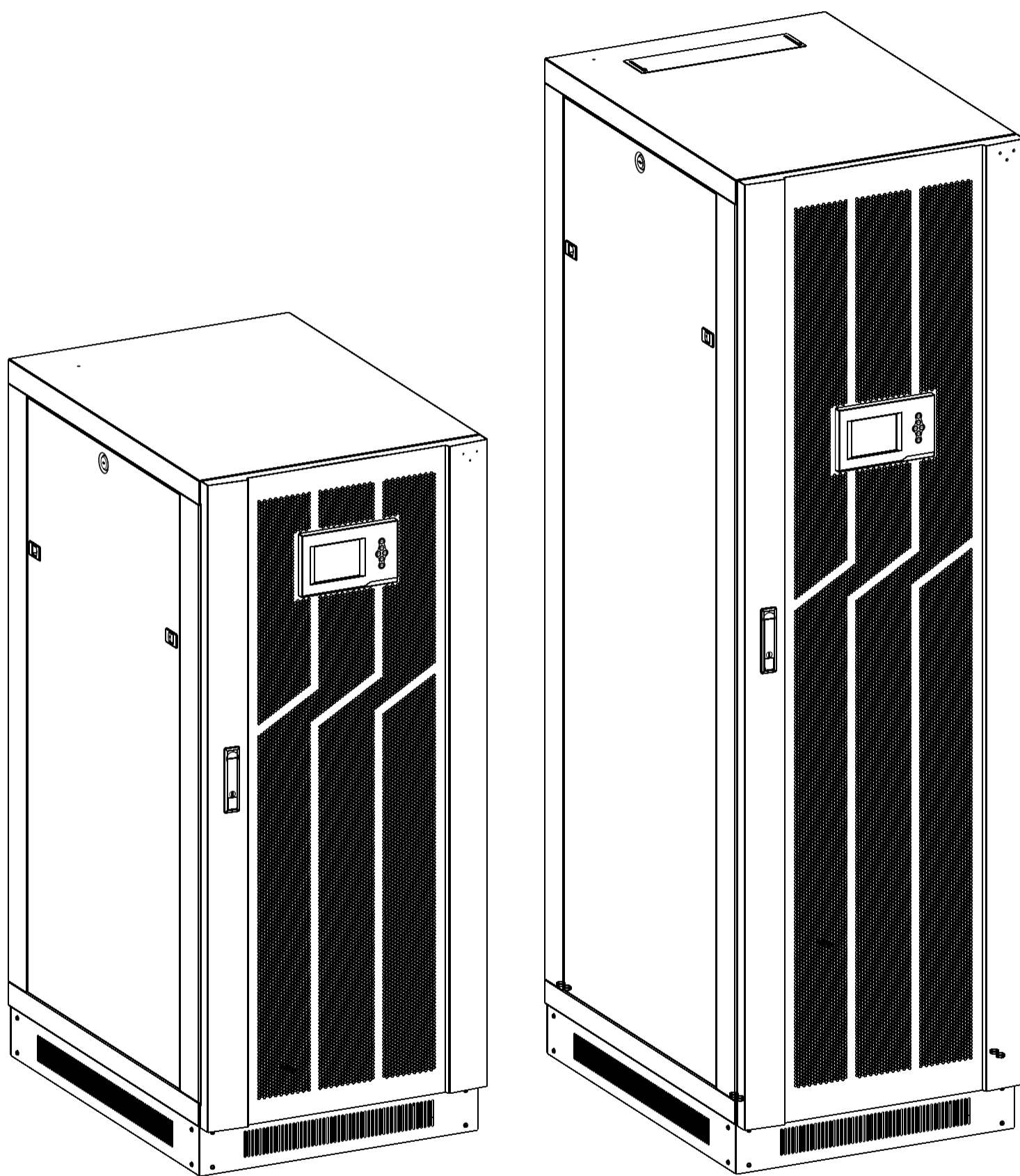


Uninterruptible Power Systems

10~200KVA



Operation Manual

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The information in this document is subject to change without notice.

Publish statement

Thank you for purchasing this series UPS.

This series UPS is an intelligent, three phase in Three phase out, high frequency online UPS designed by our R&D team who is with years of designing experiences on UPS.

With excellent electrical performance, perfect intelligent monitoring and network functions, smart appearance, complying with EMC and safety standards, The UPS meets the world's advanced level.

Read this manual carefully before installation

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

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1 . Safety

Important safety instructions – Save these instructions

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

1.1 Safety notes

- 1 . Even no connection with utility power, 220/230/240VAC voltage may still exist at UPS outlet !
- 2 . For the sake of human being safety, please well earth the UPS before starting it .
- 3 . Don't open or damage battery, for the liquid spilled from the battery is strongly poisonous and do harmful to body !
- 4 . Please avoid short circuit between anode and cathode of battery, otherwise, it will cause spark or fire !
- 5 . Don't disassemble the UPS cover, or there may be an electric shock !
- 6 . Check if there exists high voltage before touching the battery
- 7 . Working environment and storage way will affect the lifetime and reliability of the UPS. Avoid the UPS from working under following environment for long time

Area where the humidity and temperature is out of the specified range(temperature 0 to 40 , relative humidity 5%-95%)

Direct sunlight or location nearby heat

Vibration Area with possibility to get the UPS crashed.

Area with erosive gas, flammable gas, excessive dust, etc

- 8 . Keep ventilations in good conditions otherwise the components inside the UPS will be over-heated which may affect the life of the UPS.

1.2 Symbols used in this guide



WARNING!

Risk of electric shock



CAUTION!

Read this information to avoid equipment damage

2 . Main Features

2.1 Summarization

Our UPS is a kind of three-in- three -out high frequency online UPS, it provides three specifications: The 60k, 100K and 200K. The products are modularized and adopt the N+X redundancy. It can flexibly increase the number of the UPS modules according to the load capacity which is convenient for flexible allocation and gradually investment.

The UPS can solve most of the power supply problems, such as blackout, over-voltage, under-voltage, voltage sudden drop, oscillating of decreasing extent, high voltage pulse, voltage fluctuation, surge, inrush current, harmonic distortion (THD), noise interference, frequency fluctuation, etc..

This UPS can be applied to different applications from computer device, automatic equipment, communication system to industry equipment.

2.2 Functions and Features

Digital control

19-inch standard cabinet

1.4-meter and 2-meter high cabinets are provided according to the user's requirement.

Modularized design

High power-density design

The height of the single module is 3U, a standard 1.4m cabinet can hold 4 pieces modules and a standard 2M cabinet for 10 modles can reach maximum as below:

60KVA cabinet: 4 x 10K/15K modules or 3+1 x 20K modules

100KVA cabinet: 5 x 10K/15K/20K modules

200KVA cabinet: 10 x 10K/15K/20K modules

N+X parallel redundancy

This series UPS adopts N+X parallel redundancy design, user can set different redundancy according to the importance of the load. While the redundancy modules are set more than two, the availability of UPS system will achieve 99.999%, which may satisfy the required reliability of the critical load connected. Through LCD display setting, you may configure the required quantity of the redundancy unit. When the load connected is over the number of the redundancy, the UPS will alert right away. The design of the MTBF(Meantime before Failure) is up to 250,000 hours.

This series can set the number of redundancy modules. When the load exceeds the redundancy setting, the UPS can still work normally and simultaneously send out corresponding warning as long as the load doesn't exceed the total capacity of modules.

Parallel Redundant control system

Optimizing distributed convergence for the cabinet

Separated Bypass

Common Battery

Configurable Battery Voltage (32-40pcs)

Automatic charge current adjustment according to battery capacity connected.

3-Stage Intelligent charging

Touch-screen Super-large LCD display(Optional)

Each module with indiviaul LCD display

Remote Monitoring via SNMP

Optional Accessories available such as Isolation transformer, Distribution Panel, SNMP Card,

Relay Contact Board, etc..

Equip with Maintenance Bypass Switch for easy maintenance purpose.

Superior MTTR(Meantime to repair) & Short shutdown time in maintenance

Centralized monitoring module is also available

EPO function

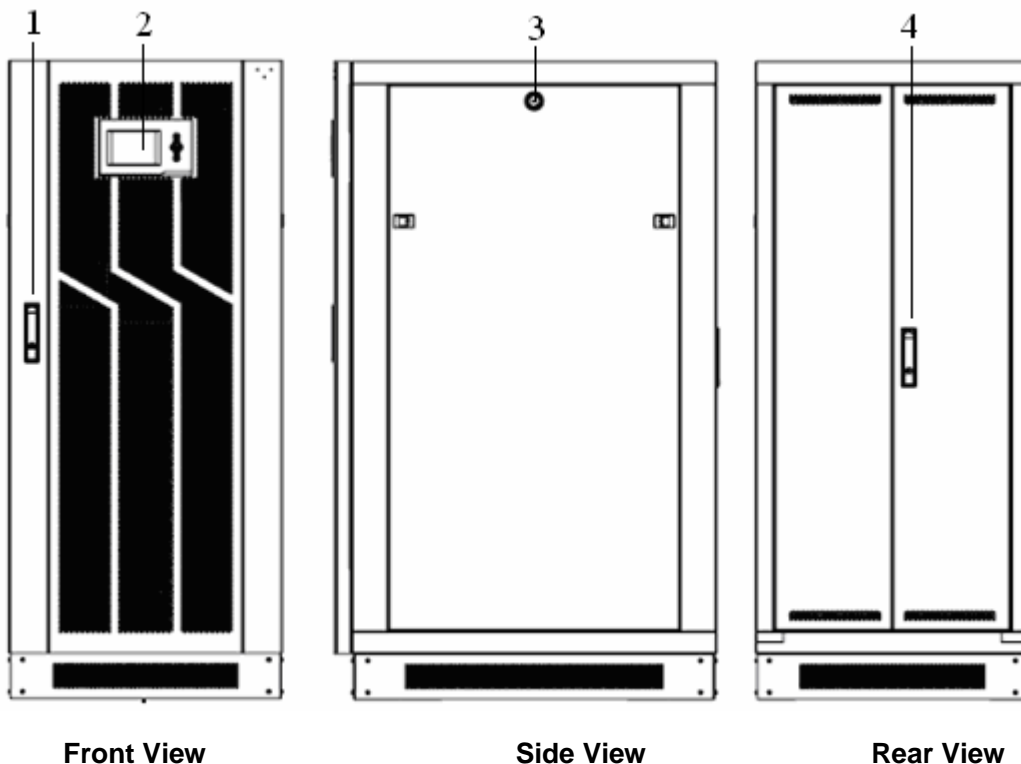
3 . Installation

3.1 Unpack checking

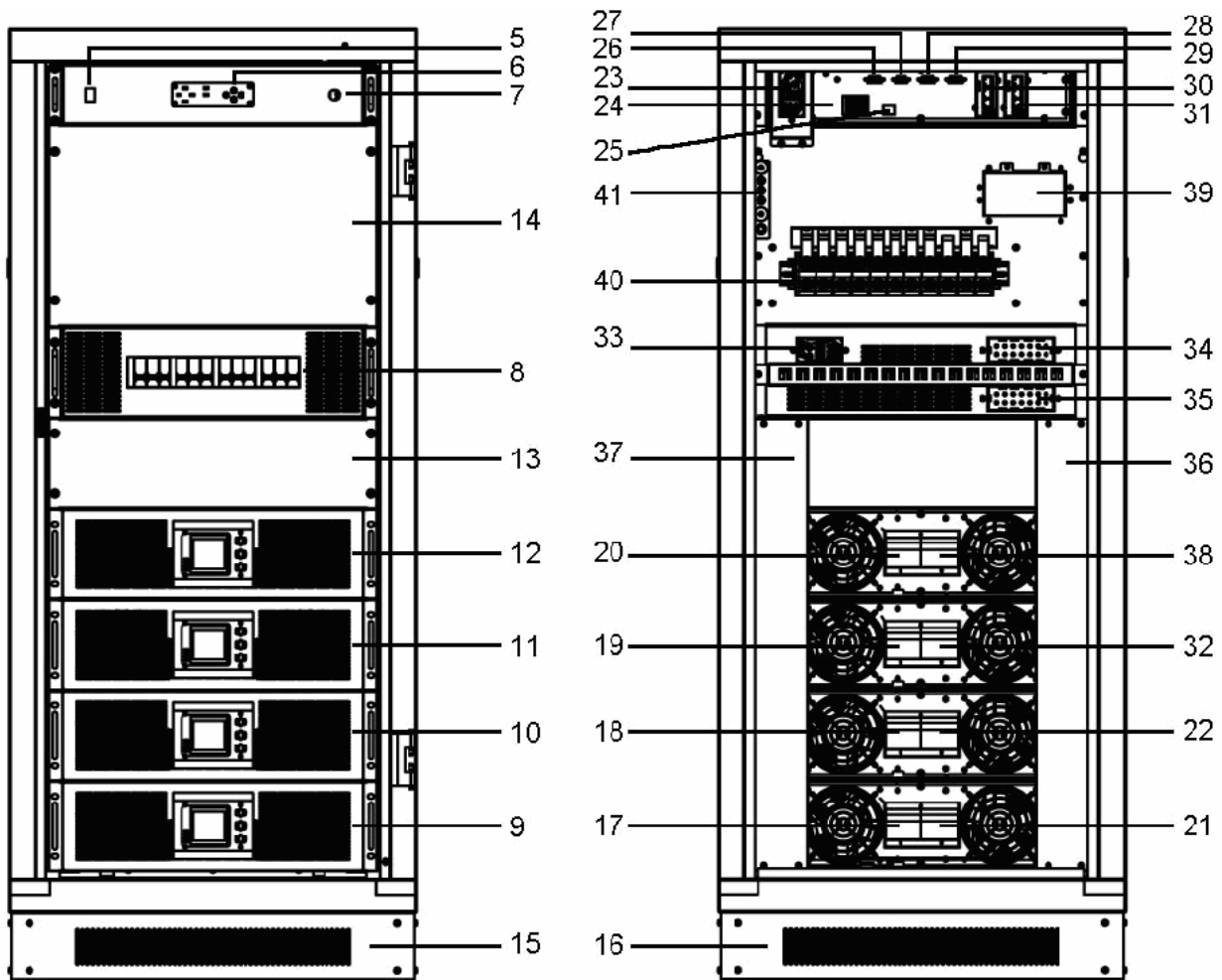
1. Don't lean the UPS when moving it out from the packaging
2. Check the appearance to see if the UPS is damaged or not during the transportation, do not switch on the UPS if any damage found. Please contact the dealer right away.
3. Check the accessories according to the packing list and contact the dealer in case of missing parts.

3.2 Cabinet Outlook

1. 1.4M 19" Rack Cabinet

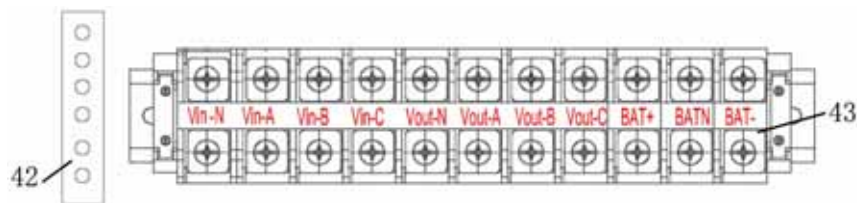


(1) front lock (2) LCD Display (3) Side Lock (4) Rear Lock



Front View(internal)

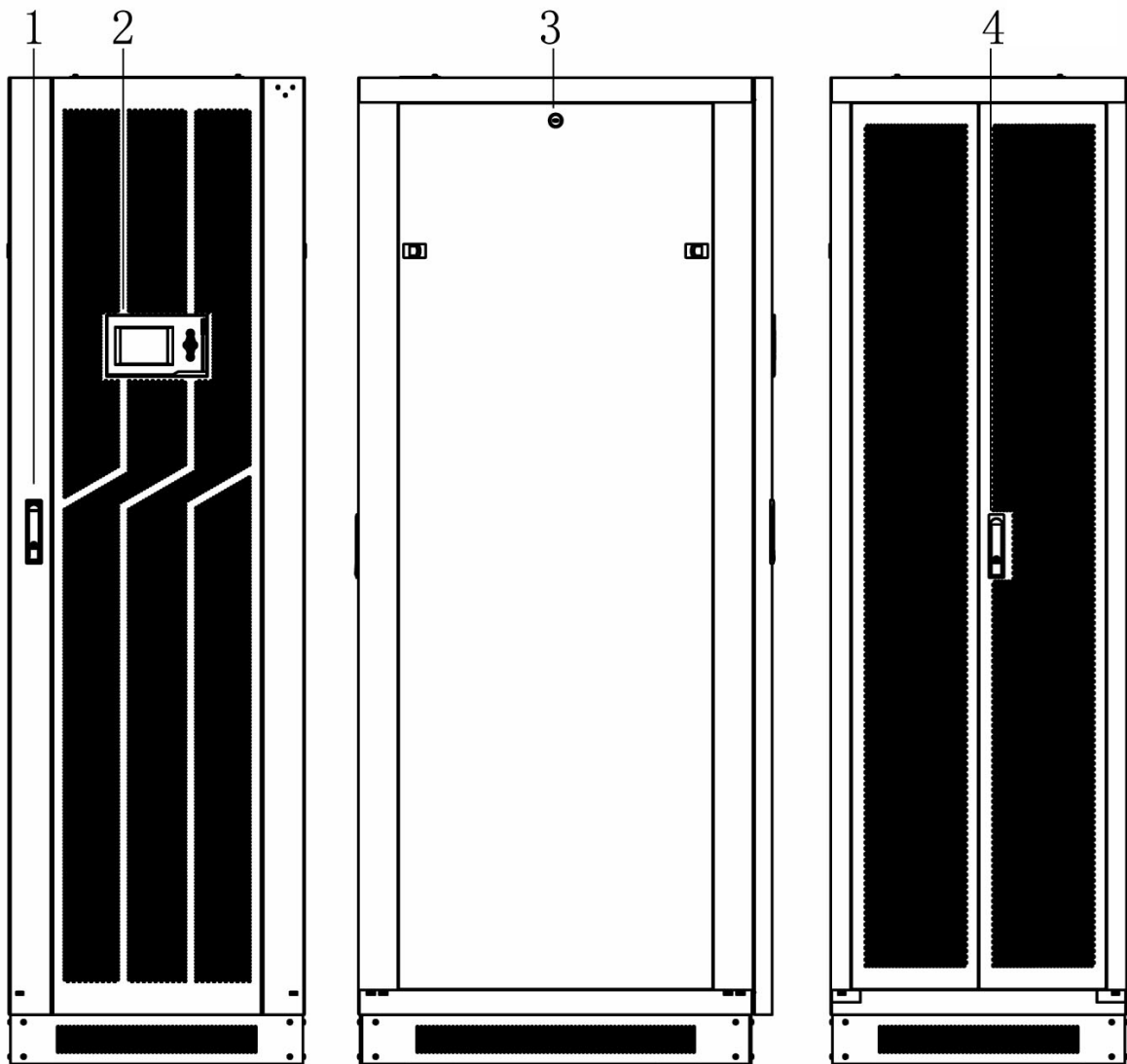
60KVA Rear View (terminal block without cover)



60KVA Terminal Block of the cabinet (terminal block without cover)

(5) Main Switch of Central Monitor Unit (6) LED display of Central Monitor Unit (7) EPO switch (8) O/P Switch (9) UPS Module 1 (10) UPS Module 2 (11) UPS Module 3 (12) UPS Module 4 (13) blind cover (14) Cover for terminal block (15) bottom cover for front door (16) bottom cover for rear door (17) Main Switch for UPS Module 1 (18) Main Switch for UPS Module 2 (19) Main Switch for UPS Module 3 (20) Main Switch for UPS Module 4 (21) bypass switch for power module 1 (22) bypass switch for power module 2 (23) Inter-connecting port for Modules (24) Dry Contact Port (25) LCD connecting port (26) RS485 port (27) RS485 port (28) RS232 port (29) OPTION port (30) Intelligent Network Port (31) SNMP port (32) bypass switch for power module 3 (33) distribution module port -1 (34) distribution module port -2 (35) distribution module port -3 (36) PDU Output (37) PDU input (38) bypass switch for power module 4 (39) maintenance switch & its cover (40) terminal block for Input, output & battery (41) GND

2. 2M 19" Rack Cabinet

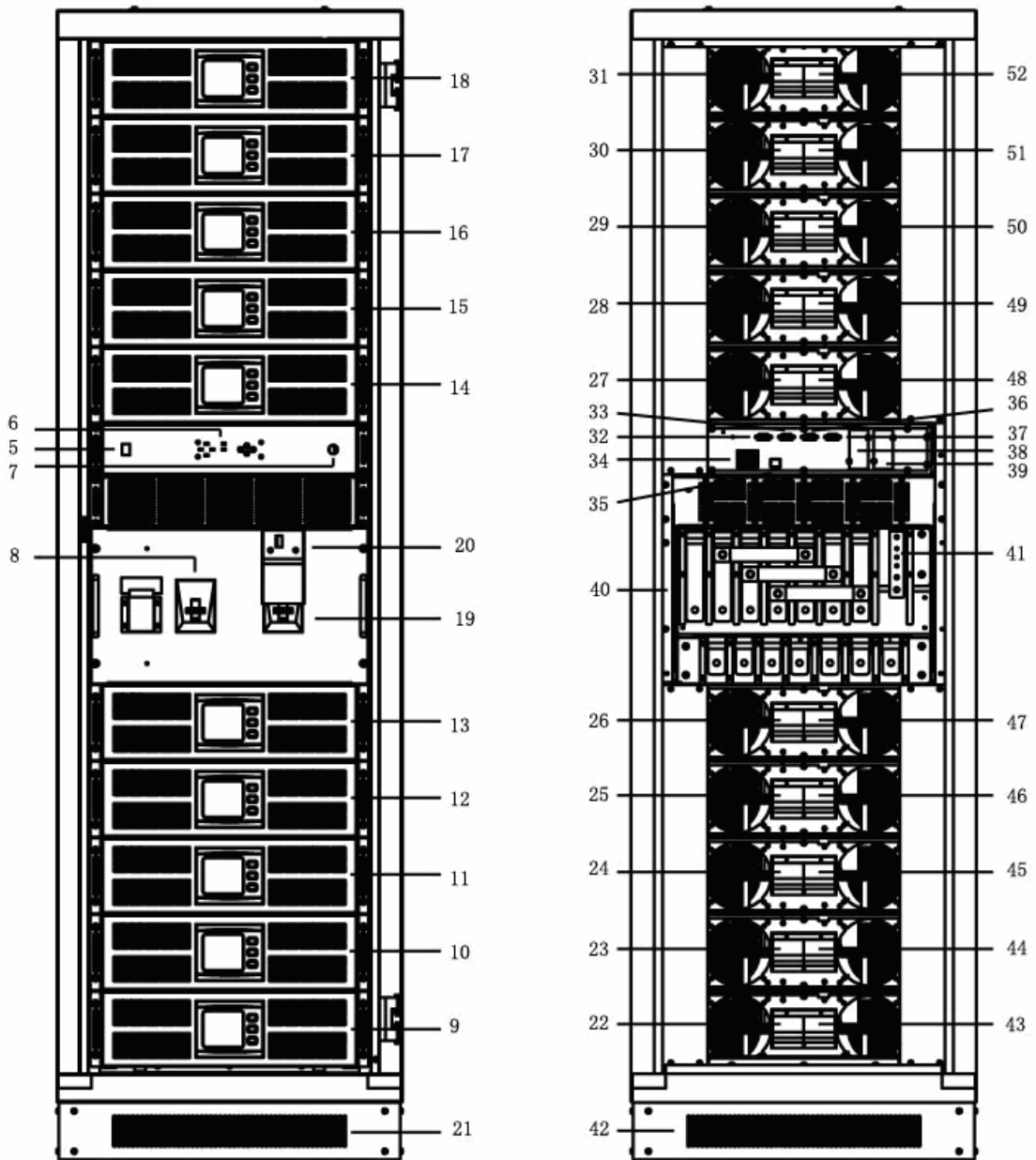


Front View

Side View

Rear View

- (1) front lock
- (2) LCD Display
- (3) Side Lock
- (4) Rear Lock

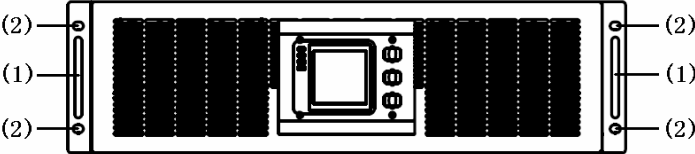


Front View(internal)

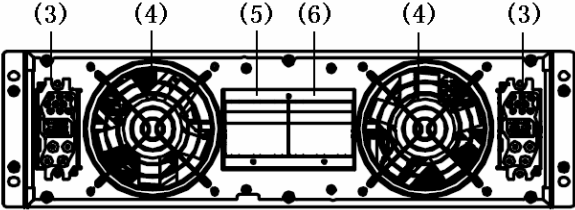
200KVA Rear View (terminal block without cover)

(5)Main Switch of Central Monitor Unit (6)LED display of Central Monitor Unit (7)EPO switch (8) O/P Switch (9)UPS Module 1 (10)UPS Module 2 (11)UPS Module 3 (12)UPS Module4 (13) UPS Module 5 (14) UPS Module 6 (15)UPS Module 7 (16)UPS Module 8 (17)UPS Module 9 (18) UPS Module 10 (19) Maintenance Switch (20) maintenance switch & its cover (21) bottom cover for front door (22)Main Switch for UPS Module 1 (23)Main Switch for UPS Module 2 (24)Main Switch for UPS Module 3 (25) Main Switch for UPS Module 4 (26) Main Switch for UPS Module 5 (27) Main Switch for UPS Module 6 (28)Main Switch for UPS Module 7 (29)Main Switch for UPS Module 8 (30)Main Switch for UPS Module 9 (31)Main Switch for UPS Module 10 (32)RS485 port (33) RS485 port (34) Dry Contact Port (35) LCD connecting port (36) RS232 port (37) OPTION port (38) Intelligent Network Port (39) SNMP port (40) terminal block for Input, output & battery (41) GND (42) back blind cover (43) bypass switch for power module 1 (44) bypass switch for power module 2 (45)bypass switch for power module 3 (46)bypass switch for power module 4 (47)bypass switch for power module 5 (48) bypass switch for Module 6 (49) bypass switch for Power module 7 (50) bypass switch for power module 8 (51) bypass switch for power module 9 (52) bypass switch for power module 10

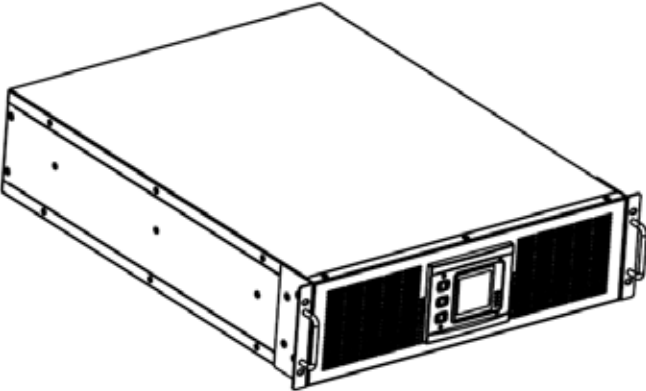
3.3 UPS module appearance



Front View



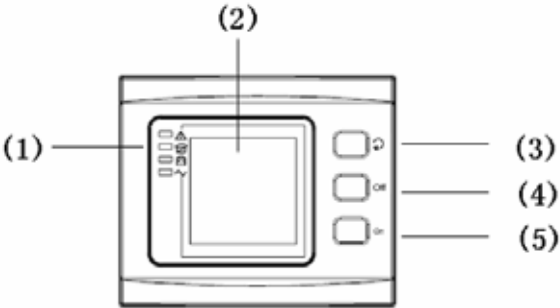
Rear View



Side View

(1) handle (2) screw holes (3) module connector slot (4) fan (5) UPS Module input switch (6) UPS Module bypass switch

3.4 UPS Module LCD control panel



LCD control panel introduction

(1) LED (from top to bottom: "alarm", "bypass", "battery", "inverter") (2) LCD display (3) scroll button (4) Off button (5) On button

3.5 Installation notes

Note: Consider for the convenience of operation and maintenance, the space in front and back of the cabinet should be left at least 100cm and 80cm respectively when installing the cabinet .

Please place the UPS in a clean, stable environment, avoid the vibration, dust, humidity, flammable gas and liquid, corrosive. To avoid from high room temperature, a system of room extractor fans is recommended to be installed. Optional air filters are available if the UPS operates in a dusty environment.

The environment temperature around UPS should keep in a range of 0 ~ 40 . If the environment temperature exceeds 40 , the rated load capacity should be reduced by 12% per 5 . The max temperature can't be higher than 50 .

If the UPS is dismantled under low temperature, it might be in a condensing condition. The UPS can't be installed unless the internal and external of the equipment is fully dry. Otherwise, there will be in danger of electric shock.

Batteries should be mounted in an environment where the temperature is within the required specs. Temperature is a major factor in determining battery life and capacity. In a normal installation, the battery temperature is maintained between 15°C and 25°C. Keep batteries away from heat sources or main air ventilation area, etc.



WARNING!

Typical battery performance data are quoted for an operating temperature between 20°C and 25°C. Operating it above this range will reduce the battery life while operation below this range will reduce the battery capacity.

Should the equipment not be installed immediately it must be stored in a room so as to protect it against excessive humidity and or heat sources.



CAUTION!

An unused battery must be recharged every 6months Temporarily connecting the UPS to a suitable AC supply mains and activating it for the time required for recharging the batteries.

The highest altitude that UPS may work normally with full load is 1500 meters. The load capacity should be reduced when this UPS is installed in place whose altitude is higher than 1500 meters, shown as the following table:

(Load coefficient equals max load in high altitude place divided by nominal power of the UPS)

Altitude (m)	1500	2000	2500	3000	3500	4000	4500	5000
Load coefficient	100%	95%	90%	85%	80%	75%	70%	65%

The UPS cooling is depending on fan, so it should be kept in good air ventilation area. There are many ventilation holes on the front and rear, so they should not be blocked by any exotic obstacles.

3.6 External Protective Devices

For safety reasons, it is necessary to install, external circuit breaker at the input A.C. supply and the battery. This chapter provides guidelines for qualified installers that must have the knowledge of local wiring practices for the equipment to be installed.

External Battery

The UPS and its associated batteries are protected against the effect of over-current through a DC compatible thermo-magnetic circuit-breaker (or a set of fuses) located close to the battery.

UPS Output

Any external distribution board used for load distribution shall be fitted with protective devices that may avoid the risk of UPS overloaded.

Over-current

Protection device shall be installed at the distribution panel of the incoming main supply. It may identify the power cables current capacity as well as the overload capacity of the system .



CAUTION !

Select a thermo magnetic circuit-breaker with an IEC 60947-2 trip curve C (normal) for 125% of the current as listed below.

3.7 Power Cables

The cable design shall comply with the voltages and currents provided in this section, Kindly follow local wiring practices and take into consideration the environmental conditions (temperature and physical support media) .

WARNING !



UPON STARTING, PLEASE ENSURE THAT YOU ARE AWARE OF THE LOCATION AND OPERATION OF THE EXTERNAL ISOLATORS WHICH ARE CONNECTED TO THE UPS INPUT/BYPASS SUPPLY OF THE MAINS DISTRIBUTION PANEL.CHECK TO SEE IF THESE SUPPLIES ARE ELECTRICALLY ISOLATED, AND POST ANY NECESSARY WARNING SIGNS TO PREVENT ANY INADVERTENT OPERATION

For future expansion purpose, it is economical to install power cable according to the full rating capacity initially. The diameter of cable is shown bellow :

UPS cabinet	Cable Dimension			
	AC Input (mm ²)	AC Output (mm ²)	DC Input (mm ²)	Grounding (mm ²)
60KVA	32	32	50	25
100KVA	50	50	75	35
200KVA	100	100	150	75



CAUTION!

Protective earth cable: Connect each cabinet to the main ground system. For Grounding connection, follow the shortest route possible.



WARNING!

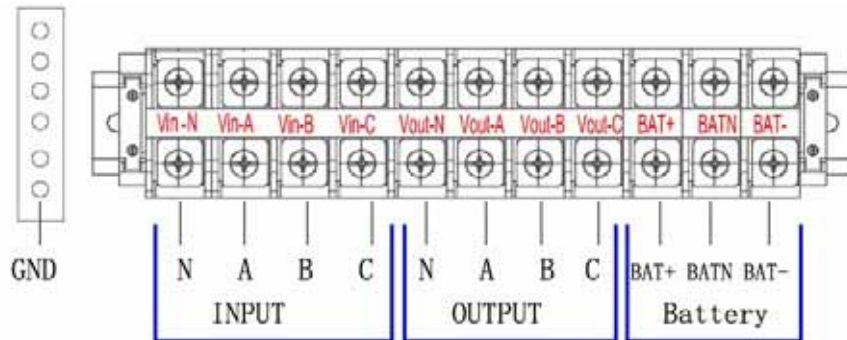
FAILURE TO FOLLOW ADEQUATE EARTHING PROCEDURES MAY RESULT IN ELECTROMAGNETIC INTERFERENCE OR IN HAZARDS INVOLVING ELECTRIC SHOCK AND FIRE

3.8 Power cable connect

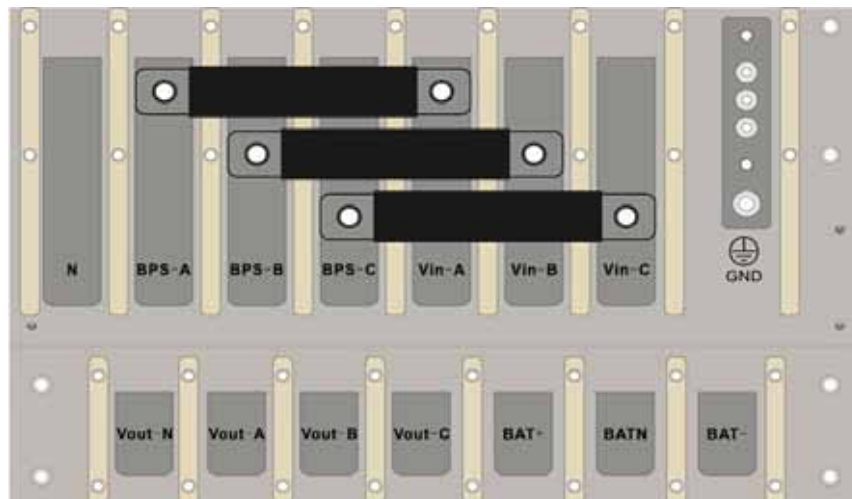
Once the equipment has been finally positioned and secured, connect the power cables as described in the following procedure.

Verify the UPS is totally isolated from its external power source and also all power isolators of the UPS are open. Check to see if they are electrically isolated, and post any necessary warning signs to prevent their inadvertent operation .

Open the UPS rear panel, remove the cover of terminals for wiring easily.



60KVA



200KVA

Choose appropriate power cable. (Refer to the table above) and pay attention to the diameter of the connection terminal of the cable that should be greater than or equal to that of the connection poles;



WARNING!

If the load equipment is not ready to accept power on the arrival of the commissioning engineer then ensure that the system output cables are safely isolated at their ends

Connect the safety earth and any necessary bonding earth cables to the copper earth screw located on the floor of the equipment below the power connections. All cabinets in the UPS must be grounded properly.

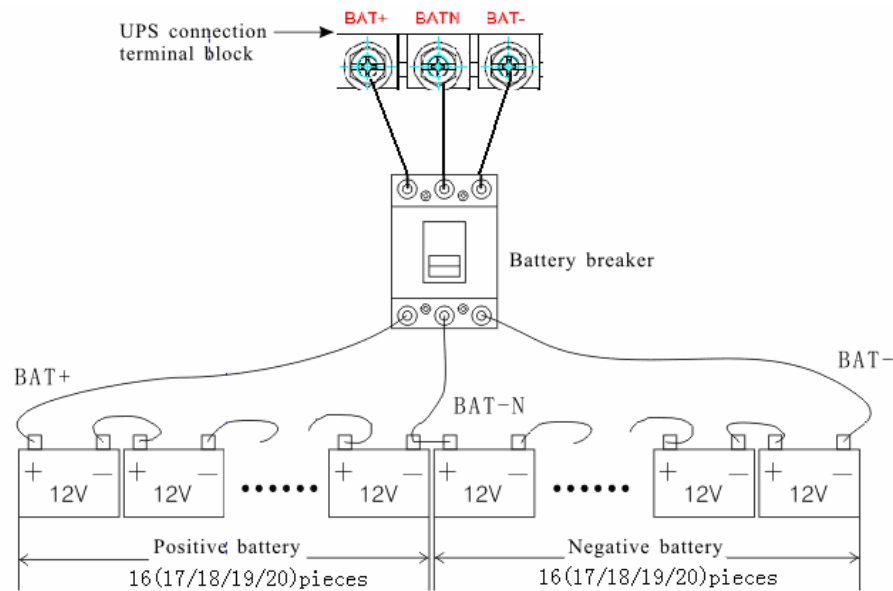


CAUTION!

The earthing and neutral bonding arrangement must be in accordance with local and national codes of practice.

3.9 Battery connection

The UPS adopts positive and negative double battery framework, total 32(optional 34/36/38/40) in series. A neutral cable is retrieved from the joint between the cathode of the 16th (17th/18th/19th/20th) and the anode of the 17th (18th/19th/20th/21th) of the batteries. Then the neutral cable, the battery Positive and the battery negative are connected with the UPS respectively. The battery sets between the Battery anode and the neutral are called positive batteries and that between neutral and cathode are called negative ones. The user can choose the capacity and the numbers of the batteries according to their desire. The connection is shown as following:



Note :

The BAT+ of the UPS connect poles is connected to the anode of the positive battery, the BAT- is connected to the cathode of the positive battery and the anode of the negative battery, the BAT- is connected to the cathode of the negative battery.

Factory default setting for battery quantity is 32pcs and for battery capacity is 40AH (charger current 6A). connecting 34/36/38pcs or 40pcs batteries, please re-set desired battery quantity and its capacity after UPS starts at AC mode. Charger current could be adjusted automatically according to battery capacity selected. (Also charger current is selectable). Please refer to "LCD display"



CAUTION!

Ensure correct polarity battery string series connection. i.e. inter-tier and inter block connections are from (+) to (-) terminals.

Don't mix batteries with different capacity or different brands, or even mix up new and old batteries, either.



WARNING!

Ensure correct polarity of string end connections to the Battery Circuit Breaker and from the Battery Circuit Breaker to the UPS terminals i.e. (+) to (+) / (-) to (-) but disconnect one or more battery cell links in each tier. Do not reconnect these links and do not close the battery circuit breaker unless authorized by the commissioning engineer.

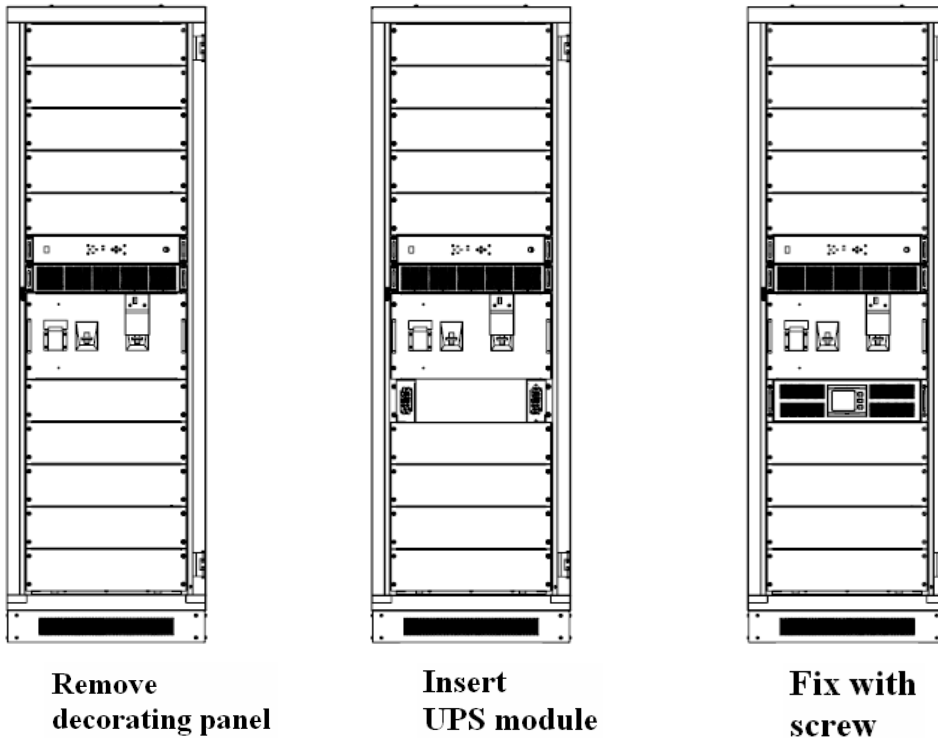
3.10 Online UPS Modules Replacement

For the UPS, modules must be inserted to make a complete UPS system.

The replacement of UPS module is very simple and can be operated online. The control system of the UPS can detect the inserted or removed module(s) automatically. The user may operate easily by following the steps mentioned below.

NOTE: The UPS module is rather heavy, please move it by two people!

Insert module



(1) Remove decorated panel;

(2) Put the UPS module in the cabinet module slot. Push the module along the slot into the cabinet until the module is inserted properly.

(3) Fix the module with screws (M5*16) at the positioning screw holes;

(4) Open input switch at modules' rear panel, and output switches accordingly. (From bottom to top, the order is 1-5 or 10)

(5) After the modules start up , the system will detect the modules inserted automatically, and parallel up the modules into whole system.

Remove UPS module

Remove the coronal screws on the left side of the module to stop the module running completely and remove the module after fan stop spinning.

WARNING!

(1) Make sure the LCD screen is totally off before removing the module; otherwise, electric sparks will occur at the connection of module and system cabinet.

(2) The coronal screw at left side of the module controls the operation of the module. Only after the screw is tightened, the module can start running. When insert new module, make sure the screw is tightened properly.

(3) When insert the module under battery mode, please press "ON" button at module's LCD panel until the module starts.

4 . Operation

4.1 Operation Modes

The UPS is a double-conversion on-line UPS that may operate in the following alternative modes :

Normal mode

The rectifier/charger derives power from the AC Mains and supplies DC power to the inverter while floating and boosting charge the battery simultaneously. Then, the inverter converts the DC power to AC and supplies to the load.

Battery mode (Stored Energy Mode)

If the AC mains input power fails, the inverter, which obtains power from the battery, supplies the critical AC load. There is no power interruption to the critical load. The UPS will automatically return to Normal Mode when AC recovers.

Bypass mode

If the inverter is out of order, or if overload occurs, the static transfer switch will be activated to transfer the load from the inverter supply to bypass supply without interruption to the critical load. In the event that the inverter output is not synchronized with the bypass AC source, the static switch will perform a transfer of the load from the inverter to the bypass with power interruption to the critical AC load. This is to avoid paralleling of unsynchronized AC sources. This interruption is programmable but typically set to be less than an electrical cycle e.g. less than 15ms (50Hz) or less than 13.33ms (60Hz).

Maintenance mode (Manual Bypass)

A manual bypass switch is available to ensure continuity of supply to the critical load when the UPS is out of order or in repair. This manual bypass switch is fitted for all UPS modules and bears for equivalent rated load.

Redundancy mode

Based on different demands, The UPS can be set as N+X redundancy mode to increase the reliability to the load connected.

4.2 Turn on/off UPS

4.2.1 Restart procedure



CAUTION!

MAKE SURE GROUNDING IS PROPERLY DONE!

Set the Battery Breaker to the “ON” position according to the user’s manual.

Open the front and rear doors of the UPS to access to the main power switches. During this procedure the output terminals will become alive.



CAUTION !

Check to see if the load is safely connected with the output of the UPS. If the load is not ready to receive power from the UPS, make sure that it is safely isolated from the UPS output terminals

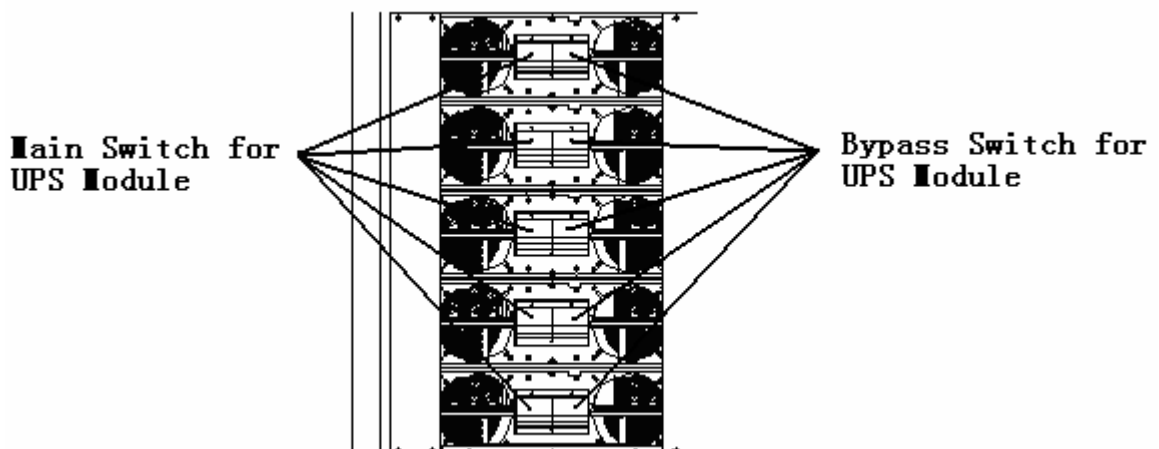
Check the status of the power switch of the monitoring module. Default is set at “ON”.

Monitoring module power supply switch



Turn ON the power switch of the monitoring module, so that the UPS system can communicate normally through the monitoring unit. When hot-swap this monitoring unit, the power switch must be OFF.

Turn ON the input and bypass switches of all UPS modules, which locate at the modules’ rear panels.



When AC MAINS input voltage within the range, And the rectifiers of the UPS will be started up in 30 seconds, then the inverter is started completely. When the output breaker is “ON”, the inverter LED lights up.

Switch ON all output breakers, which locate at module’s front panel.



If the rectifier of the module does not start-up, the bypass LED will light up. When the inverter is on, the UPS will transfer from bypass mode to inverter mode, then the bypass LED is off and the inveter LED is on.

No matter the UPS is operated normally or not, the LCD display will indicate current status.

4.2.2 Test procedure



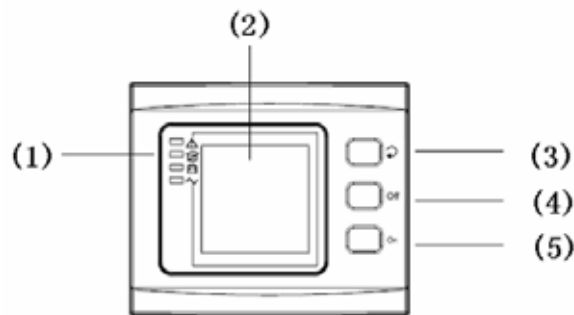
CAUTION!

The UPS is operating normally.
It may take 60 seconds to boost up the system and perform self-test completely.

Switch off the MAINS to simulate utility failure, the rectifier will turn off and the battery should feed the inverter without interruption. At this time, the LEDs of battery should be turned on.

Switch on the MAINS to simulate utility recovery, the rectifier will restart automatically after 20 seconds and the inverter will supply to the load. It is suggested to use Dummy loads for testing. The UPS can be loaded up to its maximum capacity during load test.

4.2.3 Black(Cold) start procedure



CAUTION!

Follow these procedures when the input AC Utility Failure, but battery is normal

Turn on the battery switch.

The battery will feed the Auxiliary power board.

Turn on the Output switch

Trigger the cold start buttons of the modules respectively as the position 5 of the above drawing.

When battery normal, rectifier starts operation, 30s later, inverter starts and operates and battery LED on



CAUTION!

Wait for approximately 30 seconds before you press the black start key

4.2.4 MAINTENANCE BYPASS

To supply the load via Mains, you may simply active the internal mechanical bypass switch.



CAUTION!

The load is not protected by the UPS when the internal mechanical bypass system is active and the power is not conditioned.

Switch to mechanical bypass



CAUTION!

If the UPS is running normally and can be controlled through the display, carry out steps 1 to 5; otherwise, jump to Step 4.

Open the cover of maintenance switch, the UPS turns to bypass mode automatically.

Turn on MAINTANCE breaker;

Open BATTERY breaker;

Switch OFF the MAINS breakers of all modules

Open all OUTPUT breakers;

At this time the bypass source will supply to the load through the MAINTENANCE breaker.

Switch to normal operation (from mechanical bypass)



CAUTION!

Never attempt to switch the UPS back to normal operation until you have verified that there are no internal UPS faults

Open the front and rear doors of the UPS to be easily access to the main power switches

Switch ON the output breakers of the modules.

Switch ON the input breakers of the modules.

The UPS powers from the static bypass instead of the maintenance bypass, then the bypass LED will light up.

Switch OFF the maintenance bypass breaker, then the output is supplied by the bypass of the modules.

Put on the maintenance switch cover.

The rectifier will operate normally after 30 seconds. If the inverter works normally, the system will be transferred from bypass mode to normal mode.

4.2.5 Shut down procedure



CAUTION!

This procedure should be followed to completely shut down the UPS and the LOAD. After all power switches, isolators and circuit breakers are opened, there will be no output.

Press the INVERTER OFF button on the right side of the operator control panel for about two seconds ;

The Inverter LED will be extinguished and audible alarm comes simultaneously.

Open the BATTERY breaker ;

Open the UPS door to easily access to the main power switch ;

Switch OFF the input breakers of all modules.

Open the OUTPUT power switch. The UPS shuts down ;

To completely isolate the UPS from AC Mains, all input switches of Utility shall be completely off, which includes the ones for rectifier and bypass.

The primary input distribution panel, which is often located far away from the UPS area, so a label should be posted to advise service personnel that the UPS circuit is under maintenance.

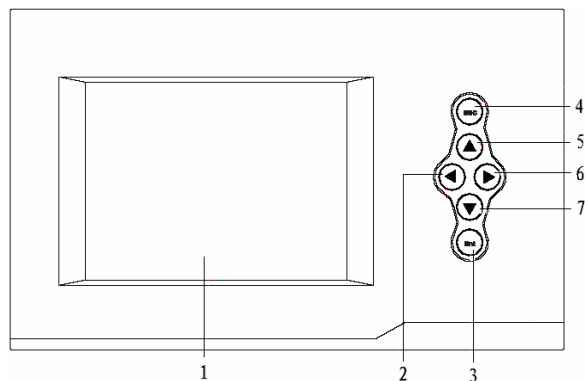


WARNING!

Wait for about 10 minutes for the internal D.C. bus bar capacitors to be completely discharged.

4.3 The Display

4.3.1 System LCD display



Overview of the operating panel of the UPS

- 1) Touch LCD screen :monitoring of all measured parameters, UPS and Battery status and event and alarm logs
- 2) LEFT KEY: turn left or scroll up
- 3) ENT KEY: enter the items or ensure the select
- 4) ESC KEY: exit the items or cancel
- 5) UP KEY: scroll up
- 6) RIGHT KEY: turn right or scroll down
- 7) DOWN KEY: scroll down
- 8)

Introduction



CAUTION!

The display provides more functions than those described in this manual.

30KVA		ONLINE		22-12-2011		
ID:01				08:30		
◀	Output	Module	Input	Batt	State	▶
			A			
Phase Voltage(v)			220	220	220	
Phase Current(A)			1	1	1	
Frequency(Hz)			50			
Active Power(kw)			0.0	0.0	0.0	
Apparent Power(KVA)			0.0	0.0	0.0	
Load percent(%)			0	0	0	
Load crest factor			0.0	0.0	0.0	

Output data

30KVA		ONLINE		22-12-2011		
ID:01				08:30		
◀	Output	Module	Input	Batt	State	▶
Module01		Non-Output				
Module02		Non-Output				
Module03		Non-Output				
Module04		Non-Output				
Module05		Non-Output				
Module06		Non-Output				
Module07		Non-Output				
Module08		Non-Output				
Module09		Non-Output				
Module09		Non-Output				
Module10		Non-Output				

Modules data

30KVA		ONLINE		22-12-2011		
ID:01				08:30		
◀	Output	Module	Input	Batt	State	▶
Module01						
Invert Voltage(V)			220	220	220	
Invert Current(A)			0	0	0	
Frequency(HZ)			50			
Positive Bus Voltage(V)			390			
Negative Bus Voltage(V)			390			
Code		8000-8000	D800-8000			
		0000-0000	0000-0000			
Back						

Detailed module data

30KVA		ONLINE		22-12-2011		
ID:01				08:30		
◀	Output	Module	Input	Batt	State	▶
Mains			A	B	C	
Phase Voltage(V)			220	220	220	
Phase Current(A)			2	2	2	
Frequency(HZ)			50			
Power Factor			0.99	0.99	0.99	
Bypass						
Phase Voltage(V)			220	220	220	
Frequency(HZ)			50			

Input data

30KVA		ONLINE		22-12-2011		
ID:01				08:30		
◀	Output	Module	Input	Batt	State	▶
Positive Battery Voltage (V)			240.0			
Negative Battery Voltage (V)			240.0			
Positive Battery Current (A)			10.0			
Negative Battery Current (A)			10.0			
Battery State			Charge			
Battery Temperature ()			28			
Lasting(min)			90			

Battery data

30KVA		ONLINE		22-12-2011		
ID:01				08:30		
◀	Output	Module	Input	Batt	State	▶
Input Switch			ON			
Output Switch			ON			
Bypass Switch			Invalid			
Manu-Bypass Switch			OFF			
Inside Temperature ()			30			

Status data

30KVA		ONLINE		22-12-2011	
ID:01				08:30	
◀	Command	Setting	Record	Version	▶
Battery Test					
Buzzer Set		Mute			
Default Set					

Command data

30KVA		ONLINE		22-12-2011	
ID:01				08:30	
◀	Command	Setting	Record	Version	▶
Language					
Change Password					
Date Setting			2008-12-22 08:30:00		
Back-Light Delay			10Min		
Contrast			20		
Self-Test Date			STA 18:36		
Timing of ON/OFF			FOR:60min	Back	
			ON:MON 08:48		
			OFF:SUN 17:25	Next	

Setting data1

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Work Mode		Single			
LBS Group Setting		Master			
System Voltage Level		220V			
System Frequency Level		50HZ			
Auto Turn-on		Enable			
Bypass Frequency Range		2%			
Bypass Volt. Upper Limit		10%		Back	
Bypass Volt. Lower Limit		-30%			
O/P Volt Micro tuning		0%		Next	

Setting data2

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Parallel ID		01			
M/S hot standby Cyc.		Invalid			
UPS Output		Enable			
Float Volt Revise		0.001			
Parallel Amount		04			
Parallel Redundancy		01		Back	
				Next	

Setting data3

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Single Battery Volt.		12V			
Battery Number		20			
Battery Group		1			
Single Battery Capa.		100AH			
Boost Upper Limit Volt.		2.31			
Float Base Volt.		2.25			
Battery Protect Volt.		1.70			
Boost Charge		Enable		Back	
Boost Last Time		231 Min			
Max Charge Current		25A		Next	

Setting data3

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
0001	12-21 15:00:26	On Line			
0002	12-21 15:00:25	Rectifier Active..			
0003	12-21 15:00:10	Int.Input Switc..			
0004	12-21 15:00:08	Int.Bypass Swit..			
0005	12-21 15:00:05	Int.Output Swit..			
0006	12-21 15:00:00	Ext. Output Swit..		Back	
				Next	

Record data

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
SYS Version: V02 x 10					
LCD Version: 701 x 02F					

Version data

30KVA ID:01		ONLINE		22-12-2011 08:30															
◀	Command	Setting	Record	Version	▶														
<table border="1"> <tr> <td>ID:00</td> <td>Record:0001</td> </tr> <tr> <td colspan="2">2008-12-21 15:00:25</td> </tr> <tr> <td colspan="2">Status:On Line</td> </tr> <tr> <td colspan="2">Event: On Line</td> </tr> <tr> <td colspan="2">Alarm:</td> </tr> <tr> <td>CODE:CC00-0000</td> <td>DF00-0000 0000</td> </tr> <tr> <td>0000-0000</td> <td>0000-0000 Quit</td> </tr> </table>						ID:00	Record:0001	2008-12-21 15:00:25		Status:On Line		Event: On Line		Alarm:		CODE:CC00-0000	DF00-0000 0000	0000-0000	0000-0000 Quit
ID:00	Record:0001																		
2008-12-21 15:00:25																			
Status:On Line																			
Event: On Line																			
Alarm:																			
CODE:CC00-0000	DF00-0000 0000																		
0000-0000	0000-0000 Quit																		

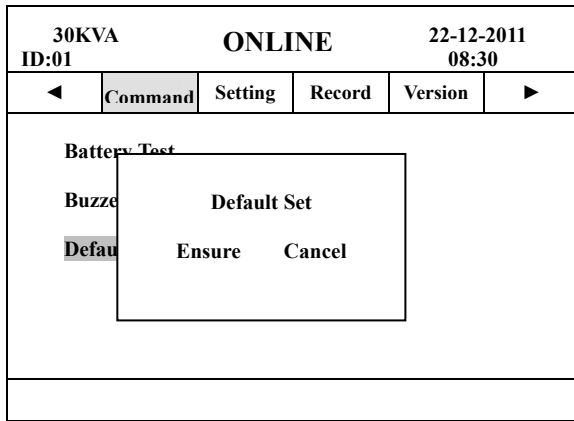
Module detailed record data

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Battery Test					
Buzzer	Battery Test				
Default	10Min				
	Ensure Cancel				

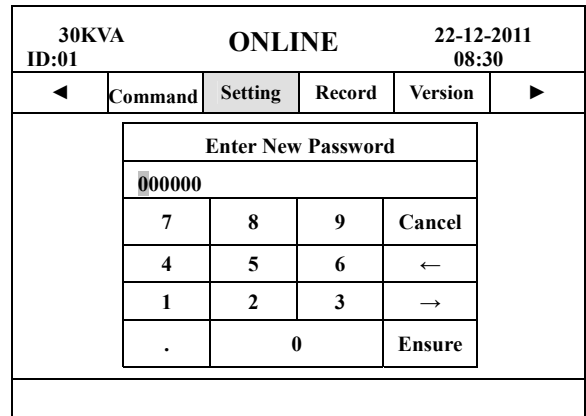
Setting of battery test

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Battery Test					
Buzzer	Buzzer Set				
Default	On Mute				
	Ensure Cancel				

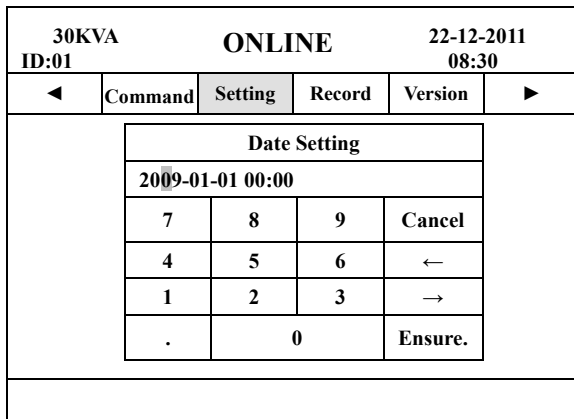
Setting of Buzzer



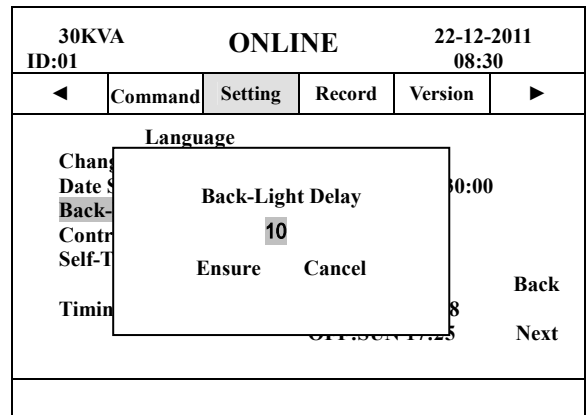
Restore default setting



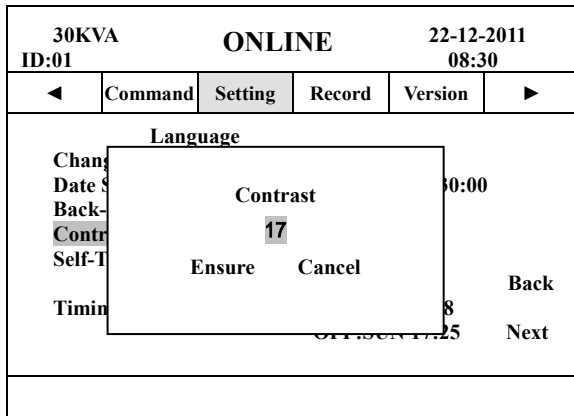
Password setting



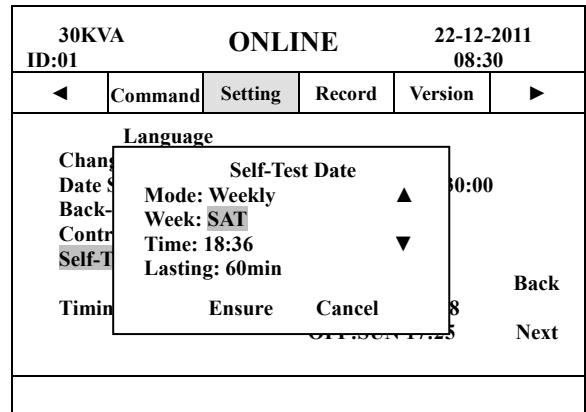
Date setting



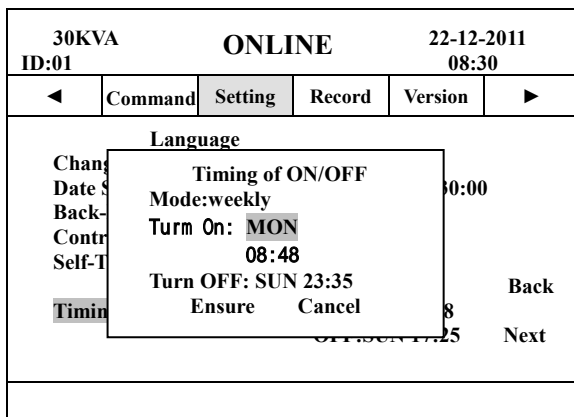
Back-Light Delay setting



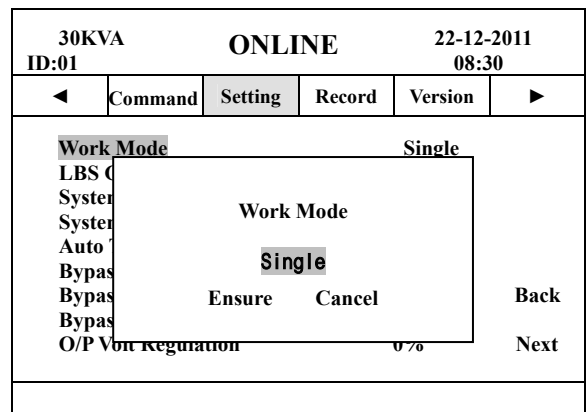
Contrast setting



Self-Test time setting



Setting of UPS timing ON/OFF



Setting of work mode

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Work Mode		Single			
LBS	LBS Group Setting				
System	Master				
System	Ensure Cancel				Back
Auto					
Bypass					
Bypass					
Bypass					
O/P Volt Regulation	0%				Next

LBS group setting

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Work Mode		Single			
LBS	System Volt. Level				
System	220V				
System	Ensure Cancel				Back
Auto					
Bypass					
Bypass					
Bypass					
O/P Volt Regulation	0%				Next

Setting of system volt. Level

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Work Mode		Single			
LBS	System Freq. Level				
System	60HZ				
System	Ensure Cancel				Back
Auto					
Bypass					
Bypass					
Bypass					
O/P Volt Regulation	0%				Next

Setting of system freq. level

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Work Mode		Single			
LBS	Auto Turn-on				
System	Enable				
System	Ensure Cancel				Back
Auto					
Bypass					
Bypass					
Bypass					
O/P Volt Regulation	0%				Next

Setting of auto turn-on

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Work Mode		Single			
LBS	Bypass Freq. Range				
System	2%				
System	Ensure Cancel				Back
Auto					
Bypass					
Bypass					
Bypass					
O/P Volt Regulation	0%				Next

Setting of bypass freq.range

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Work Mode		Single			
LBS	BPV. Upper Limit				
System	10%				
System	Ensure Cancel				Back
Auto					
Bypass					
Bypass					
Bypass					
O/P Volt Regulation	0%				Next

Setting of bypass volt. Upper limit

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Work Mode		Single			
LBS	BPV. Lower Limit				
System	-30%				
System	Ensure Cancel				Back
Auto					
Bypass					
Bypass					
Bypass					
O/P Volt Regulation	0%				Next

Setting of bypass volt. Lower limit

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Work Mode		Single			
LBS	O/P Volt Regulation				
System	0%				
System	Ensure Cancel				Back
Auto					
Bypass					
Bypass					
Bypass					
O/P Volt Regulation	0%				Next

Setting of output volt. regulation

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Parallel ID	01				
M/S	Parallel ID				
UPS	01				
Pre-A	Ensure				Cancel
Float					Back
Paral					Next
Paral					

Whole system ID (parallel ID) setting

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Parallel ID	01				
M/S	M/S hot standby Cyc.				
UPS	3				
Pre-A	Ensure				Cancel
Float					Back
Paral					Next
Paral					

Hot-standby alternative time setting

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Parallel ID	01				
M/S	UPS Output				
UPS	Enable				
Pre-A	Ensure				Cancel
Float					Back
Paral					Next
Paral					

Setting of UPS output

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀		Setting	Record	Version	▶
Single Battery Volt.	12V				
Battery	Max Charge Current				
Battery	25				
Single	Ensure				Cancel
Boost					Back
Float					Next
Battery					
Boost					
Boost					
Max Charge Current	25A				

Setting of max. Charge current

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Parallel ID	01				
M/S	Float Volt Revise				
UPS	0.000				
Pre-A	Ensure				Cancel
Float					Back
Paral					Next
Paral					

Setting of float charge volt. Compensation factor

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Parallel ID	01				
M/S	Parallel Amount				
UPS	01				
Pre-A	Ensure				Cancel
Float					Back
Paral					Next
Paral					

Setting of parallel modules amount

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Parallel ID	01				
M/S	Parallel Redun.				
UPS	00				
Pre-A	Ensure				Cancel
Float					Back
Paral					Next
Paral					

Setting of parallel redundancy

30KVA ID:01		ONLINE		22-12-2011 08:30	
◀	Command	Setting	Record	Version	▶
Single Battery Volt.	12V				
Battery	Single Battery Volt.				
Battery	6V				
Single	Ensure				Cancel
Boost					Back
Float					Next
Battery					
Boost					
Boost					
Max Charge Current	25A				

Setting of single battery voltage

30KVA ID:01	ONLINE	22-12-2011 08:30			
◀	Command	Setting	Record	Version	▶
Single Battery Volt.	12V				
Battery	Battery Number				
Battery	20				
Single	Ensure	Cancel	Back		
Boost Volt.	25A		Next		
Float E					
Battery					
Boost C					
Boost L					
Max Charge Current					

Setting of battery number

30KVA ID:01	ONLINE	22-12-2011 08:30			
◀	Command	Setting	Record	Version	▶
Single Battery Volt.	12V				
Battery	Battery Group				
Battery	1				
Single	Ensure	Cancel	Back		
Boost Volt.	25A		Next		
Float E					
Battery					
Boost C					
Boost L					
Max Charge Current					

Setting of battery group

30KVA ID:01	ONLINE	22-12-2011 08:30			
◀	Command	Setting	Record	Version	▶
Single Battery Capa.					
1000					
7	8	9	Cancel		
4	5	6	←		
1	2	3	→		
.	0	Ensure			

Setting of single battery capacity

30KVA ID:01	ONLINE	22-12-2011 08:30			
◀	Command	Setting	Record	Version	▶
Single Battery Volt.	12V				
Battery	Boost Volt.				
Battery	2.32				
Single	Ensure	Cancel	Back		
Boost Volt.	25A		Next		
Float E					
Battery					
Boost C					
Boost L					
Max Charge Current					

Setting of boost charge voltage upper limit

30KVA ID:01	ONLINE	22-12-2011 08:30			
◀	Command	Setting	Record	Version	▶
Single Battery Volt.	12V				
Battery	Float Base Volt.				
Battery	2.28				
Single	Ensure	Cancel	Back		
Boost Volt.	25A		Next		
Float E					
Battery					
Boost C					
Boost L					
Max Charge Current					

Setting of float base charge voltage

30KVA ID:01	ONLINE	22-12-2011 08:30			
◀	Command	Setting	Record	Version	▶
Single Battery Volt.	12V				
Battery	Bat. Protect Volt.				
Battery	1.28				
Single	Ensure	Cancel	Back		
Boost Volt.	25A		Next		
Float E					
Battery					
Boost C					
Boost L					
Max Charge Current					

Setting of battery low protection voltage

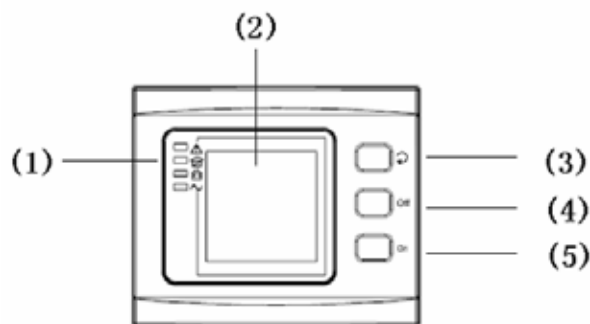
30KVA ID:01	ONLINE	22-12-2011 08:30			
◀	Command	Setting	Record	Version	▶
Single Battery Volt.	12V				
Battery	Boost Charge				
Battery	Enable				
Single	Ensure	Cancel	Back		
Boost Volt.	25A		Next		
Float E					
Battery					
Boost C					
Boost L					
Max Charge Current					

Setting of boost charge

30KVA ID:01	ONLINE	22-12-2011 08:30			
◀	Command	Setting	Record	Version	▶
Single Battery Volt.	12V				
Battery	Boost Last Time				
Battery	231				
Single	Ensure	Cancel	Back		
Boost Volt.	25A		Next		
Float E					
Battery					
Boost C					
Boost L					
Max Charge Current					

Setting of boost charge lasting time

4.3.2 UPS Module LCD display



Overview of the operating panel of the UPS

- 9) LED indicator
- 10) LCD Display
- 11) scroll button : enter to next item
- 12) OFF button :
- 13) ON button:

Introduction



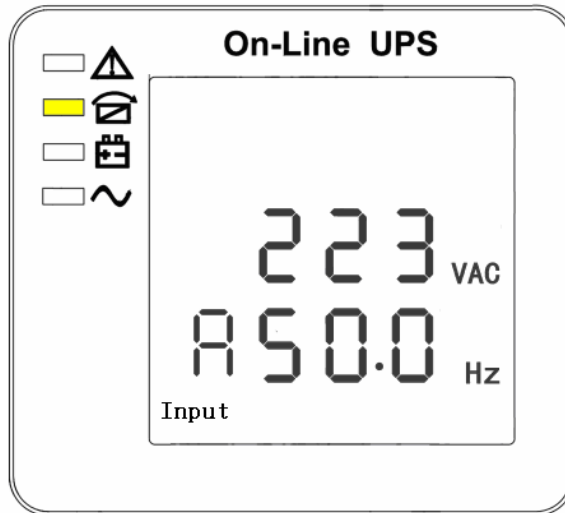
CAUTION!

The display provides more functions than those described in this manual.

There are 15 interfaces available in the LCD display:

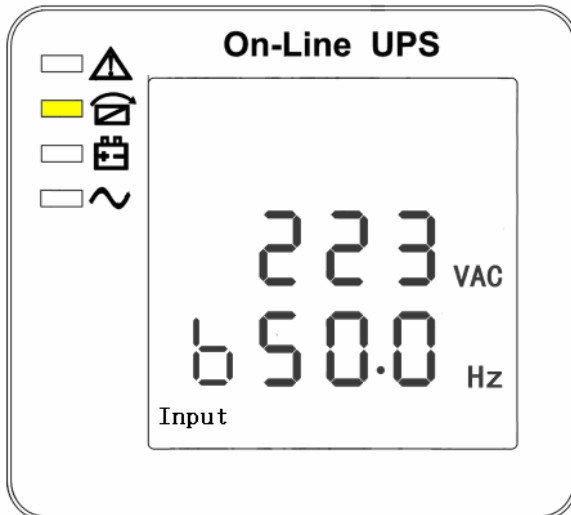
Item	Interface Description	Content Displayed
01	Input A(Input L1)	Voltage & Frequency
02	Input B(Input L2)	Voltage & Frequency
03	Input C(Input L3)	Voltage & Frequency
04	Bat. +	Voltage & Current
05	Bat. -	Voltage & Current
06	Output A(Output L1)	Voltage, Frequency & Load
07	Output B(Output L2)	Voltage, Frequency & Load
08	Output C(Output L3)	Voltage, Frequency & Load
09	Load A	Load
10	Load B	Load
11	Load C	Load
12	Total Load	Load
13	Temperature	Rectifier/Inverter Temperature
14	CODE	Operational status and mode
15	CODE	Alarm Code(Warming Message)

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

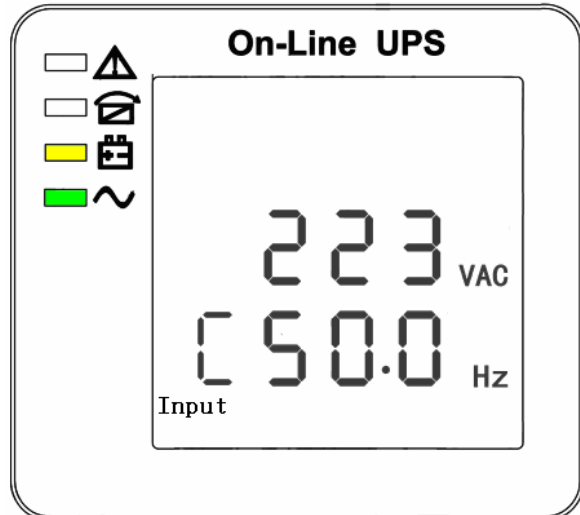


1.Phase A(L1) Input Voltage/Frequency

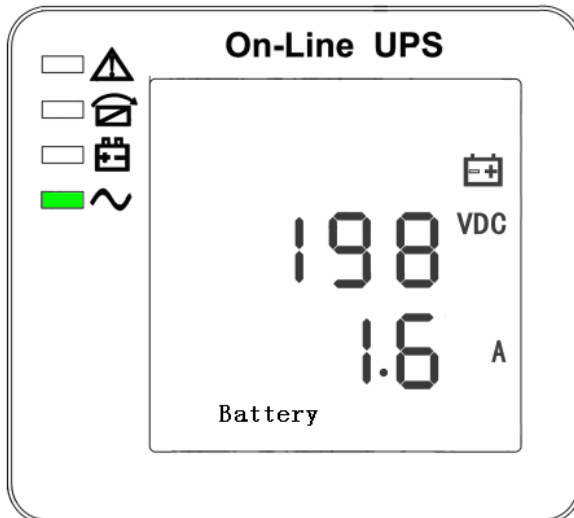
- 2) Press “scroll” button, the UPS goes to next page as shown below.



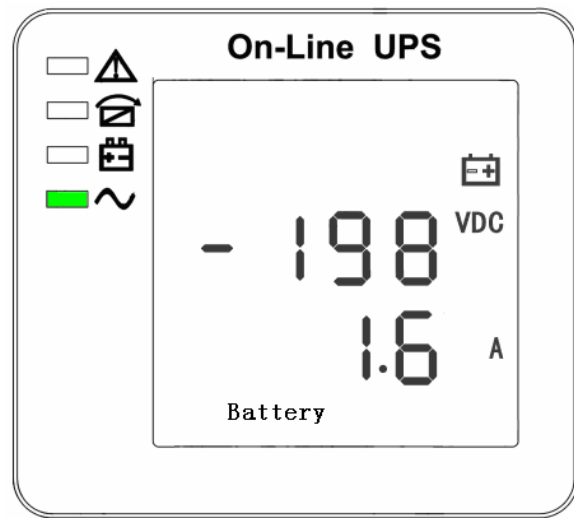
2.Phase B(L2) Input/Frequency



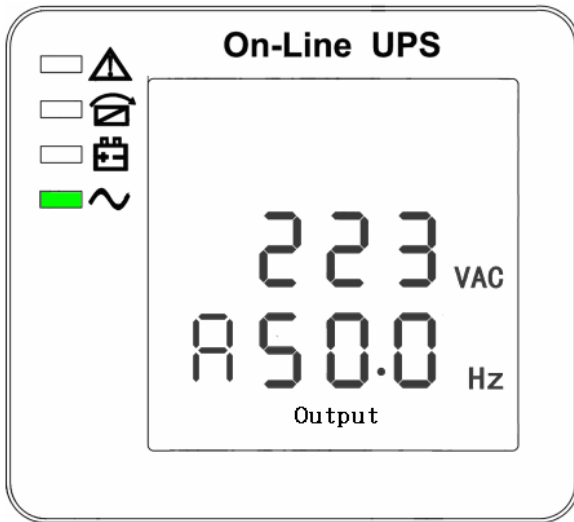
3. Phase C(L3) Input/Frequency



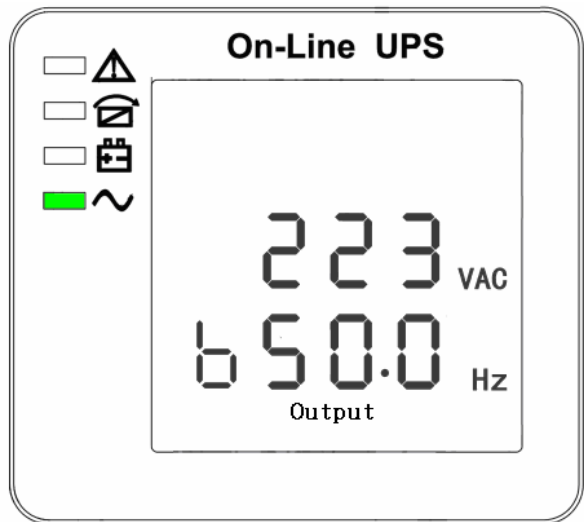
4.Bat +(Positive)



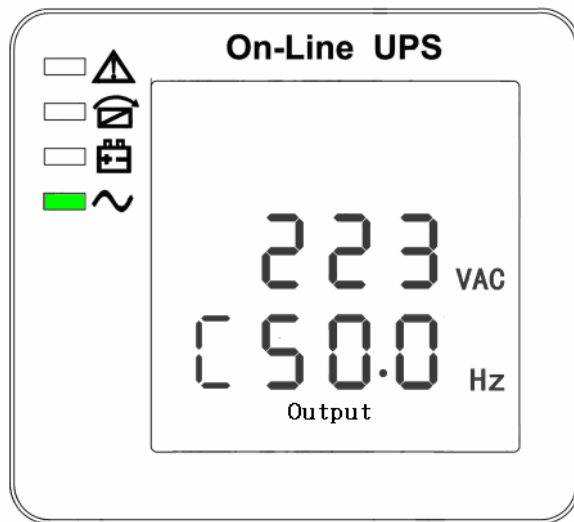
5. Bat -(Negative)



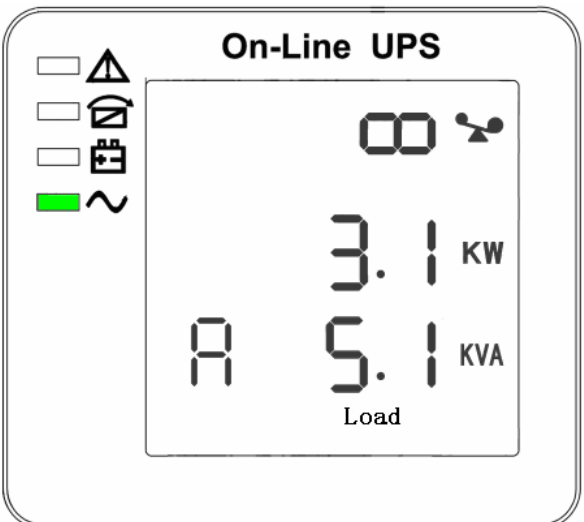
6.Phase A(L1) Output Voltage/Frequency



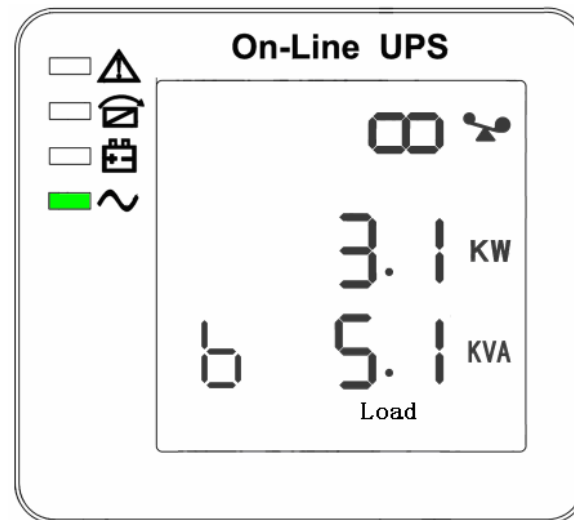
7. Phase B(L2) Output Voltage/Frequency



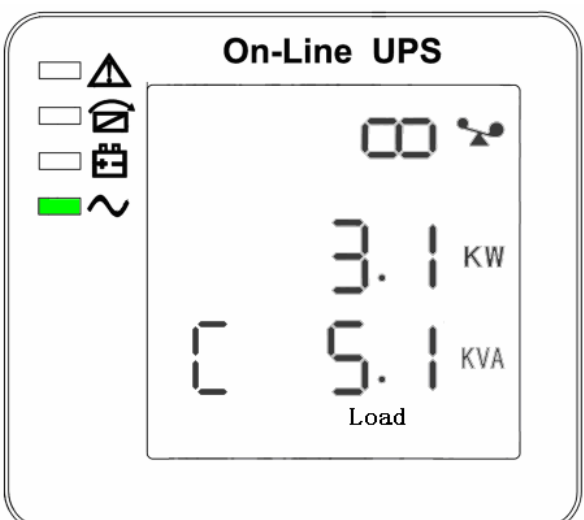
8. Phase C(L3) Output Voltage/Frequency



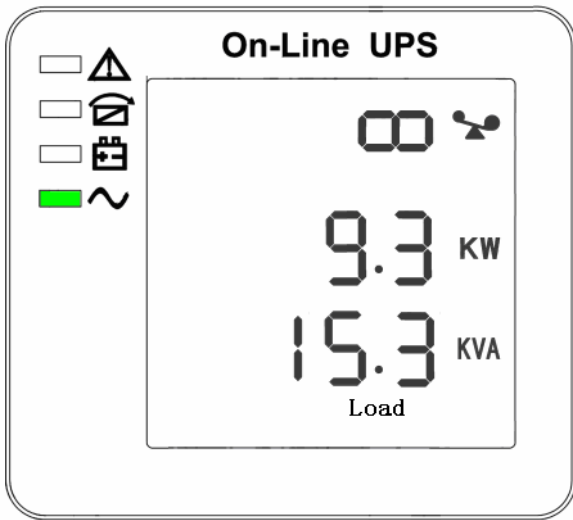
9. Phase A(L1) Load Capacity



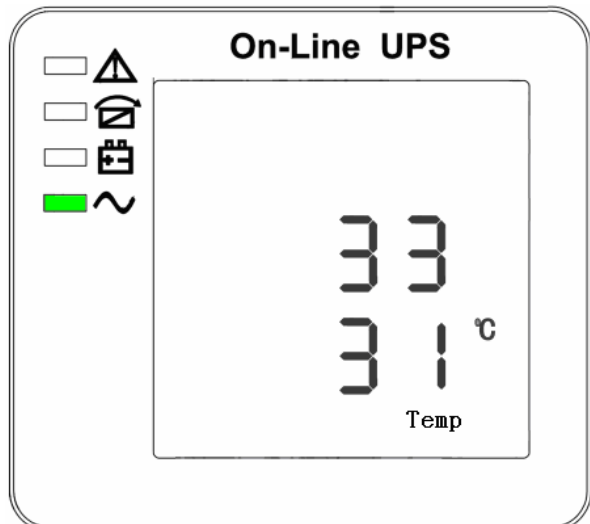
10. Phase B(L2) Load Capacity



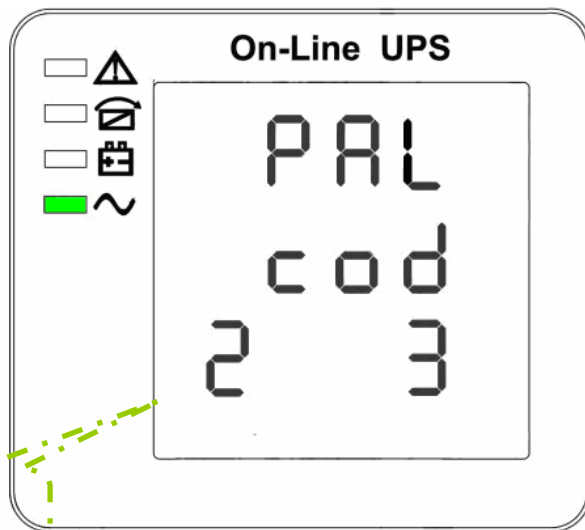
11. Phase C(L3) Load Capacity



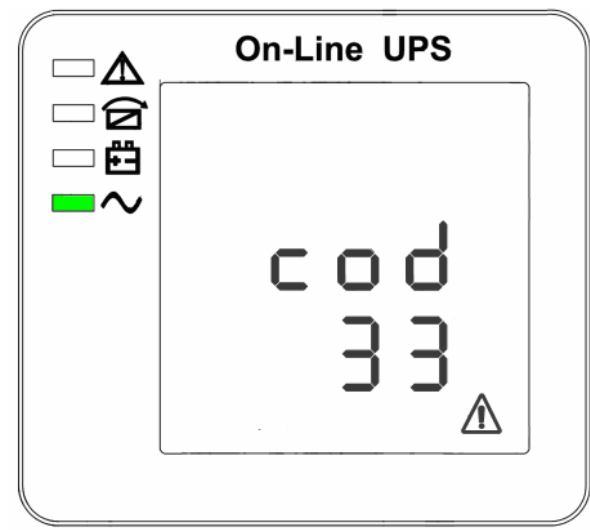
12. Total Load Capacity



13. Internal temperature and ambient temperature

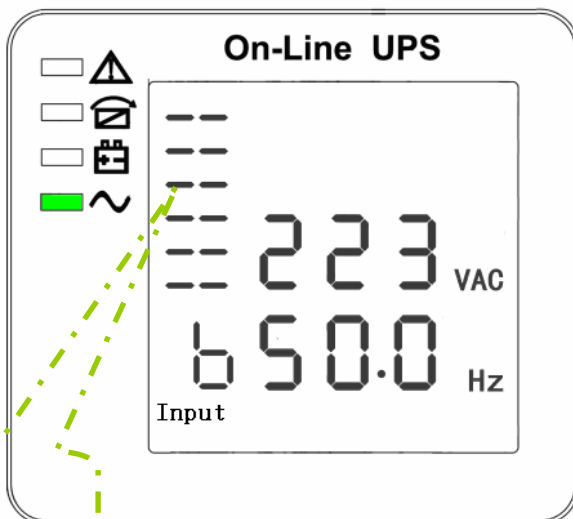


14. module ID and status code

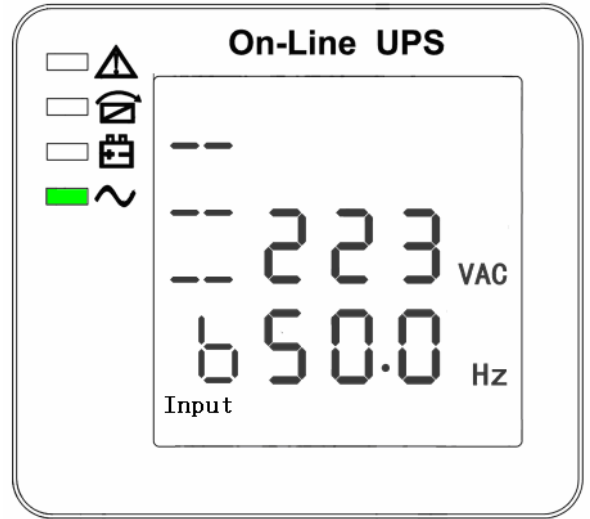


15. Alarm Code

The charging status can also be shown on the screen as below while the charger is on.



Boost

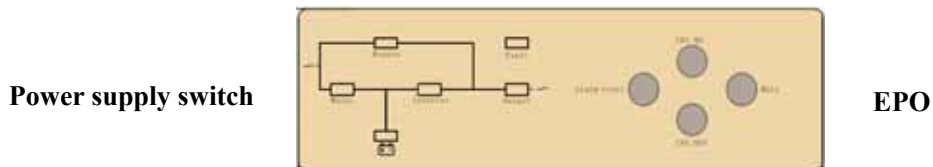


Floating

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

4.3.3 Monitoring module control panel

Monitoring module control panel is at UPS top. Through this control panel and LED, the operator may monitor all measured datas, UPS & battery status, and alarm events.



- 1) Power supply switch: the power supply switch of the monitoring module. After switch it off, the monitoring module can be hot swapped.
- 2) EPO KEY: Disconnects Power to the Load. Disables rectifier, inverter, static bypass and battery operation
- 3) MAINS INDICATOR (LED): the status of the AC Input
- 4) INVERT INDICATOR (LED): the status of the inverter
- 5) OUTPUT INDICATOR (LED): the status of the output
- 6) BYPASS INDICATOR (LED): the status of the bypass Input
- 7) BAT INDICATOR (LED): the status of the battery
- 8) FAULT INDICATOR (LED): UPS is faulty
- 9) ALARM RESET: to reset alarm.
- 10) MUTE : MUTE function of monitoring module, to mute buzzer, The buzzer will be re-started automatically when fault occurs.
- 11) INVERTER OFF KEY: Disable Inverter Operation
- 12) INVERTER ON KEY: Enable Inverter Operation



CAUTION!

The LEDs mounted on the mimic flow chart represent the various power paths and current UPS operational status.

Mains indicator

Green	Rectifier in Normal Operation
Flashing Green	Input mains voltage or frequency out of normal range
Off	Input AC Not Available

Battery indicator

Green	Battery Normal, but discharging and powering the load
Flashing Green	Battery End of Discharge pre-warning, Battery abnormal (high or low voltage, Absent or Polarity Reversed), charger abnormal
Off	Battery and Converter Normal, Battery charging.

Bypass indicator

Green	Load on Bypass power
Flashing Green	Bypass not available, out of normal range, Static bypass switch short or broken fault, bypass switch wiring fault, bypass over current
Off	Bypass Normal, load not on bypass

Inverter indicator

Green	Inverter Normal and powering the load
Flashing Green	Inverter failed, Inverter IGBT bridge direct conduct protection, Inverter Thyristor short or broken fault, over load or Parallel Overload, Feedback protection
Off	Inverter not operating

Output indicator

Green	UPS output ON and Normal
Off	UPS output OFF.

Ffault indicator

Off	Normal Operation
Red	UPS fault e.g.

4.4 Display Messages/Troubleshooting

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

Module Display messages**Operational Status and Mode(s)**

item	Content Displayed
1	Initialized
2	Standby Mode
3	No Output
4	Bypass Mode
5	Utility Mode
6	Battery Mode
7	Battery Self-diagnostics
8	Inverter is starting up
9	ECO Mode
10	EPO Mode
11	Maintenance Bypass Mode
12	Fault Mode

Module Alarm Information

Event log	UPS Alarm Warning	Buzzer	LED
1	Rectifier Fault	Beep continuously	Fault LED lit
2	Inverter fault(Including Inverter bridge is shorted)	Beep continuously	Fault LED lit
3	Inverter Thyristor short	Beep continuously	Fault LED lit
4	Inverter Thyristor broken	Beep continuously	Fault LED lit
5	Bypass Thyristor short	Beep continuously	Fault LED lit
6	Bypass Thyristor broken	Beep continuously	Fault LED lit
7	Fuse broken	Beep continuously	Fault LED lit
8	Parallel relay fault	Beep continuously	Fault LED lit
9	Fan fault	Beep continuously	Fault LED lit
10	Fan Power fault	Beep continuously	Fault LED lit
11	Auxiliary power fault	Beep continuously	Fault LED lit
12	Initialization fault	Beep continuously	Fault LED lit
13	P-Battery Charger fault	Beep continuously	Fault LED lit

14	N-Battery Charger fault	Beep continuously	Fault LED lit
15	DC Bus over voltage	Beep continuously	Fault LED lit
16	DC Bus below voltage	Beep continuously	Fault LED lit
17	DC bus unbalance	Beep continuously	Fault LED lit
18	Soft start failed	Beep continuously	Fault LED lit
19	Rectifier Over Temperature	Twice per second	Fault LED lit
20	Inverter Over temperature	Twice per second	Fault LED lit
21	Input Neutral line missing	Twice per second	Fault LED lit
22	Battery reverse	Twice per second	Fault LED lit
23	Cable connection error	Twice per second	Fault LED lit
24	CAN comm. Fault	Twice per second	Fault LED lit
25	Parallel load sharing fault	Twice per second	Fault LED lit
26	Battery over voltage	Once per second	Fault LED blinking
27	Mains Site Wiring Fault	Once per second	Fault LED blinking
28	Bypass Site Wiring Fault	Once per second	Fault LED blinking
29	Output Short-circuit	Once per second	Fault LED blinking
30	Rectifier over current	Once per second	Fault LED blinking
31	Bypass over current	Once per second	BPS LED blinking
32	Overload	Once per second	INV or BPS LED blinking
33	No battery	Once per second	Battery LED blinking
34	Battery under voltage	Once per second	Battery LED blinking
35	Battery low pre-warning	Once per second	Battery LED blinking
36	Internal Communication Error	Once per 2 seconds	Fault LED blinking
37	DC component over limit.	Once per 2 seconds	INV LED blinking
38	Parallel Overload	Once per 2 seconds	INV LED blinking
39	Mains volt. Abnormal	Once per 2 seconds	Battery LED lit
40	Mains freq. abnormal	Once per 2 seconds	Battery LED lit
41	Bypass Not Available		BPS LED blinking
42	Bypass unable to trace		BPS LED blinking
43	Inverter on invalid		

Cabinet Display messages

Events:

No.	Display message	Meaning
1	Initializing	The DSP and MCU are in Initializing.
2	Standby	
3	Non-Output	The UPS does not provide power to the load equipment.
4	On Bypass	Inverter output is turned off and the load connected at the inverter output receives power from utility line via STS.
5	On Line	Inverter output power is the primary energy source to load
6	EPO Activated	Emergency Power Off Switch has been activated.
7	Automatic Self Test	The UPS has started pre-programmed battery test.
8	Inverter in soft starting	The inverter is in soft-starting
9	System Fault Detected	The system has detected an internal error
10	MBS status	status of maintenance bypass
11	EPO status	status of EPO(emergency power off)
12	Int. Input Switch closed	The internal input breaker is closed manually.

13	Int. Input Switch opened	The internal input breaker is opened manually.
14	Rectifier Deactivated	The rectifier has been deactivated.
15	Rectifier Activated	The rectifier has been activated.
16	Rectifier Current Limit	When the input voltage is at 208V~305V, the output of the UPS will not be interrupted, but it will be at current limit, for example, to reduce charge current. When the load connected exceeds its limit, the warning shall occur.
17	Battery charge deactivated	The charger has been deactivated.
18	Positive Battery Boost Charging	The Positive battery is in boost charge, which is Constant voltage boost charge mode or constant current boost charge mode.
19	Positive Battery Float Charging	The Positive battery is in float charge.
20	Negative Battery Boost Charging	The Negative battery is in boost charge.
21	Negative Battery Float Charging	The Negative battery is in float charge.
22	Int. bypass Switch Opened	The internal bypass breaker is opened manually
23	Int. bypass Switch Closed	The internal bypass breaker is closed manually
24	Int. output Switch Opened	The internal output breaker is opened manually
25	Int. output Switch Closed	The internal output breaker is closed manually
26	Ext. bypass Switch Opened	The external bypass breaker(parallel system) is opened
27	Ext. bypass Switch Closed	The external bypass breaker(parallel system) is closed
28	Ext. output Switch Opened	The external output breaker(parallel system) is opened
29	Ext. output Switch Closed	The external output breaker(parallel system) is closed
30	Coming to Interval transfer	Allows transfer to bypass or inverter with 3/4 cycle break. Use of this command will drop load.
31	Coming to over load due to inverter off	When the inverter is turned off manually, the load will exceed the power capacity.
32	Coming to Interval transfer due to inverter off	When the inverter is turned off manually, the load will exceed the power capacity.
33	Inverter invalid due to over load	The load exceeds the capability of the single or parallel modules.
34	Inverter Master	It indicates the Master Inverter.
35	Transfer Times-out	Latched load transfer to bypass as a result of too many successive transfers within the current hour. Automatic reset attempt within the next hour.
36	UPS In shutdown Due To Overload.	The load exceeded the power capacity. The UPS has been shutdown
37	UPS In Bypass Due To Overload.	The load exceeded the power capacity. The UPS has switched to Bypass Mode.
38	Parallel in Bypass	The parallel system has switched to bypass mode
39	LBS Activated	LBS has been activated.
40	Lightning Protection	Lightning protector has been activated.
41	Battery low to UPS OFF	battery voltage lower than protection point
42	UPS timing on	UPS on at certain time
43	UPS timing OFF	UPS off at certain time
44	timing self-test start	start to self-test at certain time
45	Stop self-test	self-test stops
46	manual OFF	turn off UPS manually
47	remote OFF	turn off UPS remotely
48	module connected	module is connected
49	module removed	module is removed

Cabinet Alarm Information

No.	Display message	Meaning
1	Rectifier Fault	Rectifier detected faulty. Rectifier and inverter and charger shut down.
2	Rectifier Over Temperature	The temperature of heatsink is too high to keep the rectifier running. Charger and inverter shut down.
3	Inverter Over temperature	The temperature of the inverter heatsink is too high to keep inverter running.
4	Rectifier over-current	Rectifier failure due to over-current
5	Input thyristor failure	Failure of input thyristor
6	Battery discharge thyristor failure	Failure of battery discharge thyristor
7	Battery charge thyristor failure	Failure of battery charge thyristor
8	Fan fault	At least one of the cooling fans fails. Rectifier and inverter and charger shut down.
9	DC Bus over-voltage	Rectifier, inverter and battery converter are shutdown due to high DC bus voltage.
10	DC Bus under-voltage	Rectifier, inverter and battery converter are shutdown due to low DC bus voltage.
11	DC bus unbalance	If the difference between positive DC bus and negative DC bus exceeds 30V, this warning shall occur.
12	Soft start fault	Rectifier could not be started due to low DC bus voltage
13	Input Neutral line missing	If Input Neutral line is missing or disconnected while the UPS is in operation, the UPS will generate Neutral line failure alarm and go into Battery mode.
14	Battery Reverse	The polarity of the battery is reversed.
15	No Battery	Battery is disconnected
16	Positive Battery Charger fault	The positive battery Charger is fault. The charger will be shut down.
17	Negative battery charger fault	The negative battery charger is fault. The charger will be shut down.
18	Battery under-voltage	The battery voltage is too low and the charger has been deactivated.
19	Battery over-voltage	The battery voltage is too high and the charger has been deactivated.
20	Battery under-voltage pre-warning	The UPS is in battery operation and the battery voltage is low. Note: Runtime is limited in duration.
21	Mains freq. abnormal	Mains frequency is out of limit range and results in rectifier shutdown.
22	Mains volt. Abnormal	Mains Voltage exceeds the upper or lower limit and results in rectifier shutdown.
23	Inverter fault	When inverter has been turned on for a certain time, but the output voltage of the inverter is still out of the range of Rating voltage +12.5% and -25%, inverter fault will occur, and the inverter will be shut down and the UPS will transfer to bypass. This fault cannot be cleared until this unit is completely powered off.
24	Inverter IGBT bridge direct conduct protection	If the two IGBTs in the same bridge of inverter are on simultaneously, inverter should be shut down
25	Inverter Thyristor short fault	SCR at the inverter side is short-circuited
26	Inverter Thyristor broken fault	SCR at the inverter side is open-circuited
27	Bypass Thyristor short fault	SCR at the bypass side is short-circuited
28	Bypass Thyristor broken fault	SCR at the bypass side is open-circuited

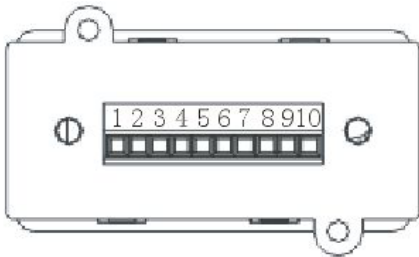
29	CAN comm. Fault	The CAN bus communication fails
30	Parallel system load sharing fault	If any unit in a parallel system has an unbalance load share that exceeds 30%, this warning will occur.
31	Bypass Site Wiring Fault	Wrong phase rotation on the bypass side.
32	System Not Synchronized To Bypass.	System cannot synchronize to bypass. Bypass Mode may not be available.
33	Bypass unable to trace	Bypass is unable to trace
34	Bypass Not Available	The frequency or voltage is out of acceptable range for bypass. This message occurs when the UPS is online, and indicates that the bypass mode may not be available if required.
35	IGBT over current	IGBT current is over limit.
36	Parallel cable connection error	If a unit is set as parallel mode, but parallel cable is not connected correctly, this warning will occur
37	Parallel relay fault	Relay of parallel circuit must be turned on when the system are in parallel and the inverter is on. If the relay of parallel circuit cannot be turned on correctly, this unit should be shut down (include inverter and bypass). This fault cannot be cleared until this unit is completely powered off.
38	LBS Not SYNC.	Two parallel systems are not in synchronization.
39	initialization fault	When the procedure of initialization is wrong, this warning will occur.
40	Inverter is invalid	The inverter on button has been activated.
41	Overload	The load exceeds the system power capacity.
42	Parallel Overload	The UPS parallel system is confirmed to be overloaded according to the set number.
43	DC component over limitation	If the DC component of the UPS output rating power is larger than the limitation, this warning should occur
44	Bypass over current	When the bypass current exceeds the limitation, this alarm will occur.
45	Feedback protection	This UPS is fitted with a voltage free contact closure signal for use with an external automatic disconnect device (by others) to protect against back-feeding voltage into the incoming bypass supply
46	Ext. Fire Alarm	External fire detector has been activated.
47	Ext. Smoke Alarm	External smoke detector has been activated.
48	battery damaged	battery has been damaged, this warning shall occur.
49	battery over-temperature	battery over-temperature, this warning shall occur.
50	model set wrong	Model setting of the UPS is incorrect.

Relay card

A 10-pin terminal is supported to offer the signals of Bypass, Utility Failure, Inverter On, Battery Low, UPS fault, UPS Alarm, and UPS Shutdown.

The relay communication card contains six dry contact outputs and one dry input. The inputs and outputs are factory programmed according to functions listed in the table

Table:Relay Contacts (communication card)



Port		Function
1	Output	Utility Failure
2		/
3		Battery Low
4		On Bypass
5		UPS Fault
6		Inverter On
7		UPS Alarm
8		COM
9	EPO Input	+12V
10		0V



CAUTION!

The output contacts numbers for a second relay board installed will be 1 to 7.

Contacts are NO (normally open) type.



available at no charge in any of

Overview of the relay card

Appendix 1 Specifications

Model		60KVA	100KVA	200KVA	
Capacity	UPS Cabinet	10~60KVA/9~54KW	10~100KVA/9~90KW	10~200KVA/9~180KW	
	UPS Module	10KVA/9KW, 15KVA/13.5KW, 20KVA/18KW			
Input	Phase	3 Phase 4 Wires and Ground			
	Rated Voltage	380/400/415Vac			
	Voltage Range	208~478Vac			
	Frequency Range	40Hz-70Hz			
	Power Factor	0.99			
	Current THDi	3%(100% nonlinear load)			
	Bypass Voltage Range	Max.voltage: +15%(optional +5%、+10%、+25%) Min. voltage: -45% (optional -20%、-30%) Frequency protection range: ±10%			
	Generator Input	Support			
Output	Phase	3 Phase 4 Wires and Ground			
	Rated Voltage	380/400/415Vac			
	Power Factor	0.9			
	Voltage Regulation	± 2%			
	Frequency	Utility Mode	±1%、±2%、±4%、±5%、±10% of the rated frequency(optional)		
		Battery Mode	(50/60±0.2%)Hz		
	Crest Factor	3:1			
	THD	2% with linear load 5% with non linear load			
	Waveform	Pure Sinewave			
Efficiency		92% at normal mode			
Battery	Voltage	±192V\±204V\±216V\±228V\±240V DC; battery quantity(optional)			
	Charging Current	UPS Cabinet	18A Max.	30A Max.	
		UPS Module	6A Max.		
			charge current can be set according to battery capacity installed		
Transfer Time		Utility to Battery : 0ms; Utility to bypass: 0ms			
Protection	Overload	AC Mode	Load 110%: last 60min , 125%: last 10min , 150%: last 1min , 150% shut down UPS immediately.		
		Bat. Mode	Load 110%: last 10min , 125%: last 1min , 150%: last 1S , 150% shut down UPS immediately.		
		Bypass Mode	Breaker (10KVA: 20A / 15KVA: 32A / 20KVA:40A)		
	Short Circuit	Hold Whole System			
	Overheat	Line Mode: Switch to Bypass; Backup Mode: Shut down UPS immediately			
	Battery Low	Alarm and Switch off			
	Self-diagnostics	Upon Power On and Software Control			
	EPO(optional)	Shut down UPS immediately			
	Battery	Advanced Battery Management			
Noise Suppression	Complies with EN62040-2				
Alarms	Audible & Visual	Line Failure, Battery Low, Overload, System Fault			

Display	Status LED & LCD		Line Mode, Eco Mode, Bypass Mode, Battery Low, Battery Bad, Overload & UPS Fault			
	Reading On the LCD		Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage & Inner Temperature			
Communication Interface			RS232, RS485, Intelligent slot x 2, Dry Contact			
Environment	Operating Temperature		0 ~ 40			
	Storage Temperature		-25 ~ 55			
	Humidity		0 ~ 95% non condensing			
	Altitude		< 1500m			
Other	Unit Dimensions(W*D*H)	UPS Cabinet	600x840x1400mm		600x840x2000mm	
		UPS Module	443x580x131mm			
	Weight (Kg)	UPS Cabinet	145	170	230	
		UPS Module	10KVA:26, 15KVA:30, 20KVA:31			
Safety Conformance			CE,EN/IEC 62040-2,EN/IEC 62040-1-1			

Appendix 2 UPS message table

1. The Inner Code is applied to this Series. The following format block is Inner Code display on LCD :

AAAA-AAAA BBBB-BBBB EEFF
 CCCC-CCCC DDDD-DDDD

2. The part of Inner Code means

AAAA-AAAA (Rectifier State) :

Axxx-xxxx															
							8	9	A	B	C	D	E	F	Int. Input Switch closed
			4	5	6	7					C	D	E	F	Rectifier Activated
	2	3			6	7			A	B			E	F	Emergency Power off
1		3		5		7		9		B		D		F	Rectifier current Limt
xAxx-xxxx															
							8	9	A	B	C	D	E	F	Input Power work on
			4	5	6	7					C	D	E	F	Power by Input
	2	3			6	7			A	B			E	F	Battery Test
1		3		5		7		9		B		D		F	Battery Charge
xxAx-xxxx															
							8	9	A	B	C	D	E	F	P-Battery Boost Charge
			4	5	6	7					C	D	E	F	N-Battery Boost Charge
	2	3			6	7			A	B			E	F	
1		3		5		7		9		B		D		F	
xxxA-xxxx															
							8	9	A	B	C	D	E	F	
			4	5	6	7					C	D	E	F	
	2	3			6	7			A	B			E	F	
1		3		5		7		9		B		D		F	

xxxx-Axxx

							8	9	A	B	C	D	E	F	communication connected
			4	5	6	7					C	D	E	F	
	2	3			6	7			A	B			E	F	
1		3		5		7		9		B		D		F	

xxxx-xAxx

							8	9	A	B	C	D	E	F	
			4	5	6	7					C	D	E	F	
	2	3			6	7			A	B			E	F	
1		3		5		7		9		B		D		F	

xxxx-xxAx

							8	9	A	B	C	D	E	F	
			4	5	6	7					C	D	E	F	
	2	3			6	7			A	B			E	F	
1		3		5		7		9		B		D		F	

xxxx-xxxA

							8	9	A	B	C	D	E	F	
			4	5	6	7					C	D	E	F	
	2	3			6	7			A	B			E	F	
1		3		5		7		9		B		D		F	

BBBB-BBBB (Inverter State) :

Bxxx-xxxx

							8	9	A	B	C	D	E	F	Int. bypass Switch Closed
			4	5	6	7					C	D	E	F	Int. output Switch Closed
	2	3			6	7			A	B			E	F	Manu-Bypass Switch Closed
1		3		5		7		9		B		D		F	Ext. bypass Switch Closed

xBxx-xxxx

							8	9	A	B	C	D	E	F	Ext. output Switch Closed
			4	5	6	7					C	D	E	F	00 : Shut Down , 01 : Inv starting , 10 :Inv work on ,but No Output 11 : Normal Output
	2	3			6	7			A	B	C		E	F	
1		3		5		7		9		B		D		F	Output by Inv

xxBx-xxxx

							8	9	A	B	C	D	E	F	Output by Bypass
			4	5	6	7					C	D	E	F	Cue: Interval Transfer
	2	3			6	7			A	B			E	F	Cue: trun-off, System will be broken
1		3		5		7		9		B		D		F	Cue:trun-off,Parallel will be overloaded

xxxB-xxxx

							8	9	A	B	C	D	E	F	Emergency Power off
			4	5	6	7					C	D	E	F	INV.invalid due to Overload
	2	3			6	7			A	B			E	F	Change Master
1		3		5		7		9		B		D		F	Transfer Times-out

xxxx-Bxxx

						8	9	A	B	C	D	E	F	Shutdown Due To Overload	
			4	5	6	7				C	D	E	F	On Bypass Due To Overload	
	2	3			6	7		A	B			E	F	Parallel in Bypass	
1		3		5		7		9		B		D		F	LBS Activated

xxxx-xBxx

						8	9	A	B	C	D	E	F	INV standby	
			4	5	6	7				C	D	E	F		
	2	3			6	7		A	B			E	F		
1		3		5		7		9		B		D		F	

xxxx-xxBx

						8	9	A	B	C	D	E	F	Shutdown Due To Overload	
			4	5	6	7				C	D	E	F	On Bypass Due To Overload	
	2	3			6	7		A	B			E	F	Parallel in Bypass	
1		3		5		7		9		B		D		F	LBS Activated

xxxx-xxxB

						8	9	A	B	C	D	E	F	INV standby	
			4	5	6	7				C	D	E	F		
	2	3			6	7		A	B			E	F		
1		3		5		7		9		B		D		F	

CCCC-CCCC (Rectifier Alarm) :

Cxxx-xxxx

						8	9	A	B	C	D	E	F	Rectifier fault	
			4	5	6	7				C	D	E	F	Rectifier over temperature	
	2	3			6	7		A	B			E	F	Inverter over temperature	
1		3		5		7		9		B		D		F	Rectifier over current

xCxx-xxxx

						8	9	A	B	C	D	E	F	Auxiliary power 1 fault	
			4	5	6	7				C	D	E	F	Auxiliary power 2 fault	
	2	3			6	7		A	B			E	F	Input Thyristor failed	
1		3		5		7		9		B		D		F	Discharge Thyristor failed

xxCx-xxxx

						8	9	A	B	C	D	E	F	Charge Thyristor failed	
			4	5	6	7				C	D	E	F	Fan fault	
	2	3			6	7		A	B			E	F	Fan Power fault	
1		3		5		7		9		B		D		F	DC Bus over voltage

xxxC-xxxx

						8	9	A	B	C	D	E	F	DC Bus below voltage	
			4	5	6	7				C	D	E	F	DC bus unbalance	
	2	3			6	7		A	B			E	F	Mains Site Wiring Fault	
1		3		5		7		9		B		D		F	Soft start failed

xxxx-Cxxx

						8	9	A	B	C	D	E	F	Input Neutral line missing	
			4	5	6	7				C	D	E	F	Battery reverse	
	2	3			6	7		A	B			E	F	No battery	
1		3		5		7		9		B		D		F	P-Battery Charger fault

xxxx-xCxx

							8	9	A	B	C	D	E	F	N-Battery Charger fault
			4	5	6	7					C	D	E	F	Battery under voltage
	2	3			6	7			A	B			E	F	Battery over voltage
1		3		5		7		9		B		D		F	Battery low pre-warning

xxxx-xxCx

							8	9	A	B	C	D	E	F	Mains freq. abnormal
			4	5	6	7					C	D	E	F	Mains volt. Abnormal
	2	3			6	7			A	B			E	F	
1		3		5		7		9		B		D		F	

xxxx-xxxC

							8	9	A	B	C	D	E	F	
			4	5	6	7					C	D	E	F	
	2	3			6	7			A	B			E	F	
1		3		5		7		9		B		D		F	

DDDD-DDDD (Inverter Alarm) :

Dxxx-xxxx

							8	9	A	B	C	D	E	F	Inverter fault
			4	5	6	7					C	D	E	F	Inv. IGBT bridge shorted
	2	3			6	7			A	B			E	F	Inverter Thyristor short
1		3		5		7		9		B		D		F	Inverter Thyristor broken

xDxx-xxxx

							8	9	A	B	C	D	E	F	Bypass Thyristor short
			4	5	6	7					C	D	E	F	Bypass Thyristor broken
	2	3			6	7			A	B			E	F	CAN comm. Fault
1		3		5		7		9		B		D		F	Parallel load sharing fault

xxDx-xxxx

							8	9	A	B	C	D	E	F	Bypass Site Wiring Fault
			4	5	6	7					C	D	E	F	System not Sync. to Bypass
	2	3			6	7			A	B			E	F	Bypass unable to trace
1		3		5		7		9		B		D		F	Bypass Not Available

xxxD-xxxx

							8	9	A	B	C	D	E	F	IGBT over current
			4	5	6	7					C	D	E	F	Fuse broken
	2	3			6	7			A	B			E	F	Cable connection error
1		3		5		7		9		B		D		F	Parallel relay fault

xxxx-Dxxx

							8	9	A	B	C	D	E	F	LBS Not SYNC.
			4	5	6	7					C	D	E	F	Initializtion fault
	2	3			6	7			A	B			E	F	Inverter on invalid
1		3		5		7		9		B		D		F	Overload

xxxx-xDxx

							8	9	A	B	C	D	E	F	Parallel Overload
			4	5	6	7					C	D	E	F	DC component over limit.
	2	3			6	7			A	B			E	F	Bypass over current
1		3		5		7		9		B		D		F	Feedback protection

xxxx-xxDx

							8	9	A	B	C	D	E	F	BUS voltage abnormal
			4	5	6	7					C	D	E	F	
	2	3			6	7			A	B			E	F	
1		3		5		7		9		B		D		F	

xxxx-xxxD

							8	9	A	B	C	D	E	F	
			4	5	6	7					C	D	E	F	
	2	3			6	7			A	B			E	F	
1		3		5		7		9		B		D		F	

EE (Inside Monitor) :

Ex

							8	9	A	B	C	D	E	F	generator Connect
			4	5	6	7					C	D	E	F	ShutDown Due To Batt. Low
	2	3			6	7			A	B			E	F	Time to turn on
1		3		5		7		9		B		D		F	Time to turn off

xE

							8	9	A	B	C	D	E	F	timing self test start
			4	5	6	7					C	D	E	F	Surge protection active signal, from monitoring board IO
	2	3			6	7			A	B			E	F	battery monitoring system
1		3		5		7		9		B		D		F	system unregistered

FF (Monitoring)

Fx

							8	9	A	B	C	D	E	F	Battery Falut (from battery monitoring)
			4	5	6	7					C	D	E	F	Battery over temperature (from battery monitoring)
	2	3			6	7			A	B	C		E	F	Battery over voltage (from battery monitoring)
1		3		5		7		9		B		D		F	Battery under voltage (from battery monitoring)

xF

							8	9	A	B	C	D	E	F	External Fire Alarm (from monitoring board IO)
			4	5	6	7					C	D	E	F	External Smoke Alarm (from monitoring board IO)
	2	3			6	7			A	B			E	F	UPS model wrong
1		3		5		7		9		B		D		F	time up for suggested maintenance

Appendix 3 Problems and Solution

In case the UPS can not work normally, it might be wrong in installation, wiring or operation. Please check these aspects first. If all these aspects are checked without any problem, please consult with local agent right away and provide below informations.

- (1) Product model name and serial number, which can be found in LCD display.
- (2) Try to describe the fault with more details, such as LCD display info, LED lights status, etc.

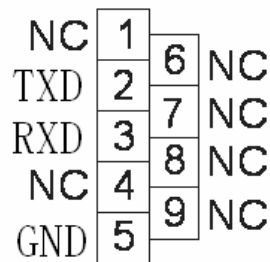
Read the user manual carefully, it can help a lot for using this UPS in the right way. Some FAQ (frequently asked questions) may help you to troubleshoot your problem easily.

No.	Problem	Possible reason	Solution
1	LCD not display	The network cable is not fixed properly or the telephone line of the front door is not fixed properly.	Connect the network cable and telephone cable properly.
2	LCD Blue screen	LCD is Interferenced	Take out the cable and insert back properly
3	Utility is connected but the UPS can not be powered ON.	Input power supply is not connected; Input voltage low; The input swith of the module is not switched on .	measure if the UPS input voltage/frequency are within the window. Check if all modules input are switched on
4	Utility normal but Utiliy LED does not light on, and the UPS operates at battery mode	The input breakers of the Modules are not switched on; input cable is not well connected	Switch on the input breaker; Make sure the input cable is well connected.
5	The UPS does not indicate any failure, but output do not have voltage	Output cable does not well connected	Make sure the output cable is well connected.
6	The UPS module can not transfer to bypass or inverter	Module does not well inserted; The left coronal screw is not tight. Output breaker do not switch on	Pull out the module and insert again; Tighten the screw; Switch on the output breaker.
7	The UPS module fault LED remains ON	The module is already damaged	Take out this module, replace with a new module.
8	Utility LED is flashing	Utility voltage exceeds UPS input range.	If the UPS operates at battery mode, please pay attention to the remaining backup time needed for your system.
9	Battery LED is flashing but no charge voltage and current	Battery breaker does not switch on, or batteries are damaged, or battery is reversely connected. battery number and capacity are not set correctly.	Switch on the battery breaker. If batteries are damaged, need to replace whole group batteries, Connect the battery cables correctly; Go to LCD setting of the battery number and capacity, set the correct data.

10	Buzzer beeps every 0.5 seconds and LCD display "output overload"	Overload	remove some load
11	Buzzer long beeps, LCD display "output short circuit"	The UPS output is in short circuit	Make sure the load is not in short circuit, then restart the UPS.
12	The LED of the Module with RED light	The module is not inserted properly.	Pull out the module and insert properly.
13	The UPS only works on bypass mode	The UPS is set to ECO mode, or the transfer times to bypass mode are limited.	Set the UPS working mode to Single Module type(non-parallel) or to reset the times of transferring to bypass or re-start the UPS
14	Can not Black start	Battery switch is not properly closed ; Battery fuse is not open ; Or Battery low	Close the battery switch ; Change the fuse ; Recharge the battery
15	Buzzer beeps continuously and LCD indicates Rectifier fault or output fault	UPS is out of order	Consult with your local agent for repair

Appendix 4 RS232 communication port definition

Definition of Male port :



Connection between PC RS232 port and UPS RS232 port

PC RS232 port	UPS RS232 port	
Pin 2	Pin 2	UPS send , PC receive
Pin 3	Pin 3	PC send , UPS receive
Pin 5	Pin 5	ground

Available function of RS232

Monitor UPS power status.

Monitor UPS alarm info.

Monitor UPS running parameters.

Timing off/on setting.

RS-232 communication data format

Baud rate ----- 2400bps

Byte length ----- 8bit

End bit ----- 1bit

Parity check -----