Quant

ELEVATING TECHNOLOGY

1-3KVA Rack UPS User Manual

SMART TOWER ONLINE UPS (1–3kVA Single-Phase)	SMART RACK ONLINE UPS (1–3kVA Single-Phase)	SMART TOWER ONLINE UPS (1–3kVA Single-Phase)
SMT-T001-I	SMT-R001-I	SMT-T001-I
SMT-T01.5-I	SMT-R01.5-I	SMT-T01.5-I
SMT-T002-I	SMT-R002-I	SMT-T002-I
SMT-T003-I	SMT-R003-I	SMT-T003-I
SMT-T001-X	SMT-R001-X	SMT-T001-X
SMT-T002-X	SMT-R01.5-X	SMT-T002-X
SMT-T003-X	SMT-R002-X	SMT-T003-X
	SMT-R003-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.
- Do not place the UPS power cord where it might be damaged.

1. Electromagnetic Compatibility

*** Safety**	
IEC/EN 62040-1-1	
*** EMI**	
Conducted Emisión.....IEC/EN 62040-2	Class C2
Radiated Emission.....IEC/EN 62040-2	Class C2
***EMS**	
ESD.....IEC/EN 61000-4-2	Level 4
RS.....IEC/EN 61000-4-3	Level 3
EFT.....IEC/EN 61000-4-4	Level 4
SURGE.....IEC/EN 61000-4-5	Level 4
Low Frequency Signals.....:IEC/EN 61000-2-2	
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.	

NOTICE

- This product is for restricted sales distribution to informed partners.
- Installation restrictions or additional measures may be needed to prevent radio interference.
- Operate the UPS indoors only, in an ambient temperature range of 0–40°C (32–104°F).
- Install it in a clean environment, free from moisture, flammable liquids, gases, and corrosive substances.

WARNING

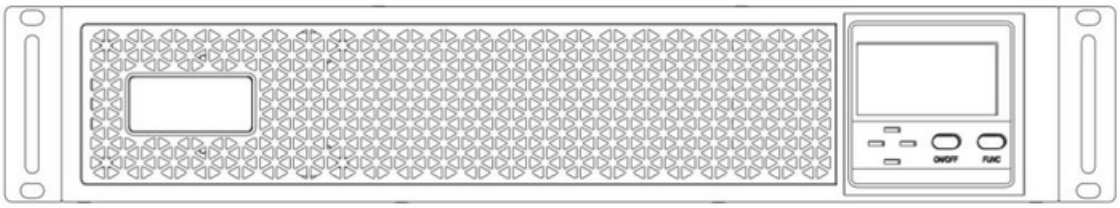
This UPS contains no user-serviceable parts except the internal battery pack. Under no circumstances attempt to gain access internally, due to the risk of electric shock or burning. Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and precautions. Keep unauthorized personnel away from the batteries. Proper disposal of batteries is required. Refer to your local laws and regulations for disposal requirement. DO NOT CONNECT equipment that could overload the UPS or demand DC current from the UPS, for example: electric drills, vacuum cleaners, laser printers, hair dryer or any appliance using half-wave rectification.

2. Introduction

The UPS is an on-line UPS. An on-line UPS continuously regulates its output voltage, whether utility power is present or not. It supplies connected equipment with clean sinewave power. For ease of use, the UPS features a LCD display to indicate all information of UPS and provide kinds of function buttons.

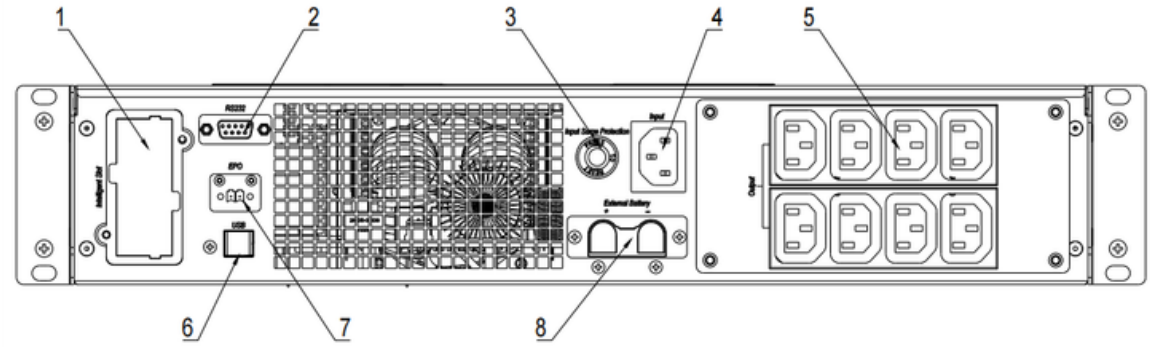
2.1 Front View

1-3kVA



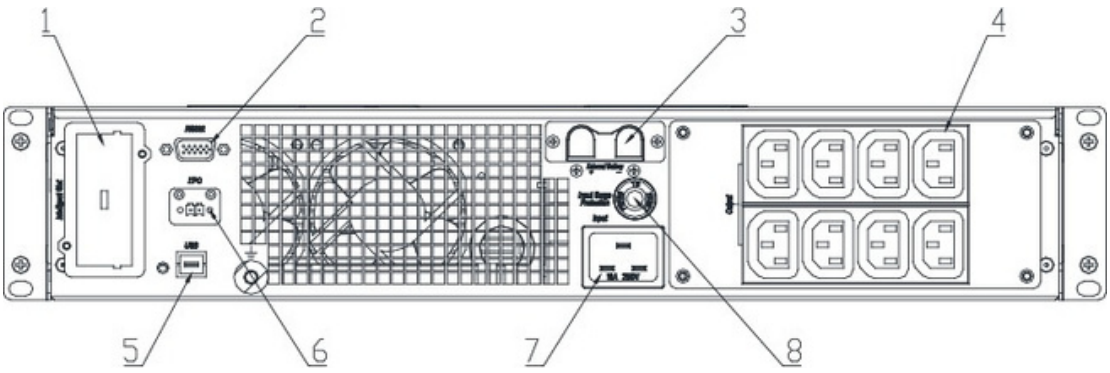
2.2 Rear View

1kVA-Long backup time/Standard



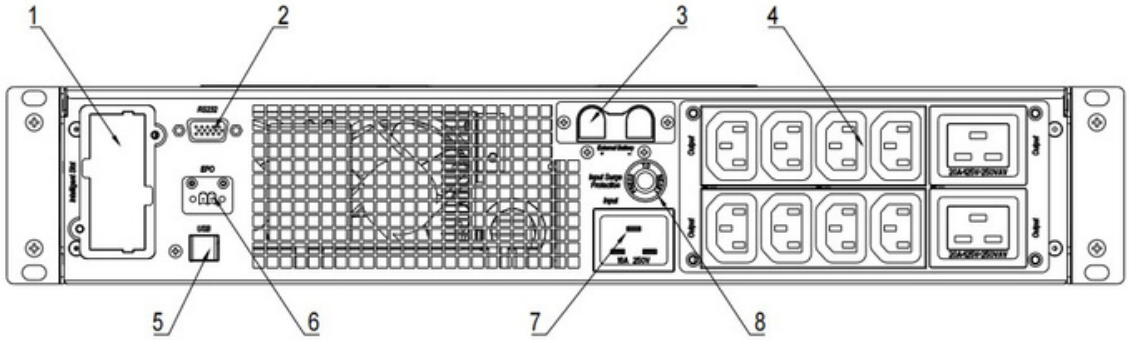
1	Intelligent slot.
2	RS-232 communication port. DB9 type.
3	Input surge protection slot.
4	Input socket 10A.
5	Output Socket IEC C13
6	USB port. B type. (Optional).
7	EPO. Open to activate.
8	External battery port. Optional for standard model.

2kVA-Long backup/Standard



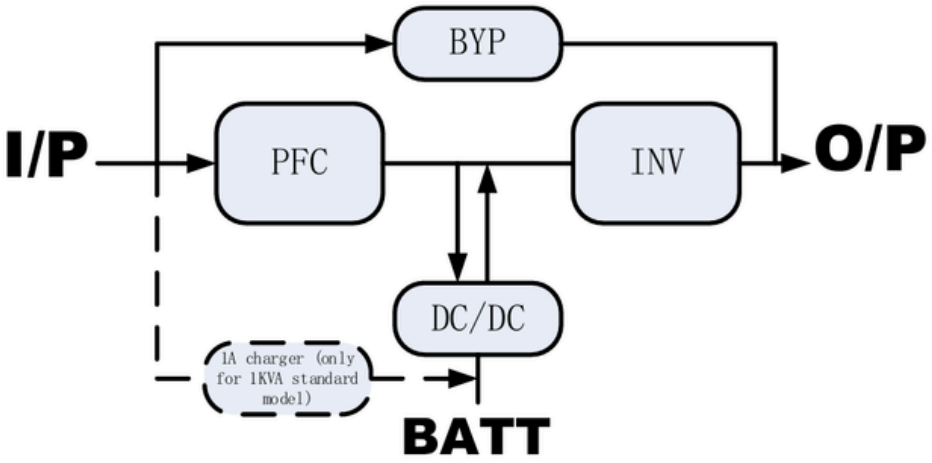
1	Intelligent slot.
2	RS-232 communication port. DB9 type.
3	External battery port. Optional for standard model.
4	Output Socket IEC C13.
5	USB port. B type. (Optional)
6	EPO. Open to activate.
7	Input socket 16A.
8	Input surge protection slot.

3kVA-Long backup/Standard



1	Intelligent slot.
2	RS-232 communication port. DB9 type.
3	External battery port. Optional for standard model.
4	Output Socket IEC C13+C19.
5	USB port. B type. (Optional)
6	EPO. Open to activate.
7	Input socket 16A.
8	Input surge protection slot.

3. System Description



3.1 Rectifier/Power Factor Correction(PFC)Circuit

In normal operation, the rectifier/power factor correction (PFC) circuit converts utility AC power to regulated DC power for use by the inverter while ensuring that the waveform of the input current used by the UPS is near ideal. Extracting this sinewave input current achieves two objects:

- The utility power is used as efficiency as possible by the UPS.
- The amount of distortion reflected on the utility is reduced.

This results in cleaner power being available to other devices in the building not being protected by the UPS.

3.2 Inverter

In normal operation, the inverter utilizes the DC output of the power factor correction circuit and inverters it into precise, regulated sinewave AC power. Upon a utility power failure, the inverter receives its required energy from the battery through the DC-to-DC converter. In both modes of operation, the UPS inverter is on-line and continuously generating clean, precise, regulated AC output power.

3.3 1A Battery Charger

The charger is only available in 1kVA standard model.

3.3 1A Battery Charger

The DC/DC converter utilizes energy from the battery system and raises the DC voltage to the optimum operating voltage for the inverter. The converter includes boost circuit which is also used as PFC.

The DC/DC converter also converts DC bus energy to charge batteries in all models except 1kVA standard model.

3.5 Battery

The standard model includes value-regulated, non-spillable, lead acid batteries inside. To maintain battery design life, operate the UPS in an ambient temperature of 14-25°C.

3.6 Dynamic Bypass

Bypasses connect loads directly to the utility if inverter was failure.

NOTICE

The bypass power path does NOT protect the connected equipment from disturbances in the utility supply.

4. Product Specification and performance

General Specification

Model		1K Standard	1K Long backup time	2K Standard	2K Long backup time	3K Standard	3K Long backup time
Power Rating		1000VA/	1000VA/	2000VA/	2000VA/	3000VA/	3000VA/
		1000W	1000W	2000W	2000W	3000W	3000W
Frequency (Hz)		50/60		50/60		50/60	
Input	Voltage	110Vac~288Vac					
	Current	5.5A max.		11A max		16A max	
Battery	Model	12V7Ah	Depending on external battery	12V7Ah	Depending on external battery	12V9Ah	Depending on external battery
	Numbers	2/3		4/6		6	
	Max charging	1A	1-12A	1A	1-12A	1A	1-12A
	Voltage	24/36VDC		48/72VDC		72VDC	
	Current	35A max	35A max	35A max	35A max	50A max	50A max
Output	Voltage	200V/208V/220V/230V/240V					
	Current	5/4.8/4.5/4.3/4.2A		10/9.6/9/8.6/8.4A		15/14.4/13.5/12.9/12.6A	

Model		1K Standard	1K Long backup time	2K Standard	2K Long backup time	3K Standard	3K Long backup time
Dimension (WxDxH) mm		440*440*86（Long backup time/ standard backup time）		440*440*86（Long backup time）			
				440*580*86（standard backup time）			
Weight	Standard	12Kg		21Kg			
	Long	6.5Kg		8Kg			

Electrical Performance

Input			
Model	Voltage	Frequency	Power Factor
1-3kVA	Single-phase	+-5Hz@50or60Hz	>0.99(Full load)

Output					
Voltage Regulation	Power Factor	Frequency Tolerance	Distortion	Overload capacity	Crest ratio
±1%	1	±0.5% of normal	THD<2%Full Linear LoadTHD<5%Full nonlinear load	102%~110%: 30mins，110%~125%:10mins，125%~150%: 30 seconds	3:1 maximum

Operating Environment

Temperature	Humidity	Altitude	Storage temperature
0°C-40°C	<95%	<1000m	-20°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 in use, please refer to the following:

Altitude (M)	1000	1500	2000	2500	3000	3500	4000	4500	5000
Derating Power	100%	95%	91%	86%	82%	78%	74%	70%	67%

5. Installation

5.1 Unpacking and Inspection

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

- 1 UPS
- 1
- 1 Input Cable
- 1 Battery Cable (For Long backup model only)

2) Inspect the appearance of the UPS to check 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 some parts.

5.2 Mechanical Installation

Two installation modes are available: tower installation and rack installation, depending on available space and use considerations.

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 to ensure good ventilation.
- 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.

5.2.1 Tower Installation

Various installation configurations are available: single UPS, single UPS with single or multiple battery cabinets. Their installation methods are all the same.

The installation procedures are as follows:
Step 1: Take out the support bases from the accessories. Their appearances are shown in Fig.5-1.

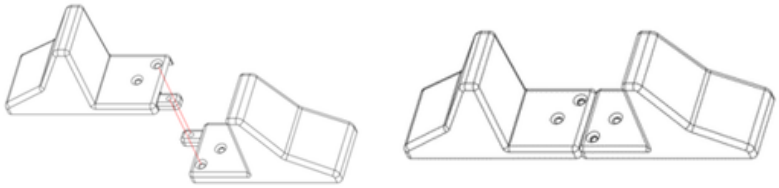


Fig.5-1 Support bases

Step 2: Adjust the direction of UPS operation and display panel.
1. Remove the front plastic bezel cover gently and remove two brackets' screws, as shown in Fig.5-2.

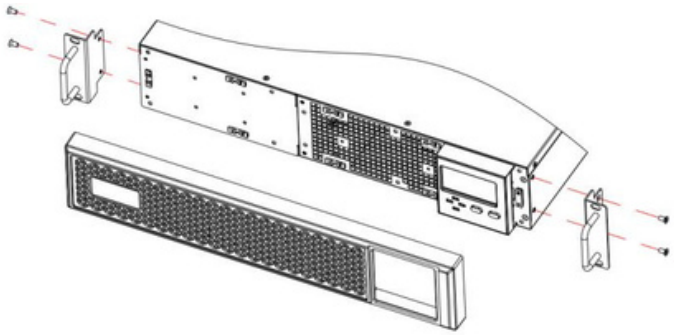


Fig.5-2 Removing the front plastic bezel cover

2.Pulltheoperationanddisplay panel gently, rotate it 90 degrees clockwise and snap it back into position,asshowninFig.5-3

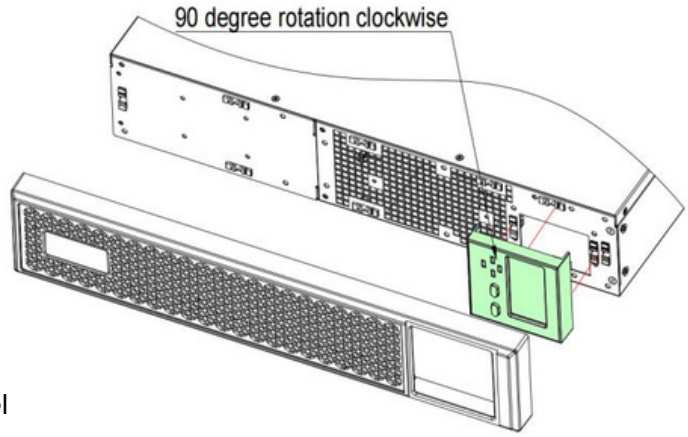


Fig.5-3 Rotating the operation and display panel

3. Restore the front plastic bezel cover to the UPS. At this point, the UPS operation and display panel have been rotated 90 degrees clockwise, which provides upright viewing for users.
Step 3: Place the UPS (and battery cabinet) on the support bases. Each UPS needs two pairs of support bases to install, as shown in Fig.5-4.

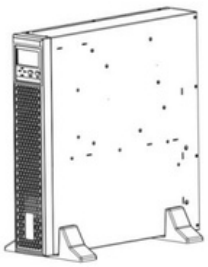


Fig.5-4 Tower installation

5.2.2 Rack Installation

Various installation configurations are available: single UPS, single UPS with single or multiple battery. The installation methods are all the same.

Installation steps:

Place the UPS onto the guide rail in the rack and push it completely into the rack along the guide rail (it is prohibited to move the UPS through the brackets). And fix the UPS onto the rack.

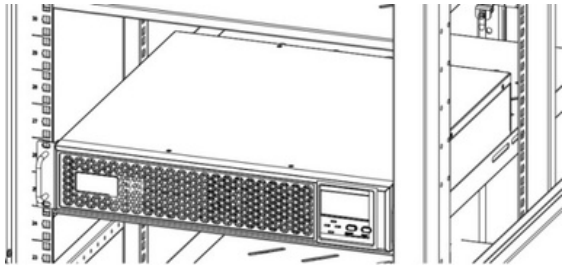


Fig.5-5 Installing UPS

5.3 Operating procedure for connecting the long backup time model UPS with the external battery

Notice: Please connect the external battery at least 40AH while the charge current is 8A, at least 20AH for 4A, otherwise it may cause damage to the battery.

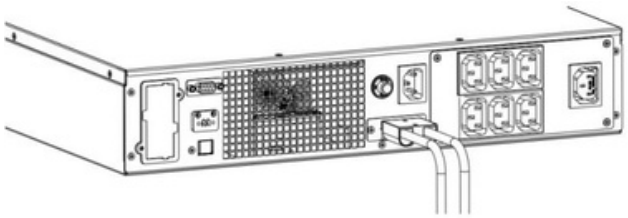


Fig.5-6 Battery terminal connection

2. Take out battery cables and connect the RED wire to the “+” terminal of the battery pack. Connect the BLACK wire to the “-“terminal of the battery pack.

NOTICE

DO NOT connectthe battery plug to the battery socket of UPS first, otherwise, it maycause electric shock.

6. Display and Settings

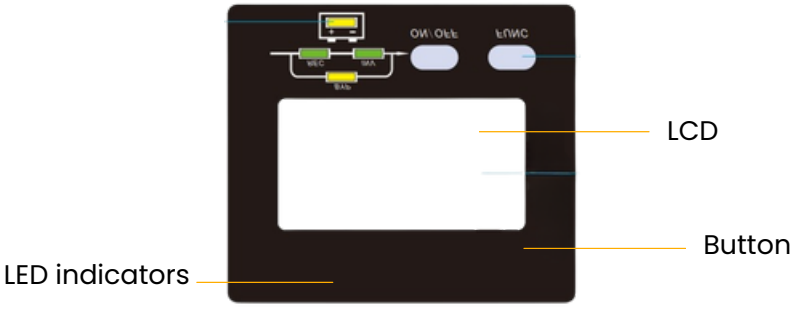


Fig 6- 1: Display Panel

6.1 Description of Panel

Controls	Description
ON/OFF	1.Press ON/OFF to start inverter when rectifier is OK NOTE Not available when UPS is set in automatically start mode 2.Press ON/OFF for 2.5s to shut down inverter and transfer to bypass 3.Press ON/OFF for 2.5s to shut down UPS completely when UPS is in battery mode 4.Press ON/OFF to confirm setting when in setting mode
Functional button	1. Press FUNC to page down to check LCD menu 2.Press FUNC for 1.5s at the page 1 to mute off, press again to mute on 3.Press FUNC and ON/OFF together for 2.5s to enter in setting mode 4.Press FUNC for 1.5s at the page 4 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

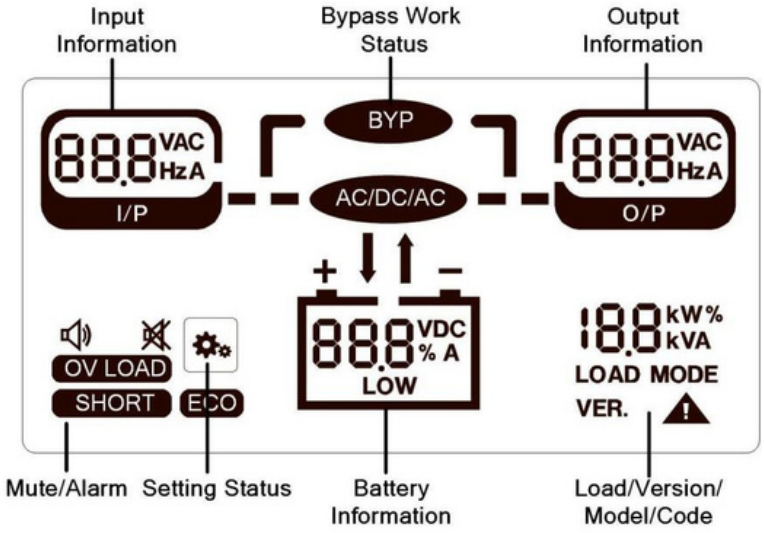


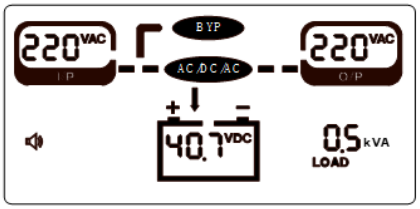
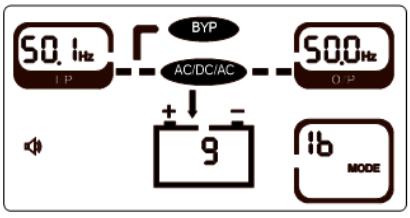
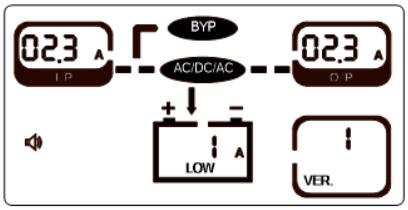
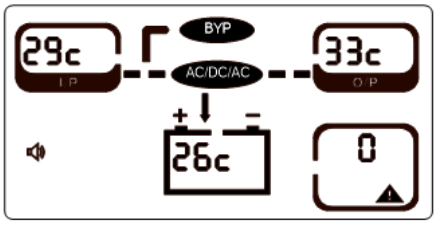
Fig 6-2: LCD Menu

6.2 Description of LCD Menu

Menu	Information
Input information	Main input: voltage VAC, current A, frequency Hz
	Bypass input (bypass "B" flicks):
	Voltage VAC, current A, frequency Hz
	PFC temperature: 66c—66°C
Battery information	Battery: voltage VDC, Battery current A, remained capacity %, battery low alarm LOW, battery temperature (c)
Output information	Output information:
	Voltage, current, frequency
	INV temperature: 66c--66°C
Alarm	mute on/off
	OV LOAD: overload
	SHORT: output short
	ECO: working in ECO mode

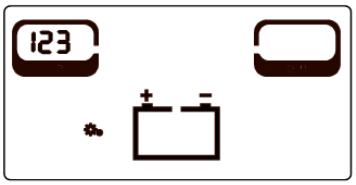
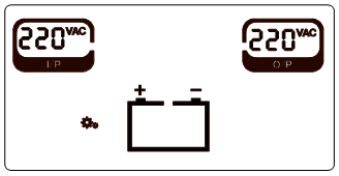
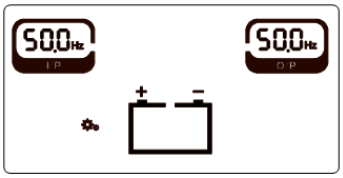
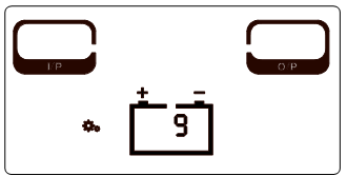
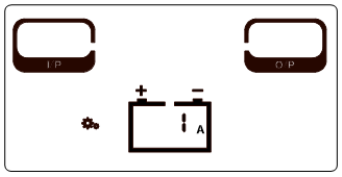
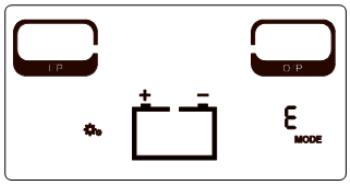
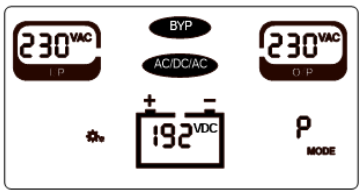
6.2 Description of LCD Menu

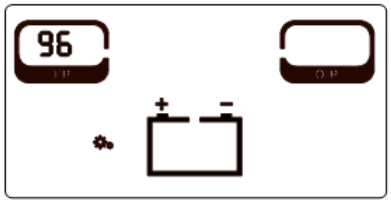
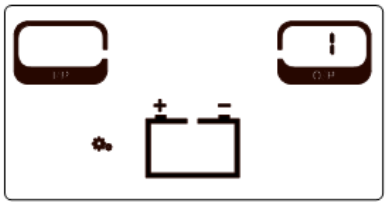
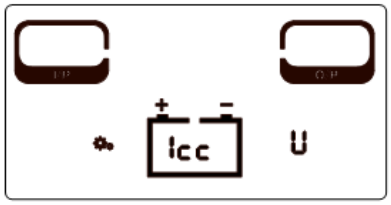
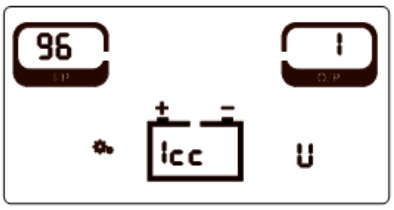
Menu	Information
Load/Version/model/Code	Load: active load KW, apparent load kVA, load percentage %
	VER: firmware version. V1.021 for example (v1 and 021 display in turn)
	MODE: system model, 1b,1L,2b,2L,3b,3L
	warning code, refer to "***7. Trouble Shooting***" to get detailed code list
Others	setting mode
	BYPASS: bypass conversion

Page	Description
	Page 1: INPUT voltage: 220VAC OUTPUT voltage: 220VAC Battery voltage: 40.7VDC LOAD: 0.5kVA Load percent (%), active power(KW), apparent power(kVA) are displayed in turn Press "FUNC" for 1.5s in this page to mute off
	Page 2: INPUT frequency: 50Hz OUTPUT frequency: 50Hz Battery AH: 9AH-200AH System MODEL: 1b—1kVA standard L- Long backup model, b- standard model
	Page 3: INPUT current: 2.3A OUTPUT current: 2.3A Battery current: 1A (downwards arrow: charge, upwards arrow: discharge, no arrow: no battery) Firmware Version: V1.17 (v1 and 17 display in turn)
	Page4: Input and output temperature29℃,33℃ Battery temperature: 26℃ alarm code: 0 Press "FUNC" for 2.5s to manually fault clear

6.3 Parameters 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 or switch to next menu page, press “ON/OFF” to confirm selection and enter in setting. 123—rated setting, 232—RS232 setting, 345—SNMP card, 485—485 setting, 567—Recover factory setting.	
Input and output rated voltage setting	Selection 123 then enter in rated setting. Select input and output voltage as 200VAC/ 208VAC/ 220VAC/ 230VAC/ 240VAC, press FUNC to select, press ON/OFF to confirm selection and enter in next page	
Input and output rated frequency setting	Select input and output frequency as 50Hz/60Hz, press FUNC to select, press ON/OFF to confirm selection and enter in next page	
Battery capacity setting	Select battery AH according to real application, press FUNC to select, press ON/OFF to confirm selection and enter in next page	
Charge current setting	Charger current could be set as below: Standard model: 1A Long backup model: 1-12A, default 3A. Press FUNC to select, press ON/OFF to confirm and enter in next page	
System mode	S-Normal mode E-ECO mode Press FUNC to select, press ON/OFF to confirm and exit setting.	
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, 240 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—Net Agent 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

7 Operation Mode

Turn on the UPS in normal mode

1) After you make sure that the power supply connection is correct and then close the battery breaker (long backup time model), that turn on the utility power. The fans rotate, and LCD is on

2) REC led starts with green flicker. BYP led is steady yellow and UPS works in bypass model. Inverter then starts and the INV led green flickers when REC led are steady green.

3) About several seconds, the UPS turn into normal mode. Inverter feeds power to the load.

Turn on the UPS from battery

1) Make sure that the breaker of the battery pack is in the "ON" position (long backup model), press the ON/OFF button once to power on the LCD, then press ON/OFF button again for 5 seconds.
2) A few seconds later, the UPS turns into Battery mode, and inverter feeds the load.

Turn off the UPS in normal mode

1) Press ON/OFF button for 2.5 seconds, UPS transfers to bypass.
2) Turn off utility power
3) If it's a long backup model, open the battery breaker to turn off UPS completely. If it's an internal battery model, the UPS will shut down completely after several seconds.

Turn off the UPS at battery mode

1) To power off the UPS by pressing the ON/OFF button for more than 2.5 seconds
2) When powered off, the UPS will turn into No Output mode. Finally, the UPS will shut down completely.

NOTICE

Please turn off the connected loads before turning on the UPS and turn on the loads one by one after the UPS is working in INV mode. Turn off all the connected loads before turning off the UPS.

8. Battery Maintenance

8.1 Battery maintenance

The batteries used for standard models are value regulated, sealed lead-acid, and maintenance free battery.

- The UPS should be charged once every 4 to 6 months if it has not been used for a long time.
- 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.
- Under normal conditions, the battery life lasts 3 to 5 years. In case the battery is found in bad condition, earlier replacement should be made.
- Battery replacement should be performed by qualified personnel.
- Replace batteries with the same number and same type of batteries.
- Do not replace the battery individually. All the batteries should be replaced at the same time following the instructions of the battery supplier.

8.2 Replacing Internal Battery Pack

Battery replacement procedures
Step 1: Remove the front plastic bezel cover from the UPS

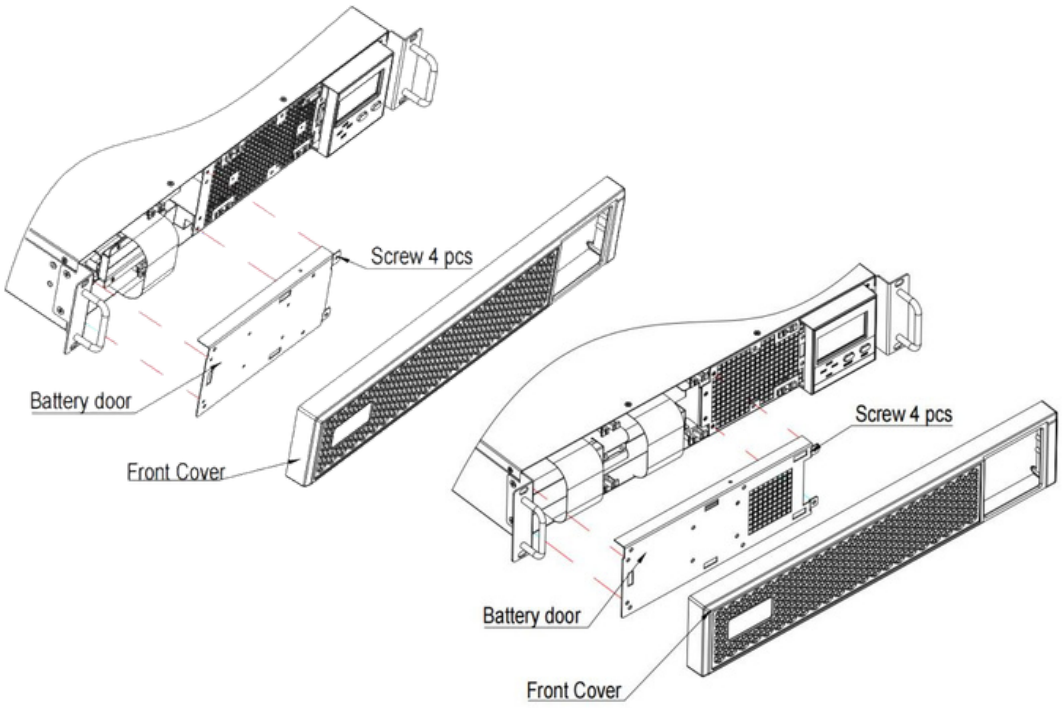
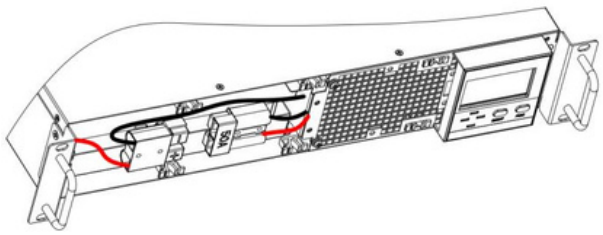


Fig.8-1 Removing the front plastic bezel cover and battery door

Step 3: Gently pull the battery wire out and disconnect battery wires.



Step 4: Grasp the battery handle, and pull the internal battery pack out of the UPS, as shown in Fig.8-2.

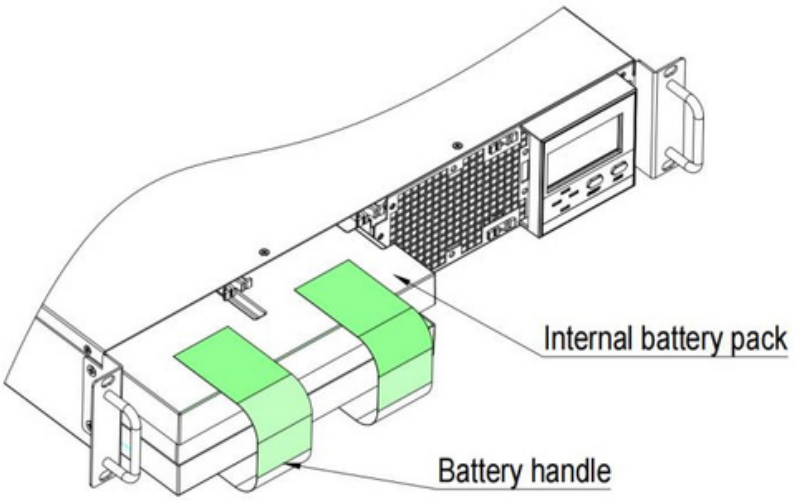


Fig.8-2 Pulling out the internal battery pack

Step 5: Unpack thenew internal battery pack. Take care not to destroy the packaging. Compare the newand old internal battery pack to make sure they are the same. If so, proceed with Step 6; otherwise stopoperation and contact your local dealer.

Step 6: Line up andslide in the new internal battery pack.

Step 7: Reconnectthe battery plug and battery receptacle and gently push the battery wire and internal
battery pack backinto the UPS.

Step 8: Reattachthefront battery door with the four screws.

Step 9: Reattachthefront plastic bezel cover to the UPS.

(For battery packassembly, refer to Annex C)

NOTICE

Do not replace the internal battery pack while UPS is operating in Battery Mode. This will result in a loss of output and will drop the connected load. Moreover, it will jeopardize personnel safety!

9. Battery disposal and replacement procedures

9.1 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 overheating 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 shorten 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 person should handle the batteries

9.2 Battery Replacement Procedures

1) Turn off UPS completely.
2) Remove covers from UPS.
3) Disconnect the battery wires one by one.
4) Remove metal bars which are used to fasten batteries.
5) Replace batteries one by one.
6) Screw metal bars back to UPS.
7) Connect the battery wires one by one. Take care of electrical shock while connecting the last wire

10. Trouble shooting

This section describes checking UPS' status. This section also indicates various UPS symptoms a user may encounter and provides a troubleshooting guide in the event the UPS develops a problem. Use the following information to determine whether external factors caused the problem and how to remedy the situation.

10.1 Checking UPS status

It is recommended that checking the UPS operation status every six months.

- l Check whether the UPS is faulty: Is the Fault Indicator on? Is the UPS sounding like an alarm?
- l Check whether the UPS is operating in Bypass mode. Normally, the UPS operates in Normal Mode. If it is operating in Bypass Mode, stop and contact your local representative, or Channel Support.
- Check whether the battery is discharged. When the utility input is normal, the battery should not be discharged. If UPS is operating in Battery Mode, stop and contact your local representative, or Channel Support.

10.2 Adjust the factors that caused the problem

When the fault indicator is on, press FUNC button to see the fault code and warn code. Fault and warning codes are listed as follows

Code	Event	Possible cause	Solution
1	Warn: Battery not connected	Battery not connected	Check if battery switch is off or battery cables are disconnected
2	Warn: EPO	Emergency power off	Short the EPO terminal 1&2 to activate EPO
3	Warn: Inverter on Less	Available ups capacity is less then the load capacity.	Please reduce the load capacity or make sure that the UPS capacity is big enough.
4	Warn: Input voltage abnormal	Utility is failure	/
		Input surge protector opens	If utility is normal but rectifier is not working, reset input surge protector
5	Warn: Line neutral wires reversed	Input Line and neutral is reversed	Check the polarity of line wire and neutral wire
6	Warn: Bypass voltage abnormal	Bypass voltage is out of bypass range or is off	Check if utility power is indeed out of range.
7	Fault: Bypass fail	Bypass input power is abnormal or bypass input breaker is opened.	Please recover bypass input power, otherwise there will be no backup circuit when UPS is faulty.
8	Warn: Bypass over load	Load is on bypass and is overload	Remove some loads to ensure that total loads is less than 95% of rated capacity
9	Warn: Bypass overload timeout	Load is on bypass and overload. Overload time is longer than the overload capacity of bypass. UPS will shutdown output and loads will loss power.	Remove some loads and restart UPS again. When UPS is working normally, turn on loads one by one.
10	Warn: Transfer times over limit in 1 hour	Transfer times between inverter and bypass is over 5 in recent 1 hour. UPS works in bypass mode.	Check if output is overload or some loads are shorted. Remove the failure loads and restart the UPS or wait for starting inverter automatically.

Code	Event	Possible cause	Solution
11	Warn: output shorted	Something shorted	Please remove all loads from UPS output. Check if UPS output is shorted. If not, please check all loads.
12	Warn: End of discharge	UPS works in battery mode for long time after utility failure. UPS output will be off until utility power is on.	Please save your data when UPS alarm “utility fail”
13	Fault: Battery self-detect fault	UPS transfer to battery mode for 20 seconds to check if batteries are normal	Please check the battery cables connect.
14	Fault: Rectifier fault	Bus over voltage, bus unbalance, rectifier starting failure, bus under voltage, input fuse is off	Please contact with distributer or service center.
15	Fault: Inverter fault	Inverter over voltage, inverter under voltage,	Please contact with distributer or service center.
16	Warn: Rectifier over temperature	Rectifier heatsink is over temperature or the temp sensor is not connected correctly.	l Check if fans are working normally
			l Check if any thing block ventilation
			l Check if the sensor is connected correctly
			Check if the environmental temp is over the range of UPS
17	Fault: Fan failure	One or more fans are failure, fan wires are loosen	Please contact with distributer or service center
18	Warn: Inverter overload	Loads are on inverter and over the capacity of the UPS	Remove some loads to ensure that total loads is under the capacity of the UPS
19	Warn: Inverter overload timeout	Load is over the capacity of the UPS and timeout, UPS will transfer to bypass mode if bypass is available	Remove some loads to under 95%, UPS will transfer to inverter automatically
20	Warn: 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
21	Warn: Battery low	UPS works in battery and battery voltage is low	Recover input power or save data upon “battery low”
22	Warn: input natural line lost	Input natural line disconnect	Please check the input cables connect.

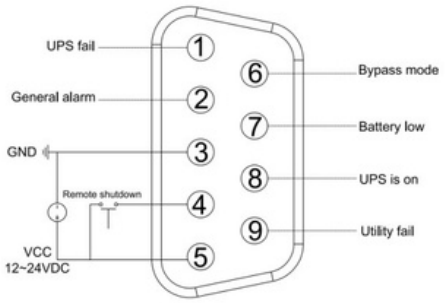
Code	Event	Possible cause	Solution
23	Fault: Bypass Fan failure	One or more fans are failure, fan wires are loosen	Please contact with distributer or service center.
24	Warn: Manual shutdown	UPS will shutdown output or transfer to bypass mode	/
25	Fault: Charger fault	There is no charger output.	Please contact with distributer or service center.
27	Warn: input over current	Abnormal large current enter in rectifier.	Please contact with distributer or service center.
28	Warn: auxiliary power supply lost	Auxiliary power supply abnormal.	Please contact with distributer or service center.
29	Fault: UPS model fault	UPS model ID detect abnormal.	Please contact with distributer or service center.
30	Fault: Output CT fault	Output current detection CT reversed connection	Please check the output current transformer connect.
31	Battery discharge time diminishes	The battery has not been fully charged	Charge the battery for more than 10 hours.
		UPS is overload	Check the loads and remove some devices.
		Battery aged	Replace the batteries. Please contact with distributer or service center to obtain replacement

NOTICE

Please provide the following information when reporting fault UPS:
The UPS model and serial NO. the warn and fault code happened.
Details of fault, include LED indicates, buzzer beeps, power condition, load capacity and configuration of battery (long backup time model)

Annex A. Dry Contact Card

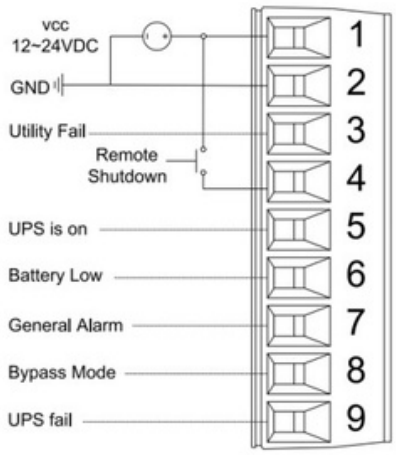
There are two types of dry contact card for option: DB9 port, phoenix port. Max output current for them is 1A. NC: normally close/NO: normally open



a. DB9 port

Description of DB9 port:

Port PIN	DB9	Description
UPS fail (Other functions can be set)	1	Pin1 to pin5 is open if something is failure in UPS. If not, NC (Can set reverse logic)
General alarm (Other functions can be set)	2	Pin2 to pin5 is open if something is abnormal. If not, NC (Can set reverse logic)
GND	3	External power supply GND
Remote shutdown (Other functions can be set) VCC	4	1.UPS shutdowns rectifiers and inverter if utility is normal. 2.UPS shutdowns completely if in battery mode. 3.Remote shut down if in high level
VCC	5	External power supply.12VDC~24VDC, Common connection.
Bypass mode	6	Pin6 to pin5 is close if UPS works in bypass mode. If not, NO. (Can set reverse logic)
Battery low (Other functions can be set)	7	Pin7 to pin5 is open if battery voltage is low. If not, NC. (Can set reverse logic)
Normal mode	8	Pin8 to pin5 is NC if UPS works in normal mode. (Can set reverse logic)
Utility fail (Other functions can be set)	9	Pin9 to pin5 is open if utility is failure. If not, NC. (Can set reverse logic)



b. Phoenix port

Description of Phoenix port:

Port PIN	Phoenix	Description
VCC	1	External power supply.12VDC~24VDC, Common connection.
GND	2	External power supply GND
Utility fail (Other functions can be set)	3	Pin3 to pin1 is open if utility is failure. If not, NC. (Can set reverse logic)
Remote shutdown	4	1.UPS shutdowns rectifier and inverter if utility is normal.
		2.UPS shutdowns completely if in battery mode.
		3. Remote shut down if in high level
Normal mode	5	Pin5 to pin1 is NC if UPS works in normal mode. (Can set reverse logic)
Battery low (Other functions can be set)	6	Pin6 to pin1 is open if battery voltage is low. If not, NC. (Can set reverse logic)
General alarm (Other functions can be set)	7	Pin7 to pin1 is open if something is abnormal. If not, NC. (Can set reverse logic)
Bypass mode	8	Pin8 to pin1 is close if UPS works in bypass mode. If not, NO. (Can set reverse logic)
UPS fail (Other functions can be set)	9	Pin9 to pin1 is open if something is failure in UPS. If not, NC. (Can set reverse logic)

Annex B. EPO

EPO (Emergency Power Off) is a function to shutdown UPS completely in emergency conditions. This function can be activated through a remote contact or a similar switch provided by the user. Normal, EPO terminals are short. If an emergency, open the EPO, UPS close the rectifier, inverter output immediately:

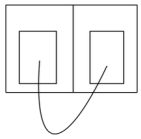
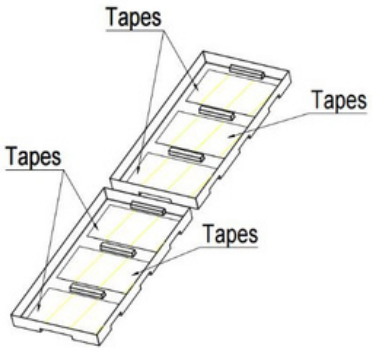


Fig.11 EPO function

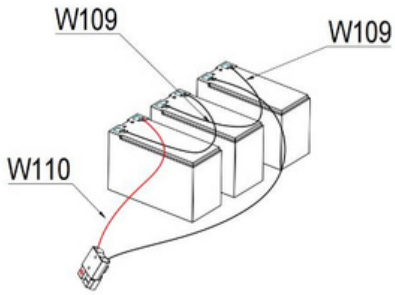
Annex C. Battery Pack Assembly

1k battery pack

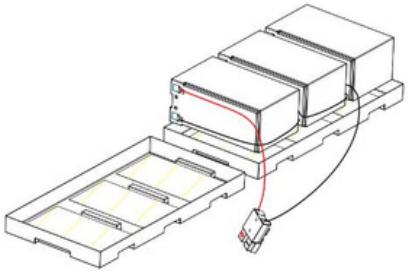
Step 1: Remove adhesive tapes



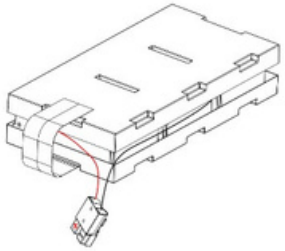
Step 2: Connect all battery terminals as below.



Step 3: Put batteries on as below.

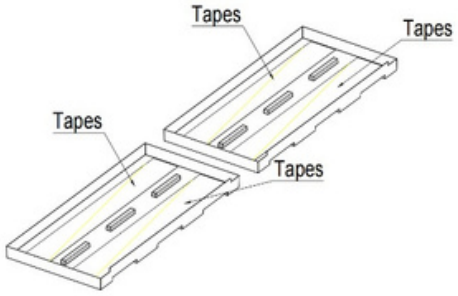


Step 4: Cover the other side of plastic shell as below. Finished.

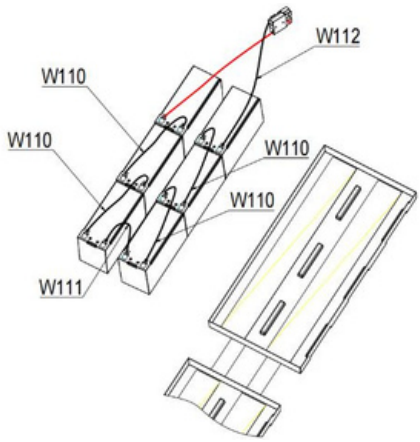


2k/3K battery pack

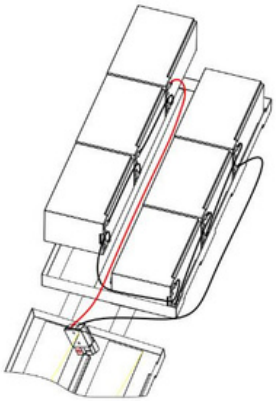
Step 1: Remove adhesive tapes.



Step 2: Connect all battery terminals as below.



Step 3: Put batteries on one side of plastic shells.



Step 4: Cover the other side of plastic shell. Finished