GUARD

UPS User Manual

1-10KVA Online UPS

Uninterruptible Power Supply System

Preface

We thank you for selecting our High Frequency Series UPS and recommend you read these instructions carefully before installation and operation. Please keep this user manual in a safe place for future references.

Tested

To ensure our quality, we have already tested each UPS reliability and performance before deliveries. All components have already passed our quality control standards and attached appropriate specifications based on tolerance.

Content

1. Safety Instruction

Introduction

Before using our product, please read carefully on the safety instruction section toproper use and ensure your safety during the operation. Also, please keep the solution manual carefully for future use.

1.1 Symbol Description

All symbols in this user manual will be shown in the following chart. Please read carefully for reference in installation, maintenance, and repair.

Symbols and meanings	
Item	Description
⚠	Caution
⚠	Danger
~	Ac Power
⎓	Dc power
⏚	Power Distribution PE
⏚	PE
♻	Recycle
☒	Do not randomly diposal
	Overload
	Battery
⏻	On/Off

1.2 Environmental Safety Instruction

1.2. 1 Before using our product, please read carefully on the safety instruction section in order to proper use and ensure your safety during the operation. Also please keep the solution manual carefully for future use.

1.2.2 During the operation, please pay attention to all warning signs, and response accordingly.

1.2.3 When placing UPS, please keep safety distance for cooling in order to keep try. Please take reference on this manual during installation.

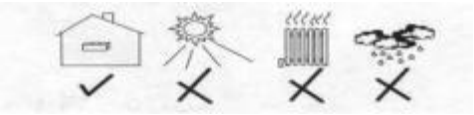
1.2.4 While cleaning, please use dry cleaners to wipe UPS.

1.2.5 When facing fire hazard, please make sure to use only dry-chemical fire extinguisher, otherwise it will be in shock-hazard dangerous.

1.2.6 UPS should have well grounding connection on the AC input terminals. Please disconnect UPS Input while connecting UPS accessory signal lines in order to reduce the risk ofelectric shocks due to poor Loads grounding connections.

1.2.7 Even though UPS is not connected to Mains Input, there might still be 220VAC power on the UPS output.

1.2 .8 UPS has high hazardous voltage internally. Please do not place UPS in high humidity or near water environment. UPS should be installed in the well-ventilated place, should be placed away from inflammable, explosive gas or liquid. To further reduce the risk of overheating, UPS should be avoid of direct sunlight and heat source (such as electric heating, electric stove, etc.).



1.2.9 Please buy spared parts from authorized suppliers ifany power cords or battery wires need to be replaced. Discrepancy wires or cords may cause serious fire hazard due to lack of capacities.

1.2. 10 Please do not open the UPS enclosure, otherwise it may cause electrical shock.

1 .2. 11 Do not dispose the battery in fire, it will cause explosions . Do not overhaul batteries while battery electrolytes are highly corrosive and harmful to human. Do not short-circuit batteries, otherwise it will cause electric shock or fire hazard.

1.2. 12 There might be high voltage and current between the battery terminals. Please do not touch batteries when open the battery cabinet.

Caution High AC voltage and DC voltage inside the machine do not open the machine for maintenance without the permission of supplier.

1.3 Electrical Safety

1.3. 1 Before putting on power on the UPS, please check UPS has been properly connected with grounding. Also check the polarity of battery connections.

1.3 .2 If user need to move or reconnect all wires from UPS, please make sure to disconnect all AC input power, and ensure that UPS is completely stopped. Otherwise, the output of the UPS may still have power, which may cause electrical shocks.

1.3.3 Please use our company certified accessories and parts.

1.3.4 According to EMC requirements, UPS output cable length should be within 10 meters.

1.4 Battery Safety

1.4.1 Battery life-circle is based on the working environment. So periodically changing or maintain batteries can guarantee UPS working status and backup time.

1.4.2 Battery Maintenance should only be performed by certified technicians.

1.4.3 Battery has electrical shock hazard and short-circuit danger. In order to prevent these hazards, please follow the following steps:

- Do not wear watches, rings or similar metal objects.
- Use insulated tools.
- Wear rubber shoes and gloves
- In the process of installing the battery, first reserve an opening, and the DC voltage is reduced to 1V before the final connection
- Before removing the battery connection terminal, the load connected to the battery must be disconnected..
- Make sure the battery cabinet switch is "OFF" before installation

1.4.4 Do not dispose the battery in fire, it will cause explosions. Do not overhaul batteries while battery electrolytes are highly corrosive and harmful to human. Do not short-circuit batteries, otherwise it will cause electric shock or fire. hazard

1.5 Maintenance

1.5.1 UPS lifetime will be affected by working environment: so please do not work under the following environments:

- ➢ Environment exceed the standard situation (Standard:Temp. 0℃~40℃, Humidity 0%~90%);
- ➢ Easy damaged and shock environment;
- ➢ Environment with metal dust, erosive corporation, and flammable gas.

1.5.2 If UPS is in stock without using for a long period. Please disconnect batteries and store the UPS in dry environment with Temp.: −25℃~+55℃。 The working temperature should be more than 0℃ to boost up the UPS.

2.Product Introduction

This Series UPS adopts full digital control with smart compact size and high performance. It is an advanced online structure with pure-sinewave output. UPS provides perfect electrical environment, and solve lots of electricity environmental issues, such as power outage, power surge, voltage sags, temporary over voltage, and temporary under voltage, frequency offset, power disturbances, switching transients, and harmonic wave distortion.

2.1 Model

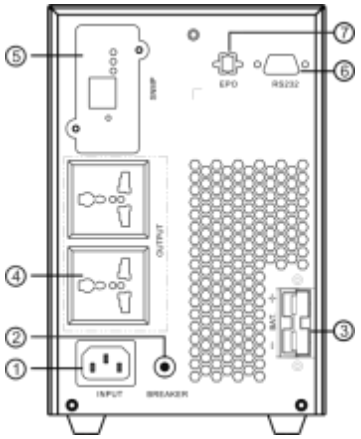
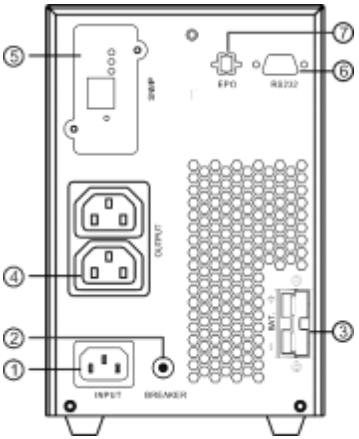
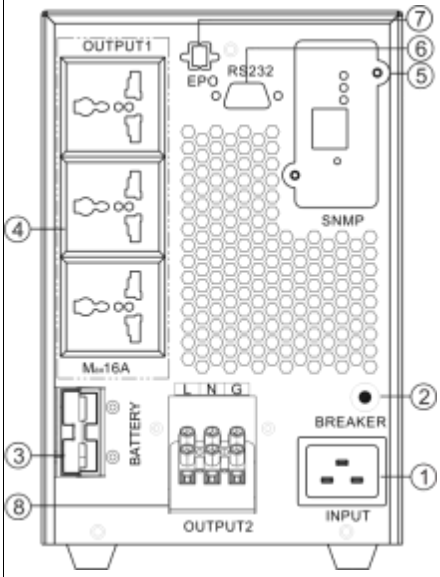
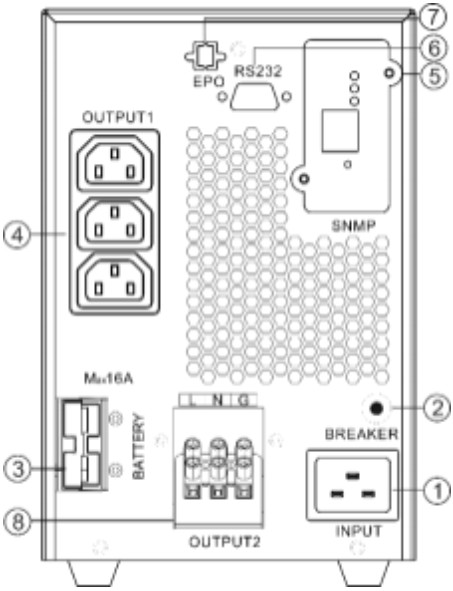
Models will be named in the following:

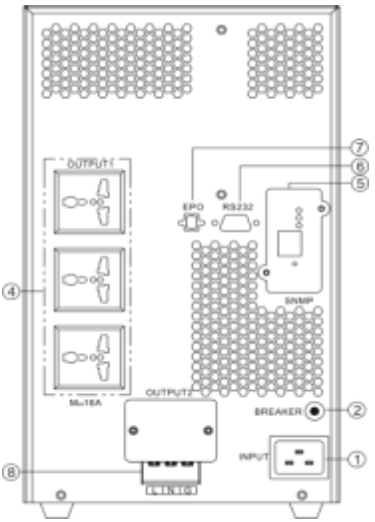
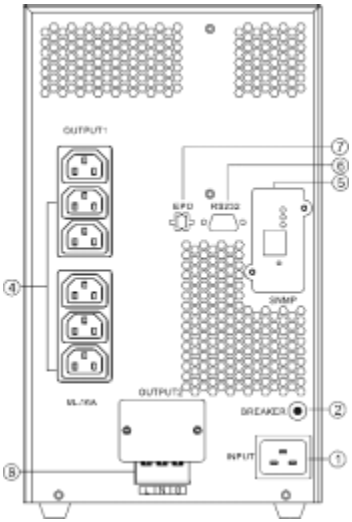
E.g: 10KVAS、10KVAL 10KVA

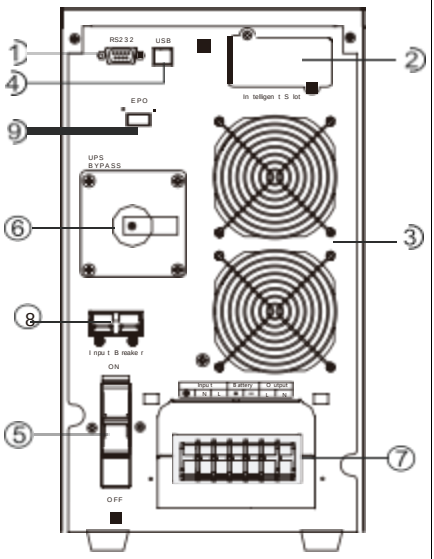
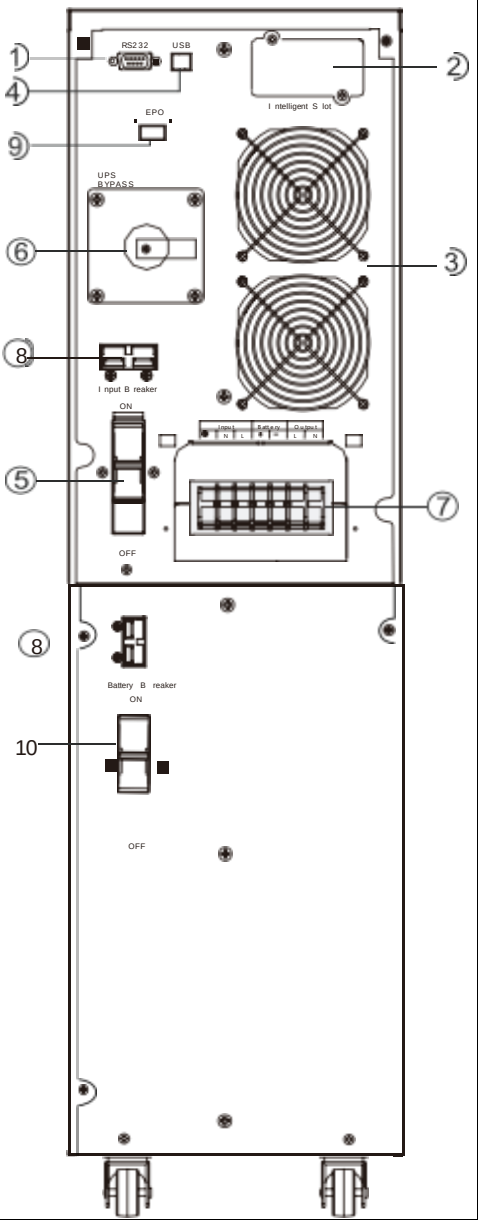
- (10KVA)KVA is the capacity of the UPS. E.g:here as 10KVA.
- S/L means the difference between standard and long backup . S means standard backup (Internal Battery). L or without indication will be long backup (external battery)
- RM means rack-mount type. Otherwise will be tower.

Model		Description
Tower Built-in Battery	1KVAS	Built-In 1A Charger, Built-in 2 Units Batteries
	2KVAS	Built-In 1A Charger, Built-in 4 Units Batteries
	3KVAS	Built-In 1A Charger, Built-in 6 Units Batteries
	6KVAS	Built-In 1A Charger, Built-in 16 Units Batteries
	10KVAS	Built-In 1A Charger, Built-in 16 Units Batteries
Tower External Battery	1KVAL	1-8A Adjustable, External with 3 Units Batteries
	2KVAL	1-8A Adjustable, External with 6 Units Batteries
	3KVAL	1-8A Adjustable, External with 8 Units Batteries
	6KVAL	1-12A Adjustable, External with 16 Units Batteries
	10KVAL	1-12A Adjustable, External with 16 Units Batteries
Rack-Mount UPS	1KVAS/L	Built-In 1A Charger With 2 Batteries/ 1-8A Adjustable, External With 3 Units Batteries
	2KVAS/L	Built-In 1A Charger With 4 Batteries/ 1-8A Adjustable , External With 6 Units Batteries
	3KVAS/L	Built-In 1A Charger With 6 Batteries/ 1-8A Adjustable , External With 8 Units Batteries
	6KVAL-RM	1-12A Adjustable, External with 16 Units Batteries
	10KVAL-RM	1-12A Adjustable, External with 16 Units Batteries
Note: Customization can be done by providing with order.		

2.2 Rear Panel View

1Kva External Battery Type Rear Panel- Universal sockets	1Kva Standard Battery type Rear Panel – IEC C13 10Asockets
	
2Kva External/Standard Battery Type Rear Panel- Universal sockets	2Kva External/Standard Battery Type Rear Panel- IEC C13 10A sockets
	

LV1KVA、3Kva Standard Battery Type Rear Panel- Universal sockets	3Kva Standard Battery Type Rear Panel- IEC C13 10Asockets
	
Note: 1-3kva output sockets can be customized as requirements	

LV2-3KVA、 6-10Kva External Battery Rear Panel	6-10Kva Standard Battery Rear Panel
	

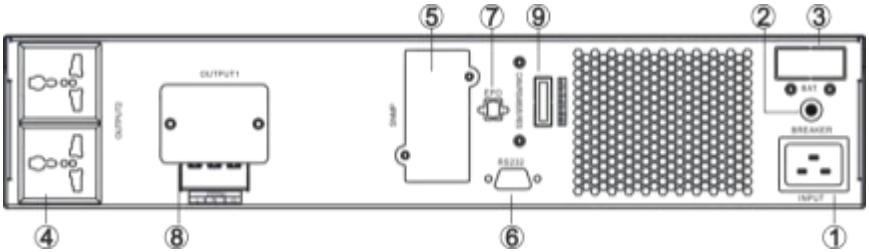
1K-3KVA Tower Type Rear Panel Description

1. Input Sockets	2.Surge Protector	3. External Battery Connection Port
4 . Output Sockets	5 . Optional SNMP	6.RS232
7 . Optional EPO	8 . 3 Kva Output Terminal Blocks	

6K- 10KVA Tower Type Rear Panel Description

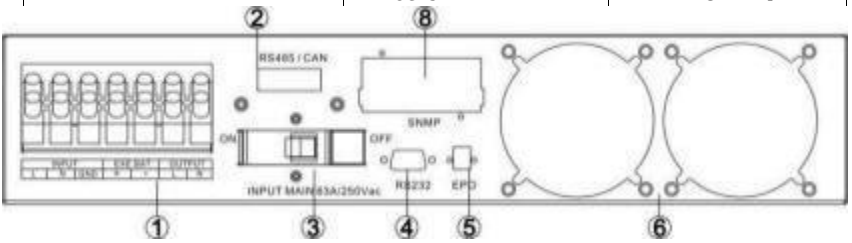
1、RS232	2 、 Intellingent Slot	3、Fan
4 、 USB (optional)	5 、 Input protection switch	6 、 Maintenance switch (optional)
7 、 Terminal strip	8 、 External battery connection (optional)	9、EPO(optional)
10 、 Battery protection switch		

1-3K-RM Rackmount Rear Panel



1-3K-RM Rear Panel Description:

1.Input Plug	2. Surge Protector	3. External Battery Connector
4 . Output Sockets	5 . SNMP Optional	6.RS232
7.EPO Optional	8.3K Output Terminal Blocks	8 . Lithium Monitoring Optional



6K- 10K Rackmount Rear Panel Description：

1.Output Terminal Blocks	2.RS485/CAN（Optional）	3. Input Breaker
4.RS232	5.EPO （Optional）	6.Cooling Fan
8.SNMP （Optional）		

2.3 Specification

1-3K 220Vac Specification

Model		1KVAS	1KVAL	2KVAS	2KVAL	3KVAS	3KVAL
Rated Power		1KVA/900W		2KVA/ 1800W		3KVA/2700W	
Input	Wiring	L+ N+ PE					
	Rated Voltage	208/220/230/240Vac					
	Voltage Range	110~300VAC 176~276VAC±5V@ 100%Load 110~ 176VAC@ 100%~50% Linear Load Derated 110VAC/300VAC@50%Load					
	Frequency	50/60±6Hz（Preset），± 10Hz Adjustable					
	Power Factor	≥0.99					
	Generator Compatibility	Available					
Output	Wiring	L+ N+ PE					
	Rated Voltage	208/220/203/240Vac，Factory Preset：220Vac					
	Output Voltage Regulation	± 1%					
	Power Factor	0.9					
	Frequency	Online Mode ：Follow Grid Frequency； Battery Mode ： 50/60±0. 1Hz					
	THD	Linear Load≤2%，Non-Linear Load≤5% （PF=0.8）					
	Voltage transient response	Rated Voltage≤ 10%					
	Switching Time	AC Mode to Battery Mode 0ms，Inverter to Bypass 4ms(Typical)					
	Overload	**AC Mode**： 1102%~ 110% 30mins then transfer to bypass, 110%~ 130% 10mins &transfer to bypass, 130%~ 150% 30s, ≥ 150% 500ms transfer to bypass, Load≤70% recover to inverter mode. **Battery Mode**： 102%~ 109% 1minute backup then shutdown, 110%~ 130% 10s then shutdown, 130%~ 150% 3s , ≥ 150% 200ms, （under BAT mode UPS will be closed after 1mins when INV. Turn off）					
	Crest Ratio	3:1					
Efficiency	Online Mode	94.5%					
	Battery Mode	88.5%		91.5			
Transfer Time	AC to Battery	0ms					
	Battery To AC						
	AC Inverter to Bypass	0ms （Typical）					
	ECO Mode to Battery	4ms （Typical）					

Battery and Charger	Battery Type	Lead Acid Maintenance Free Battery		
	Ext. Model Battery Numbers	3 Units	6 Units	8Units
	Built- in Battery Model Numbers	2 Units	4 Units	6 Units
	Cut- off Protection	Available		
	High Voltage protection	Available		
	Equalized Charge Voltage	14. 1*N （N Refers to the Battery Quantity）		
	Charging Voltage	13.5*N （N Refers to the Battery Quantity）		
	Charging Method	2 Stages/3 Stages Charging		
	Battery Fault Detection	Available		
	Charging Current	1-8A Adjustable		
Audible Alarm	Long Beep	UPS abnormal		
	Once Every Second	Battery Low or overload		
	Once Every 2 Minutes	Inverter “off” (bypass mode)		
	Once Every 4 Seconds	1，battery disconnect 2，battery under self-test 3，Other Alarms		
EPO		Available for Premium Version		
ECO		Available for Premium Version		
RS232		5PIN/ Pitch2.0mm, Baud Rate 2400		
Intelligent Slot		Optional for SNMP, Dry- Contact, SMS Message, Etc		
Short- Circuit Protection		Available		
Audible Noise (dB)		＜55db （1meter）		

1-3K 110Vac Specification

Model		LV1KVAS	LV1KVAL	LV2KVAS	LV2KVAL	LV3KVAS	LV3KVAL
Rated Power		1KVA/ 1000W		2KVA/2000W		3KVA/3000W	
Input	Wiring	L+ N+ PE					
	Rated Voltage	100/ 110/ 115/ 120/ 127Vac					
	Voltage Range	55~ 150VAC 85~ 140VAC±5V@ 100%Load 55~ 150VAC@ 100%~50% Linear Load Derated 55VAC/ 150VAC@50%Load					
	Frequency	50/60±6Hz （Preset），± 10Hz Adjustable					
	Power Factor	≥0.99					
	Generator Compatibility	Available					
Output	Wiring	L+ N+ PE					
	Rated Voltage	100/ 110/ 115/ 127Vac，Factory Preset：220Vac					
	Output Voltage Regulation	± 1%					
	Power Factor	0.9					
	Frequency	Online Mode ：Follow Grid Frequency； Battery Mode ： 50/60±0. 1Hz					
	THD	Linear Load≤4%，Non-Linear Load≤5% （PF=0.7）					
	Voltage transient response	Rated Voltage≤ 10%					
	Switching Time	AC Mode to Battery Mode 0ms，Inverter to Bypass 4ms(Typical)					
	Overload	**AC Mode**： 1102%~ 110% 10mins then transfer to bypass, 110%~ 130% 1mins &transfer to bypass, 130%~ 150% 10s, ≥ 150% 500ms transfer to bypass, Load≤70% recover to inverter mode. **Battery Mode**： 102%~ 109% 1minute backup then shutdown, 110%~ 130% 10s then shutdown, 130%~ 150% 3s , ≥ 150% 200ms, （under BAT mode UPS will be closed after 1mins when INV. Turn off）					
	Crest Ratio	3:1					
Efficiency	Online Mode	93.5%		95.5%			
	Battery Mode	88.5%		91.5%			
Transfer Time	AC to Battery	0ms					
	Battery To AC						
	AC Inverter to Bypass	0ms （Typical）					
	ECO Mode to Battery	4ms （Typical）					

Battery and Charger	Battery Type	Lead Acid Maintenance Free Battery		
	Ext. Model Battery Numbers	3 Units	6 Units	8Units
	Built- in Battery Model Numbers	2Units	4Units	6Units
	Cut- off Protection	Available		
	High Voltage protection	Available		
	Equalized Charge Voltage	14. 1*N （N Refers to the Battery Quantity）		
	Charging Voltage	13.5*N （N Refers to the Battery Quantity）		
	Charging Method	2 Stages/3 Stages Charging		
	Battery Fault Detection	Available		
	Charging Current	1- 12A Adjustable		
Audible Alarm	Long Beep	UPS abnormal		
	Once Every Second	Battery Low or overload		
	Once Every 2 Minutes	Inverter “off” (bypass mode)		
	Once Every 4 Seconds	1，battery disconnect 2，battery under self-test 3，Other Alarms		
EPO		Available for Premium Version		
ECO		Available for Premium Version		
RS232		5PIN/ Pitch2.0mm， Baud Rate 2400		
Intelligent Slot		Optional for SNMP， Dry- Contact， SMS Message， Etc		
Short- Circuit Protection		Available		
Audible Noise (dB)		＜55db （1meter）		

6-10K 220Vac Specification

Model		6KVAS	6KVAL	10KVAS	10KVAL
		----	6KVAL RM	----	10KVAL-RM
Rated Power		6KVA/5.4KW		10KVA/9KW	
Input	Wiring	L+ N+ PE			
	Rated Voltage	208/220/230/240Vac			
	Voltage Range	110~300VAC 176~276VAC±5V，100%load			
Input		110~176VAC，100%~50% Load linear derating110VAC/300VAC，50%load			
	Frequency	50/60±6Hz（Preset），±10Hz Adjusted by port			
	Power Factor	≥0.99			
	Generator Compatibility	Support/Compatible with different Generators			
Output	Wiring	L+ N+ PE			
	Rated Voltage	208/220/203/240Vac			
	Output Voltage Regulation	±1%			
	Power Factor	0.9			
	Frequency	Online mode: Synchronized with AC Grid Input frequency; Battery mode：50/60±0.1Hz			
	THD	Linear Load≤3%，Non-Linear Load≤5%（PF=0.8）			
	Voltage transient response	Rated Voltage≤10%			
	Dynamic Responsetime	≤40ms			
	Overload	**Online Mode**：102%~110% 30mins then transfer to bypass, 110%~130% 10mins &transfer 130%~150% 30s, ≥150% 500mstransfer to bypass, Load≤70% recover to inverter mode. **Battery Mode**：102%~109% 1mins to shutdown, 110%~130% 10s then shutdown, 130%~150% 3s, ≥150% 200ms,（under BAT mode UPS will be closed after 1mins when INV. Turn off）			
	Crest Ratio	3:1			

Efficiency	Online Mode	100%load≥95%，MAX≥95.5%
	Battery Mode	≥94.8%（20 units Battery Configuration），MAX≥95.3%
Transfer Time	Online → BAT	0ms
	BAT → Online	
	BAT → Bypass	
	ECO Mode →	2ms
Battery and Charger	BAT Type	Lead Acid Battery
	BatteryUnits	16 Pcs Standard
	Charging voltage	218.5Vdc± 1V （Preset as 16 Pcs Battery）
	Shutdown Protection	Available
	Over- charging Protection	Available
	Charging Form	2 Stages/ 3 Stages Charging
	BAT Abnormal Alarm	Available
	Charging Current	1- 12A Adjustable
AudibleAlarm	Long Beep	UPS abnormal
	BAT Low Voltage	Once Every Second
	Once Every Second	Battery Low or overload
	Once Every 2 Minutes	Inverter “off” (bypass mode)
	Once Every 4 Seconds	1，battery disconnect 2，battery under self-test 3，Other Alarms
EPO		Premium LCD display equipped as default
ECO		Available（LCD Screen setting)
RS232		5 PIN/ Pitch2.0mm，Baud Rate 2400
Intelligent Slot		SNMP, Dry Contact, SMS Message, etc.
Short-Circuit Protection		Available
Noise (dB)		＜55db （Distance:1m）
Standards and certifications		EN/IEC 61000, EN/IEC 62040,GB/T 7260, GB/T 4943, YD/T1095, TLC, etc.

Note: Specification are subject to change with different requests of customers.

2.4 Dimension and Weight

Note: W/ D/ H refer to the unit as mm, and the unit of weight is kg. The weight of the standard type is various due to the different quantity of the batteries .

MODEL	D*W*H (UPS)	N.W	G.W
1KVAL	282*145*221	3.5kg	3.95kg
1KVAS	282*145*221	7.3 kg	7.95kg
2KVAL	398*145*221	5. 1kg	5.95kg
2KVAS	398*145*221	13.7 kg	14.5 kg
3KVAL	398*145*221	7. 0kg	8.3 kg
3KVAS	398*190*318	19.55kg	20.85kg
6KVAL	398*190*318	8 .6kg	10 .25kg
LV1 KVAL	398*145*221	7 .1kg	8 .4kg
LV1 KVAS	398*145*221	9 .7kg	10.5kg
LV2 KVAL	398*190*318	8 .3kg	9 .95kg
LV2 KVAS	398*190*318	16 8kg	18 45kg
LV3 KVAL	398*190*318	8.8kg	10.45kg
LV3 KVAS	398*190*318	20.8kg	22.45kg
10KVAL	398*190*318	9.35 kg	11.0kg
6KVAS	470*190*693	51.2kg	53.5kg
10KVAS	470*190*693	51.2kg	53.5kg
1KVAS-RM	380*438*88	11kg	12.5kg
2KVAS-RM	380*438*88	15.5kg	17kg
1KVAL-RM	380*438*88	7kg	8.5kg
2KVAL-RM	380*438*88	7.7kg	9.2kg
3KVAL-RM	380*438*88	8kg	9.5kg
3KVAS-RM	490*438*88	20	21.5
6KVAL-RM	380*438*88	10.5 kg	11.5 kg
10KVAL-RM	380*438*88	11 kg	12kg

2.5 Environmental

ITEM	RANGE
ENVIRONMENTAL TEMP	0C~ +40C (CUSTOMIZATION CAN EXCEED THE RANGE)
STORAGE TEMP	-25C-55C
HUMIDITY	20%~90% , ,NON-CONDENSING
ELEVATION	LESS THAN 1000M WITHOUT DERATING

Note : The series is only applied in areas below 2000m above sea level.

3.Installation

Attention : To ensure safety, please turned off the mains electricity switch before installation. For long run type, please turned off the battery input switch also. Below installation instructions should be taken by professional technician.

3.1 Packing Inspection

1. Unpack UPS package. Check if there is any shipping damage.

2. In case of any sign of physical damages, please notify your local dealer immediately.

UPS accessory list:

UPS MODEL	ITEM	QTY	UNIT
1KVA-3KVA (include RM)	USER MANUAL	1	PIECE
	QC CARD	1	PIECE
	INPUT CABLE	1	PIECE
	BATTERY CONNECTION CABLE	1	PIECE
6KVA- 10KVA (include RM)	USER MANUAL	1	PIECE
	QC CARD	1	PIECE
	TERMINAL BLOCKS	1	MULTIPLE

Note : The package materials can be recycled, please keep it for future use.

3.2 Installation notice

UPS should be placed in safe, keep and tidy place in order to prevent dangers. Please keep safety distance for cooling/ventilation in order to keep dry.

Please install the UPS properly. Do not laying the UPS with the side. Please do not block the ventilation on the side of the UPS enclosure.

Please place UPS near the Utility input. If any emergency happens, user can easily cut or pull out the input socket and turn off the battery input. All sockets, terminal blocks should be well grounded.

When installing a 1- 10K long run type, the charging voltage must be tested with an external battery. when the battery is not connected the voltage is a false voltage. Please ensure that the number of battery installed is consistent with the UPS configuration requirements

3.3 Cable Selection

Note : Power Cord Diameter and cross section area are affected by UPS rated power.

Model	Max Input Current	L-Wire Input air switch	Input Wire Diameter	Max Output Current	Output Wire Diameter	Max BAT current	BAT Wire Diameter

6KVA Std.	30A	50A	≥ 10Awg	27A	≥ 10Awg	33A	≥ 10Awg
6KVA Ext.	40A	50A	≥ 10Awg	27A	≥ 10Awg	33A	≥ 10Awg
6KVA RM	40A	50A	≥ 10Awg	27A	≥ 10Awg	33A	≥ 10Awg
10KVA Std.	49A	63A	≥ 8 Awg	45A	≥ 8 Awg	55A	≥ 8 Awg
10KVA Ext.	60A	63A	≥8 Awg	45A	≥8 Awg	55A	≥8 Awg
10KVA RM	60A	63A	≥8 Awg	45A	≥8 Awg	55A	≥8 Awg

3.4 UPS Cable Connection Instruction

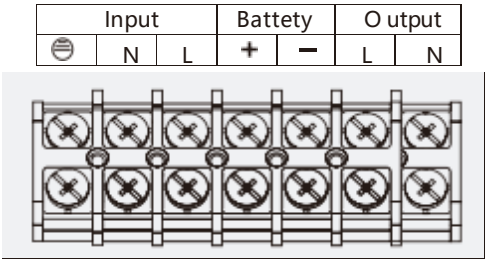
LV3KVA、6- 10KVA UPS Connection Steps

Mains Input switch maximum input current must be bigger than UPS input current, otherwise UPS might be damaged.

1. Please take the reference on the section 3.3 for cable selection.
2. Open the UPS Terminal Block cover on the rear panel.
3. Connect the output cable to the terminal output blocks and the side ofload.
4. Also connect the input and battery cable to the related terminal blocks.
5. Put all wires through the cable holder.
6. Please binding all input, output, and battery connecting cable on the cable holder.

Note： **When connecting cables, please make sure the cable is completed fixed on the terminal blocks.**

7. Please put back the terminal block cover after connected all cables and use the screws to lock the cover on the rear panel.



8. After all the cables are fully connected, turn on the input breaker.

Note： **This terminal block photo isjust for a reference, please refer to the UPS real object during installation.**

3.5 External Battery UPS Model Connection Steps

6- 10KVA External Type is using 16 units batteries in series connection. 192Vdc as 1 group. User can use multiple groups for longer backup. Battery connection is really important and dangerous, please follow the steps below. Otherwise, shock hazard might occurred:

1. Please put battery switch to position "OFF", and then connect batteries in series.

2. Choose the proper connecting cables to connect battery groups and UPS. There should be 1 air switch in between UPS and the UPS cabinet, the voltage & current of the switch should no less than the rated voltage and current.

 Danger : Please do not connect UPS first, otherwise it might cause shock hazards.

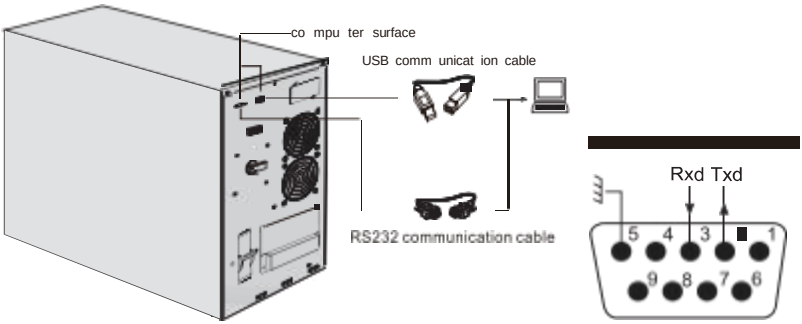
3 . Connect the other side of the battery connection cable to UPS side to finish the external battery connection . After that please do not connect to any load, and then put the battery switch to on, and put on mains power. UPS will then charge the batteries.

 Danger : Battery grounding wire should be connect to the right side of the UPS enclosure, labeled as  .

3.6 Communication Port

RS232: Standard RS-232 Port, using this port to monitor UPS status.

1. Connect the RS232 Communication Cable to the PC interface.
2. Connect the RS232 Communication Cable to the UPS interface.



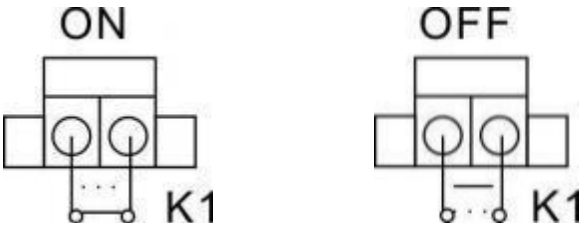
3.7 EPO Function(Optional)

EPO （Emergent Power Off） is on the rear panel of the UPS. It is a green color block. UPScan be quickly turn offunder emergency circumstance, there are 2 ways to use it:

Method 1: Short-circuit Effective ON diagram:

1. Set EPO “ON” in the LCD screen。

2. After external switch K1 is short circuit (connect), UPS Emergent power off will be active and UPS will have no output.



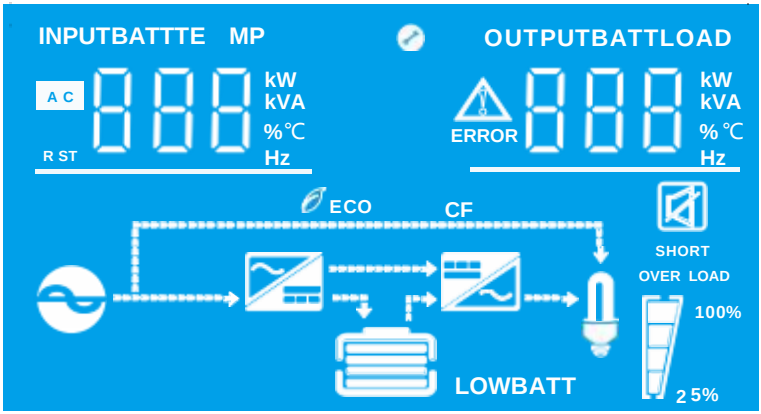
Method 2: Open circuit Effective Off diagram:

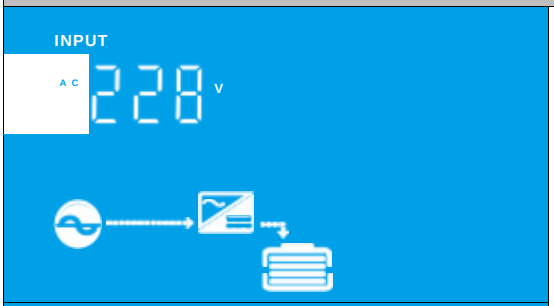
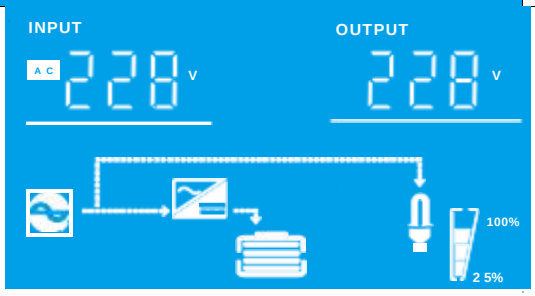
1. Set EPO “OFF” in the LCD screen .

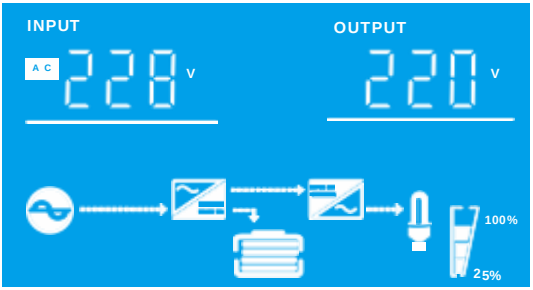
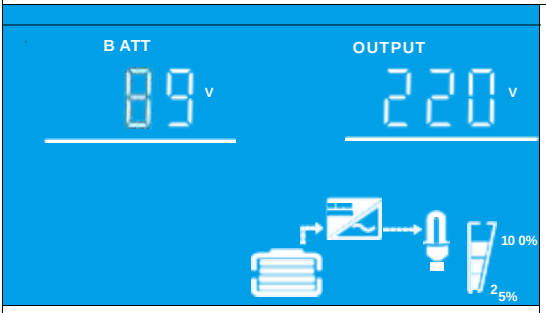
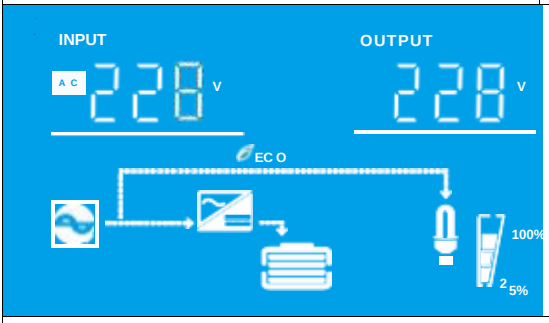
2. After external switch K1 is opened (disconnect), UPS Emergent power off will be active and UPS will have no output.

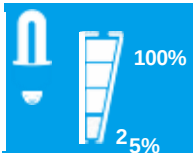
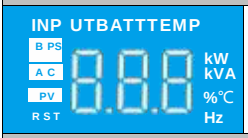
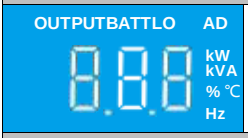
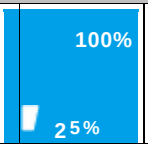
4. Operation

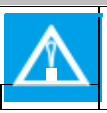
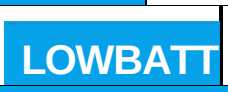
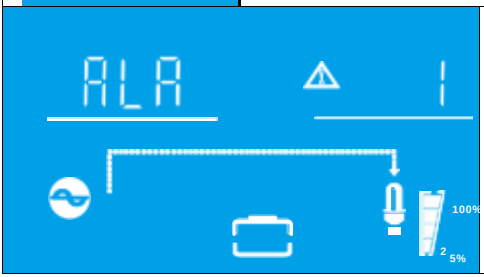
4.1 Panel display



Display	Function
Operating Mode Description	
	Standby mode: UPS is powered off and no output supply power, but still can charge batteries.
	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.

	Online 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.
	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.
	ECO mode： Energy saving mode: When the input voltage is within voltage regulation range, UPS will bypass voltage to output for energy saving.
	Indicates the UPS connects to the mains.

	Indicates the Inverter circuit is working.
Display	**Function**
	Indicates the load level by 0-25%, 26-50%, 51-75%, and 76- 100%.
Input & Battery voltage information	
	Indicates the input voltage or frequency or battery voltage. Vac: Input voltage, Vdc: battery voltage, Hz: input frequency
Output & Battery voltage information	
	Indicates the output voltage, frequency or battery voltage. Vac: output voltage, Vdc: battery voltage, Hz: frequency
Load information	
	Indicates the load level by 0-25%, 26-50%, 51-75%, and 76- 100%.
	Indicates overload.
	Indicates the load or the UPS output is short circuit.
Mute operation	
	Indicates that the UPS alarm is disabled.

Fault information	
	Indicates that the warning and fault occurs.
	Indicates the warning and fault codes, and the codes are listed in details in 3-5 section.
Battery information	
	Indicates the Battery level by 0-25%, 26-50%, 51-75%, and 76-100%.
	Indicates low battery level and low battery voltage.
	Indicates the battery is fault. Battery not connected

4.2 LED indicator

① Fault indicator is RED: flashing when UPS alarm, and always on when fault.

② Bypass indicator is YELLOW: LED is continuous on when UPS working in bypass mode or ECO mode. When UPS working in standby mode, its frequency conversion do not turn on and bypass abnormal, LED flashes.

③ Battery indicator is YELLOW : LED is always on when UPS work in battery mode and battery self-test mode, LED flashes and UPS alarm when battery is low.

④ Inverter indicator is GREEN: LED is always on when UPS work in the inverter mode (such as: AC mode, battery mode, battery self-test mode, ECO mode, frequency conversion mode).

4.3 Function of button

Button	Functional Description
Combo key for turning on the UPS (↵ + ◀)	Turn on the UPS: Press the combo key for 1 sec.
Combo key for turning off the UPS (◀ + ▶)	Turn off the UPS: Press the combo key for 1 sec.
Combo key for self-checking and mute function (↵ + ▶)	Self-checking: in AC mode, press the combo key for more than 1 second, can test whether the battery is normal. mute function: in the battery / fault / self-test mode, press the combo key more than 1 second to eliminate the alarm, press the combo key again more th[redacted]
Function setting/confirmation key (↵)	Function setting: press the key more than 2 seconds to enter the function setting page, determine the options and press the key more than 2 seconds again to return to the main page. Confirmation: in the function setting page, press the confirmation key 1 sec to 2 secs to confirm the setting options.
Page turning/query key (◀ , ▶)	Page turning: Press ◀ or ▶ key 1 to 2 seconds to turn to left or right page Polling mode: press the ▶ key more than 2 seconds to enter polling mode, circularly display each page content for 2 seconds, press ▶ more than 2 seconds again to return to the main page.

4.4 UPS working status table of LED indicator and beeping

Beeping :

Beeping	Description
Continuous beeping	Fault mode
Beep every second	Battery low voltage in DC mode
	Overload
Beep every two minutes	Bypass mode
Beep every four seconds	Other beeping

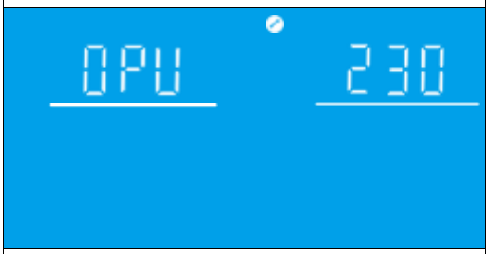
UPS working status table of LED indicator :

Working mode	Panel display				Beeping
	Inverter LED	Battery LED	Bypass LED	Fault LED	
AC mode					
Normal working	●				N/A
Warnings	■			★	
Battery mode					
Warnings except the battery low voltage	●	●		★	Beep every four seconds
Battery low voltage warning	●	★		★	Beep every second
Bypass mode					
Normal working			●		Beep every two minutes
Warnings			●	★	Beep every second/Beep every four seconds
ECO mode					
Normal working	●		●		N/A
Warnings	●		●	★	Beep every second/Beep every four seconds
Other mode					
Battery self-checking mode/ Boot process	★	★	★	★	Beep every four seconds
Fault mode				●	Continuous beeping

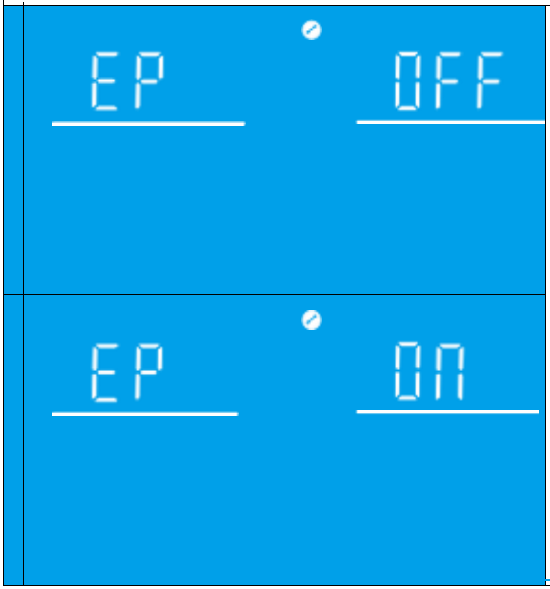
● Indicator on. ★ Indicator flashing.

4 .5 UPS **Setting**

- **OPU : Output voltage setting**

Interface	Setting
	Output voltage : For 200/208/220/230/240 VAC models, you may choose the following output voltage: 208: presents output voltage is 208Vac 220: presents output voltage is 220Vac 230: presents output voltage is 230Vac (Default) 240: presents output voltage is 240Vac

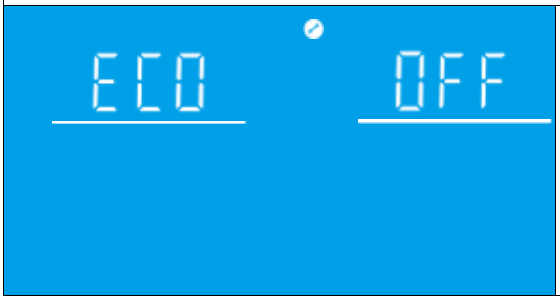
- **EP: Expert Mode**

Interface	Setting
	**Expert Mode:** The Expert Mode setting with ON, then go to the functional setting page again. The functional setting will show battery QTY (PCS), EPO, charging current and other items can be chosen. When the Expert Mode setting with OFF, functional setting page will show only the general options. Note: The Expert Mode default to OFF. When setting as ON then re-connected the AC power, the EP can be recovered as OFF.

- **CHG: Charger Current**

Interface	Setting
	When EP is set to ON, the CHG option appears on the function Settings page, charger current can be set, 1-12A optional, default 1A ; Noted:If UPS bulit-in batteries, the charger current default 1A, and can't be change.

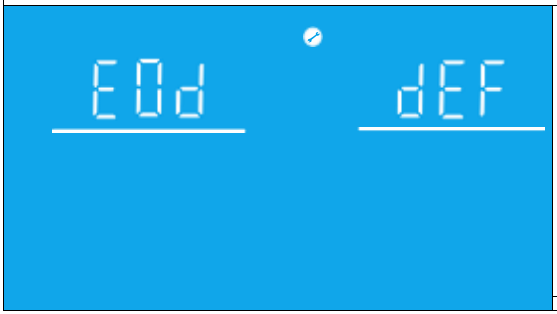
- **ECO: Economic Operation Mode (optional)**

Interface	Setting
	ECO is OFF by default, can be set as ON to improve the efficiency of system operation. Note: For the models with PF< 1, OFF by default, and unable to set.

- **EPO: Emergency shut down**

Interface	Setting
	When EP is set to ON, the EPO option appears on the function Settings page, emergency shutdowns can be set. Emergency shutdown function default that plug EPO terminal valid (OFF), can choose to plug EPO terminal valid (ON). Note: After EPO action, emergency shutdown, close all outputs immediately

- **EOd : Battery Low voltage shutdown point/ End of Discharge voltage**

Interface	Setting
	The options of EOD setting are dEF, 9.8V, 9.9V, 10V, 10.2V, 10.5V. By default, the EOD is dEF (The EOD will be changed according to loading condition. 10.5V@ Loading<25%, 10.2V@ 25%< Loading< 50%, 10V@ Loading >50%)

- **CPS: Battery quantity**

Interface	Setting
	When EP is set to ON, the PCS option appears on the function Settings page, will enter the password page, enter the password (the general password is 135), you can set the number of batteries. The battery number system defaults to 16pcs, which can be set to 16/ 18/20pcs

- Press the Enter "↵"key for more than 2 seconds to exit the setting and return to the main page.

5.Warning code/fault code and solution

5.1 Warning code and solution

When the " ⚠ symbol on the UPS LCD flashes, the UPS is in alarm state. Press the page turn key to the error state page (refer to 3.5), observe the alarm code and make appropriate processing according to the table below.

Warning code	Meaning	Possible reasons	[redacted]
1	Do not connect with battery	1.Do not connect with battery 2.Battery damage	1.Check the connection of battery. 2.Change the battery
2	Low battery voltage	The battery voltage is less than the low voltage warning point. The battery discharge is below the alarm point.	[redacted]d of time, it can be turned on again. The built-in ch[redacted]attery
8	High battery voltage	UPS detects high battery voltage	Check that the battery quantity setting is consistent with the actual battery quantity.
9	Failure of charger	[redacted]	Contact with supplier
10	Over-temperature	1.Fan fault 2.Air duct of UPS rear panel is blocked. 3.Overload 4.NTChardware abnormal or connection abnormal 5.Power device IGBT is damaged	1.Check the rectifier fan 2.Remove UPS back plate obstruction 3.Check the load 4.If the above treatment cannot be solved, contact the supplier
12	Fan fault	1.Fan wiring is loose 2.Fan hardware abnorm[redacted]	[redacted]
13	The mains insurance is disconnected	Fuse blown	Contact with supplier
14	EEPROM Chip failure	[redacted]	Contact with supplier
21	Over-load	The load exceed rated power	Check the load
24	[redacted]	The maintenance switch is pressed	[redacted]

5.2 Fault code and solution

When the **"FAULT"** is long bright, and "⚠" symbol on the UPS LCD flashes, the UPS is in fault state.UPS automatically switches to the error status page (refer to 3.5) to observe the fault code and make appropriate processing according to the following table.

Fault code	Meaning	Possible reasons	[redacted]
1	Busbar booster soft lift failed	1.AC abnormal 2.Abnormal soft-starting circuit of bus	[redacted] with supplier
2	Bus over-voltage	1.AC abnormal 2.Software processing error 3.BUS capacitance fault	[redacted] with supplier

Fault code	Meaning	Possible reasons	[redacted]
3	Busbar undervoltage	1. city electricity is too low 2. software processing errors 3.BUS capacitor failure	Please check the city electricity, if no any abn[redacted]
7	Over temperature	1. Fan failure 2.The air duct on the rear panel of the UPS is blocked 3. Overload 4. NTC hardware abnormality or abnormal wiring 5. Power device IGBT damaged	1.Please check the rectifier on the fan; 2. Clean the obstacles on the air duct of the rear panel of the UPS; 3. check the loads; 4. if all of above can not be solved, please contact supplier;
8	Short Circuit on Battery Relay	Relay RL1/RL3 hardware damaged	[redacted]
9	Busbar is failure when Relay starts	1.city electricity is abnormal 2.Busbar starts and loop in abnormal	Please check the city electricity, if no any abn[redacted]
17	[redacted]	1.Some hardware of Inverter is damaged; 2.Control panel is failure	[redacted]
18	[redacted]	1.Some hardware of Inverter is damaged; 2.Control panel is failure	[redacted]
19		1.Some hardware of Inverter is damaged; 2.Control panel is failure	[redacted]
20	[redacted]	1.Some hardware of Inverter is damaged; 2.Output short circuit	1. Check if short circuit caused on the output of UPS 2. Check if the loads is short circuit 3.if n[redacted]plier
26	Overload protection	1. Bypass reverse to the inverter 2. Overload abnorma	Check the loads and if no any abnormal, please contact supplier;
33	relay of Inverter is in open status	[redacted]	[redacted]
34	relay of Inverter is in short circuit		
35	bypass of relay is in open status		[redacted]
36	bypass of relay is in short circuit		
37	Reverse wiring on input and output	Reverse wiring on input and output	Please check the wiring harness of input and output
39	Charger short circuit	1.output of Charger short circuit 2.Charger [redacted]	[redacted]
66	Overload error	1.overload too much 2.The voltage reduction causes the system rated power to decrease	1. Check if the load is within the specified range 2Check if the pressure has been reduced
67	Charger overvoltage or battery in reverse wiring	1.Hardware error 2.Number of Battery wrong 3.Wiring wrong	1. Check whether the battery wiring or battery number meets the requirements 2.if no any abnormal, please contact supplier
68	Unknown machine model number	[redacted]	1.Restart machine; 2.if no any abnormal, pl[redacted]
72	Charger over current	1.Hardware error 2.Battery abnormal	1.Check whether the battery wiring or battery number meets the requirements 2.if no any abno[redacted]
73	No boot loader	[redacted]	1.Restart machine; 2.if no any abnormal, pl[redacted]

Fault code	Meaning	Possible reasons	[redacted]
81	Unknown the setting of battery number	[redacted]	1.Check whether the battery number meets the requirements 2.Check if the configuration of the battery jumper cap is the same as the software setting
82	The setting of battery number is wrong	Number of Battery setting wrong and can not be matched with software setting	
83	EPO action	Press EPO button	1. Release EPO button 2.Check the wiring harness on EPO button

5.3 Common faults and trouble shooting

Number	Problem or errors Description	Reason	Solution
1	Connect to city electricity, and no display on LCD display panel	No Input power	Check if the input wiring harness of UPS is in well connection
		Input voltage under voltage or overload	[redacted] e if in normal or meets the requirements
2	City electricity in normal, no AC current Input indicator, UPS is still working in battery mode	[redacted]	[redacted]
		The wiring harness is loosen or in poor connection	[redacted]
3	UPS no display error, but no output voltage	The wiring harness is loosen or in poor connection	Make sure the wiring harness in well connection
4	Press button, UPS did not start	[redacted]	Press over 5 seconds, hear "Di" sound
		overloads	[redacted]
5	With City electricity, but no City electricity indicator	Mains voltage or frequency over UPS input range	Use a multimeter to check the input voltage, whether the input frequency meets the requirement
6	The battery discharge time is lower than the standard time	The power of battery has been used	Change new battery
		The battery did not charge in full	[redacted] der normal city electricity,then retest it
7	Abnormal sound or smell come out from the inside of UPS		Please immediately turn off the UPS, cut off the power input, and contact the customer s[redacted]
8	Battery mode display yellow light, long buzzer sounds, battery capacity is insufficient, ready to shut down	The power of battery is low, UPS is ready to shut down, and the loads will be cut off	[redacted] ely and complete shutdown the important loads to avoid data loss or damage. 2. Immediately connect the UPS input termin[redacted]

6 . Battery Maintenance & Repair

● This series of UPS only needs very little maintenance . The batteries of the standard machine are seal type and no need to maintain frequently. But also keep charging to get the excepted battery life . UPS keep charging when it is connecting to AC , no matter on/ off. And if also have function of over charging and overload protection.

● If you don't use UPS for a long time, you should charge the UPS every 4 -6 months. In the areas of high temperature, battery should be charging and discharging every two months , the charging time should not be less than 1 2 hours.

● In normal circumstances, service life of the battery is 3 - 5 years , If the battery is found to be in poor condition, it must be replaced in advance . When replacing the battery, it must be done by a professional.

● When replacing the battery, follow the principle of quantity Model consistent and model Model consistent.

● The battery should not be replaced individually and when it replaced as a whole should be according to the battery supplier' s instructions.

● In normal circumstances(under the condition of UPS with little back up power) , the battery should be charged and discharged every 4 - 6 months . Keep discharging before UPS shut down then keep charging . the standard machine charging time should not less than 1 2 hours .

Product are subject to change without notice.