



LEGA 1-1 SERIES MANUEL USER

Thanks for using our products

Please strictly obey all the instructions in this manual and pay attention to all the warning and operation information. It is not advisable to install or operate the machine before reading this manual.

LEGA ELECTRONIC A.S.

1. Safety instructions

- The power output voltage may still have 220V or 120V even not connect to the mains power.
- For the battery cable or power cord replacement, please contact our service station or dealer to purchase, in order to avoid fire caused by inadequate capacity or heat ignition.
- Do not place the battery or battery pack in the fire, which will injure due to explosion.
- Please do not open the UPS case as you will, there is risk of electric shock
- Do not touch the battery connection terminals. Battery loop and input voltage loop is without isolation, which may cause high voltage risk between the battery terminal and ground.
- Do not connect to the equipment like hair dryer or electric heater, to ensure the safety for the UPS

⚠Attention:

UPS has high voltage inside, for personal safety, please do not repair by yourself. If any questions, please contact local service center or dealer.

2. Installation instructions

2.1 Unpacking inspection

- Open the UPS package, please check the enclosed accessories including a user manual, communication cable, CD-ROM. The long-back model also includes the cable for connection to battery bank.
- Check the UPS if any damage in transport. If find damaged or parts missing, do not power on, please turn to the carrier and dealer.
- To determine whether this UPS is the model you want to buy. Check the model name showed both on the front panel and rear panel of UPS to confirm.

| Model | Type | Model | Type |
|----------|------------------------|----------|---------------------------|
| 1KVAS | 1KVA Standard model | 1KVAH | 1KVA Long backup model |
| 1.5 KVAS | 1.5 KVA Standard model | 1.5 KVAH | 1.5 KVA Long backup model |
| 2KVAS | 2KVA Standard model | 2KVAH | 2KVA Long backup model |
| 3KVAS | 3KVA Standard model | 3KVAH | 3KVA Long backup model |
| 6KVAS | 6KVA Standard model | 6KVAH | 6KVA Long backup model |
| 10KVAS | 10KVA Standard model | 10KVAH | 10KVA Long backup model |

Note:

Please save the packaging box and packaging materials for future transport use. As heavy product, please transit the UPS with care.

2.2 Attention items of installation

- The UPS installation environment must be with good ventilation, away from water, flammable gases and corrosive entities.
- Do not lie down the UPS against the wall so that front and side panel air intake hole, rear panel air outtake hole will be unobstructed.
- The peripheral environment temperature around the UPS should be within 0 °C ~ 40 °C
- If dismantling the machine at low temperatures, there may be condensation droplets, users can not install or operate it before UPS completely got dry both inside and outside, otherwise there will be danger of

electric shock.

- Place the UPS near the mains socket to cut off AC mains without any delay at any emergent case.

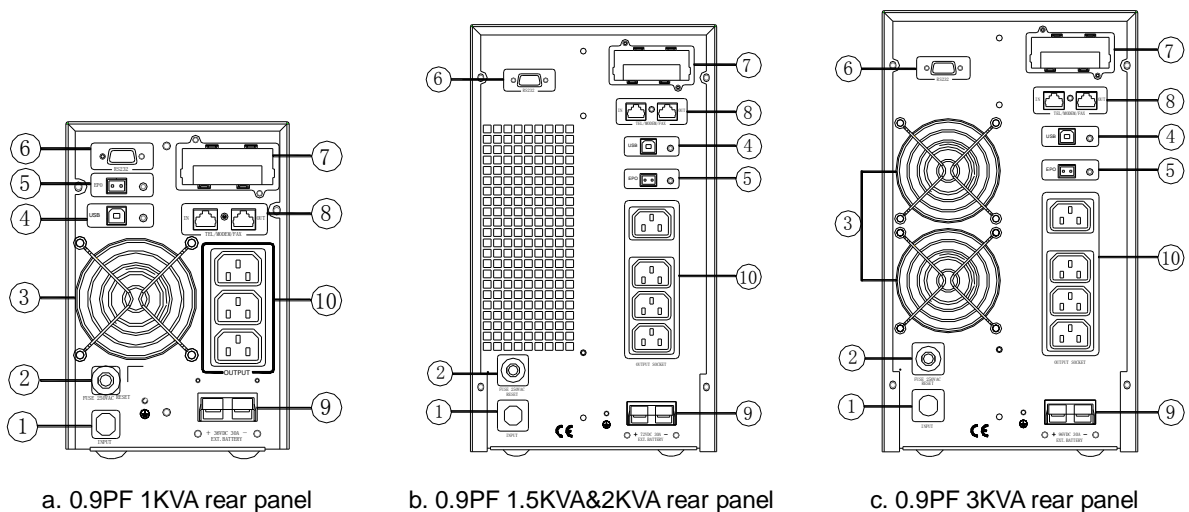
⚠Attention:

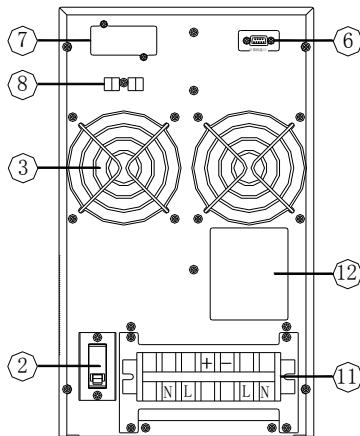
- Make sure the load behind the UPS is off when users connect the load to UPS, and then turn on the load one by one later.
- Please connect the UPS with the socket which is over-current protected. Do not connect the UPS with the socket which rated current is less than the Maximum input current of the UPS.
- All the power socket should be configured with earthing device for safety.
- UPS could be electrified or powered no matter the input power cable is tied or not, even when the UPS is off. The only way to cut off the output is switching off the UPS and disconnecting the mains power supply.
- For all standard type UPS, it is advised to charge the battery over 8 hours before used. Once the AC mains power energizes the UPS, it will automatically charge the battery. Without prior charging, UPS output remains as usual but with shorter back-up time than normal.
- When connected to motor, display equipment, laser printer etc, UPS power selection should be based on the startup power of the load which is usually twice as rated power.

2.3 UPS rear panel view

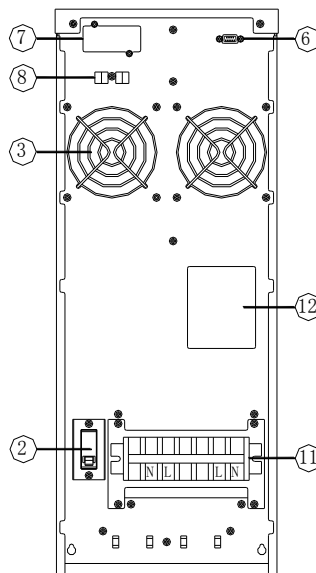
Note: following diagrams take the type of 0.9PF for example, the type of 0.8PF is similar.

2.3.1 The type of 220V (output could be 208V, 210V, 220V, 230V, 240V)

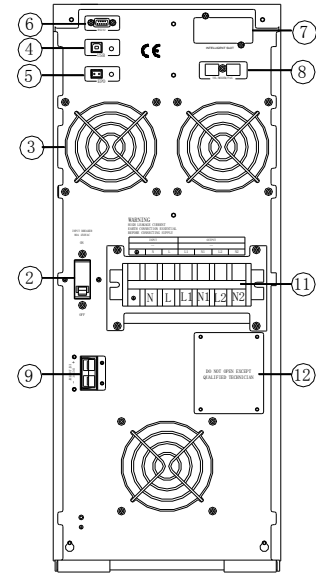




d. 6KVA & 10KVA Long back up

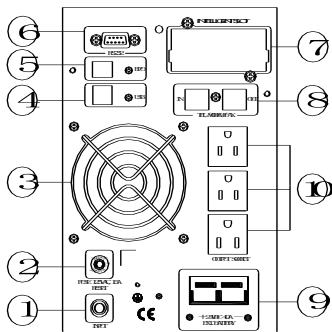


e. 6KVA & 10KVA Standard type

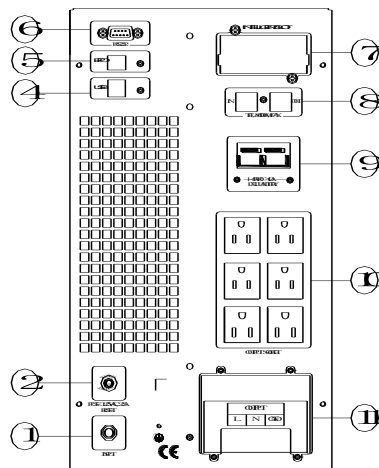


f. 0.8/0.9PF 6/10KVA with ISO

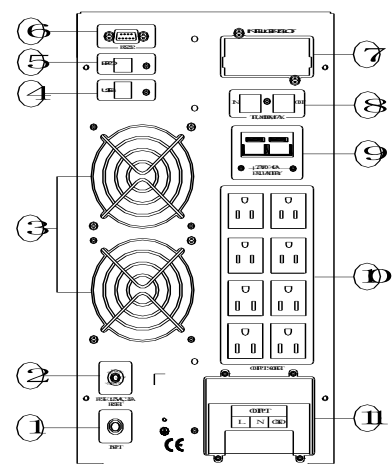
2.3.2 The type of 120V (output could be 100V, 110V, 115V, 120V, 127V)



a. 0.9PF 1KVA rear panel



b. 0.9PF 2KVA rear panel



c. 0.9PF 3KVA rear panel

- (1) Input Power Terminals; (2) Over Current Protector; (3) Fan; (4) USB;
 (5) Emergency Power Off; (6) RS232 Communication Interface; (7) Intelligent Slot;
 (8) Surge Protection for Network/Fax/Modem; (9) Battery Slot; (10) Output Socket;
 (11) Terminal Block; (12) Manual bypass switch cover.

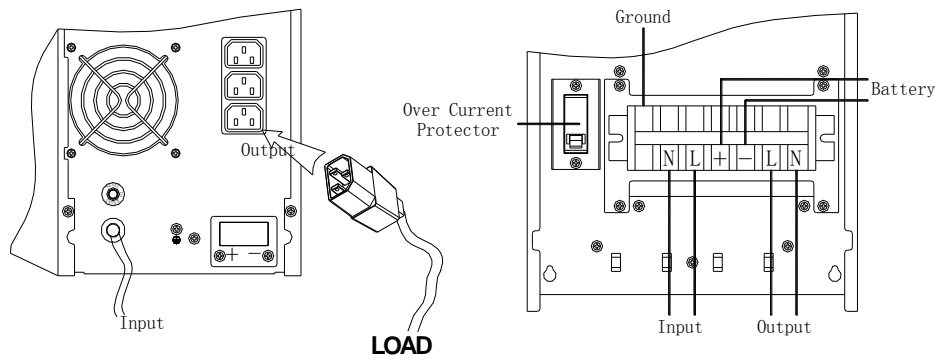
2.4 UPS output connection

Output connection of 1~10KVA type is configured with sockets or terminal blocks, users can plug the load cable into the UPS socket to energize the load as below. Make sure the mains wire and breakers in the building are enough for the rated capacity of UPS to avoid the hazards of electric shock or fire.

Note: To the type of 6-10KVA, do not use the wall receptacle as the input power source for the UPS, which rated current is less than the UPS's maximum input current. Otherwise the receptacle may be burned and destroyed.

(1) In general, users can easily connect the load cable into the socket or terminal block of the UPS as

following pictures.



(2) To the type of 6~10KVA witch contains isolation transformer, there are more methods of output connection. Before installing, prepare wires for terminal block of the UPS based on the following table.

| Model | Wiring spec(AWG) | | | | |
|--------|------------------|--------|---------|----------------------|--------|
| | Input | Output | Battery | Non-isolated Neutral | Ground |
| 6KVAS | 6mm2 | 6mm2 | 6mm2 | 6mm2 | 6mm2 |
| 6KVAH | 6mm2 | 6mm2 | 6mm2 | 6mm2 | 6mm2 |
| 10KVAS | 10mm2 | 10mm2 | 10mm2 | 10mm2 | 10mm2 |
| 10KVAH | 10mm2 | 10mm2 | 10mm2 | 10mm2 | 10mm2 |

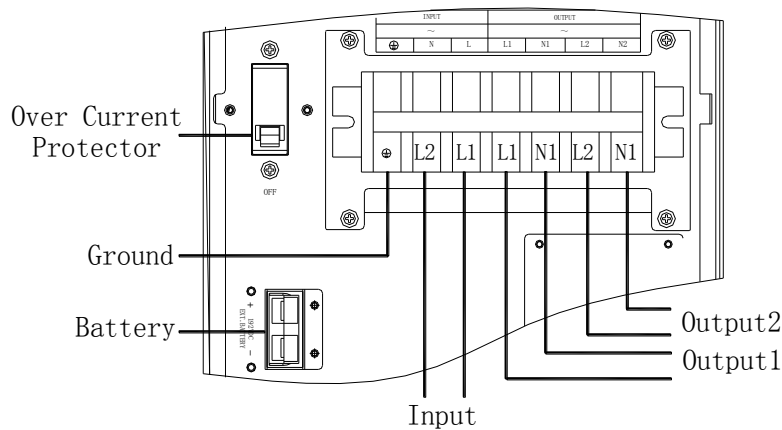
Note: ①The cable for 6KVAS/6KVAS should withstand over 40A current. It is recommended to use 10AWG or thicker wire for safety and efficiency.

②The cable for 10KVAS/10KVAS should withstand over 63A current. It is recommended to use 8AWG or thicker wire for safety and efficiency.

③The selections for color of wires should be followed by the local electrical laws and regulations.

Installation:

A. Remove the terminal block cover on the rear panel of UPS. Then connect the wires according to the following terminal block diagrams: Connect the earth wire first when making wire connection. Disconnect the earth wire last when making wire disconnection!)



Note: ①Make sure the wires are connected tightly with the terminals.

②There are two output terminals to meet customers' diverse requirements for serial or parallel connection. We will introduce the methods of connection later.

③Please install the output breaker between the output terminal and the load, and the breaker should be qualified with leakage current protective function if necessary.

B. Insert the EPO plug into the EPO slot on the rear panel.

C. Put the terminal block cover back to the rear panel of the UPS.

Warning: (only for long-run model)

◇Make sure a DC breaker or other protection device between UPS and external battery pack is installed. if not, Please install it carefully. Switch off the battery breaker before installation.

Note: Set the battery pack breaker in "OFF" position and then install the battery pack.

◇Pay highly attention to the rated battery voltage marked on the rear panel. if you want to change the numbers of the battery pack, please make sure you modify the setting simultaneously. The connection with wrong battery voltage may cause permanent damage of the UPS. Make sure the voltage of the battery pack is correct.

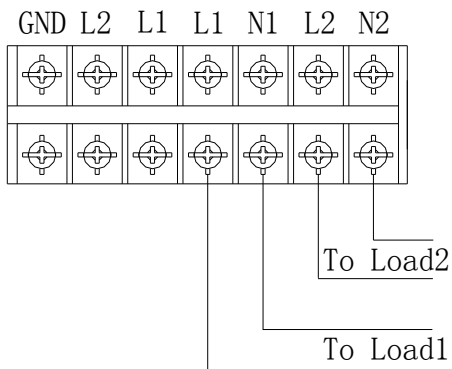
◇Pay highly attention to the polarity marking on external battery terminal block, and make sure the correct battery polarity connected. Wrong connection may cause permanent damage of the UPS.

◇Make sure the protective earth ground wiring is correct. The wire current spec, color, position, connection and conductance should be checked carefully.

◇Make sure the utility input& output wiring is correct. The wire current spec, color, position, connection and conductance should be checked carefully. Make sure the L/N site is correct, not reverse or short-circuited.

Output Configuration

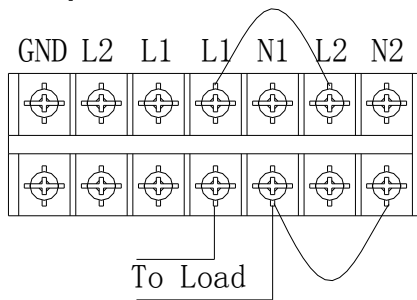
★Option 1:



There are 2 sets of low-voltage output (100V/110V/115V/120V) with L1-N1 and L2-N2. Each of them is able to

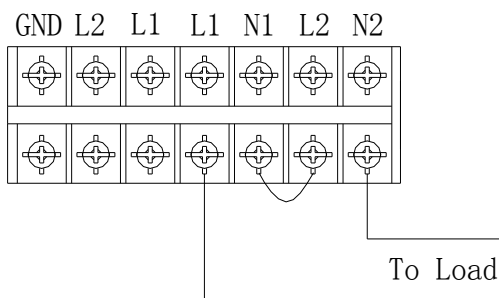
provide 50% of UPS rating power. Connect one load to L1-N1 and the other load to L2-N2.

★ **Option 2:**



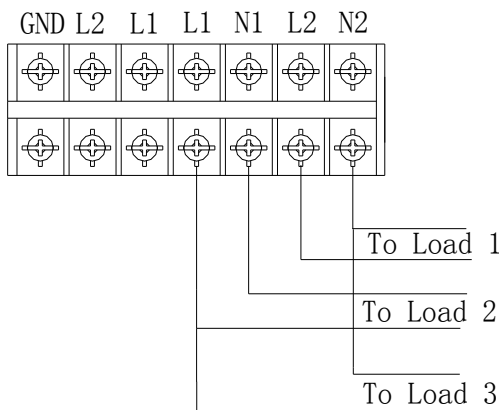
After connecting L1&L2 and N1&N2, it becomes one low-voltage output (100V/110V/115V/120V) at L1-N1 for 100% of UPS rating power. Connect load to L1-N1 or L2-N2.

★ **Option3:**



After connecting N1 and L2, it becomes one low-voltage output (208V/220V/230V/240V) at L1-N2 for 100% of UPS rating power. Connect load to L2-N1

★ **Option4:**



After connecting N1 & L2, it becomes three outputs, one high-voltage((208v/220v/230v/240V) at L1-N2 two low-voltage outputs (100v/110v/115v/120V) at L1-N1 and L2-N2. However, there is a limit for current rating at L1-N1 and L2-N2: 25A is for 6KVA model and 42A is for 10KVA model. You must connect the load under the limitation. Please read Note first before installation.

Connect low-voltage load to L1-N1 and L2-N2, and connect high-voltage load to L1-N2.

Note: ①if any load current in L1-N1 or L2-N2 is higher than 25A in 6KVA model and 42A in 10KVA model.

The UPS will still operate normally without overload warning because the total load is under the specification. However, the isolation transformer will be damaged with overheat due to high current.

Hence, the installation must be done with technician and make sure that the load current does not exceed this limitation.

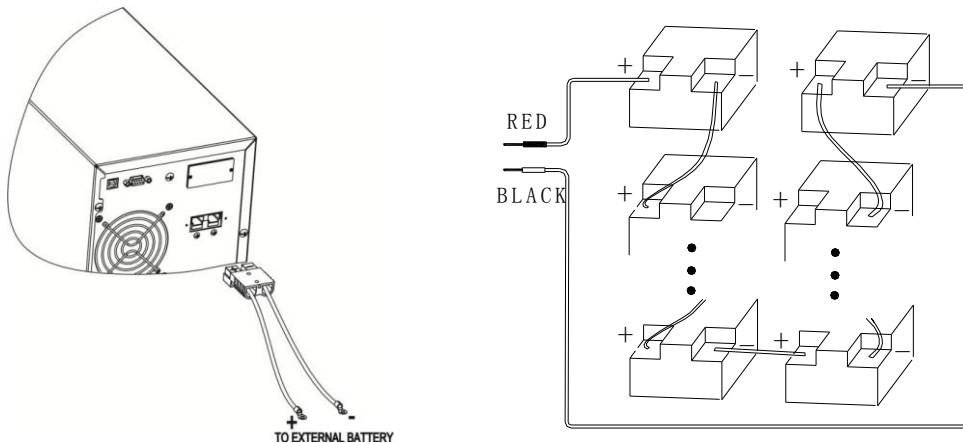
②When connecting to low-voltage and high –voltage at the same time like option 4, it will cause the L1-N1 & L2-N2 with low-voltage loads in Non-Isolated status, we recommend that you may only use two low-voltage at L1-N1 or L2-N2 like option 1, and also make sure that the total current in L1-N1 or L2-N2 does not exceed the value on Note 1.

2.5 External battery connection procedure for long back up type

- For different UPS type, users are instructed to configure different battery voltage as below sheet. More or less units are forbidden, or else something abnormal or faulty will appear.

| Type | Battery Quantity (unit) | Battery Voltage (volt) |
|--------|-------------------------|------------------------|
| 1KVA | 2/3 | 24/36 |
| 1.5KVA | 4 | 48 |
| 2KVA | 4/6 | 48/72 |
| 3KVA | 6/8 | 72/96 |
| 6KVA | 14/16 | 168/192 |
| 10KVA | 14/16 | 168/192 |

- One end of battery cable is for UPS terminals while the other end with triple cables is for battery terminals. Correct installation procedure is highly vital or else probable electric shock will arise. Users are strictly required to follow the below procedure.
- Connect battery in correct way and make sure the total battery voltage is available for UPS.
- Correctly connect the long battery cable to battery terminals first, red wire is to positive plate while black is to negative. If users connect the UPS first, electric shock or other danger could not be avoided.
- Before connecting load after UPS, users should supply main power to UPS and energize it.
- Connect long battery cable to UPS terminals with correct poles link (red is for “+”, black is for “-”), UPS will start the charging work automatically.



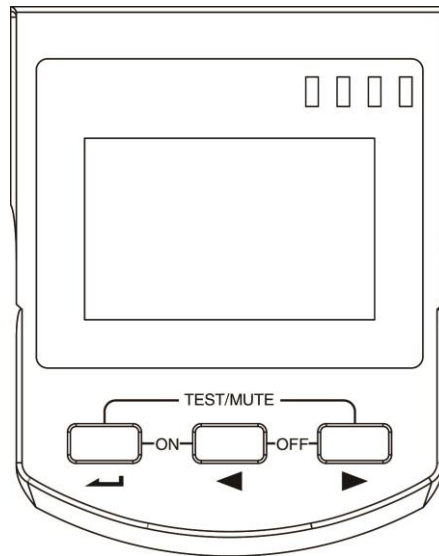
2.6 Installation

- UPS installation work should comply with local electrical standard and only can be done by professional technician. 1KVA~3KVA units could use wall socket as input power connection.
- For all type UPS, it is advised to charge the battery over 8 hours before the first use. Once the AC mains power energizes the UPS, it will charge the battery automatically. Without prior charging, UPS output remains as usual but with shorter back up time than normal.

3. Panel function and operation

The operation is simple, operators only need to read the manual and follow the operation instructions listed in this manual without any special training.

3.1 Keys function



※ON KEY (◀ + ▶)

Press and hold the two keys for more than half a second to turn on the UPS.

※OFF KEY (▶ + ▶)

Press and hold the two keys for more than half a second to turn off the UPS.

※TEST/MUTE KEY (◀ + ▶)

Press and hold the two keys for more than 1 second in mains mode or economical mode: UPS runs the self-test function.

Press and hold the two keys for more than 1 second in battery mode: UPS runs the mute function.

※INQUIRING KEY (▶ , ▶)

Non-function setting mode:

Press and hold ▶ or ▶ for more than half a second (less than 2 seconds): display the items orderly.

Press and hold ▶ for more than 2 seconds: Circularly and orderly display the items every 2 seconds, when press and hold the key for some time again, it will turn to output status.

Function setting mode:

Press and hold the key for more than half a second (less than 2 seconds): Select the set option.

※FUNCTION SETTING KEY ◀

Non-function setting mode:

Press and hold the key for more than 2 seconds: Function setting interface.

Function setting mode:

Press and hold the key for more than half a second (less than 2 seconds): Enter the function setting option.

Press and hold the key for more than 2 seconds: exit from this function setting interface.

3.2 LED Function



From left to right is inverter LED, battery LED, bypass LED and warning LED.

Warning red LED is on: UPS fault. For example: Overload beyond the allowed time, inverter fault, BUS fault, over temperature fault etc.

Bypass yellow LED is on: UPS is alarming. For example: Bypass mode supply power and etc.

Battery yellow LED is on: UPS is alarming. For example: Battery mode supply power and etc.

Inverter green LED is on: UPS is normally powered by mains or ECO mode or battery mode.

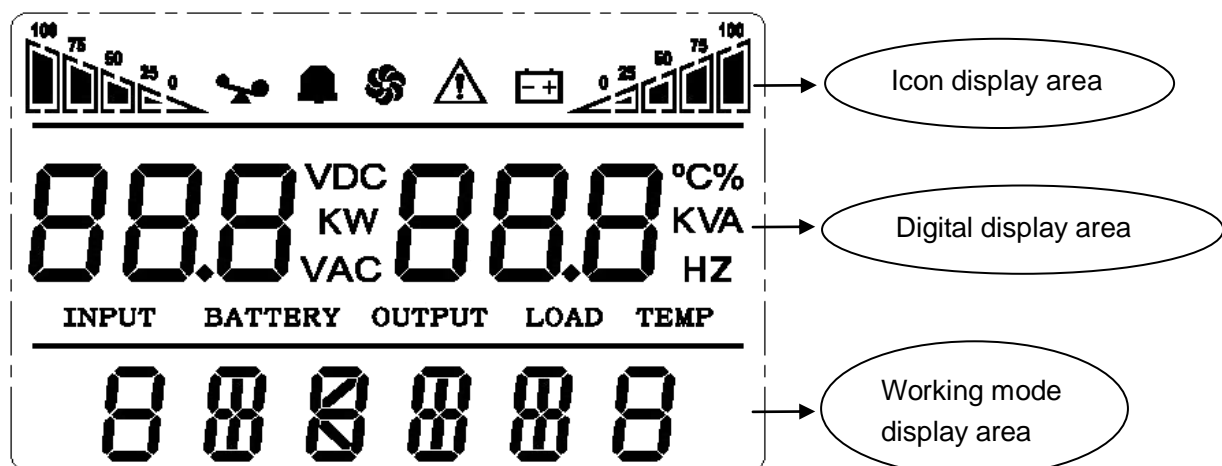
PS: LED display detail in different mode is listed in 5 items.

3.3 LCD display function

LCD displays as following figure.

※ Icon display area:

- A. The top diagram is for load and battery capacity indication, each grid of which represents 25%. When UPS is over load, the load light will blink the same as the battery light blink when the capacity of battery get low or battery disconnected.
- B. The fan icon is for fan working indication; when fan normally runs, the icon will display rotation; if the fan is not connected or faulty, the icon blinks;
- C. Press the mute button under the battery mode, buzzer icon will blink; it will disappear in other cases.
- D. Fault icon will be on when UPS is in fault mode, otherwise it will not.



※ Digital display area:

- A. Under none setting mode, it will display UPS output information when UPS normally runs in AC mode; other information like input, battery, load and temperature will be showed after pressing the inquiring key; Fault code will be told in fault mode.
- B. Under setting mode, user could adjust different output voltage as well as activate ECO and BYPASS mode by operating function setting key and inquiring keys.

※ Mode display area:

- A. This area will display the power capacity of the machine after starting the UPS within 20 seconds.
- B. After over 20 seconds, this area will display the working mode of the machine. Such as STDBY(standby

Mode), BYPASS(Bypass Mode), LINE(AC Mode), BAT(Battery Mode), BATT(Battery Self Test Mode), ECO(economic mode), SHUTDN(shutdown mode).

3.4 Turn On/Off operation

3.4.1 Turn On operation

i. Turn on the UPS on line mode

- ① Once mains power is plugged in, the UPS will charge the battery, at the moment, LCD shows that the output voltage is 0, which means UPS has no output as default condition. If it is expected to have output of bypass, you can set the BPS "ON" by LCD setting menu.
- ② Press and hold the ON key for more than half a second to start the UPS, then it will start the inverter.
- ③ Once started, the UPS will perform a self-test function, and LED will light and go off circularly and orderly. When self-test finishes, it will come to online mode, the corresponding LED lights, UPS is working in line mode.

ii. Turn on the UPS by DC without mains power

- ① When main power is disconnected, press and hold the ON key for more than half a second to start UPS.
- ② The operation of UPS in the process of start is almost the same as that when mains power is on. After the self-test finishes, the corresponding LED lights and UPS are working in battery mode.

3.4.2 Turn Off operation

i. Turn off the UPS in line mode

- ① Press and hold the OFF key for more than half a second to turn off the UPS and inverter.
- ② After UPS shutting down, LED goes out and there is no output. If output is needed, you can set BPS "ON" on LCD setting menu.

ii. Turn off the UPS in DC mode without mains power

- ① Press and hold the OFF key for more than half a second to turn off the UPS.
- ② When turning off the UPS, it will do self-test first. LED lights go out circularly and orderly until there is no display on the panel.







3.5 UPS self-test/mute test operation

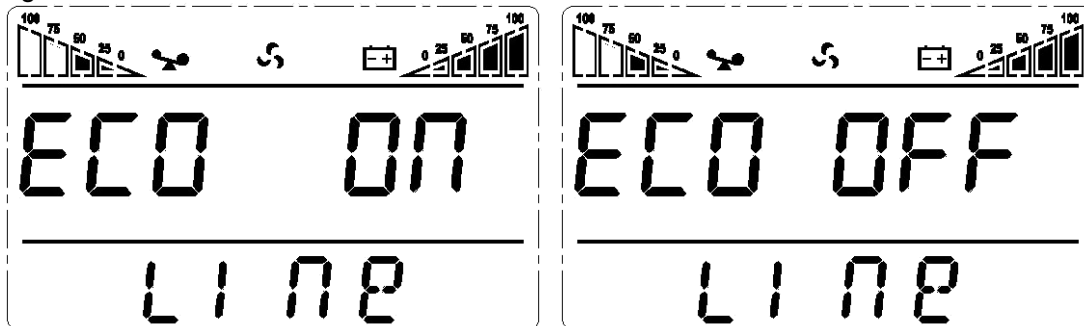
- ① When UPS is in LINE Mode, press and hold the self-test/mute key for more than 1 second, LED light will go off circularly and orderly. UPS comes to self-test mode and tests its status. It will exit automatically after finishing test.
- ② When UPS is in BAT Mode, press and hold the self-test/mute key for more than 1 second, the buzzer stops beeping. If you press and hold the self-test/mute key for one more second, it will restart to beep again.

3.6 Panel function setting








UPS has setting function. It can run the setting in any mode. After setting, it will become effective at once when meets some standards. The set information can be saved only when the battery connected and normally turning off the UPS.

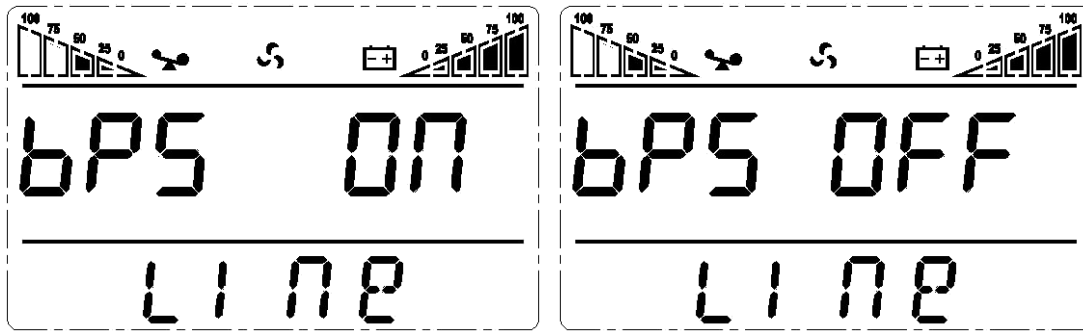
3.6.1 ECO mode setting

- ① Enter the setting interface. Press and hold the function setting key  for more than 2 seconds, then come to setting interface, the letters “ECO” will flash;
- ② Enter the ECO setting interface. Press and hold the function setting key  for more than half a second (less than 2 seconds), then come to setting interface of ECO, at this time, the letters “ECO” will light for a long time. The “ON” (or OFF) will flash. Press and hold the inquiring key ( , ) for more than half a second (less than 2 seconds) to determine whether the ECO function is used or not. If used, the corresponding word is “ON”, if not, the word is “OFF”. It can be determined by yourself.
- ③ Confirm the ECO selecting interface. After selecting ON or OFF, press and hold the function setting key  for more than half a second (less than 2 seconds). Now, the ECO setting function is completed and the “ON” or “OFF” will light without flash.
- ④ Exit from the setting interface. Press and hold function setting key  for more than 2 seconds, exit from the setting interface and return to main interface.











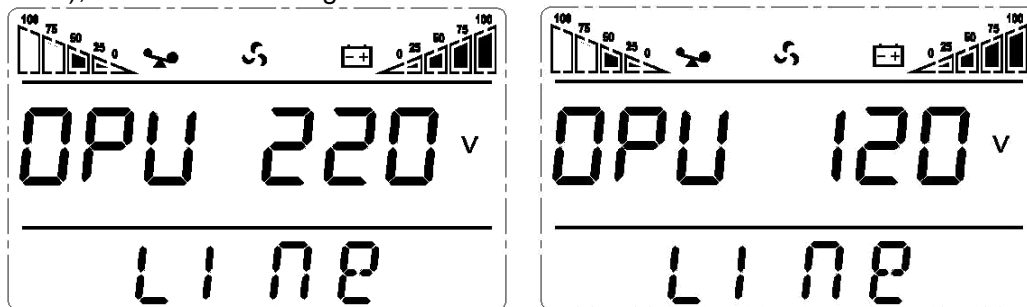
3.6.2 Bypass mode setting

- ① Enter the setting interface. Press and hold the function setting key  for more than 2 seconds, then come to setting interface, press and hold the function setting key  for more than half a second (less than 2 seconds), select the function setting, choose the bypass output interface, at the moment, the letters “BPS” will flash.
- ② Enter the Bypass output setting interface. Press and hold the function setting key  for more than half a second (less than 2 seconds), then come to setting interface of BPS, at this time, the letters “BPS” will light for a long time. The “ON” letter will flash. Press and hold the inquiring key ( , ) for more than half a second (less than 2 seconds) to determine whether the BPS function is used or not. If used, the corresponding word is “ON”, if not, the word is “OFF”. It can be determined by yourself.
- ③ Confirm the Bypass output setting interface. After selecting ON or OFF, press and hold the function setting key  for more than half a second (less than 2 seconds), Now, the BPS setting function is completed and the “ON” or “OFF” will light without flash.
- ④ Press and hold the function setting key  for more than 2 seconds, exit from the setting interface and return to main interface.
- ⑤ After setting BPS ON, without turning on the UPS whatever mains power being plugged in or not, there is bypass output but no backup function.







3.6.3 Output voltage setting



- ① Enter the setting interface. Press and hold the function setting key  for more than 2 seconds, then come to setting interface, press and hold the inquiring key ( , ) for more than half a second (less than 2 seconds), select the function setting, choose output voltage setting interface, at the moment, the letters “OPU” will flash.
- ② Enter the output voltage setting interface. Press and hold the function setting key  for more than half a second (less than 2 seconds), then come to setting interface of output voltage OPU, at this time, the letters “OPU” will light for a long time. The numerical value under the OPU will flash. Press and hold the inquiring key ( , ) for more than half a second (less than 2 seconds), select the numerical value in accordance with “OPU” function. The provided voltages are 208V, 210V, 220V, 230V, 240V or 100V, 110V, 115V, 120V, 127V, you can choose anyone by yourself (The default value is 220V).
- ③ Confirm the output voltage setting interface. After selecting numerical value, press and hold the function setting key  for more than half a second (less than 2 seconds). Now, the OPU setting function is completed and the numerical value will light without flash.
- ④ Exit from the setting interface. Press and hold function setting key  for more than half a second (less than 2 seconds), exit from the setting interface and return to main interface.

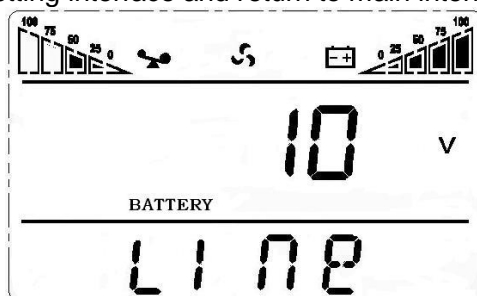


3.6.4 Low voltage of battery setting

- ① Enter the setting interface. Press and hold the function setting key  for more than 2 seconds, then come to setting interface, Press and hold the inquiring key ( , ) for more than half a second (less than 2 seconds), select the function setting, choose battery voltage setting interface, at the moment, the letters “bat” will flash.
- ② Enter the battery voltage selecting interface. Press and hold the function setting key  for more than half a second (less than 2 seconds), then come to setting interface of battery voltage, at this time, the letters “bat” will light for a long time. The numerical value below the “bat” will flash. Press and hold the inquiring

key (◀ , ▶) for more than half a second (less than 2 seconds), select the numerical value in accordance with “battery” function. The provided voltages are 10V, 10.2V, 10.5V, numbers stand for the voltage of each battery, you can choose anyone by yourself (The default is 10V), anyone has been chosen, under BAT MODE, UPS will shutdown when its battery voltage achieve the voltage you chose.

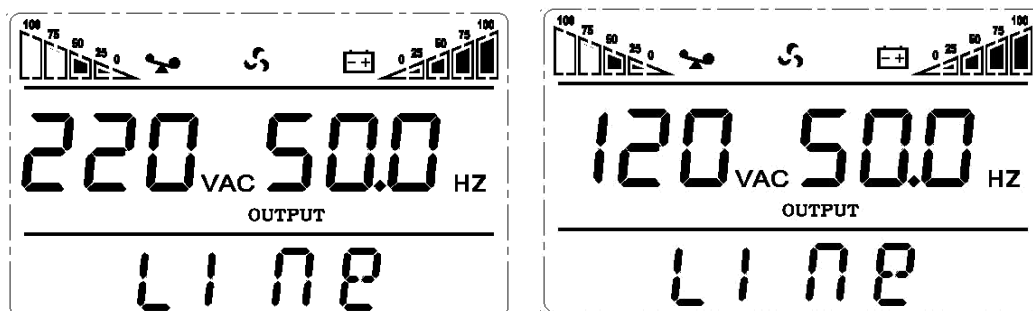
- ③ Confirm the battery voltage selecting interface. After selecting numerical value, press and hold the function setting key  , for more than half a second (less than 2 seconds). Now, the battery setting function is completed and the numerical value will light without flash.
- ④ Exit from the setting interface. Press and hold function setting key  for more than half a second (less than 2 seconds), exit from the setting interface and return to main interface.



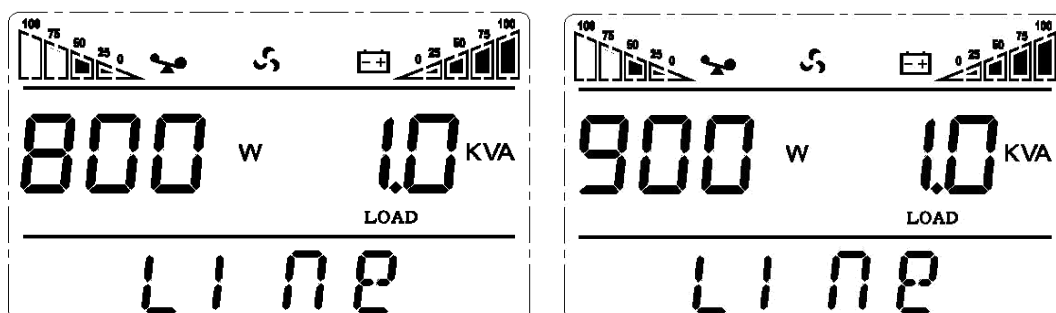
3.7 Parameters inquiring operation

Press and hold the inquiring key ◀ or ▶ for more than half a second (less than 2 seconds) to inquire about items. The inquired items include input, battery, output, load and temperature. The displayed items on LCD screen are showed as following:

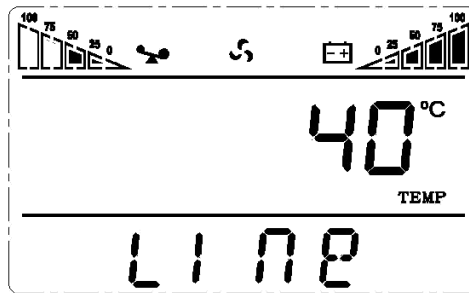
Output: Display the output voltage and output frequency of the UPS. As the following graphic shows, the output voltage is 220V or 120V, the output frequency is 50Hz.



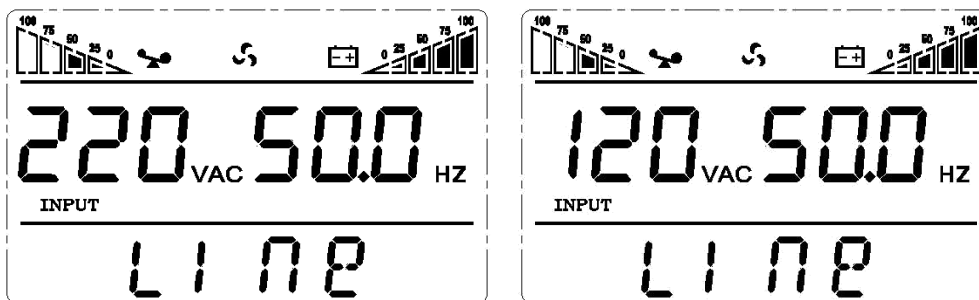
Load: Display the numerical value of the active power (WATT) and apparent power (VA) of the load. For example, as the following graphics shows: the WATT of the load is 800W or 900W, VA is 1000VA (when disconnect load, it is a normal phenomenon to show a small numerical value of WATT and VA).



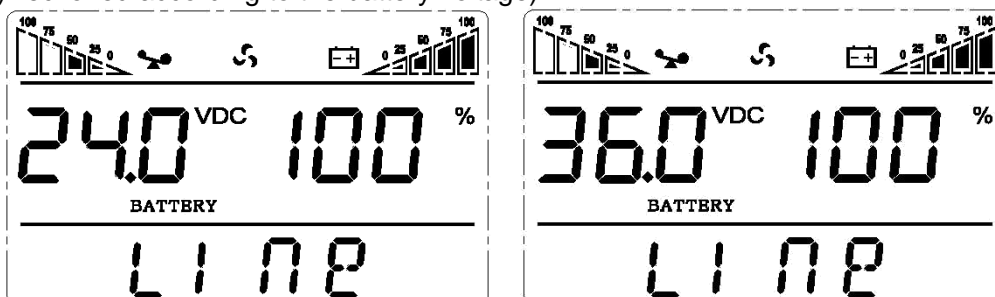
Temperature: Display the maximum temperature of the components in the UPS. As the following graphics shows: the maximum temperature is 40°C



Input: Display the voltage and frequency of the input. As the following graphics shows: the input voltage is 220V or 120V, input frequency is 50Hz.



Battery: Display the voltage and capacity of the battery (determined by type). As the following graphics shows: the battery voltage is 24V or 36V, the capacity of battery is 100% (the capacity of battery is approximately reckoned according to the battery voltage).



Press and hold the inquiring key ◀ for more than 2 seconds, LCD begins to display the items circularly and orderly which transfer to another every 2 seconds. Press and hold the key for some time again within 30s, it will return to output status.

4. Working mode introduction

4.1 Bypass mode

LED indications on front panel in bypass mode are as following:



Bypass yellow LED is on, the buzzer beeps once every 2 minutes. The warning red LED is on when beeping, what LCD displays depending on the exact load and battery capacity.

Turn to bypass mode under the following two conditions:

- ① Turn off the UPS line mode while start the bypass output.

② Overload in line mode.

Note: When UPS is working in bypass mode, it has no back up function.

4.2 Line mode

LED indications on front panel in line mode are as following: The inverter green LED is on.



When input AC mains correspond to the working conditions, UPS will work in line mode.

4.3 Battery mode

LED indications on front panel in battery mode are as following: both the inverter green LED and battery yellow LED is on, the buzzer beeps once every 4 seconds. The warning red LED will be on while beeping.



When the mains power is low or unstable, UPS will turn to battery mode at once.

4.4 ECO mode

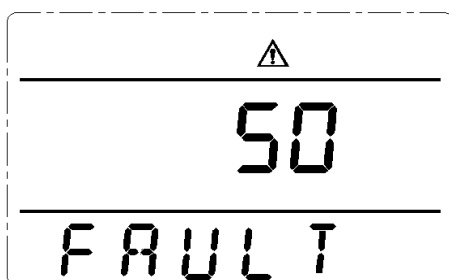
LED indications on front panel in ECO mode are as following: both the inverter green LED and bypass yellow LED are on.



When the input mains meets the input range of the ECO mode and the ECO function is on, the UPS will works in ECO mode. If input AC mains exceed the range of ECO several times within one minute but stays in inverter input range, UPS will work in AC inverting mode automatically.

4.5 Fault mode

LED indications on front panel in Fault mode are as following: warning red LED is on and LCD display fault code and related icon.



Fault mode (LCD interface on which the fault code display)

When UPS has faulted. The warning LED is on and the buzzer beeps. UPS will turn to fault mode. UPS cuts off the output and LCD display fault codes. At the moment, you can press the mute key to make the buzzer stop beeping temporarily to wait for maintenance. You can also press the OFF key to shut down the UPS when confirmed that there is no serious fault.

5. The warning code list of the LED light and display panel

Appendix 1: The table of the fault code

| Fault reason | Fault code |
|------------------------|------------|
| BUS voltage fault | 00-14 |
| Power soft start fault | 15-24 |
| Inverter voltage fault | 25-39 |
| Overheat | 40-44 |
| Output short circuit | 45-49 |
| Overload | 50-54 |
| Input NTC fault | 55-59 |
| Power fault | 60-64 |
| Input FUSE fault | 65-69 |
| Other | 88 |

Appendix 2: Table for working status

| S/N | Working status | LED on Front panel | | | | Alarm beep | Note |
|-----|---|--------------------|---------|--------|-------|-------------------|------|
| | | Normal | Battery | Bypass | Fault | | |
| 1 | Inverter mode (mains power) | | | | | | |
| | Mains power voltage | ● | | | | N | |
| | Mains power high/low voltage protection, switch to battery mode | ● | ● | | ★ | One beep / 4 sec | |
| 2 | Battery mode | | | | | | |
| | Battery voltage - normal | ● | ● | | ★ | One beep / 4 sec | |
| | Warning for abnormal voltage of battery | ● | ★ | | ★ | One beep / sec | |
| 3 | Bypass mode | | | | | | |
| | Mains power – normal (under Bypass) | | | ● | ★ | One beep / 2 mins | |
| | Mains power – high voltage warning (under Bypass) | | | ● | ★ | One beep / 4 sec | |
| | Mains power – low | | | ● | ★ | One beep / 4 sec | |

| | | | | | | | |
|---|---|---|---|---|---|------------------|--|
| | voltage warning (under Bypass) | | | | | | |
| 4 | Warning for battery disconnected | | | | | | |
| | Bypass mode | | | • | ★ | One beep / 4 sec | |
| | Inverter mode | • | | | ★ | One beep / 4 sec | |
| | Power on / Switch on | | | | | 6 beeps | |
| 5 | Output overload protection | | | | | | |
| | Warning for mains power overload | • | | | ★ | 2 beeps / sec | |
| | Protect operation for mains power mode overload | | | • | • | Long beep | |
| | Warning for battery overload | • | • | | ★ | 2 beeps / sec | |
| | Protect operation for battery mode overload | • | • | | • | Long beep | |
| 6 | Warning for bypass mode overload | | | • | ★ | One beep / 2 sec | |
| 7 | Fans fault(fan icon) | ▲ | ▲ | ▲ | ★ | One beep / 2 sec | |
| 8 | Faults mode | | | | • | Long beep | |

• LED indicator lights long time

★LED indicator flicker

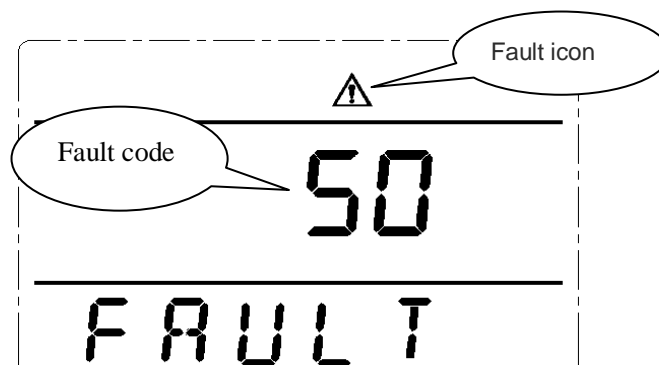
▲ LED indicator status depends on other conditions

Note: End user need to provide below information when require to maintain the UPS.

- UPS Model No. & Serial No.
- Date of fault occurrence.
- Fault detail (LED status, noise, AC power situation, load capacity, for long back up type, battery capacity configuration is also necessary.)

6. Trouble shooting

When the system runs in failure mode, the LCD will show as below:



Explicit Troubleshoot Introduction Sheet

| Trouble indication | Failure point | Solution |
|--|-------------------------|---|
| Fault LED on, audible buzzer Persistently alarm, the fault code is 00-14 | Bus bar voltage fault | Please test the bus bar voltage or contact the supplier. |
| Fault LED on, audible buzzer persistently alarm, the fault code is 15-24 | Soft start fault | Please check the soft start up circuit, especially the soft start resistance or contact the supplier directly. |
| Fault LED on, audible buzzer persistently alarm, the fault code is 25-39 | Inverter voltage fault | Please contact the supplier. |
| Fault LED on, audible buzzer persistently alarm, the fault code is 40-44 | Over temperature inside | Please make sure the UPS didn't get overload, and the fan vent was not obstructed, as well as the indoor temperature is not high. Leave alone the UPS 10 minutes for cooling, and restart it. If failure remains, please contact the supplier. |
| Fault LED on, audible buzzer Persistently alarm, the fault code is 45-49 | Output short-circuit | Turn off the UPS and disconnect all the load, make sure there is no any fault or internal short circuit of the load. And then restart the UPS, if failure still, please contact the supplier. |
| Fault LED on, audible buzzer persistently alarm, the fault code is 50-54 | Over load | Please check the load level and disconnect the noncritical devices, recount the total capacity of your load and reduce the load to the UPS. Please check whether the load device has fault or not? |
| Fault LED on, audible buzzer persistently alarm, the fault code is 55-59 | Input NTC fault | Please contact the supplier. |
| Fault LED on, audible buzzer persistently alarm, the fault code is 60-64 | Power fault | Please Check whether the input & output power normal or not, contact the supplier if it is abnormal. |
| Fault LED on, audible buzzer persistently alarm, the fault code is 65-69 | Input fuse fault | Please check if the input fuse is burnt. Replace the old fuse and restart the UPS. If failure remains, please contact the supplier. |
| Fault LED on, audible buzzer Persistently alarm, fan icon in the LCD flickers | Fan fault | Please check whether the fans connect well, is the fan plugged and is the fan broken? If all above condition is ok, please |

| | | |
|--|--|---|
| | | contact the supplier. |
| UPS fail to start when operate "On" key | Pressing time too short | Please press the power key more than 2 seconds to start the UPS. |
| | The input connection is not ready or UPS internal battery disconnect | Please connect the input well, if the battery voltage is too low, please disconnect the input and start the UPS with no-load. |
| | UPS internal system fault | Please contact the supplier. |
| Back up time become short | Battery undercharge | Please keep the UPS battery recharging more than 3 hours |
| | UPS overload | Please check the load level and disconnect the noncritical devices, |
| | Battery maturing, capacity descend | Please change new battery, contact your supplier to get the new battery and spare parts. |
| UPS doesn't have any power go through even main power on | UPS input breaker disconnects | Please reset the circuit breaker by manual. |

⚠Attention: When the output is short-circuited, the action of the protection of the UPS will show up. Before turning off the UPS, please make sure to disconnect the entire load and cut off the AC mains power supply, otherwise will make the AC input short-circuit.

7. Attention of battery disposal

- ◇Please take off metal objects, such as, ring, watch and the likes before dealing with batteries.
- ◇If you want to replace the battery cable, please purchase it from our local service center or distributors to avoid fever and lighter which can cause fire from inadequate power capacity.
- ◇Don't dispose the battery or battery pack by fire, it will explode.
- ◇Don't damage or open the battery case, the overflow battery electrolyte has a strong toxicity which will do harm to humans.
- ◇Please avoid short circuit which may cause fire or electric shock.
- ◇Please check the battery voltage before touching. Otherwise, it will form a high voltage environment between BAT. There will be high voltage between the terminals and the ground when battery circuits and the input voltage loop is not isolated.

8. Network communication

This series UPS offer intelligent network interface with a dedicated Ethernet card (optional accessory), to realize network communications. For more details, please contact our local distributor or service center.

9. Communication interface introduction

The UPS communicates with PC via analog relay joint and serial interface (RS232). The former transmits the input power and UPS status to PC by choosing "on" or "off" states of transistor. The latter offers communication interface serials with PC to monitor input power and UPS status information, and control the UPS also.

Note: The communicating function is only realizable with the specific communicating cable from the supplier. RS232 interface is set as below:













- ◇Bit rate: 2400bps
- ◇Byte: 8bit
- ◇Completion code: 1bit
- ◇Bit Pattern: None

Appendix 1: EMC Level

The series product is designed to meet the below standard.

| EMS | |
|-------------------------|---------|
| IEC61000-4-2(ESD) | Level 4 |
| IEC61000-4-3(RS) | Level 3 |
| IEC61000-4-4(EFT) | Level 4 |
| IEC61000-4-5(Suege) | Level 4 |
| EMI | |
| GB9254-1998/IEC 62040-2 | Class B |

Appendix 2: Symbol instructions:

| Symbols and significations | | | |
|---|-----------------------|---|---------------------------|
| Symbol | Significations | Symbol | Significations |
|  | Caution |  | Protect grounding |
|  | Danger! High Voltage! |  | Alarm cancel |
| ON | Turn on |  | Overload |
| OFF | Turn off |  | Battery inspection |
|  | Standby or Shutdown |  | Repeat |
|  | AC |  | Display screen repeat key |
|  | DC |  | Battery |

Appendix 3: Specification Sheet (1-3KVA)

| Rated Capacity | | 1KVA | 1.5KVA | 2KVA | 3KVA |
|---|------|---|---------|-----------|---------|
| Input | | | | | |
| Rated input voltage | | 220V or 120V | | | |
| Rated input frequency | | 50Hz/60Hz auto-adaptive | | | |
| Input voltage range (the type of 220V) | | (115~295)±5VAC (half load) (145~295)±5VAC(full load) | | | |
| Input voltage range (the type of 120V) | | (55~145) ±5VAC(60% LOAD); (65~145) ±5VAC(70% LOAD) (75~145) ±5VAC(80% LOAD); (85~145) ±5VAC(100% LOAD) | | | |
| Input frequency range | | 45-55Hz+/-0.5% | | 50Hz type | |
| | | 55-65Hz+/-0.5% | | 60Hz type | |
| Input current | 220V | 8A max | 12A max | 15A max | 23A max |
| | 120V | 14A max | 21A max | 27A max | 40A max |
| PFC | | ≥0.98 | | | |

| | | | | | | | | |
|-----------------------------------|------------|---|-----------|-----------|-----------|-----------|-----------|----------|
| THDI | | < 6% | | | | | | |
| Bypass voltage range | 220V | Rated output voltage -34V ~ Rated output voltage +32V | | | | | | |
| | 120V | (95~135) ±5VAC | | | | | | |
| Output | | | | | | | | |
| Output voltage | 220V | 208VAC /210VAC/220VAC/230VAC/240VAC Setting available | | | | | | |
| | 120V | 100/110/115/120/127VAC Setting available | | | | | | |
| Output PF | | 0.8/0.9 | 0.8/0.9 | 0.8/0.9 | 0.8/0.9 | | | |
| Output power(Watt) | | 800/900 | 1200/1350 | 1600/1800 | 2400/2700 | | | |
| Inverter overload capability | | 105%~150%: transfer to bypass mode after 30s giving alarm; > 150% : transfer to bypass mode after 300ms giving alarm; | | | | | | |
| Voltage accuracy | | ±0.2 | | | | | | |
| Load crest | | 3:1 | | | | | | |
| From AC mode to BAT mode | | 0ms(transfer time) | | | | | | |
| From BAT mode to AC mode | | 0ms(transfer time) | | | | | | |
| Efficiency | Mains mode | ≥90 % (full load) | | | | | | |
| | BAT mode | 87% | | | | | | |
| | ECO mode | 98% | | | | | | |
| Output frequency | | | | | | | | |
| Under Mains mode | | Same as input frequency | | | | | | |
| Under battery mode | | (50/60±0.2)Hz | | | | | | |
| Phase-locked rate | | ≤1Hz/s | | | | | | |
| Total voltage harmonic distortion | | Full linear load< 3%; Full nonlinear load< 5% | | | | | | |
| Battery | | | | | | | | |
| Battery type | | Sealed lead acid maintenance free battery | | | | | | |
| Quantity | | 2 | 3 | 4 | 4 | 6 | 6 | 8 |
| DC voltage | | 24V | 36V | 48V | 48V | 72V | 72V | 96V |
| Inbuilt battery | | 9AH/12V | 7AH/12V | 9AH/12V | 9AH/12V | 7AH/12V | 9AH/12V | 7AH/12V |
| Output voltage | | 27.1±0.4V | 40.6±0.5V | 54.2±0.6V | 54.2±0.6V | 81.3±0.9V | 81.3±0.9V | 108.4±1V |
| Back up time | | Based on battery capacity | | | | | | |
| Charge method | | Three-stage charging | | | | | | |
| Charge current | | Standard model:1A | | | | | | |
| | | Long time model: 6A | | | | | | |
| System Control and Communication | | | | | | | | |
| Function | | Silence; cold start; AC restart; Auto restart. | | | | | | |
| Protection | | Over-temp protection; Fan testing protection; AC L and N reversely connecting protection; Output short circuit protection | | | | | | |
| Communication port | | RS232; SNMP card; USB | | | | | | |
| Software function | | Graphics analyze; Switch on/off UPS system; Monitor UPS working status; History record and event log | | | | | | |
| Display | | LCD/LED | | | | | | |

Appendix 4: Specification Sheet (6-10KVA)

| | | |
|----------------|------|-------|
| Rated Capacity | 6KVA | 10KVA |
|----------------|------|-------|

| Input | | | | |
|-----------------------------------|------------|--|---|---|
| Rated input voltage | | 220V | | |
| Rated input frequency | | 50Hz/60Hz auto-adaptive | | |
| Input voltage range | | (115~295)±5VAC (half load); (145~295)±5VAC(full load) | | |
| Input frequency range | | 45-55Hz+/-0.5% | | 50Hz type |
| | | 55-65Hz+/-0.5% | | 60Hz type |
| Input current | | 46A max | 76A max | |
| PFC | | ≥0.99 | | |
| THDI | | < 5% | | |
| Bypass voltage range | | Rated output voltage -34V ~ Rated output voltage +32V | | |
| Output | | | | |
| Output voltage | 220V | 208VAC /210VAC/220VAC/230VAC/240VAC Setting available | | |
| | 120V | 100/110/115/120VAC Setting available | | |
| Output PF | | 0.8 | 0.9 | 0.8 0.9 |
| Output power(Watt) | | 4800 | 5400 | 8000 9000 |
| Inverter overload capability | | 105%~125%: 10 mins; 125%~150%: 30 secs; > 150%: 100ms; | 105%~125%: 3 mins; 125%~150%: 30 secs; > 150%: 100ms; | 105%~125%: 10 mins; 125%~150%: 30 secs; > 150%: 100ms; 105%~125%: 3 mins; 125%~150%: 30 secs; > 150%: 100ms; |
| Voltage accuracy | | ±0.2 | | |
| Load crest | | 3:1 | | |
| From AC mode to BAT mode | | 0ms(transfer time) | | |
| From BAT mode to AC mode | | 0ms(transfer time) | | |
| Efficiency | Mains mode | ≥92% (full load) | | |
| | BAT mode | 90% | | |
| | ECO mode | 98% | | |
| Output frequency | | | | |
| Under Mains mode | | Same as input frequency | | |
| Under battery mode | | (50/60±0.2)Hz | | |
| Phase-locked rate | | ≤1Hz/s | | |
| Total voltage harmonic distortion | | Full linear load< 3%; Full nonlinear load< 5% | | |
| Battery | | | | |
| Battery type | | Sealed lead acid maintenance free battery | | |
| Quantity | | 14/16 | | |
| DC voltage | | 168V/192V | | |
| Output voltage | | 189.7±1V/216.8±1V | | |
| Inbuilt battery | | 9AH/12V | | |
| Charge method | | Three-stage charging | | |
| Back up time | | Based on battery capacity | | |
| Charge current | | Standard model:1A | | |
| | | Long time model: 1A /3A /5A /8A | | |
| System Control and Communication | | | | |
| Function | | Silence; cold start; AC restart; Auto restart. | | |
| Protection | | Over-temp protection; Fan testing protection; AC L and N reversely connecting protection; | | |

| | |
|--------------------|--|
| | Output short circuit protection |
| Communication port | RS232; SNMP card; USB |
| Software function | Graphics analyze; Switch on/off UPS system; Monitor UPS working status; History record and event log |
| Display | LCD/LED |

Appendix 5: Physical (The type of 220V)

| Rated Capacity | | 1KVA | | 1.5KVA | 2KVA | | 3KVA | |
|---------------------|----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Quantity of Battery | | 2 | 3 | 4 | 4 | 6 | 6 | 8 |
| Dimension (W*D*H) | | 144*357*215 | 144*410*215 | 190*452*341 | 190*452*341 | 190*470*341 | 190*452*341 | 190*470*341 |
| Weight (Kg) | Long | 6 | 6 | 10 | 12 | 12 | 12.5 | 12.5 |
| | Standard | 10 | 13.5 | 18 | 20 | 25 | 24 | 29 |

| Rated Capacity | | 6KVA | 6KVA-Isolated | 10KVA | 10KVA-Isolated |
|-----------------------------------|----------|-------------|---------------|-------------|----------------|
| Containing isolation transformers | | No | Yes | No | Yes |
| Dimension (W*D*H) | Long | 262*514*455 | 262*650*735 | 262*514*455 | 262*650*735 |
| | Standard | 262*514*735 | 262*650*735 | 262*514*735 | 262*650*735 |
| Weight (Kg) | Long | 26 | 47 | 26 | 47 |
| | Standard | 67 | 80 | 67 | 80 |

Appendix 6: Physical (The type of 120V)

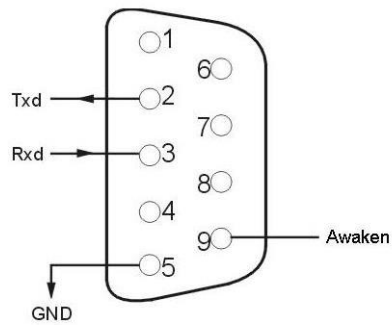
| Rated Capacity | | 1KVA | 1.5KVA | 2KVA | 3KVA |
|-------------------|----------|-------------|-------------|------|------|
| Dimension (W*D*H) | Long | 144*357*215 | 190*452*341 | | |
| | Standard | 144*357*215 | 190*452*341 | | |
| Weight (Kg) | Long | 6 | 12 | 12 | 13 |
| | Standard | 11 | 22 | 22 | 28 |

Appendix 7: Communication port

- Communicating port for PC

At the rear panel of this model, there is one DB9 port, which provides several signals as follows:

| Foot | Explanation | Foot | Explanation |
|------|-------------|------|-------------|
| 1 | empty | 6 | empty |
| 2 | Send | 7 | empty |
| 3 | receive | 8 | empty |
| 4 | empty | 9 | awaken |
| 5 | GND | | |



Communicating port for PC

- TCP/IP

This series UPS can supply one Intelligent Slot at the rear panel, which was compatible with most of the software and hardware on the network, such as running HP open view, IBM net view, SUN net manager and other operation system. UPS is with function login on internet, which can supply information of UPS status and input power, and even possible to control UPS via net management system.

For more information, please turn to local supplier or distributor.