ECSUN®

Uninterruptible Power System

User Manual

C1K / C2K / C3K

Contents

1. Important Safety Instructions

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 over 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

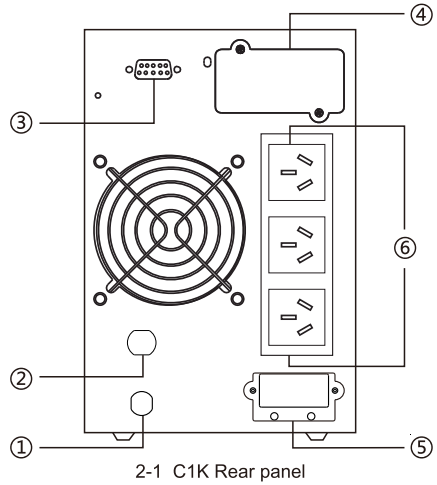
1-5. Maintenance and faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance person
- 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.

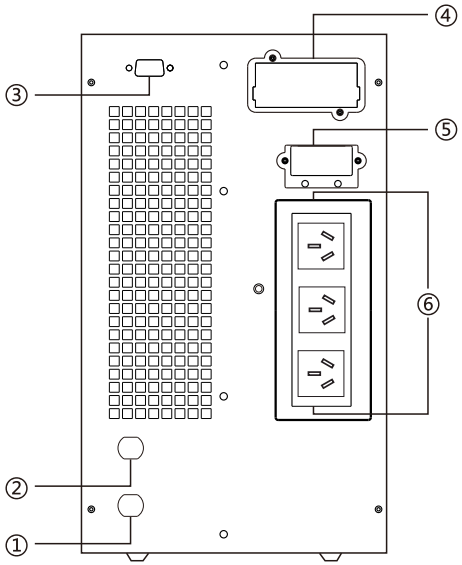
2. Installation and setup

NOTE: Before installation, please check the package to make sure that nothing inside the package is damaged. Please keep the original package in safety place for future use.

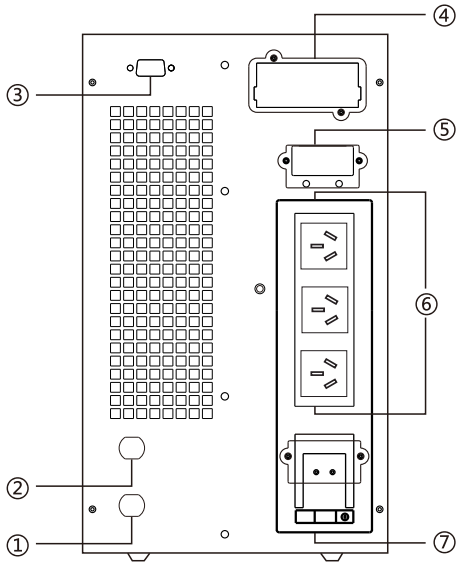
2-1. Rear panel



2-1 C1K Rear panel



2-2 C2K Rear panel



2-3 C3K Rear panel

1. AC input
2. Input circuit breaker
3. RS-232 communication port
4. SNMP smart slot (option)
5. External battery connecter (only available for Long Machine)
6. Output socket
7. Output terminal

2-2. UPS Setup

Step 1: UPS input connection

Plug the UPS into a two-pole, three-wire, grounded socket only. Avoid using extension cords , please use the original power cord.

Step 2: UPS input connection

- For socket-type outputs, simply connect devices to the outlets. So when the power cut down, ups will supply the power to the load
- For terminal-type input or outputs, please follow below steps for the wiring :

  a) Remove the small cover of the terminal block

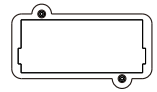
  b) Suggest using AWG14(2.1mm) power cords

  c) Upon finish the wiring , please confirm all the wires connect wel

  d) Put the small cover back to the rear panel

Step 3: Communication connection

RS-232 port



Smart slot

Communication port

In order to monitoring the status of UPS shutdown / start-up , connect the communication cable one side to the USB/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.

The UPS is equipped with intelligent slot perfect for either SNMP or AS400 card. When installing either SNMP or AS400 card in the UPS, it will provide advanced communication and monitoring options.

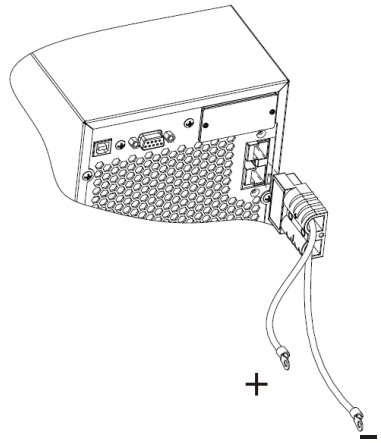
Step 4: Turn on the UPS

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

Note: for the first using,The battery should charges five hours,if it don't charger 5 hours,the discharge time of battery will be decrease

Step 5: External battery connection (Only for long-run model)

This UPS is not including batteries. Please connect external batteries as below chart.



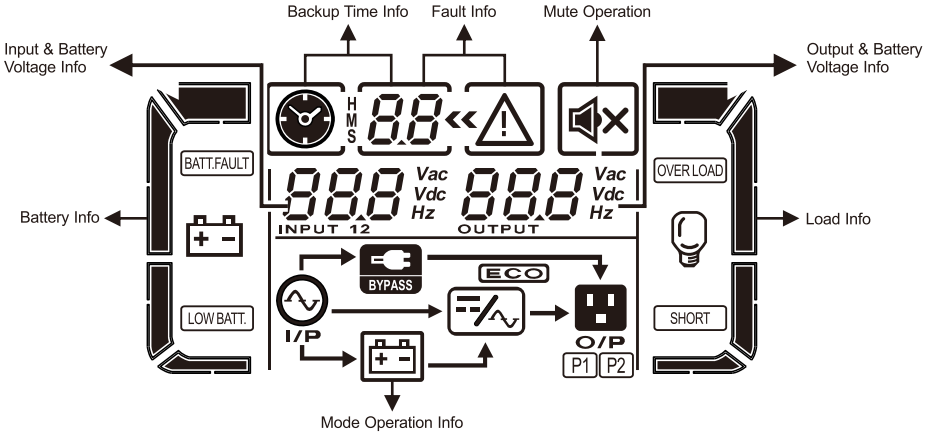
TO EXTERNAL BATTERY

3. Operations

3-1. Button operation

Button	Function
Power ON/ Mute Button	> Turn on the UPS: Press the Power ON/Mute button for at least 2 seconds to turn on the UPS > Turn off the buzzer: When the UPS is on battery mode, press the power on 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 > Up key: Press this button to display previous selection in UPS setting mode > 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
Power OFF/ Enter Button	> Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS. UPS will be in or transfer to Bypass mode if the Bypass enable setting by pressing this button > Confirm selection button : Press this button to confirm selection in UPS setting mode
Select Button	> Switching LED message: Press this button ,you can switch information from input voltage,input frequency ,battery voltage ,output voltage and frequency . after release this button more than 10 seconds ,It will return back to default display > Setting mode: Press and hold this button for 5 seconds to enter UPS setting mode when UPS is in standby mode or bypass mode > Down key: Press this button to display next selection in UPS setting mode
ON/Mute + Select Button	> 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

3-2. LCD Pear Panel



Display	Function
Back up time	
	The remain of backup time will be displayed in the Pie chart
H M S 8.8	The remain of backup time will be displayed in Digital form H: Hours M: Minute S: Second
Error Information	
<< ⚠	This indicates appear error or Alarm
8.8	Indicates the warning and fault codes, and the codes are listed in details in 3-5 sections
Mute	
	This indicates that the ups in mute mode
the information of output voltage and battery voltage	
88.8 Vac Vdc Hz OUTPUT	Display the output voltage/ frequency or battery voltage Vac: output voltage vdc: battery voltage Hz: frequency
Load	
	Load is displayed in grade, divided into 0-25%, 26-50%, 51-75% and 76-100%
OVER LOAD	Indicate it is over load
SHORT	Indicate that the load or the output had appeared short circuit
Other operational information	
I / P	Indicate that ups in AC model
	Indicate that ups in Battery model
BYPASS	Indicate that ups in Bypass model
ECO	Indicate that ups in Eco model
	Indicate that ups in Inverter form
O/P	Indicate that the current output jack output
Battery	
	Battery Capacity is displayed in grade, divided into 0-25%, 26-50%, 51-75% and 76-100%
BATT. FAULT	Indicate that battery fault
LOW BATT.	Indicate that battery capacity or low battery voltage
Input and Battery voltage	
88.8 Vac Vdc Hz INPUT 12	Display the input voltage /frequency or battery voltage Vac: output voltage vdc: battery voltage Hz: frequency

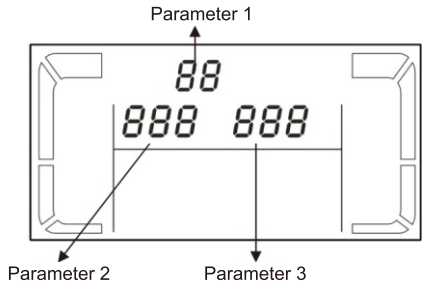
3-2-1. Audible Alarm

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

LCD display Script comparison

Abbreviation	Actual Display	Meaning
ENA	ENA	Enable
DIS	dIS	Disable
ESC	ESC	Escape
HLS	HLS	High loss
LLS	LLS	Low loss
BAT	bAt	Battery
CF	CF	Converter
TP	tP	Temperature
CH	CH	Charger
FU	FU	Bypass frequency unstable
EE	EE	EEPROM error

3-2-3. UPS setting



This UPS system can set three parameters

Parameter 1: This is the program option code. The system contains eight default setup programs, see the table below

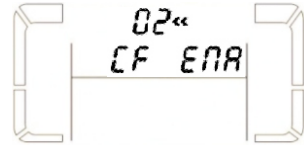
Parameters 2 and 3 are used to set options and values in each program.

- 01：Output Voltage Setting

Panel Display	Setting
	Parameters 3 : Output Voltage Output Voltage Setting 200Vac Indicate that the Output Voltage is 200vac 208Vac Indicate that the Output Voltage is 208vac 220Vac Indicate that the Output Voltage is 220vac 230Vac Indicate that the Output Voltage is 230vac

	240Vac Indicate that the Output Voltage is 240vac

- 02：Transverse mode is enabled / disabled

Panel Display	Setting
	Parameters 2&3 : Enable or disable frequency conversion mode Frequency conversion mode is enabled Frequency conversion mode is disabled

- 03： Output Frequency Setting

Panel Display	Setting
	Parameters 2&3 : Output Frequency Setting Setting the output frequency of battery model BAT 60：Indicate that the Output frequency is 60HZ In addition, you have the following output frequency options when frequency conversion mode is enabled CF 50：Indicate that the Output frequency is 50hz CF 60：Indicate that the Output frequency is 60hz

- 04：ECO is enabled / disabled

Panel Display	Setting
	Parameters 3： ECO Enabled /Disabled Function ENA：Mean that the ECO Model is Enabled DIS： Mean that the ECO Model is Disabled

- 05：The range of ECO Voltage Setting

Panel Display	Setting
	Parameters 2 & 3: Use the <Down> and <Up> buttons to adjust and set the input voltage range in the ECO energy saving mode HLS: Parameter 2 indicates the highest value of ECO energy saving mode. The setting range for parameter 3 is the rated output voltage + 7V to + 24V LLS: Parameter 2 indicates the lowest value of the ECO energy saving mode. In the range of parameter 3, the rated output voltage is -7V ~ -24V

- 06：Parameter 3: Enable or disable bypass function:

Panel Display	Setting
	Parameter 3: Enable or disable bypass function: ENA: Bypass function enabled DIS: Bypass function disabled

- 07：Bypass voltage range setting

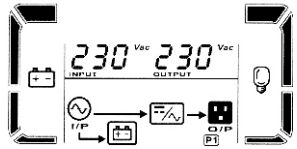
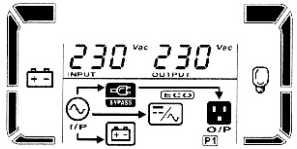
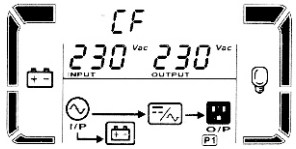
Panel Display	Setting
	Parameter 2 & 3: Use the <Down> and <Up> buttons to adjust and set the permissible voltage range in bypass mode HLS: Maximum input voltage in bypass mode is 230-264vac: The range of voltage in parameter 3 can set from 230Vac to 264Vac LS: Lowest input voltage in bypass mode is 170-220: The range of voltage in parameter 3 can set from 170Vac to 220Vac

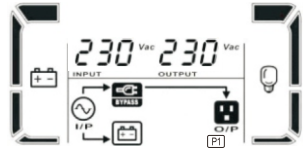
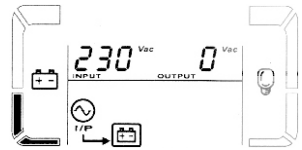
- 08：Back up time setting

Panel Display	Setting
	Parameter 3: Backup time limit setting 0-999: Indicate that you can set the back up time in battery model in minutes,the range of the back up time is 0-999 0: When the set value is "0", the backup time will only be 10 seconds 999: When the set value is "999", it will cancel the backup time limit setting

- 09：Exit setting

3-2-4. LCD Operation Mode Description

Operating mode	Description	LCD Display Content
Online Mode	When the input voltage within the allowable range , UPS will work in AC mode and can provide a stable pure sine AC power output, at the same time, it will charger the battery	
ECO Mode	Energy-saving Mode: When the input voltage within the setting voltage range, UPS will switch to bypass mode, it can achieve the purpose of energy saving	
Frequency conversion mode	When the input frequency within the allowable range, UPS can set output frequency with 50Hz or 60Hz, at the same time. ups will charge the battery	
Battery Mode	When the input voltage is not normal or power cut off , UPS will switch to battery mode, while the buzzer sounding every 4 seconds, UPS will supply power by battery mode	

Bypass Mode	If the input voltage is within the allowable range, when ups work in online mode and overload,UPS will automatically switch to bypass mode If the UPS is set to standby mode, UPS will automatically switch to bypass mode when ups connect into AC power When the UPS is in bypass mode, the buzzer beeps every 10 second	
Standby mode	When UPS connect into AC power ,not start and not set to Standby Bypass mode, UPS operates in Standby mode, ups only can charger with battery, can't output	

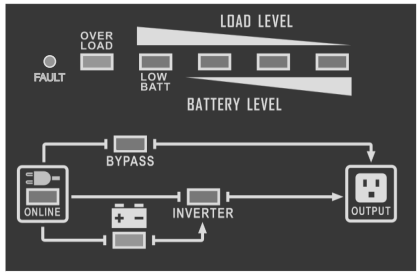
3-2-5. Error code table

Error	Error Code	Icon	Error	Error Code	Icon
Bus bar voltage start failed	01	X	Inverter voltage is lower	13	X
Bus bar voltage is higher	02	X	Inverter output is short circuit	14	SHORT
Bus bar voltage is lower	03	X	Battery voltage is higher	27	BATT. FAULT
Bus bar voltage is unbalance	04	X	Battery voltage is lower	28	BATT. FAULT
Inverter soft start failed	11	X	Over temperature	41	X
Inverter voltage is higher	12	X	Overload	43	OVER LOAD

3-2-6. Alarm

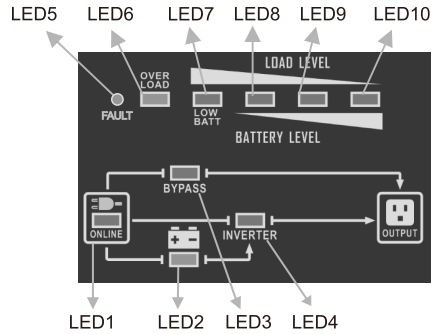
Warning content	Flash	Buzzer status
Low battery voltage	⚠ LOW BATT.	Sounding every second
Overload	⚠ OVER LOAD	Sounding twice every second
Not connect battery	⚠	Sounding every second
Over charger		Sounding every second
Over Temperature	EP ⚠	Sounding every second
Charger Error	CH ⚠	Sounding every second
Battery Error	⚠ BATT. FAULT	Sounding every second
超出旁路容许输入电压范围	⚠ BYPASS	Sounding every second
旁路频率不稳定	FU ⚠	Sounding every second
EEPROM 错误	EE ⚠	Sounding every second

3-3. LED panel



Indicators	Function
Fault information	
FAULT	Indicates that the warning and fault occurs
	Indicates the warning and fault codes, and the codes are listed in details in3-3-2 sections
The load and battery information	
LOAD LEVEL / LOW BATT / BATTERY LEVEL	Load capacity and battery capacity When UPS in battery or standby mode, it indicate battery capacity,divided into 0-25%, 26-50%, 51-75% and 76-100% When UPS in online, bypass, ECO and frequency conversion mode,it indicate load capacity,divided into 0-25%, 26-50%, 51-75% and 76-100%
OVER LOAD	Indicates overload
LOW BATT	Indicates low battery voltage , LED flash
Mode operation information	
ONLINE	Indicates the UPS connects to the mains
	Indicates the battery is working
BYPASS	Indicates the bypass circuit is working
INVERTER	Indicates the Inverter circuit is working

3-3-1. UPS Setting



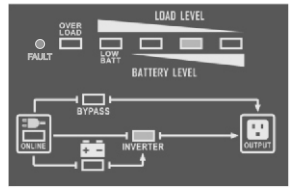
There are two setting programs

- 01：Output voltage setting
- 02：Bypass enable/disable when UPS is off

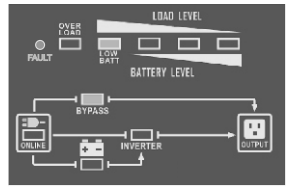
LED3 or LED4 flashing indicates setting program

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

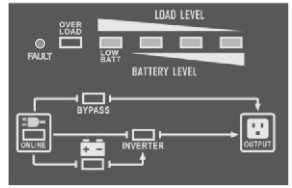
- 01：Output voltage setting

Panel Display	Setting
	you may choose the following output voltage: LED7: presents output voltage is 208Vac LED8: presents output voltage is 220Vac LED9: presents output voltage is 230Vac LED10: presents output voltage is 240Vac

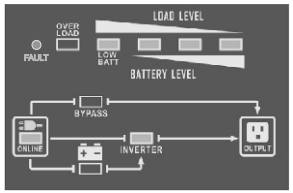
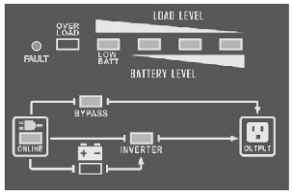
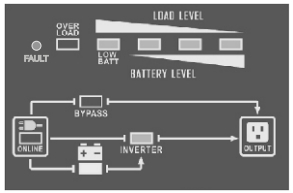
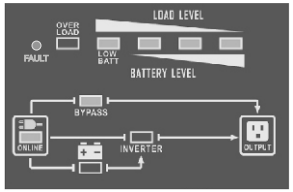
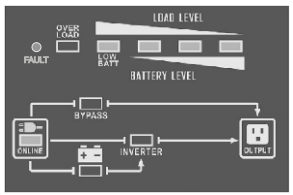
- 02：Bypass enable/disable when UPS is off

Panel Display	Setting
	LED8: Bypass enable LED7：Bypass disable

- 03：Exit setting

Panel Display	Setting
	Exit setting mode

3-3-2. Operating Mode Description

Operating mode	Description LED	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, when ups set in standby mode, it only can charge batteries. No output.	

3-3-3. Faults Reference code

Fault event	LED Indicators
Over load	LED 5 , LED 6 on
Bus abnormal	LED 5 , LED 7 on
Inverter abnormal	LED 5 , LED 8 on
Battery voltage abnormal	LED 5 , LED 9 on
Temperature abnormal	LED 5, LED 10 on

3-3-4. Warning indication

Warning	LED Flash	Alarm
Battery is not connected	LED 2 , LED 5	Sounding every second
Low Battery	LED 7 , LED 5	Sounding every secon
Overload	LED 6 , LED 5	Sounding twice every second
Out of bypass voltage range	LED 3 , LED 5	Sounding every second
Charger failure	LED 1 , LED 2 , LED 5	Sounding every second

3-4. 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

4. Troubleshooting

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

Symptom	Possible cause	Remedy
AC power is Normal, no indicator light and no buzzing sound	The input line of AC power maybe loose,not connect	Please check the input power line whether it is loose
	Maybe the input terminal of AC power had connected with Output terminal by mistake	Put the input line of AC power connect correct, put into AC power input terminal
On the LCD Panel ⚠ and 🔋 flash,at the same time. Alarm will sounding every second On the LED Panel, LED2 will flash at the same time, alarm is sounding every second	The external or internal battery is incorrectly connected	Check if all batteries are connected well
On the LCD Panel, Error code is 27, BATT. FAULT will be on,,at the same time,alarm is sounding continuously On the LED panel, LED5 and LED9 will be on ,at the same time and alarm is sounding continuously	Battery voltage is abnormal or the charger is fault	Please contact your dealer
On the LCD panel,Error code indicate 28, BATT. FAULT will be on,at the same time,alarm is sounding continuously On the LED panel,LED5 and LED9 will be on ,at the same time and alarm is sounding continuously	Battery voltage is abnormal or the charger is fault	Please contact your dealer
On the LCD Panel ⚠ and OVER LOAD flash,at the same time. Alarm will sounding every second On the LED Panel, LED2 will flash at the same time, alarm is sounding twice every second On the LED panel,LED 5 and LED 6 will beflash,at the same time,alarm will 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 AC power	Remove excess loads from UPS output first. Then shut down the UPS and restart it
On the LCD panel,error code indicate 43, OVER LOAD will be on, at the same time, alarm will be sounding continuously On the LED panel, LED 5 and LED 6 all will be on,at the same time, alarm will be sounding continuously	The UPS shut down automatically because of overload at the UPS output	Remove excess loads from UPS output and restart it

Symptom	Possible cause	Remedy
On the LCD panel,error code indicate 14, SHORT will be on,at the same time, alarm will be sounding continuously	The UPS shut down automatically because of Short circuit at the UPS output	Please check the output whether UPS output appear short circuit
On the LCD panel,error code indicate 1,2,3,4,11,12,13 or 41,at the same time,alarm will be sounding continuously	The internal of UPS appear fault,There will have appear two situations: 1. Continuous to supply power for the load,but it is in bypass mode,supply power directly by AC Power 2. Stop to supply power for the load	Please contact your dealer
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 fault	Contact your dealer to replace the battery

5. Storage and Maintenance

Operation

All components of the maintenance, replacement are handled by professionals, the general user can not engage in this operations,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℃~40℃	Every 3 months	1-2 hours
40℃~45℃	Every 2 months	1-2 hours

6. Specifications

Model		1K/1KL	2K/2KL	3K/3KL
Capacity		100VA /800W	2000VA / 1600W	3000VA / 2400W
Input				
Voltage Range	Low Line Transfer	160 VAC / 140 VAC / 120 VAC / 110 VAC ± 5% (temperature is less than 35 degrees) (According to the load ratio 100%-80% / 80%-70% / 70%-60% / 60%-0)		
	Low Line Comeback	175 VAC / 155 VAC / 135 VAC /125 VAC ± 5% (temperature is less than 35 degrees) (According to the load ratio 100%-80% / 80%-70% / 70%-60% / 60%-0)		
	High Line Transfer	300 VAC ± 5%		
	High Line Comeback	290 VAC ± 5%		
Frequency range		40Hz ~ 70Hz		
Phase		Single-phase grounding		
Power factor		≧ 0.99 @ 220-230 VAC (input voltage)		
Output				
Output Voltage		200 / 208 / 220 / 230 / 240 VAC		
AC Voltage Regulation		± 1% (Battery mode)		
Frequency range		47 ~ 53 Hz or 57 ~ 63 Hz		
Frequency range (battery mode)		50Hz ± 0.25Hz or 60Hz ± 0.3Hz		
Overload		Temperature less than 35 degrees: 05% ~ 110%: UPS in battery mode will automatically shut down after 10 minutes, or in the normal input110% ~ 130%: UPS in battery mode will automatically after 1 minuteClose, or switch to bypass mode when input is normal; > 130%: 3 seconds for UPS in battery mode Or automatically switches to bypass mode when the input is normal		
Current Crest Ratio		3 : 1		
Harmonic Distortion		≦ 3% THD (Linear load)		
		≦ 5% THD (Non-linear loads)		
Transfer time	AC mode to Battery mode	0ms		
	Inverter to bypass	4 ms (Standard conditions)		
Wave from(battey mode)		Pure sine wave		
Efficiency				
AC Mode		88%	89%	90%
Battery Mode		83%	87%	88%
Battery				
Battery capacity		Depending on the external battery		
Battery quantity		2	3	4	6	6	8
Charger current		1A / 2A / 4A / 6A		
charger voltage		27.3 VDC ± 1%	41.0 VDC ± 1%	54.7 VDC ± 1%	82.0 VDC ± 1%	82.0 VDC ± 1%	109.4 VDC ± 1%
Appearance				
Size (L*W*H mm)		344X145X225	460X192X340	
N.W (KG)		4.1	6.8	7.4
Environment				
Humidity		20-90% RH @ 0-40°C (No condensation)		
Noise		小于 50dBA @ 1m		
Management				
Smart RS-232 or USB		Supports Windows@ 2000/2003/XP/Vista/2008/7/8, Linux, Unix and MAC		
Optional SNMP		Support Power management from SNMP manager and web browser		

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