

# MSN06-10

Single Phase UPS  
Frequency converter



## Contents

|                                                                |           |
|----------------------------------------------------------------|-----------|
| <b>1. Safety .....</b>                                         | <b>3</b>  |
| 1.1 Safety.....                                                | 3         |
| 1.2 Symbol Description .....                                   | 3         |
| <b>2. Product Introduction .....</b>                           | <b>5</b>  |
| 2.1 The appearance of the product.....                         | 5         |
| 2.2 The principle of the product.....                          | 6         |
| 2.3 Product Category .....                                     | 6         |
| <b>3. Installation .....</b>                                   | <b>7</b>  |
| 3.1 Unpacking and inspection .....                             | 7         |
| 3.2 Installation note .....                                    | 7         |
| 3.3 UPS input and output connection.....                       | 8         |
| 3.4 Connection of the UPS communication Cables.....            | 8         |
| 3.5 Parallel card (Optional).....                              | 9         |
| 3.6 External battery connection (for extend model only) .....  | 10        |
| <b>4. Panel display, operation and running .....</b>           | <b>12</b> |
| 4.1 Start up and turn off UPS .....                            | 12        |
| 4.1.1 Start up operation.....                                  | 12        |
| 4.1.2 Turn off operation .....                                 | 12        |
| 4.2 Faceplate display .....                                    | 12        |
| 4.2.1 Faceplate display illumination .....                     | 12        |
| 4.2.2 LCD display .....                                        | 13        |
| 4.3 Parameters setting .....                                   | 16        |
| 4.3.1 Mode setting.....                                        | 16        |
| 4.3.2 Output voltage class setting.....                        | 16        |
| 4.3.3 Input/Output frequency class setting .....               | 17        |
| 4.3.4 Battery capacity setting .....                           | 17        |
| 4.3.5 Battery quantity setting .....                           | 18        |
| 4.3.6 Bypass Volt-HI setting .....                             | 18        |
| 4.3.7 Bypass Volt-Low setting.....                             | 19        |
| 4.3.8 Buzzer Mute Setting.....                                 | 19        |
| 4.3.9 Battery Test Setting .....                               | 20        |
| 4.3.10 Parallel ID setting .....                               | 21        |
| 4.3.11 Parallel quantity setting.....                          | 21        |
| 4.3.12 Parallel redundancy quantity setting .....              | 22        |
| 4.4 Display Messages/record .....                              | 23        |
| 4.4.1 Operational Status and Mode .....                        | 23        |
| 4.4.2 Modes and Alarm Information .....                        | 23        |
| <b>5. Maintenance .....</b>                                    | <b>24</b> |
| 5.1 Battery maintenance.....                                   | 24        |
| <b>6. Troubleshooting and performance of the product .....</b> | <b>25</b> |
| 6.1 Troubleshooting.....                                       | 25        |
| 6.2 Conformity .....                                           | 25        |
| 6.3 Product Performance .....                                  | 26        |
| <b>7. RS232 Communication port definition.....</b>             | <b>28</b> |

Thank you for purchasing this series UPS.

This series UPS is an intelligent, Single phase in Single phase out, high frequency online UPS designed by our R&D team who is with years of designing experiences on UPS. With excellent electrical performance, perfect intelligent monitoring and network functions, smart appearance, complying with EMC and safety standards, The UPS meets the world's advanced level.

Read this manual carefully before installation

This manual provides technical support to the operator of the equipment.

Note: Because of the continuous improvements, our products may differ somewhat from the contents included in this manual. You can contact local office to get the information when necessary.

## 1. SAFETY

This chapter mainly introduces the safety signs and security considerations of MISSION 6K/10K series high frequency online ups. Before any operation of equipment, you should read the content of this chapter carefully.

### 1.1 Safety

There exists dangerous voltage and high temperature inside the UPS. During the installation, operation and maintenance, please abide the local safety instructions and relative laws, otherwise it will result in personnel injury or equipment damage. Safety instructions in this manual act as a supplementary for the local safety instructions. Our company will not assume the liability that caused by disobeying safety instructions.

Our company will not assume the liability that caused by disobey of safety instructions. Please note the following:

1. Don't use the UPS when the actual load exceeds the rated load.
2. There are high-capacity batteries in the standard type UPS. You must not open the enclosure or it will lead to electric shock. If it needs internal maintenance or battery replacement, please send it to the designated site.
3. Internal short-circuit of the UPS will cause electric shock or fire. So don't place the containers equipped with liquid on the top of the UPS so as not to cause danger of electric shock and so on.
4. Don't put the UPS in a place with high temperature or humidity as well as the corrosive gas, much dust.
5. Keep good air circulation between in-vent on front panel and out-vent on back panel.
6. Avoid direct sunlight or near heat-dispersed objects.
7. In case that the smoke appears on the UPS, please cut off the power as soon as possible and contact the dealer service site.

### 1.2 Symbol Description

The safety symbols cited in this manual are shown in Fig. 1-1, which are used to inform readers of safety issues that should be obeyed when installation, operation and maintenance.

Fig.1-1 Symbol meanings

| Safety Symbol                                                                       | Indication                 |
|-------------------------------------------------------------------------------------|----------------------------|
|  | Attention                  |
|  | Static discharge sensitive |
|  | Electric shock             |

There are three levers of safety grade: Dangerous, Warning and Attention. The remark is on the right side of the safety symbol, the detailed comments are shown as following:



**Dangerous:** Indicate risk of serious injury or death or seriously damage of the equipment.



**Warning:** Indicate risk of serious injury or damage of the equipment.



**Attention:** Indicate risk of injury or damage of the equipment.

### Description of Commonly Used Symbols

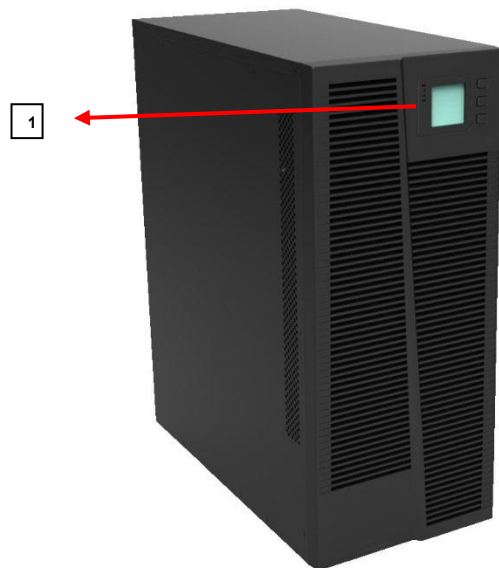
Some or all of the following symbols may be used in this manual. It is advisable to familiarize yourself with them and understand their meaning:

| Symbol and Explanation |                                    |        |                                    |
|------------------------|------------------------------------|--------|------------------------------------|
| Symbol                 | Explanation                        | Symbol | Explanation                        |
|                        | Alert you to pay special attention |        | Direct current source (DC)         |
|                        | Caution of high voltage            |        | Protective ground                  |
|                        | Turn on or turn off the UPS        |        | Recycle                            |
|                        | Alternating current source (AC)    |        | Do not dispose with ordinary trash |

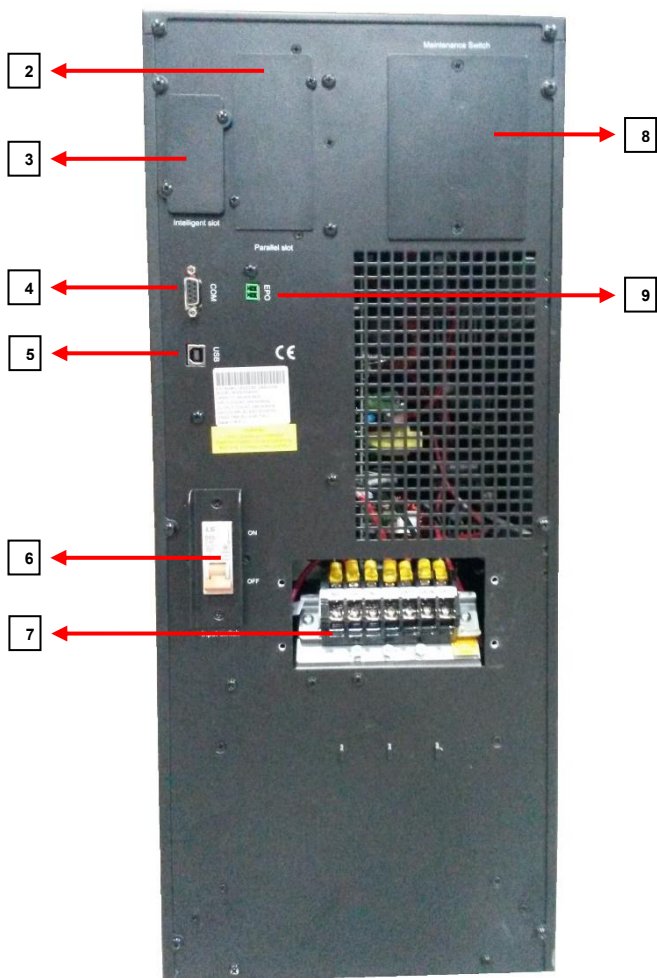
## 2. PRODUCT INTRODUCTION

### 2.1 The appearance of the product

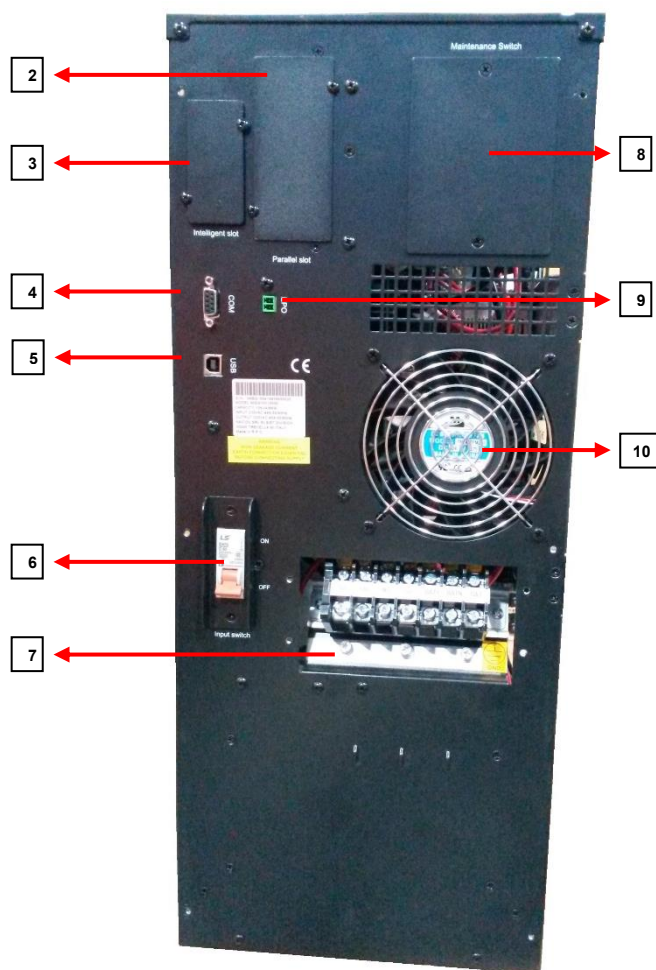
Frontal view



- 1) LCD Display
- 2) Slot for Parallel card (optional)
- 3) Slot for Relay / SNMP card (optional)
- 4) COM Port
- 5) USB Port
- 6) Input breaker
- 7) Terminal block (Input / Output / Batteries)
- 8) Manual Bypass
- 9) EPO Connector
- 10) Fan



6KVA - Rear Panel view



10KVA - Rear Panel view

## 2.2 The principle of the product

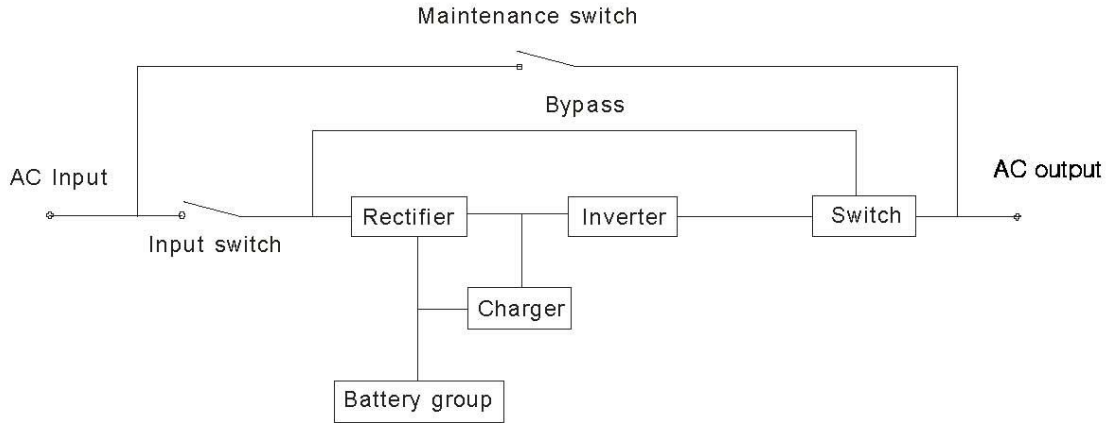


Fig. 2-1 UPS Principle Diagram

1. Input filter: Complete filtering the input AC utility power to provide the clean power for UPS.
2. AC/DC converter: Convert the filtered AC mains to DC and boost the DC for DC/AC inverter.
3. DC/DC booster: When the UPS works in battery mode, the circuit boosts the DC for DC/AC inverter.
4. DC/AC inverter: Convert the boosted DC to stable AC output.
5. Bypass: When overload or failure of inverting happen in the UPS, it transfers to bypass mode to supply power to loads.
6. Charger: Standard unit provides 1A; long backup unit provides 6A Max.
7. Battery: Sealed Lead Acid Battery.
8. Output filter: Complete filtering the output of the UPS to provide the clean power for loads.

## 2.3 Product Category

| UPS Type      |       | Remark                                |
|---------------|-------|---------------------------------------|
| Standard unit | 6KVA  | Internal 16~20PCS (12V/PCS) batteries |
|               | 10KVA | Internal 16~20PCS (12V/PCS) batteries |

### 3. INSTALLATION

#### 3.1 Unpacking and inspection

1. Unpacking the box and check the UPS. If damaged or some parts missing, don't start the machine and inform your supplier.
2. Check the box content (please consult Box Content Table).
3. Check if the UPS is that you wanted to purchase. You can verify it on the label on the rear panel of the UPS.

#### 3.2 Installation note

Put the UPS at flat place next to the equipment.

Keep UPS at least 20cm from wall or equipment or other object. Don't block the ventilation holes of the UPS front panel and bottom part, so as to keep the ventilation in good conditions to prevent the temperature inside becomes high.

Keep the UPS away from high temperature, water, flammable gas, corrosive gas, dust, direct sunlight or explosive. Don't leave the UPS outdoor.

Install a double-pole joined actuator with more than 40A/63A (6KVA/10KVA) at the input L-N, in order to cut off the power when in emergency situation.

PDU is required to connect to the UPS output so as to weaken the affect between loads.

In order to fix the UPS, please lock its wheels by shifting the sheet on each wheel.

RCD load like computer, linear load and small inductive load can be connected to the UPS. Please contact dealer if other types of loads are required to connect.

For the security of the users and equipments, please be sure to take correct power configuration.

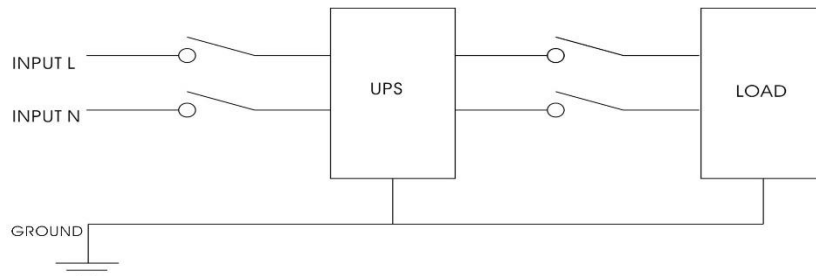


Fig.3-1 Correct power configuration

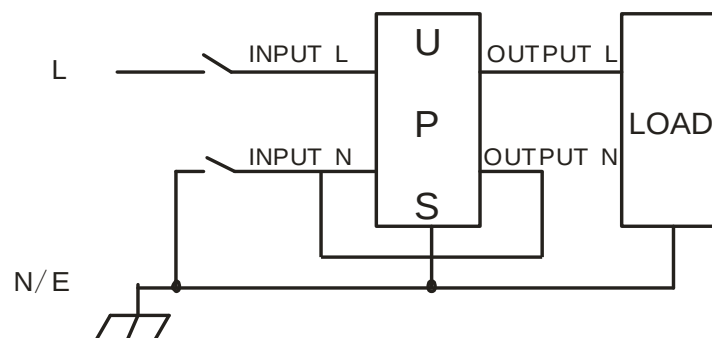


Fig.3-2 Wrong power configuration

### 3.3 UPS input and output connection

Minimum 6AWG copper wires are required for the 6KVA, and 10AWG for 10KVA, including input/output cables and battery cables.

- 1) Switch off all breakers before connecting cables.
- 2) Remove the cover of the terminals, refer to chapter 2.1, follow fig. 3-3 to connect the cables

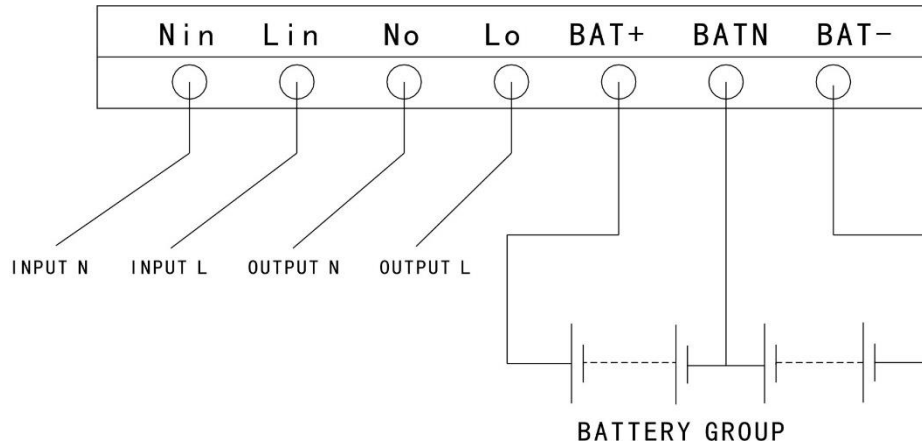


Fig.3-3 I/O terminals connection

#### CAUTION!

Connector are required so as to ensure the connections have a better clamping.

Don't reverse the input L and N.

Don't connect the UPS input to a wall outlet or the outlet will get burnt.

- 3) Connect the UPS output L, N, GND to L, N, GND of load via a PDU. Tighten the screws and shelter the terminals

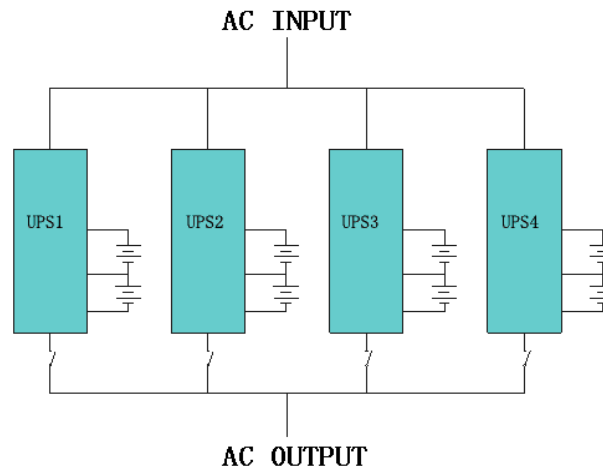
### 3.4 Connection of the UPS communication cables

- 1) USB cable provided in accessories can be used to connect the UPS with PC
- 2) Follow steps below to install SNMP (optional):
  - A. Remove the cover of SNMP slot at UPS rear panel and keep it for further use.
  - B. Insert the SNMP card and tighten the screws
  - C. Connect the UPS with internet by network cable.
  - D. Refer to the SNMP manual provided to do SNMP setting.

### 3.5 Parallel Card (Optional)

Parallel installation steps as below:

- 1) Loosen the screws in the parallel card slot and remove the cover, please keep the cover for future use.
- 2) Insert the parallel card into the slot and tighten the screws.
- 3) Connect the UPS with parallel cables.



- 4) Connect all the outputs of the parallel UPS to one patch board before connect to the loads. See the picture as follows.
- 5) Start one UPS in turn and set parameters through LCD: working mode: parallel mode; parallel ID: setting ID in sequence; total numbers in parallel: according to the actual numbers; parallel redundancy sets: setting when redundancy requirement (See the Manual Chapter 4.3.10; 4.3.11; 4.3.12 for more methods of parameter setting).
- 6) Start UPS at the same time or in turn, they will provide power supply to loads in parallel operation after finishing setting the ups. Additional, it can also be communicated and setted with PC through USB. See the steps as below.
  1. Start up the UPS one by one, connect USB to the computer, start up software and manual are included in the CD-ROM.
  2. Open the set up interface to set up relevant parameters as below:
    - Work mode, parallel operation;
    - Parallel ID: Set up the ID one by one;
    - Parallel amount: set the amount in parallel.
  3. After finishing setting up, the UPS can be started up at the same time or one by one. The UPS will work in parallel to supply power to the loads.



**NOTICE:** When the UPS in parallel, the input can be the same or different, but the output should be paralleled to one patch board.

### 3.6 External battery connection (for extend model only)

- 1) Make sure battery quantity complies with the specs (16/18/20 pieces of 12V battery in parallel). Measure the voltage of battery bank after finishing connection and the battery voltage should be around 192/216/240Vdc.



#### NOTICE:

1. Don't mix batteries with different capacity, manufacturers and don't mix brand new and old batteries, either.
  2. The standard setting of the battery is 16 pcs and battery capacity is 65AH (charge current is 6A). When connecting with 18 pcs or 20 pcs battery, please start up the UPS under AC mode, connect to the computer to set up battery number and capacity, the UPS will follow battery capacity to distribute charge current automatically (Max charge current is 6A)
- 2) The breaker on battery cabinet should be off.
  - 3) Remove the cover of terminals. Pay attention! DC voltage is always present on the battery terminals of UPS.
  - 4) Connect batteries following this procedure step by step (don't reverse battery connection):
    - A) positive pole UPS side to positive pole Battery Cabinet side (BAT+)
    - B) common pole UPS side to common pole Battery Cabinet side (BAT N)
    - C) negative pole UPS side to negative pole Battery Cabinet side (BAT-)

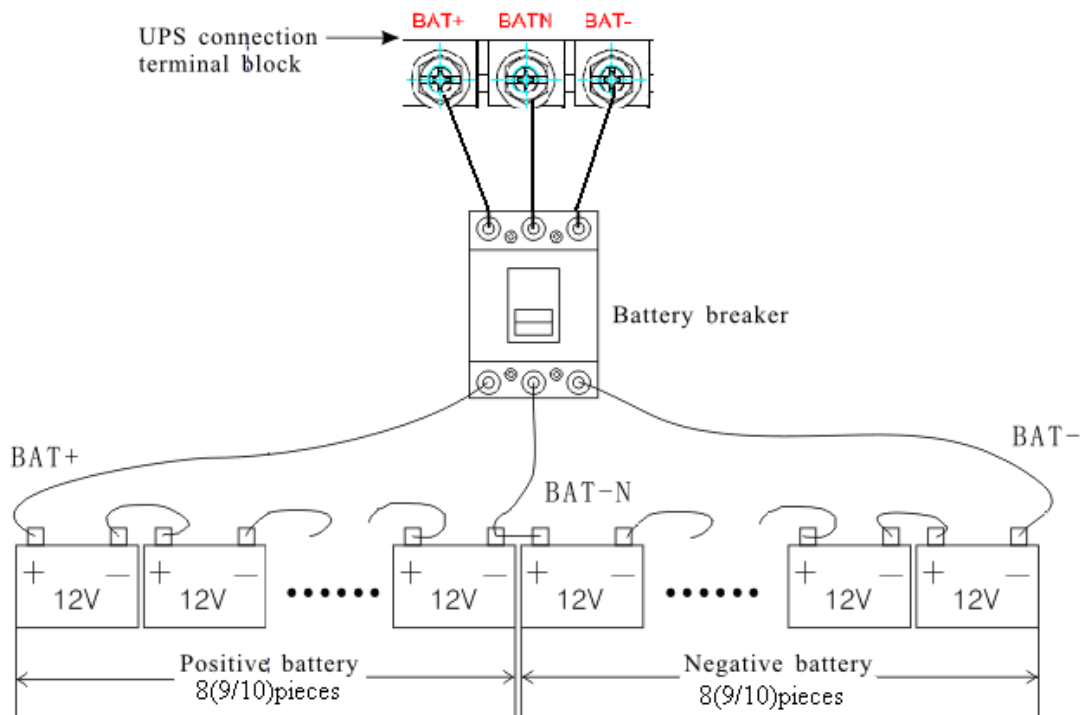


Fig.3-4 External battery connection



**Warning:**

- ★ Before installing battery, make sure that the UPS and breaker are all turned off. Remove all your metallic adornment such as finger ring, watch, and so on before connecting battery.
- ★ No anti-connection or short circuit between the battery anode and cathode forever. Red cable connect with battery anode “+” and black cable connect with cathode “-”.
- ★ Please use the screwdriver with insulating handle. Do not lay the tools or metallic goods on the battery.



**Notice:**

- ★ When using the external battery, It is best to use external battery cable which matches with the equipment.
- ★ When connecting load to UPS, first turn off load and then connect the power cable and finally turn on load one-by-one.
- ★ Inductance loads such as motor, fluorescent lamp, photocopier are strictly prohibited connecting to UPS to avoid damage.
- ★ Plug UPS on the special socket with over-current protection, the power socket that used should be connected with ground wire.
- ★ UPS is likely to have output voltage no matter whether the power input cable is plugged in mains input socket. If you wish UPS have no output, first break off the switch and then cancel the mains.
- ★ When connect laser printer, select the capacity of UPS according to the UPS start power because the startup power is higher.

## 4. PANEL DISPLAY, OPERATION AND RUNNING

The operation is simple, operators only need to read the manual and follow the operation instructions listed in this manual, no need any special training.

### 4.1 Start up and turn off UPS

#### 4.1.1 Start up operation

- 1、Turn on the UPS with Main present.

Once AC Power Cord is plugged in, close the Input Switch on the rear panel, the UPS will start automatically and the LCD display of the UPS will be lit on. You may view the data and set parameters on the LCD display as well as the LED display showing the status of the UPS.

- 2、Turn on the UPS with battery. (Main not present)

Close the Input Switch on the rear panel, press “On” on the front panel to start the UPS and in the meantime, the LCD display will light up. You may view the data and set parameters on the LCD display and the LED display of the UPS will show the latest status of the UPS.

#### 4.1.2 Turn off operation

- 1、Turn off the UPS with Main present

- a) Press and hold the OFF key for 2 seconds to turn off the inverter, the UPS is in Bypass mode now.
- b) To shut down (turn off) the UPS completely, you need to open the input switch.

- 2、Turn off the UPS with connecting batteries (main not present)

- a) Press and hold the OFF key for 2 seconds to turn off the UPS.
- b) After UPS is turned off, all LED and LCD will be extinguished and there is no output.

Remarks: When the UPS is turned off from the inverter mode, it will discharge DC Bus to 80V, then shut down completely; therefore, sometimes, it takes more several seconds to complete.

### 4.2 Faceplate display

#### 4.2.1 Faceplate display illumination

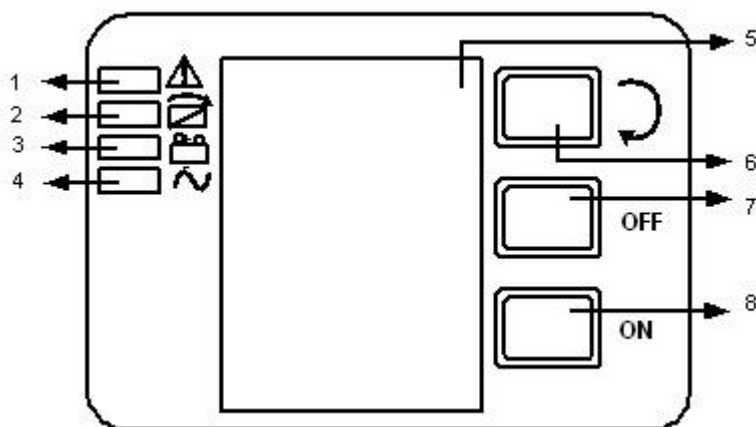


Fig.4-1 Overview of the operating panel of the UPS

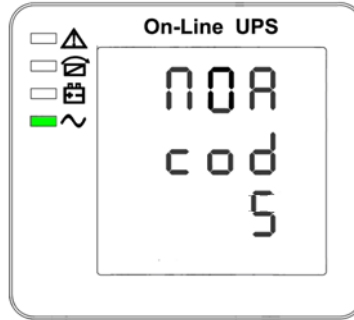
- (1) ALARM LED
- (2) BYPASS LED
- (3) BATTERY LED
- (4) INVERTER LED
- (5) LCD display
- (6) Scroll button: enter to next item
- (7) OFF button
- (8) ON button

#### 4.2.2 LCD display

NOTICE! The display provides more functions than those described in this manual. There are 10 interfaces available in the LCD display:

| ITEM | Interface Description    | Content Displayed                                |
|------|--------------------------|--------------------------------------------------|
| 01   | Input                    | Voltage & Frequency                              |
| 02   | Bat. +                   | Voltage & Current                                |
| 03   | Bat. -                   | Voltage & Current                                |
| 04   | Output                   | Voltage & Frequency                              |
| 05   | Load                     | Load                                             |
| 06   | Temperature              | PFC/Internal temperature and ambient temperature |
| 07   | CODE                     | Alarm Code(Warning Message)                      |
| 08   | Software version & model | DSP version of inverter software, model          |
| 09   | Bus voltage              | Bus voltage $\pm$                                |
| 10   | CODE                     | Operational Status and Mode                      |

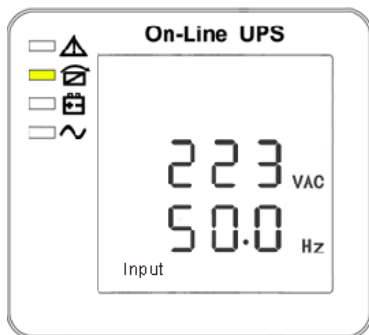
1. When the UPS is connecting with the Utility or Battery at cold start mode, it shows as drawing below:



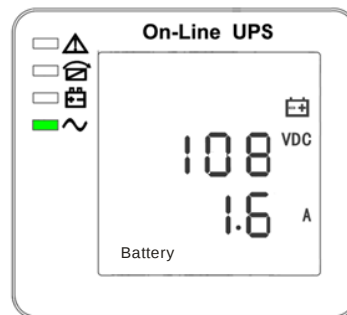
(1) Operational Status and mode

1) Operational Status and mode When the UPS at single mode, it shows “NOA” or “ECO”, but If the UPS at parallel mode, it shows “PAL” instead.

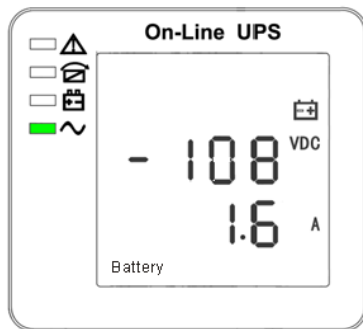
- 2) Press “scroll” button, the UPS goes to next page as shown below.



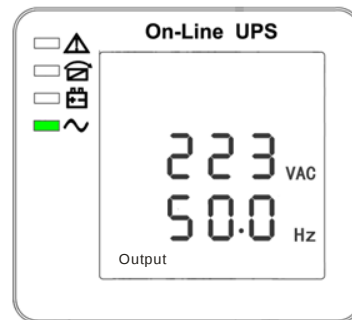
(2) Input voltage



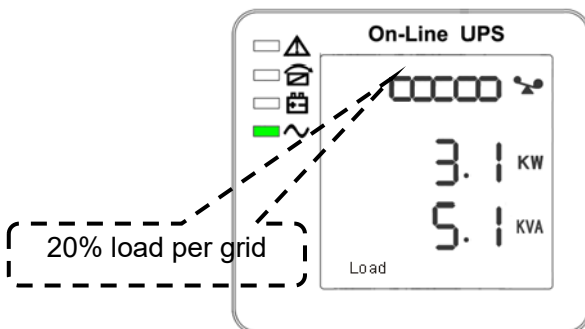
(3) Bat + voltage (Positive)



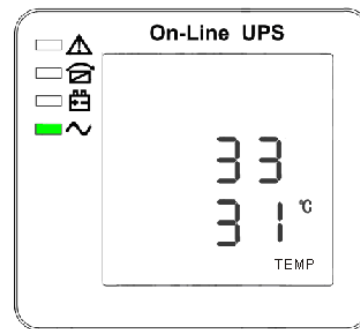
(4) Bat – voltage (Negative)



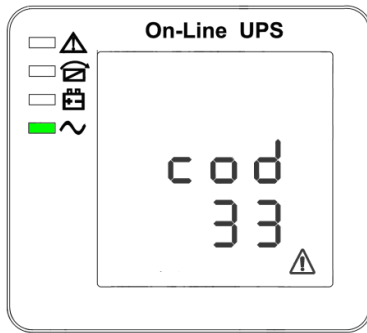
(5) Output voltage



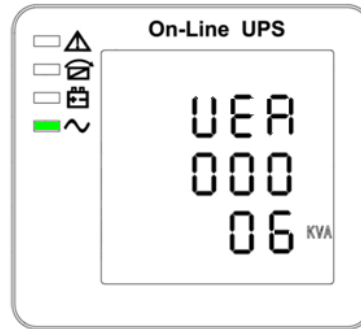
(6) Load



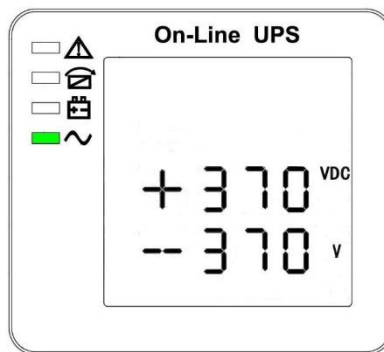
(7) PFC/ Ambient temperature up,  
only shows the high temperature  
Internal temperature (down)



( 8 ) Alarm Code

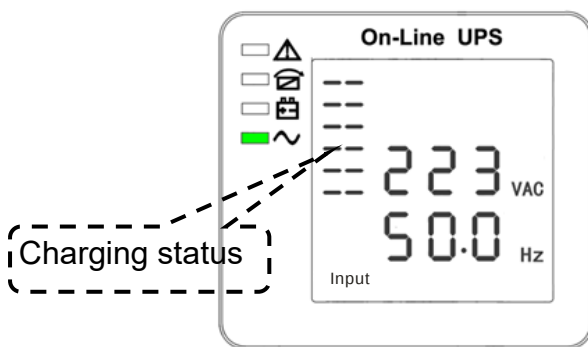


(9) Software version & model

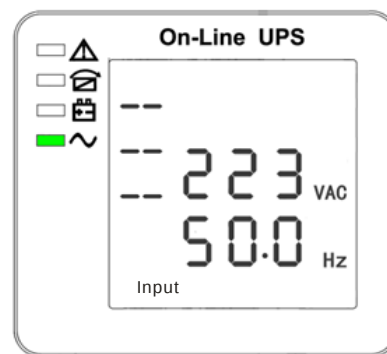


( 10 ) Bus voltage

1. If some of above interfaces have battery charging, it will display the charging information at the same time as shown below.



Boost



Floating

2. Pressing "scroll" button, you may circulate all messages from the first one to the last one then returns back to the first one and vice versa.
3. All alarm codes are present when abnormal behaviour (s) occur (s).

The display value of the above parameter will update within 0.2s.

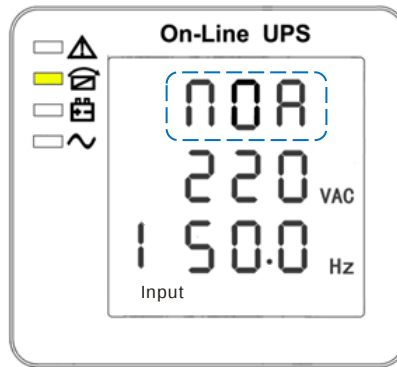
### 4.3 Parameters setting

The setting function is controlled by 3 buttons (Enter ◀, Off ▲, On ▼): Enter ◀---goes into the setting page and value adjustment; Off ▲ & On ▼---for choosing different pages.

After the UPS turn ON, press buttons ◀ & ▲ for 3 seconds and then goes into the setting interface page. After finishing setting the parameter, press "ON" until exiting out of the current interface.

Note: Figure at left corner is the page number of the setting pages. After entering the setting interface, it will exit when without operation in 30s.

#### 4.3.1 Mode setting

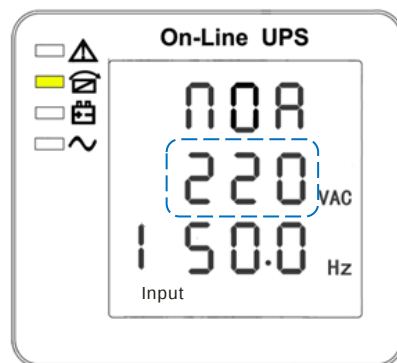


Mode setting (Note: Inside the broken-line is the flashing part.)

After entering the setting menu, it's mode setting defaulted, and the mode setting line flashing as in above picture.

- Use button Enter ◀ to choose different mode. There are 4 different modes for setting: ECO, PAL, NOR, CF.
- Press ▲ or ▼ to exit the mode setting (save the mode setting), and goes to output voltage setting or parallel redundancy quantity setting.

#### 4.3.2 Output voltage class setting



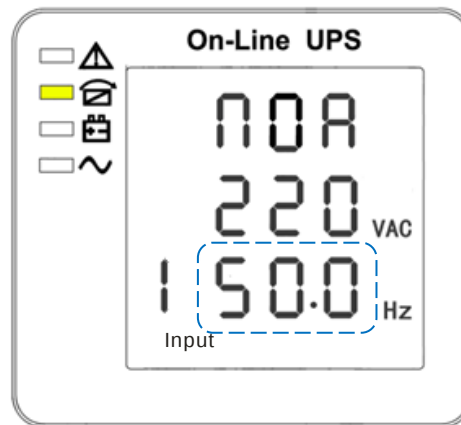
Output voltage setting (Note: Inside the broken-line is the flashing part.)

When under the mode setting press On ▼ or when under frequency setting press Off ▲, it goes to the output voltage setting. The output voltage line flashes as in above picture.

- Use button Enter ◀ to choose the different output voltage. There are 3 different voltages---220, 230, 240.
- Press ▲ or ▼ to exit the output voltage setting (save the output voltage setting) and goes to mode setting or frequency setting.

NOTE: When powered by inverter, it is necessary to turn off the inverter before setting voltage and frequency level.

#### 4.3.3 Input/Output frequency class setting

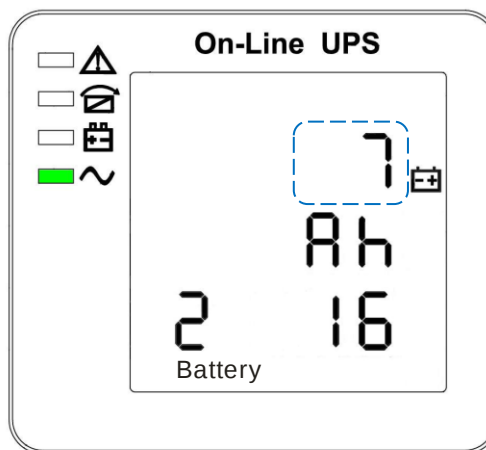


Frequency setting (Note: Inside the broken-line is the flashing part.)

When under the output voltage setting press On ▼ or when under battery capacity setting press Off ▲, it goes to the frequency setting. The frequency line flashes as in above picture. There are 2 different frequency: 50/60Hz. Note: it is necessary to turn off the inverter before setting voltage and frequency level.

1. Press OFF to turn off the Inverter.
2. Press ENTER and OFF at the same time, NOR starts to flash.
3. Press ENTER button until CF will shows on the display.
4. Press ON button to move on frequency field then press ENTER button to choose the frequency. After that press ON button to exit the menu.
5. Turn off Input main and wait until the UPS turn off.
6. Turn on the Ups and the setting will be present.

#### 4.3.4 Battery capacity setting

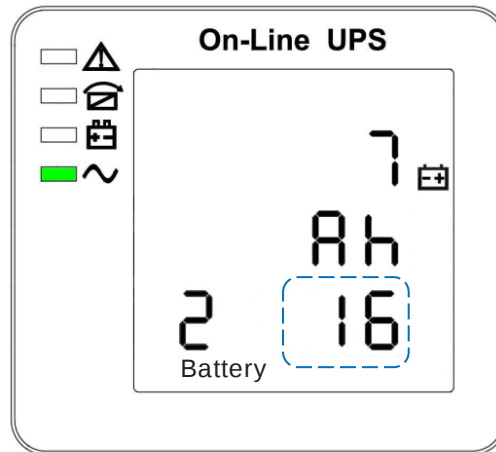


Battery capacity setting (Note: Inside the broken-line is the flashing part.)

When under the frequency setting press On ▼ or when under battery quantity setting press Off ▲, it goes to the battery capacity setting. The battery capacity line flashes as in above picture.

- Use button Enter ⏵ to choose the different battery capacity. Battery capacity range is 1-200Ah. (Note: long-press of Enter ⏵ can adjustment battery capacity quickly.)
- Press ▲ or ▼ to exit the battery capacity setting (save the capacity setting) and goes to frequency setting or battery quantity setting.

#### 4.3.5 Battery quantity setting

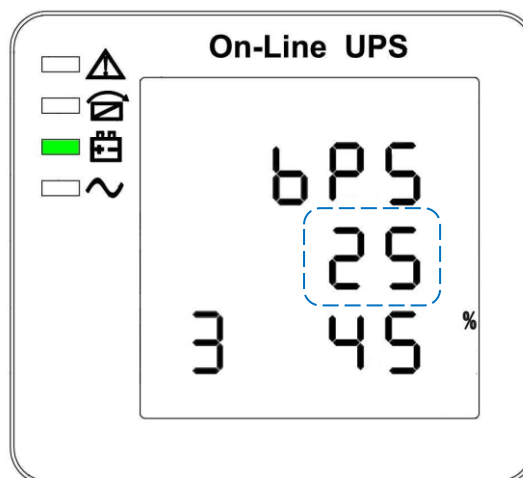


Battery quantity setting (Note: Inside the broken-line is the flashing part.)

When under the battery capacity setting press On▼ or when under bypass voltage upper limit setting press Off▲, it goes to the battery quantity setting. The battery quantity line flashes as in above picture.

- Use button Enter↵ to choose the different battery quantity. Battery quantity range is 16、18、20.
- Press▲ or ▼ to exit the battery quantity setting (save the battery quantity setting) and goes to battery capacity setting or bypass voltage upper limit setting.

#### 4.3.6 Bypass Volt-Hi setting

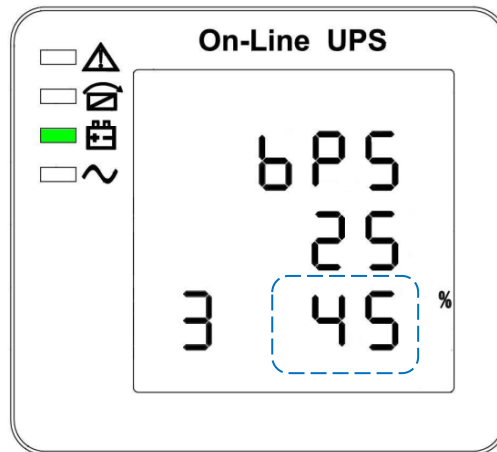


Bypass voltage upper limit setting (Note: Inside the broken-line is the flashing part.)

When under the battery quantity setting press On▼ or when under bypass voltage lower setting press Off▲, it goes to the bypass upper limit setting. The bypass upper limit line flashes as in above picture.

- Use button Enter↵ to set the different bypass voltage upper limit. The bypass voltage upper limit range is 5%,10%,15%,25%(25% only for 220V output).
- Press▲ or ▼ to exit the bypass voltage upper limit setting (save the bypass voltage upper limit setting) and goes to battery quantity setting or bypass voltage lower limit setting.

#### 4.3.7 Bypass Volt-Low setting

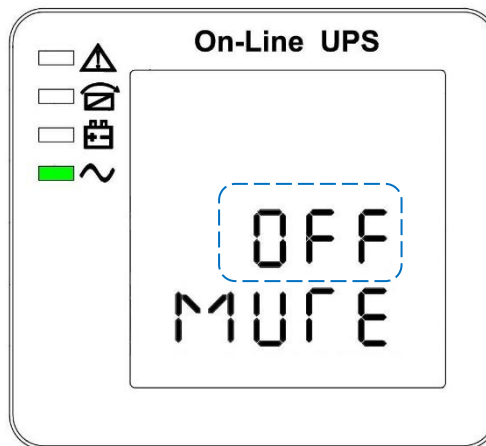


Bypass voltage lower limit setting (Note: Inside the broken-line is the flashing part.)

When under the bypass voltage upper limit setting press On ▼ or when under parallel ID setting press Off ▲, it goes to the bypass lower limit setting. The bypass lower limit line flashes as in above picture. (“-” for negative, positive does not have any symbol.)

- Use button Enter ( to set the different bypass voltage lower limit. The bypass voltage lower limit range is 20%,30%,45%.
- Press ▲ or ▼ to exit the bypass voltage lower limit setting (save the bypass voltage lower limit setting) and goes to bypass upper limit setting or parallel ID setting.

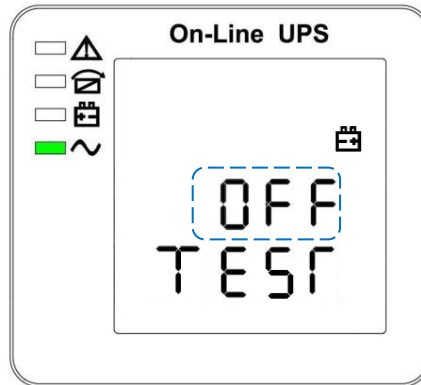
#### 4.3.8 Buzzer Mute Setting



Buzzers mute setting (Note: flashing part in dashed box)

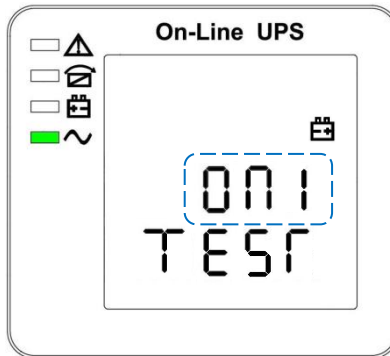
Press ON under bypass voltage lower limit setting or press OFF under the parallel ID setting can enter the buzzer setting. Now the setting status is flashing as the Figure 14 shows (note: on=mute; off= no mute). When press, it shows the mute cycle setting, the selection includes ON and OFF. ( Press the up button or down button can exit the mute setting (save the mute setting status) and switch to bypass voltage lower limit setting or parallel ID setting (note: when in stand-alone mode, press down button to exit and save the settings, then the settings is completed for stand-alone unit).

#### 4.3.9 Battery Test Setting

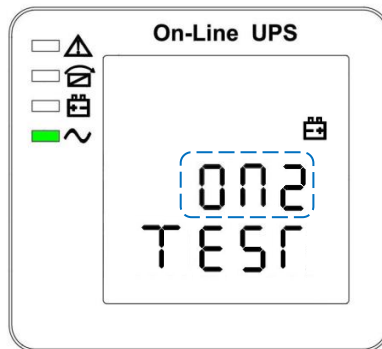


Battery self-test setting

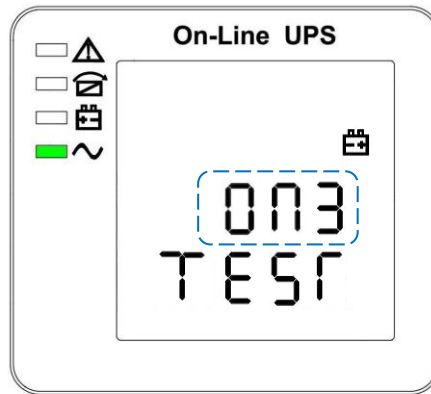
This page is the introduction to the Battery self-test setting. The default Settings is “OFF” when the UPS has no need of the battery self-test function. When turn to “ON”, batteries can do the self-test automatically per 30 days. Three kinds of Battery Self-test Time can be chose as below.



When choosing On1, UPS can transfer to Battery Mode automatically per 30 days. And the Battery Self-test Time is 10 seconds.

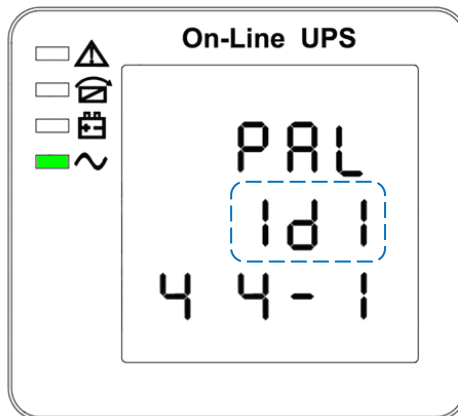


When choosing On2, UPS can transfer to Battery Mode automatically per 30 days. And the Battery Self-test Time is 10 minutes.



When choosing On3, UPS can transfer to Battery Mode automatically per 30 days. And the Battery Self-test Time is EOD.

#### 4.3.10 Parallel ID setting



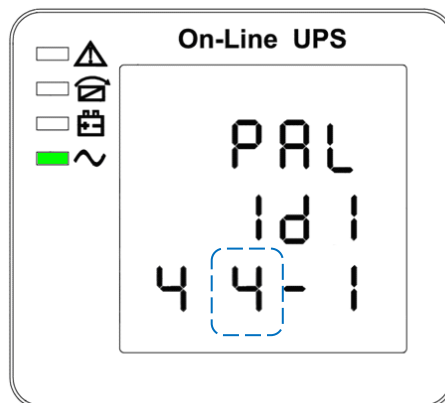
Parallel ID setting (Note: Inside the broken-line is the flashing part.)

When under the bypass voltage lower limit setting press On ▼ or when under parallel quantity setting press Off ▲, it goes to the parallel ID setting. The parallel ID flashes as in above picture.

- Use button Enter ↵ to set the different parallel ID. The parallel ID range is 1~4.
- Press ▲ or ▼ to exit the parallel ID setting (save the parallel ID setting) and goes to bypass lower limit setting or parallel quantity setting.

NOTICE! Parallel cable cannot be connected when setting the parallel parameters.

#### 4.3.11 Parallel quantity setting

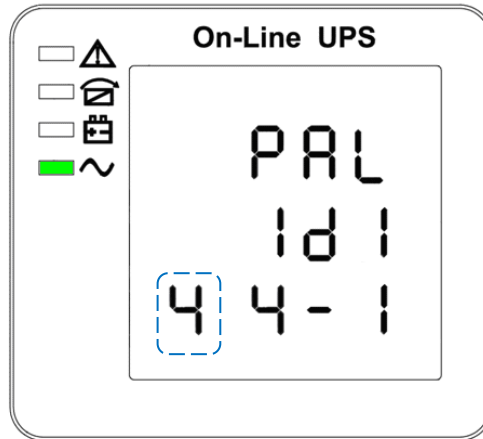


Parallel quantity setting (Note: Inside the broken-line is the flashing part.)

When under the parallel ID setting press On ▼ or when under parallel redundancy quantity setting press Off ▲, it goes to the parallel quantity setting. The parallel quantity flashes as in above picture.

- Use button Enter↵ to set the parallel quantity. The parallel quantity range is 2~4.
- Press ▲ or ▼ to exit the parallel quantity setting (save the parallel quantity setting) and goes to parallel ID setting or parallel redundancy quantity setting.

#### 4.3.12 Parallel redundancy quantity setting



Parallel redundancy quantity setting (Note: Inside the broken-line is the flashing part.)

When under the parallel quantity setting press On ▼, it goes to the parallel redundancy quantity setting. The parallel redundancy quantity flashes as in above picture.

- Use button Enter↵ to set the parallel redundancy quantity. The parallel redundancy quantity range is 0~1
- Press ▲ to go to parallel quantity setting, or ▼ to exit the mode setting. Then UPS LCD panel setting is accomplished.

## 4.4 DISPLAY MESSAGES/ RECORDS

This section lists the event and alarm messages that the UPS might display. The messages are listed in alphabetical order. This section is listed with each alarm message to help you troubleshoot problems .

### 4.4.1 Operational Status and Mode

| Item | Content Displayed       | LED   |        |         |          |
|------|-------------------------|-------|--------|---------|----------|
|      |                         | Fault | Bypass | Battery | Inverter |
| 1    | Initialized             | OFF   | OFF    | OFF     | OFF      |
| 2    | Standby Mode            | OFF   | OFF    | X       | OFF      |
| 3    | No Output               | OFF   | OFF    | X       | OFF      |
| 4    | Bypass Mode             | OFF   | ON     | X       | OFF      |
| 5    | Utility Mode            | OFF   | OFF    | X       | ON       |
| 6    | Battery Mode            | OFF   | OFF    | ON      | OFF      |
| 7    | Battery Self-diagnostic | OFF   | OFF    | ON      | OFF      |
| 8    | Inverter is starting up | OFF   | X      | X       | OFF      |
| 9    | ECO Mode                | OFF   | X      | X       | X        |
| 10   | EPO Mode                | ON    | OFF    | X       | OFF      |
| 11   | Maintenance Bypass Mode | OFF   | OFF    | OFF     | OFF      |
| 12   | Fault Mode              | ON    | X      | X       | X        |

**Note:** “X” shows that it will determined by other conditions.

### 4.4.2 Modes and Alarm Information

| Item | UPS Alarm Warning                                    | Buzz              | LED           |
|------|------------------------------------------------------|-------------------|---------------|
| 1    | Rectifier Fault                                      | Beep continuously | Fault LED lit |
| 2    | Inverter fault(Including Inverter bridge is shorted) | Beep continuously | Fault LED lit |
| 3    | Inverter Thyristor short                             | Beep continuously | Fault LED lit |
| 4    | Inverter Thyristor broken                            | Beep continuously | Fault LED lit |
| 5    | Bypass Thyristor short                               | Beep continuously | Fault LED lit |
| 6    | Bypass Thyristor broken                              | Beep continuously | Fault LED lit |
| 7    | Fuse broken                                          | Beep continuously | Fault LED lit |
| 8    | Parallel relay fault                                 | Beep continuously | Fault LED lit |
| 9    | Fan fault                                            | Beep continuously | Fault LED lit |
| 10   | Reserve                                              | Beep continuously | Fault LED lit |
| 11   | Auxiliary power fault                                | Beep continuously | Fault LED lit |
| 12   | Initialization fault                                 | Beep continuously | Fault LED lit |
| 13   | P-Battery Charger fault                              | Beep continuously | Fault LED lit |
| 14   | N-Battery Charger fault                              | Beep continuously | Fault LED lit |
| 15   | DC Bus over voltage                                  | Beep continuously | Fault LED lit |
| 16   | DC Bus below voltage                                 | Beep continuously | Fault LED lit |
| 17   | DC bus unbalance                                     | Beep continuously | Fault LED lit |
| 18   | Soft start failed                                    | Beep continuously | Fault LED lit |
| 19   | Rectifier Over Temperature                           | Twice per second  | Fault LED lit |
| 20   | Inverter Over temperature                            | Twice per second  | Fault LED lit |
| 21   | Reserve                                              | Twice per second  | Fault LED lit |
| 22   | Battery reverse                                      | Twice per second  | Fault LED lit |

| Item | UPS Alarm Warning            | Buzz               | LED                 |
|------|------------------------------|--------------------|---------------------|
| 23   | Cable connection error       | Twice per second   | Fault LED lit       |
| 24   | CAN comm. Fault              | Twice per second   | Fault LED lit       |
| 25   | Parallel load sharing fault  | Twice per second   | Fault LED lit       |
| 26   | Battery over voltage         | Once per second    | Fault LED blinking  |
| 27   | Mains Site Wiring Fault      | Once per second    | Fault LED blinking  |
| 28   | Bypass Site Wiring Fault     | Once per second    | Fault LED blinking  |
| 29   | Output Short-circuit         | Once per second    | Fault LED blinking  |
| 30   | Rectifier over current       | Once per second    | Fault LED blinking  |
| 31   | Bypass over current          | Once per second    | BPS LED blinking    |
| 32   | Overload                     | Once per second    | INV or BPS blinking |
| 33   | No battery                   | Once per second    | BATTERY blinking    |
| 34   | Battery under voltage        | Once per second    | BATTERY blinking    |
| 35   | Battery low pre-warning      | Once per second    | BATTERY blinking    |
| 36   | Internal Communication Error | Once per second    | Bypass LED lit      |
| 37   | DC component over limit.     | Once per 2 seconds | INV blinking        |
| 38   | Parallel Overload            | Once per 2 seconds | INV blinking        |
| 39   | Mains volt. Abnormal         | Once per 2 seconds | BATTERY LED lit     |
| 40   | Mains freq. abnormal         | Once per 2 seconds | BATTERY LED lit     |
| 41   | Bypass Not Available         |                    | BPS blinking        |
| 42   | Bypass unable to trace       |                    | BPS blinking        |
| 43   | Inverter on invalid          |                    |                     |



## NOTICE:

The following process must be performed if UPS is connected with generator:

- First turn on generator, after it runs stably connect output power of generator to UPS input terminal, then turn on UPS. After UPS turned on, please connect load one-by-one.
- It is recommended that the generator capacity is as twice as UPS rated capacity.

## 5. MAINTENANCE

UPS use in the appropriate environment (see 3.2 installation note) can be free maintenance or less maintenance.

### 5.1 Battery maintenance

1. It is recommended that the batteries are manually charged or discharged

Once every three or four months if the UPS has not been used for a long time or the power is long-term uninterrupted. The battery will be fully discharge to low-voltage protection shutdown. Then it needs to be fully charged at once.

2. In high temperature area, batteries should be manually charged and discharged once every two months. The process is the same as that said above.

3. Under normal circumstances of using, the battery working life is three to five years. If you find that the battery do not act well such as obviously shortening of backup time, too much imbalance on battery voltage and so on, the battery should be replaced as soon as possible, which must be performed by qualified personnel.

4. When replace battery, it is recommended to change battery all together instead of changing separately.



## NOTICE:

- ★ Before replacing batteries, first please turn off the UPS and break off the mains. Remove your metallic adornment such as finger ring, watch and so on.
- ★ When replace batteries, please use the screwdriver with insulating handle. Do not lay the tools or metallic goods on the battery.
- ★ Never reverse or short circuit between the battery anode and cathode.

## 6. TROUBLESHOOTING AND PERFORMANCE OF THE PRODUCT

1. In case the UPS can not work normally, it might be wrong in installation, wiring or operation. Please check these aspects first. If you need help, contact our service department, the following messages should be provided for analysis:

- UPS MODEL and SERIAL NO.
- Date of fault happened
- Detailed description of the problem (include indicator statements on panel)

### 6.1 Troubleshooting

When the fault occurs, firstly, perform troubleshooting by referring to the troubleshooting table. If the fault still exists, please contact the franchiser.

| Fault                                                    | Cause                                                                            | Solution                                                                                                    |
|----------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Battery LED flashes                                      | Battery low voltage or battery disconnected                                      | Check UPS battery, connect battery well, if battery damaged, replace it                                     |
| Mains normal, but UPS has no input                       | UPS input breaker open circuit                                                   | Press the breaker for reset                                                                                 |
| Short back up time                                       | Battery not fully charged                                                        | Keep UPS connecting with mains power for more than 8 hours, recharge battery                                |
|                                                          | UPS overload                                                                     | Check the usage of loads, remove some redundant devices                                                     |
|                                                          | Battery aged                                                                     | When replace battery, contact franchiser to get battery and relative assembly                               |
| No AC power, UPS can't startup after pressing the ON key | Press the ON key for a short time                                                | Press and hold the ON key for more than one second to start the UPS                                         |
|                                                          | UPS has no battery connected or battery voltage low and too many loads connected | Connect UPS battery well, if battery voltage low, please turn off UPS and remove some loads, then start UPS |
|                                                          | Fault occurs inside UPS                                                          | Contact supplier for servicing                                                                              |

### 6.2 Conformity

Our products are manufactured according to the following EMC international grade standard and has passed the CE authentication:

| CONFORMITY of NORMATIVES |
|--------------------------|
| IEC/EN 62040-1           |
| IEC/EN 62040-2           |
| IEC/EN 62040-3           |
| IEC/EN 60950-1           |
| EN50171                  |

### 6.3 Product Performance

| TYPE      |                                                        | MSN06                                                                                                                                    | MSN10          |
|-----------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Capacity  |                                                        | 6KVA / 5.4 KW                                                                                                                            | 10KVA / 9 KW   |
| AC INPUT  | Input                                                  | Single phase & Ground                                                                                                                    |                |
|           | Power factor                                           | ≥ 0.8 (input THDV ≤1%)                                                                                                                   |                |
|           | Rated voltage                                          | 220VAC / 230VAC / 240VAC                                                                                                                 |                |
|           | Rated frequency                                        | 50Hz/60Hz Automatically selected                                                                                                         |                |
|           | Voltage range                                          | 120~276Vac                                                                                                                               |                |
|           | Frequency range                                        | 45~66Hz                                                                                                                                  |                |
|           | Bypass voltage range                                   | 220Vac max: default +25% (+10% ,+15%, 20% , 25%)<br>230Vac max: default +20% (+10% ,+15%, 20% )<br>240Vac max: default +15% (+10% ,+15%) |                |
|           |                                                        | min: default-45%(-20%, -30% , -45%, )                                                                                                    |                |
|           | Bypass frequency range                                 | ±1%、±2%、±4%、±5%、±10%                                                                                                                     |                |
|           | THDI                                                   | ≤3% (100% liner load, input THDV ≤1%)                                                                                                    |                |
|           |                                                        | ≤5% (100% non linear load, input THDV ≤1%)                                                                                               |                |
|           | Connection                                             | Terminal block                                                                                                                           |                |
| BATTERY   | Battery number                                         | 16 standard - 18/20 optional                                                                                                             |                |
|           | Battery type                                           | 12V/7Ah                                                                                                                                  | 12V/9Ah        |
|           |                                                        | VRLA                                                                                                                                     |                |
|           | Charge model                                           | Boost charge or float charge auto switch                                                                                                 |                |
|           | Charge time                                            | Boost charge up to 20Hr (Max)                                                                                                            |                |
|           | Charge current (Max)                                   | 1A (Standard)                                                                                                                            |                |
| AC OUTPUT | Output type                                            | Single phase & Ground                                                                                                                    |                |
|           | Voltage regulation                                     | ±1.0%                                                                                                                                    |                |
|           | Voltage distortion(THD)                                | less than 2% at 100% liner load                                                                                                          |                |
|           |                                                        | less than 5% at 100% non-liner load                                                                                                      |                |
|           | Rated voltage                                          | 220V/230V/ 240Vac can be setted                                                                                                          |                |
|           | Power factor                                           | 0.9                                                                                                                                      |                |
|           | Frequency regulation                                   | ±0.1% (stand alone)                                                                                                                      |                |
|           |                                                        | ±0.25% (parallel operation)                                                                                                              |                |
|           | Frequency                                              | Utility mode: tracking mains frequency                                                                                                   |                |
|           |                                                        | Battery mode: 50Hz/60Hz                                                                                                                  |                |
|           | Frequency track speed                                  | 1Hz/s (stand alone)                                                                                                                      |                |
|           |                                                        | 0.5Hz/s (parallel operation)                                                                                                             |                |
|           | Load capacity<br>(Mains, drop a level in battery mode) | 105 %~ 110 %, lasts 1 hour                                                                                                               |                |
|           |                                                        | 110%~125%,lasts 10 minutes                                                                                                               |                |
|           |                                                        | 125%~150%, lasts 1 minute                                                                                                                |                |
|           |                                                        | >150%, switch to bypass immediately                                                                                                      |                |
|           | Overload for bypass                                    | >95%, can not inverter-fed                                                                                                               |                |
|           |                                                        | Load for a long time when rated output current under 125%                                                                                |                |
|           |                                                        | Bypass load capacity is controlled by bypass circuit breaker, tripping when circuit breaker operating current.                           |                |
|           | Crest factor                                           | 3:1                                                                                                                                      |                |
|           | Efficiency                                             | Line Mode                                                                                                                                | Full Load ≥90% |
|           |                                                        | Battery Mode                                                                                                                             | Full Load ≥88% |
|           |                                                        | ECO                                                                                                                                      | Full Load ≥96% |
|           | Dynamic respond                                        | ± 5.0% (100% balance load)                                                                                                               |                |
|           |                                                        | ≤5% in a cycle                                                                                                                           |                |

|                |                                 |                                                                                                                                                                                |
|----------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Switch<br>time | Inverter output current limit   | When current instantaneous value is 2 ~ 3 times of rated current peaks (1.414 * rated power/(3 * 220)), the inverter will be conducted in each pulse current limit protection. |
|                | DC component                    | ≤200mV                                                                                                                                                                         |
|                | Connection                      | Terminal block                                                                                                                                                                 |
|                | Between Normal and battery mode | 0ms                                                                                                                                                                            |
|                | Between inverter and bypass     | 0ms                                                                                                                                                                            |
|                | Noise                           | <55dB (1m)                                                                                                                                                                     |
|                | Display                         | LED+LCD                                                                                                                                                                        |
|                | Safety                          | Meeting IEC62040-1, GB4943                                                                                                                                                     |
|                | EMI                             | Conduction : IEC 62040-2                                                                                                                                                       |
|                |                                 | Radiation : IEC 62040-2                                                                                                                                                        |
|                |                                 | Harmonics : IEC 62040-2                                                                                                                                                        |
|                | EMS                             | IEC 62040-2                                                                                                                                                                    |
|                | Isolation resistance            | > 2MΩ (500Vdc)                                                                                                                                                                 |
|                | Isolation intension             | 2820Vdc, <3.5mA, 1min                                                                                                                                                          |
|                | Surge                           | Meeting IEC60664-1 1.2/50uS+8/20uS 6kV/3kA.                                                                                                                                    |
|                | Protection                      | IP20                                                                                                                                                                           |

#### ◆ Work Environment

| TYPE              | MSN06                                             | MSN10 |
|-------------------|---------------------------------------------------|-------|
| Temperature       | 0°C~40°C                                          |       |
| Relative humidity | 0~95% non-condensing                              |       |
| Altitude          | <1500m when >1500m, lower the rated power for use |       |

#### ◆ Mechanical Specification

| TYPE            | MSN06 | MSN10 |
|-----------------|-------|-------|
| Height (mm)     | 616   |       |
| Width (mm)      | 250   |       |
| Depth (mm)      | 502   |       |
| Net weight (Kg) | 62    | 64    |
| Color           | Black |       |

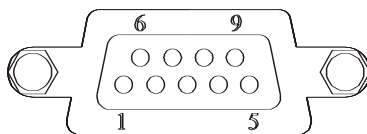
#### ◆ Box content

| TYPE              | MSN06 | MSN10 |
|-------------------|-------|-------|
| User Manual       | ●     |       |
| Software (CD-ROM) | ●     |       |
| RS232 Cable       | 1     |       |
| USB Cable         | 1     |       |
| EPO Connector     | 1     |       |

**Note:** 16 pcs. 7-9Ah Battery can be installed inside of standart UPS. External battery Cabinet or Rack must be used for higher quantity and capacity of batteries.

## 7. RS232 COMMUNICATION PORT DEFINITION

Definition of Male port:



| PIN         | DEFINITION |
|-------------|------------|
| 1-4-6-7-8-9 | Not used   |
| 2           | TX         |
| 3           | RX         |
| 5           | GND        |

Connection between PC RS232 port and UPS RS232 port:

| PC RS232 port | UPS RS232 port |                      |
|---------------|----------------|----------------------|
| Pin 2         | Pin 2          | UPS send, PC receive |
| Pin 3         | Pin 3          | PC send, UPS receive |
| Pin 5         | Pin 5          | Ground               |

Available function of RS232:

- ◆ Monitor UPS power status
- ◆ Monitor UPS alarm info
- ◆ Monitor UPS running parameters
- ◆ Timing off/on setting

RS-232 communication data format:

|              |         |
|--------------|---------|
| Baud rate    | 2400bps |
| Byte length  | 8bit    |
| End bit      | 1bit    |
| Parity check | none    |