USER MANUAL

MUOD1~3K Outdoor UPS

Uninterrupted power supply

Contents

1. Introduction

1.1 Application occasions

Outdoor type UPS with high reliability design can be used in complex outdoor environment, it can Not only provide reliable and high-quality AC power to your precision instruments and equipment, But also provide the same AC power supply for your small power station equipment outdoor Communication machine etc.

1.2 Working principle diagram

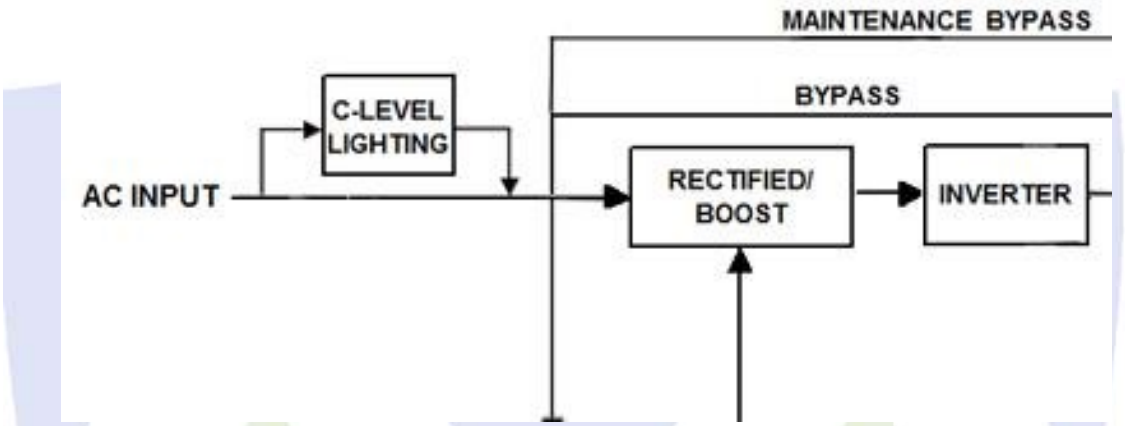


Figure1-1 Schematic diagram of working principle

1.3 Appearance and panel instructions

1.3.1 Appearance of the whole machine

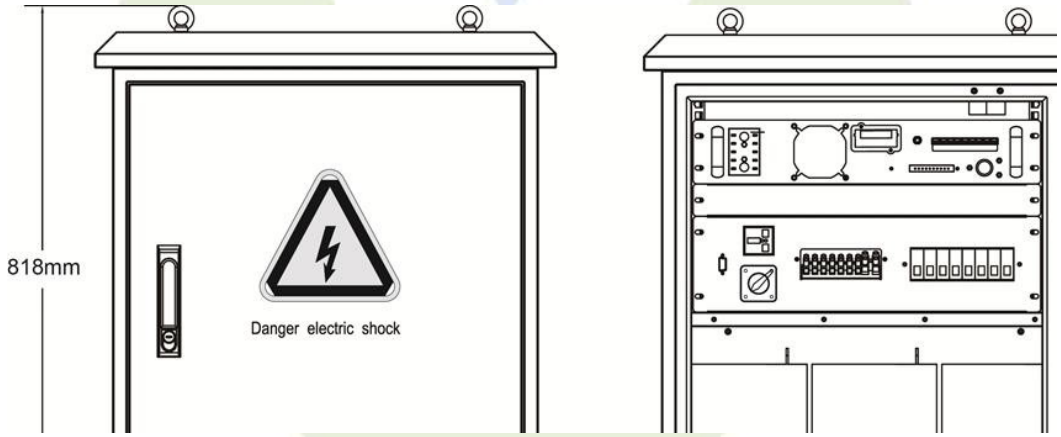


Figure1K Schematic diagram of the whole machine-Front

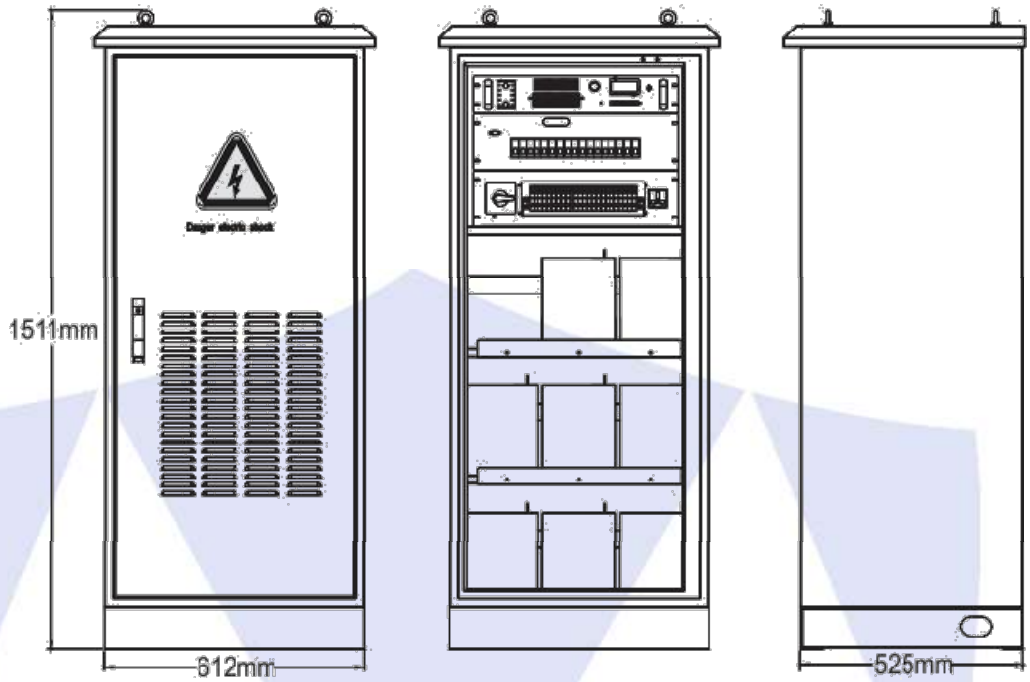


Figure2-3K Schematic diagram of the whole machine-Front

1.3.2 Schematic diagram of the interior panel

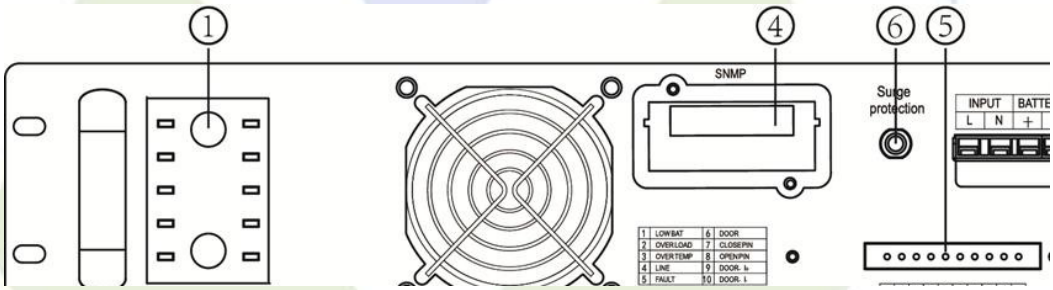


Figure1K Schematic diagram of the internal host-Front panel

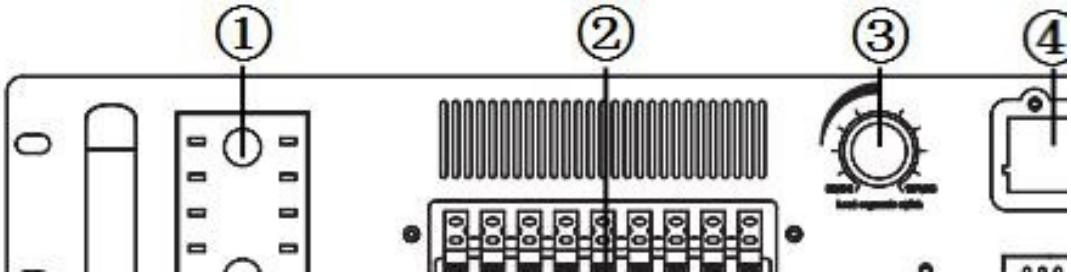


Figure2-3K Schematic diagram of the internal host-Front panel

① Display lamp panel (Used to display working status of the current UPS).

② Terminal row (Be attention there have two outputs, one is main output, power supply for Important loads, another output is 2nd output, power supply for unimportant loads, When in Battery mode, with the battery discharge, the battery´s voltage will get to the setting Voltage, the 2nd output will cut off, please note when accessing the load device).

③ Load segments switch (For setting the battery´s voltage when battery discharge, it will cut off the 2nd output supply, reduce some loads and delay the backup time of UPS).
④ SNMP card (Which can load in monitor and control unit).
⑤ **Dry contact signal detection point.**
⑥ **AC input protection switch (2KVA for 12A 250VAC; 3KVA for 16A 250VAC).**

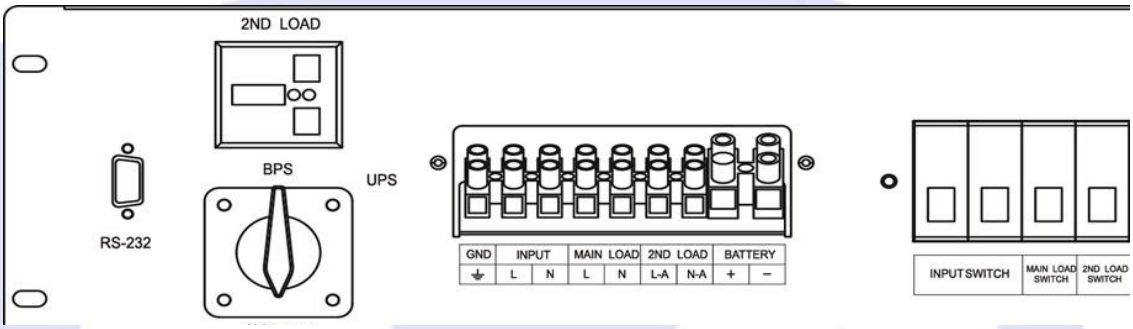
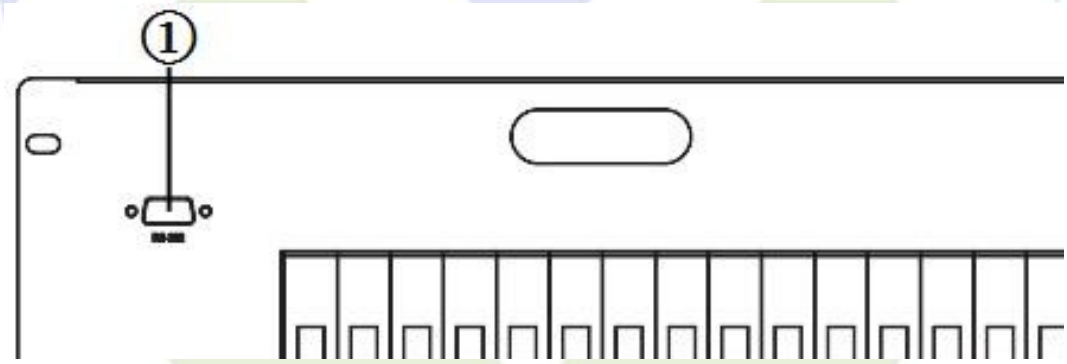


Figure1K Schematic diagram of circuit breaker panel



① RS232 interface.

Figure2-3K Schematic diagram of circuit breaker panel

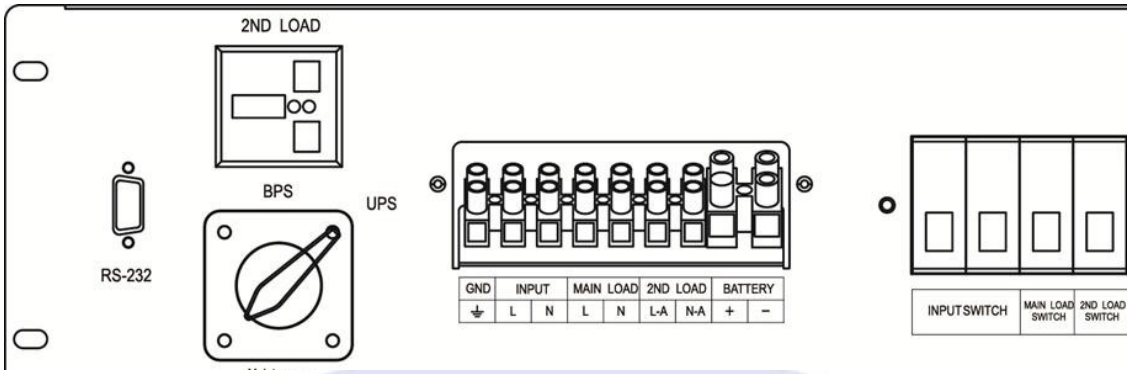


Figure1K Schematic diagram of wiring terminal panel

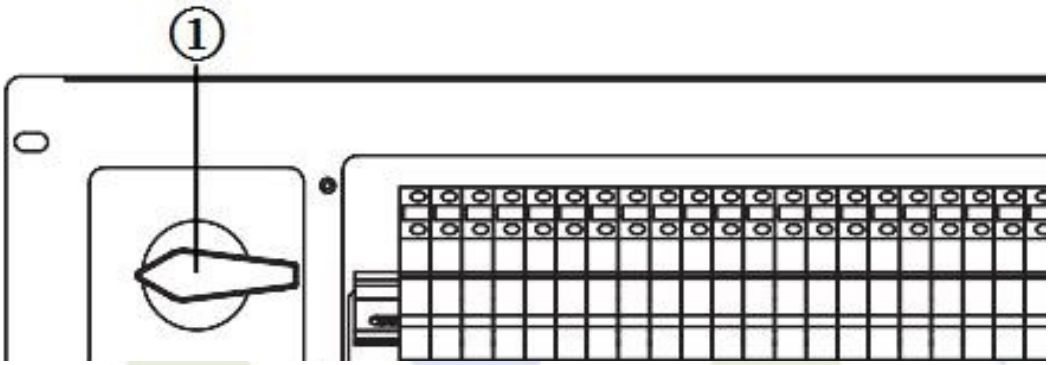


Figure2-3K Schematic diagram of wiring terminal panel

① Maintenance switch (When the host is in need of repairing, through a series of operations, in the Case of uninterrupted power supply, the host can be removed for repaired, does not affect the Power supply of load).

② Universal output socket (Controlled by circuit breaker of OUTPUT 8, provide input interface for Some unconventional devices).

2. Installation

2.1 Open box inspection

2.1.1 Disassemble the packaging of UPS and check the appearance.

2.1.2 Check the appearance of UPS is damaged or not in transportation, if any damage is found, please Contact the dealer.

2.1.3 Open the front door of the UPS, check whether there is any damage inside it; check the random Accessories, if there is a lack, please contact the dealer.

2.2 Erection sequence

2.2.1 Installation notes

1. Outdoor type UPS must be fixed at the bottom.

2. Outdoor type UPS can be used for RC (such as computer), resistance and micro inductive load, Better not be used for pure inductive and pure capacitive loads (such as motor, air conditioning And copying machines, etc.), cannot be connected to half wave rectifier load.
3. Please avoid in the dust, volatile gases, high-salt, corrosive substances in the environment to Use UPS.
4. To ensure the ups and your equipment safe, please use the right way of connections.

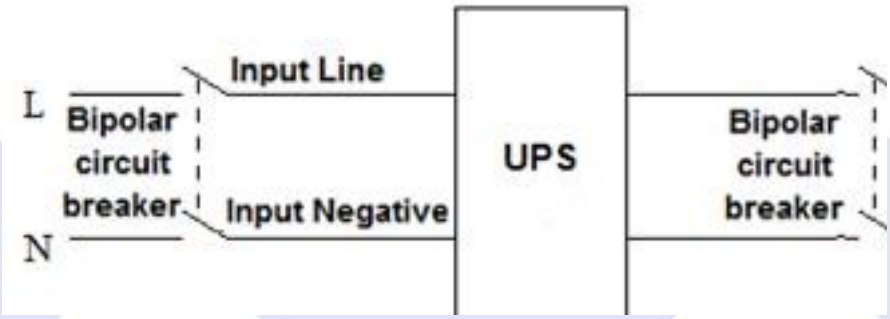


Figure2-1 Schematic diagram of distribution wiring

2.2.2 UPS installation steps

1. Hoisting and positioning

Outdoor type UPS top with four mounting rings, can be used for hoisting UPS.

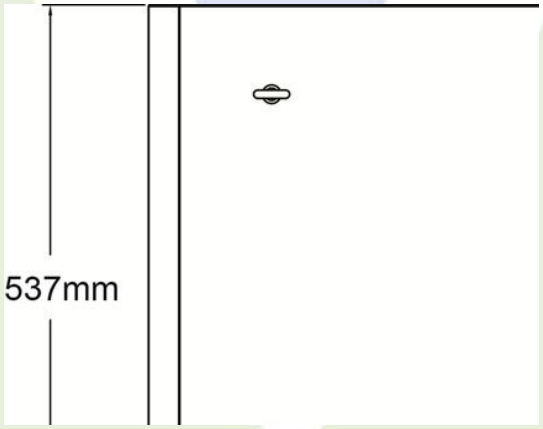


Figure1K Top size chart

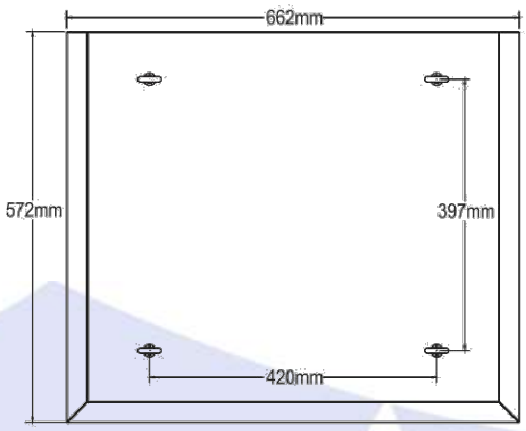


Figure2-3K Top size chart

3. The bottom of the outdoor type has six holes, which can be used for fixing.

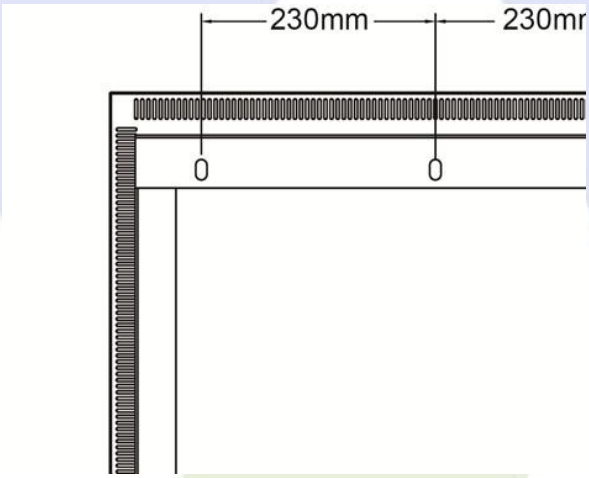


Figure1K Bottom fixed-hole size chart

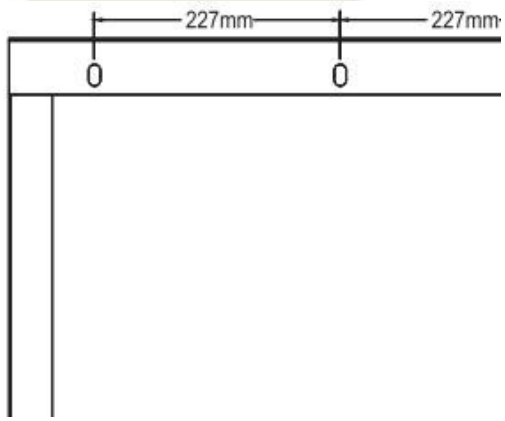


Figure2-3K Bottom fixed-hole size chart

Notes: When UPS installed outdoors, please pay attention to the hidden troubles of Raining days such as Accumulation of rain, to avoid water from the bottom of the Junction hole into the cabinet, resulting damages to UPS, take some protective Measures, such as build the construction of waterproof slope or elevated Platform around UPS.

Battery installation

1. Please check the UPS model, use the correct battery pack voltage, 1KVA UPS use 36V battery Pack (3×12V batteries inside), 2KVA and 3KVA UPS use 96V battery pack (8×12V batteries Inside). Please pay attention that one unit of batteries cannot be more or less, voided to cause Damage to the UPS and batteries.
2. Please measure each batteries voltage before installed in the cabinet, in the range of 12 to 13.5V is normal.

Notes: Do not mix the different manufacturers, different types, new and old batteries. The batteries replacement should be done in a state of system shutdown. Live charged operation and reverse connect batteries are strictly prohibited, prohibited! During use, keep UPS and battery box in a fixed position, move Freely is prohibited.

UPS input connection

1. Please confirm that the integrated cabinet has a good grounding.
2. Please make sure that the input voltage is in conformity with the UPS index.
3. Before installing the input cable, all circuit breaker must be set to "OFF" position.
4. When using power line connection, please confirm that the capacity of the input power cord Must be above 10A.

UPS output connection

1. When installing, please confirm the maximum capacity of the terminal output.

Notes: Prior to the electrical inspection, all wiring must be checked.

3. Operation

3.1 Operation mode description

The operation mode of UPS can be divided into five modes, such as normal model, battery mode, bypass mode, fault mode and maintenance mode.

3.1.1 Normal model

1. UPS after installation, access to the AC, turn on the input and battery circuit breaker, if input Voltage Range in 115-300V, UPS will in the bypass operation state, long press the ON button for 2 Seconds or so, UPS will automatically enter the inverter power mode.
2. When input voltage and output load in the normal range, load by mains supply through rectifier, Inverter and charger for battery, the mains indicator light (green) and the inverter indicator light (Green)on the display panel.
3. If the generator supplied with alternating current to UPS, please follow the following Requirements: start generator, first do not open the UPS load, connect the generator to UPS, Wait until the operation is stable then open load one by one (in order to ensure reliable operation Of the generator, the UPS load should be less than 30% of the generator capacity.

3.1.2 Battery mode

1. When mains power down or the input voltage limit, frequency exceeds the limit, the rectifier and Charger will stop running, the battery discharge through the inverter to provide power supply to Load. The panel of the battery indicator light (yellow) and inverter indicator light (green), Issued A warning to user.
2. Although the battery has been charged in the factory, but after transportation, storage, the Energy will be lost and the voltage will be declined, so before first use of UPS, it should be Charged for 8 hours to ensure that it have sufficient backup time.

3.1.3 Bypass mode

1. While the input voltage range from 115V ~300V, happened overload, inverter fault, over Temperature, rectifier fault etc, UPS will conversion to bypass mode which can offer power To loads and charge to the battery simultaneously. Bypass indicator light (yellow) on the panel display.
2. In bypass mode, if the input failure or input voltage beyond 80V to 265V, UPS will shut down.

3.1.4 Fault mode

1. In normal mode, if it happen inverter fault, the machine with a high temperature inside, UPS will conversion to bypass mode; in battery mode, if it happen inverter fault with normal Temperature inside, UPS will cut off the output. Once UPS is in trouble, fault indicator light (Red) on the panel display and the buzzer belling.

3.1.5 Maintenance mode

1. When the outdoor UPS internal host failure need to be repaired, first make sure that the UPS Is in bypass mode, then Rotary maintenance switch from “UPS” to “BYPASS”, then turn off The input and the battery circuit breaker, make sure that the internal host have none input and Output voltage, then Remove terminal line from the internal host and begin to repair it.
2. After the completion of repairing and make sure that the internal host is good, then connects the Terminal line, turn on the battery and the input circuit breaker, then Rotary maintenance switch From “BYPASS” to “UPS”, long press the ON button on the panel to boot the host.

Notes: When the host is in inverter mode, strictly forbid revolve the maintenance switch.

3.2 Automatic conversion of the UPS operating mode

Under normal conditions, UPS will work in normal mode, if the mains power is Down, UPS Will automatic conversion to battery mode without interruption; if it overloaded, UPS will automatically Conversion to bypass model without interruption; if the inverter fails, UPS works in the fault mode.

3.2.1 Overload protection conversion to bypass

When the UPS load exceeds the rating and the specified time, UPS will convert from the Normal mode to bypass mode, at this time the UPS output is the same as input voltage, Redundant loads should be disconnected from UPS, wait 30 seconds the UPS will auto back to Normal mode.

3.2.2 Mains power off conversion to battery inverter

If mains power off, the UPS will automatic convert to the battery mode, it will work Until the mains Back, if not, the UPS will work until the battery run out then shut down the UPS, After the mains Recover, it will remain in bypass mode.

3.2.3 Output short circuit protection conversion to fault

If the UPS load occurred short-circuit, UPS output will cut off, the fault indicator light (red), please Disconnect the short circuit load and remove the UPS connection, then cut off the input power, Press the off button, confirm the short-circuit fault is eliminated, then reconnect the input power And reboot the UPS.

4. Maintenance

4.1 Battery maintenance

Outdoor UPS use sealed maintenance-free lead-acid battery, Battery lifespan depends on the Ambient Temperature and the charge &discharge frequency, under high temperature working or deep Discharging will shorten the lifespan of the battery, please regular Maintenance the batteries:

- Must used within the prescribed ambient temperature;
- If the UPS is placed for a period of time and the batteries without charged for three months, the Batteries needs to charge for once, each time no less than 12 hours, if in high temperature Environment placed for two months without charge or discharge then they need to charge once Time, not less than 12 hours.

Notes: If the battery power supply time is significantly reduced or the UPS Display battery Fault, please contact the dealer, to confirm whether the battery needs to be replaced Or not.

4.2 UPS status check

4.2.1. Check the status of UPS: fault lamp is light or not.

4.2.2. Whether it works on bypass mode: UPS normal working state is normal mode, if it works in Bypass mode, need to confirm the causes, such as human action, overload, internal fault Etc.

4.2.3. Whether the battery in the state of discharge: in normal circumstances, the battery should not Be discharge, if it works in battery mode, you need to confirm the causes, such as mains power Outage, battery self-test, human action etc.

4.3 Function test

UPS function testing should be done each six months.

4.3.1 Press the "OFF" button to check whether the panel indicator is normal or not, only confirm the Mains up and data backup is ok, and then it can be done.

4.3.2 According to the "ON / MUTE" button, check again the panel indicator is normal or not, whether The UPS switch to inverter or not.

4.3.3 After the inverter is running (the inverter indicator light), long press the " ON / MUTE " for 2 Seconds, start battery self check, test battery is normal or not, If the battery is found to have Problems, should immediately identify the problem and take measures to solve it.

4.4 Fault alarming and displaying

4.4.1 The UPS power control and operating indicators are located on the front display panel.

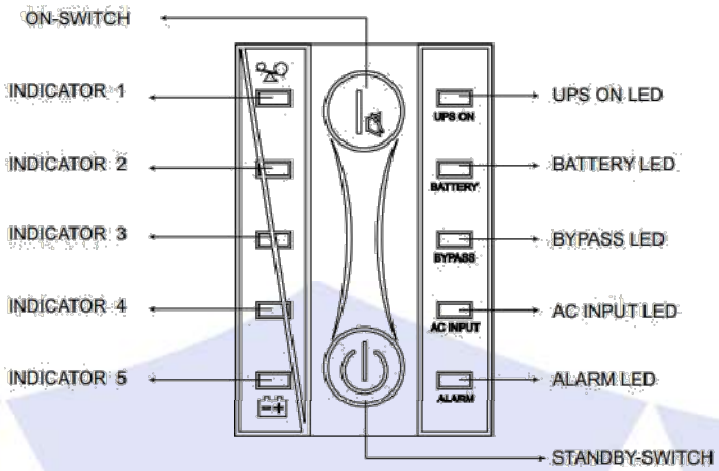


Figure4-1 Internal host lamp panel display and use

Directions for use

The ON /MUTE button	UPS off , press the key over 2 seconds to boot the inverter output; UPS mains power on the operation, press the key over 2 seconds can turn on the manual battery test.
The OFF button	When the UPS is in battery mode, press the key over 1 second to turn off the output.
LED indicator light	Multiple LED indicators also used to indicate the status of the ups, such as fault conditions.

LED display instructions

Mains indicator light (green)	Power normal light, power down off, the input voltage abnormal it twinkles.
Bypass indicator light (yellow)	Power normal light, power down off.
Battery indicator light (yellow)	Power normal light, abnormal twinkles.
Inverter indicator light (green)	Charger fault or battery connection fault, reverse battery connection, battery fault, it twinkles.
Fault indicator light (red)	Fault light, normal off.

ON-SWITCH

- The UPS can be turned on by pressing ON-SWITCH button at least 2 seconds.
- The alarm can be deactivated by pressing ON-SWITCH button.

STANDBY-SWITCH

- The inverter can be turned off by pressing STANDBY-SWITCH. Output can be provided by the Mains Power via the bypass.

AC INPUT LED

- Lights up when the mains power is normal.
- Blinks when the mains power is abnormal or the live conductor and the neutral conductor reversed.

UPS ON LED

- Lights up when output power provided by the mains power via the inverter.

BATTERY LED

◆ Lights up when the mains power is failed , the inverter is powered by the batteries.

BYPASS LED

◆ Lights up when output power provided by the mains power via the bypass.

ALARM LED

◆ Lights up when the system is in fault conduction, and acoustic warning signal is issued every second.

INDICATOR #

	Load level		Battery level
INDICATOR 1~5	96%~105%	INDICATOR 1	1%~35%
INDICATOR 2~5	76%~95%	INDICATOR 1~2	36%~55%
INDICATOR 3~5	56%~75%	INDICATOR 1~3	56%~75%
INDICATOR 4~5	36%~55%	INDICATOR 1~4	76%~95%
INDICATOR 5~5	1%~35%	INDICATOR 1~5	96%~105%

4.4.2 Using the table below, some common problems can be solved. If the problem still exists or Some problems not found in the following table, please call the After-Sales service department.

Be sure you have the following information:

1.Model number, serial number.

2.Date on which the problem occurred.

NO.	Fault	Cause	Solutions
1	ALARM LED and INDICATOR 5 light, Buzzer beeps	UPS closed due to internal over-temperature	Ensure the UPS is not overloaded, vents not blocked, if temperature too high outside, please open the front door and allow the UPS to cool for 10 minutes, then restart, If it fails, please contact supplier
2	ALARM LED and INDICATOR 4 light, Buzzer beeps	UPS internal fault closed	Please contact supplier
3	ALARM LED and INDICATOR 3 light, Buzzer beeps	UPS internal fault closed	Please contact supplier
4	ALARM LED and INDICATOR 2 light, Buzzer beeps	UPS overcharge protection	UPS charger fault, please contact supplier
5	AC INPUT LED blinks	Mains voltage or frequency exceeds the UPS input range (UPS beeps every 2 seconds, Beeps 8 times when UPS boot)	UPS works in battery mode, Please save the data and close the application, to ensure that the mains within UPS input voltage or frequency range
		L line and N line are reversed, UPS beeps every 2 minutes	Re connect the city electric zero wire correct connection
6	ALARM LED and INDICATOR 1 light, Buzzer beeps	Battery mode overload or load failure	Check load level and remove unimportant load, to check whether there is a fault in the load device.
7	ALARM LED, INDICATOR 1 and INDICATOR 5 light, Buzzer beeps once a second	UPS fans missed or damaged	Please contact supplier

8	ALARM LED, INDICATOR 1 and INDICATOR 4 light, Buzzer beeps	UPS output short circuit	Turn off UPS, remove all loads, making sure that the load is not faulty or internal short circuit. Reboot, if it failed, please contact supplier

5. Technical Data

5.1 Electrical Specification

Model		1K(L)	2K(L)	3K(L)
Input	Power Rating	1KVA/800W	2KVA/1600W	3KVA/2400W
	Input Voltage	100/110/115/120VAC or 200/220/230/240VAC		
	Voltage range	60~138VAC or 115~300VAC		
	Frequency	46Hz~54Hz/ 56Hz~64Hz		
	Phase	Single phase with Ground		
	Power Factor	≥0.97		
Output	Voltage	100/110/115/120VAC or 200/220/230/240VAC		
	Frequency	50/60 (1±0.2%) Hz (Battery Model)		
	Wave Form	Pure Sine Wave		
	Power Factor	0.8		
	Harmonic Distortion	≤3% THD (Linear load); ≤7% THD (Non-Linear load)		
	Overload Capacity	110%～150% maintain 30s then turn to bypass output; over 150% maintain 200ms		
	Current Crest Ratio	3:1		
	Connections	Two terminal output (Main load and 2nd load)		
Battery	Type	Sealed free maintenance lead acid battery		
	Quantity	12VDC×3 PCS	12VDC×8 PCS	
	Back-up Time	Depend on requested back-up time		
	Charge Current (Max)	5.0A/8.0A		
	Charge Voltage (VDC)	41.1V±0.4V	110V±0.6V	
Communications	Intelligent RS232 serial port	Software support Windows family software, Linux, Sun network operating system, IBM Aix, Compaq True64 SGI IRIX, FreeBSD, HP-UX and MAC		
	SNMP (Optional)	Remote control UPS through SNMP management and Internet		
	USB (Optional)	Windows family software and Mac OS		
Environmental	Operating Temperature	0~40℃		
	Operating Humidity	20-90% (No condensing)		
Weight	Net Weight (Kg)	52	100	

5.2 CE Conformity

1K(L)/ 2K(L)/ 3K(L)

Safety: EN62040-1: 2003 Conducted Emission: EN50091-2 Class B

Radiated Emission: EN50091-2 Class B Harmonic Current: EN61000-3-2

Voltage Fluctuations and Flicker: EN61000-3-3

EMS: EN61000-4-2(ESD) Level 4

EN61000-4-3(RS) Level 3

EN61000-4-4(EFT) Level 4

EN61000-4-5(lighting surge) Level 4

EN61000-2-2 (Immunity to low frequency signals)

5.3 Communication Port

The type of signals, serial command (RS232), is provided by the UPS to communicate with a host Computer. The RS232 communication port transmits both utility power and UPS status to the Host Computer, providing the host computer with proprietary command sequence to monitor the Utility Power and UPS status and to control the UPS output. The data format of RS232 is listed As followed:

Baud Rate: 2400 bps

Data Length: 8 bits

Ending Bit: 1 bit

Parity Bit: none

5.3.1 RS232 INTERFACE

For 1K(L)/2K(L)/3K(L):

Two types of signals, relay contact or serial command (RS232), are provided by the UPS to Communicate with a host computer. The relay contact transmits both utility power and UPS Status to the host computer by using " ON " and " OFF " states of relays, providing the host Computer with proprietary command sequence to monitor the utility power and UPS status And to control the UPS output. The host computer can also monitor the UPS through RS232 Communication port.

Pin#	Description	I/O
2	TXD	Output
3	RXD	Input
5	GND	Input

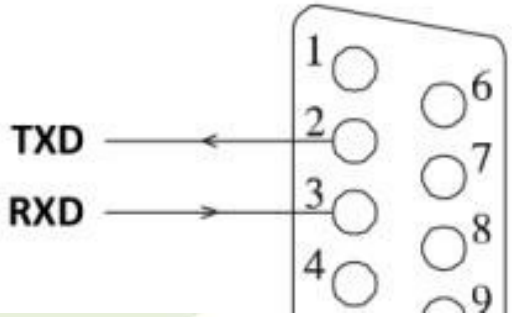


Figure5-1 RS232 Interface

5.3.2 AS400 INTERFACE

Except for the communication protocol as mentioned above, this series UPS has AS400 card (An optional accessory) for AS400 communication protocol. Please contact your local distributor For details.

The following is the pin assignment and description of DB-9 connector in AS400 card

Pin	Description	I/O type
1	UPS Failure	Output
2	Summary Alarm	Output
3	GND	
4	Remote Shutdown	Input
5	Common	
6	Bypass	Output
7	Battery Low	Output
8	UPS ON	Output
9	Utility power failure (Line Loss)	Output

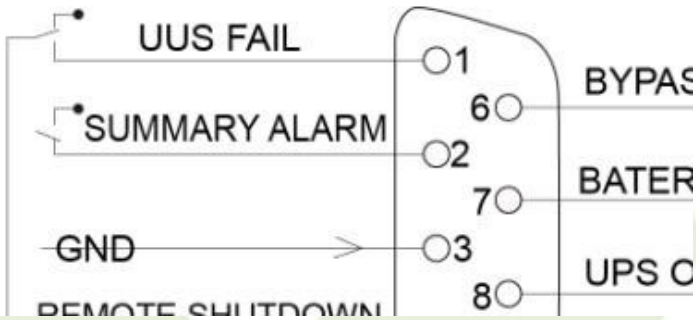


Figure5-2 DB9 Interface of AS400 communication protocol

6. Service warranty

Under normal use, outdoor UPS products from the date of purchase for 2 years free warranty Service (Original configuration of batteries inside for 1 year).

Dealer valid certificate:

- According to the machine warranty card warranty.
- If the machine fails, please contact the dealer or the company customer service staff, resulting in The warranty period the transportation costs borne by the user.
- Online technical support.

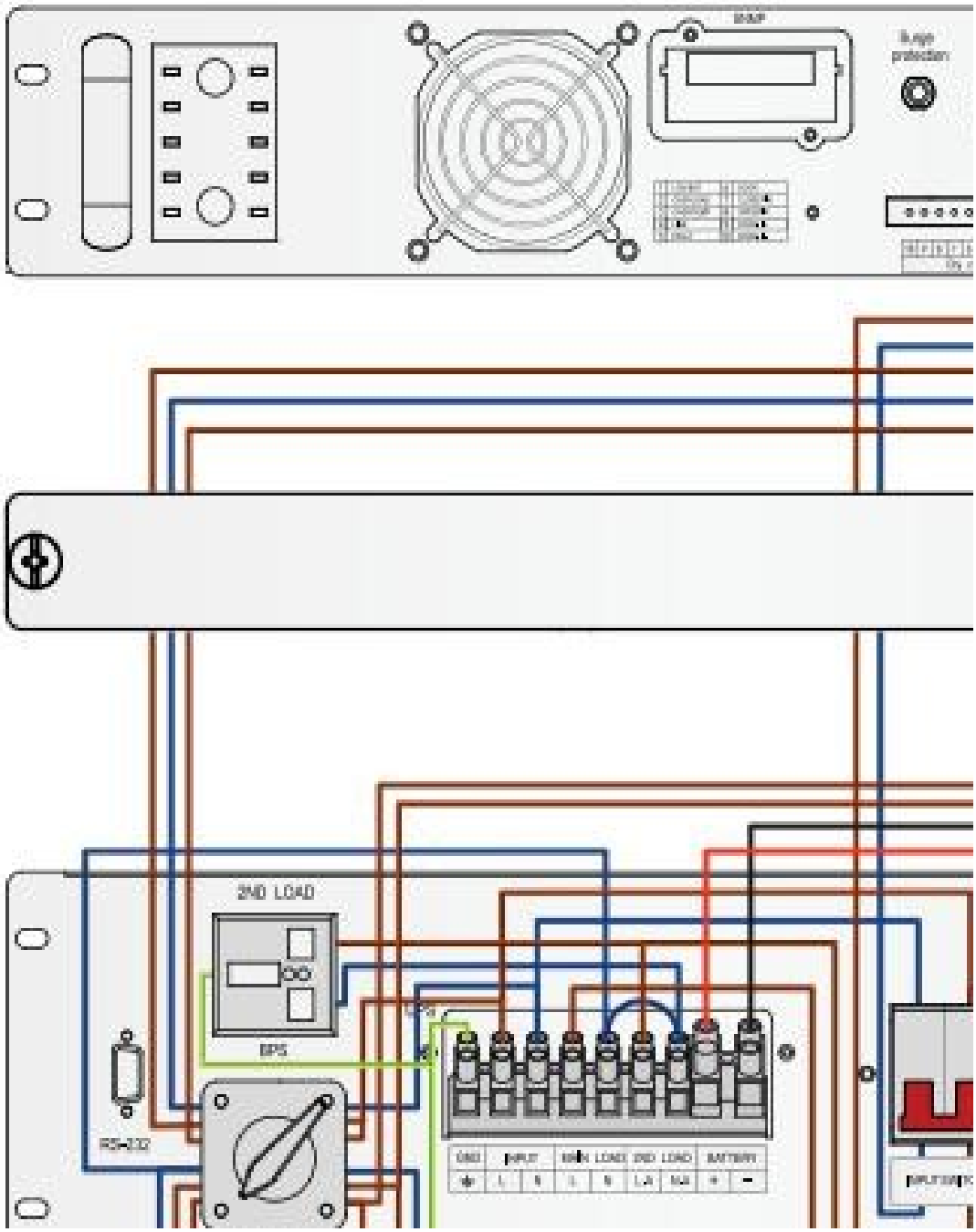
The following situation is out of free warranty:

- Beyond the warranty period.
- Battery configured by user.
- Damages caused by operation not according with user manual.
- Changes and loss of production sequence.
- Due to fire, flood and other damage caused to the UPS caused by power supply or environment.

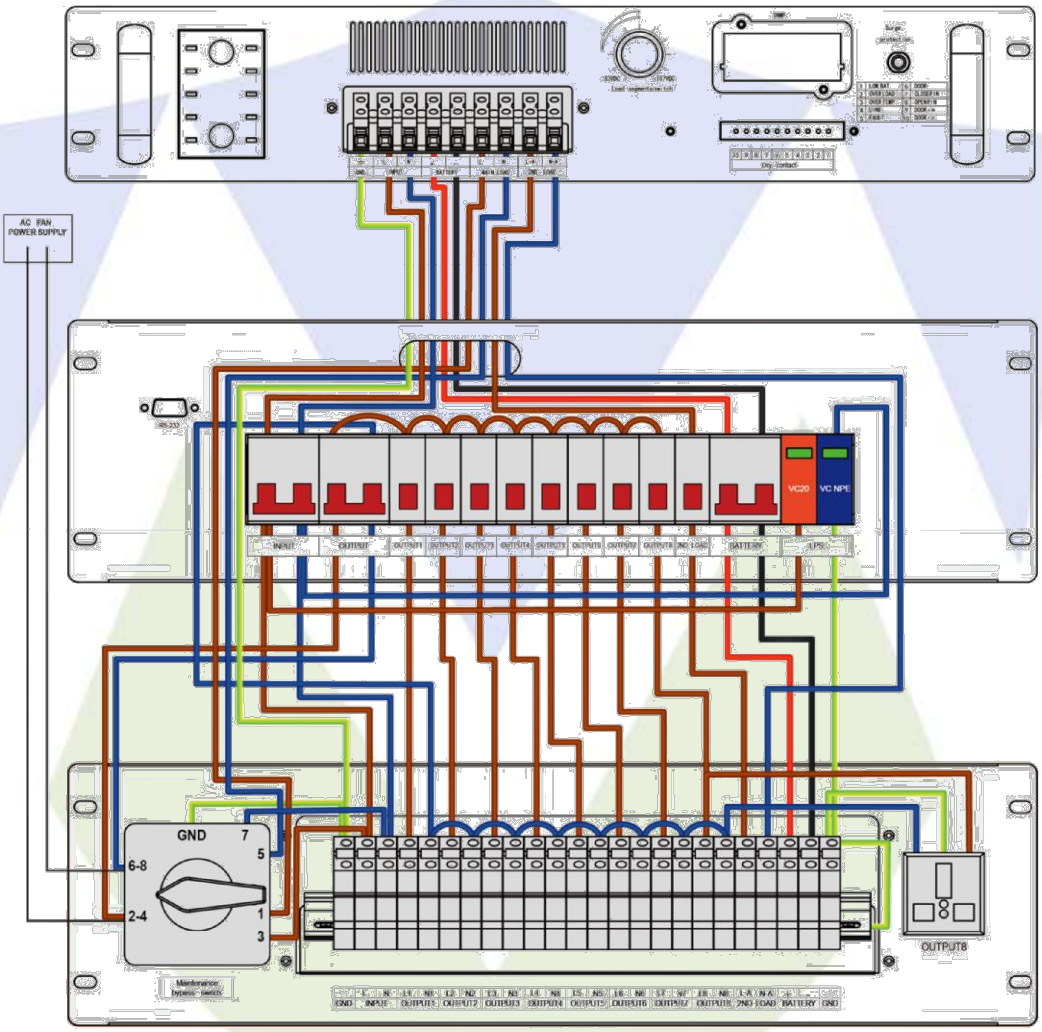
Note: The above content is subject to change without notice and possessing the right To final interpretation!

Appendix 1: Schematic diagram of panel electrical connection

1K Electrical wiring diagram

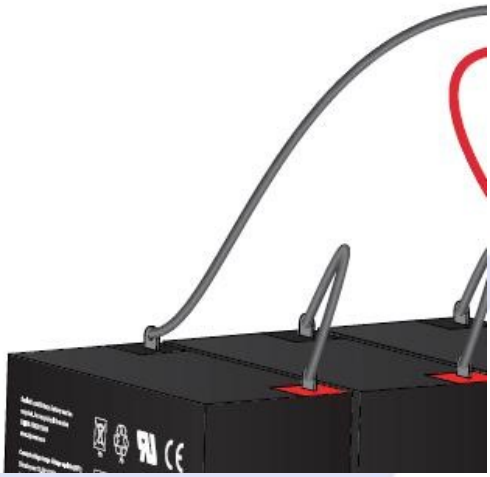


2-3K Electrical wiring diagram



1. Brown and blue lines are 16Awg.
2. Kelly line is 16Awg.
3. Red and black lines are 12Awg.
4. Please pay attention to the wire diameter of terminal connection.

Appendix 2:



1K Schematic diagram of battery wiring

2-3K Schematic diagram of battery wiring