

# **User Manual**

## **1K/2K/3K Online UPS**

Uninterruptible Power Supply System

Version:1.1

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## **1. Important Safety Warning**

Please comply with all warnings and operating instructions in this manual strictly. Save this manual properly and read carefully the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully

### **1-1. Transportation**

- Please transport the UPS system only in the original package to protect against shock and impact.

### **1-2. Preparation**

- Condensation may occur if the UPS system is moved directly from cold to warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate the environment.
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near heater.
- Do not block ventilation holes in the UPS housing.

### **1-3. Installation**

- Do not connect appliances or devices which would overload the UPS system (e.g. laser printers) to the UPS output sockets.
- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.
- The UPS can be operated by any individuals with no previous experience.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Please use only VDE-tested, CE-marked mains cable (e.g. the mains cable of your computer) to connect the UPS system to the building wiring outlet (shockproof outlet).
- Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.
- When installing the equipment, it should ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5mA.

### **1-4. Operation**

- Do not disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- In order to fully disconnect the UPS system, first press the OFF/Enter button to disconnect the mains.
- Prevent no fluids or other foreign objects from inside of the UPS system.

## 1-5. Maintenance, service and faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.
- **Caution** - risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery and electrically live and dangerous.
- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capability capacitor such as BUS-capacitors.
- Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.
- **Caution** - risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!
- Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:
  - remove wristwatches, rings and other metal objects
  - use only tools with insulated grips and handles.
- When changing batteries, install the same number and same type of batteries.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.
- Please replace the fuse only with the same type and amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.
- **WARNING:** This is a category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures. (only for 220/230/240 VAC system)

### Only for 110/120 VAC system:

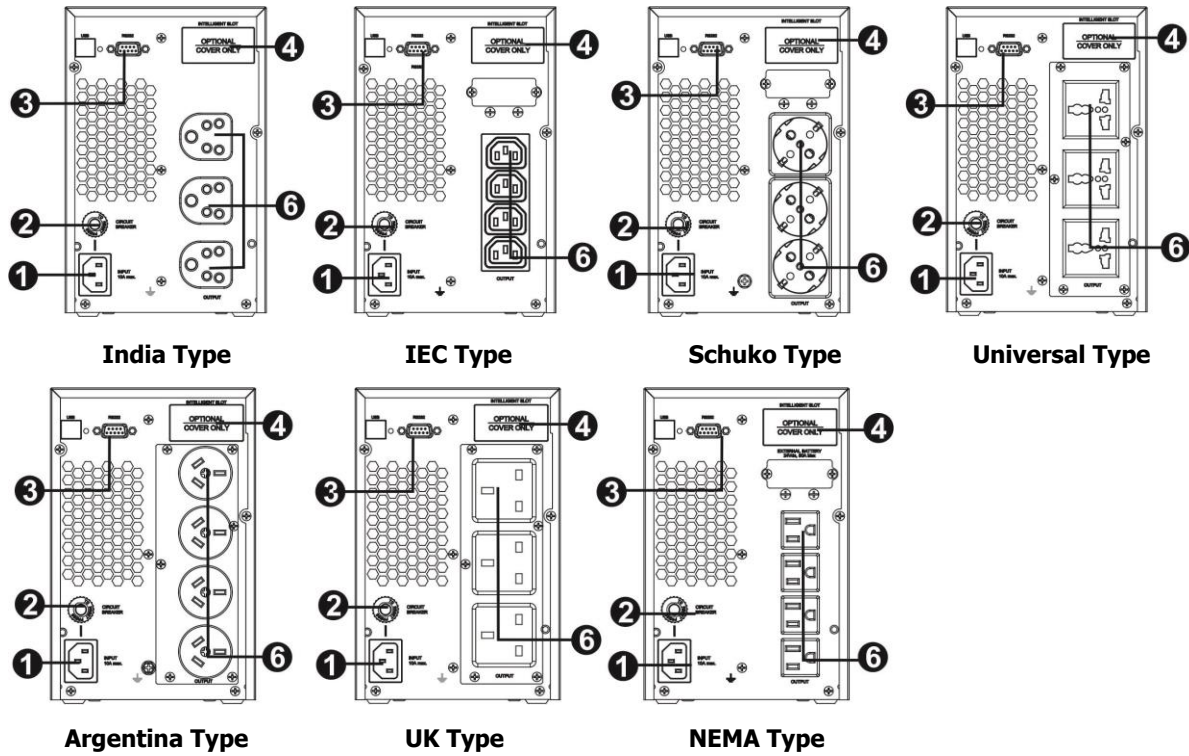
- **NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- **WARNING:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## 2. Installation and setup

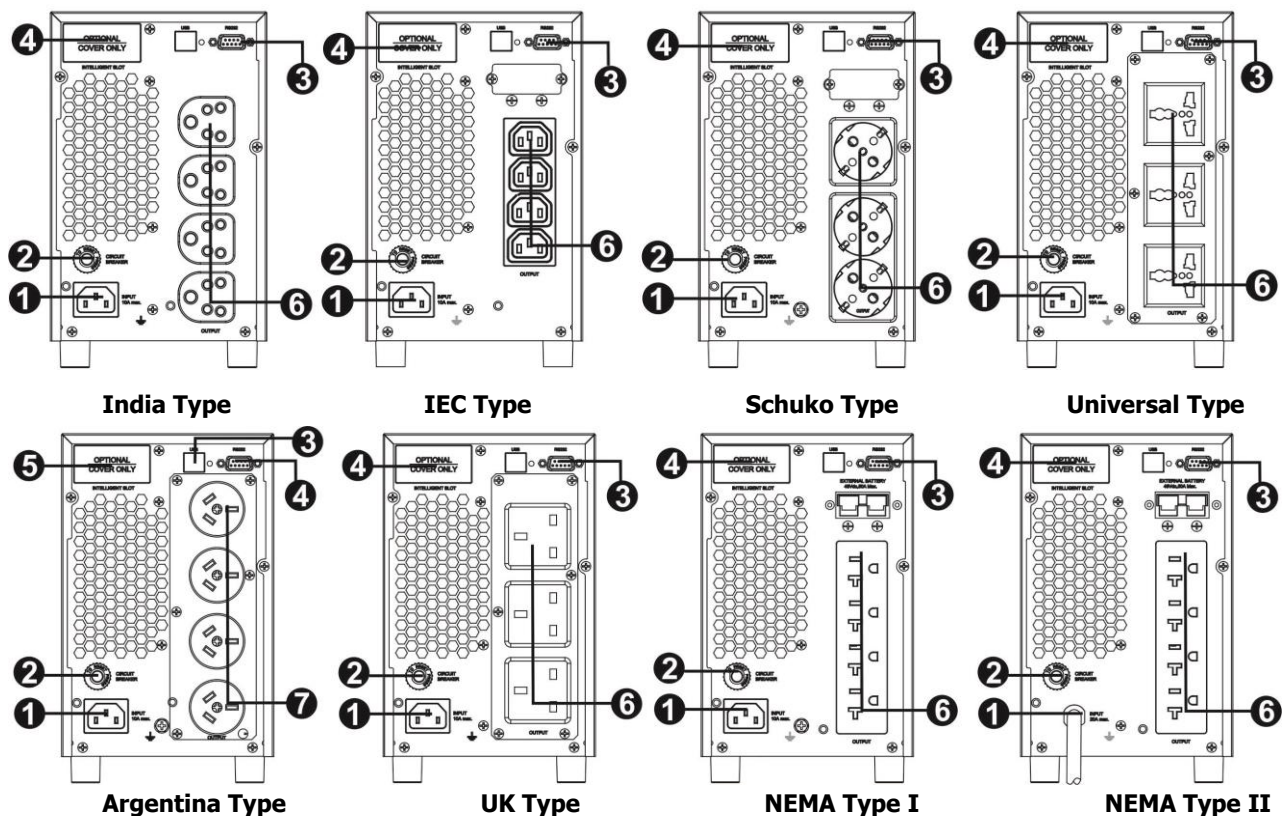
**NOTE:** Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. Please keep the original package in a safe place for future use.

### 2-1. Rear panel view

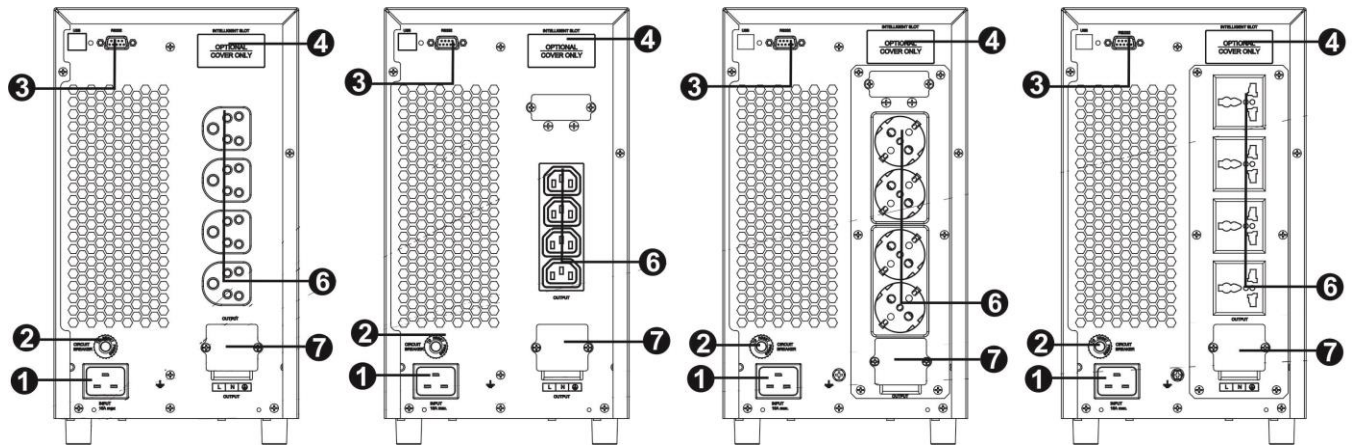
1K



2K



3K

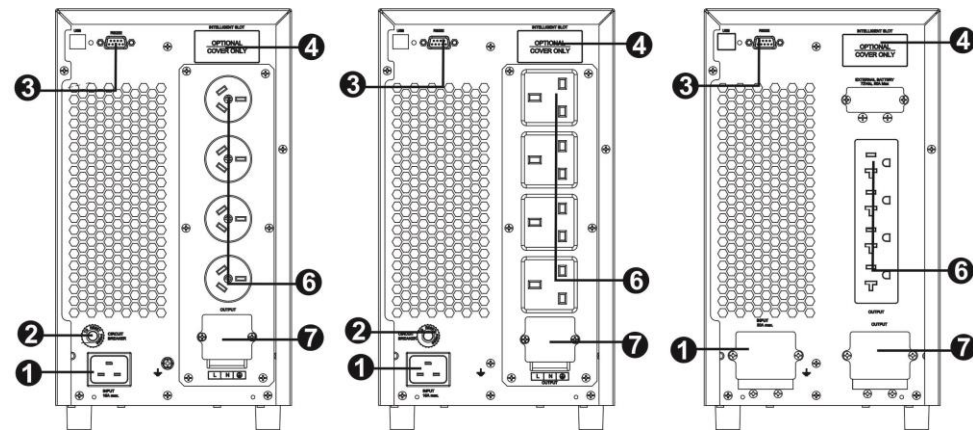


**India Type**

**IEC Type**

**Schuko Type**

**Universal Type**

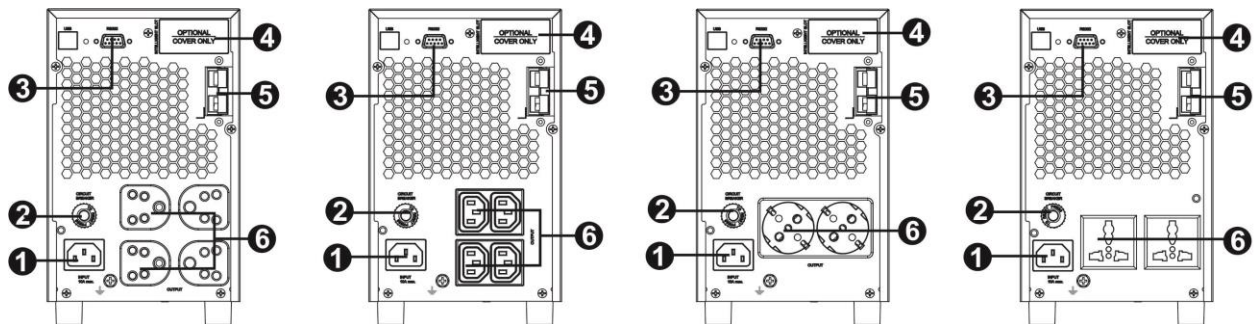


**Argentina Type**

**UK Type**

**NEMA Type**

1KL/2KL

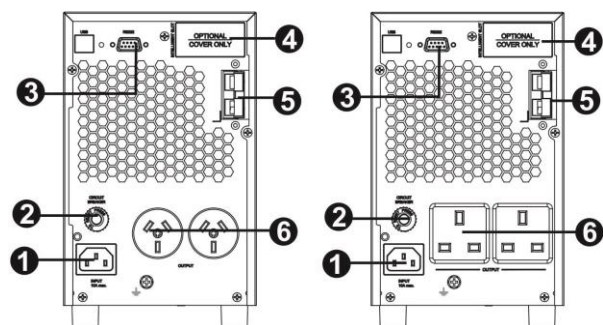


**India Type**

**IEC Type**

**Schuko Type**

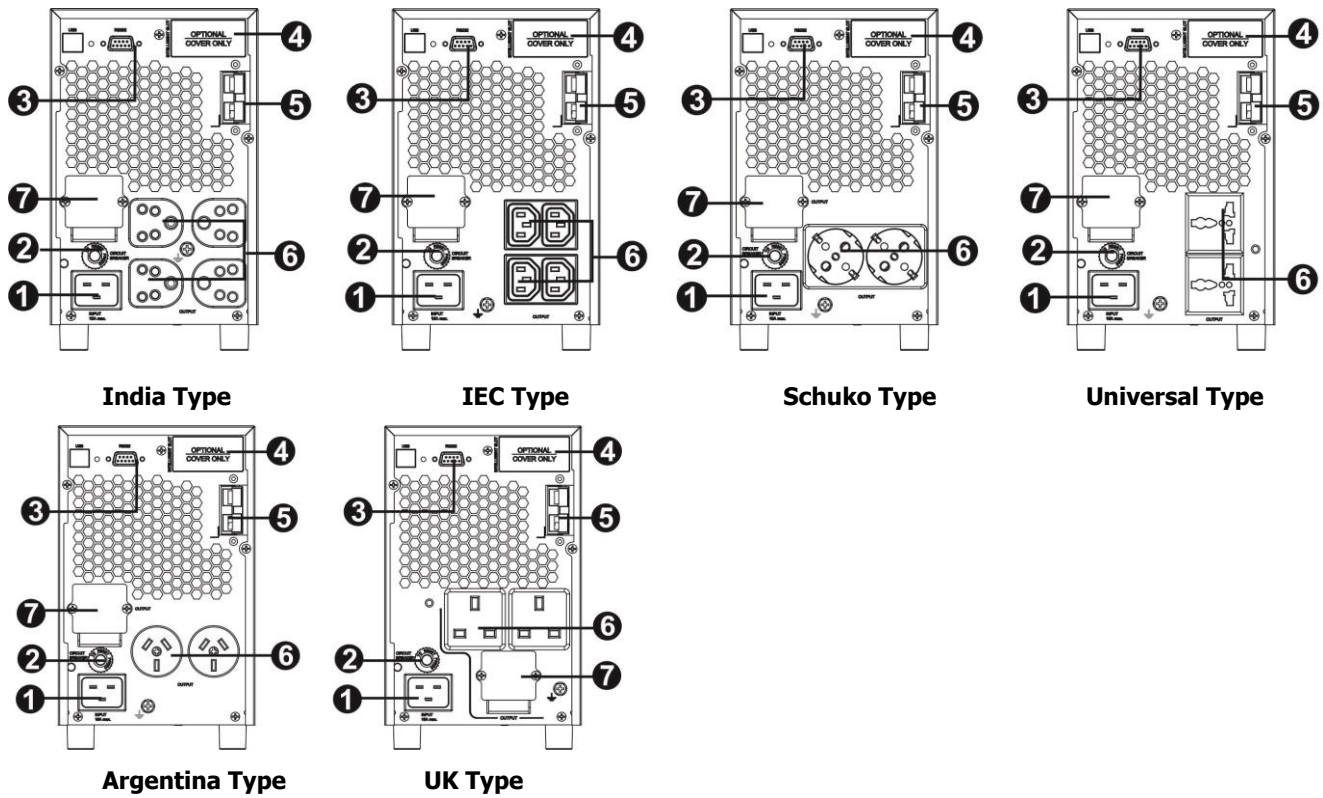
**Universal Type**



**Argentina Type**

**UK Type**



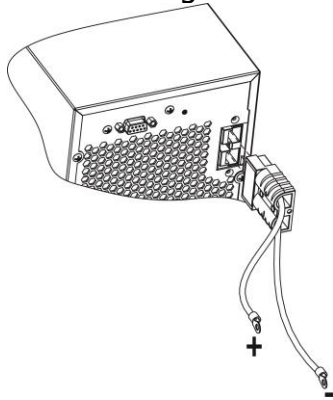


1. AC input
2. Input circuit breaker
3. RS-232 communication port
4. SNMP intelligent slot (option)
5. External battery connection (only available for L model)
6. Output receptacles
7. Output terminal

## 2-2. Setup the UPS

### Step 1: Connect battery wires

If UPS is long-run model, please connect external batteries as below chart.



External battery

## Step 2: UPS input connection

Plug the UPS into a two-pole, three-wire, grounded receptacle only. Avoid using extension cords.

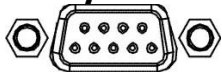
- For 200/208/220/230/240VAC models: The power cord is supplied in the UPS package.
- For 100/110/115/120/127VAC models: The power cord is attached to the UPS. The input plug is a NEMA 5-15P for 1K model and NEMA 5-20P for 2K model.

## Step 3: UPS output connection

- For socket-type outputs, simply connect devices to the outlets.
- For terminal-type input or outputs, please follow below steps for the wiring configuration:
  - a) Remove the small cover of the terminal block
  - b) Suggest using AWG14 or 2.1mm<sup>2</sup> power cords for 3KVA (200/208/220/230/240VAC models). Suggest using AWG12-10 or 3.3mm<sup>2</sup>-5.3mm<sup>2</sup> power cords for 3KVA (100/110/115/120/127VAC models). Please also install a circuit breaker (40A) between the mains and AC input of UPS in 3KVA (100/110/115/120/127VAC models) for safety operation.
  - c) Upon completion of the wiring configuration, please check whether the wires are securely affixed.
  - d) Put the small cover back to the rear panel.

## Step 4: Communication connection

### ***RS-232 port communication port:***



To allow for unattended UPS shutdown/start-up and status monitoring, connect the communication cable one end to the RS-232 port and the other to the communication port of your PC. With the monitoring software installed, you can schedule UPS shutdown/start-up and monitor UPS status through PC.

## Step 5: Turn on the UPS

Press the ON/Mute button on the front panel for two seconds to power on the UPS.

Note: The battery charges fully during the first five hours of normal operation. Do not expect full battery run capability during this initial charge period.

## Step 6: Install software

For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown. You may insert provided CD into CD-ROM to install the monitoring software. If not, please follow steps below to download and install monitoring software from the internet:

1. Go to the website <http://www.power-software-download.com>
2. Click ViewPower software icon and then choose your required OS to download the software.
3. Follow the on-screen instructions to install the software.
4. When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.

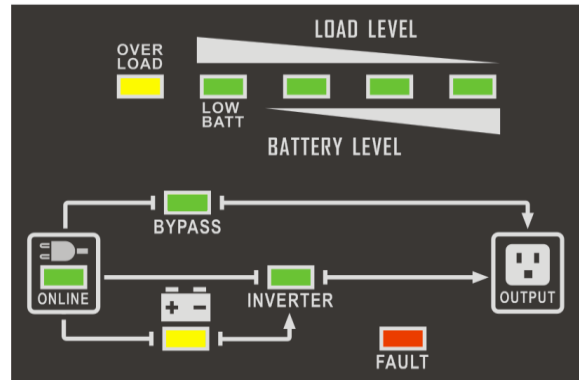




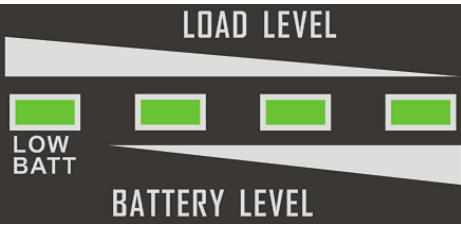






### 3. Operations

#### 3-1. Button operation

Button	Function
ON/Mute Button	<ul style="list-style-type: none"><li>➤ Turn on the UPS: Press and hold ON/Mute button for at least 2 seconds to turn on the UPS.</li><li>➤ Mute the alarm: When the UPS is on battery mode, press and hold this button for at least 5 seconds to disable or enable the alarm system. But it's not applied to the situations when warnings or errors occur.</li><li>➤ Up key: Press this button to display previous selection in UPS setting mode.</li><li>➤ Switch to UPS self-test mode: Press and hold ON/Mute button for 5 seconds to enter UPS self-testing while in AC mode, ECO mode, or converter mode.</li></ul>
OFF/Enter Button	<ul style="list-style-type: none"><li>➤ Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS. UPS will be in standby mode under power normal or transfer to Bypass mode if the Bypass enable setting by pressing this button.</li><li>➤ Confirm selection key: Press this button to confirm selection in UPS setting mode.</li></ul>
Select Button	<ul style="list-style-type: none"><li>➤ Switch LCD message: Press this button to change the LCD message for input voltage, input frequency, battery voltage, output voltage and output frequency. It will return back to default display when pausing for 10 seconds.</li><li>➤ Setting mode: Press and hold this button for 5 seconds to enter UPS setting mode when UPS is in standby mode or bypass mode.</li><li>➤ Down key: Press this button to display next selection in UPS setting mode.</li></ul>
ON/Mute + Select Button	<ul style="list-style-type: none"><li>➤ Switch to bypass mode: When the main power is normal, press ON/Mute and Select buttons simultaneously for 5 seconds. Then UPS will enter to bypass mode. This action will be ineffective when the input voltage is out of acceptable range.</li></ul>

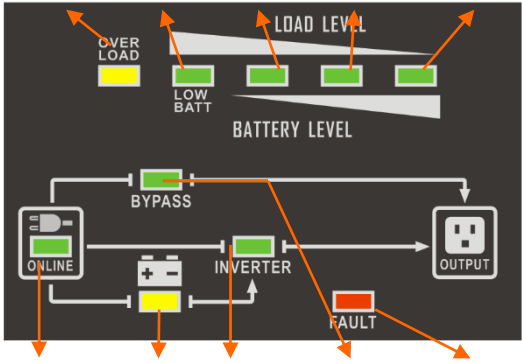
### 3-2. LED Indicators



Indicators	Function
<b>Fault information</b>	
	Indicates that the warning and fault occurs.
	Indicates the warning and fault codes, and the codes are listed in details in 3-6 and 3-8 sections.
<b>Load and Battery information</b>	
	Indicates the load level or battery level. It indicates battery level by 0-25%, 26-50%, 51-75% and 76-100% when UPS is in battery or standby mode. It indicates load level by 0-25%, 26-50%, 51-75% and 76-100% when UPS is in online, bypass, ECO and converter mode.
	Indicates overload.
	Indicates low battery level and low battery voltage.
<b>Mode operation information</b>	
	Indicates the UPS connects to the mains.
	Indicates the battery is working.
	Indicates the bypass circuit is working.
	Indicates the Inverter circuit is working.

3-3. UPS Setting

LED6 LED7 LED8 LED9 LED10



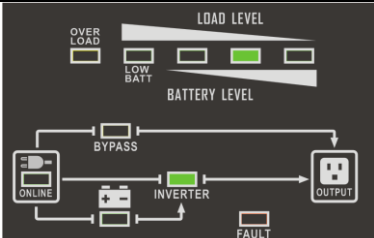
LED1 LED2 LED3 LED4 LED5

LED3 or LED4 flashing indicates setting program. There are two setting programs.

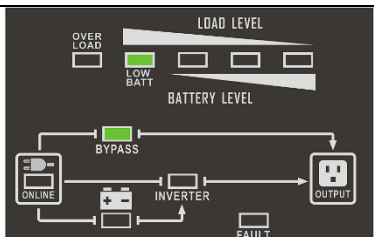
- LED3: Output voltage setting
- LED4: Bypass enable/disable when UPS is off

LED7, LED8, LED9 and LED10 flashing indicates value or disable selection.

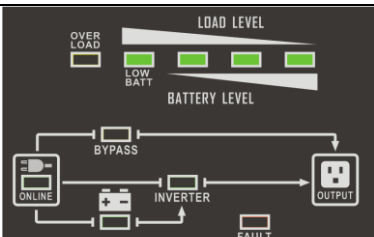
● LED3 flashing: Output voltage setting

Interface	Setting
	For 200/208/220/230/240 VAC models, you may choose the following output voltage: <b>LED7:</b> presents output voltage is 208Vac <b>LED8:</b> presents output voltage is 220Vac <b>LED9:</b> presents output voltage is 230Vac <b>LED10:</b> presents output voltage is 240Vac

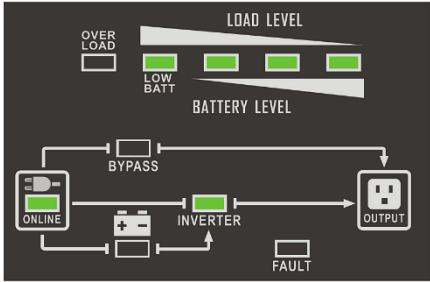
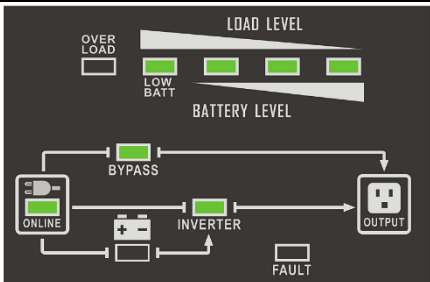
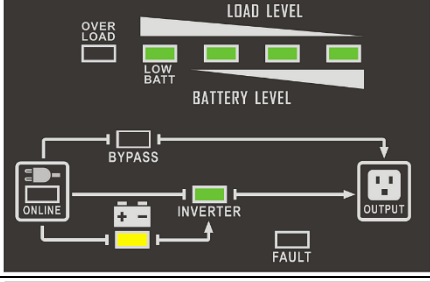
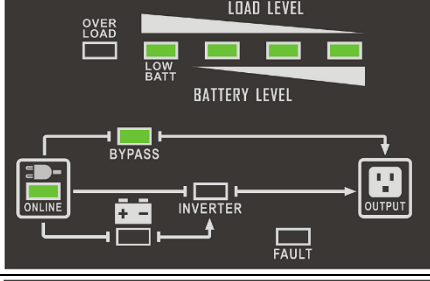
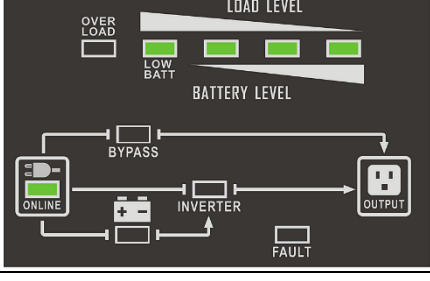
● LED4 flashing: Bypass enable/disable when UPS is off

Interface	Setting
	Enable or disable Bypass function. You may choose the following two options: <b>LED8:</b> Bypass enable <b>LED7:</b> Bypass disable

● 00: Exit setting

Interface	Setting
	Exit setting mode.

### 3-4. Operating Mode Description

Operating mode	Description	LED Indicators
Online mode  Or  Frequency Converter mode	When the input voltage is within acceptable range, UPS will provide pure and stable AC power to output. The UPS will also charge the battery at online mode.  When input frequency is within 40 Hz to 70 Hz, the UPS can be set at a constant output frequency, 50 Hz or 60 Hz. The UPS will still charge battery under this mode.	
ECO mode	Energy saving mode: When the input voltage is within voltage regulation range, UPS will bypass voltage to output for energy saving.	
Battery mode	When the input voltage is beyond the acceptable range or power failure and alarm is sounding every 4 second, UPS will backup power from battery.	
Bypass mode	When input voltage is within acceptable range but UPS is overload, UPS will enter bypass mode or bypass mode can be set by front panel. Alarm is sounding every 10 second.	
Standby mode	UPS is powered off and no output supply power, but still can charge batteries.	

### 3-5. Audible Alarm

Battery Mode	Sounding every 4 seconds
Low Battery	Sounding every second
Overload	Sounding twice every second
Fault	Continuously sounding
Bypass Mode	Sounding every 10 seconds

### 3-6. Faults Reference Code

Fault event	LED Indicators	Fault event	LED Indicators
Output short circuited	LED5 and LED7 on	Overload	LED5 and LED6 on
Inverter abnormal	LED5 and LED4 on	Bus abnormal	LED5, LED8 and LED 9 on
Charger failure	LED5 and LED8 on	High voltage fault	LED5, LED9 and LED10 on
PFC fault	LED5 and LED9 on	Low voltage fault	LED5, LED7, LED8 and LED 9 on
Boost fault	LED5 and LED10 on	High voltage in charger	LED5 , LED7, LED8, LED9 and LED10 on
Temperature abnormal	LED5, LED7 and LED8 on	Low voltage in charger	LED5 , LED8, LED9 and LED10 on

### 3-7. Warning indicator

Warning	LED (flashing)	Alarm
Input wiring is not connected correctly	LED1, LED5	Sounding every second
Battery is not connected	LED2, LED5	Sounding every second
Battery fault	LED5, LED9	Sounding every second
Battery overcharging	LED5, LED7, LED8, LED9, LED10	Sounding every second
Low Battery	LED5, LED7	Sounding every second
Overload	LED5, LED6	Sounding twice every second
Out of bypass voltage range	LED3, LED5	Sounding every second
Charger warning	LED5, LED8	Sounding every second
Other warnings	LED5	Sounding every second

## 4. Troubleshooting

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

Symptom	Possible cause	Remedy
LED2 and LED5 will flash at the same time. And alarm is sounding every second.	The external or internal battery is incorrectly connected.	Check if all batteries are connected well.
LED5, LED7, LED8 and LED9 will be on at the same time and alarm is sounding continuously.	Battery voltage is too high or the charger is fault.	Contact your dealer.
LED5, LED8, LED9 and LED10 will be on at the same time and alarm is sounding continuously.	Battery voltage is too low or the charger is fault.	Contact your dealer.
LED5 and LED6 will flash at the same time and alarm is sounding twice every second.	UPS is overload	Remove excess loads from UPS output.
	UPS is overloaded. Devices connected to the UPS are fed directly by the electrical network via the Bypass.	Remove excess loads from UPS output.
	After repetitive overloads, the UPS is locked in the Bypass mode. Connected devices are fed directly by the mains.	Remove excess loads from UPS output first. Then shut down the UPS and restart it.
LED5 and LED6 will be on at the same time. And alarm is continuously sounding.	The UPS shut down automatically because of overload at the UPS output.	Remove excess loads from UPS output and restart it.
Battery backup time is shorter than nominal value	Batteries are not fully charged	Charge the batteries for at least 5 hours and then check capacity. If the problem still persists, consult your dealer.
	Batteries defect	Contact your dealer to replace the battery.



## 5. Storage and Maintenance

### Operation

The UPS system contains no user-serviceable parts. If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case, please contact your dealer.



Be sure to deliver the spent battery to a recycling facility or ship it to your dealer in the replacement battery packing material.

### Storage

Before storing, charge the UPS 5 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
-25°C - 40°C	Every 3 months	1-2 hours
40°C - 45°C	Every 2 months	1-2 hours

## 6. Specifications

MODEL		1K(L)		2K(L)			3K(L)	
CAPACITY*		1000 VA / 800 W		2000 VA / 1600 W			3000 VA / 2400 W	
INPUT								
Voltage Range	Low Line Transfer	85VAC/75VAC/65VAC/55VAC±5% or 160VAC/140VAC/120VAC/110VAC±5% ( Ambient Temp.<35°C) ( based on load percentage 100% - 80 % / 80 % - 70 % / 70 - 60 % / 60 % - 0)						
	Low Line Comeback	95VAC/85VAC/75VAC/65VAC or 175VAC/155VAC/135VAC/125VAC ± 5 % ( Ambient Temp.<35°C) ( based on load percentage 100% - 80 % / 80 % - 70 % / 70 - 60 % / 60 % - 0)						
	High Line Transfer	145 VAC ± 5 % or 300 VAC ± 5 %						
	High Line Comeback	140 VAC ± 5 % or 290 VAC ± 5 %						
Frequency Range		40Hz ~ 70 Hz						
Phase		Single phase with ground						
Power Factor		≥ 0.99 @ nominal voltage (input voltage)						
OUTPUT								
Output voltage		100/110/115/120/127VAC or 200/208/220/230/240VAC						
AC Voltage Regulation		±1% (Batt. Mode)						
Frequency Range		47 ~ 53 Hz or 57 ~ 63 Hz (Synchronized Range)						
Frequency Range (Batt. Mode)		50 Hz ± 0.25 Hz or 60Hz ± 0.3 Hz						
Overload		Ambient Temp.<35°C 105%~110%: UPS shuts down after 10 minutes at battery mode or transfer to bypass when the utility is normal 110%~130%: UPS shuts down after 1minute at battery mode or transfer to bypass when the utility is normal >130%:UPS shuts down after 3 seconds at battery mode or transfer to bypass when the utility is normal						
Current Crest Ratio		3:1						
Harmonic Distortion		≤ 3 % THD (linear load); ≤ 6 % THD (non-linear load)						
Transfer Time	AC Mode to Batt. Mode	Zero						
	Inverter to Bypass	4 ms (Typical)						
Waveform (Batt. Mode)		Pure Sinewave						
EFFICIENCY								
AC Mode		88%		89%			90%	
Battery Mode		83%		87%			88%	
BATTERY								
Standard Model	Battery Type	12 V / 9 AH		12 V / 9 AH			12 V / 9 AH	
	Numbers	2		4			6	
	Recharge Time	4 hours recover to 90% capacity (Typical)						
	Charging Current	1.0 A (max.)						
Long-run Model*	Charging Voltage	27.4 VDC ± 1%		54.7 VDC ±1%			82.1 VDC ±1%	
	Battery Numbers	2	3	4	6	8	6	8
	Charging Current	1.0A/2.0A/4.0A/6.0 A						
Long-run Model*	Charging Voltage	27.4 VDC ± 1%	41.0VDC ± 1%	54.7 VDC ±1%	82.1VDC ±1%	109.4VDC ±1%	82.1 VDC ±1%	109.4VDC ±1%
	PHYSICAL							
Standard Model	Dimension, D X W X H	282 X 145 X 220 (mm)		397 X 145 X 220 (mm)			421 X 190 X 318 (mm)	
	Net Weight (kgs)	9.8		17			27.6	
Long-run Model*	Dimension, D X W X H	282 x 145 x 220 (mm)		397x 145 x 220(mm)				
	Net Weight (kgs)	4.1	4.1	6.8	6.8	6.8	7.4	7.4
ENVIRONMENT								
Operation Humidity		20-90 % RH @ 0- 40°C (non-condensing)						
Noise Level		Less than 50dBA @ 1 Meter						
MANAGEMENT								
Smart RS-232		Supports Windows® 2000/2003/XP/Vista/2008/7/8, Linux, Unix and MAC						
Optional SNMP		Power management from SNMP manager and web browser						

\*Long-run model is only available in 200/208/220/230/240VAC systems.

\*\* Derate capacity to 80% of capacity in Frequency converter mode or when the output voltage is adjusted to 100/200/208VAC.

\*\*\* Product specifications are subject to change without further notice.