



Aplus, Reliable Power Brand Deserve Your Trust

## USER'S MANUAL

208/220/230/240VAC



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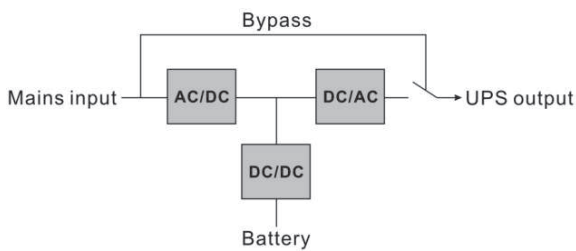
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# 1. Product Introduction

## 1.1 Functions description



This product is a true online double-conversion UPS (Uninterruptible Power Supply). It provides perfect protection for critical load such as computer system. It can eliminate almost all mains power disturbances. The input AC current can be corrected to a wave following the mains voltage, so it is a high power factor system. Through the PWM control technology, the output voltage can be a pure & stable sine wave AC voltage.

When the mains input become abnormal, the controller will stop the AC/DC and start the DC/DC section immediately to make sure the DC/AC (inverter) section can continue to work. After the mains input comeback to normal range, the DC/DC will be stopped and the AC/DC works again. So the load is always power-supplied through inverter without any interrupt if the UPS is turned on.

The UPS also provides an internal bypass way to make the load can be powered by mains input directly when the UPS is off or failed.

The UPS have an internal charger for batteries, the charger will charge the batteries when the mains is in a reasonable range on "bypass mode" or "line mode".

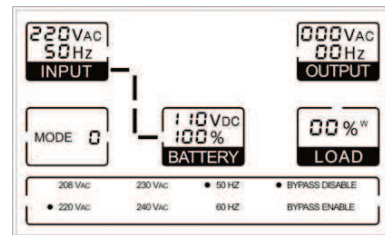
## 1.2 Mode description

The different codes could be displayed on the LCD screen corresponding to their own operating modes, and they are illustrated as the following table. At any time, only one normal operating mode or fault mode is presented. But the warning, even several warnings could appear in a certain normal operating mode at one time. And the normal operating mode code and the warning code would be shown circularly. Once one fault is come forth, then all previous warnings would not be shown again but only the fault code is presented.

Normal Operating Mode	Code
No output mode	0
Bypass mode	1
Line mode	2
Battery mode	3
Battery test mode	4
ECO mode	5
Converter mode	6

### ◆ No output mode

The LCD display in No output mode is shown in the following diagram. The information about the utility power, the battery level, the UPS output and the load level could be displayed. The code "MODE 0" indicates the UPS is working in the No output mode.

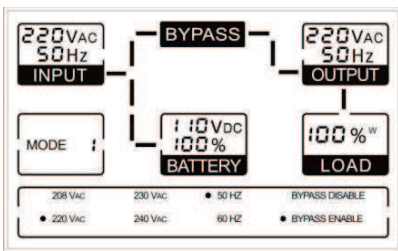


No Output Mode

◆ **Bypass mode**

Bypass mode means that the UPS provides the power through the internal bypass way to load directly without any regulation. If the controller detects the mains is abnormal, it will shut off the output to protect the load. The UPS bypass voltage/frequency range and default output status (on/off) could be set by communication software. However, UPS output power will be cut off if mains input range exceeds the setting value.

The LCD display in bypass mode is shown in the following diagram. The information about the utility power, the battery level, the UPS output and the load level could be displayed. The UPS will beep once every 2 minutes in bypass mode. The code "MODE 1" indicate the UPS is working in the bypass mode.

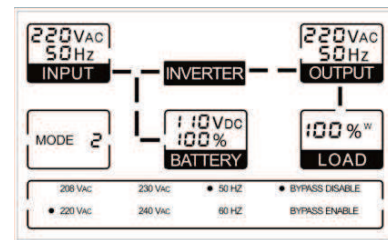


**Bypass mode**

◆ **Line mode**

Line mode means that the mains input is rectified/converted by the AC/DC section and then inverted to stable output by DC/AC section. In line mode, the output is clean and good to the loads. If the mains get abnormal, the UPS will transfer to battery mode without interrupt.

The LCD display in Line mode is shown in the following diagram. The information about the utility power, the battery level, the UPS output and the load level could be displayed. The code "MODE 2" indicates the UPS is working in Line mode.



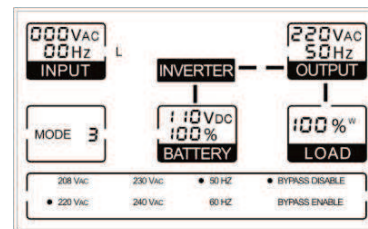
**Line Mode**

◆ **Battery mode**

Battery mode means that the battery power goes through the DC/DC section to the inverter (DC/AC) and get a stable backup output when the mains input is not usable. If the mains input recovered, the UPS will transfer to line mode without interrupt.

The LCD display in battery mode is shown in the following diagram. The information about the utility power, the battery level, the UPS output and the load level could be displayed. The code "MODE 3" indicates the UPS is working in the battery mode.

When the UPS is running in battery mode, the buzzer beeps once every 4 seconds. If the ON-button on the front panel is pressed for more than 1 second again, the buzzer will stop beeping (in silence mode). Press the ON-button once again for more than 1 second to resume the alarm function.



**Battery Mode**

#### ◆ Converter mode

On LCD display, "MODE 6" indicates the UPS is working in the converter mode.

The UPS would free run with fixed output frequency (50Hz or 60Hz) in converter mode. Once the mains is loss or abnormal, the UPS would transfer to battery mode and the load is supplied continuously by the battery.

- 1) It could be enabled through the LCD setting or the software (WinPower).
- 2) The load should be derating to 60% in converter mode.

#### ◆ Battery test mode

In this mode, the UPS will stop the AC/DC section and discharge the battery while mains input is normal. If the controller found the battery is error, it will transfer back to line mode immediately, and warning by display to see whether the battery needs to be replaced. The battery test mode could be triggered in line mode by pressing the button or by the communication command.

The LCD display in battery test mode is same as the battery mode. On LCD display, "MODE 4" indicates the UPS is working in the battery test mode.

#### ◆ ECO mode

It is also called high efficiency mode. On LCD display, "MODE 5" indicates the UPS is working in the ECO mode.

After the UPS is turned on, the power used by the load is supplied from the utility power via internal filter while the utility power is in normal range, so the high efficiency could be gained in the ECO mode. Once the mains is loss or abnormal, the UPS would transfer to battery mode and the load is supplied continuously by the battery.

- 1) It could be enabled through the LCD setting or the software (WinPower).
- 2) It is attention that the transfer time of UPS output from ECO mode to battery mode is less than 10ms.

#### ◆ EPO (Emergency Power Off)

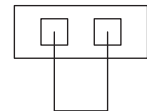
It is also called RPO (Remote Power Off). Turn off the EPO switch could occur RPO .On LCD display, "Warning 30" indicates the UPS is working in the EPO mode.

It is a special status in which the UPS would shut the output off and alarm. The UPS could not be turned off by pressing OFF-button on the panel, only after releasing EPO status by connecting the EPO switch.

Normally the EPO connector is closed with a wire on the rear panel. Once the connector is open, the UPS would stop the output and enter EPO status.



Enable the EPO status



Disable the EPO status

#### ◆ Fault mode

If the UPS generates some internal failure and have to stop its inverter, it will go into fault mode and alarm by display and buzzer.

In fault mode, the loads have the risk of power loss because the output will come from the bypass after UPS fault.

In fault mode such as BUS fault etc., the corresponding fault code would be shown to indicate the operating mode of the UPS. For more fault code detail, please check Chapter 4.2.

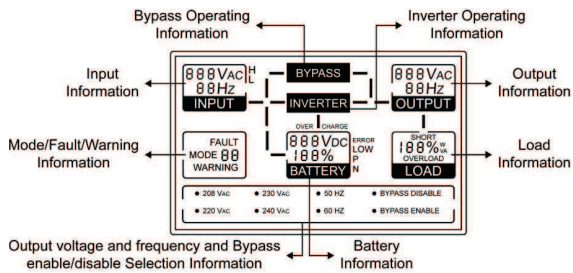
### 1.3. Description of commonly used symbols

Some or all of the following symbols may be used in this manual. It is advisable to familiarize yourself with them and understand their meaning:

Nation and Explanation			
Nation	Explanation	Nation	Explanation
	Alert you to pay special attention		Protective ground
	Caution of high voltage		Overload indication
	ON/OFF		Bypass
	Alternating current source (AC)		Inverter
	Direct current source (DC)		Do not dispose with ordinary trash
	Battery		

### 1.4 Front panel

#### ◆ LCD display information:



Input information	
888VAC	Indicates input Line voltage value, value displayed 0- 999Vac
88Hz	Indicates frequency value of input Line voltage, value displayed 0- 99Hz
H	Indicates input Line voltage is higher than the SPEC range, and the UPS would be working in Battery mode
L	Indicates input Line voltage is lower than the SPEC range, and the UPS would be working in Battery mode
Output information	
888VAC	Indicates UPS output voltage value, value displayed 0-999Vac
88Hz	Indicates frequency value of the UPS output voltage, value displayed 0- 99Hz
Load information	
188% <sup>W</sup> / <sub>VA</sub>	Indicates load percentage in Watt or VA, value displayed 0-199%
SHORT	Indicates load or UPS output is short and the UPS would shut down
OVER LOAD	Indicates load is over the SPEC range
Battery information	
888VDC	Indicates battery voltage value, value displayed 0-999Vdc
188%	Indicates battery capacitance percentage, value displayed 0-199%
OVER CHARGE	Indicates battery is over charged, and UPS will switch to Battery mode
LOW	Indicates battery is weak, and the UPS would shut down soon
Mode/Fault/Warning code information	
FAULT MODE 88 WARNING	Indicates the operating mode of the UPS, Mode code or Fault code or Warning code could be displayed.
Inverter & Bypass operating information	
INVERTER	Indicates the circuit of the inverter is working
BYPASS	Indicates the circuit of Bypass is working

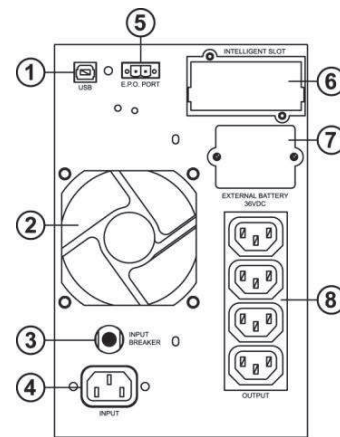
Other selection information	
208 VAC 230 VAC 220 VAC 240 VAC	The four value of the output voltage could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time
50 HZ 60 HZ	The two frequency value of the output voltage could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time
BYPASS DISABLE BYPASS ENABLE	Bypass disable or enable could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time

Remark: "UPS" means the setting of normal inverter mode (Line mode). ; "ECO" means the setting of ECO mode. ; "CUF" means the setting of converter mode.

◆ **Button information:**

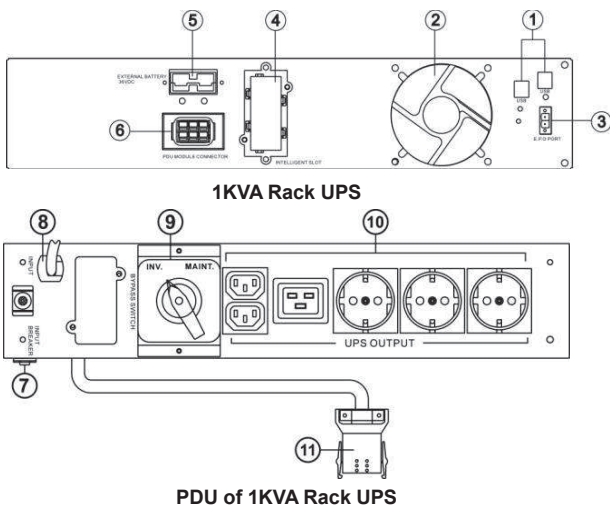
Switch	Function
<b>ON/MUTE-Button</b>	1) Turn on UPS system: By pressing this Button the UPS system is turned on. 2) Deactivate acoustic alarm: By pressing this Button an acoustic alarm can be deactivated in the battery mode. 3) Do the battery test: By pressing this Button the UPS can do the battery test in the Line mode or ECO mode or Converter mode.
<b>OFF-Button</b>	1) When mains power is normal, the UPS system switches to No output or Bypass mode by pressing this Button, and the inverter is off. At this moment, if Bypass is enabled, then the output are supplied with voltage via the bypass if the mains power is available. 2) Deactivate acoustic alarm: By pressing this Button an acoustic alarm can be deactivated in the bypass mode. 3) Release the UPS back to Bypass mode or no output mode from fault mode and EPO status.
<b>SELECT-Button</b>	If the UPS system is No output or Bypass mode, the output voltage, frequency, Bypass disable/enable and operating mode, could be selected by pressing SELECT-Button, and confirmed by pressing ENTER-Button.

### 1.5 Rear panel

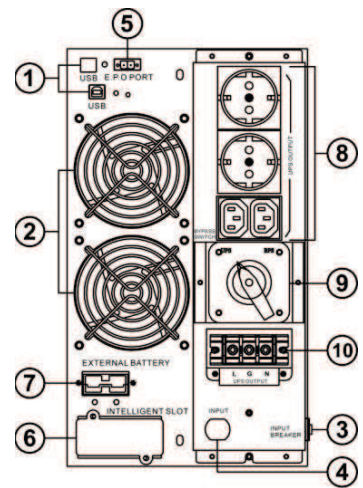


**1KVA Tower UPS**

- ① USB Port
- ② Cooling Fan
- ③ Input Breaker
- ④ AC Input
- ⑤ E.P.O. Port
- ⑥ Intelligent Slot(Optional)
- ⑦ External Battery Connector: 36VDC (Optional)
- ⑧ Output Socket

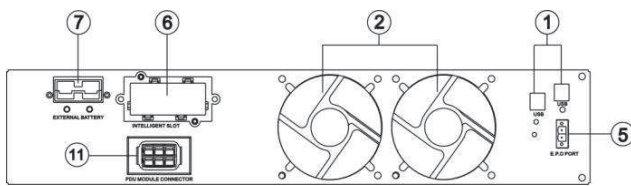


- ① USB Port
- ② Cooling Fan
- ③ E.P.O. Port
- ④ Intelligent Slot(Optional)
- ⑤ External Battery Connector: 36VDC (Optional)
- ⑥ PDU Module Connector
- ⑦ Input Breaker
- ⑧ AC Input
- ⑨ Maintenance Bypass Switch
- ⑩ Output Socket
- ⑪ PDU Module Plug

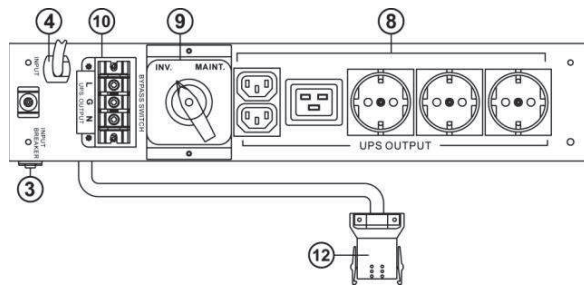


- ① USB Port
- ② Cooling Fan
- ③ Input Breaker
- ④ AC Input
- ⑤ E.P.O. Port
- ⑥ Intelligent Slot(Optional)
- ⑦ External Battery Connector: 96VDC (Optional)
- ⑧ Output Socket
- ⑨ Maintenance Bypass Switch
- ⑩ Output Terminal





**2KVA/3KVA Rack UPS**



**PDU of 2KVA/3KVA Rack UPS**

- ① USB Port
- ② Cooling Fan
- ③ Input Breaker
- ④ AC Input
- ⑤ E.P.O. Port
- ⑥ Intelligent Slot(Optional)
- ⑦ External Battery Connector: 96VDC (Optional)
- ⑧ Output Socket
- ⑨ Maintenance Bypass Switch
- ⑩ Output Terminal
- ⑪ PDU Module Connector
- ⑫ PDU Module Plug

## 1.6 Product specification

### 1.6.1 Environment specification

Model	1KVA	2KVA	3KVA
Operating Temperature	0-45°C		
Storage Temperature	0-45°C		
Altitude	<1000m		
Relative Humidity	<95%		

### 1.6.2 Mechanical specification

#### ◆ Tower model:

Model	1KVA	2KVA	3KVA
Dimension (D×W×H)	420×145×230MM	560×193×346MM	

#### ◆ Rackmount model:

Model	1KVA	2KVA	3KVA
Dimension (D×W×H)	480×440×90MM	480×440×180MM	
Rack Height	2U	4U	

### 1.6.3 Electrical specification

Model	1KVA	2KVA	3KVA
Power	1000VA	2000VA	3000VA
<b>Input</b>			
Normal Current (@230V/battery recharged fully)	4.3A	8.7A	13A
Voltage Range	110~300VAC		
Frequency Range	45 ~ 55Hz @ 50Hz system 54 ~ 66Hz @ 60Hz system		
Input Power Factor	≥ 0.99 @ full load		
<b>Output</b>			
Voltage	200/208/220/230/240 ± 2%		
Frequency	Synchronizing mains input @ line mode		
	50/60Hz ± 0.2 Hz @ battery mode		
THD	≤ 3% ( Linear load )		
Voltage Regulation	≤ 2%		
Overload Capacity	1 min @ 105%~110% ; 30s @ 110%~125% ; 10s @ 125%~150% ;1s @ >150%		
<b>Efficiency</b>			
Line Mode	88%		
Battery Mode	85%		
<b>Battery &amp; Charger @ 25°C</b>			
Total battery rating voltage	36VDC	96VDC	96VDC
Backup Time (Half Load)	>11min	>18min	>10min
Recharge Time (to 90%)	5Hours	5Hours	5Hours
Charging Current (Max.)	1A	1A	1A
Rated Charging Voltage	41VDC	109VDC	109VDC

### 1.7 Communication port

The communication port is for the monitoring software and program update.

#### 1.7.1 USB interface

The USB port is compliance with USB 1.1 protocol.

## 2. Installation

### 2.1 Installation safety instructions

This product must be installed only by qualified or professional personnel accord to safety instructions.

#### ◆ Installation personnel

Please read the following safety instructions before installation!

#### ◆ Installation environment

⚠ Do not install and operate the UPS when water condensation happen which may occur if the UPS is moved directly from a cold to a warm environment. The UPS must be absolutely dry before being installed and operated. Please allow an acclimatization time of at least 2 hours. Otherwise there is hazard of electric shock!

⚠ Do not install the UPS in the environment that is exposed to direct sunlight or near heat. Ensure the UPS is far away from water, inflammable gas and corrosive agents.

⚠ Do not connect appliances or items of equipment which would overload the UPS system (e.g. laser printers) to the UPS output terminals or sockets.

⚠ Do not block air vents in the housing of UPS. The UPS must be installed in a location with good ventilation. Ensure enough space on each side for ventilation.

⚠ With the installation of the equipment, the sum of the leakage current of the UPS and the connected load does not exceed 3.5mA.

⚠ A readily accessible disconnect device shall be incorporated in the building of installation wiring and must be close to the UPS system.

⚠ Place cables that no one can step on or trip over them.

⚠ Assure to connect with the earth reliably and connect the UPS only to an earthed shockproof socket.

⚠ Assure external battery source must be earthed.

#### ◆ Wiring & Grounding

⚠ Installation and Wiring must be performed in accordance with the local electrical laws and regulations.

⚠ The UPS must be securely grounded. If there are external UPS battery cabinets, please make sure the battery cabinets have the equipotential earth bonding to the UPS main cabinet.

⚠ An appropriate switch device as backup protection for over-current or short-circuit should be provided in the input utility.

⚠ Use No. 14AWG (for 2KVA/3KVA output wire), 90°C copper wire and 4.4 lb-in Torque force when connecting to terminal block.

#### ◆ Battery

⚠ Strictly follow the principle of "same voltage, same type" when paralleling multi battery packs.

⚠ DC breaker or fuse must be used as a protection device between the external battery pack and the UPS. The spec of protection must be matched to the UPS specification.

	1KVA	2KVA/3KVA
Fuse/Breaker	50A/250VDC	60A/250VDC

## 2.2 Unpacking and inspection

Inspect the appearance of the UPS to see if there is any damage during transportation. Do not turn on the unit and notify the dealer immediately if there is any damage or lack of some parts. Please keep the packaging in a safe place for future use.

## 2.3 Installation steps for standard model

- 1) Make sure the wire / circuit breaker / socket are enough for the current rating of UPS to avoid the hazards of electric shock and fire. It is recommended to use 14AWG for 2KVA/3KVA.
- 2) Make sure the mains switch in the building is cut off.
- 3) Make sure the UPS is not being turned on before wiring operation.
- 4) Turn off all load switches first before connecting the load to the UPS.
- 5) Connect the loads to the UPS through the output sockets or terminal block.

## 2.4 Installation steps for external battery

- 1) Make sure the wire / circuit breaker / socket are enough for the power rating of UPS to avoid the hazards of electric shock and fire.
- 2) Make sure the mains switch in the building is cut off.
- 3) Turn off all load switches first before connecting the load to the UPS.
- 4) Make sure the protective earth ground is correct.
- 5) Install the external battery as following:
  - A) **Warning:** Make sure the mains input have been cut off.
  - B) Switch off the battery breaker if there is a battery breaker.
  - C) Remove the cover of external battery terminal of UPS.
  - D) **Warning:** Pay highly attention to the rating battery voltage marked on the

rear panel, the connection with wrong battery voltage may cause permanent damage of the UPS

E) **Warning:** Pay highly attention to the polarity marking on external battery terminal block, and make sure the correct battery polarity is connected. Wrong connection may cause permanent damage of the UPS.

F) Specified external battery cable is recommended. Using the specified external battery cable to connect the external battery and UPS could be safer.

G) If there isn't any specified external battery cable. Please prepare the external battery cable that should be able to carry the current of >33A for 2KVA/3KVA, and >30A for 1KVA, the cross section area should be greater than 2.5mm<sup>2</sup>(14AWG) for all model. And battery wire color is recommended as following:

+	GND	-
Red wire	Yellow/Green wire	Black wire

H) Connect the GND pole of external battery cable to the earth point of battery pack. Connect the Positive (+) pole of external battery cable to the Positive polarity of battery pack; Connect the Negative (-) pole of external battery cable to the Negative polarity of battery pack.

**Note:** Always connect the earth wire first!

I) Connect the plug of external battery cable to external battery terminal block on the rear panel of UPS.

J) Check the wiring and voltage of the battery pack. Make sure the polarity and voltage is correct, and the wires are fastened.

- 6) Connect the loads to the UPS through the output sockets or terminal block.
- 7) Connect the input power cord of UPS to mains.

## 2.5 Installation for communication software

Connect the communication cable between UPS and PC. If the port is USB, it has Plug and Play function.

Please refer to the guide manual of software or contact the service center for installation and operation of management monitoring software.

## 3. Operation

### 3.1 Operation safety instructions

Please read the following safety instructions before operation.

#### ◆ Operation personnel

Laymen can operate this product.

#### ◆ Operation warning



Do not disconnect the earth conducting wire on the UPS or the building wiring terminals in any time since this would cancel the protective earth of the UPS system and all connected loads.



Do not try to disassemble the original part of the UPS before turn off and disconnect it from the mains power & external battery.



The UPS output socket or terminal block may be electrically lived even if the UPS system is not connected to the mains power source.



Do not make any liquid and foreign objects enter the UPS.



Turn off the mains input switch and external battery switch immediately at any accident of electric shock and fire related to the UPS.

### 3.2 Start the UPS with mains (AC source)

- 1) If the UPS is a long back up time model, with external battery banks, please switch on the battery breaker first;
- 2) If the wiring is correct, turn on the mains breaker in your building. Then the power supply inside the UPS will be started automatically, the fans will run, and the LCD will display with bypass mode or no output mode.

**Note 1:** If the UPS have been set to enable the bypass output, the output will have the voltage directly from mains after you turn on the input breaker, and the LCD display "BYPASS ENABLE", else the output will not have the voltage and the LCD display "BYPASS DISABLE".

**Note 2:** In bypass mode, the load is not protected. You should go on to the next step to turn on the UPS for protecting your load.

3) Press the ON-button of the UPS front panel continuously for more than 1 second. The buzzer will beep once. After a few seconds, the UPS will be turned on to the normal mode (line mode) and output the spec voltage.

4) After the UPS is turned on to line mode normally. There is no beep of buzzer.

**Note:** If the UPS is shutdown in battery mode automatically, when the mains power returned to the input, the UPS will start up and switch to line mode automatically.

### 3.3 Start the UPS with battery (DC source) only

This UPS can be started with DC source (battery) without AC source.

1) If the UPS is a long back up time model with external battery banks, please switch on the battery breaker first.

2) Press the ON-button of the UPS front panel continuously for more than 1 second. The buzzer will beep once. After a few seconds, the UPS will be turned on to the battery mode and output the spec voltage.

3) After the UPS is turned on to battery mode normally. The buzzer will beep according to the battery level.

### 3.4 Connect loads to UPS

After the UPS is turned on, you can switch on the loads.

1) It is recommended to switch on the load one by one. The Load percentage will indicate the load capacity in line mode.

2) If it is necessary to connect the inductance load such as a printer to the UPS, the start-up power should be considered for calculating the capacity of the UPS,

because the power consumption is too big when this kind of load is started.

3) If the UPS is overloaded, LCD display will show "OVER LOAD "and code show "Warning 29" or "Fault 07", and the buzzer will beep twice every second for alarming.

4) If the UPS is overloaded, some loads must be switched off or decreased immediately. It is recommend that the total loads connected to the UPS had better be less than 80% of its nominal power capacity to prevent the overload happen at the transient time, and it will make your system more safe.

5) If the overload time is over spec in line mode, the UPS will transfer to bypass, after the overload disappears, it will return to line mode. If the overload time is over spec in battery mode, the UPS will cut off the output and then shutdown according battery level.

### 3.5 Charge the batteries

1) After the UPS is connected to normal mains, the charger will work and charge the batteries automatically in bypass mode or line mode.

2) Suggest charging the batteries for 10 hours before use. Otherwise the backup time may be less than the standard value.

### 3.6 Discharge the batteries

1) When the UPS is in battery mode, the buzzer will beep according to different battery level. If the battery voltage drops to the alarming level, the buzzer will beep hurry (once every sec) to remind the user that the battery is low level and the UPS will be shutdown automatically soon. The user could switch off some non-critical loads to avoid the shutdown alarming and prolong the backup time. If have no more load to be switched off at that time, you have to shutdown all loads as soon as possible to protect the loads or save data. Otherwise there is the risk of data loss or load failure.

2) In battery mode if the user doesn't like the buzzer noise, the beep could be muted by press the MUTE-button.

3) The backup time of the long backup time model is dependent on the external battery capacity except the load capacity mainly.

4) The backup time may vary from different environment temperature and load type.

### 3.7 Test the batteries

1) If you need to check the battery level or aging status when the UPS is running on normal mode (line mode), you could press the ON-button for more than 1 second to let the UPS transfer to battery test mode.

2) The battery test could be performed by the command from monitoring software through the communication port.

3) If the UPS enter the battery test mode, the display and buzzer indication will be same as the battery mode except that LCD displays code "MODE 4". So you can check the battery level at this mode.

### 3.8 Turn off the UPS with mains (AC source)

1) Firstly turn off the UPS (inverter) to bypass mode, please press the OFF-button continuously for more than 1 second.

2) After you press the OFF-button, the buzzer will beep once. Then the panel will display the bypass mode or no output mode.

**Note 1:** If the UPS have been set to enable the bypass output, the output socket or terminal block will have voltage from mains directly after you turn off the UPS (inverter) to bypass mode.

**Note 2:** Because there is risk of power loss for the loads if you turn off the UPS to bypass mode, please make sure the loads are prepared for your operation.

3) If you want to turn off the output of UPS and shut down the UPS completely, you have to cut off the mains input of UPS.

**Note:** please make sure all the loads are prepared or turned off for your operation before you shutdown the UPS system.

4) After you cut off the mains input of UPS to shut down. After a few seconds, the UPS will be shutdown completely and the LCD extinguish.

### 3.9 Turn off the UPS with battery (DC source) only

1) To turn off the UPS in battery mode, please press OFF-button continuously for more than 1 second.

2) After you press the button, the buzzer will beep once. After a few seconds, the UPS will be shutdown completely and the LCD extinguish.

**Note:** please make sure all the loads are prepared or turned off for your operation before you shutdown the UPS system.

### 3.10 Mute the buzzer

1) If the alarm is too annoying in battery mode, you may press MUTE-button continuously for more than 1 second to clear it. Moreover, the alarm will be enabled when the battery is low to remind you to shutdown the load soon.

2) If the alarm is too annoying in bypass mode, you may press OFF-button continuously for more than 1 second to clear it. The action doesn't affect the warning and fault alarm.

### 3.11 UPS in warning status

1) If UPS is on warning status and the buzzer is beeping once every second, it shows that the UPS system have some troubles, please check the troubleshooting table in Chapter 4.

2) If UPS is on warning status, the UPS will continue work in the original mode, the operation will not be interrupted. If the error is corrected, the warning alarm will stop.

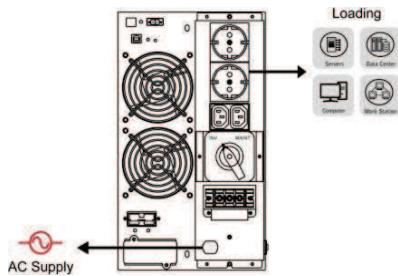
### 3.12 UPS in fault mode

- 1) If UPS is on fault status and the buzzer beep continuously, it shows UPS is operating in abnormal mode.
- 2) If UPS is on fault status, please make record for the information of the LCD display and refer to the troubleshooting table of Chapter 4 for detail.
- 3) When UPS is failure, please check the loads, cable wiring, ventilation system, AC mains, and battery firstly and please DO NOT turn on the UPS again before UPS problem is solved. If the problems still exist, please contact the distributor or call for the service.
- 4) For emergency, please cut off the connection from AC mains / external battery / output immediately to avoid hazards or danger.

### 3.13 Remove main UPS from UPS system for maintenance

#### Tower Model (2KVA/3KVA model available):

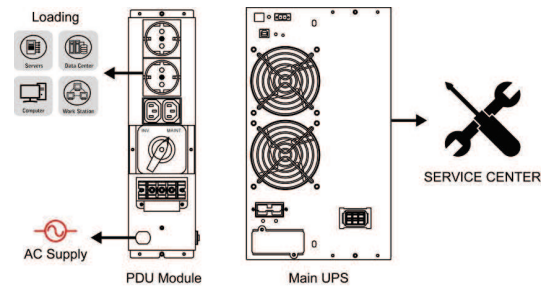
- 1) Please press OFF-button to switch UPS to Bypass Mode.



- 2) Change over the Maintenance Bypass Switch of PDU module from "INV." to "MAINT.", and release the screws of PDU module, then PDU module can be disassembled from UPS unit. Main UPS can be sent to repair service. The load connected on PDU module will continuously be supplied by AC mains.

**Note 1:** Ensure UPS is on Bypass mode when operating Maintenance Bypass Switch to avoid serious danger.

**Note 2:** Maintenance Bypass Switch can only be operated by qualified personnel.

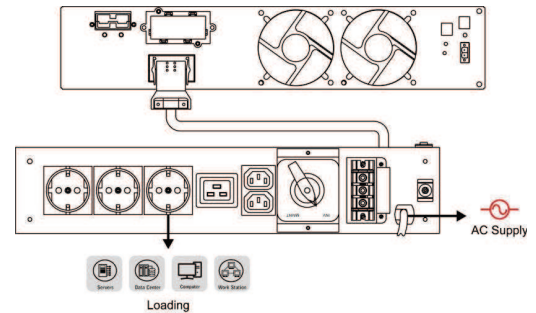


- 3) When UPS is returned from repair service, screw PDU module back to the UPS cabinet. Change over the Maintenance Bypass Switch of PDU module from "MAINT." to "INV." and lastly press ON-button to turn on the UPS.

**Note 1:** Make sure the cover plate of Maintenance Bypass Switch locked tightly when operating UPS.

#### Rackmount Model:

- 1) Please press OFF-button to switch UPS to Bypass Mode.

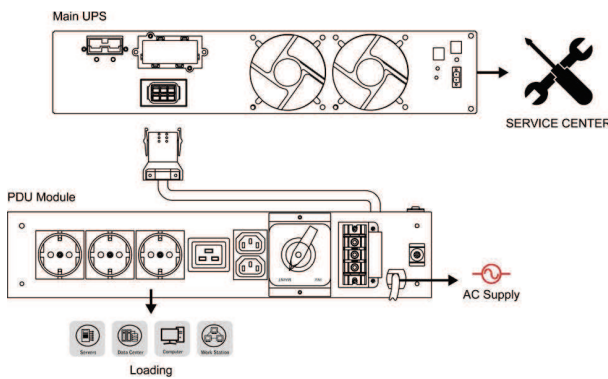




2) Change over the Maintenance Bypass Switch of PDU module from "INV." to "MAINT.", and disconnect the cable between PDU module and Main UPS. Main UPS can be sent to repair service. The load connected on PDU module will continuously be supplied by AC mains.

**Note 1:** Ensure UPS is on Bypass mode when operating Maintenance Bypass Switch to avoid serious danger.

**Note 2:** Maintenance Bypass Switch can only be operated by qualified personnel.



3) When UPS is returned from repair service, connect PDU module back to the main UPS. Change over the Maintenance Bypass Switch of PDU module from "MAINT." to "INV." and lastly press ON-button to turn on the UPS.

**Note 1:** Make sure the cover plate of Maintenance Bypass Switch locked tightly when operating UPS.

### 3.14 Setting by LCD module

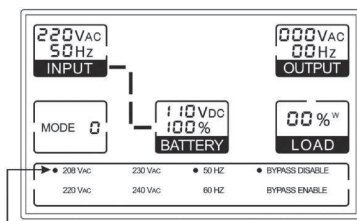
The output voltage, output frequency, bypass state, Converter mode, and ECO mode could be set directly through LCD module. The output voltage could be set to 208Vac, 220Vac, 230Vac and 240Vac. The output frequency could be set to 50Hz and 60Hz. The operating mode of UPS could be set between the Line mode Converter mode and ECO mode. The bypass state could be set to enable and disable. But all the settings could only be done when the UPS is in bypass or no output mode.

In bypass or no output mode, pressing the SELECT-button on the LCD panel for more than one second, a flickering black dot would be shown before "208V" on the screen. And if pressing the SELECT-button continuously again, the flickering black dot would move to "220V", next to "230V", "240V", "50Hz", "60Hz", "Bypass Disable", "Bypass Enable", "UPS", "ECO", "CVF" in turn. (Here "UPS" means the normal inverter mode, and "UPS", "ECO", and "CVF" would be presented circularly at the position of output information.) And if pressing the ENTER-button for more than one second at this time, the flickering black dot would turn to flickerless and the output voltage or frequency or bypass state or mode state setting would be modified to the selected value. And if no any pressing on the SELECT-button or ENTER-button lasting for more than 30 seconds, the flickering black dot would disappear, the setting mode exit automatically.

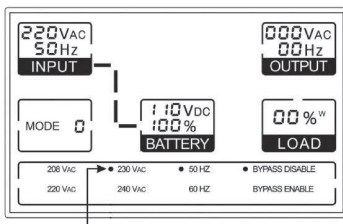
The only one voltage value could be selected in "208Vac", "220Vac", "230Vac", "240Vac" at any time. The only one frequency value could be selected in "50Hz", "60Hz" at any time. And the output voltage and frequency would be changed to the corresponding value after the right values are selected on the LCD panel and the UPS is turn on by pressing the ON-Button. The UPS would turn to bypass mode in several seconds after "Bypass Enable" is selected, and turn to no output mode in several seconds after "Bypass Disable" is selected. The mode change would be active only after the UPS is turned on.

Here is an example for changing the output voltage from 220Vac to 230Vac through the LCD panel.

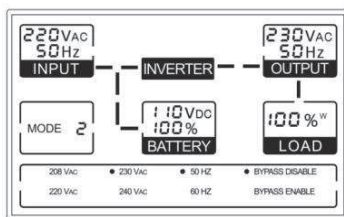
Step 1: One flickering black dot would appear before "208Vac" after pressing the SELECT-button.



Step 2: The flickering dot would move to "230Vac" after pressing the SELECT-button two times again. The dot before "230Vac" would turn to flickerless after pressing the ENTER-button.



Step 3: The output voltage would be 230Vac after the UPS is turned on.



## 4. Maintenance


### 4.1 Maintenance safety instructions


Please read the following safety instructions before maintenance.


#### ◆ Maintenance personnel


This product must be maintained only by qualified professional personnel accord to safety instructions.


#### ◆ Risk of electric shock


 No matter the UPS is connected to the utility power or not, the output may have electricity. The parts (battery, capacitor) inside the unit may still have hazardous voltage after turning off the UPS.

 Make sure to disconnect the batteries before carrying out any kind of maintenance or repair. In this product, the battery is dangerous.

 Verify that no voltage between the battery terminals and the ground is present before maintenance or repair. In this product, the battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground.

 Verify that no hazardous voltage exists in the energy storage capacitor before maintenance or repair.

 Remove all jewellery, wristwatches, rings and other metal personal goods before maintenance or repair.

 Only use tools with insulated grips and handles when maintaining or repairing

◆ **Battery**

Only qualified personnel can replace the batteries.

⚠ Do not short the positive and negative of the battery electrode. Batteries have a high short-circuit current and may cause a risk of serious shock or fire.

⚠ When changing batteries, replace with the same quantity and the same type of batteries.

⚠ Do not attempt to dispose of batteries by burning them. It could cause explosion. The batteries must be rightly disposed according to local regulation.

⚠ Do not open or destroy batteries. Effluent electrolyte can cause injury to the skin and eyes. It may be toxic.

◆ **Fuse**

⚠ Please replace the fuse only by a fuse of the same type and of the same amperage in order to avoid fire hazards.

**4.2 Typical trouble shooting**

If the UPS system does not operate correctly, first check the operating information on the LCD display. Please attempt to solve the problem using the table below. If the problem still persists, consult your dealer.

<b>Normal operating mode</b>	No output mode	Code 0
	Bypass mode	Code 1
	Line mode	Code 2
	Battery mode	Code 3
	Battery test mode	Code 4
	ECO mode	Code 5
	Converter mode	Code 6

<b>Warning</b>	Site fail	Code 09
	Fan fail	Code 10
	Battery over voltage (over charged)	Code 11
	Battery low	Code 12
	Charge fail	Code 13
	DC-DC temperature high	Code 21
	Inverter temperature high	Code 24
	Ambient temperature high	Code 25
	Line voltage high (OVCD action)	Code 26
	Battery open	Code 27
Overload	Code 29	
EPO function is active	Code 30	
<b>Fault</b>	Bus fault	Code 05
	Inverter fault	Code 06
	Overload fault	Code 07
	Over temperature fault	Code 08
	Inverter short	Code 14
	Bus short	Code 28

If the UPS system does not operate correctly, please attempt to solve the problem using the table below.

<b>Problem</b>	<b>Possible cause</b>	<b>Solution</b>
No indication, no warning tone even though system is connected to mains power supply	No input voltage	Check building wiring socket outlet and input cable.
Display code "MODE 1" in LCD, even though the power supply is available	Inverter not switched on	Press ON-Button.

Problem	Possible cause	Solution
Display code "MODE 3" in LCD, and audible alarm beep once every 4 seconds	Mains power supply has failed, or Input power and/or frequency are out of tolerance	Switching to battery mode automatically. Check input power source and inform dealer if necessary.
Emergency supply period shorter than nominal value	Batteries not fully charged / batteries defect	Charge the batteries for at least 10 hours and then check capacity. If the problem still persists, consult your dealer.
Fan fail	Fan abnormal	Check if the fan is running.
Battery over voltage	Battery is over charged	Switching to battery mode automatically, and after the battery voltage is normal and the mains is normal, the UPS would switch to line mode automatically again.
Battery low	Battery voltage is low	When audible alarm sounding every second, battery is almost empty.
Charge fail	The charge is broken	Notify dealer.
DC-DC temperature high	Inside temperature of the UPS is too high	Check the ventilation of the UPS, check the ambient temperature.
Inverter temperature high	Inside temperature of the UPS is too high	Check the ventilation of the UPS, check the ambient temperature.
Ambient temperature high	The ambient temperature is too high	Check the environment ventilation.
Line voltage high (OVCD action)	Input power voltage is too high	Switching to battery mode automatically, and after the mains is normal, the UPS switch to line mode automatically again.

Problem	Possible cause	Solution
Battery open	Battery pack is not connected correctly	Do the battery test to confirm. Check the battery bank is connected to the UPS. Check the battery breaker is turn on.
Overload	Overload	Check the loads and remove some non-critical loads. Check whether some loads are failed.
Site fail	Phase and neutral conductor at input of UPS system are possibly reversed	Check the phase and neutral conductor to see if reversed.
EPO active	EPO function is enabled	Turn off the EPO switch.
BUS fault	UPS internal fault	Notify dealer
Inverter fault	UPS internal fault	Notify dealer
Over temperature fault	Over temperature	Check the ventilation of the UPS, check the ambient temperature and ventilation.
Inverter short	Output short circuit	Remove all the loads. Turn off the UPS. Check whether the output of UPS and loads is short circuit. Make sure the short circuit is removed, and the UPS has no internal faults before turning on again.
UPS internal fault	UPS internal fault	Notify dealer

**Please have the following information at hand before calling for service.**

- 1) Model number, serial number
- 2) Date on which the problem occurred
- 3) LCD display information, buzzer alarm status
- 4) Mains power condition, load type and capacity, environment temperature, ventilation condition
- 5) The information (battery capacity, quantity) of external battery pack.
- 6) Other information for complete description of the problem

### 4.3 Battery maintenance

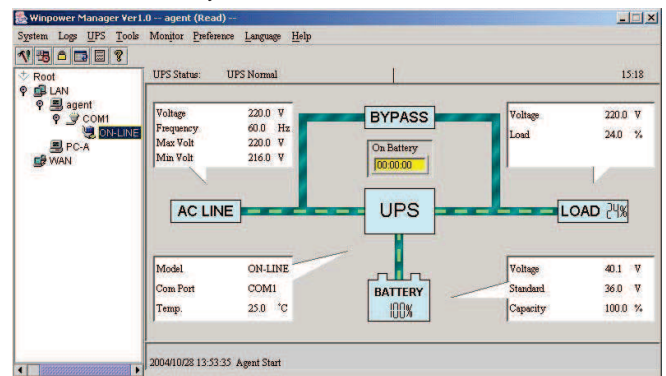
Battery replacement should be performed by qualified personnel.

- 1) This series UPS only requires minimal maintenance. The battery used for standard models are value regulated sealed lead-acid maintenance free battery. These models require minimal repairs. The only requirement is to charge the UPS regularly in order to maximize the expected life of the battery. When being connected to the mains power, whether the UPS is turned on or not, the UPS keeps charging the batteries and also offers the protective function of overcharging and over-discharging.
- 2) The UPS should be charged once every 4 to 6 months if it has not been used for a long time.
- 3) In the regions of hot climates, the battery should be charged and discharged every 2 months. The standard charging time should be at least 12 hours.
- 4) Under normal conditions, the battery life lasts 3 to 5 years. In case if the battery is found not in good condition, earlier replacement should be made.
- 5) Replace batteries with the same number and same type of batteries.
- 6) Do not replace the battery individually. All the batteries should be replaced at the same time following the instructions of the battery supplier.
- 7) If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced.

## 5. Monitoring Software

### 5.1 Free software download – WinPower

WinPower is a brand new UPS monitoring software, which provides user-friendly interface to monitor and control your UPS. This unique software provides safely auto shutdown for multi-computer systems while power failure. With this software, users can monitor and control any UPS on the same LAN no matter how far from the UPS.



### 5.2 Installation procedure:

- 1) Go to the website: <http://www.ups-software-download.com/>
- 2) Choose the operation system you need and follow the instruction described on the website to download the software.
- 3) When downloading all required files from the internet, enter the serial No: **511C1-01220-0100-478DF2A** to install the software.
- 4) When your computer restarts, the WinPower software will appear as a green plug icon located in the system tray, near the clock.