1.Profile

1. Preface

This unit is designed to apply for the computer, accurate electronic equipment and the like, featuring easy operation, compact casing and high quality.

2. 5 factors to be considered upon design

I. Compact size
11. Light weigh
111. Graceful outlook
IV. Easy maintenance
V. Environment-protection materials

3. Precautions

Please read and adhere to the following instructions for easy operation and maintenance.

I. Follow the instruction step by step.
11. Handle with care.
III. Power the unit according to the instruction.
IV. DO NOT remove the cover in case of damage to the equipment and personnel.
V. Charge the battery every three-month if the unit is put away for future use.
VI. Always avoid overload in case of unit failure.
VII. If the machine is in the state of malfunction, follow the step of Fault Handling.
VIII. Keep the unit neat.

2.Physical specification and function

Mains indicator: utility power input indication.
2. Bypass indicator: utility power output indication.
3. Output indicator: inverter output indicator.

4. Battery capacity indicator: indicate battery will discharge completely.
5. Overload indicator: overload indication.
6. Fault indicator: UPS malfunction indication.
7. LCD display: value display in digit

(1).AC: IN (loss) BAT: OK (low)
No output (bypass output, inverter output)

(2).Input voltage: input voltage display
220 Vac # 1

(3).Output voltage: output voltage display
220 Vac # 2

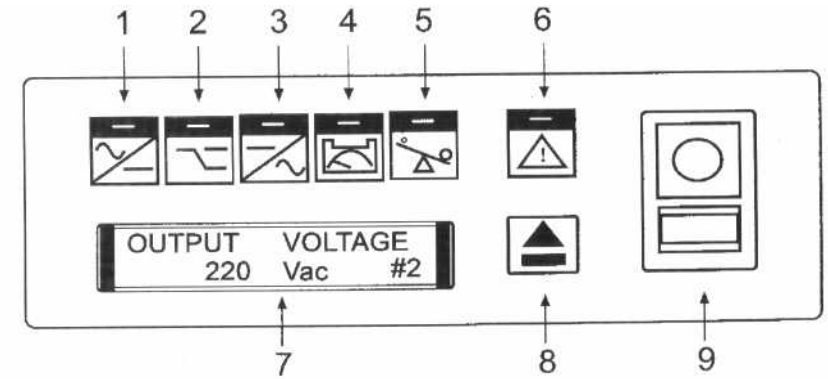


Figure 1. Front panel indicator symbol instruction

(4).Input frequency: input frequency display
50 (60) HZ # 3

(5).Output frequency: output frequency display
50 (60) HZ # 4

(6).Battery voltage:battery voltage display
220 Vdc #5(4~30KVA) 110Vdc (2.3KVA) 55Vdc (1KVA)

(7).Output power:output power percentage display
100% # 6

8. Page up and down button: turning pages by pressing the button to display UPS starus.
9. UPS power on-off button
   (1) Press the UPS power on-off button, the inverter inside the inverter starts to work. About 20 seconds later, the unit output is provided by inverter instead of by utility power with pure AC output in sine waveform.
   (2) Press the UPS power on-off button again to turn off the inverter,with the unit being powered by utility power in bypass mode.

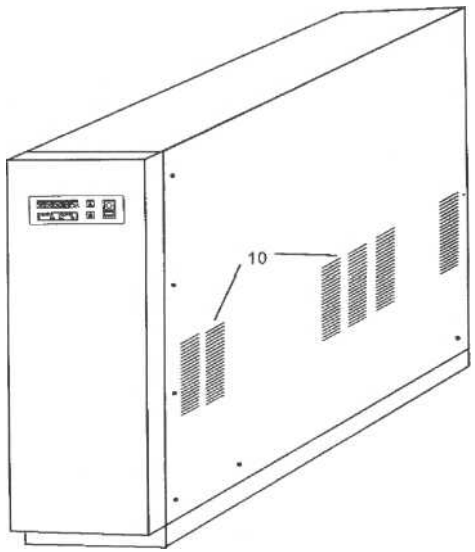


Figure2:Front outlook

10. Ventilation intake.
11. Distribution wire intake.
12. DB-9 communication interface socket: standard interface set between the unit and computer.

13. Power supply switch: taking control of input, output and battery power supply.
14. Distribution terminals port.
15. Movable wheels:
    4 wheels are available in the bottom.

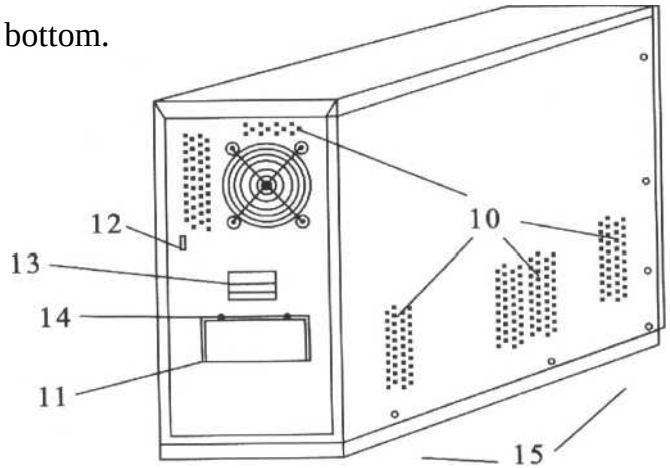
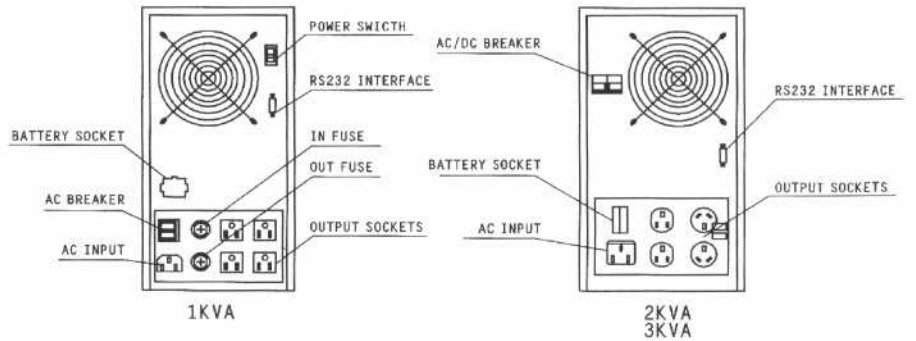


Figure3: Rear panel outlook



3.Setting up

(1). Transportation

1. Firstly disconnecting all line.
2. Handle carefully.
3. DO NOT turn the unit upside down.

(2). Placement

1. DO NOT put the unit on the uneven surface.
2. Allow adequate ventilation all around the unit so that heat from the unit can properly disperse. DO NOT install the unit in an air-blocked area.
3. Avoid direct sunshine, rain or moist air.
4. Keep away from fire or high temperature.
5. DO NOT place articles on the top of unit.
6. Environment temperature: 0℃-V40℃.

4. Installation

(1). Input

1.Prohibit to employ normal plug for connection, because the maximum current of normal plug is 15A, which **will** lead to overload and damage to the unit.

2. Connect the unit input with 220V.

3. Wire connection

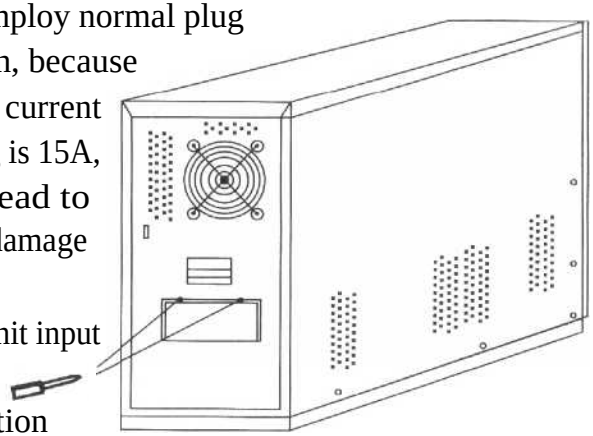


Figure 4

a. Unscrew the nail as shown in figure 4

b. Open the lid, and distribution terminal port under the power switch can be presented as shownin figure 5.

4. After completion of wire connection, put the lid back.

5. Connect the input wire, output wire and battery wire from distribution wire intake to the terminal.

6. Do NOT reverse the power polarity. Judgment of power polarity is as follows:

(1). Hot line (L): 220V

(2). Neutral (L): 220V to hotline, and 0.5-2 V to ground line.

(3). Ground (G): locate the real ground point

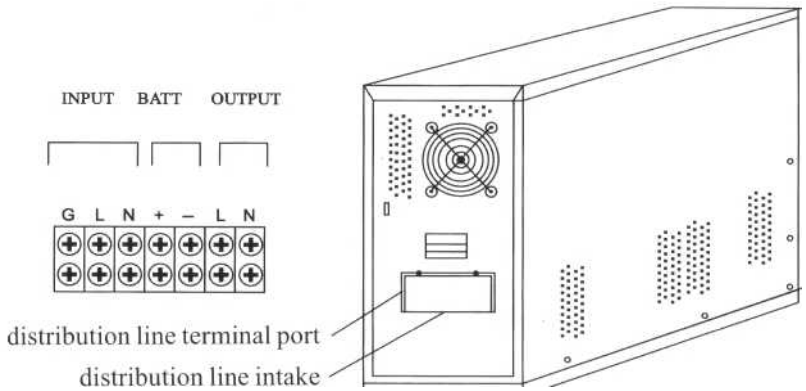


figure 5: UPS distribution terminal block

4. If the voltage tolerance between neutral and ground is more than 5V, reinstall to make sure sound grounding and safety operation.

5. The relationship between input current rating and input

wire diameter is shown in below timetable

Model	Inpu tmax. urrent	Input wire spec	Terminal pec.
2, 3 KVA	17 A	3 mm (soft wire)	5.5~6
4, 6 KVA	34A	5.5 mm (soft wire)	5.5-6
8 KVA	45 A	5.5 mm (soft wire)	5.5~6
10 KVA	56A	8.5 mm (soft wire)	8.5~9
15 KVA	80A	8.5 mm (soft wire)	8.5~9
20 KVA	10A	12 mm (soft wire)	1012
30 KVA	168 A	18 mm (soft wire)	1215

6. Make sure the wire and other relevant component is well qualified to avoid unexpected event such as short circuit.
7. Turning off the unit when connecting wire to make sure safety.
8. Turn off the power supply when carry out connection.
9. When connect wire to distribution terminal, DO NOT share the switch with other equipment as shown in figure 6
7. In 3 phase and 4 wire systems, make sure the voltage between neutral line and three phase R, S, T is close to 220V.
8. If you purchase a unit with 110V input voltage, make sure to connect UPS line L to hot line, N to neutral line, and UPS'-GND to ground object.

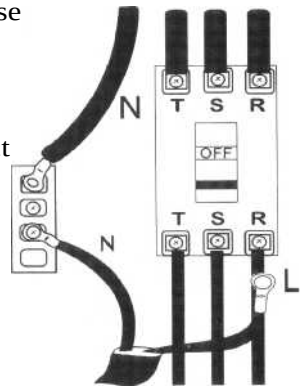


Figure 6: UPS input terminal wire

(2). Precaution:

(1). Make sure the right connection. Adhere to the above-mentioned procedure.

(2). Output

1. Refer to figure 7 for wire connection

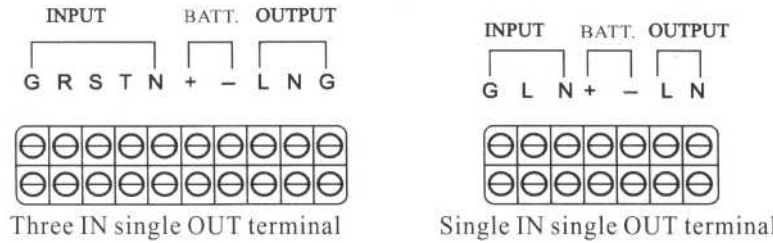


figure 7

2. The wire diameter is according to the load current, DO NOT employ thin wire.
3. Do not allow for short circuit or overload.
4. Relationship between current rating and wire diameter is shown in below timetable.

Model	Input max. current	Input wire spec.	Terminal pee.
2, 3 KVA	II A	2.5 mm (soft wire)	5.5~6
4, 6 KVA	34A	5.5 mm (soft wire)	5.5~6
8 KVA	45 A	5.5 mm (soft wire)	5.5~6
10 KVA	56A	8.5 mm (soft wire)	8.5~9
15 KVA	80 A	8.5 mm (soft wire)	8.5~9
20 KVA	110A	12 mm (soft wire)	1012
30 KVA	168 A	18 mm (soft wire)	1215

5. The ground line is only for reference point to the unit. If any disturbance resulting from ground wire connection or whatever, consult professional.

6. User should provide sound grounding system.
7. Pinpoint the location close to ground object or the starting point in the power distribution plate for ground connection. Refer to figure 8.

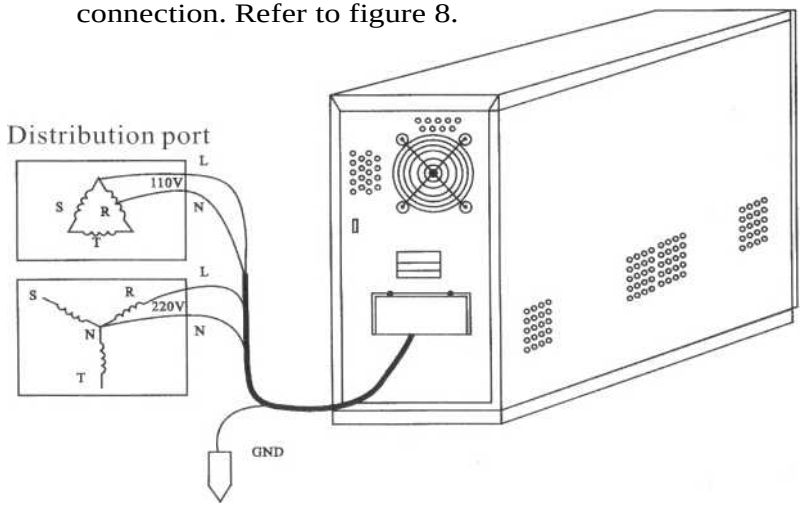


figure 8: input single-phase 220V and 110V distribution wire system

Attention:

Operate according to the input voltage system.

5. Operating procedure

(1). Preparation before startup

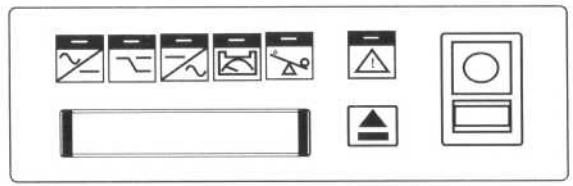
Pay attention to the following steps before start the unit to make sure the normal operation of the unit.

1. Make sure all power switches are in OFF position.
2. Check the setup location again.
3. Make sure the wire is tight.
4. No connection to load.
5. Make sure the input voltage is in accordance with what the unit requires (220V± 10%).

(2). Startup procedure for first time

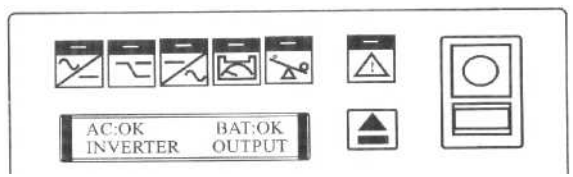
After making sure the above-mentioned procedure, start up the unit by following steps:

1. Turn on the non-fuse breaker in the real panel, meanwhile the mains indicator and bypass indicator in the front panel will be on as shown below figure.

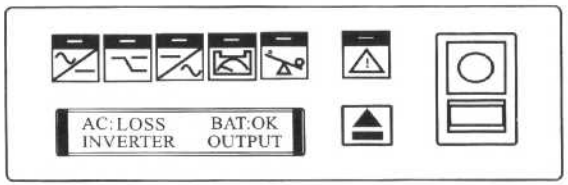


2. Press the UPS power on-off button, as shown below. Mains indicator and bypass indicator in the front panel will be on continuously, and LCD shows that mains is normal, battery is normal, and utility power goes through bypass circuit.

3. After 20 seconds, mains indicator in front panel is on, bypass indicator is off, output indicator is on. LCD shows that AC is in, BAT is normal, and output is from inverter.



4. Cut off the unit input power, and mains indicator is off. LCD shows AC loss, BAT OK, and output is provided by inverter as below figure shows. Buzzer alarms every 4 seconds, and battery capacity indicator flashes, which indicates the unit is powered by batteries. (UPS continuously alarms for 90 seconds, then stop automatically, until the battery discharge entirely, UPS alarms every second).



5. Recover UPS input, mains indicator will be on. Press page up and down button to make sure all display value right, and then first start up procedure is completed. After confirm the output voltage is up to requirement, connect the load to the unit output terminal.
6. Connect to load. Press the Page up and down button to make sure that the percentage of output power is no more than 100%

(3). Daily procedure for startup and turndown

1. For daily turndown of the unit, press the power on-off button to shut down the unit. And now the unit is in the status of bypass, the output is powered by utility power and the batteries are being charged.
2. For daily startup of the unit, press the power on-off button to start up the unit.

(4). Operating procedure for long time not using UPS

1. If DO NOT use the unit for more than 10 days, press all UPS button off, then shut down the unit.
2. If DO NOT use the unit for more than 30 days, follow the first time startup procedure and run the UPS for 24 hours to make sure the battery capacity is full to extend battery life.

Fault handling

(1). Mea ning of symbol:

• ["°,1 ~ ~ Bz

on off flash buzzer buzzer buzzer buzzer

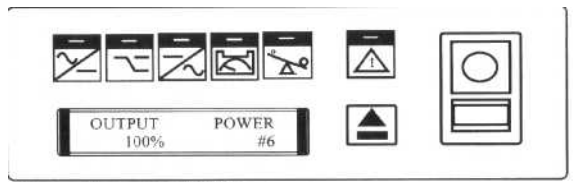
keep every every

alarming 4 sec 1 sec no alarm

(2). Unit operation status display and fault handling

Detect the unit operation status with reference to panel indicator, LCD display value and buzzer alarm. If the unit works abnormally, handle with panel display information

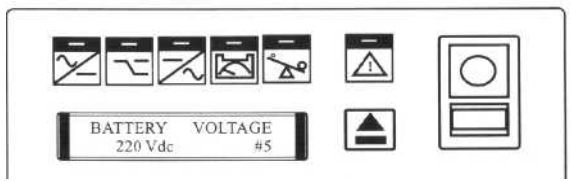
1. LCD display as below shown



a. Unit operation status:
Mains power supply ok, UPS run normally in full load

b. No fault

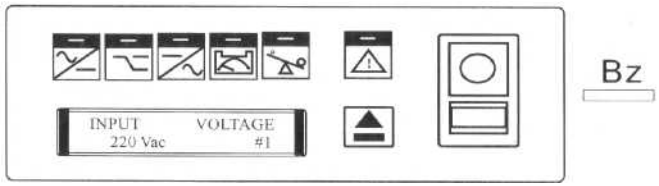
2. LCD display as below shown



a. Unit operation status:
Mains power supply ok, UPS run normally with battery capacity more than 90%.

b. No fault

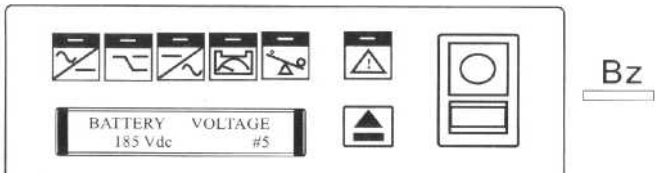
3. LCD display as below shown



a. Unit operation status:
Unit is powered by mains with 200Vac, and UPS work normally.

b. No fault

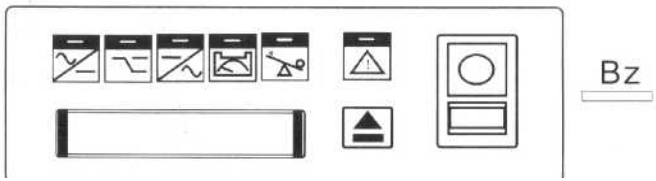
4. LCD display as below shown



a. UPS operation status:
Mains power supply ok, UPS run normally with low battery capacity.

b. Handling:
Charger is in the statue of malfunction, replace charger.

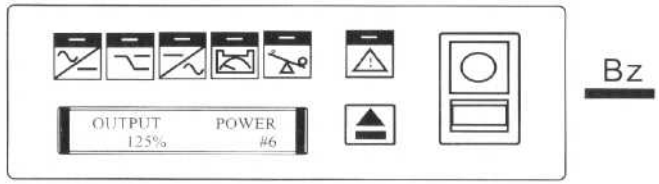
5. LCD display as below shown



a. Unit operation status:
Mains power supply ok, and supplied under bypass mode.

b. Refer to fault handling procedure fault handling procedure figure 10.

6. LCD display as below shown



a. Unit operation status:
Mains power supply ok, UPS run abnormally with 125% load, while overload indicator is on, and buzzer alarms.

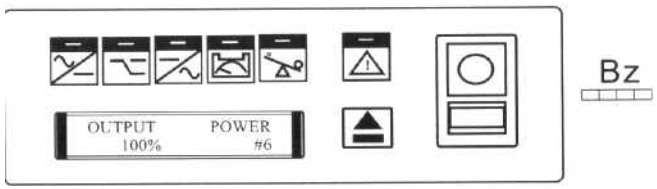
b. Handling
Remove part of load to make the output power percentage less than 100%. If nothing goes change, get engineer for help. If remains unchanged after removing part of the load, refer to fault handling procedure figure 11.

7 LCD display as below shown

a. Unit operation status:
Mains power supply ok,UPS is in the status of malfunction, then powered by mains instead of unit.

b. Handling
Refer to fault handling procedure figure 12.

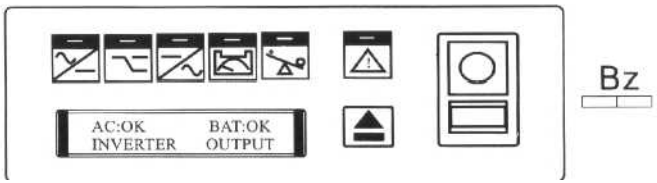
8. LCD display as below shown



a. Unit operation status:
Mains power supply is off, and is powered by batteries with full load. Buzzer alarms every 4 seconds, and battery capacity indicator flashes every 4 seconds (after 90 seconds, buzzer and indicator stop alarming and flashing)

b. Handling
If the mains power supply is off, remove part of load to increase usage time. And refer to fault handling procedure figure 9.

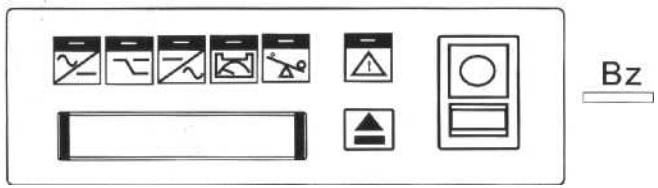
9. LCD display as below shown



a. UPS operation status:
Mains power supply is off, and is powered by batteries. Batteries will be discharged completely very soon, buzzer alarms every second, and battery capacity indicator flashes every second

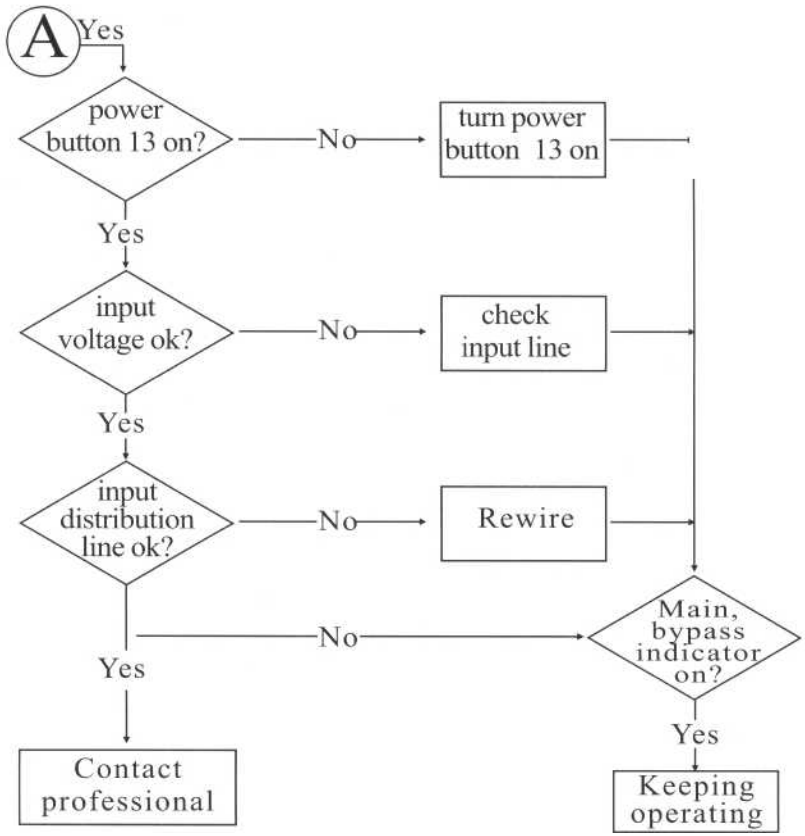
b. Handling
UPS will be off automatically, complete your job quickly and save files.

1 O.LCD display as below shown



a. UPS operation status:
Probably mains power supply is in the event of outage and battery will discharge completely, UPS will be off automatically.

b. Handling
Upon recovery of mains power supply, UPS will restart automatically.
If mains power supply will be in the situation of outage for more than 6 hours, turn off all UPS button.



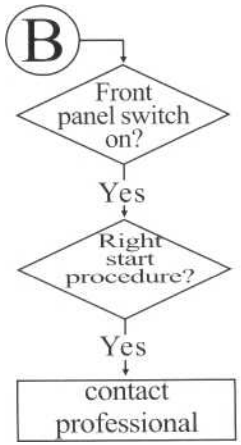


figure 10: fault handling chart

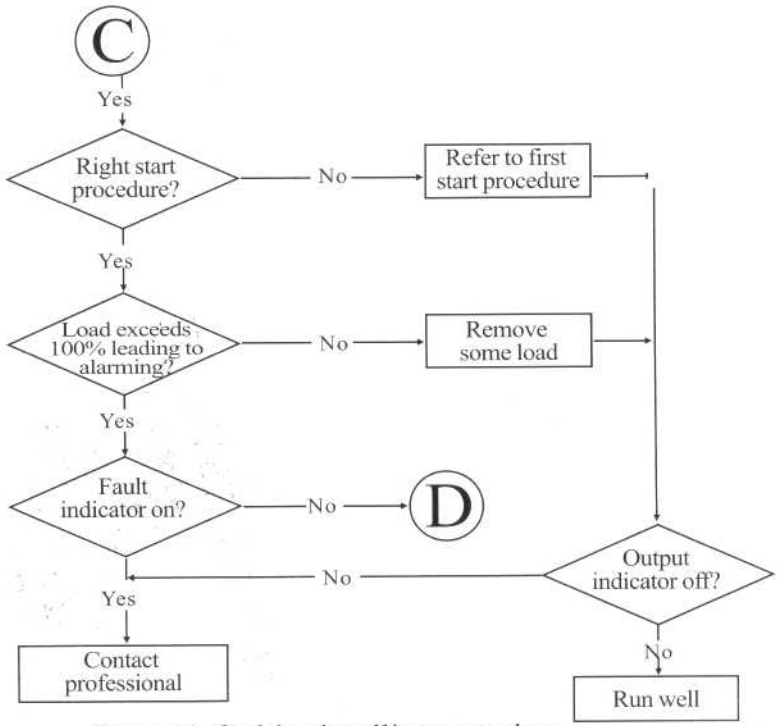


figure 11: faulting handling procedure

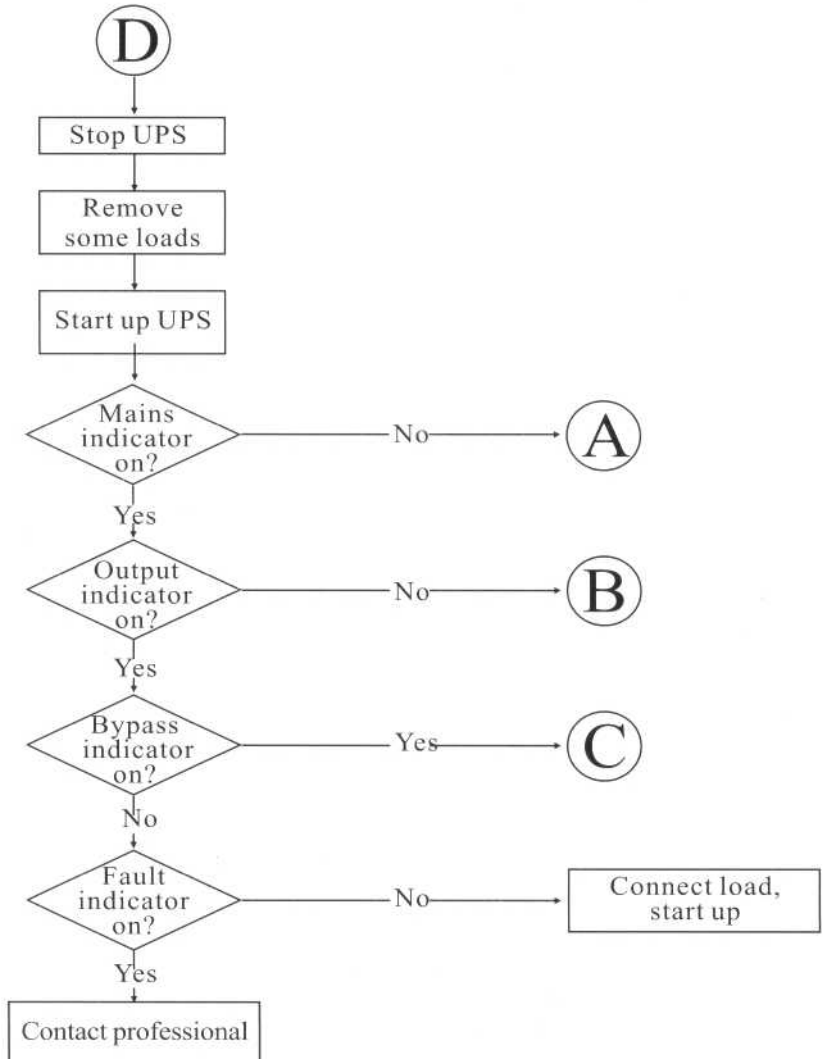


figure 12: faulting handling procedure

Principle

(1). Unit systematic block diagram as shown below

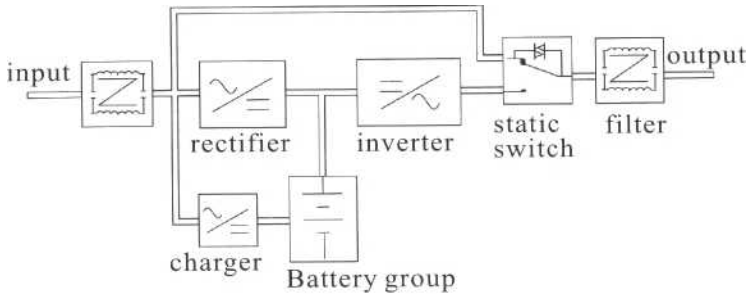


figure 13: unit systematic diagram

(2). Normal operation

When UPS run normally, high frequency harmonics coming from mains can be minimimized by filter as shown in the below figure 14. Some signal will charge the battery through charger to keep the battery capacity in full, while other signal go through rectifier and transform to DC current. Then it will be converted into sine wave by inverter and sent to the end equipment through static switch and filter.

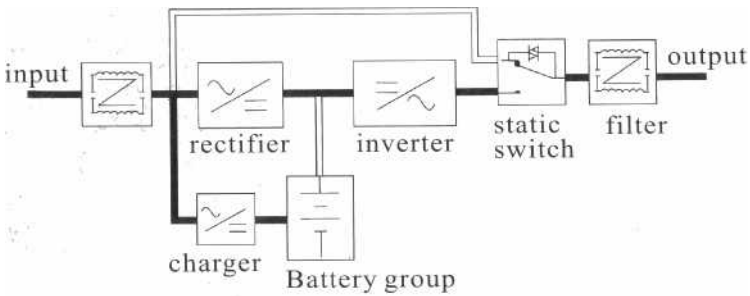


Figure 14: Normal operation

(3). Operation in the event of outage

As shown in the below figure, output is powered by built-in batteries through inverter, static switch and filter for better sine waveform to guarantee continuous power supply.

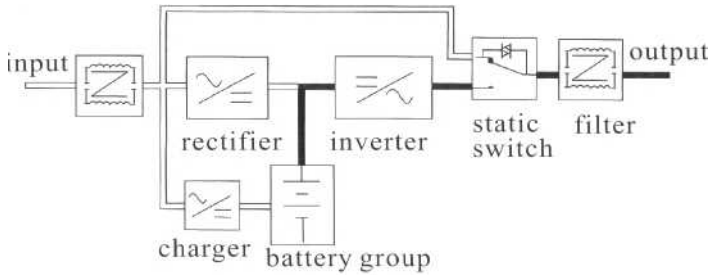


Figure 15: Operation in the event of outage

(4). Bypass

There are five statuses resulting in bypass

a) Overload.

b) Inverter failure.

c) Within 20 seconds after press the UPS power on-off button to startup UPS, during which period the UPS come into operation gradually.

d) During the process when shut up UPS.

e) UPS operate in the status of over temperature inside the unit.

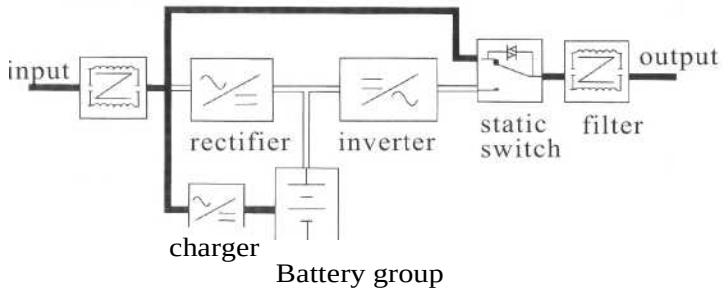


Figure 16: Operation in the event of bypass

(5). Battery and charging

1. Set the power switch on the rear panel to ON position to charge the battery. After 10 hours, the battery can be charged up to 90 % full capacity.
2. Battery supply time is relevant to the load, as below figurehows.

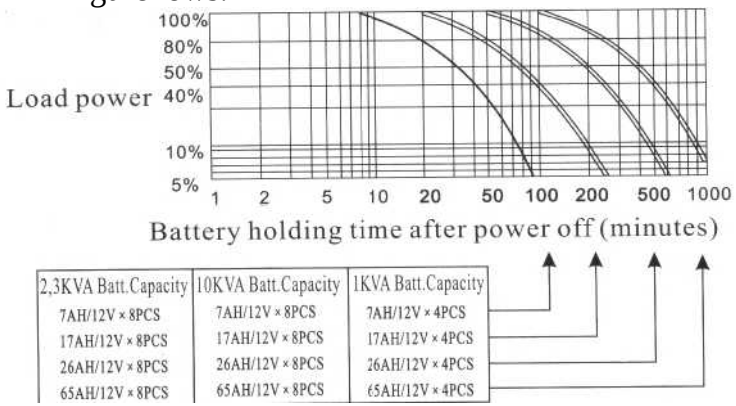


Figure 17: battery supply time versus load

3. Get professional to add outside battery if want to extend backup time.
4. Always maintain the battery in full capacity to extend battery life expectancy.
5. DO NOT remove the cover except for an engineer.

This manual provides installation and operation of UPS, subject to the difference of area and other relevant condition. Consult your supplier for further information.

(6). Daily maintenance

1.Clean the UPS to get rid of dusts timely.

2.Rinse with soft cloth when cleaning.

3.Check all kinds of wire per month.

4.Keep all ventilation intakes well ventilated.

The built-in battery provided is free of maintenance. If the

battery you employ is normal lead-acid battery for automobile use, check the electrolytic liquid per month. Refill with steaming water if the level is low.

Attention:

Maximize the life expectancy of the unit by following the procedure provided in the manual.

8. Communication interface description

(1). Most of computer system is equipped with UPS in case of power outage, so communication interface is provided to connect with computer for monitoring power supply.

(2). UPS status can be displayed by connecting computer with DB9 communication interface in the rear panel on the condition that the operating system such as DOS, WINDOW S3.1, WINDOWS95, WINDOWS/NT, NOVELL should be employed. Alarm signal can be sent in the event of outage. Upon the set time, the unit can be off automatically following set procedure. Upon recovery of utility power, the unit start to operate, and the system start to run.

(3). There are two kinds of communication interface to be selected. One is only for providing UPS status, suitable for PC usage, while the other can offer detailed information for usage in the computer network, work station, monitoring system and etc. Standardized UPS only offer the first type of interface for personal computer, and the expense of software is on users' account.

1. For the first kind of computer interface: only the function of outage of utility power, low battery alarm and auto shutdown is offered.
2. For the second kind of computer interface: RS232

communication port is employed to connect computer for continuous transmitting files. The information provided includes input voltage value, output voltage value, output frequency, input frequency, battery voltage value, load percentage, UPS inside temperature and etc.

(4). Outlook of DB9 is shown below figure 18.

The pin signal of DB9 is as bellows:

Pin l : unit failure

Pin2: utility power outage

Pin3: inverter power on

Pin4: joint ground of Pin l, 2, 3, 5, 8

Pin5: battery will discharge completely

Pin6: turn off unit or RS232 RXD line

Pin7: grounding of Pin6

Pin8: inverter output

Pin9: RS232 TXD

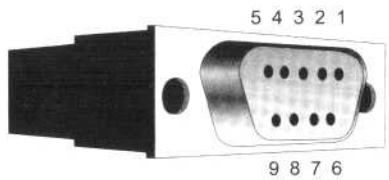


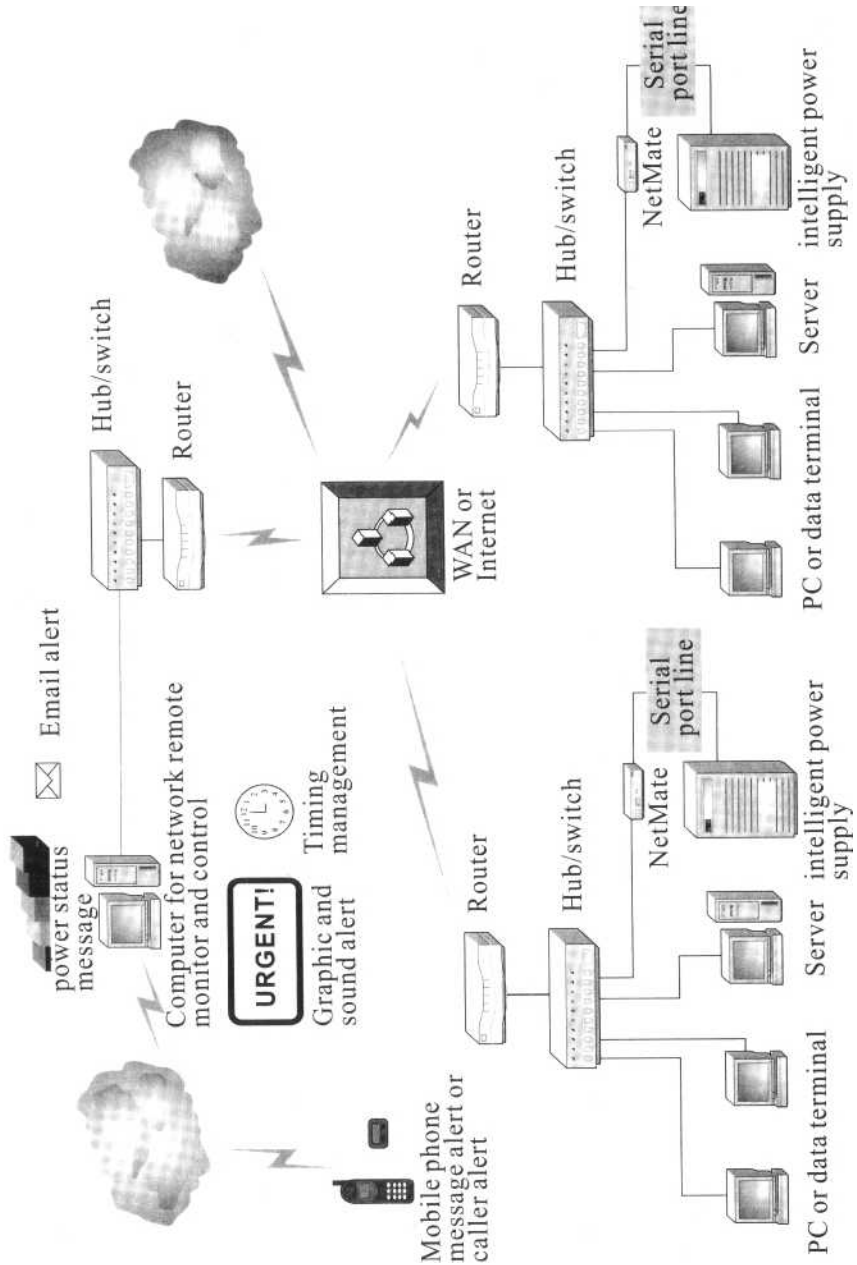
Figure 18: Db9 communication interface

9.Property timetable

Capacity		1K	2K	3K	4K	6K	8K	10K	15K	20K	30K
	Voltage	220VAC/380VAC 25%									
C in-	Frequency	50 (60) Hz +/-5									
put	Phase	Single phase/ three phase									
	Voltage	220 VAC									
	Frequency	50 (60) Hz									
	Voltage stability	+/-1									
	Frequency stability	+/-1 % in the event of outage									
C	Waveform	Sine wave									
out-	Factor	0.7 (lag behind)			1 0.8 (lag behind)						
put	THD	<0.3 (linear load)									
Transient response		4%, (100%) load									
	Voltage	48VDC	96VDC		192VDC						
	Mode	Sealed lead acid battery, free of maintenance									
Batt-er	Supply time	Refer to figure 17.									
y	Charging time	During 8 to 10 hours, up to 90% full capacity									
Efficiency		>85%									
Transfer time in the event of outage		Zero									

Capacity		1K	2K	3K	4K	6K	8K	10K	15K	20K	30K
Ala-rm	Utility power outage	Battery capacity indicator flashes every 4 second, buzzer alarms every 4 second									
	Battery depletion	Battery capacity indicator flashes every second, buzzer alarms every second									
	Overload	Overload indicator is on, buzzer alarms every second									
	UPS failure	Buzzer alarms continuously									
Ins-ide Prot-ec ti-on	Battery	Auto shutdown, non-fuse switch protection									
	Overload	30 seconds later go to bypass after overload of 110%~150%, auto recovery									
	Over-temperatur e	Go to bypass automatically when UPS inside temperature is more than 85?									
	Output short circuit	Current limitation, auto shutdown, non-fuse switch protection									
	UPS failure	Go to bypass automatically powered by utility power									
	Noise filter	10~100KHz at 40dB, 100KHZ~100MHz at 70dB									
LCD Panel	LCD display	Display input voltage, frequency, battery voltage, output power (%)									
	Battery BVL	1 LED will be on in the event of low battery									
UPS status indicator		Utility power, inverter, bypass, failure									
Envi-r onm-e nt	Communication interface	DB9 interface									
	Operation temperature	0~40℃									
	Moisture	20~90%, non-condensing									
	Noise	<58dB, (with a distance of 1 meter to UPS									

10. UPS network remote monitor and control diagram



11. Packing list

Series number	Content	Unit	Number
1	UPS	Piece	1
2	UPS user manual	Piece	1
3	Qualification certificate	Piece	1
4	Upsilon 2000 intelligent monitor laser disc	Piece	1
5	Computer terminal connection cable	Piece	1