On-line uninterruptible power supply

Power Series

GP800

User manual

Contents

1 BRIEF INTRODUCTION

1.1 Prolegomenon

The product is designed for mini to micro level computer companies who is looking for exquisite quality, excellent function and easy to operate. This product is the optimum power supply partner for the office and ensures you can attain optimal clean power quality.

1.2 Five design points

1. Slim design
2. Light weight and convenient to transport
3. Reliable and easy to operate
4. Convenient to maintain
5. Packaged material with environmental protection

1.3 Note

The manual explains how to operate and maintain the system.

To optimize the use of the UPS, please note the following:

1. Read the manual carefully before use
2. Perform the operation strictly according to operating process
3. Place the UPS in a convenient, dry and safe area.
4. Install the power according to the instructions manual
5. Do not open the covers to avoid injury
6. Please charge batteries once every 6 months if not in use
7. Do not overload the UPS
8. Keep the manual for the future reference
9. Do not use the UPS while in fault condition. See manual for various troubleshooting methods
10. Please keep UPS area clean and run in a temperature controlled

environment.

11. Do not leave objects on top of the UPS
12. Do not obstruct the air flow

2 CONFIGURATION AND FUNCTION

2.1 Front panel

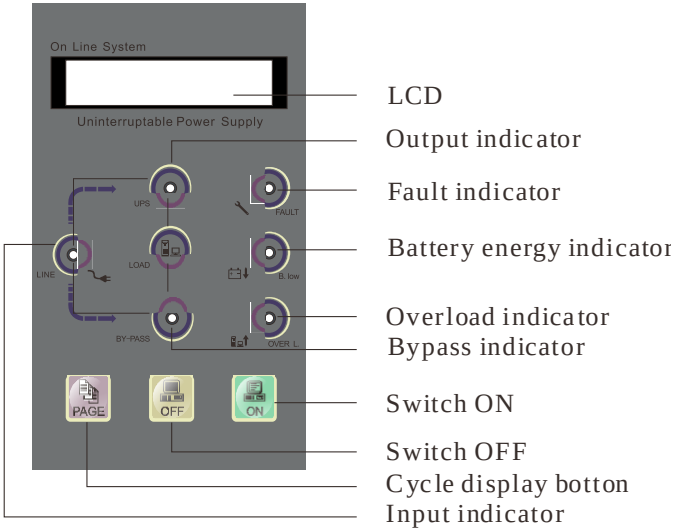


Figure 1. Symbol instruction of front panel indicator

1) Welcome screen
   WELCOME
   ××××××××××
2) Display of system status
   ××××××
   ××KVA.
3) Display of input voltage value*
   ON LINE
   AC IN： 230V
4) Display of input frequency value*
   ON LINE
   AC FRE：50Hz

5) Display of output voltage value*

ON LINE

OUTPUT： 230V

6) Display of output frequency value

ON LINE

OUT FRE：50Hz

7) Display of output power percentage

ON LINE

LOAD： 80%

8) Display of battery voltage value

ON LINE

BATTERY： 218V

9) Temperature display in machine

ON LINE

TEMP： 33℃

Note：ON BYPASS mode， the output voltage and frequency are displayed “0”. LED would display only after the unit is switched on.

***These parameters vary with machine model.**

10) LCD cycle display switch button: digital signal display items switch button.

11) 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 sine wave AC output power is supplied by UPS internal power supply equipment.

(2) By pressing the OFF switch button for 3s，the inverter shuts down and the UPS turns to bypass mode.

The button acts as general switch.

2.2 Appearance

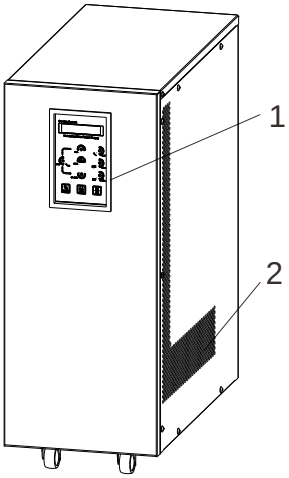


Figure 2 Front panel

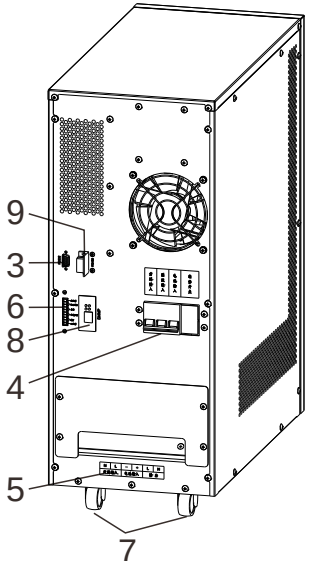
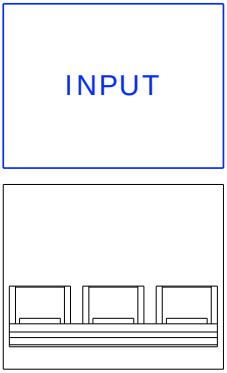


Figure 3 Rear panel

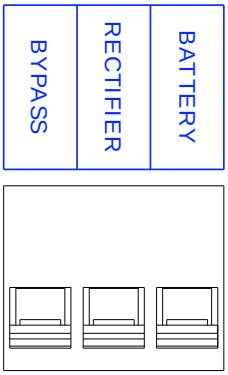
1. Control panel: UPS display and operation panel
2. Emission heat ventilation hole: The ventilation hole and other small long ventilation holes should be kept open for good ventilation.
3. RS232 communication interface: Standard communication interface between UPS and computer.
4. Power switch: Power switch controls input, output and battery power switch at the same time.
5. Wiring terminal: Power wiring terminal for input, output and battery connections.
6. Dry contact (optional): 4 routes 10A dry contact output
7. Wheels: Movable wheels
8. SNMP card (optional): remotely monitor the UPS
9. RS485 (Optional): communicate with UPS

2.3 Switch position and function



1. Input switch: when turned on, the UPS is connected with AC and battery power

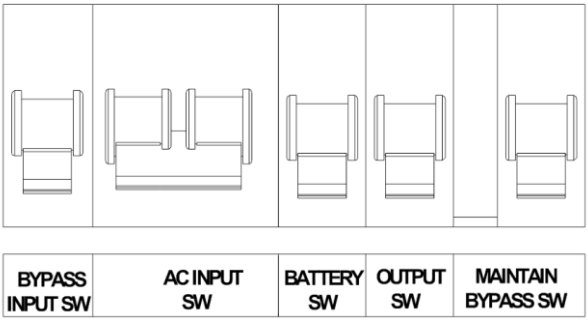
Switch position: (1-3kva 48v)



1. BYPASS OUTPUT SWITCH
When switch is turned on, power is provided to the UPS and the UPS runs in bypass.
2. RECTIFIER INPUT SWITCH
When switched on, the AC will be rectified.
3. BATTERY INPUT SWITCH
When turned on, the battery begins to charge and discharges accordingly.

Switch position: (1-3kva 192v)

4. OUTPUT SWITCH (optional): when turned on， there is output power
5. MAINTENANCE BYPASS SWITCH (optional): When turning on the switch, the AC will bypass the UPS and supply power to the load without the UPS. The UPS can be serviced or repaired



Switch Position (15-20kva)

1. BYPASS OUTPUT SWITCH When switch is turned on, power is provided to the UPS and the UPS runs in bypass.
2. AC INPUT SWITCH When switched on, the AC will be rectified.
3. BATTERY INPUT SWITCH When turned on, the battery begins to charge and discharges accordingly.
4. OUTPUT SWITCH (optional): when turned on, there is output power.
5. MAINTENANCE BYPASS SWITCH (optional): When turning on the switch, the AC will bypass the UPS and supply power to the load without the UPS. The UPS can be serviced or repaired

3 PLACEMENT NOTES

3.1 Transit or move

1. Please disconnect all connections. (First turn off before performing)
2. Please do not move UPS while functioning.

3.2 Placement

1. Do not place the UPS on a slope or uneven surface. (Figure 4)

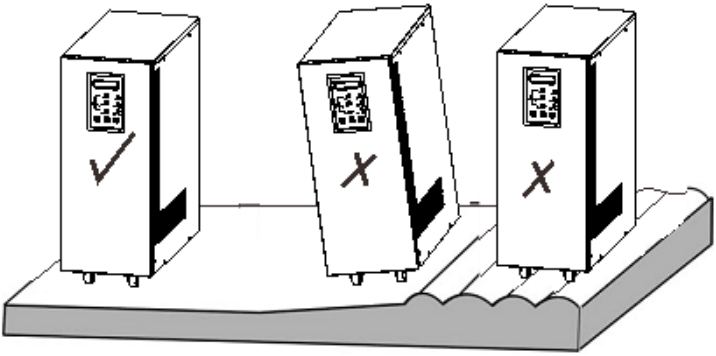


Figure 4

2. Place the UPS in a room where there is good ventilation. The rear panel of UPS and two side faces should be more than 10cm away from the wall. (Figure 5)
3. Do not install the UPS in direct sunlight, rain or damp areas. (Figure 6, 7)

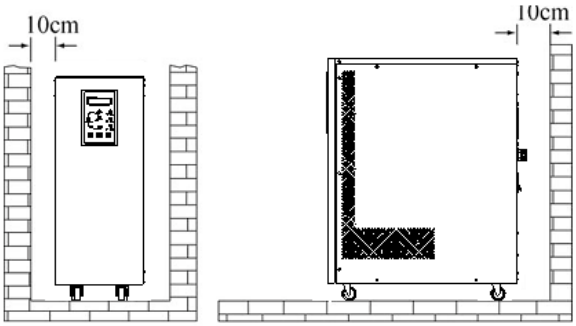


Figure 5

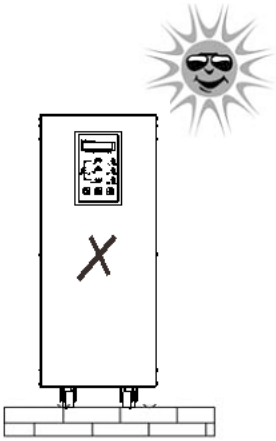


Figure6

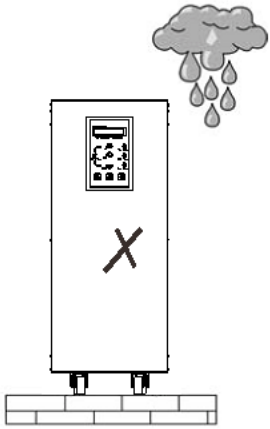


Figure 7

4. Please keep away from any fire source and high temperatures to avoid overheating. (Figure 8)
5. Do not place goods on the UPS. (Figure 9)
6. Do not install the UPS in places which contains caustic gasses. (Figure 10)
7. Running environment temperature: 0℃-40℃.

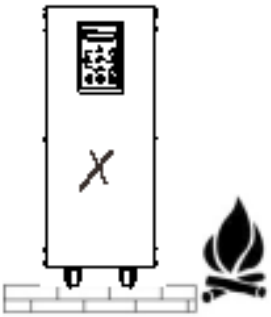


Figure 8

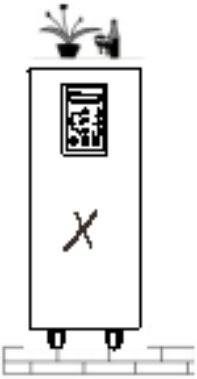


Figure 9

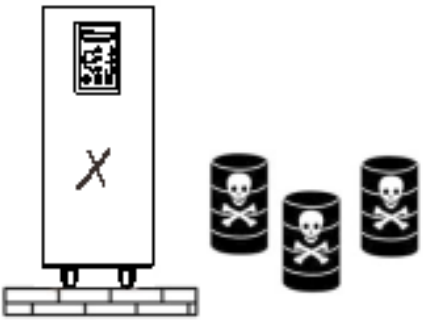


Figure 10

4 INSTALLATION

4.1 Input

1. Forbid using general household sockets, the maximum current of general sockets is 15A, the socket may cause fire because of overload.
2. Turn off power when connecting cables, prohibit operation on live wires.
3. Please connect UPS input terminal to utility power from a switchboard. Figure 11.

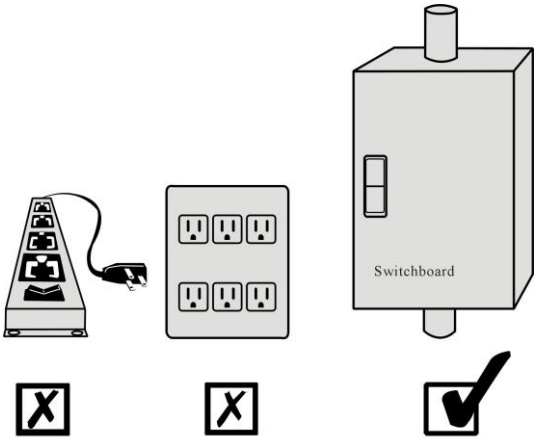


Figure 11

Note: Do not swop live and neutral

4. Back panel position and connection
   (1) Remove two screws with "+" screwdriver (Figure 12)
   (2) Open the back panel and inspect the wiring terminal below the power switch. (Figure 13)
5. Feed in the input, output and battery pack power cables through the inlet/outlet hole and connect to the terminal block on the UPS.

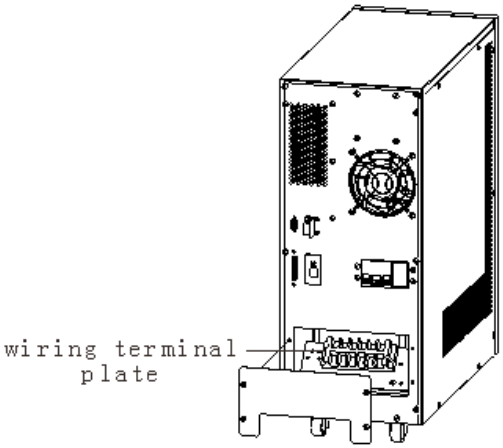


Figure 12

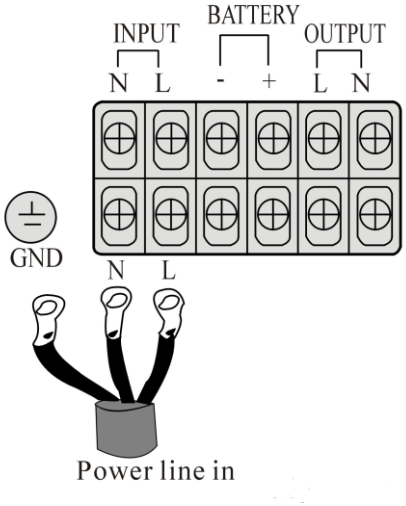


Figure 13

6. Connect power correctly
   (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): Connect correctly to ground in the switchboard.

7. If the difference between the neutral and the ground is more than 2V or it cannot meet the requirements, please reinstall good grounding to ensure safety of UPS operation.
8. The comparison list of input current rating and input cable size is as follows:

Model	Max. input	Input wire	Terminal specification
1KVA	8.5A	12AWG	5.5-5
2KVA	14A	10AWG	5.5-5
3KVA	17.5A	10AWG	5.5-5
4KVA	22.5A	10AWG	5.5-5
6KVA	31A	10AWG	5.5-5
8KVA	40A	8AWG	8.5-6
10KVA	50A	8AWG	8.5-6
12KVA	60A	6AWG	16-6
15KVA	72A	6AWG	16-6
20KVA	90A	4AWG	25-6

Table 1

9. The power cable and terminal must be a first-grade product manufactured by an authentic manufacturer.
10. Do not wrap the power cables around the terminal block screws.
11. After fastening the input cable, to avoid short-circuit, please see if the input cable contacts properly and does not touch other wiring.
12. Follow the electrical laws when doing installation.
13. Avoid using the same circuit breaker with other equipment when connecting to the switchboard.

14. For 3Ø 4-wire connections, please respectively measure the voltage between R/N,S/N, T/N with a meter and see if they are close to 220V, then connect L cable of the UPS to the cable whose voltage measured the highest (meaning supply power of this phase is lighter than that of the other two phase), the N cable of UPS is connected to utility neutral cable N, the UPS-GND is connected to the grounding club.

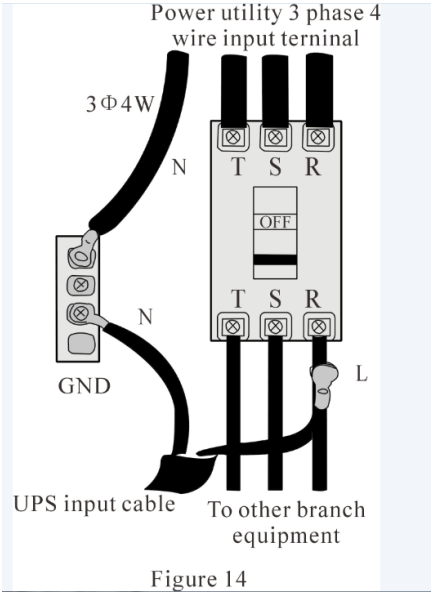


Figure 14

15. If the model of the unit you purchased is 110V input, please connect UPS-L cable into line, connect N cable into neutral cable, and connect UPS-GND cable to grounding club.

Please note that this equipment is single phase 220V or 110V, do not connect to 3 phase 380V.

4.2 Output

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

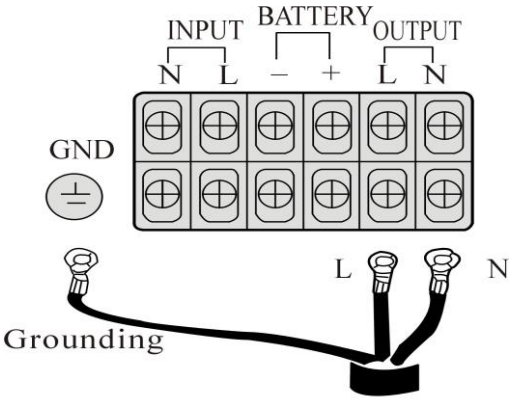


Figure 15

3. Output power cable should be sized according to UPS size, do not use undersized cabling. Please refer to Table 2

Model	Max. output current	Output cable	Terminal specification
1KVA	4A	12AWG	5.5-5
2KVA	7.5A	10AWG	5.5-5
3KVA	11A	10AWG	5.5-5
4KVA	15A	10AWG	5.5-5
6KVA	22A	10AWG	5.5-5
8KVA	30A	8AWG	8.5-6
10KVA	36A	8AWG	8.5-6
12KVA	44A	8AWG	16-6
15KVA	55A	6AWG	16-6
20KVA	72A	6AWG	16-6

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 grounding is bad, that may cause disturbance and false management, and affect UPS performance. Speak to professional personnel for assistance

immediately.

7. Use a good grounding system.
8. Try to make the ground close to the connecting point of the grounding club or origination point in the switchboard. Please refer to figure 16.

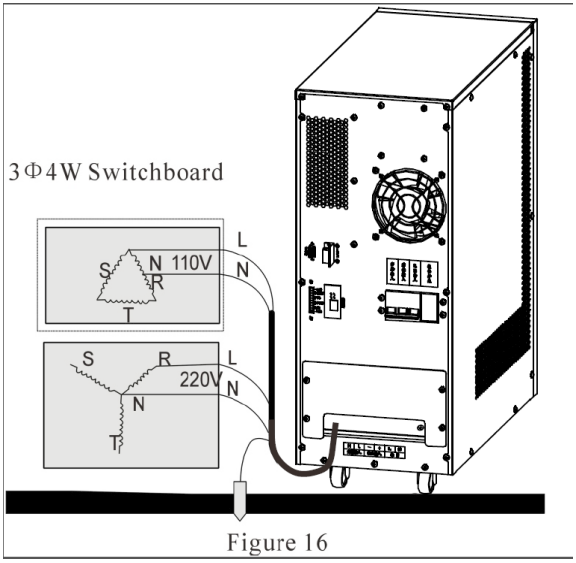


Figure 16

*** Please install wiring according to input voltage**

Contact an electrician or our service department if there is problem with the installation.

4.3 DC input wiring

1. DC input connection please refer to AC input installation rules.
2. Connection way and position, please refer to figure 17.

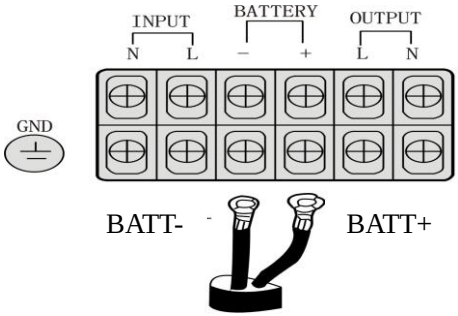


Figure 17

Model	Max. Battery current	Battery cable	Terminal specification
1KVA(48Vdc)	25A	12AWG	5.5-5
2KVA(48Vdc)	50A	10AWG	5.5-5
3KVA(48Vdc)	75A	10AWG	5.5-5
1KVA	6A	12AWG	5.5-5
2KVA	12A	10AWG	5.5-5
3KVA	18A	10AWG	5.5-5
4KVA	25A	10AWG	5.5-5
6KVA	37A	10AWG	5.5-5
8KVA	50A	8AWG	10-6
10KVA	60A	6AWG	16-6
12KVA	75A	6AWG	16-6
15KVA	90A	4AWG	25-6
20KVA	120A	4AWG	25-6

Table 3

5 OPERATION PROCESS

5.1 Preparation before start-up.

To ensure the UPS runs normal and correct, please confirm the following. (Refer to figure 2)

1. Verify the power switch on the back panel is in the “OFF” position.
2. Verify the installation procedure again. (Figure 4 to 10)
3. Pull the power cables by hand and see if there are any looseness, if so, retighten them.
4. Do not connect load.
5. Inspect if the input voltage meets the demand of the UPS (220V±10%) with a meter.

5.2 Operation process for first start-up

After verifying the above items are correct, please turn on the UPS according to the following ways: (Refer to figure 1, figure 2 and figure 3)

1. Please switch the breaker “NON-FUSEBREAKER” (NFB) on the back panel to the “ON” position. Input indicator light and bypass indicator light on the front panel are lit at the same time.

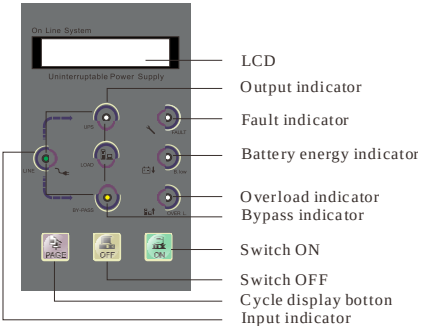


Figure 18

2. Press the “ON” button on front panel. As per figure 19. The input indicator and the bypass indicator are solid on. LCD display is lit on. Output is utility powered via bypass.

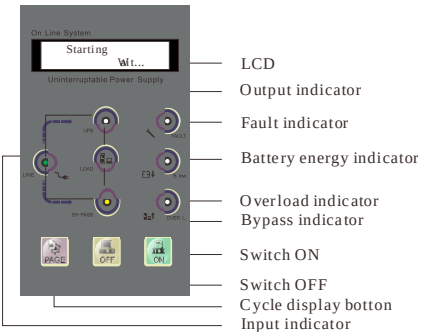


Figure 19

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.

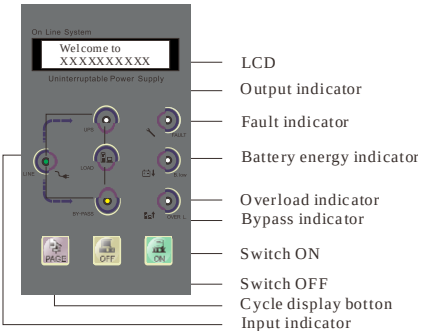


Figure 20

4. Shutdown input power of UPS, utility indicator light is off, the welcome information is displayed on the LCD, and output is UPS inverter powered, as following drawing. UPS sounds every four seconds, which indicates the UPS runs on battery at present. The sound will automatically stop 90s later. UPS will sound alarm every 1s again when battery power is to be exhausted.

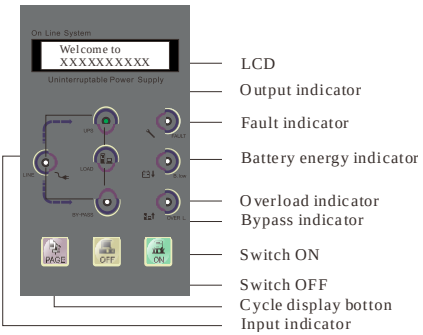


Figure 21

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 the load to the UPS output terminal. Use pure power provided by UPS.
6. After load is connected, press LCD display cycle switch button to switch items displayed until it displays the output power percent %. If the value displayed is more than 100%, please disconnect unimportant load till the value displayed is less than 100%.

5.3 Operation process for routine turn-on/off

If you want to switch the UPS on or off, please operate the UPS according to the following ways:

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

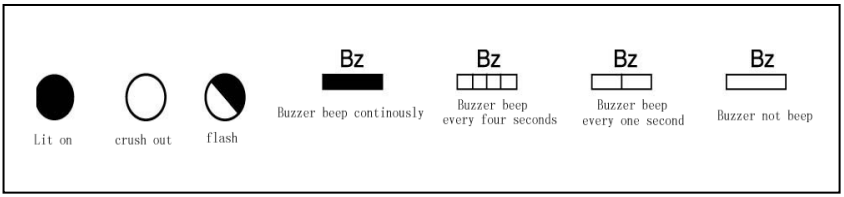
5.4 Operation process if UPS is not in use

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

6 STATUS HANDLING

6.1 Symbol signification

Note: If indicator light flashes, the flash period is synchronized with the buzzer and indicates alarms for different modes.



6.2 Status indication and handling

Please refer to the indicators on the UPS panel, the LCD indicator and the LED lights will be as follows to indicate what mode the UPS is in.

1. Panel indicator status:
   (1) UPS running status:
   Utility is normal, UPS runs normal and UPS is used under full-load.
   (2) Action to be taken:
   non-needed.

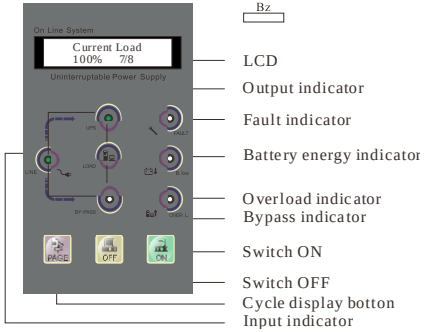


Figure 22

2. Panel indicator status:

(1) UPS running status:

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

(2) Action to be taken:

non-needed.

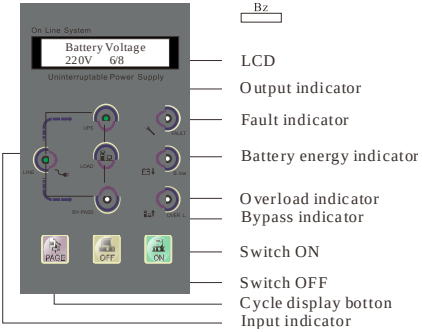


Figure 23

1. Panel indicator status:

(1) UPS running status:

Utility supplies power of 220Vac and UPS runs normal.

(2) Action to be taken:

non-needed.

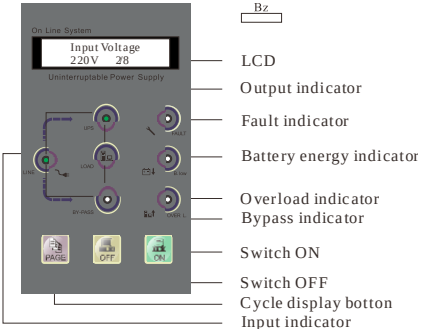


Figure 24

4. Panel indicator status:

(1) UPS running status:

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

(2) Action to be taken:

The charger is faulty, please replace charging board.

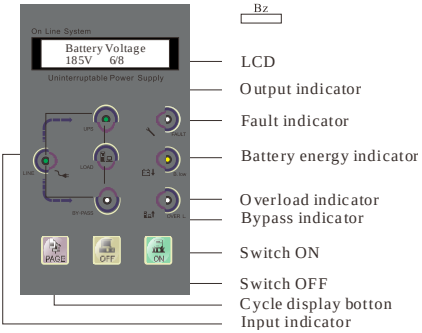


Figure 25

***Note: the material parameters indicated may vary with the UPS**

6. Panel indicator status:

(1) UPS running status:

Utility power is normal and it converts to utility mode. UPS will not start-up unless the "ON" button is pushed down on the UPS panel.

(2) Action to be taken:

Refer to status dealing flow Chart 2.

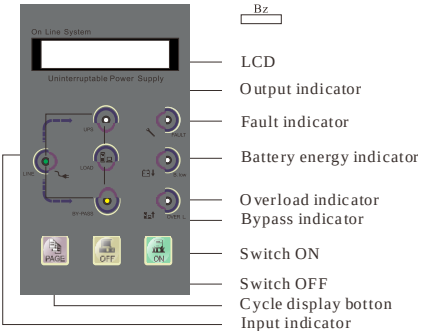


Figure 26

7. Panel indicator status:

(1) UPS running status:

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

(2) Action to be taken:

Please remove load to ensure the percentage of LCD output power indicated is below 100%. If the problem is still present after removing load, please refer to flow Chart 3 of status handling.

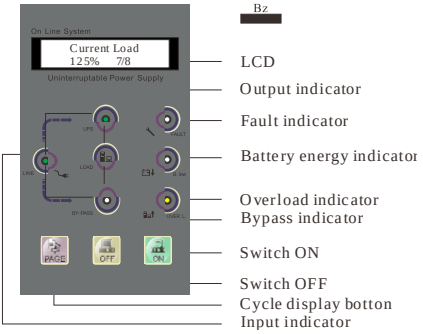


Figure 27

8. Panel indicator status:

(1) UPS running status:

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

(2) Action to be taken:

Please refer to flow Chart 4 of status handling.

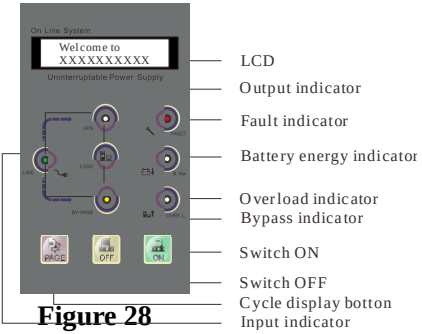


Figure 28

9. Panel indicator status:

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

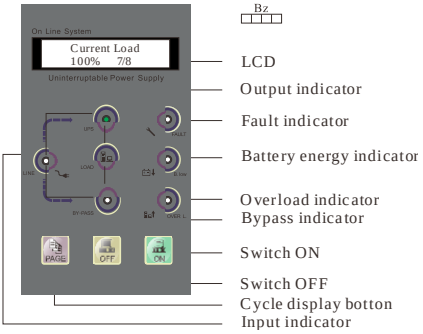


Figure 29

(2) Action to be taken:

If utility is disconnected normally, please remove non-critical loads to increase used time. If it is disconnected abnormally, please refer to flow Chart 1 of status handling.

10. Panel indicator status:

(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) Action to be taken:

UPS will shut down, please save files and shutdown your computers.

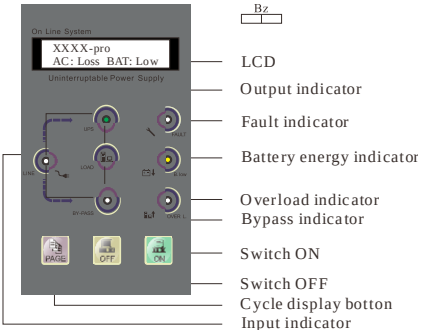


Figure 30

11. Panel indicator status:

(1) UPS running status:

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

(2) Action to be taken:

When utility power comes back, UPS will automatically restart. If utility power is disconnected for a long time (above 6 hours), please turn off UPS according to switch on/off program for power disconnection of long time.

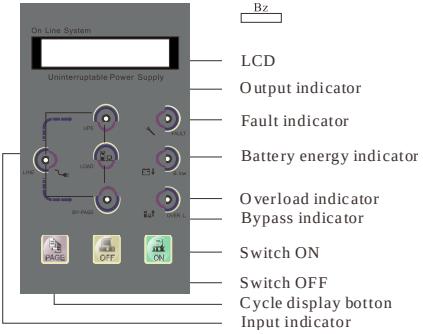
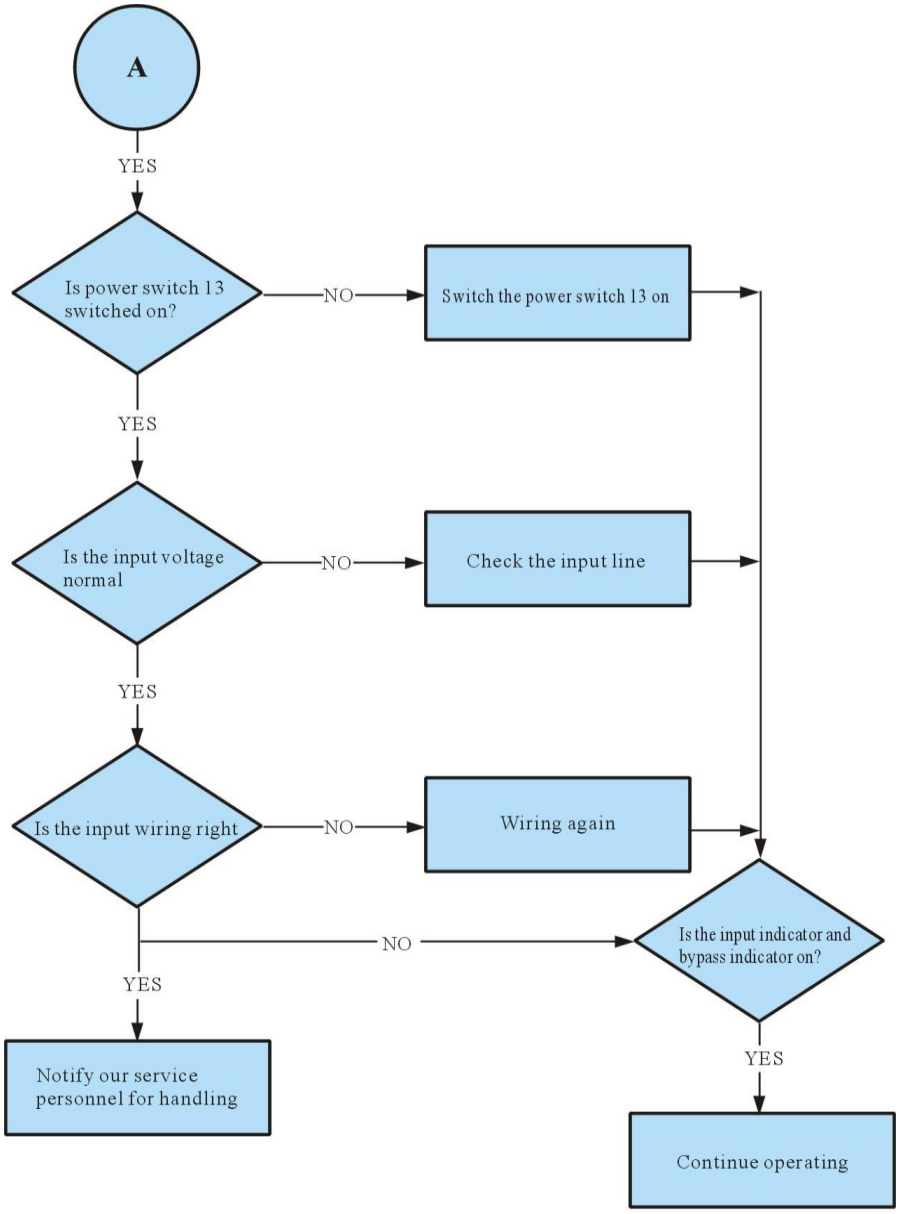
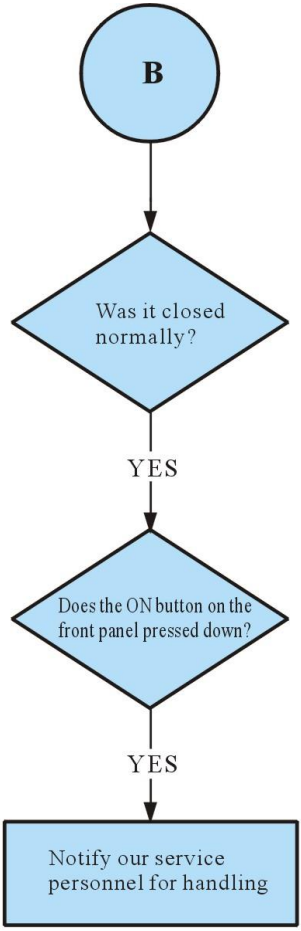


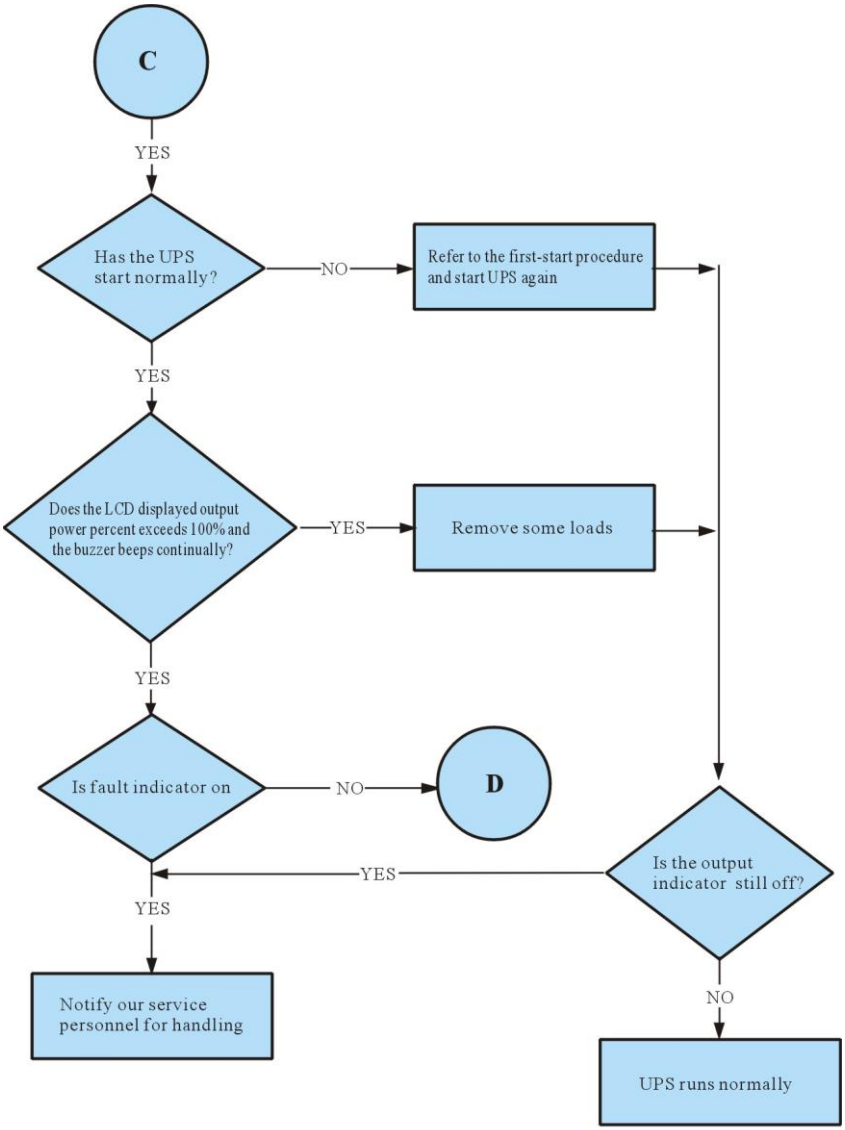
Figure 31



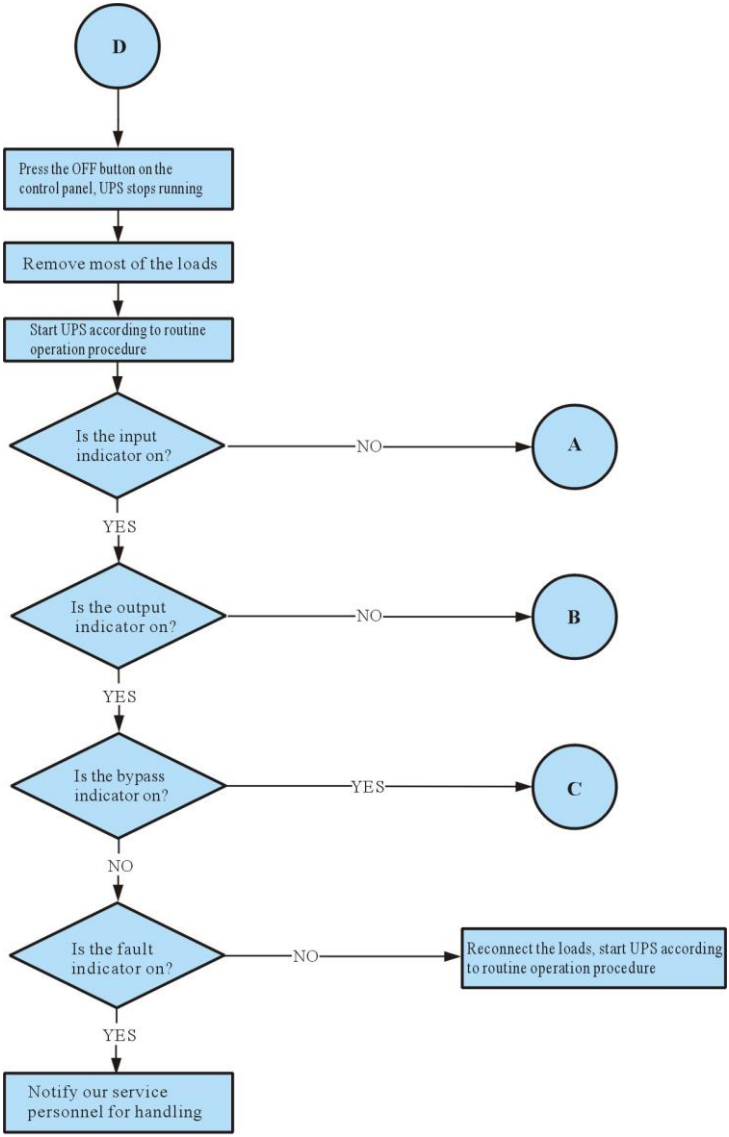
Flow chart 1 of status handing



Flow chart 2 of status handing



Flow chart 3 of status handing



Flow chart 4 of status handing

7 UPS Configuration in different modes

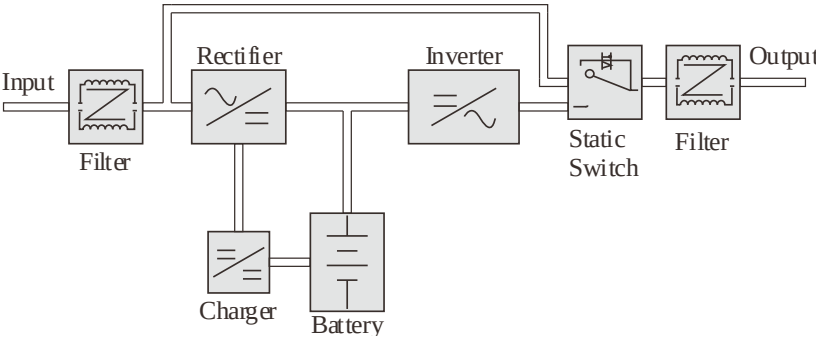


Figure 32

7.1 UPS in normal mode

When UPS runs normally, after high-frequency harmonic noise in utility power is filtered by the filter, utility power charges the battery pack via the charger and keeps battery power at full voltage level, while utility power is converted to DC power via the rectifier and is converted into pure sine wave power via the inverter, feeding the load via the static switch and filter.

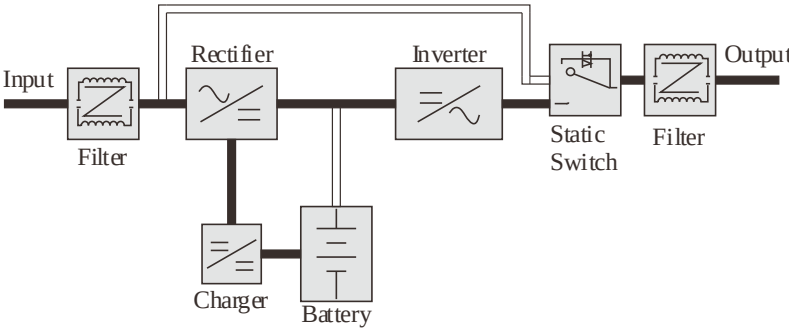


Figure 33

7.2 UPS mode while utility power fail

When the utility fails, battery power is supplied through the inverter and the load is supplied through the static switch.

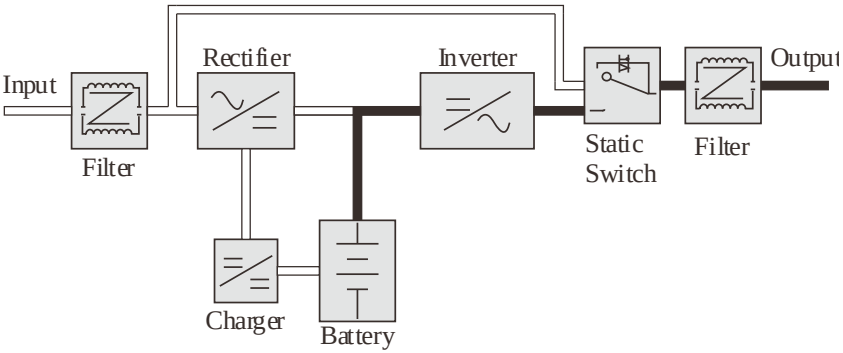


Figure 34

7.3 UPS in static bypass mode

The UPS will switch to bypass in the following conditions:

1. Overload
2. Inverter failure
3. During start-up
4. When the inverter is switched off
5. UPS over-temperature.

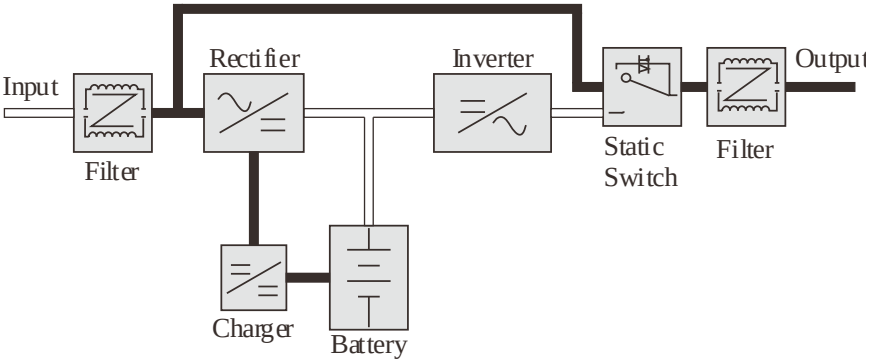


Figure 35

7.4 Battery and charger

1. When the breaker on back panel is on the position of “ON”, the batteries can automatically be charged and the charger can charge to

90% of the battery capacity after 8 hours.

2. The following chart will give a rough estimate on discharge times during utility failure.

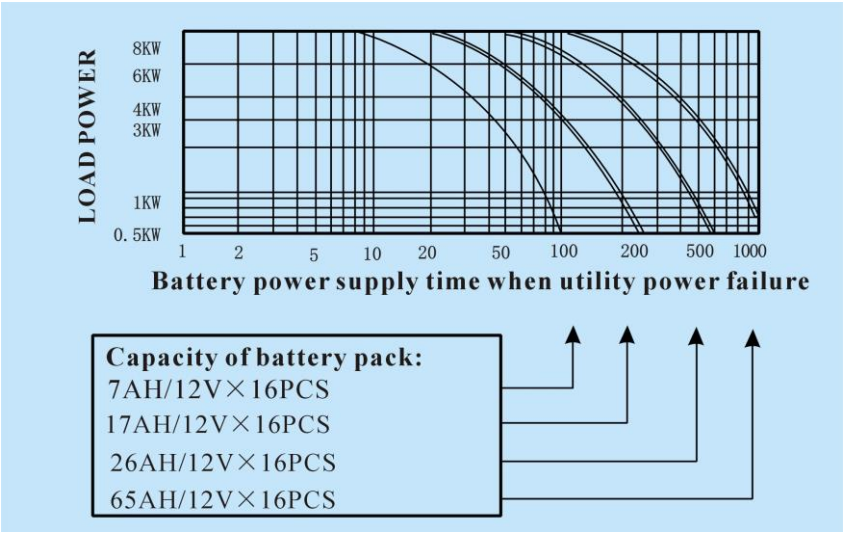


Figure 36

3. Should you wish to extend battery autonomy time, please contact your closest UPS service centre.
4. Keep the batteries fully charged to extend the battery life.

7.5 Daily maintenance

1. UPS should be cleaned and maintained termly, avoid any dust.
2. Please clean UPS lightly with a soft cloth.
3. Termly inspect all connections and avoid heat, looseness or humidity.
4. Please keep good ventilation at inlet/outlet holes, termly inspect the holes and ensure they are obstruction free.
5. The battery is sealed lead-acid and maintenance-free. Batteries must be inspected once every six months.

8 Communication interface

1. Monitoring software is supplied with the UPS for monitoring purposes.
2. A serial cable is supplied for communication between the UPS and computer. The supplied serial cable connects to the RS232 communication interface on back panel of UPS. The user is able to monitor the status of the UPS through the computer interface software works on operating software such as WINDOWS, LINUX, NOVELL, etc. When utility power is disconnected, the UPS notifies via the software that there is a utility fault and send out alarm information. A predetermined time can be set in order for the software to automatically save files and shutdown the operating system. When utility power returns, the UPS will automatically run and system can automatically start.
3. Transmitted data from the UPS includes input voltage value, output voltage value, output frequency, input frequency, battery capacity percent, used load percent, UPS internal temperature, etc.

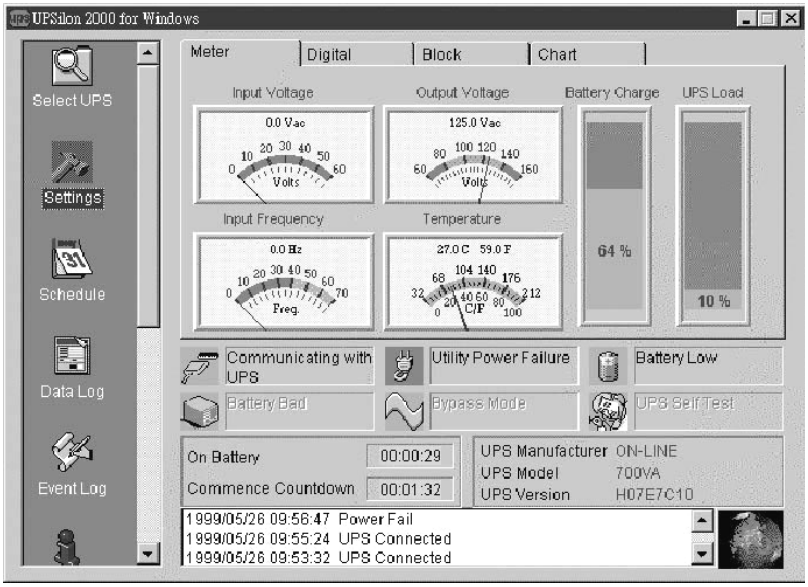


Figure 37

4. Serial cable

   RS232 appearance, figure 38

   The pinout of RS232 is:

   PIN2: RS232 RXD
   PIN3: RS232 TXD
   PIN5: GND

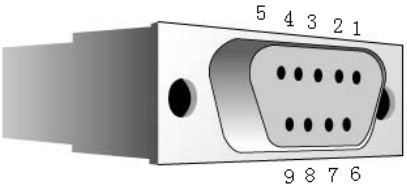
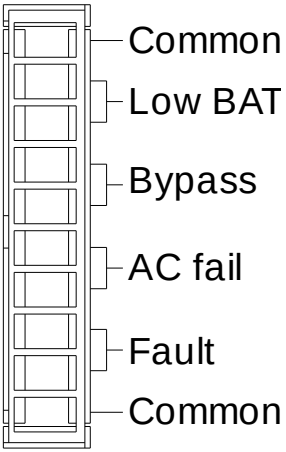


Figure 38

5. Dry contact (optional)



Common	Fault		Ac fail		Bypass		Low BAT		Common
1	2	3	4	5	6	7	8	9	10

1. Pin 1 and 10 are common contact
2. Fault: Pin 2 is NO type contact, pin 3 is NC type contact. When UPS works normally, pin2 and pin 1 are open; when UPS fails, pin2 and pin1 are closed, whereas pin3 and pin 1 are open.
3. AC fail: pin 4 is NO type contact, pin 5 is NC type contact. When AC is normal, pin 4 and pin 1 are closed; when AC abnormal, pin 4 and pin 1 are closed, whereas pin 5 and pin 1 are open.
4. Bypass: pin 6 is NO type contact, pin 7 is NC type contact. When UPS works normally, pin 6 and pin 1 are open; when UPS works in bypass, pin 6 and pin 1 are closed, whereas pin 7 and pin 1 are open
5. Low BAT: pin 8 is NO type contact, pin 9 is NC type contact. When UPS works noramlly, pin 8 and pin 1 are closed; when UPS battery low, pin 8 and pin 1 are closed, whereas pin 9 and pin 1 are open.

9 SPECIFICATION

Model	1KVA	2KVA	3KVA	4KVA	6KVA	8KVA	10KVA	12KVA	15KVA	20KVA
AC input										
Voltage	160-260VAC or 160-310VAC									
Frequency	50)Hz±5%									
Phase	Single									
Max.	8.5A	14A	17.5A	22.5A	31A	40A	50A	60A	70A	90A
AC output										
Voltage	230VAC									
Frequency	50Hz									
Voltage stability	±1%									
Frequency stability	±0.5% (battery mode)									
Wave form	SPWM sine wave									
Power factor	0.8									
Distortion	＜3%(linear load)									
Transient response	≤4%(100% load ～ 0% load)									
Battery										
Voltage	48VDC/192VDC			192VDC						
Rated charging current	Standard:1.2A long run： 6A， 12A (optional)									
Model	Maintenance-free lead-acid battery									
Runtime	Refer to figure 39									
Charging	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 a long-time.									
UPS abnormal	Fault indicator light is solid on, buzzer continuously beeps for a long-time.									

Model	1KVA	2KVA	3KVA	4KVA	6KVA	8KVA	10KVA	12KVA	15KVA	20KVA
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									
LCD display	input, output voltage, frequency, battery voltage, output power (%), temperature									
Battery BVL	One LED, on when battery low voltage									
UPS status indicator light	Utility, inverter, bypass, UPS abnormal (fault)									
Environment										
Temperature	0-40℃									
Humidity	20-90% non-condensing									
Noise	＜56dB((1m away from enclosure)					＜59dB((1m away from enclosure)				
General										
Output socket	Terminal plate									
Unit weight	80Kg	85Kg	99Kg	102Kg	108Kg					
Unit weight (no battery)	45Kg	50Kg	54Kg	57Kg	63Kg	105Kg	115Kg	125Kg	180Kg	200Kg
Dimension (mm) W×D×H	230*580*720 250*500*635(no battery)					305*585*864(no battery)			409*798*1044(no battery)	
Others										
Full efficiency	＞82%			＞85%		＞88%				
Transform time when utility fault	0ms									
Communication interface	RS232 interface (RS485，SNMP，dry contact)									

10 Shipping list

Order	Consent	Number
1	UPS	1
2	UPS user manual	1
3	Intelligent monitoring software	1
4	RS232 Computer port cable	1