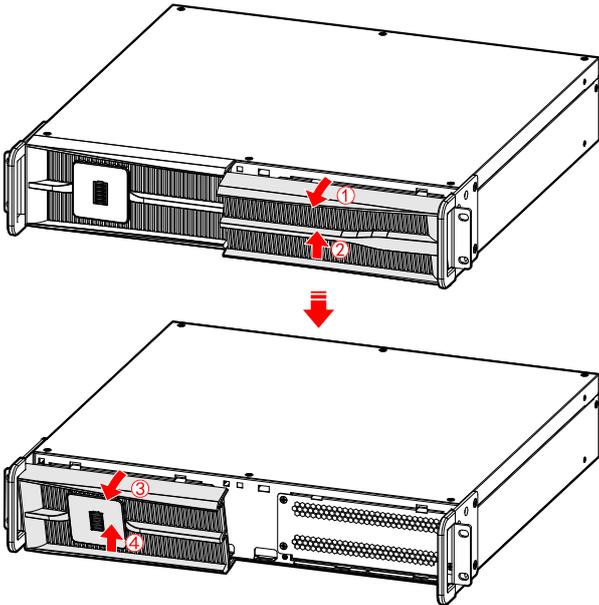
---End

### 5.3.3 Battery Pack of Battery Box Replacement

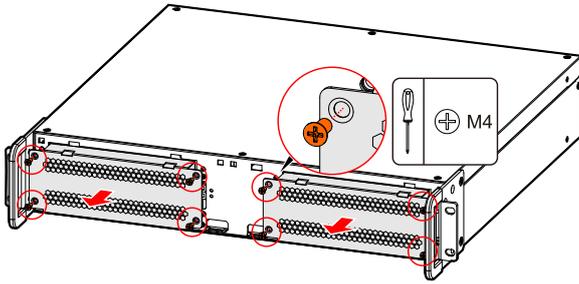
 **NOTE**

The battery pack of battery box replacement for IST3-J 1kVA, IST3-J 2kVA, IST3-J 3kVA UPS are similar, the following take the battery pack of battery box for IST3-J 1kVA for an example. The battery pack is hot-pluggable.

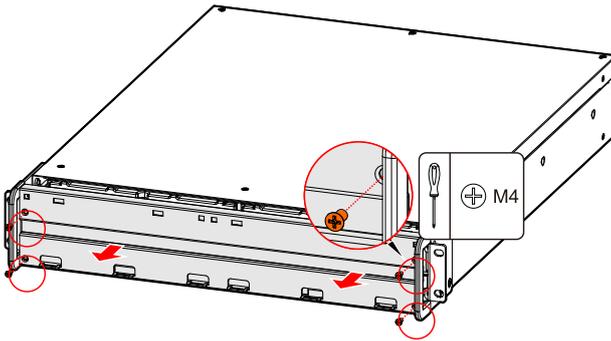
Step 1 Dismantle the left and right plastic panel.



Step 2 Dismantle the battery plate.

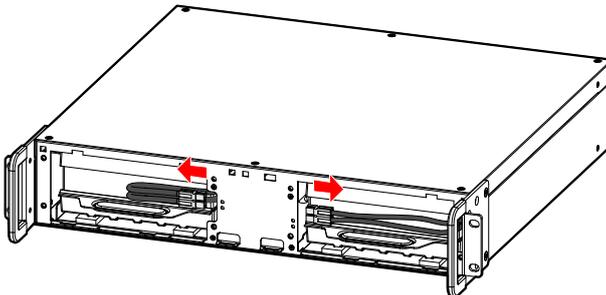


Battery box for KR1000-RM

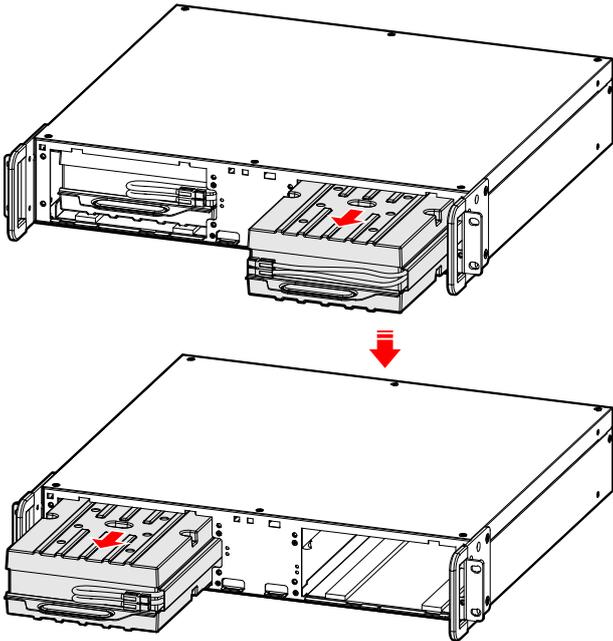


Battery box for KR2000-RM/KR3000-RM

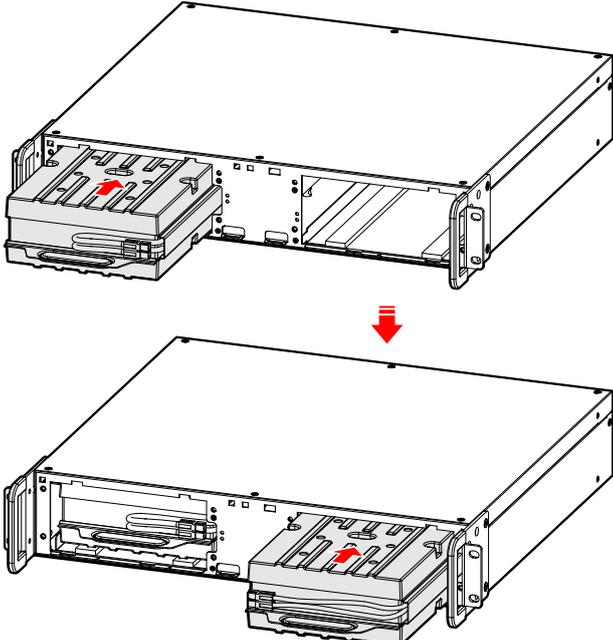
Step 3 Unplug the battery wire.



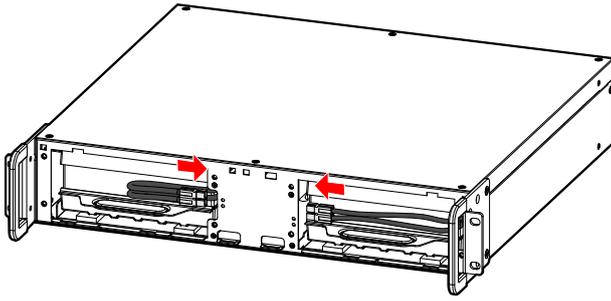
Step 4 Pull out the left and right battery pack.



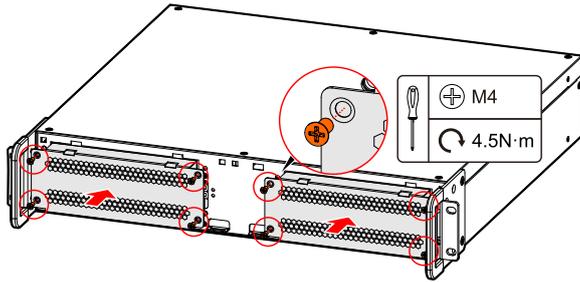
Step 5 Push the left and right new battery pack into battery box.



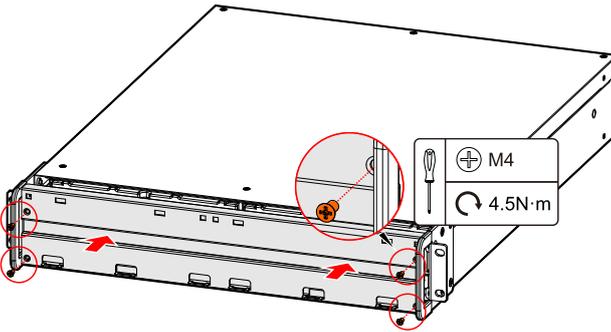
Step 6 Plug the battery wire.



Step 7 Install the battery plate.

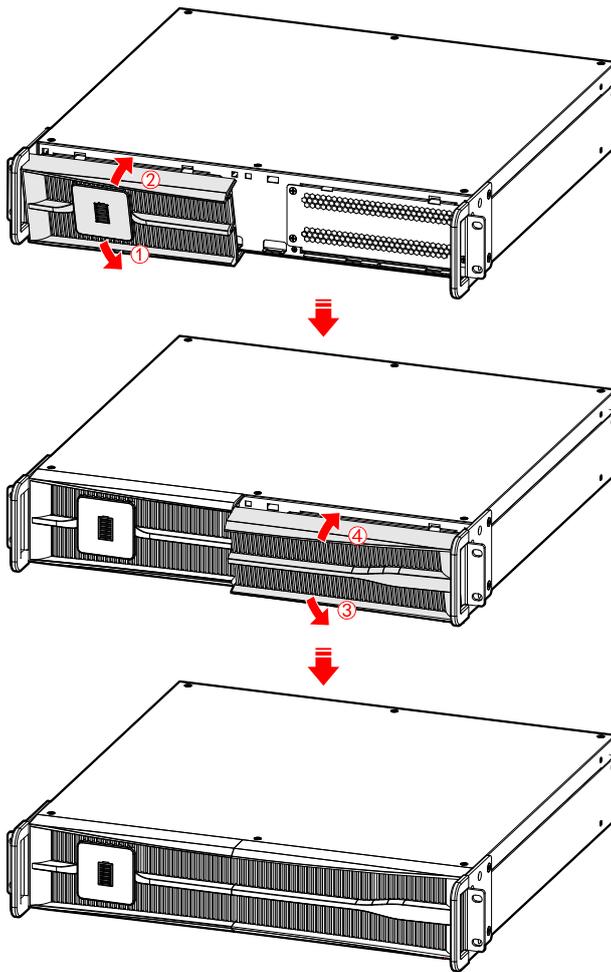


Battery box for KR1000-RM



Battery box for KR2000-RM/KR3000-RM

Step 8 Install the left and right plastic panel.



---End

## 5.4 Troubleshooting

After starting UPS, if UPS works abnormally, please refer to Table5-1 to find possible reason. Meanwhile, check whether the fault is caused by external environment, such as temperature, humidity are not accordance with requirements or UPS is overload.

Table5-1 only includes some simple diagnosis. If the diagnosis is not clear, or not sufficient to solve problem, please contact with local agency or dealer to deal with.

Table5-1 Troubleshooting

No.	Phenomenon	Possible reasons
1	The mains is normal. When starting UPS, it can output 220V AC. But	Make poor connection in the contacts of grid feeding circuit or outlets, which will lead to power input is

No.	Phenomenon	Possible reasons
	UPS works in the battery inverting status, and the buzzer beeps intermittently.	not expedite.
2	After installing UPS, switch on breaker or press " I " button will break fuse or switch off breaker.	The wiring for three phase of input is wrong, e.g. connect neutral wire and ground wire, live wire and ground wire reversely, as well as in the output.
3	When starting UPS, it can output 220V AC. But UPS works in the bypass status("⚡" indicator is always on.)	(1) The load exceeds the rated output capacity of UPS. It should reduce load or select UPS with more larger output capacity. (2) It is normal that shock from load startup leads to turn into bypass mode temporarily and recovery automatically
4	After starting UPS, output is normal. But when starting load, UPS will stop output immediately.	(1) If UPS is serious overload or output is short circuit, it should reduce load to proper or find reason of short circuit. The common reason is that the output multi-tap is short circuit or the input is short circuit after device is damaged,. (2) If you does not follow the startup sequence that is "high power device → small power device" to start load, restart UPS. When UPS works steadily, restart load following the sequence.
5	After starting UPS, UPS works normally. After a while, UPS will shutdown automatically.	In the battery mode, it is normal that UPS turns off automatically when battery runs out and takes battery low voltage protection. When mains is normal, system will start automatically and charge battery.  Warning: If it is in the battery low voltage for a long time, it will affect service life of battery. When it takes battery low voltage protection, if the mains can't recovery for a long time, switch off battery breaker to protect battery and restart UPS to charge battery when the mains is normal.

No.	Phenomenon	Possible reasons
7	Buzzer long beeps, fault indicator is on, inverter failure and UPS turns to bypass mode.	(1) Load overload or output short circuit, UPS will turn off automatically. (2) Drive or power transistor failure. (3) Main control board failure. (4) UPS over-temperature protection
8	After starting UPS, UPS works normally. When mains powers down, UPS has no output.	(1) Battery failure. (2) Battery charger failure. Generally, it can't charge battery. (3) Battery haven't been connected with UPS or battery has been damaged seriously.
9	The input is normal, but buzzer still beeps intermittently.	The mains voltage or frequency is out of the range of UPS requirements.
10	When the load is computer, everything works normally. But when powering off, the computer halts.	The grounding is unreliable for the floating voltage between the neutral wire and the grounding wire is too high.
11	Indicators on the panel are all off.	The wiring for display board is unreliable or fault.

If UPS failure, press " ■■ " button. It can view the UPS failure prompting on the LCD, which is good for finding the fault source quickly.

The meaning of fault symbol and buzzer status in Table5-2.

Table5-2 The meaning of fault symbol and buzzer status

Fault symbol		Buzzer status	Meaning
Fault info. page (page up or page down by "SELECT" button)	EPO	Long beep	UPS has emergency protection(if equipped with EPO function), Bypass output and inverting output are all closed.
	BUS	Long beep	There has busbar voltage fault in the UPS, the inverting output is closed.
	TMP	Long beep	UPS has over-temperature protection, the

Fault symbol		Buzzer status	Meaning
			inverting output is closed. Please check if cooling fan damage and air vents blocked.
	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.
	FAN	Rapid beep (Alarm once about every 0.2s)	Fan fault alarm prompting, the inverting output is going to protect. Please check if cooling fan damage.
Load energy bars all flicker		Rapid beep (Alarm once about every 0.2s)	Output overload alarm. the output is going to close, please reduce load.
Battery energy bar 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 are all off and the frame flickers		Rapid beep (Alarm once about every 0.2s)	Battery is about to run out. Please pay attention to protect device and save you data in the PC.

## 6 Package, Transportation, Storage

This chapter mainly describes the announcements about the package, transportation, storage.

### 6.1 Package

The package of product is carton. When packing, pay attention to the placing direction requirements. On one side of the carton, it should print warning icons, including keep dry, handle with care, this end up, stacking layer limit, etc. On the other side of carton, paste the model type, etc.

### 6.2 Transportation

When transportation, UPS should be handled with care. Don't impact it severely. It should strictly follow the placement direction that shows on the carton to avoid UPS damage.

### 6.3 Storage

UPS should be stored in the dry warehouse. Don't put it under the sunshine or in the rain. It should follow the placement direction that shows on the carton. The storage environment temperature is  $-25^{\circ}\text{C}\sim+55^{\circ}\text{C}$ (no battery). If it is the standard UPS or the storage batteries, the recommended storage temperature is  $0\sim40^{\circ}\text{C}$ , the relative humidity is 20%~80%. In warehouse, It's prohibited that there has poisonous gas, objects that inflammable and explosive, corrosive chemical objects. Besides, it shouldn't have too strong mechanical shaking, impact and strong magnetic field. Under the storage conditions above, the storage period is six months. If it is long time storage ,it should charge the storage battery every three months.

# A Technical Specifications

Index		Model		
		IST3-J 1kVA	IST3-J 2kVA	IST3-J 3kVA
Input features	Voltage range(V)	When the voltage range is 176Vac~295Vac, it can connect with more than 75% load; when the voltage range is 154Vac~176Vac, it can connect with 50~75% load; when the voltage range is 120Vac~154Vac, it can connect with less than 50% load.		
	Frequency range(Hz)	40/70±10%(40/70 self-adaption)		
	Input method	Single phase three wire		
	Battery voltage(V)	36	48	72
Output features	Power capacity(VA/W)	1000/900	2000/1800	3000/2700
	Voltage(V)	208/220/230/240±1%(settable)		
	Frequency(Hz)	50/60±0.2%(battery mode)		
	Wave	Sine-wave		
	Voltage distortion	THD <2%(linear load)		
	Power factor	0.9 (when environment temperature is lower than 30°C, 1.0 optional)		
	Transfer time between battery mode and mains mode(ms)	0		

Index		Model			
		IST3-J 1kVA	IST3-J 2kVA	IST3-J 3kVA	
Overload ability	Low overload for 10min	1050VA/945W<Load ≤1100VA/990W	2100VA/1890W<Load ≤2200VA/1980W	3150VA/2835W<Load ≤3300VA/2970W	
	Medium overload for 1min	1100VA/990W<Load ≤1300VA/1170W	2200VA/1980W<Load ≤2600VA/2340W	3300VA/2970W<Load ≤3900VA/3510W	
	High overload for 1s	1300VA/1170W<Load ≤1500VA/1350W	2600VA/2340W<Load ≤3000VA/2700W	3900VA/3510W<Load ≤4500VA/4050W	
	Highest overload for 200ms	1500VA/1350W<Load	3000VA/2700W<Load	4500VA/4050W<Load	
	Output receptacles	8*IEC320 C13	8*IEC320 C13+1*IEC320 C19		
Other features	Backup time	3mins			
	Charge recovery time	<10hours			
	Communication interface	Standard: RS232 and USB port support UPS power management software Optional: RS485+dry contact, protocol transfer card, SNMP card			
	Display	LCD displays the running status of UPS.			
	Alarm function	Battery low-voltage, mains abnormal, UPS fault, output overload			
	Protection function	Battery under-voltage protection, overload protection, short-circuit protection, over-temperature protection, input over-voltage protection			
	Noise(dB)	<50			
	Working temperature(°C)	-5~50 (Best operating temperature is -5~40, output power derated from 40~50)			
	Relative humidity	0~95%, non-condensation			
	IP grade	IP20			

Index		Model	IST3-J 1kVA	IST3-J 2kVA	IST3-J 3kVA
		Altitude	2000m (When the altitude exceeds 2000m, it is necessary to decrease rated power to use.)		
AC distribution system	TN distribution system				
Dimensions (mm) (W*D*H)	438*420*87	438*570*87			
Weight(kg)	14	20	26		
Battery box (optional)	Battery type	2 groups of 3*7AH12V	2 groups of 4*9AH12V	2 groups of 6*9AH12V	
	Dimensions (mm) (W*D*H)	438*420*87 (2U)	438*570*87 (2U)		
	Weight(kg)	20	29	40	

- Specifications are subject to change without prior notice.

# B Acronyms and Abbreviations

<b>AC</b>	Alternating Current
<b>DC</b>	Direct Current
<b>ECO</b>	Energy Control Operation
<b>EPO</b>	Emergency Power Off
<b>IEC</b>	International Electrotechnical Commission
<b>LCD</b>	Liquid Crystal Display
<b>PE</b>	Protective Earthing
<b>RS232</b>	Recommend Standard232
<b>RS485</b>	Recommend Standard485
<b>SNMP</b>	Simple Network Management Protocol
<b>UPS</b>	Uninterruptible Power System
<b>USB</b>	Universal Serial Bus

# UPS IST3-J

(6-10kVA) Series

*User Manual*





# Foreword

Thank you for choosing the uninterruptible power system AEC UPS IST3-J!

This document gives a description of the (6-10kVA) series UPS.

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



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

## Symbol Conventions

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

Symbol	Description
 <b>DANGER</b>	Alerts you to a high risk hazard that could, if not avoided, result in serious injury or death.
 <b>WARNING</b>	Alerts you to a medium or low risk hazard that could, if not avoided, result in moderate or minor injury.
 <b>CAUTION</b>	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.
 <b>TIP</b>	Provides a tip that may help you solve a problem or save time.
 <b>NOTE</b>	Provides additional information to emphasize important points.

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# 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.

## 1.1 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.

### 1.1.1 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 unbalanced 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.

---

## 1.1.2 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.

## 1.2 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( $\geq 10$ min). 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.

## 1.3 Working Environment Requirements

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

- Generally, the working temperature of the UPS is  $-5^{\circ}\text{C}\sim+40^{\circ}\text{C}$  and the relative humidity is  $0\%\text{RH}\sim 95\%\text{RH}$  with no condensation (The recommended working temperature is  $20^{\circ}\text{C}\sim 25^{\circ}\text{C}$  and the recommended relative humidity is about 50%).
- Put UPS in the flat floor without vibration and the vertical gradient is less than  $5^{\circ}$ . 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  $300\text{mm}\sim 500\text{mm}$ . 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.

### 2.1 Product Intro

The (1-10kVA) series 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, mirco-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.

#### 2.1.1 Model Meaning

##### UPS that the output power is less than 10kVA

The "L" means long backup model. If there is no "L" symbol, it means standard model.

For the 2-3kVA standard model UPS, it also includes a UPS and a battery box.

For 6kVA(L) UPS, it just has long backup model.

##### UPS that the output power is not less than 10kVA

The "L" means long backup model. If there is no "L" symbol, it means standard model.

The"/B" means it can be used in parallel model. If without "/B", it means the UPS can be used in single mode.

The 10kVA(/B) UPS just has long backup model.

#### 2.1.2 Features

##### Intelligent RS232 communication

By the RS232 standard 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 (external, connect with UPS through RS232), 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 conversions 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.

## 2.2 Appearance and Structure

### 2.2.1 appearance

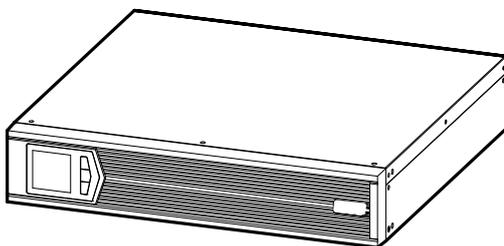


Figure2-1 UPS appearance

For 2-3kVA standard backup model, besides UPS host, we will provide a battery box, for 1 kVA(L), 2-3kVA(L) long backup model, the battery box can be provided according to use needs. The corresponding battery box appearance is as shown in Figure2-2.

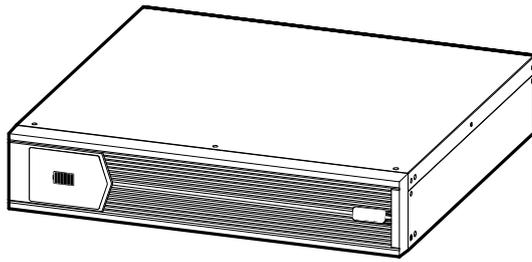


Figure2-2 Battery box appearance of 2-3kVA

For 6kVA(L), 10kVA(/B) model, the battery box can be provided according to use needs, corresponding battery box appearance is as shown in Figure2-3.

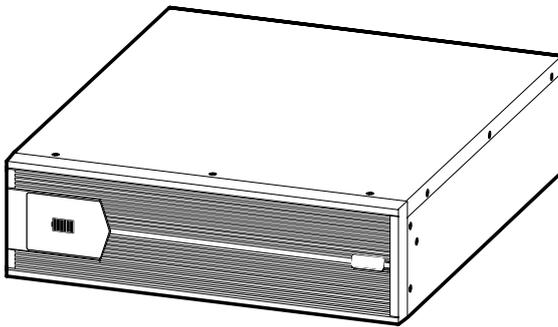


Figure2-3 Battery box appearance of 6kVA(L), 10kVA(/B)

 **NOTE**

The battery box amount of long backup model is different on the basis of required backup time. The relationship between battery box and UPS is as shown in Table2-1.

Table2-1 Relationship between UPS and battery box

UPS model	Battery box model
2kVA	48VDC
2kVA(L)	72VDC
3kVA	72VDC
3kVA(L)	96VDC
6kVA(L)	192VDC
10kVA	
10kVA (/B)	

## 2.2.1 Operation Panel

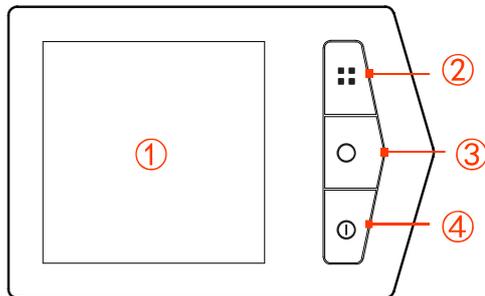


Figure2-4 Operation panel

Table2-2 The illustration of operation panel

No.	Name	Illustration
○,1	LCD	Shows the working status, battery backup capacity and fault alarm, alarm.
○,2	"■" button	<ul style="list-style-type: none"> <li>● 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.</li> <li>● 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.</li> </ul>
○,3	"Ⓜ" button	When UPS is on, long press "Ⓜ" button for 1s, the UPS will be turned off.
○,4	"Ⓜ" button	<ul style="list-style-type: none"> <li>● When UPS off, long press "Ⓜ" button for 1s, the UPS starts.</li> <li>● When UPS on, at mains mode, long press "Ⓜ" button for 3s, the UPS start to perform battery test.</li> <li>● At battery mode, long press "Ⓜ" button for 3s to mute the buzzer (cancel mains abnormal alarm).</li> </ul>

LCD panel

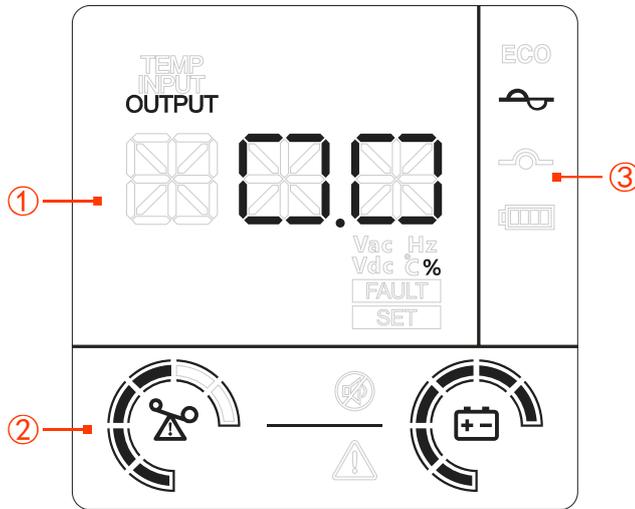


Figure2-5 LCD panel

The illustration for the LCD panel is as shown in Table2-3.

Table2-3 The illustration of LCD panel

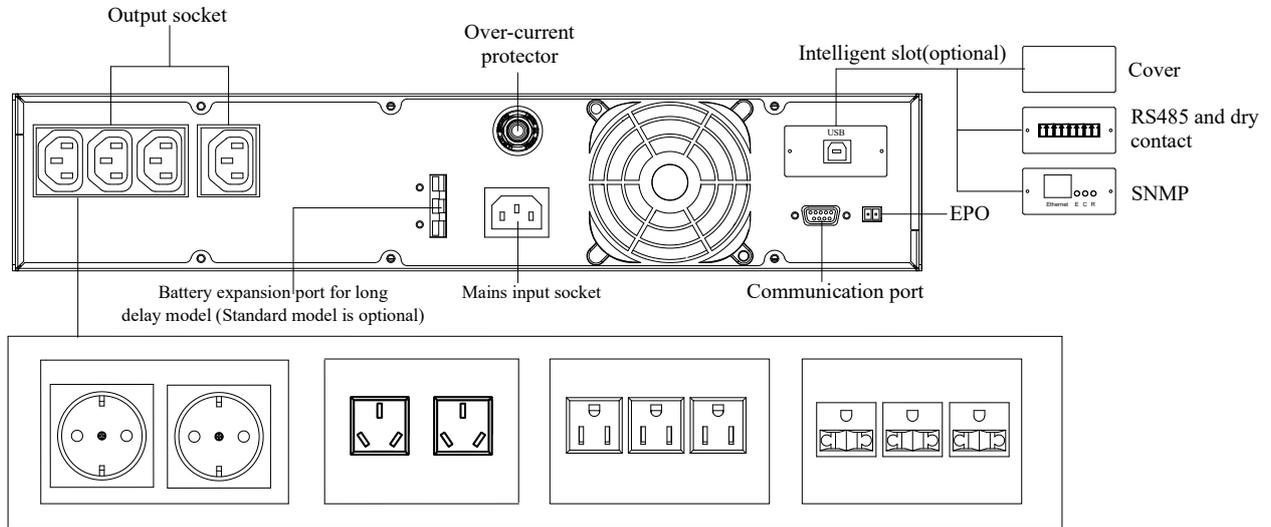
NO.	Name	Illustration
○,1	Running status display area	Shows the input, output, temperature, fault type and setting, etc. of the UPS.
○,2	Output status display area	Shows the load capacity, battery capacity, fault indication and buzzer silence, etc.
○,3	Work mode display area	Shows the UPS work status: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

**NOTE**

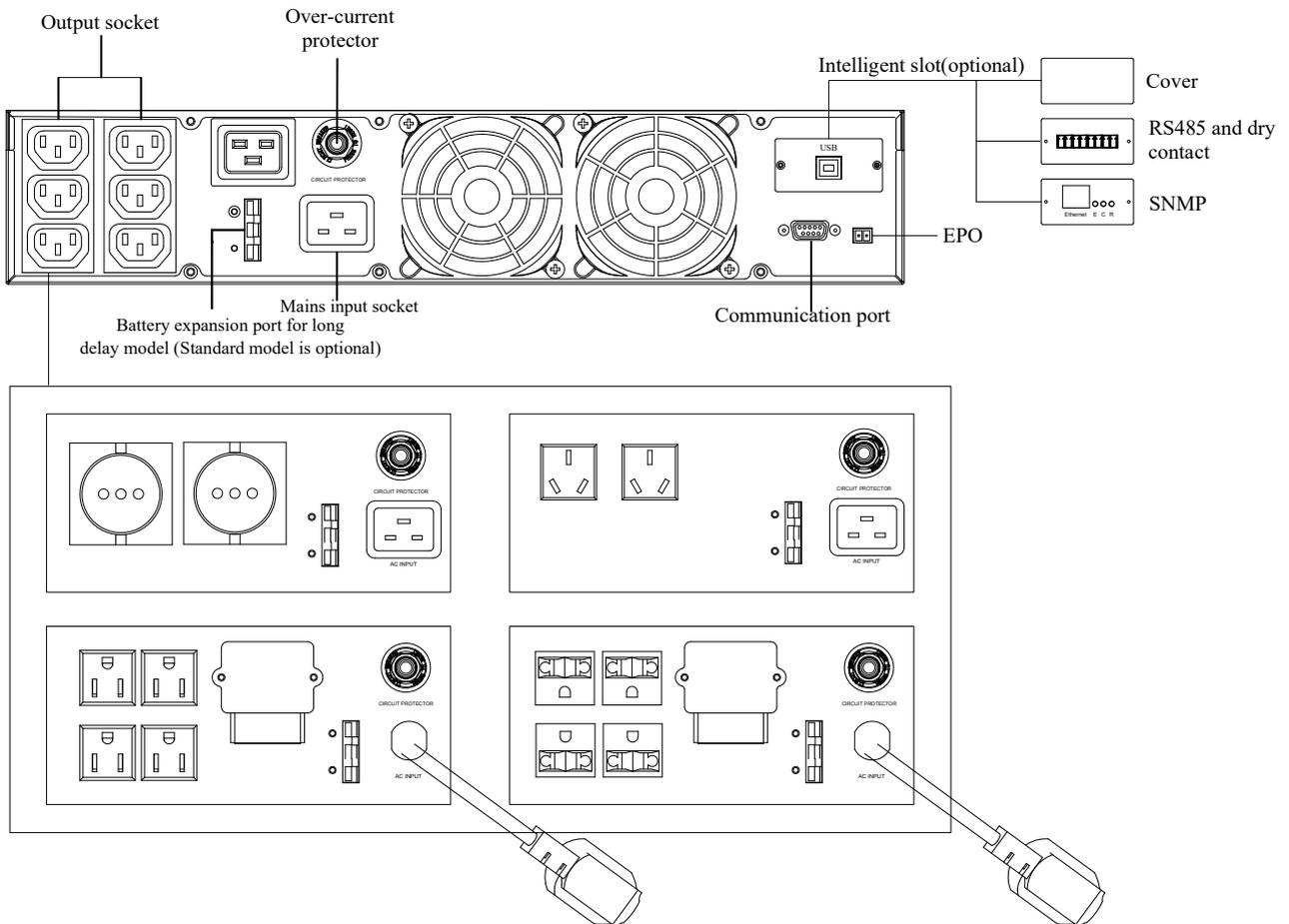
Fault model and corresponding dispose please see Table4-2.

## 2.2.2 Rear Panel

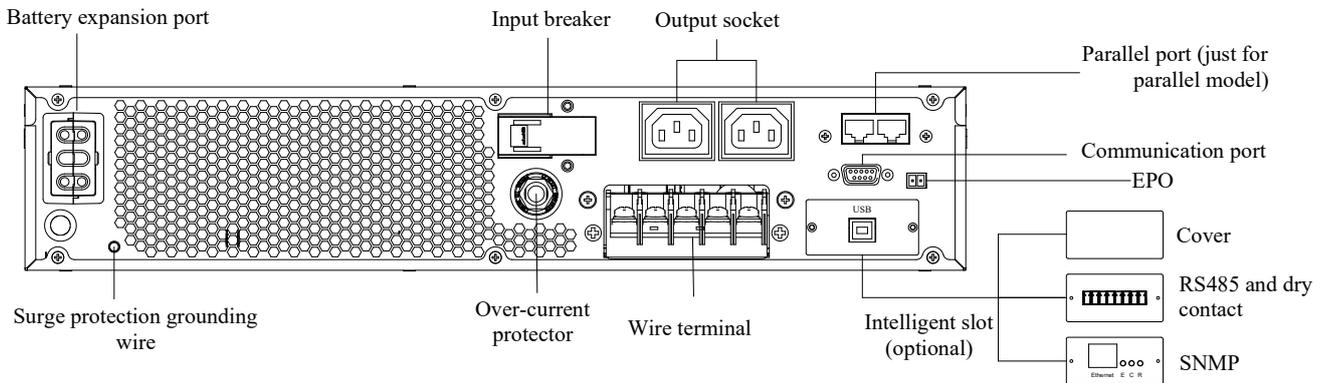
### UPS 1Kva (L)



### UPS 2-3Kva (L)



## UPS 6Kva (L), 10Kva (/B)



## 2.3 Communication

1kVA(L), 2kVA(L), 3kVA(L), 6kVA(L), 10kVA(/B) adopt RS232 series port to communicate with PC. The corresponding pin relationship of RS232 port between UPS and PC is as shown in Table2-4.

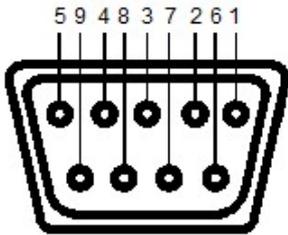


Table2-4 The corresponding pin relationship of RS232 port between of UPS and PC

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

## 2.4 Intelligent Slot

### RS485 and dry contact (optional)

The pin sequence and pin definition of RS485 and dry contact is as shown in Figure2-6 and Figure2-7.

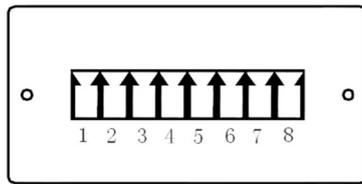


Figure2-6 RS485 and dry contact

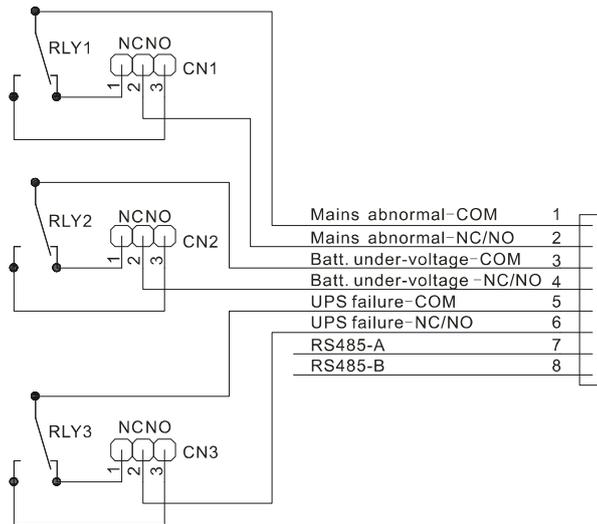


Figure2-7 Pin definition of RS485 and dry contact

The illustration of dry contact is as below:

1. CN1, CN2, CN3 determine that dry contact output signal is normal open or normal close. In default, dry contact output signal is normal close, that is PIN1 connects with PIN2. If one route signal needs to set to normal open, connect PIN2 with PIN3.
2. The requirements for input signal of dry contact: the voltage should be less than 60Vdc or 42Vac RMS and the current should be less than 1.25A.

## 2.5 EPO Connector

When connecting two ports in the EPO connector together, UPS will close output. If it needs to recover output, disconnect two ports in the EPO connector and power UPS off, and then restart UPS.

## 2.6 Working Principles

When the mains is normal, the input of the UPS is converted into the  $\pm 360\text{V}$  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  $\pm 360\text{V}$  DC voltage for DC/AC inverter through DC/DC.

The working principles of the (1-10kVA) series UPS is as shown in Figure2-8, Figure2-9. 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.

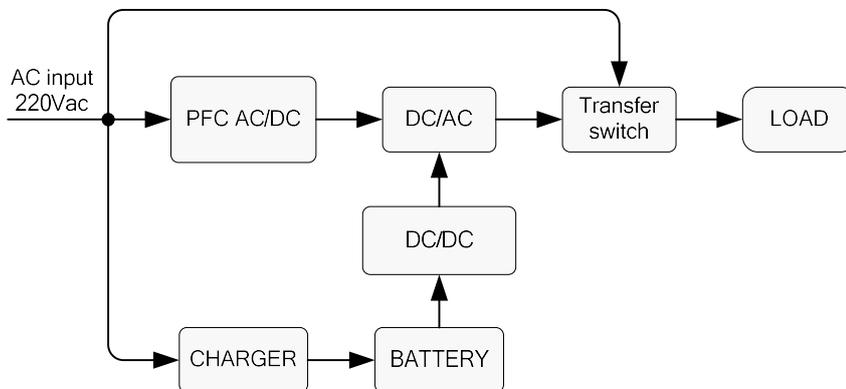


Figure2-8 Work principle of 1-3kVA(L)

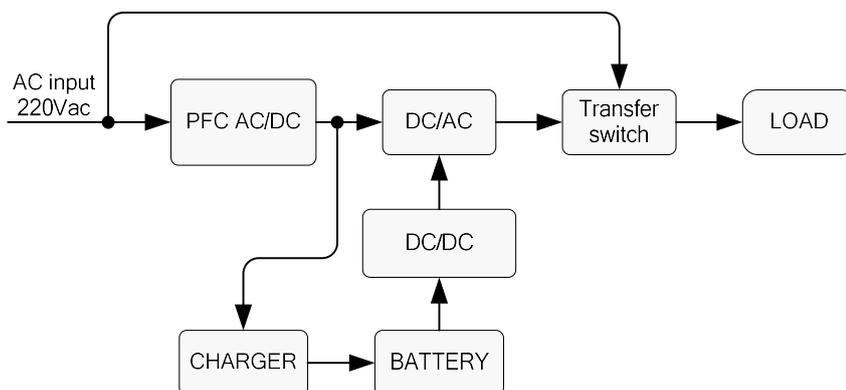


Figure2-9 Work principle of 6kVA(L), 10kVA(B)

## 3 Installation

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

### 3.1 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.

### 3.2 Cable and Breaker Selection

#### 3.2.1 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 <sup>2</sup> )		1	1.5	2.5	4	6	10	16	25
Current-carrying capacity (A)	Rubber (25°C)	8	12	20	28	42	70	96	125
	Plastic (25°C)	6	9	15	20	30	50	64	100

#### 3.2.2 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

	1kVA(L)		2kVA(L)		3kVA(L)		6kVA(L)		10kVA (/B)	
	Max. current	Breaker								
AC input (A)	6	10	12	20	18	32	36	50	60	100
DC input (for long backup model) (A)	37	50	37	50	42	50	39	50	65	100

### 3.3 Install UPS



**NOTE**

The installation for the UPS and the battery box is the same, in this section, we take the UPS installation as an example to illustrate.

- Step 1 Fasten the two angle irons onto the two sides of the UPS by 4 sunk screws, as shown in Figure3-1.

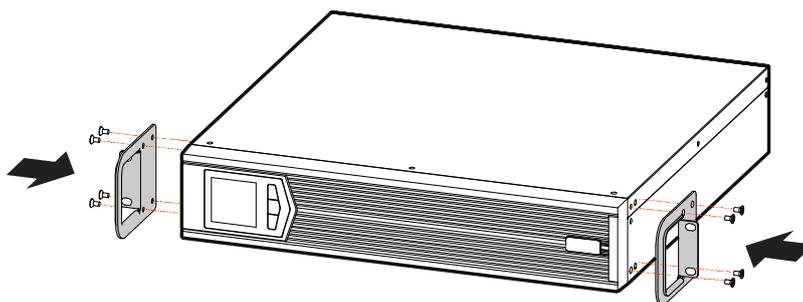


Figure3-1 Install angle iron

- Step 2 Push the UPS into the cabinet, and fasten it by screws, as shown in Figure3-2.

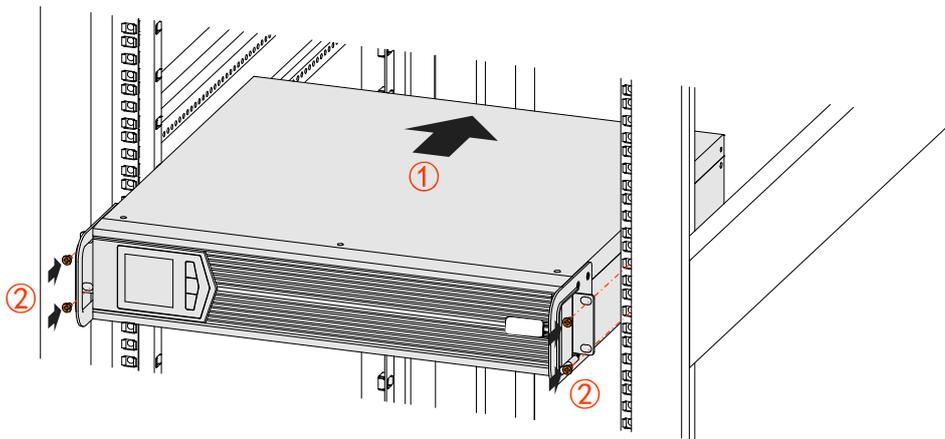


Figure3-2 Fasten the UPS

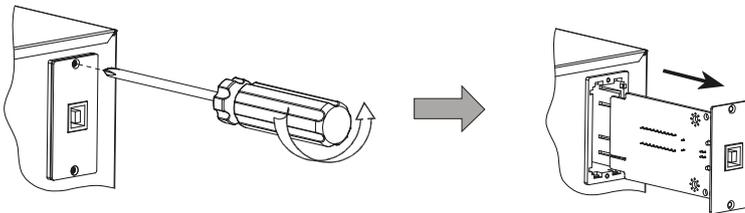


**CAUTION**

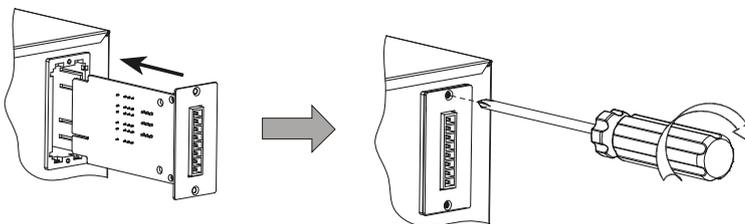
The battery box is heavy, when installing, the battery box must be installed down below the UPS.

### 3.4 Intelligent Slot Installation

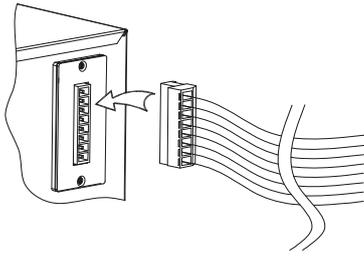
Step 1 Dismantle standard intelligent slot.



Step 2 Install optional intelligent slot and fix it.



Step 3 Connect communication cable.



## 3.5 Electrical Connection

The UPS and battery box 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 in Figure3-3 to Figure3-5.

3 Installation

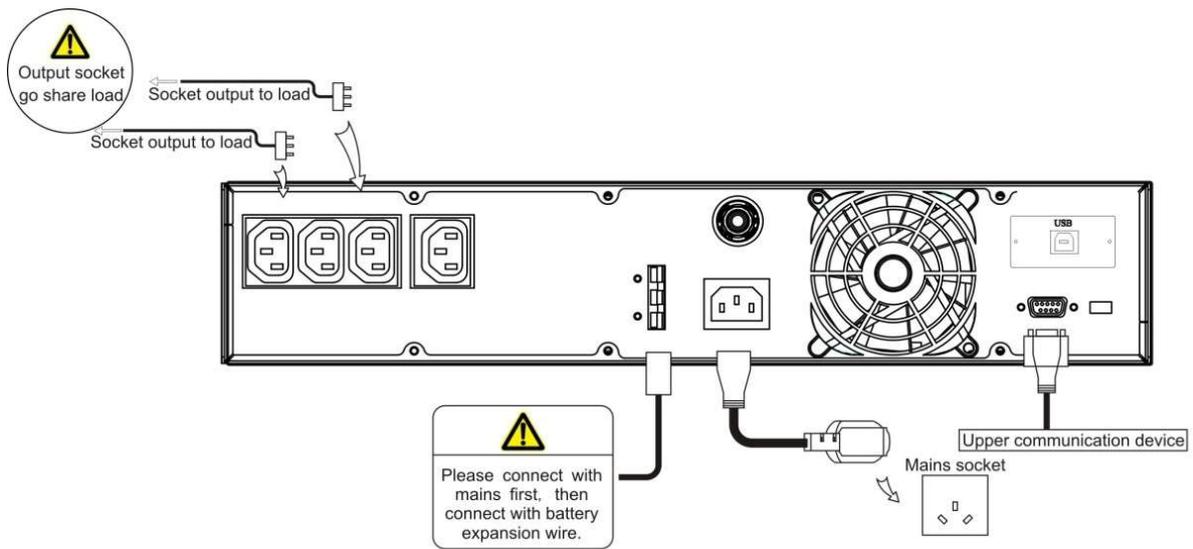


Figure3-3 Wiring diagram of 1kVA(L)

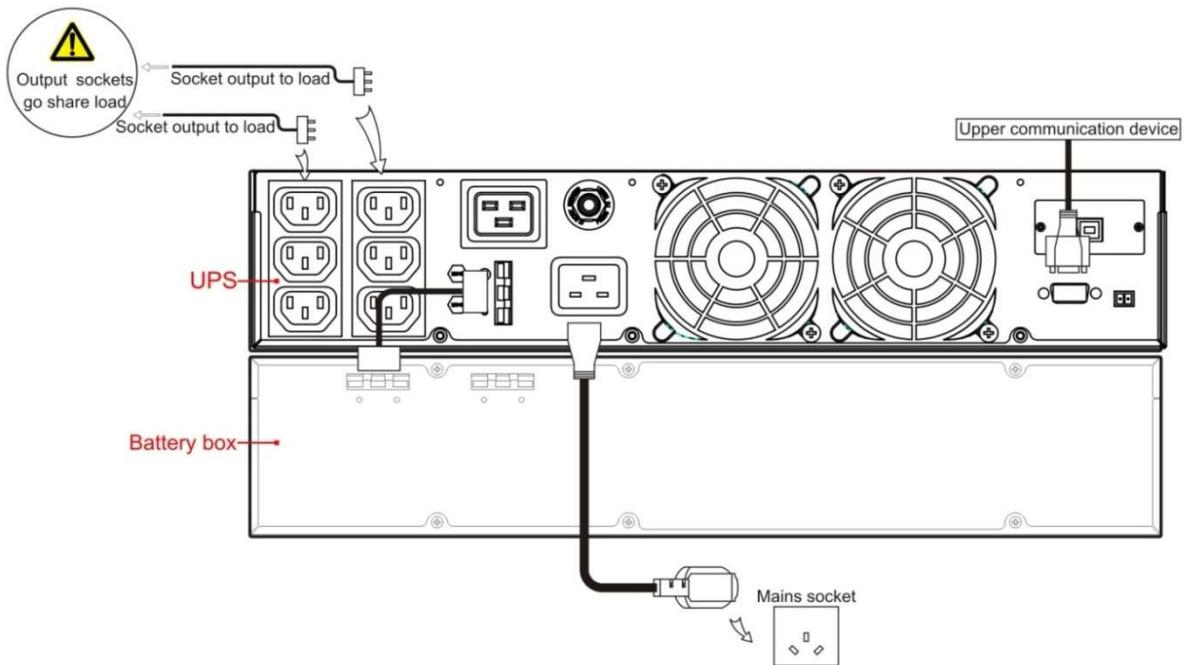


Figure3-4 Wiring diagram of 2-3kVA/(L)

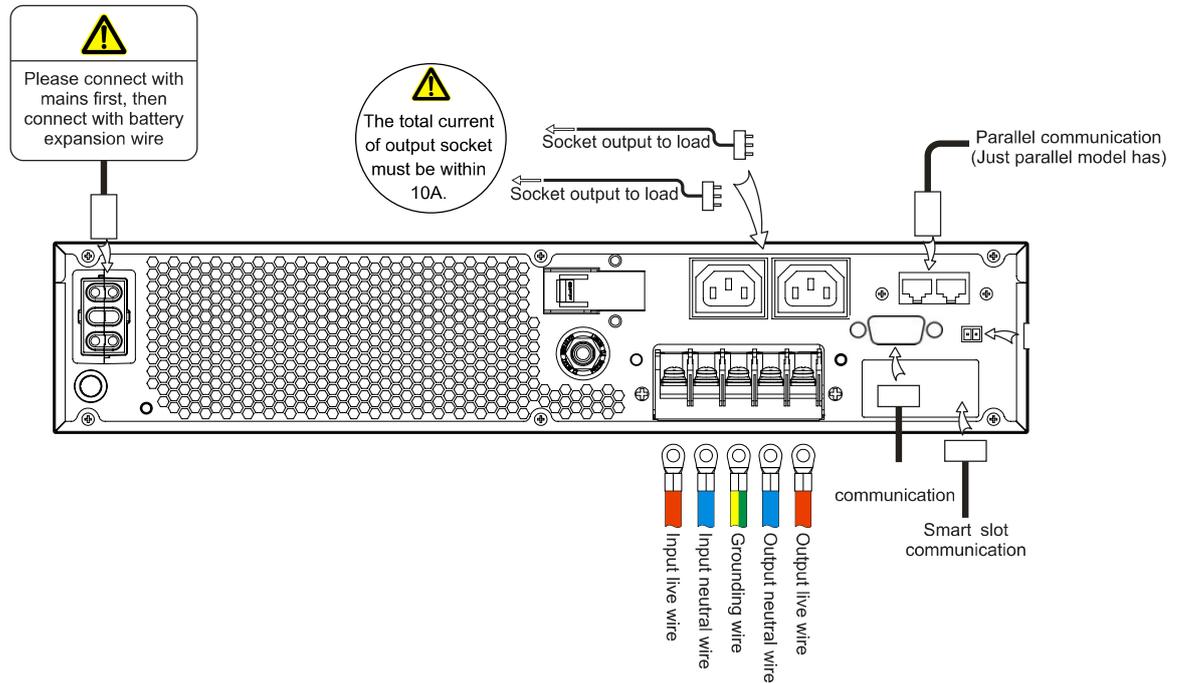


Figure3-5 Wiring diagram of 6kVA(L), 10kVA (/B)

 **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

#### 4.2.1 1kVA(L), 2kVA(L), 3kVA(L)

Step 1 Insert the mains socket 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.

---

#### 4.2.2 6kVA(L), 10kVA (/B)

- Step 1 Switch on the mains input breaker.
- Step 2 Press "ⓘ" button on the panel for 1s to start UPS.
- Step 3 About 10s later, if the UPS works steadily, start loads, such as PC, etc.



### CAUTION

Start load with the sequence that "high power device→small power device", which is to avoid overload protection when starting high power device.

---

## 4.3 Shutdown Operation

#### 4.3.1 1kVA(L), 2kVA(L), 3kVA(L)

- Step 1 Close load and keep the UPS running without load for about 10min to exhaust heat.
- Step 2 Press "○" button on the panel for 1s.
- Step 3 Unplug mains socket.

#### 4.3.2 6kVA(L), 10kVA (/B)

- Step 1 Close load and keep UPS running without load for about 10min to exhaust heat.
- Step 2 Press "○" button on the panel for 1s.
- Step 3 Switch off the mains input breaker.

## 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.

- Charge the battery for 10 hours before using. During charging, the UPS still can be used, but if power outage at the same time, the discharging time may be less than the standard value.
- Generally, charge and discharge the battery once every 4 to 6 months. Discharge the battery till under-voltage and power off and then charge it. In high temperature area, charge and discharge the battery once every 2 months. The charging time for the standard battery should be more than 10 hours every time.
- If the UPS hasn't been used for a long time, it is recommended to charge the battery more than 10 hours every three months.
- Generally, the working life of battery is 3 to 5 years. If battery is not so good, replace it in time. The battery replacement should be performed by authorized professional.

## 4.6 Troubleshooting

As shown in Table4-1, 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
<p>The mains normal. After starting the UPS, it outputs normally, but it works in the battery mode and the buzzer beeps intermittently.</p>	<ol style="list-style-type: none"> <li>1) Check if the contactors and sockets in the input circuit are in good condition;</li> <li>2) Check if the displayed input voltage amplitude or frequency of mains on the LCD is beyond the allowable range of UPS;</li> <li>3) Check if the over-current protector in the rear panel is sprung. If yes, press the over-current protector switch.</li> </ol>
<p>After installing UPS, connecting with power will fuse the fuse or cause tripping operation.</p>	<p>UPS output is short circuit.</p>
<p>After starting, the LCD display and output are normal. But once connecting with load, it will stop outputting immediately.</p>	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> </ol>
<p>Buzzer long beeps, fault indicator lights on, UPS works in bypass mode and inverter failure.</p>	<ol style="list-style-type: none"> <li>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.</li> <li>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</li> </ol>

Fault phenomenon	Possible reason
	allowable range.
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 busbar 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.

Fault symbol		Buzzer status	Meaning
	BAT	Long beep	Battery fault, battery voltage too low or too high protection.
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 1kVA/(L), 2kVA/(L), 3kVA/(L)

Index		Model	1kVA	1kVA(L)	2kVA	2kVA(L)	3kVA	3kVA(L)
		Input	Voltage range (V)	<p>When the voltage within the range of 176Vac~295Vac, the UPS can bear more than 75% load;</p> <p>When the voltage within the range of 154Vac-176Vac, the UPS can bear less than 75% load;</p> <p>When the voltage within the range of 120Vac~154Vac, the UPS can bear less than 50% load.</p>				
Frequency range (Hz)	50/60±10% (50/60 self-adaption)							
Input way	Single- phase three-wire							
Battery voltage (V)	24		36	48	72	72	96	
Output	Capacity (VA/W)	1000/900		2000/1800		3000/2700		
	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 < 3% (linear load)						
	Power factor	0.9 (when the environment temperature lower than 30°C, the power factor can be set to 1.0 according to series port command)						
	Transfer time (ms)	0						

Index		Model	1kVA	1kVA(L)	2kVA	2kVA(L)	3kVA	3kVA(L)
		Overload capacity	Low overload for 1min	1000VA/900W < Load≤1300VA/1040W	2000VA/1800W < Load≤2600VA/2080W	3000VA/2700W < Load≤3900VA/3120W		
Medium overload for 1s	1300VA/1040W < Load≤1500VA/1200W		2600VA/2080W < Load≤3000VA/2400W	3900VA/3120W < Load≤4500VA/3600W				
Heavy overload for 200ms	Load > 1500VA/1200W		Load > 3000VA/2400W	Load > 4500VA/3600W				
Others	Backup time	With full load for 3min	Long backup time Can be configured any backup time according to needs	With full load for 3min	Long backup time Can be configured any backup time according to needs	With full load for 3min	Long backup time 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	Equips RS232 port to support UPS power management software						
	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)	<50					<55		

A Technical Specifications

Index \ Model		1kVA		2kVA		3kVA	
		1kVA	1kVA(L)	2kVA	2kVA(L)	3kVA	3kVA(L)
	Work temperature (°C)	-5 ~ 40					
	Relative humidity	0 ~ 95%, non-condensation					
	Size (W×D×H) (mm)	438×413×86					
	UPS weight (kg)	11	5.8	7.2	8	7.2	8
	Battery box weight (kg)	--	13	13	17.5	17.5	24

- Specifications are subject to change without prior notice.

## A.2 6kVA(L), 10kVA (/B)

Index		Model		
		6kVA(L)	10kVA(/B)	
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 of 80Vac~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		
	Overload capacity	Low overload for 10min	6900VA/6210W < Load≤7800VA/7020W	11500VA/10350W < Load≤13000VA/11700W
		Medium overload for 30s	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)	438×500×86		
	Weight(kg)	10.6	12.2	

Index		Model	
		6kVA(L)	10kVA(/B)
Others	Backup time	For long backup model, it can be configured any backup time according to needs	For long backup model, it can be configured any backup time according to needs.
	Charge recovery time	It 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 (°C)	-5 ~40	
	Relative humidity	0 ~ 95%, non-condensation	

- Specifications are subject to change without prior notice.