Quant

ELEVATING TECHNOLOGY

6-20kVA Online Rack UPS User Manual

QUANT PROLINE TOWER ONLINE UPS (6–20kVA Single-Phase)	PROLINE RACK ONLINE UPS (6–20kVA Single-Phase)
PL-T006-I	PL-R006-I
PL-T010-I	PL-R010-I
PL-T006-X	PL-R006-X
PL-T010-X	PL-R010-X
PL-T015-X	
PL-T020-X	

Important Safety Instructions

DANGER

The battery can present a risk of electrical shock and high short circuit current.

Following precautions should be observed before replacing the battery.

- Wear rubber gloves and boots.
- Remove rings, watches and other metal objects.
- Use tools with insulated handles.
- Do not lay tools or other metal objects on the batteries.
- If the battery is damaged in any way or shows signs of leakage, contact your local representative immediately.
- Do not dispose of batteries in a fire. The batteries may explode.
- Handle, transport and recycle batteries in accordance with local representative

WARNING

Improper use can result in electrical shock or fire. To ensure safety, observe the following precautions:

- Turn off and unplug the UPS before cleaning it.
- Clean the UPS with a dry cloth. Do not use liquid or aerosol cleaners.
- Never block or insert any objects into the ventilation holes or other openings of the UPS.

1. Electromagnetic Compatibility

*** Safety** IEC/EN 62040-1-1	
*** EMI** Conducted Emisión.....IEC/EN 62040-2 Radiated Emission.....IEC/EN 62040-2	 Category C3 Category C3
***EMS** ESD.....IEC/EN 61000-4-2 RS.....IEC/EN 61000-4-3 EFT.....IEC/EN 61000-4-4 SURGE.....IEC/EN 61000-4-5 Low Frequency Signals.....:IEC/EN 61000-2-2	 Level 4 Level 3 Level 4 Level 4
Warning: This is a product for commercial and industrial application in the second environment-installation restrictions or additional measures may be needed to prevent disturbances.	

FEATURES

Fully digital controlled technology based on DSP to achieve high reliability and power function
Digitally controlled and intelligent battery management to extend the battery life
Operation and display with LCD and LED indicators, which can indicate all system information
Fan speed can be auto conditioned according to the loads, current or working mode
Digitally controlled charger current and voltage
Battery capacity management
Self-aging function enable user to test UPS at customer site without load

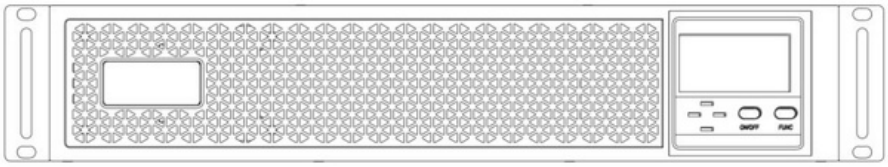
MODELS

Available models are shown as Table1-1:

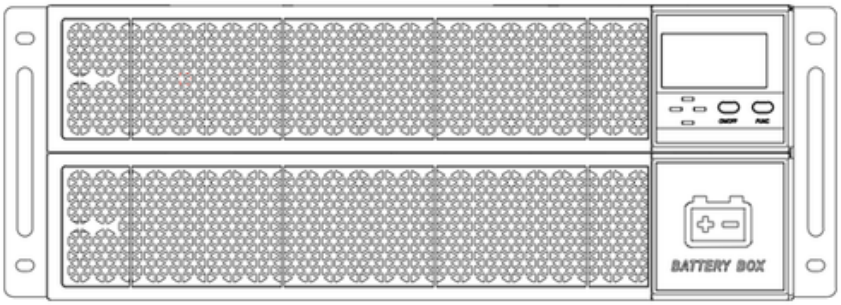
Model	Nominal Power	Model	Nominal Power
6K long backup rack	6000VA/6000W	10K long backup rack	10000VA/10000W
6K standard rack	6000VA/6000W	10K standard rack	10000VA/10000W
3/1 10K long backup rack	10000VA/10000W	3/1 20K long backup rack	20000VA/20000W
3/1 15K long backup rack	15000VA/15000W		

Long back up model: no internal batteries, max charger current is 8A, settable. 12A optional.

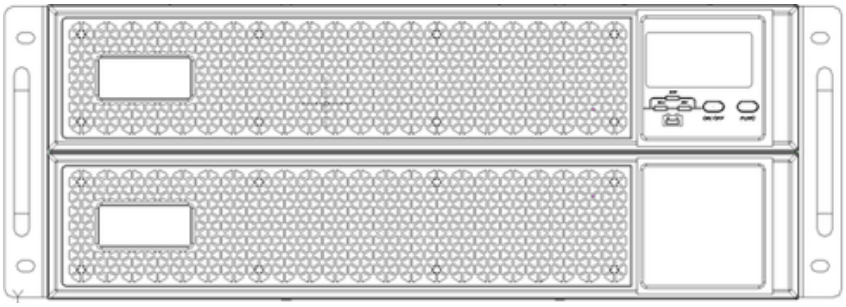
1.4 Appearance



6K/10K-Long backup

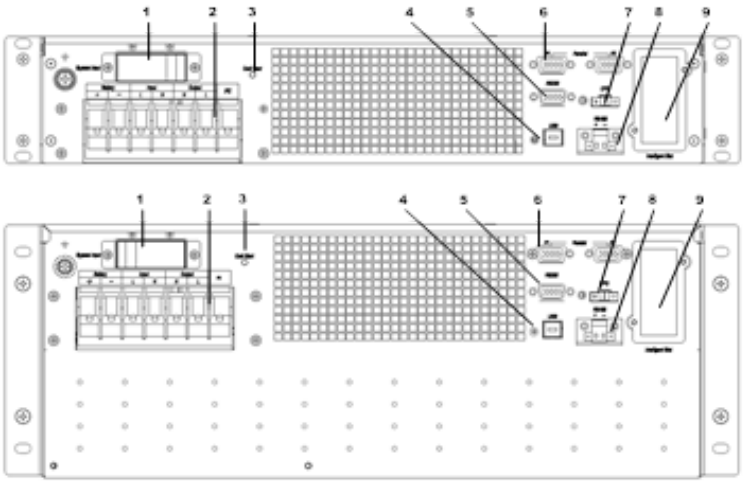


6K/10K-Standard

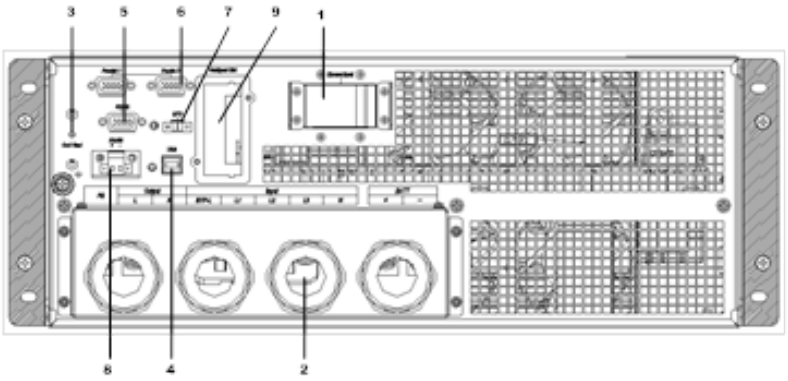


3/1 10K/15K/20K-Long backup

Fig 1- 1: Front View



6K/10K-Long backup&Standard



3/1 10K/15K/20K-Long backup

1	Bypass input breaker
2	Connector: input, output, battery
3	Cold start button
4	USB. Optional
5	RS232
6	Parallel ports. Optional
7	EPO Open to activate
8	RS485
9	Intelligent slot

1.5 System description

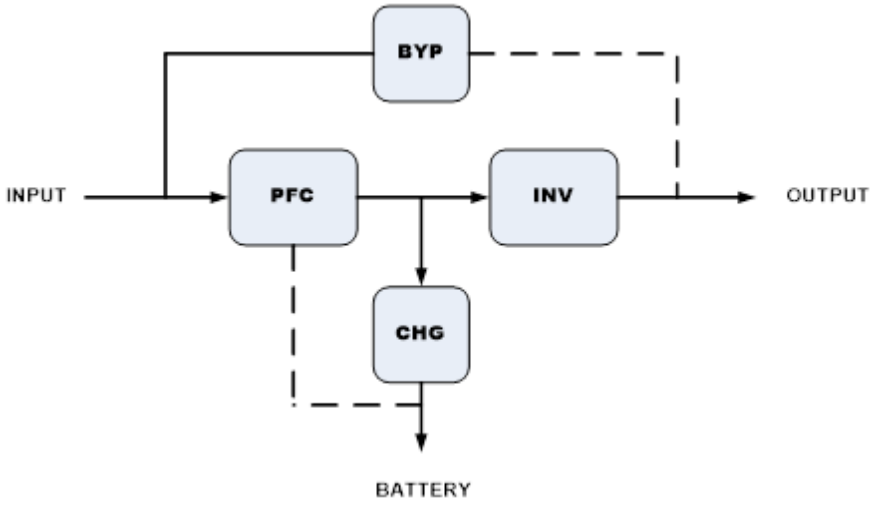


Fig 1- 3: UPS system

1.5.1 PFC
In normal operation, PFC converts utility AC power to regulated DC power for use by the inverter. And also, PFC reduces the amount of input current distortion on the utility.

1.5.2 Inverter
In normal operation, the inverter converters the DC bus power into precise, regulated sinewave AC power. Upon an utility power failure, the inverter receives energy from the battery.

1.5.4 Battery Charger
The battery charger utilizes energy from the DC bus and regulates it to charge the batteries. The batteries are being charged whenever the UPS is connected to utility power.

1.5.5 DC/DC Converter
The converter includes boost circuit which is also used as PFC.

1.5.6 Battery
The 6K/10K Standard include value-regulated, non-spillable, lead acid batteries inside. To maintain battery design life, operate the UPS in an ambient temperature of 15-25°C.

1.5.7 Static Bypass
Static bypass connect utility input and load directly

1.6 UPS Working Mode
UPS working mode include normal mode, bypass mode, battery mode, ECO mode, frequency converter mode, self aging mode.

Normal mode:

Shown as Fig 1-4, rectifier supply DC supply to inverter, the load is feed by inverter. Charger is charging the battery.

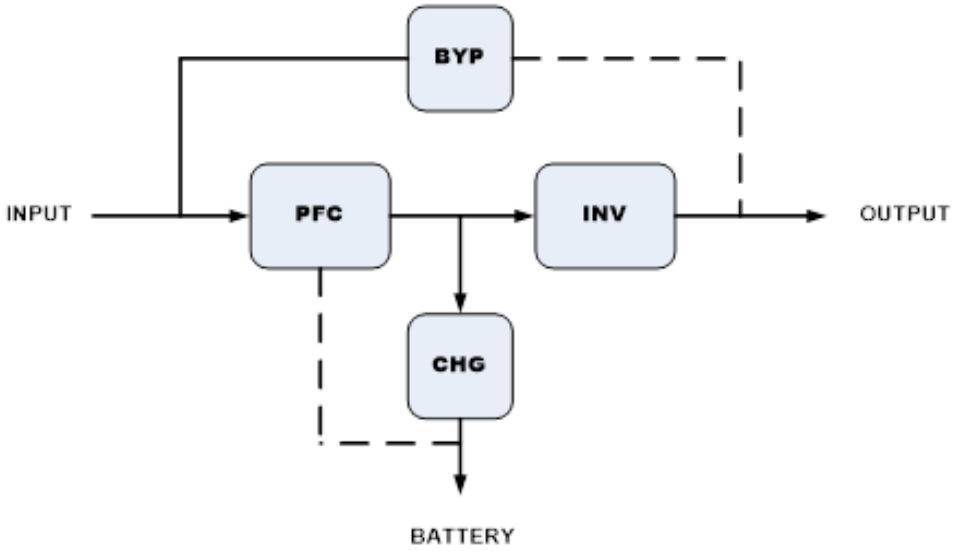
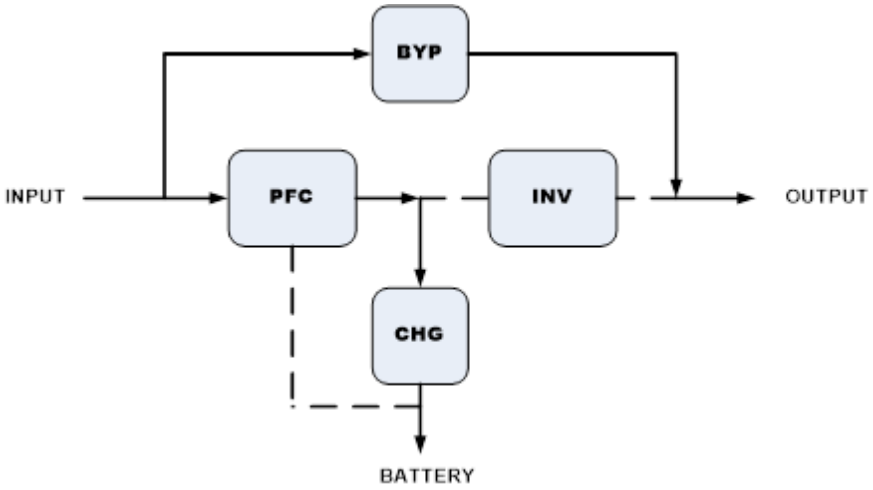


Fig 1- 4: Normal Mode

Static Bypass Mode

If inverter is failure or overload, UPS will transfer to bypass mode. Or press ON/OFF to transfer to bypass mode in normal mode. The load is feed by input power directly, and UPS can not protect load from surge. Shown as Fig 1-5.



Battery Mode

If input power is failure when in normal mode, UPS will transfer to battery mode. In this mode, the battery provide power to inverter. Shown as Fig 1-6.
NOTICE: press ON/OFF in battery mode will shutdown UPS completely.

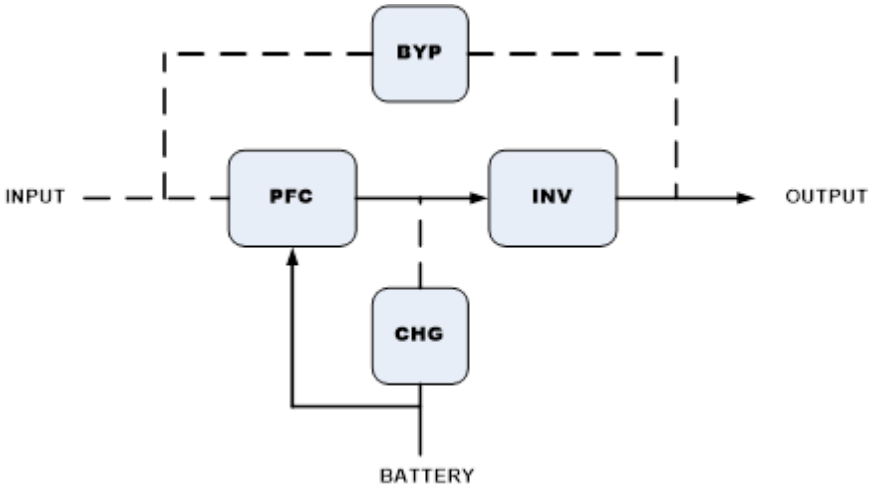


Fig 1- 6: Battery Mode

ECO Mode (only available for single unit)

When UPS works in ECO mode, load is feed by bypass. Inverter is standby, charger is working normally. The efficiency is up to 98%, but UPS can protect the load from surge disturb. If input power is failure, UPS transfer to battery mode. Shown as Fig 1-7.

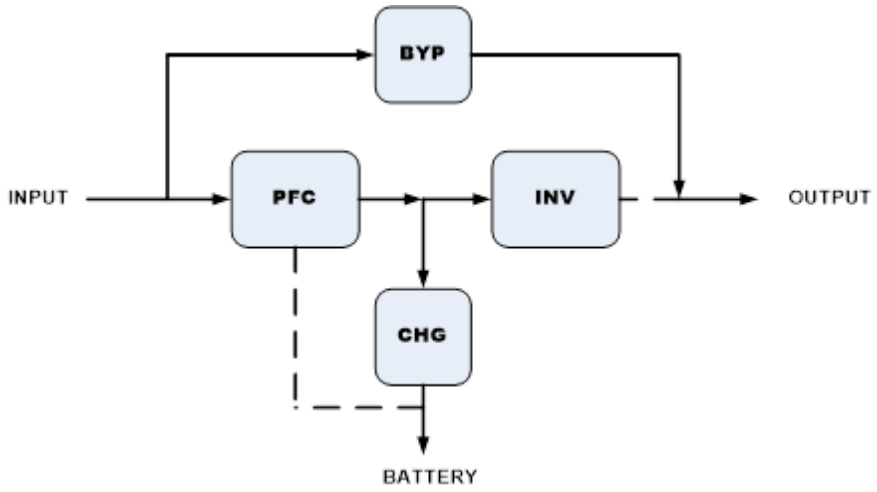


Fig 1- 7: ECO Mode

Frequency Converter Mode

In this mode, input and output nominal frequency is different, and the bypass is forbidden to use.

NOTICE

- If overload timeout, UPS will shutdown output.
- The load should be derated to 50% and below.

Self Aging Mode

If users want to burn in UPS without load, could set the UPS as Self Aging Mode, in this mode, the current flow through rectifier, inverter, and back to input through bypass. It needs only 5% loss to burn in UPS with 100% load. Shown as Fig 1-8.

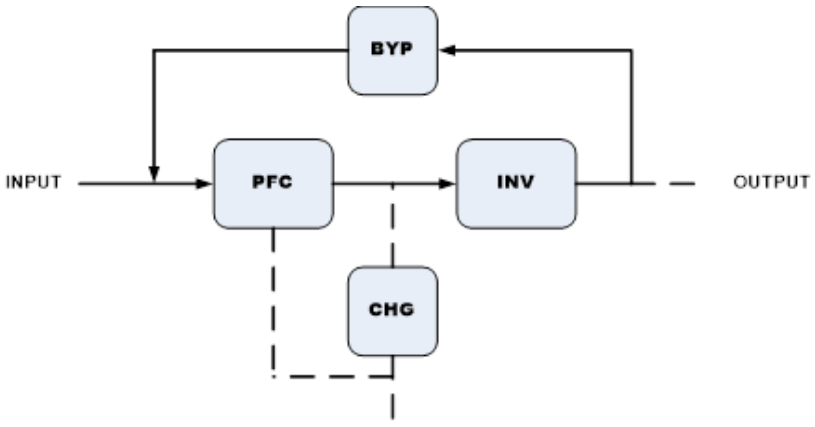


Fig 1- 8: Self Aging Mode

1.7 Electrical Specification

General Specification

Model		6K Long backup/Standard	10K Long backup/Standard	3/1 10K/15K/20K Long backup time		
Power Rating		6kVA/6kW	10kVA/10kW	10kVA/10kW	15kVA/15kW	20kVA/20kW
Frequency (Hz)		50/60	50/60	50/60		
Input	Voltage	(176-288)VAC	(176-288)VAC	(305-407)VAC		
	Current	36A max.	60A max	19/19/19A max	29/29/29A max	38/38/38A max
Battery	Voltage	192VDC	192VDC	192VDC		
	Current	40A max	62A max	62A max	94A max	125A max
Output	Voltage	220/230/240	220/230/240	220/230/240	220/230/240	220/230/240
	Current	27/26/25A	45/43/42A	45/43/42A	67/65/63A	90/86/84A
Efficiency		95.5% max	95.5% max	95.5% max		
Dimension (WxDxH) mm		440*580*86 440*660*172	440*580*86 440*660*172	440*580*172		

2. Electrical Performance

Input			
Model	Voltage	Frequency	Power Factor
UPS	Single-phase	40-70Hz	>0.99(Full load)

Output					
Voltage Regulation	Power Factor	Frequency tolerance.	Distortion	Overload capacity	Crest ratio
±1%	1	±0.1	THD<1% Full load (Linear Load)	105%~110%: 10mins 111%~125%: 1 min 126%~150%: 30 seconds	3:1 maximum

3. Operating Environment

Temperature	Humidity	Altitude	Storage temperature
0°C-40°C	<95%	<1000m	0°C-70°C

NOTICE

If the UPS is installed or used in a place where the altitude is above than 1000m, the output power must be derated.

Installation

The system should be installed and wired only by qualified electricians in accordance with applicable safety regulations.

2.1 Unpacking and Inspection

Unpack the packaging and check the package contents. The shipping package contains:

- 1 UPS
- 1 user manual

Inspect the appearance of the UPS to see if there is any damage during transportation. Do not turn on the unit and notify the carrier and dealer immediately if there is any damage or lacking of some parts.

2.2 Cabinet Installation

Tower installation and Rack installation are available. You can select an appropriate installation mode according to the site application.

NOTE

- The UPS must be installed in a location with good ventilation, far away from water, inflammable gas and corrosive agents.
- Ensure the air vents on the front and rear of the UPS are not blocked. Allow at least 0.5m of space on each side.
- Condensation to water drops may occur if the UPS is unpacked in a very low temperature environment. In this case it is necessary to wait until the UPS is fully dried inside out before proceeding installation and use. Otherwise there are hazards of electric shock.

2.2.1 Tower Installation

Various installation configurations are available: single UPS, single UPS with battery cabinets. Their installation methods are all the same. Please prepare support bases and spacers before installation.

1)Take out the support bases and spacers and then assemble the spacers and the support bases, shown as Fig 2-1. 4 support bases are needed for long backup models UPS, 4 extra spacers are needed for standard models UPS or battery cabinets.

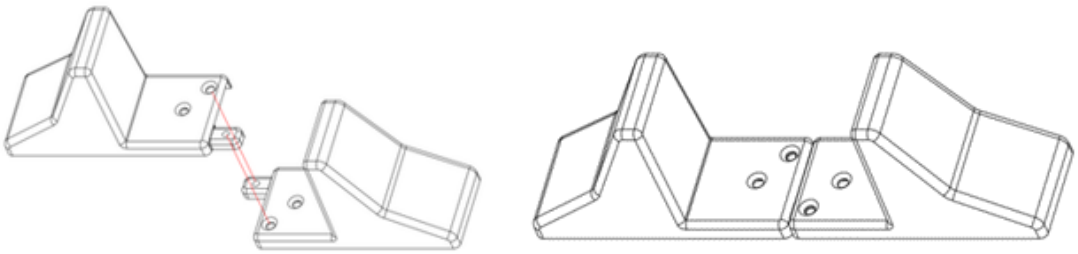


Fig 2- 1: Support Bases and Spacers Assembly

1) Rotate the direction of UPS LCD

a. Remove the front plastic bezel cover gently and remover two brackets screws, as shown in Fig.5-2.

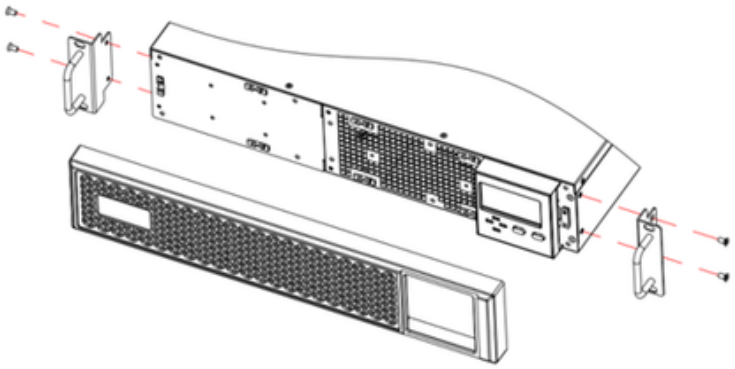


Fig 2- 2: Remove Front Panel

b. Rotate LCD clockwise.

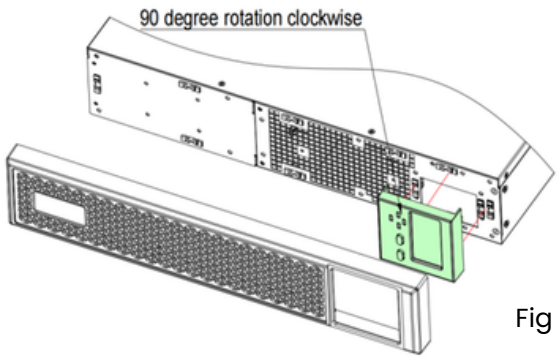


Fig 2- 3: Rotate LCD

c. Recover the front panel

3) Place the UPS and battery cabinet on the support bases

2.2.2 Rack Installation

Please install battery cabinets and UPS from bottom to top.

1) Install the side rails

2) Put the UPS and battery cabinet on, fix the units to the service rack

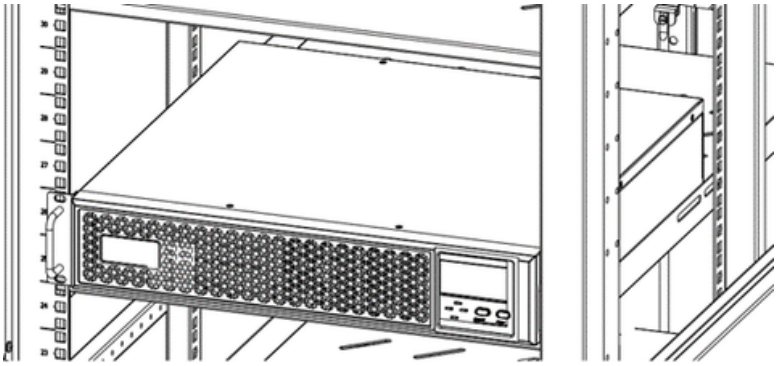


Fig 2- 4: Rack Mounted Installation

2.2 Connect AC Power Cables

Recommended size of cables is shown as below:

Rated power	AC input	AC output	Battery
6kVA	10AWG or 6mm2	10AWG or 6mm2	8AWG or 10mm2
10kVA	8AWG or 10mm2	8AWG or 10mm2	6AWG or 16mm2
	Input breaker	**Output breaker**	**Battery breaker**
6kVA	40A	40A	40A
10kVA	63A	63A	80A
Rated power	**AC input**	**AC output**	**Battery**
3/1 10kVA	8AWG or 10mm2	8AWG or 10mm2	8AWG or 10mm2
3/1 15kVA	6AWG or 16 mm2	6AWG or 16 mm2	4AWG or 25mm2
3/1 20kVA	4AWG or 25mm2	4AWG or 25mm2	2AWG or 35mm2
	Input breaker	**Output breaker**	**Battery breaker**
3/1 10kVA	63A 3P	63A	80A

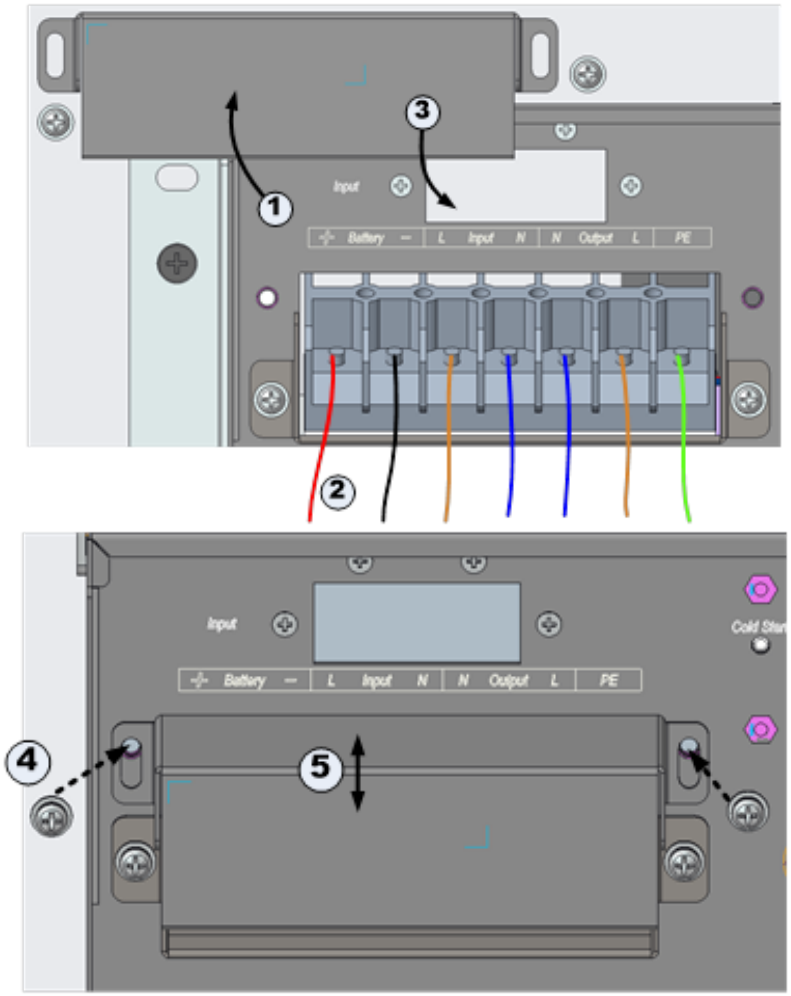
	Input breaker	Output breaker	Battery breaker
3/1 15kVA	100A 3P	100A	100A
3/1 20kVA	125A 3P	125A	125A

NOTICE

For the long backup time modes, make sure that the capacity of batteries is larger than 38AH to avoid over charging. If not, please confirm the charge current and set the charge current is smaller than 0.2*AH.

NOTICE

Make sure that the input and output wires and the input and output terminals are connected tightly.



Single phase model

3/1 models

Fig 2- 5: Terminal Block Wiring Diagram

1) Recover the cover of terminal on the rear panel
2) Connect input and output cables as Fig 2-5

NOTICE

Connect an AC breaker between output and load to protect UPS from interrupt of load fail.

2.3 Connect UPS with the external battery

1) Connect an DC breaker between UPS and battery cabinet.
2) Open DC breaker before connect battery cables to UPS.
3) Connect battery cables to UPS terminal as Fig 2-5.

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2.4 Connect Parallel Cables

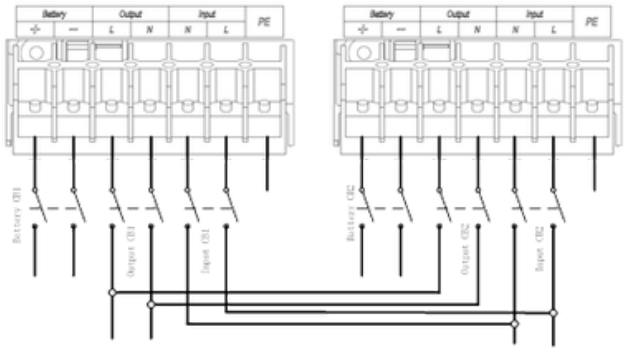
Parallel installation

1) Users need to opt two standard DB15 communication cables.
2) Connect input cables of each UPS with an independent AC breaker as Fig 2-6.
3) Connect the output wires of each UPS to an output breaker.
4) Please select suitable breaker according to input, output and battery current.

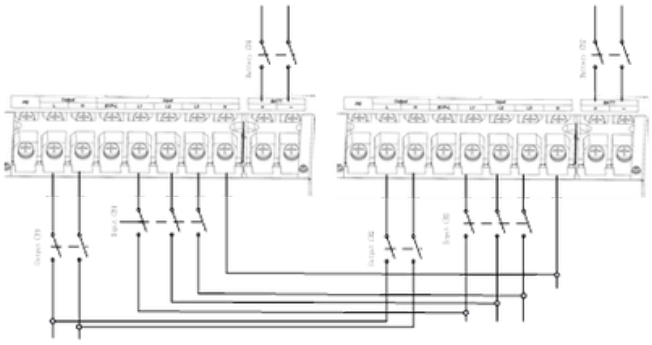
NOTICE

- The requirement of the output cables is as follows:
- It's recommended that the cables of output of the UPS to be less than 20m.
- The difference between the cables of input & output of the UPSs is required to be less than 10%.

The wiring diagram is shown as follows:



Single phase models connection



3/1 10-20K models connection

Fig 2- 6: Parallel Wiring Diagram

2.5 Connect Communication Cables

Communication cable includes: USB cable and parallel communication cables.

Connect USB cable:

1) Connect USB cable to USB port at the back panel of UPS shown as Fig 1-2

2) Connect USB cable to PCB

Connect communication cables:

If there are two UPS are paralleled, connect communication cables as Fig.2-7

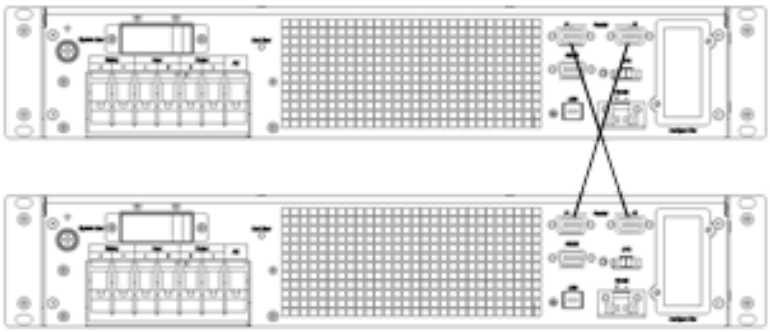


Fig 2- 7: 2 UPS Paralleled System

If there are 3 or more UPS are paralleled, connect communication cables as Fig 2-8

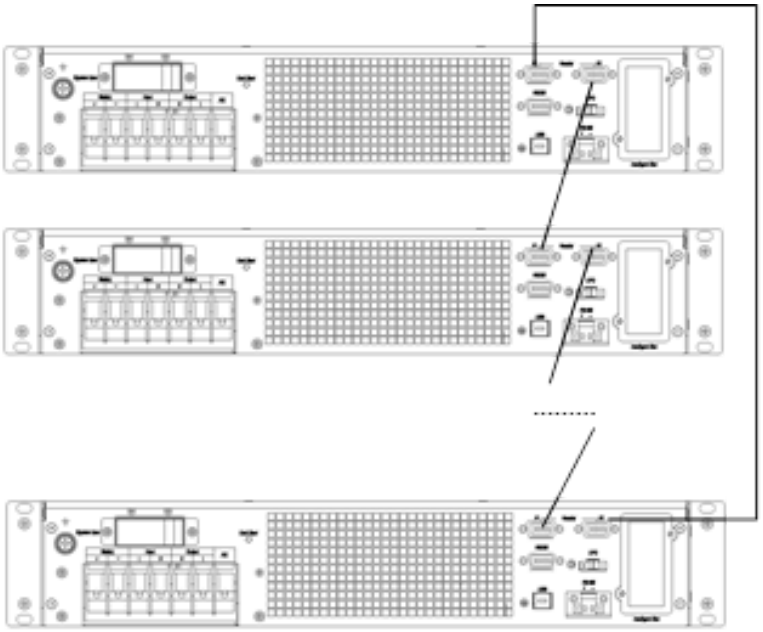


Fig 2- 8: 3 UPS Paralleled System

Must set the UPS is parallel system as “parallel mode” via software according to “Annex A” before start parallel system

3. Controls And Indicators

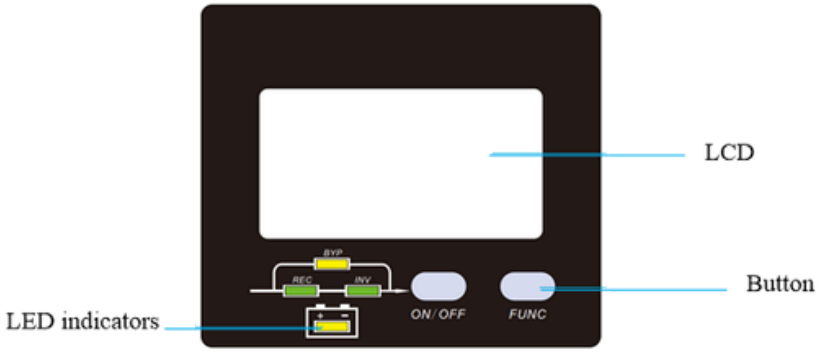


Fig 3- 1: Display Panel

3.1 Description of Panel

Controls	Description
ON/OFF	Press ON/OFF to cold start UPS from battery Press ON/OFF for 2.5s to shut down inverter and transfer to bypass Press ON/OFF for 2.5s to shut down UPS completely when UPS is in battery mode Press ON/OFF to confirm setting when in setting mode
FUNC	Press FUNC to page down to check LCD menu Press FUNC for 2.5s at the page 1 to mute off, press again to mute on Press FUNC and ON/OFF together for 2.5s to enter in setting mode Press FUNC for 2.5s at the P4 to fault clear
Indicators	**Description**
REC	Rectifier indicator: green--rectifier is normal, green flicker--rectifier is starting, dark—rectifier is not working
INV	Inverter indicator: green--inverter is normal, green flicker--inverter is starting or tracking with bypass(ECO), dark—inverter is not working
BYP	Bypass indicator: yellow—bypass is normal, yellow flicker—bypass alarm ,dark—UPS is in normal mode and bypass is normal
BAT	Battery indicator: yellow—battery discharged, yellow flicker—No battery or battery alarm, dark—battery is connected

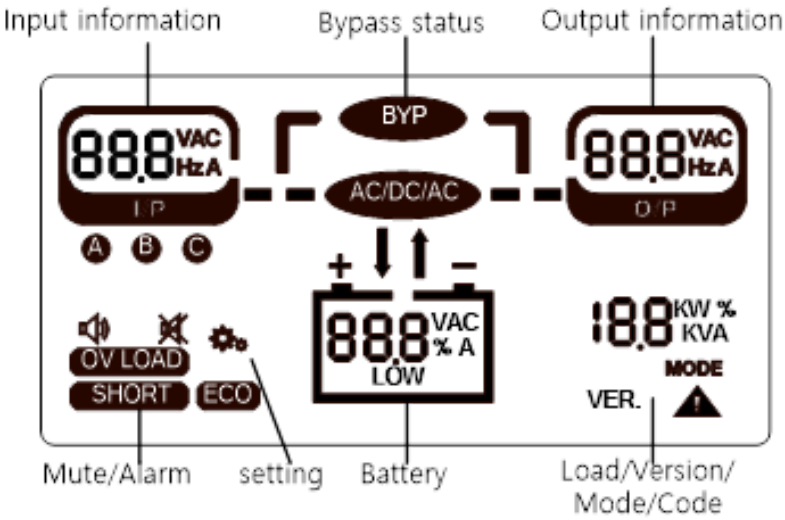
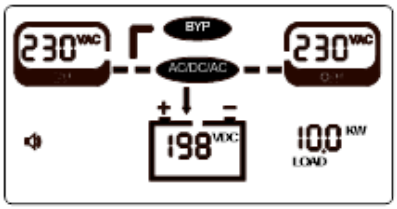
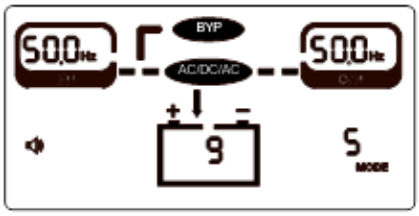
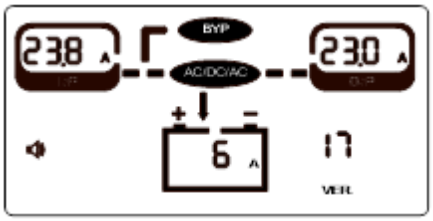
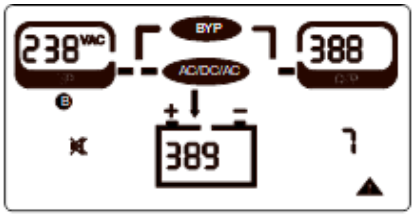
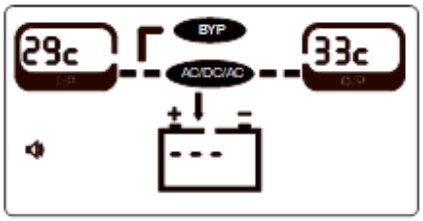


Fig 3- 2: LCD Menu

3.2 Description of LCD Menu

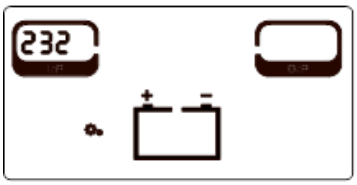
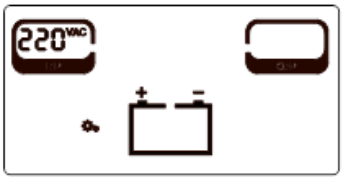
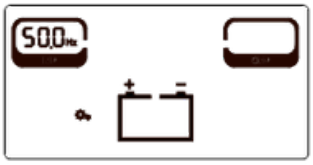
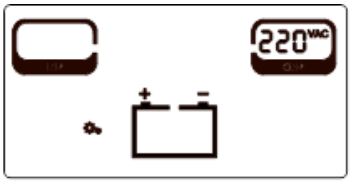
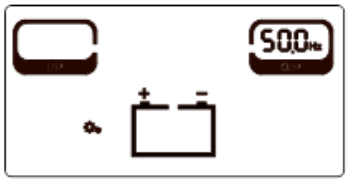
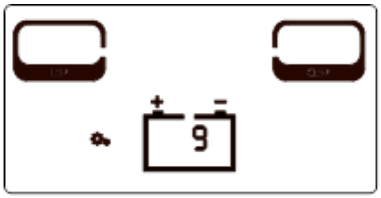
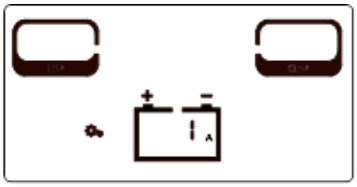
Menu	Information
Input information	Main input: voltage VAC, current A, frequency Hz, “A,B,C” display in turn for phase A,B,C Bypass input (bypass “B” flicks): Voltage VAC, current A, frequency Hz
Battery information	Battery: voltage VDC, discharge/charger current A, remained capacity %, battery low alarm LOW!
Output information	Output information: Voltage, current, frequency
Alarm	 : mute on/off OV LOAD! : over load SHORT: output short ECO: working in ECO mode
Load/Version/Code	Load: active load KW, apparent load kVA, load percent % VER: firmware version MODE: system mode, S-single mode, P- parallel mode, E-E mode, A-self aging mode  : warning code, refer to “***7. Trouble Shooting***” to get detailed code list
Others	SETTING: LCD is in setting mode BYPASS: bypass conversion

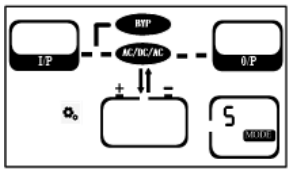
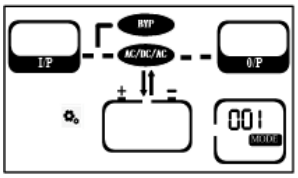
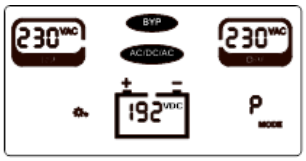
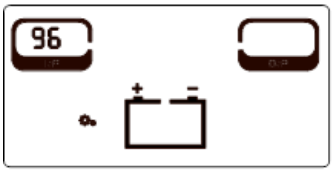
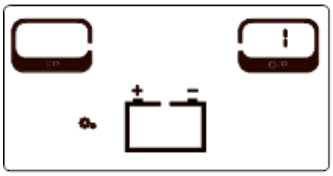
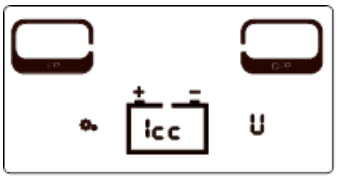
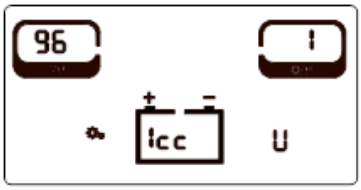
Press FUNC to check menu:

PAGE	DETAILS
	P1: INPUT voltage: 230VAC OUTPUT voltage: 230VAC Battery voltage: 198VDC LOAD: 10KW Load percent (%), active power(KW), apparent power(kVA) are displayed in turn Press “FUNC” for 2.5s in this page to mute off
	P2: INPUT frequency: 50Hz OUTPUT frequency: 50Hz Battery AH: 9AH. If remained capacity is set available, AH and remained capacity (%) are displayed in turn System MODE: S-single unit
	P3: INPUT current: 23.8A OUTPUT current: 23A Battery current: 6A (downwards arrow: charge, upwards arrow: discharge, no arrow: no battery) Firmware Version: VER. V1.017 for example, 1 and 17 display in turn
	P4: “B”: flicks, bypass input menu now Bypass INPUT voltage: 220VAC BUS+ voltage:388VDC BUS- voltage:389VDC alarm code: 07 Press “FUNC” for 2.5s to manually fault clear
	P5: Input and output temperature29℃,33℃

3.3 Setting

If want to set rated parameters, press ON/OFF and FUNC buttons together for 2.5s to enter in setting mode, “SETTING” on the bottom of LCD present and all LEDs flicks, LCD displays current setting in turn.

Main page	Press “FUNC” to select setting menu, press “ON/OFF” to confirm selection and enter in setting. 123—rated setting 232—RS232 setting 345—SNMP card 485—485 setting 567—setting recovery	
Input rated voltage setting	Could select input voltage as 110VAC/115VAC/120VAC/200VAC/ 208VAC/ 220VAC/ 230VAC/ 240VAC, press FUNC to select, press ON/OFF to confirm selection and enter in next page	
Input rated frequency setting	Could select input frequency as 50Hz/60Hz, press FUNC to select, press ON/OFF to confirm selection and enter in next page	
Output rated voltage setting	Could select output voltage as 110VAC/115VAC/120VAC/200VAC/ 208VAC/ 220VAC/ 230VAC/ 240VAC, press FUNC to select, press ON/OFF to confirm selection and enter in next page	
Output rated frequency setting	Could select output frequency as 50Hz/60Hz, press FUNC to select, press ON/OFF to confirm selection and enter in next page	
Battery number setting	Could select battery number as 10(120VDC)/12(144VDC)/16blocks (192VDC)/18 blocks(216VDC)/20 blocks (240VDC), press FUNC to select, press ON/OFF to enter in next page	
Battery capacity setting	Select battery AH according to site application, press FUNC to select, press ON/OFF to confirm selection and enter in next page	
Charger current setting	Charger current could be set as below: Standard model: 1A Long backup model: 1,2,3,4,5,6,7,8A Press FUNC to select, press ON/OFF to confirm and enter in next page	

System mode	S-single mode P-parallel mode E-ECO mode A-self aging mode Press FUNC to select, press ON/OFF to confirm and enter in next page.	
	001- parallel ID1 In parallel mode, the parallel ID could be set as 000 to 008 Press FUNC to select, press ON/OFF to confirm and enter in next page.	
Exit	If all settings are finished, settings will be displayed on LCD, press ON/OFF to exit. The setting will be activated after restart UPS.	
Communication protocol setting	Select 232, 345 or 485 at main page to set communication: Baud rate:96—9600, 12—1200, 24—2400,48—4800,192--19200 Press “ON/OFF” to confirm and enter in ID setting	
Communication ID setting	Set ID as 1 to 32. Press “ON/OFF” to confirm and enter in protocol setting	
Communication protocol setting	0cc--ModBus 1cc--RTU 2cc—NetAgent Press “ON/OFF” to confirm and finish communication setting	
Exit setting	If all settings are finished, settings will be displayed on LCD, press ON/OFF to exit. The setting will be activated after restart UPS.	

NOTE

Press “FUNC” and “ON/OFF” at any setting page for 2.5s to exit setting mode.

4. OPERATION

4.1 Operation Mode

4.1.1 Turn on the UPS

- Close the battery breaker (long backup model), close the main input and bypass input breaker.
- UPS starts automatically, after about 1 minute, UPS works at normal mode.
- Connect loads one by one to UPS.

4.1.2 Turn off the UPS at normal mode

- Shutdown the connected load and open external output breaker
- Press ON/OFF button for 2.5S to transfer to bypass.
- Open the mains input breaker and bypass input breaker. For long backup model, open the battery breaker to turn off UPS completely.
- For standard model, press ON/OFF for 2.5S then to shutdown completely.

4.1.3 Turn on the UPS from battery

- Make sure the battery is correctly connected.
- Press “Cold start” button on the rear panel until LCD is on and buzzer alarms.
- UPS starts from battery automatically after about 1minutes. If set as “manual start”, please press “FUNC” to start.

4.1.4 Turn off the UPS at Battery mode

- Press ON/OFF for 2.5S to shutdown. Then open external battery breaker.
- Wait for a moment, the UPS will shutdown completely.

WARNING

Internal DC bus still has hazardous high voltage in several minutes, please wait for at least 5 minutes to open UPS. And check the DC bus voltage before maintenance.

4.2 Parallel Operation

4.2.1 Turn on the UPSs of Parallel System

- Make sure the power cables and communication cables are correctly.
- Close external output CB1 and CB2
- Turn on UPS1. Then turn on UPS2.
- Close external battery breakers
- Turn on loads one by one

4.2.2 Turn off Parallel System

- Turn off the connected load. Press ON/OFF button to transfer to bypass. Open output breakers. Open mains input and bypass input breakers of all UPSs.
- For long backup model, open external battery breakers. After a few seconds, the UPSs will shutdown completely.

4.2.2 How to remove a single UPS from the parallel system:

- If you need to remove one UPS of the UPSs parallel system which is in normal mode, open input/output/battery breaker to shutdown the UPS firstly.
- Remove the parallel cables of the UPS that need to be removed. Then connect remained parallel cables back to remained parallel system.
- Disconnect all cables of removed UPS and remove it.

5. Control and Communication

UPS includes several communication ports: RS232,EPO,SNMP card, USB, dry contact, RS485.
NOTICE: Only one of SNMP card, dry contact can be installed at the same time. Only one of RS232 and USB is available at the same time.

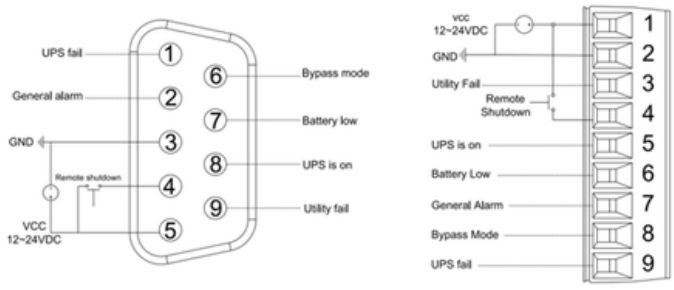
5.1 SNMP Card

SNMP card is used to monitor the UPS via TCP/IP, user can check the UPS status, voltage and current on the internet. Pleaser refer to the user manual of SNMP card to get more detailed information.

5.2 Dry Contact

There are two types of dry contact for option: DB9, phoenix terminal.
Max output current for dry contact is 1A. The function of dry contact is listed as

Fig 5-1:



a. DB9 port b. Phoenix port

Table 5- 1: Function of Dry Contact

Port PIN Function	DB9	Phoenix	Description
UPS fail	1	9	Pin1 to pin5 is NO（Normally Open） if something is failure in UPS. If not, NC （Normally Close）
General alarm	2	7	Pin2 to pin5 is NO if something is abnormal. If not, NC
GND	3	2	External power supply GND
Remote shutdown	4	4	UPS shutdowns rectifier and inverter if utility is normal. UPS shutdowns completely if in battery mode. Close switch to activate.
Power supply	5	1	External power supply.12VDC~24VDC, Common connection.
Bypass mode	6	8	Pin6 to pin5 is NC if UPS works in bypass mode. If not, NO.
Battery low	7	6	Pin7 to pin5 is NO if battery voltage is low. If not, NC.
Normal mode	8	5	Pin8 to pin5 is NC if UPS works in normal mode. If not, NO.
Utility fail	9	3	Pin9 to pin5 is NO if utility is failure. If not, NC.

5.3 EPO

The remoted EPO is located on the rear panel of UPS shown as Fig 1-2. It's normal closed, if it's opened, it will acivate EPO function, the UPS will be shutdown.
NOTE: The system EPO doesn't work as default, please set it via software if needed.

6. Maintenance

6.1 Battery Maintenance

The batteries used in standard models are value regulated, sealed lead-acid, maintenance free battery. When being connected to the utility power, whether the UPS is turned on or not, the UPS keeps charging the batteries.

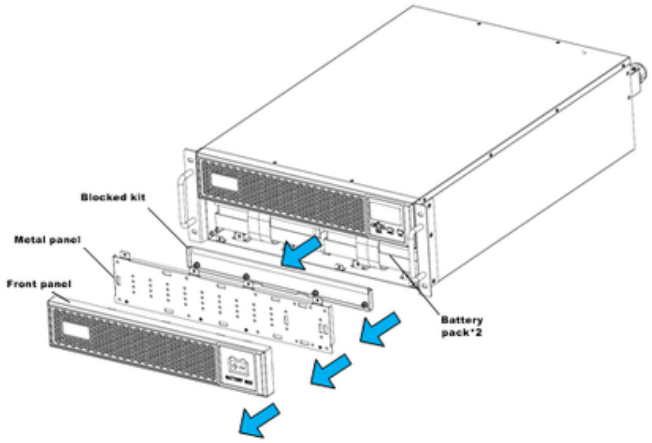
1) The UPS should be charged once every 4 to 6 months if it has not been used for a long time.
2) In the regions of hot climates, the battery should be charged and discharged every 2 months. The standard charging time should be at least 12 hours.
3) At normal conditions, the battery life lasts 3 to 5 years. In case if the battery is abnormal, earlier replacement should be made.
4) Battery replacement should be performed by qualified personnel.
5) Replace batteries with the same number and same type of batteries.
6) All the batteries should be replaced at the same time.

6.2 Battery Disposal

1) Before disposing of batteries, remove jewelry, watches and other metal objects.
2) Use rubber gloves and boots, use tools with insulated handles.
3) If it is necessary to replace any connection cables, please purchase the original materials from the authorized distributors or service centers, so as to avoid overheat or spark resulting in fire due to insufficient capacity.
4) Do not dispose of batteries or battery packs in a fire. The batteries may explode.
5) Do not open or mutilate batteries, released electrolyte is highly poisonous and harmful to the skin and eyes.
6)Do not short the positive and negative of the battery electrode, otherwise, it may result in electric shock or fire.
7)Make sure that there is no voltage before touching the batteries. The battery circuit is not isolated from the input potential circuit. There may be hazardous voltage between the battery terminals and the ground.
8)Even though the input breaker is disconnected, the components inside the UPS are still connected with the batteries, and there are potential hazardous voltages. Therefore, before any maintenance and repairs work is carried out, switch off the breaker of the battery pack or disconnect the jumper wire of connecting between the batteries.
9)Batteries contain hazardous voltage and current. Battery maintenance such as the battery replacement must be carried out by qualified personnel who are knowledgeable about batteries. No other persons should handle the batteries

6.3 Battery Replacement Procedures

1)Transfer to bypass mode
2)Close the manual bypass breaker. Open input, output and battery breaker to shutdown UPS. If no manual bypass breaker, please shutdown UPS completely.
3)Remove the front battery panel and metal panel, then remove the battery locked kit.
4)Pull out the battery pack



6.4 Checking UPS status

It is recommended to check the UPS once every half year.
Check if the UPS is faulty: Are the LED indicators abnormal? Is there any alarm?
Check if the UPS is working in bypass mode: Normally, the UPS works at normal mode, if it's working in bypass mode, please check: overload, internal fault and so on.
Check if the battery is discharging: When the mains input is normal, the battery should not discharge, if the UPS is working at battery mode, please check: if mains input is failure, battery test, operator intervention and so on.
Check if the ventilation of UPS is blocked: If blocked, please clear it to make sure the UPS is normally working.

7. Trouble Shooting

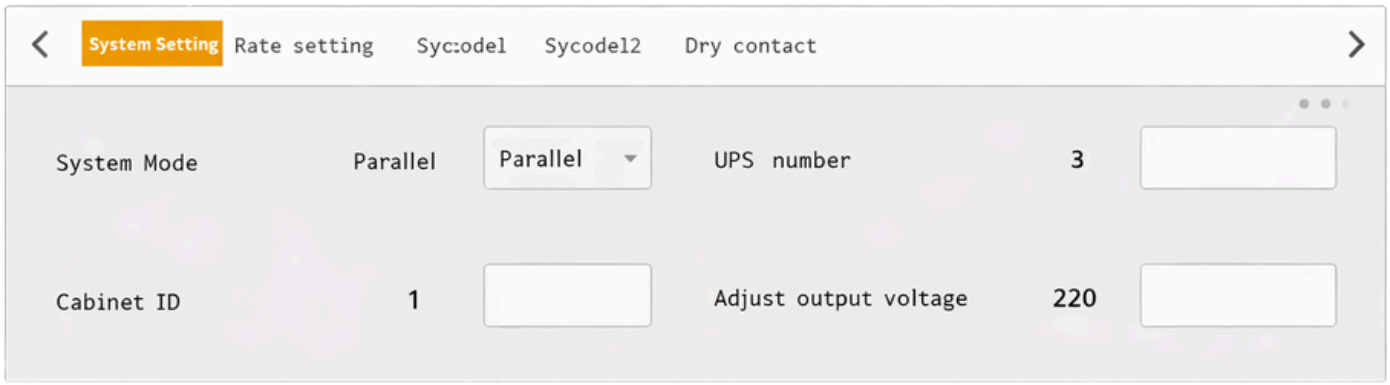
If UPS alarms and buzzer sound, please press "FUNC" to get alarm code on the menu of alarm code(page) on LCD. And press "FUNC" for 2.5s when at page 4 to manually fault clear. If alarms are still existent, please check the problem follow the Table 7-1:

Code	Cause	Solution
7	No battery	Check if the battery cables are connected correctly Check battery breaker or fuses are opened Check if batteries are damaged
8	Manual bypass on	Manual bypass is closed, the UPS will transfer to bypass and forbidden to transfer back to inverter
10	EPO	Check if EPO is closed correctly Check if EPO is activated manually
16	Utility abnormal	UPS mains input is abnormal. Check if mains input is normal Check if mains input voltage and frequency is over the working range Check if mains input breaker or external input breaker is opened Check if the input phase sequence against Please recover mains input power, otherwise output will be shutdown if battery is discharged to EOD
20	Bypass abnormal	Check if bypass input power is abnormal Check if bypass input breaker is opened Please recover bypass input power, otherwise there will be no backup circuit when UPS is faulty

22	Bypass fault	Bypass SCR is opened or shorted, please contact with local dealer
24	Bypass overload	Check the load and remove some non critical load until the load is below 95%
26	Bypass overload timeout	Bypass overload and timeout, UPS will shutdown output
28	Over synchronization	Bypass voltage or frequency is over tracking range. There could be interruption if manually transfer to bypass or inverter is faulty
30	Over transfer times	Mains and battery or inverter and bypass transfer for 5 times in 1hour
32	Output short ciucuit	Load is abnormal or output breaker is failure. Check if load is abnormal and the faulty load is shutdown Check if output breaker is failure If the abnormal load is removed, please manually fault clear to restart UPS.
47	Rectifier fault	DC bus over voltage, low voltage, shorted or IGBT opened. Please manually clear the fault and if the fault is still on, please contact with local dealer
49	Inverter fault	Inverter voltage is abnormal, or inverter IGBT opened. Please manually clear the fault and fi the fault is still on, please contact with local dealer
51	Rectifier over temperature	Rectifier heatsink is over temperature or the temp sensor is not connected correctly. Check if fans are working normally Check if any thing block ventilation Check if the sensor is connected correctly Check if the environmental temp is over the range of UPS
53	Fan fault	One or more fans are faulty or blocked Check if all fans working normally Check if something blocks fan
55	Overload	Inverter is overload. Please remove numbers of non critical loads, or else UPS could transfer to bypass
57	Over load timeout	UPS will transfer to bypass and if bypass overload, output could be shutdown caused by bypass overload timeout. Please remove numbers of loads and the UPS will transfer back to inverter
59	Inverter over temperature	Inverter heat sink is over temperature or the temp sensor is not connected correctly. Check if fans are working normally Check if any thin block ventilation Check if the sensor is connected correctly Check if the environmental temp is over the range of UPS
63	Manual transfer to bypass	If bypass is over synchronization range, output could be interrupted if manually transfer to bypass
65	Battery low	Remained battery capacity is low when in battery mode

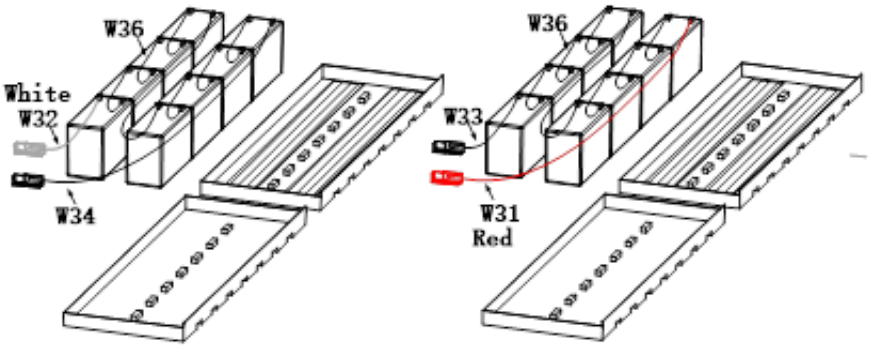
Annex A. Parallel Setting

1. Connect UPS1 with RS232 cable to PC. Connect UPS with monitoring software.
2. Under system settings, set "System Mode" -- "parallel", if have 3 cabinet parallel, setting the UPS number to "3", and if only 2 UPS to "2". Cabinet ID can be set from 0 to "n-1", "n" is the number of parallel. Ensure there are no duplicate ID settings in the parallel system.
3.Each UPS in the parallel system is set in the same setting mode, and sets the cabinet ID.
4. After setting, turn on the system

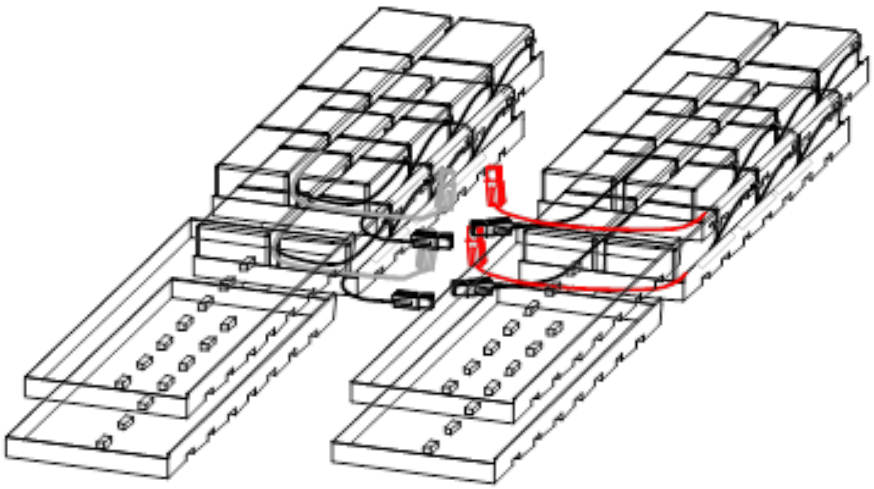


Annex B. Battery Packs Assembly

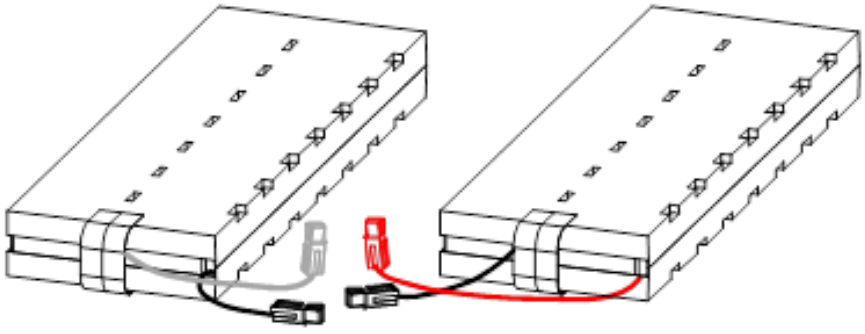
1.Put the batteries together and connect the cables as following:



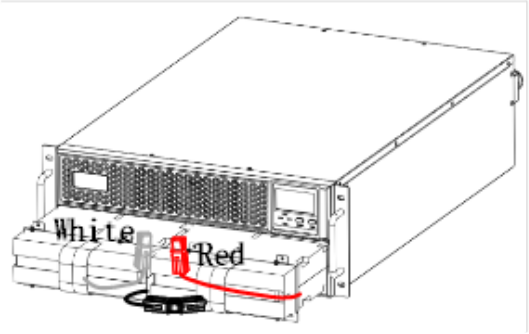
2.Put the batteries into the plastic box, stick firmly:



3.Cover, stick firmly:



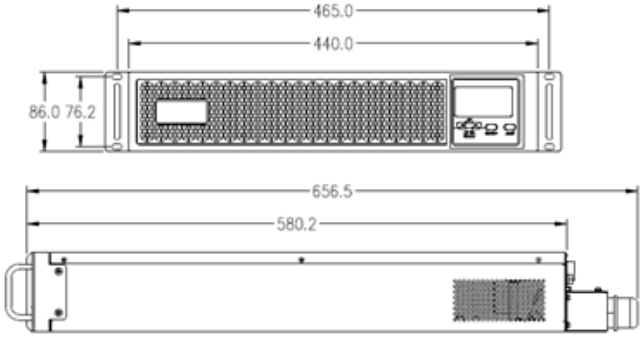
4.Insert two battery packs into UPS as below, notice that the location of two packs with different connectors:



5. Connect black terminals of battery packs. Connect red terminal to red terminal of UPS. Connect white terminal to white terminal of UPS. Cover back the front panel.

Annex C. Mechanical Dimension

6K/10K Long backup time rack



6K/10K Standard rack