

# 1 BRIEF INTRODUCTION

## 1.1 Prolegomenon

The product is designed specially aiming at the requirement of MINI and MICRO level computer with exquisite quality and excellent function, easy to operate. With the development of customer office automatism and computerism, considering the bulk and the position of positing space, the noise disturbance to personnel in office, the light, thin, short and small product is our design direction, and we stress low noise. So this product is optimum supply power partner for office and makes you can attain optimal clean power quality.

## 1.2 Five design points

1. Small bulk and no occupation space
2. Light weight and convenience to transit
3. Beauty and nature, easy to install
4. Convenient to maintain and easy to operate
5. Package material with environment protection and no pollution to environment

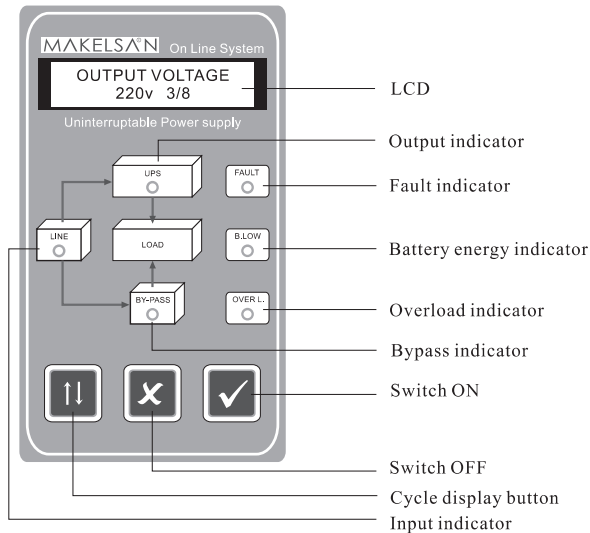
## 1.3 Note

The manual makes you can operate and maintain the system easily. To normally exert all functions of the system, please note the following:

1. Read the manual carefully before use
2. Perform the operation strictly according to operating process
3. Place the equipment carefully and lightly when moving the equipment
4. Install the power according to illumination in the manual
5. Please do not open the cover to avoid injury caused by electrical shock
6. Please charge batteries once every a period if no used for long time
7. Do not use UPS on the condition of overload to avoid UPS fault
8. Please carefully keep the manual for the future reference
9. Please handle the system according to "ABNORMITY HANDLING PROCESS" if there presents any abnormal phenomenon in machine.
10. Please keep UPS neatness and cleanness

# 2 CONFIGURATION AND FUNCTION

## 2.1 Frontpanel



- 1) Welcome screen  
WELCOME TO  
x x x x x x x x x x
- 2) Display of system status  
x x x x x \_Pro

AC: IN                      BAT: OK

Note: AC indicates utility; BAT indicates battery;  
 AC: IN indicates utility power is normal;  
 AC: LOSS indicates utility power is abnormal;  
 BAT: OK indicates battery is normal;  
 BAT: LOW indicates battery capacity isn't enough.

- 3) Display of input voltage value  
INPUT VOLTAGE  
220V 2/8
- 4) Display of output voltage value  
OUTPUT VOLTAGE  
220V 3/8
- 5) Display of input frequency value  
INPUT FREQUENCY  
50HZ 4/8
- 6) Display of output frequency value  
OUTPUT FREQUENCY  
50HZ 5/8
- 7) Display of battery voltage value  
BATTERY VOLTAGE  
220V 6/8
- 8) Display of output power percent  
CURRENT LOAD  
100% 7/8
- 9) Temperature display in machine  
TEMPERATURE  
33°C 8/8

\*These parameters vary with machine model.

## 2.2 Appearance

⑧ LCD cycle display switch button: digital signal display items switch button.

⑨ UPS switch button: UPS general switch button.

(1) Turn on UPS inverter by pressing the "ON" key. UPS convert to UPS inverter power output 20s later, UPS pure AC output power is supplied by UPS internal power supply equipment.

(2) Turn off UPS inverter by pressing the "OFF" button. UPS convert to utility bypass.

The button acts as general switch mainly.

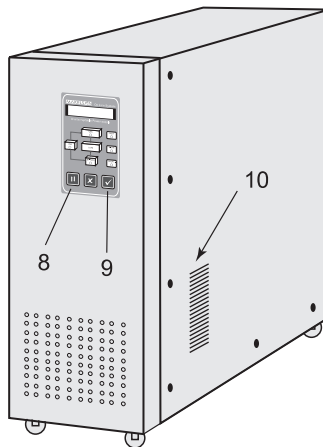


Figure 2, Front panel

⑩ Emission heat ventilation hole:

The ventilation hole and other small long elliptic ventilation holes should be kept good ventilation.

⑪ Wiring inlet/outlet hole:

Wiring inlet/outlet hole of input, output and battery pack.

⑫ DB-9 communication interface receptacle

Standard communication interface between UPS and computer.

⑬ Power switch:

Power switch controls input, output and battery power switch at the same time.

⑭ Wiring terminal support

Power wiring terminal support of input, output and battery.

⑮ Active wheel:

There are four hidden movement wheel, in favor to move.

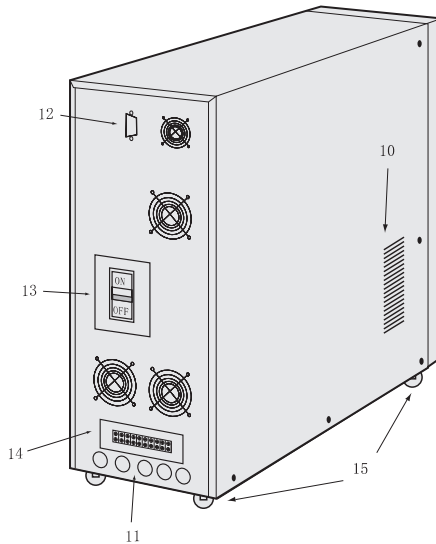


Figure 3 Rear panel

## 3 PLACEMENT NOTES

### 3.1 Transit or move

1. Please dismantle all barge connection firstly. (First turn off before performing)
2. Place lightly and carefully, forbid to hit.
3. Please do not move UPS inverted.

### 3.2 Placement

1. Do not place the UPS on the slope or scraggy land. (Figure 4)

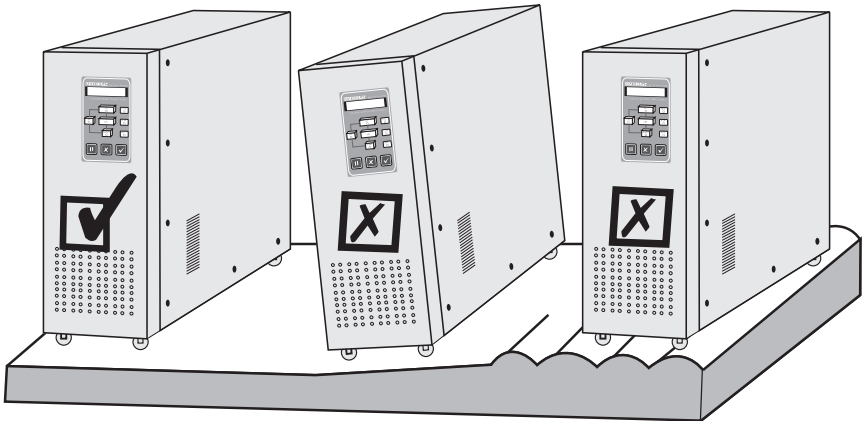


Figure 4, choice of placement position

2. Please place the UPS in the place where keeps good ventilation, rear panel of UPS and two side faces should keep more than 10cm away from the wall. (Figure 5)

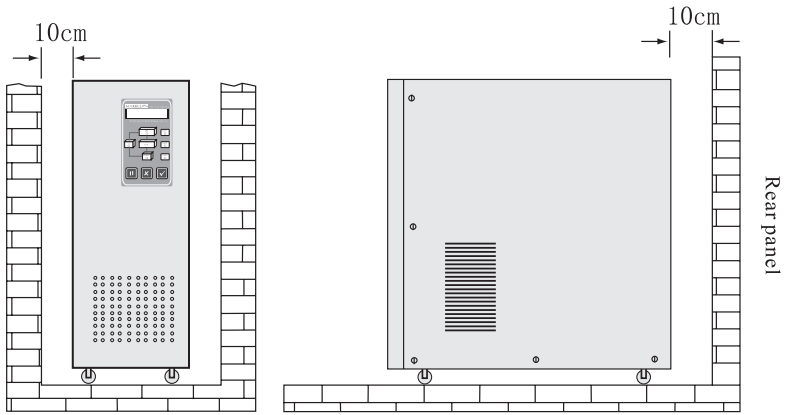


Figure 5

3. Do not install UPS under sunlight, drain and damp place. (Figure 6, 7)

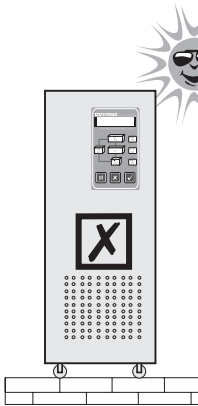


Figure 6

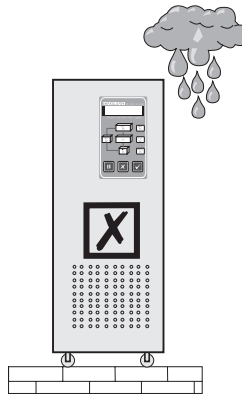


Figure 7

4. Please keep away from fire source and high temperature to avoid over-high temperature. (Figure 8)

5. Do not lay goods on the UPS. (Figure 9)

6. Do not install UPS in the place where contains caustic gas. (Figure 10)

7. Running environment temperature: 0°C–40°C

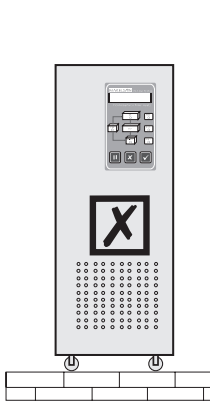


Figure 8

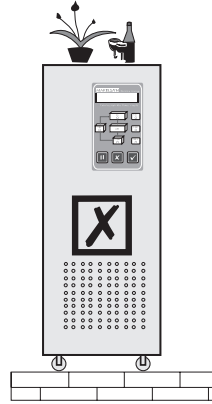


Figure 9

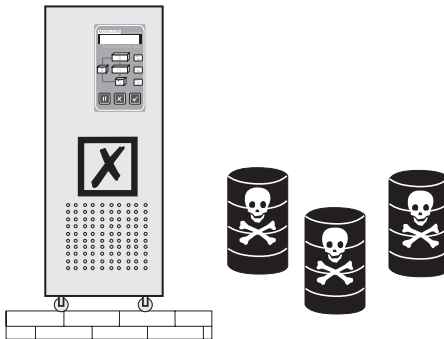


Figure 10

## 4 INSTALLATION

### 4.1 Input

1. Prohibit using general household socket, because the Max. current of general socket is 15A, the socket may be burned down because of overload.



2. Please connect UPS input terminal to utility power in nearby switchboard. Figure 11.

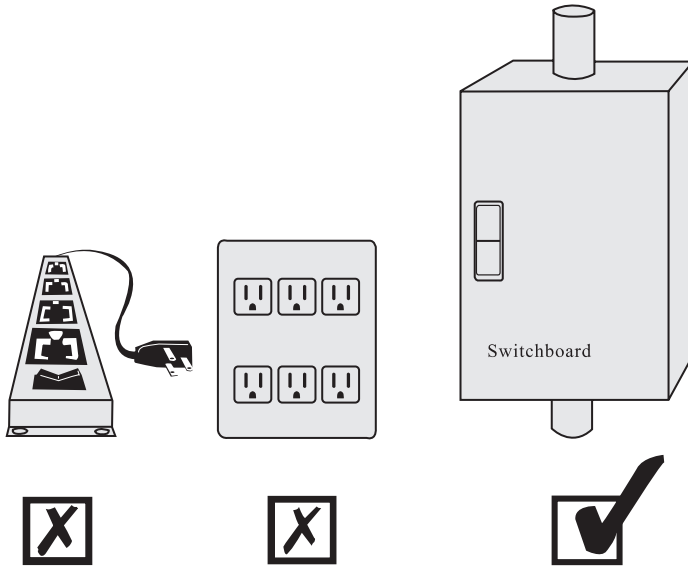


Figure 11

3. Position and way of connect

(1) Remove two screws with "+" screw-driver (Figure 12)

(2) Open the back panel and inspect the wiring terminal below the power switch. (Figure 13)

4. Relock the special cover after completing connection.

5. Please first fetch in the power cables of input, output and batteries pack through inlet/outlet hole of distribution electricity and then barge connect to terminal plate.

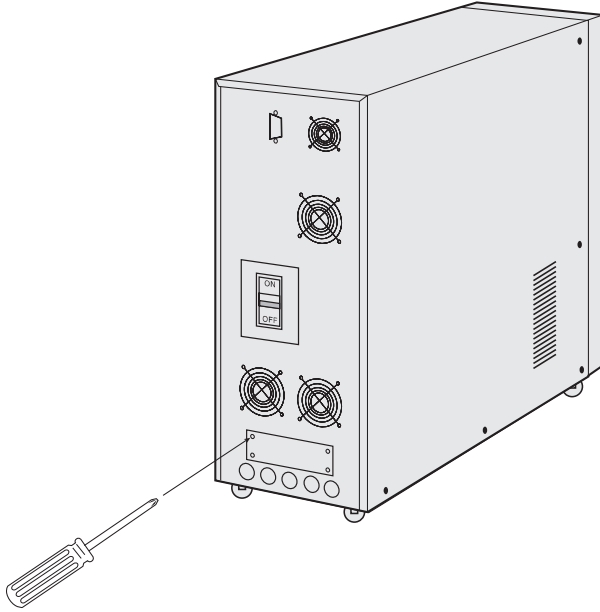


Figure 12

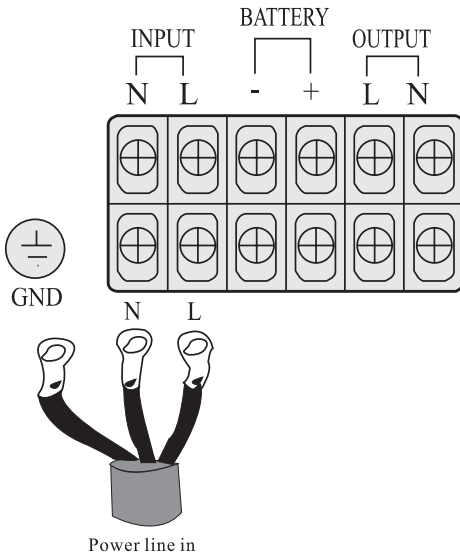
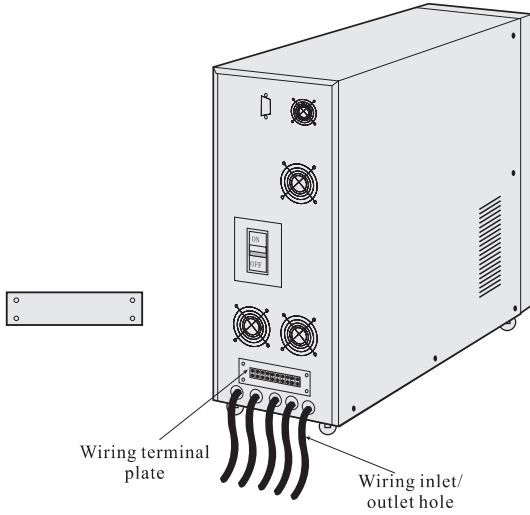


Figure 13

6. Please connect power correctly

Simple identification way to power polarity:

(1) Live (L): There is 220V relative to other two holes.

(2) Neutral (N): there is 220V relative to the Live, there is 0.5-2V relative to the ground.

(Load current circulate through neutral)

(3) Ground (G): Please find out correct connecting point to the ground in the switchboard.

7. If the difference between the neutral and the ground is more than 5V or it can't meet the requirement of system, please reinstall good grounding system to keep safety of system operation.

8. The comparison list of input current rating and input cable size is as follows:

Model	Max. input current	Input wire	Terminal specification
1KVA	8A	3.5mm <sup>2</sup> (soft wire)	5.5~6
2KVA	12A	5.5mm <sup>2</sup> (soft wire)	5.5~6
3KVA	18A	5.5mm <sup>2</sup> (soft wire)	5.5~6
5KVA	24A	5.5mm <sup>2</sup> (soft wire)	5.5~6
6.25KVA	34A	5.5mm <sup>2</sup> (soft wire)	5.5~6
10KVA	45A	5.5mm <sup>2</sup> (soft wire)	8.5~9
12.50KVA	56A	5.5mm <sup>2</sup> (soft wire)	8.5~9

Table 1

9. The power cable and the impaction terminal must be first grade product manufactured by authentic manufacturer. Prohibit use spent and inferior product.

10. The power cable must be impacted by impaction terminal of authentic manufacturer, prohibit directly wrapping power cable to the terminal plate.

11. After fastening input cable, please see if the input cable contacts with protection cover and avoid short-circuit.

12. Please turn off power when connecting cable, prohibit operation on live and keep safety.

13. Please follow the electrician law when installation.
14. Avoid using the same switch with other equipment when connect to switchboard, try to connect cable to utility terminal. Figure 14.
15. In 3  $\phi$  4W system, please respectively measure the voltage between R/N, S/N, T/N with ammeter firstly and see if they are close to 220V, then connect L cable of UPS to the cable whose voltage measured is the highest (means supply power of this phase is lighter than that of other two phase), the N cable of UPS is connected to utility neutral cable N, the UPS-GND is connected to grounding club.
16. If the model of the unit you purchase is input voltage of 110V, please connect UPS-L cable into live, connect N cable into neutral cable, and connect UPS-GND cable to grounding club.

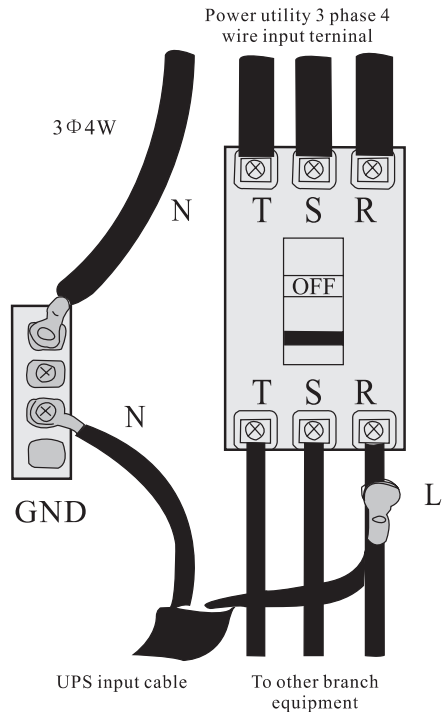


Figure 14

**Please note that this equipment is a system of 220V or 110V, do not connect 380V, and avoid causing any fault.**

4.2 Output

1. Please refer to output installation principle when installation.
2. Position and way of connection, refer to figure 15.

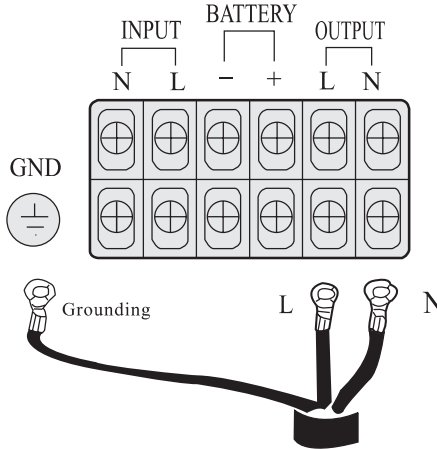


Figure 15

3. Output power cable is designed according to load current, do not use over-thin cable. Please refer to Table 2

Model	Max. input current	Input wire	Terminal specification
1KVA	6A	3.5mm <sup>2</sup>	5.5 ~ 6
2KVA	10A	5.5mm <sup>2</sup>	5.5 ~ 6
3KVA	14A	5.5mm <sup>2</sup>	5.5 ~ 6
5KVA	17A	5.5mm <sup>2</sup>	5.5 ~ 6
6.25KVA	22A	5.5mm <sup>2</sup>	5.5 ~ 6
10KVA	29A	8.5mm <sup>2</sup>	8.5 ~ 9
12.5KVA	36A	8.5mm <sup>2</sup>	8.5 ~ 9

Table 2

4. Avoid short-circuit and overload.
5. The comparison between output current rating and output cable size is listed in Table 2.

6. The ground to this unit only acts as reference point, if the ground isn't good, that may cause disturbance and false datum management, and affect UPS and computer, please ask professional personnel for handling immediately.
7. User offers a good grounding system.
8. Try to make the ground close to connecting point of grounding club or origination point in switch- board. Please refer to figure 16.

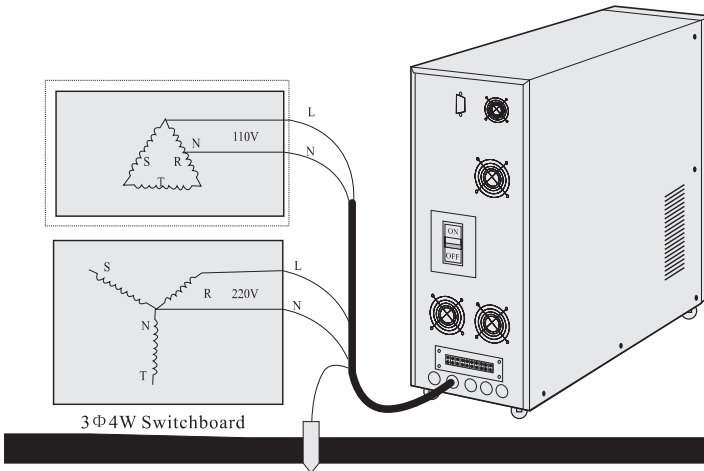


Figure 16

**\* Please install wiring according to input voltage system purchased \***  
**Please contact professional personnel or our service department if there is problem in installation.**

## 5 OPERATION PROCESS

### 5.1 Prepare before start-up.

To make UPS normally and correctly run, please confirm the following items. (Refer to figure 2)

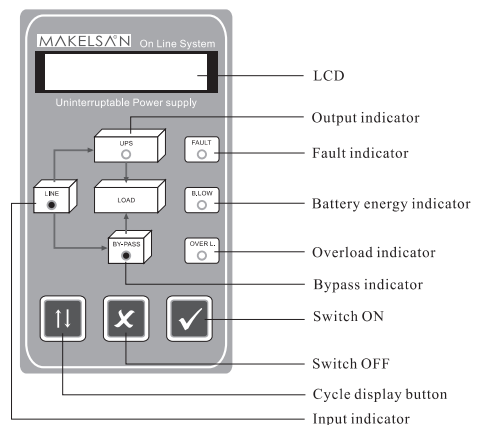
1. Verify power switch on back panel is on the "OFF" position.
2. Verify the installation position again. (Figure 4 to 10)
3. Rock power cable by hand and see if there is any looseness, retighten them if looseness.
4. Do not connect load.
5. Inspect if input voltage meet the demand of UPS ( $220V \pm 10\%$ ) with ammeter.

### 5.2 Operation process for first start-up

After verify the above items are correct, please turn on UPS according to the following ways:

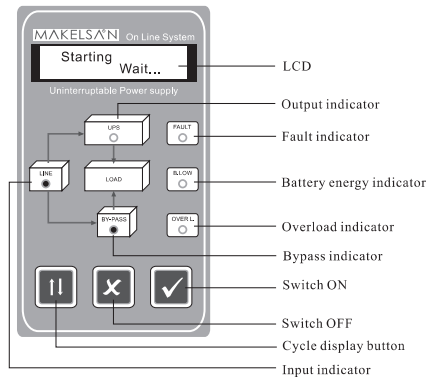
(Please refer to figure 1, figure 2, figure 3)

1. Please switch power switch "NON- FUSEBREAKER"(NFB) on the back panel to the "ON" position. Input indicator light and bypass indicator light on the front panel are lit on at the same time. As right figure.

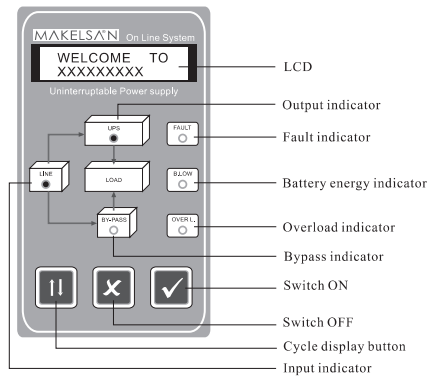




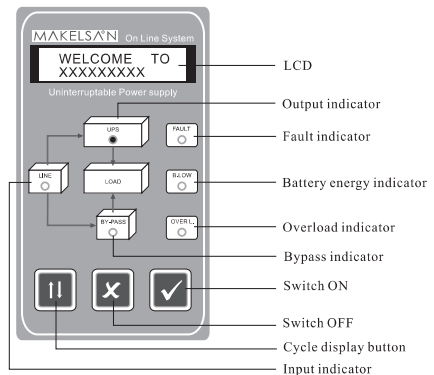
2. Press the "ON" button on front panel. As right figure. The input indicator and the bypass indicator are solid on. LCD display is lit on. Output is utility powered via bypass.



3. After 20s, input indicator light on front panel is lit on, bypass indicator is off, and output indicator is lit on. The welcome information is displayed on LCD, output is UPS inverter powered.



4. Shutdown input power of UPS, utility indicator light is off, the welcome information is displayed on LCD, and output is UPS inverter powered, as following drawing. UPS sounds every four seconds, which indicates UPS runs on battery mode at present. The sound will auto-



matically stop 90s later. UPS will sound alarm every 1s again when battery power is to be exhausted.

5. Utility indicator will be lit on when UPS input power source is resumed. Press the LCD display cycle switch button to switch items displayed, inspect if the display value is normal, thus first startup procedure has been completed. Please measure output voltage and see if it meets the requirement, then connect load to UPS output terminal. Use pure power provided by UPS.
6. After connect load, press LCD display cycle switch button to switch items displayed till display the output power display percent %. If the value displayed is more than 100%, please dismantle the unimportant load till the value displayed is less than 100%.

### **5.3 Operation process for routine turn-off**

If you want to switch on/off UPS when daily using, please operate UPS according to the following ways:

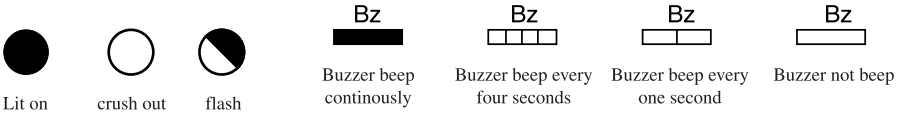
1. You can switch off UPS by pressing the "OFF" button on front panel. At the time UPS is on bypass mode, output is utility powered and the batteries are charged.
2. Always turn on UPS by pressing down the "ON" button when daily operation.

### **5.4 Operation process for long-time no switch on/off**

1. If UPS is not used above ten days, please first turn off UPS by pressing the "OFF" button on front panel, then switch the power switch NFB on back panel to the position of "OFF".
2. If UPS is not used above three months, please run UPS for above 24 hours refer to the first start-up process and keep the battery the full voltage level to extend battery life.

# 6 STATUS HANDLING

## 6.1 symbol signification



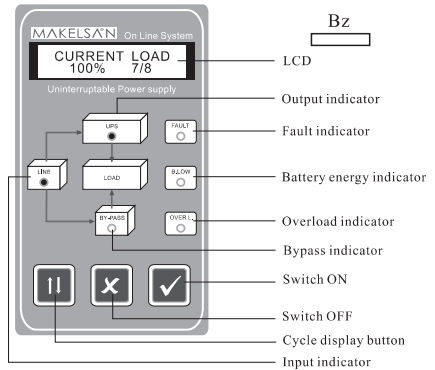
Note: If indicator light flash, the flash period is synchronal with that of buzzer sounds

## 6.2 UPS run status indication and handling ways when normal

Please refer to indicator on UPS panel, LCD indicator value and buzzer sound, you can know if UPS running is normal, if abnormal, please refer to the handling way according to panel indicator status.

1. Panel indicator status is as the right figure:

- (1) UPS running status:  
Utility is normal, UPS runs normally and UPS is used under full-load.
- (2) Handling way: needn't handling.

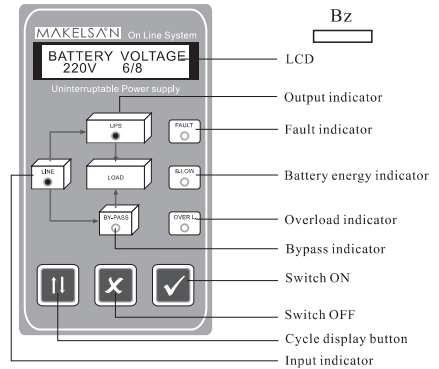


2. panel indicator status is as the right figure

(1) UPS running status:

Utility is normal, UPS runs normally and battery capacity is above 90%.

(2) Handling way: needn't handling.

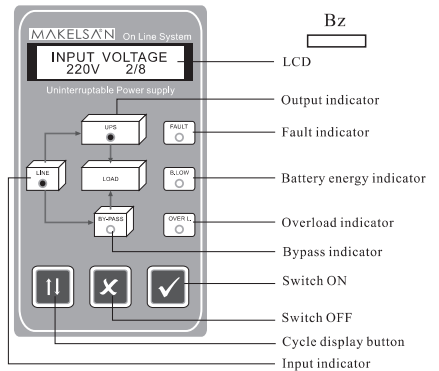


3. panel indicator status is as the right figure:

(1) UPS running status:

Utility supplies power of 220Vac normally and UPS runs normally.

(2) Handling way: needn't handling.

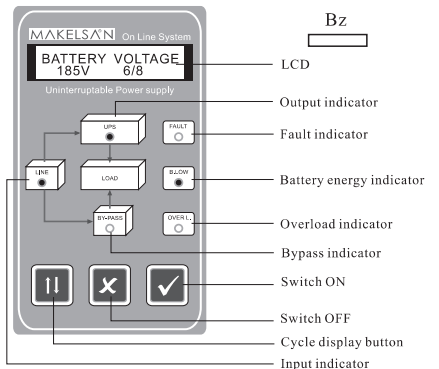


4. panel indicator status is as the right figure:

(1) UPS running status:

Utility is normal, UPS runs normally and battery voltage is low.

(2) Handling way: The charger is fault, please replace charging board.



**\*Note: the material parameters indicated vary with the machine type.**

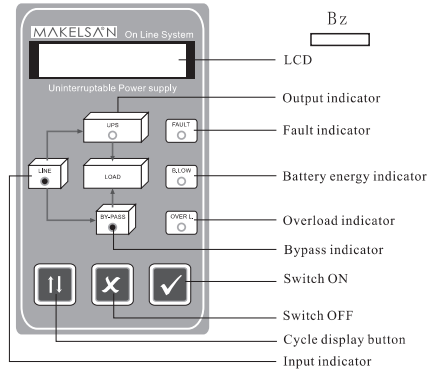
5. panel indicator status is as the right figure:

(1) UPS running status:

Utility power is normal and it converts to utility mode. UPS don't start up if didn't press the "ON" button down on the UPS panel.

(2) Handling way:

Please deal with it refer to status dealing flow Chart 20.



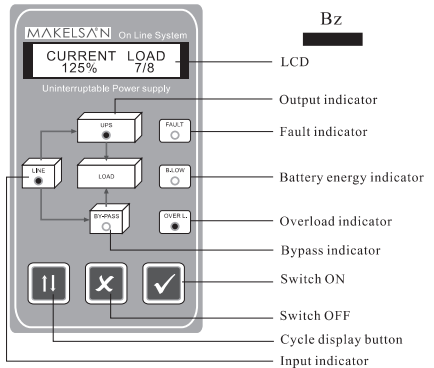
6. panel indicator status is as the right figure:

(1) UPS running status:

Utility supplies power. Under over load 125%, overload indicator is lit on and the buzzer long beeps.

(2) Handling way:

Please remove load to ensure the percent of LCD output power indicated is below 100%. If the problem still presents after removing load, please refer to flow Chart 21 of status handling.



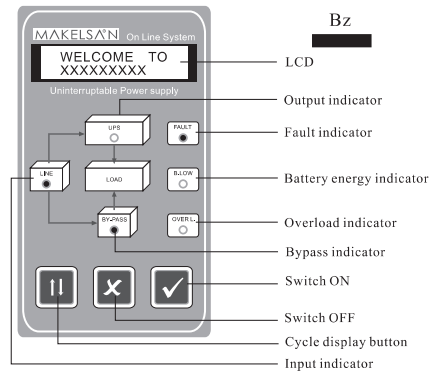
7. panel indicator status is as the right figure:

(1) UPS running status:

Utility power is normal, UPS runs abnormally and convert to be utility powered.

(2) handling way:

Please refer to flow Chart 22 of status handling.



8. panel indicator status is as the right figure:

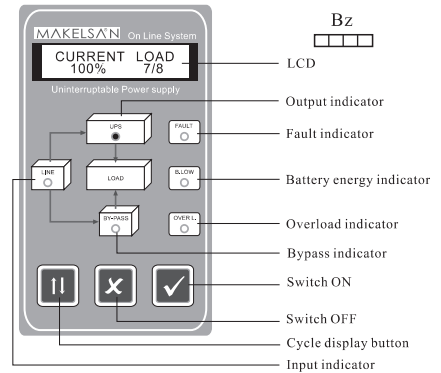
(1) UPS running status:

Utility power is disconnected, UPS is battery powered and load is full load. Buzzer beeps once every four seconds.

The indicator of battery energy flashes every four seconds (buzzer and indicator stop beep and flash 90s later).

(2) Handling way:

If utility is disconnected normally, please remove non-critical loads to increase used time. If it is disconnected abnormally, please refer to flow Chart 19 of status handling.



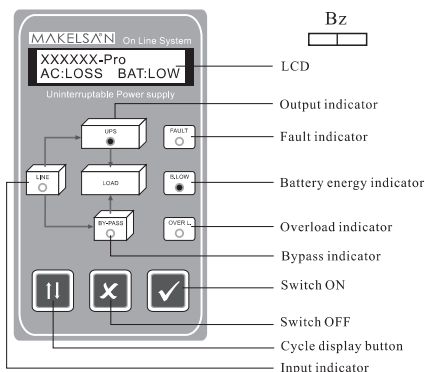
9. panel indicator status is as right figure:

(1) UPS running status:

Utility power is disconnected and UPS is battery powered. Buzzer beeps once every one second when the battery power will be exhausted.

(2) Handling way:

UPS will be shut down, please save files and close your computer.



10. panel indicator status is as right figure:

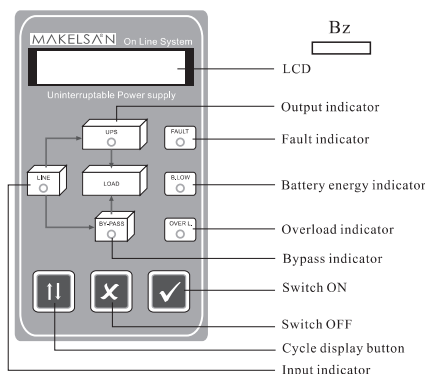
(1) UPS running status:

Utility power may have been disconnected and battery power has been exhausted, shutdown UPS automatically.

(2) Handling way:

When utility power comes back, UPS will automatically restart.

If utility power is disconnected for long time (above 6 houses), please turn off UPS according to switch on/off program for power disconnection of long time.



# 7 Movement handling

## 7.1 UPS system configuration block Figure: figure 23

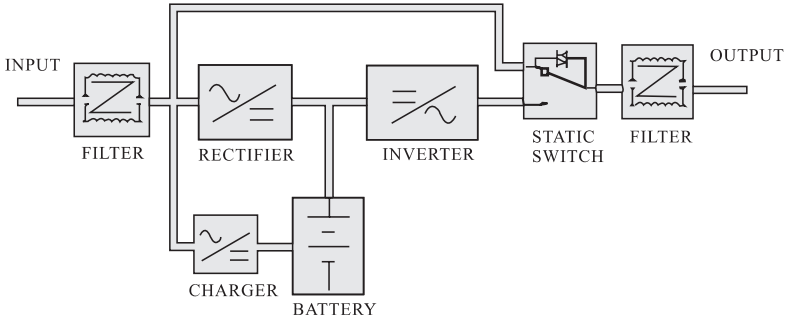


Figure 23

## 7.2 UPS's running way when UPS runs normally

When UPS runs normally, after high-frequency harmonic noise in utility power is filtered by the filter, on one hand utility power charges battery pack via the inverter and keeps battery power on full voltage level, on the other hand utility power is converted into DC power via the rectifier and is converted into pure sine wave power via the inverter, finally power is transmitted to user equipment for using via the static switch and the filter.

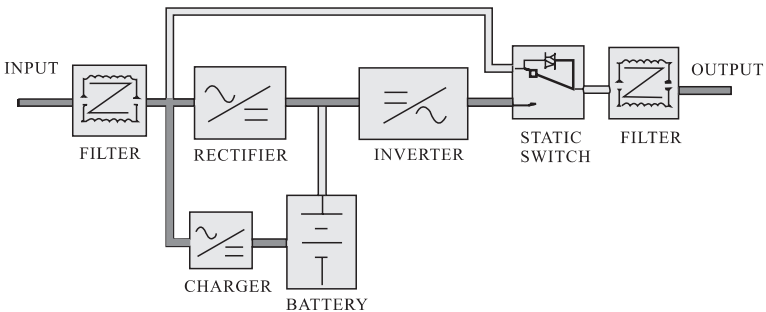


Figure 24



**7.3 UPS's running way when utility disconnected**

As figure 25, when utility disconnected, power is battery supplied to the inverter then is sostenuto transmitted to user equipment for using via the static switch and the filter to avoid power disturbance to load.

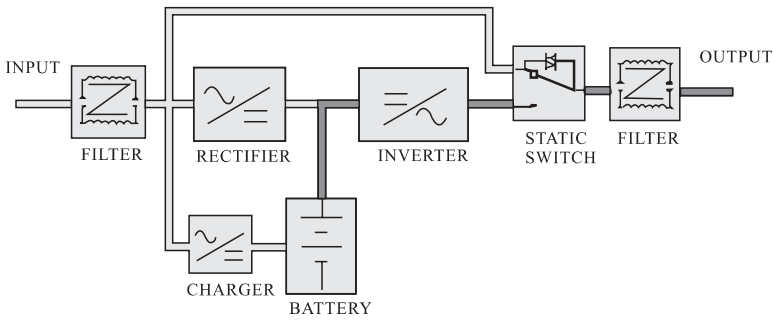


Figure 25

**7.4 UPS's running way when UPS runs on bypass mode**

There are five kinds of status when UPS runs on bypass mode

1. overload
2. inverter failure
3. when startup, UPS is in the course of slow startup during 20 seconds by pressing the "SWITCH ON" button
4. When switch off, please press the "SWITCH OFF" button.
5. UPS runs under the condition of internal over-temperature.

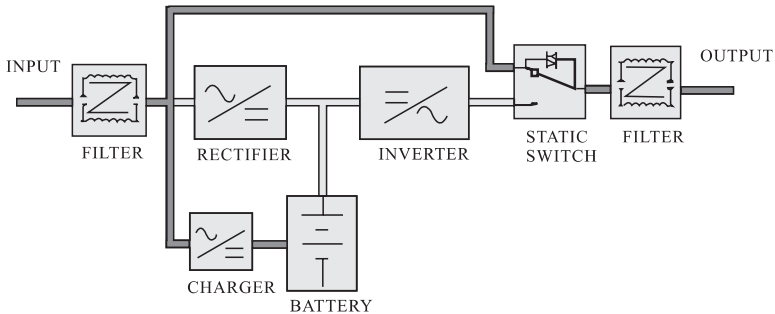


Figure 26

**7.5 Battery and charge**

1. When power switch on back panel is on the position of "ON", the batteries can automatically be charged and the charger can charge 90% of the battery capacity in 10 hours.
2. The time that battery supplies power has relation with using rate of load, please refer to figure 27.

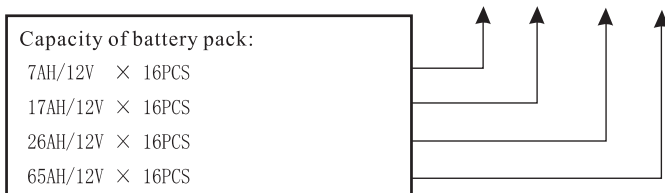
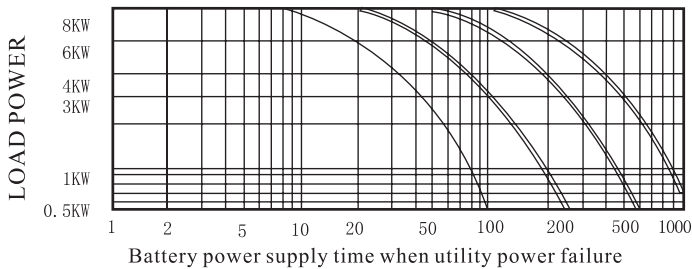


Figure 27

3. If you want to extend the time that the battery supplies power, please ask the professional to increase the battery number and don't make bold to install the battery to avoid any danger.
4. Please keep the battery full voltage level to extend the battery life.
5. There are many electron components and there also present high voltage in UPS, so non-technician can't open the panel of UPS to avoid any danger.
6. With regard to installation and using, please refer to the prescript in this manual.

## 7.6 Daily maintenance

1. UPS should be cleaned and maintained termly, avoid any dust to ensure machine life.
2. Please clean UPS lightly with soft cloth, don't use grit for instead for ever.
3. Termly inspect all kinds of connection every month and avoid any hit, looseness or humidity.
4. Please keep good ventilation at inlet/outlet hole, termly inspect the hole every month and confirm if there is any jam at inlet/outlet hole.
5. The battery is dry-type and maintenance-free and needless to maintain. If the battery you use is LEAD-ACID battery used by auto, you must inspect the electrolyte in the battery once every month, if the electrolyte is too low, please add distilled water into the electrolyte.

## 8 Communication interface

- 8.1 The great mass of computer system have equipped UPS to avoid system failure and datum damage due to utility power fault, you can monitor and control the power status through the connection between the communication interface and UPS.
- 8.2 You can get UPS's status through the connection between computer and DB9 communication interface on back panel of UPS. User can connect UPS to the computer and know the running status of UPS at any moment through the computer interface, software and OS such as DOS, WINDOWS3.1, WINDOWS95, WINDOWS/NT, NOVELL, etc. when utility power disconnected, system can know that utility fault and send out alarm information. When the reserved time goes, UPS will automatically save files and close system normally, and then automatically shutdown UPS power. When utility power come back, UPS will automatically run and system can automatically also come back to operate.

8.3 The computer interface of UPS offer detailed datum and is suit to net route, workstation, monitoring system, PC, etc.

Computer interface:

It can sostenuto transmit datum through RS232 communication series port and computer. The datum that UPS offers includes input voltage value, output voltage value, output frequency, input frequency, battery capacity percent, used load percent, UPS internal temperature, etc.



### 8.4 UPS's hardware equipment

DB9 appearance, figure 28

The pin of UPS's DB9 is the following:

PIN2:RS232RXD

PIN3:RS232TXD

PIN5:GND

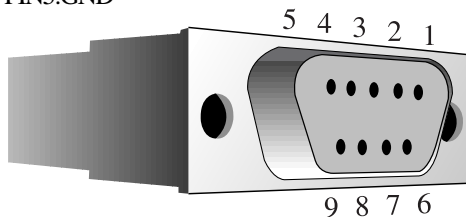


Figure 28

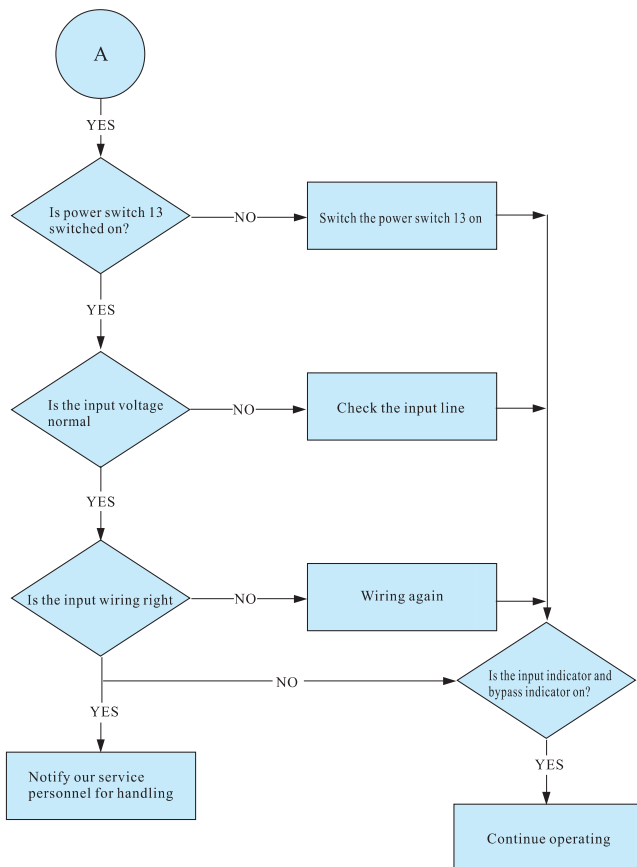
## 9 SPECIFICATION

Capacity (VA)	1K	2K	3K	5K	6.25K	10K	12.5K
AC input							
Voltage	160~310VAC (AVR)						
Frequency	50(60)Hz $\pm$ 5%						
Phase	Single						
Max.current	6A	10A	14A	24A	34A	45A	56A
AC output							
Voltage	220V						
Frequency	50(60)Hz						
Voltage stability	$\pm$ 1%						
Frequency stability	$\pm$ 0.5% (Disconnection)						
Wave form	SPWM sine wave						
Power factor	0.8						
Distortion	< 3% (linear load)						
Battery							
Voltage	48VDC			192VDC			
Model	Lead acid free from maintenance						
Offer time	Refer to figure 27						
Charging time	90% capacity after 8~10 hours						
Alarm							
Utility disconnect	Buzzer beeps once every four seconds						
Battery exhausted	Buzzer beeps once every one second						
Overload	Load indicator light is solid on,buzzer continuously beeps for long-time						
UPS abnormal	Fault indicator light is solid on,buzzer continuously beeps for long-time						

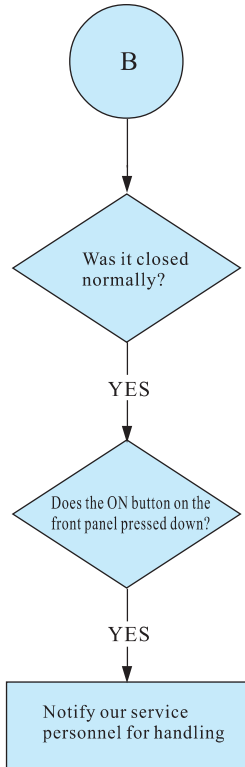
Capacity (VA)	1K	2K	3K	5K	6.25K	10K	12.5K
Internal protection equipment LCD panel							
Battery	UPS automatically shutdowns when battery is low power level there is no fuse switch protection						
Overload	When load reaches 110~150% of rating, transfer to bypass after 3s, recover auto.						
Over-temperature	Automatically transfer to bypass if UPS internal temperature >85℃						
Output short-circuit	Limit current,automatic shutdown,fuse and there no fuse switch protection						
UPS abnormal	Automatically transfer to bypass and supplied power by utility						
Noise filter	10~100KHz at 40Db;100KHz~100KHz at 70dB						
LCD display	Display:input, input voltage, frequency, battery voltage, output power(%), temperature						
Battery BVL	One LED, it lit on when battery low voltage						
Environment							
Temperature	0~40℃						
Humidity	20~90% non-condensing						
Noise	<58dB (1m away from enclosure)						
General							
Output socket	Terminal plate						
Unit weight (no battery)	50Kg	65Kg	75Kg	66Kg	70Kg	92Kg	100Kg
Dimension(mm) W x D x H	220 x 608 x 538			230 x 580 x 720		305 x 585 x 864	
Others							
Full efficiency	>85%						
Transform time when utility fault	0s						
UPS status indicator light	Utility, inverter, bypass, UPS abnormal(fault)						
Communication interface	RS232 interface of DB9 model						

# 10 Shipping list

Order	Consent	Number
1	UPS	1
2	«UPS use manual»	1
3	Intelligent monitoring software	1
4	Computer port cable	1

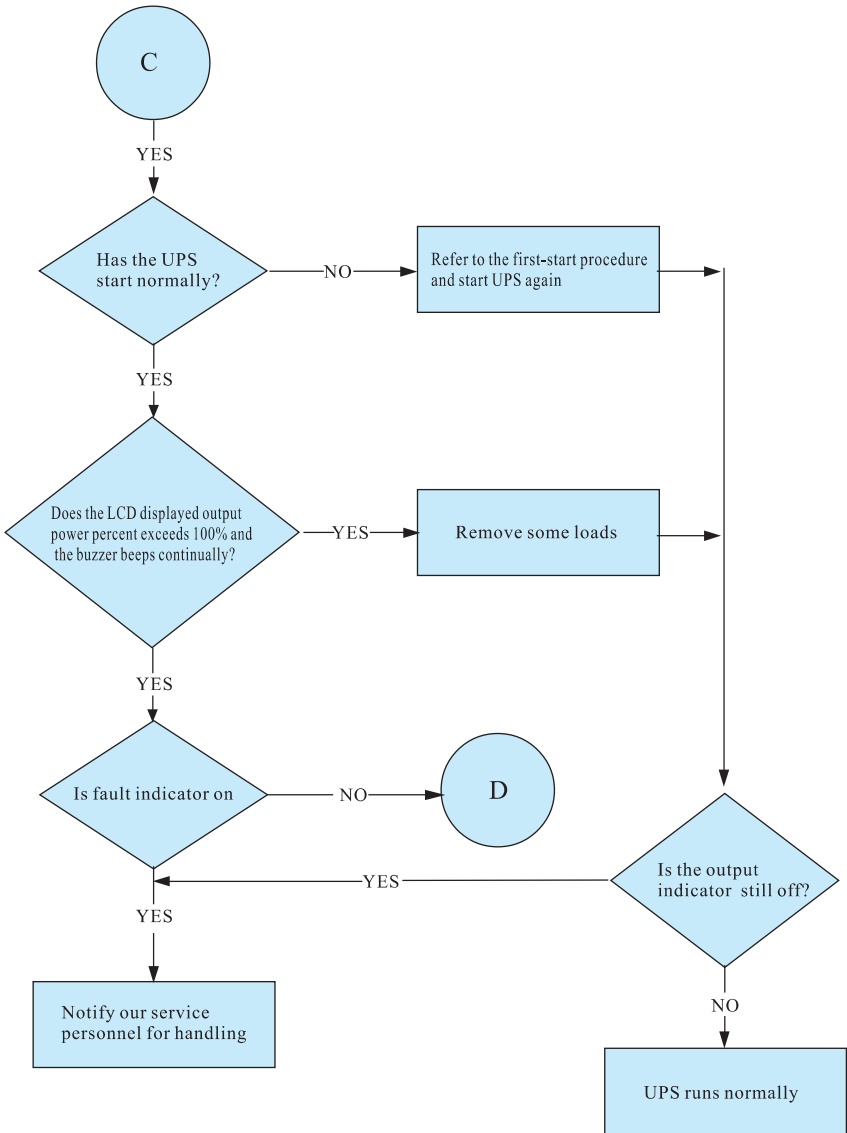


Flow chart 19 of status handling

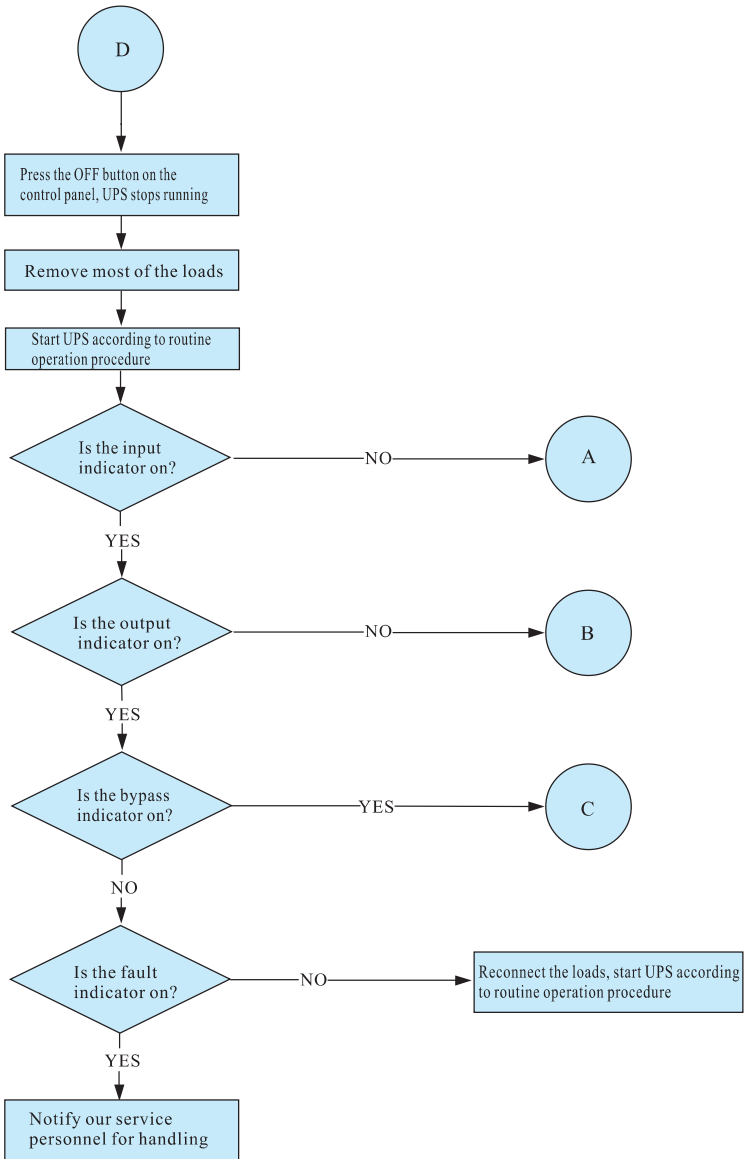


Flow chart 20 of status handling





Flow chart 21 of status handling



Flow chart 22 of status handling

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