<u>User Manual</u>

360 POWER QUALITY

Platinum Series UPS

PF1.0 1K/1.5K/2K/3K Online UPS

Uninterruptible Power Supply System

Version: 1.0

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1. Important Safety Warning

Please comply with all warnings and operating instructions in this manual strictly. Save this manual properly and carefully read the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully.

1-1. Transportation

 Please transport the UPS system only in the original package to protect against shock and impact.

1-2. Preparation

- Condensation may occur if the UPS system is moved directly from cold to warm environment. The UPS system must be completely dry before being installed. Please allow at least two hours for the UPS system to acclimate the environment.
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near heater.
- Do not block ventilation holes in the UPS housing.

1-3. Installation

- Do not connect appliances or devices which would overload the UPS system (ex. laser printers) to the UPS output sockets.
- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.
- The UPS can be operated by any individuals with no previous experience.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Please use only UL-marked mains cable (ex. the mains cable of your computer) to connect the UPS system to the building wiring outlet (shockproof outlet).
- Please use only UL-marked power cables to connect the loads to the UPS system.
- When installing the equipment, it should ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5mA.
- Temperature Rating Units are considered acceptable for use in a maximum ambient of 104°F (40°C).
- For Pluggable Equipment The socket-outlet shall be installed near the equipment and shall be easily accessible.

1-4. Operation

- Do not disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- In order to fully disconnect the UPS system, first press the OFF/Enter button to disconnect the mains.
- Prevent no fluids or other foreign objects from inside of the UPS system.

1-5. Maintenance, service, and faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.
- **Caution** risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery and electrically live and dangerous.
- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present, and no hazardous voltage exists in the terminals of high capability capacitor such as BUS-capacitors.
- Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.
- **Caution** risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!
- **Caution** Do not dispose of batteries in a fire. The batteries may explode.
- **Caution** Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.
- Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:
 - a) Remove watches, rings, or other metal objects.
 - b) Use tools with insulated handles.
 - c) Wear rubber gloves and boots.
 - d) Do not lay tools or metal parts on top of batteries.
 - e) Disconnect charging source and load prior to installing or maintaining the battery.
 - f) Remove battery grounds during installation and maintenance to reduce likelihood of shock. Remove the connection from ground if any part of the battery is determined to be grounded.
- When changing batteries, install the same number and same type of batteries or battery packs.
- For UPS with internally mounted battery
 - a) Instructions shall carry sufficient information to enable the replacement of the battery with a suitable manufacturer and catalogue number.
 - b) Safety instructions to allow access by Service Personnel shall be stated in the installation/service handbook.
 - c) If batteries are to be installed by Service Personnel, instructions for interconnections, including terminal torque, shall be provided.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.
- Please replace the fuse only with the same type and amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. Installation and setup

NOTE: Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. Please keep the original package in a safe place for future use.

2-1. Rear panel view



- 1. Programmable outlets: connect to non-critical loads.
- 2. Output receptacles: connect to mission-critical loads.
- 3. AC input
- 4. Network/Fax/Modem surge protection
- 5. USB communication port
- 6. RS-232 communication port
- 7. SNMP intelligent slot
- 8. Emergency power off function connector (EPO)
- 9. External battery connection

2-2. Operating principle

The operating principle of the UPS is shown as below



The UPS is composed of mains input, EMI/RFI filters, rectifier/PFC, inverter, battery charger, DC-to-DC converter, battery, dynamic bypass and UPS output.

2-3. Install the UPS (Only for RT Models)

For safety consideration, the UPS is shipped out from factory without connecting battery wires. Before install the UPS, please follow below steps to re-connect battery wires first.

Step 2

Step 1





Connect the AC input and re-connect battery wires.



Put the front panel back to the unit.

This UPS can be either displayed on the desk or mounted in the 19" rack chassis. Please choose proper installation to position this UPS.

Rack-mount Installation Step 1







2-4. Setup the UPS

Before installing the UPS, please read below to select proper location to install UPS.

- 1. UPS should be placed on the flat and clean surface. Place it in an area away from vibration, dust, humidity, high temperature, flammable liquids, gases, corrosive and conductive contaminants. Install the UPS indoors in a clean environment, where it is away from window and door. Maintain minimum clearance of 100mm in the bottom of the UPS to avoid dust and high temperature.
- 2. Maintain an ambient temperature range of 32°F to 113°F (0°C to 45°C) for UPS optimal operation. For every 5°C above 45°C, the UPS will derate 12% of nominal capacity at full load. The highest working temperature requirement for UPS operation is 50°C.
- 3. It's required to maintain maximum altitude of 1000m to keep UPS normal operation at full load UPS. If it's used in high altitude area, please reduce connected load. Altitude derating power with connected loads for UPS normal operation is listed as below:

Altitude	Derating factor ¹⁾	
m		
1 000	1.0	
1 500	0.95	
2 000	0.91	
2 500	0.86	
3 000	0.82	
3 500	0.78	
4 000	0.74	
4 500	0.7	
5 000	0.67	
NOTE - Note to table 1		
Based on density of dry air = 1.225 kg/m³ at sea-level, +15 °C.		
1) Since fans lose efficiency with altitude, forced air-cooled equipment will have a smaller derating		

4. Place UPS:

It's equipped with fan for cooling. Therefore, place the UPS in a well-ventilated area. It's required to maintain minimum clearance of 100mm in the front of the UPS and 300mm in the back and two sides of the UPS for heat dissipation and easy-maintenance.

5. Connect to External Battery Pack

When connecting external battery packs, please be sure to connect polarity correctly. Connect positive pole of battery pack to positive pole of external battery connector in UPS and negative pole of battery pack to negative pole of external battery connector in UPS. Polarity misconnection will cause UPS internal fault. It's recommended to add one breaker between positive pole of battery pack and positive pole of external battery connector in UPS to prevent damage to battery packs from internal fault.

The required specification of breaker: voltage \geq 1.25 x battery voltage/set; current \geq 50A Please choose battery size and connected numbers according to backup time requirement and

UPS specifications. To extend battery lifecycle, it's recommended to use them in the temperature range of 15°C to 25°C.

Step 1: External battery connection

Follow the right chart to make external battery connection.

Step 2: UPS input connection

Plug the UPS into a two-pole, three-wire, grounded receptacle only. Avoid using extension cords.

• The power cord is attached to the UPS. The input plug is a NEMA 5-15P for 1K and 1.5K models, NEMA 5-20P for 2K model and NEMA 5-30P for 3K model.

Note: Check if the site wiring fault indicator lights up in LCD panel. It will be illuminated when the UPS is plugged into an improperly wired utility power outlet (Refer to Troubleshooting section). Please also check if there is a circuit breaker against overcurrent and short circuit between the mains and AC input of the UPS for safety operation. The recommended protection value as following:

• 15A for the 1K and 1.5K models, 20A for 2K model and 30A for 3K model.

Step 3: UPS output connection

There two kinds of outputs: programmable outlets and general outlets. Please connect non-critical devices to the programmable outlets and critical devices to the general outlets. During power failure, you may extend the backup time to critical devices by setting shorter backup time for non-critical devices.

Step 4: Communication connectionCommunication port:USB portRS-232 port



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A		
SI	0000	
H	00000)HIC

Intelligent slot

To allow for unattended UPS shutdown/start-up and status monitoring, connect the communication cable one end to the USB/RS-232 port and the other to the communication port of your PC. With the monitoring software installed, you can schedule UPS shutdown/start-up and monitor UPS status through PC.

The UPS is equipped with intelligent slot perfect for either SNMP or AS400 card. When installing either SNMP or AS400 card in the UPS, it will provide advanced communication and monitoring options.

Step 5: Network connection Network/Fax/Phone surge port



Connect a single modem/phone/fax line into surge-protected "IN" outlet on the back panel of the UPS unit. Connect from "OUT" outlet to the equipment with another modem/fax/phone line cable.

Step 6: Disable and enable EPO function

This UPS is equipped with EPO function. By default, the UPS is delivered from factory with Pin 1 and pin 2 closed (a metal plate is connected to Pin 1 and Pin2) for UPS normal operation. To activate EPO function, remove two screws on EPO port and metal plate will be removed.

Note: The EPO function logic can be set up via LCD setting. Please refer to program 16 in UPS setting for the details.

Step 7: Turn on the UPS

Press the ON/Mute button on the front panel for two seconds to power on the UPS. Note: The battery charges fully during the first five hours of normal operation. Do not expect full battery run capability during this initial charge period.

Step 8: Install software

For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown. Use supplied RS-232 or USB communication cable to connect RS-232/USB port of UPS and RS-232/USB port of PC. Then, follow below steps to install monitoring software.

- 1. Insert the included installation CD into CD-ROM drive and then follow the on-screen instructions to proceed software installation. If there no screen shows 1 minute after inserting the CD, please execute setup.exe file for initiating software installation.
- 2. Follow the on-screen instructions to install the software.
- 3. When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.

2-5. Battery Replacement

NOTICE: This UPS is equipped with internal batteries and user can replace the batteries without shutting down the UPS or connected loads.(hot-swappable battery design) Replacement is a safe procedure, isolated from electrical hazards.

CAUTION!! Consider all warnings, cautions, and notes before replacing batteries. **Note:** Upon battery disconnection, equipment is not protected from power outages.









Re-connect the battery wires.

Remove the top cover of battery box and replace the inside batteries.





After replacing the batteries, put the battery box back to original location and screw it tightly.

Put the front panel back to the unit.

2-6. Battery Kit Assembly

NOTICE: Please assemble battery kit first before installing it inside of UPS. Please select correct battery kit procedure below to assemble it.

2-battery kit

Step 1: Remove adhesive tapes.



Step 3: Put assembled battery packs on one side of plastic shells.



3-battery kit

Step 1: Remove adhesive tapes.



Step 3: Put assembled battery packs on one side of plastic shells as below chart.



Step 2: Connect all battery terminals by following below chart.



Step 4: Cover the other side of plastic shell as below chart. Then, battery kit is assembly well.



Step 2: Connect all battery terminals by following below chart.



Step 4: Cover the other side of plastic shell as below chart. Then, battery kit is assembly well.



4-battery kit

Step 1: Remove adhesive tapes.



Step 3: Put assembled battery packs on one side of plastic shells.



6-battery kit Step 1: Remove adhesive tapes.



Step 3: Put assembled battery packs on one side of plastic shells.



Step 2: Connect all battery terminals by following below chart.



Step 4: Cover the other side of plastic shell as below chart. Then, battery kit is assembly well.



Step 2: Connect all battery terminals by following below chart.



Step 4: Cover the other side of plastic shell as below chart. Then, battery kit is assembly well.



3. Operations		
3-1. Button operation		
Button	Function	
ON/Mute Button	 Turn on the UPS: Press and hold ON/Mute button for at least 2 seconds to turn on the UPS. Mute the alarm: After the UPS is turned on in battery mode, press and hold this button for at least 3 seconds to disable or enable the alarm system. But it's not applied to the situations when warnings or errors occur. Up key: Press this button to display previous selection in UPS setting mode. Switch to UPS self-test mode: Press ON/Mute buttons for 3 seconds to enter UPS self-testing while in AC mode, ECO mode, or converter mode. 	
OFF/Enter Button	 Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS. UPS will be in standby mode under power normal or transfer to Bypass mode if the Bypass enable setting by pressing this button. Confirm selection key: Press this button to confirm selection in UPS setting mode. 	
Select Button	 Switch LCD message: Press this button to change the LCD message for input voltage, input frequency, input current, battery voltage, battery current, battery capacity, ambient temperature, output voltage, output frequency, load current and load percent. Setting mode: Press and hold this button for 3 seconds to enter UPS setting mode when Standby and Bypass mode. Down key: Press this button to display next selection in UPS setting mode. 	
ON/Mute + Select Button	 Switch to bypass mode: When the main power is normal, press ON/Mute and Select buttons simultaneously for 3 seconds. Then UPS will enter to bypass mode. This action will be ineffective when the input voltage is out of acceptable range. Exit setting mode or return to the upper menu: When working in setting mode, press ON/Mute and Select buttons simultaneously for 0.2 seconds to return to the upper menu. If it's already in top menu, press these two buttons at the same time to exit the setting mode. 	

3-2. LCD Panel



Display	Function		
Backup time information			
Ø 8.8	Indicates the estimated backup time. H: hours, M: minute, S: second.		
Configuration and	fault information		
8.8 «	Indicates the configuration items, and the configuration items are listed in details in section 3-5.		
8 .8 «∆	Indicates the warning and fault codes, and the codes are listed in details in section 3-7 and 3-8.		
Mute operation			
∢ ×	Indicates that the UPS alarm is disabled.		
Output information	n		
	Indicates the output voltage and output frequency. Vac: AC voltage, Vdc: DC voltage, Hz: frequency		
Load information			
25%- 50%- 75% 100%- LOAD LEVEL	Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100%.		
	Indicates overload.		
SHORT	Indicates the load or the UPS output is short circuit.		
Programmable out	tlets information		
Ρ	Indicates that programmable management outlets are working.		
Mode operation in	formation		
	Indicates the UPS connects to the mains.		
+ -	Indicates the battery is working.		
^	Indicates the bypass circuit is working.		
ECO	Indicates the ECO mode is enabled.		
=	Indicates the inverter circuit is working.		
	Indicates the output is working.		
Battery information			
BATTERY LEVEL	Indicates the battery level by 0-24%, 25-49%, 50-74%, and 75-100%.		
	Indicates the battery is fault.		
LOW BATT	Indicates low battery.		
Input & battery in	formation		
8888 VAC VAC VAC VAC VAC VAC	Indicate the input voltage, input frequency and battery voltage. Vac: AC voltage, Vdc: DC voltage, Hz: frequency		

3-3. Audible Alarm

Battery Mode	Sounding every 5 seconds	
Low Battery	Sounding every 2 seconds	
Overload	Sounding every second	
Fault	Continuously sounding	
Bypass Mode	Sounding every 10 seconds	

3-4. LCD display wordings index

Abbreviation	Display content	Meaning
ENA	EN8	Enable
DIS	d1 5	Disable
ESC	850	Escape
HLS	HLS	High loss
LLS	115	Low loss
AO	80	Active open
AC	RC	Active close
EAT	685	Estimated autonomy time
RAT	1 H A E	Running autonomy time
SD	58	Shutdown
ОК	OK	ОК
ON	ON	ON
OI		Over input current
SF	SF	Site wiring fault
EP	66	EPO
ТР	٤P	Temperature
СН	[H]	Charger
FU	FU	Bypass frequency unstable
BR	62	Battery Replace
EE	88	EEPROM error

3-5. UPS Setting



There are three parameters to set up the UPS. Parameter 1: It's for program alternatives. Refer to below table.

Parameter 2 is the setting options or values for each program.

01: Output voltage setting

Interface	Setting	
	Parameter 2: Output voltage	
	For 200/208/220/230/240 VAC models, you may choose the	
	following output voltage:	
	200: presents output voltage is 200Vac	
	208: presents output voltage is 208Vac	
┍┛╺╣╏╏ ╶─╯═┙╱═┙	220: presents output voltage is 220Vac	
	230: presents output voltage is 230Vac (Default)	
	240: presents output voltage is 240Vac	
	For 100/110/115/120/127 VAC models, you may choose the	
<u> </u>	following output voltage:	
	100: presents output voltage is 100Vac	
	110: presents output voltage is 110Vac	
	115: presents output voltage is 115Vac	
	120: presents output voltage is 120Vac (Default)	
	127: presents output voltage is 127Vac	
• 02: Frequency Converter enable/disable		
Interface	Setting	
	Parameter 2: Enable or disable converter mode. You may	
	choose the following two options:	
	CF ENA: converter mode enable	
	CF DIS: converter mode disable (Default)	
• 03: Output frequency setting		

rameter 2: Output frequency setting. u may set the initial frequency on battery mode: T 50: presents output frequency is 50Hz T 60: presents output frequency is 60Hz
converter mode is enabled, you may choose the following put frequency:
50: presents output frequency is 50Hz
60: presents output frequency is 60Hz

Interface	Setting
	 Parameter 2: Enable or disable ECO function. You may choose the following two options: ENA: ECO mode enable DIS: ECO mode disable (Default)
<u> </u>	

• 05: ECO voltage range setting

Interface	Setting
	 Parameter 2: Set the acceptable high voltage point and low voltage point for ECO mode by pressing Down key or Up key. HLS: High loss voltage in ECO mode in parameter 2. For 200/208/220/230/240 VAC models, the setting range in parameter 3 is from +7V to +24V of the nominal voltage. (Default: +12V) For 100/110/115/120/127 VAC models, the setting range in parameter 3 is from +3V to +12V of the nominal voltage. (Default: +6V) LLS: Low loss voltage in ECO mode in parameter 2. For 200/208/220/230/240 VAC models, the setting range in parameter 3 is from -7V to -24V of the nominal voltage. (Default: +12V) For 100/110/115/120/127 VAC models, the setting range in parameter 3 is from -7V to -24V of the nominal voltage. (Default: -12V) For 100/110/115/120/127 VAC models, the setting voltage in parameter 3 is from -3V to -12V of the nominal voltage. (Default: -6V)

• 06: Bypass enable/disable when UPS is off

Interface	Setting
	 Parameter 2: Enable or disable Bypass function. You may choose the following two options: ENA: Bypass enable DIS: Bypass disable (Default)

• 07: Bypass voltage range setting

Interface	Setting
	Parameter 2: Set the acceptable high voltage point and
	acceptable low voltage point for Bypass mode by pressing
	the Down key or Up key.
	HLS: Bypass high voltage point
	For 200/208/220/230/240 VAC models:
	230-264: setting the high voltage point in parameter 3
	from 230Vac to 264Vac. (Default: 264Vac)
CO7	For 100/110/115/120/127 VAC models:
	120-140: setting the high voltage point in parameter 3
	from 120Vac to 140Vac. (Default: 132Vac)
	LLS: Bypass low voltage point
	For 200/208/220/230/240 VAC models:
	170-220: setting the low voltage point in parameter 3 from
	170Vac to 220Vac. (Default: 170Vac)
	For 100/110/115/120/127 VAC models:
	85-115: setting the low voltage point in parameter 3 from
	85Vac to 115Vac. (Default: 85Vac)

• 08: Bypass frequency range setting

Interface	Setting
	 Parameter 2: Set the acceptable high frequency point and acceptable low frequency point for Bypass mode by pressing the Down key or Up key. HLS: Bypass high frequency point For 50Hz output frequency models: 51-55Hz: setting the frequency high loss point from 51Hz to 55HZ(Default: 53.0Hz) For 60Hz output frequency models: 61-65Hz: setting the frequency high loss point from 61Hz to 65Hz(Default: 63.0Hz) LLS: Bypass low Frequency point For 50Hz output frequency models: 45-49Hz: setting the frequency low loss point from 45Hz to 49HZ(Default: 47.0Hz) For 60Hz output frequency models: 55-59Hz: setting the frequency low loss point from 55Hz to 59Hz(Default: 57.0Hz)

• 09: Programmable outlets enable/disable

Interface	
<u> </u>	

	Setting
/	 Parameter 2: Enable or disable programmable outlets. ENA: Programmable outlets enable DIS: Programmable outlets disable (Default)
P	

10: Programmable outlets setting

Interface	Setting
999 © 10 ** state	 Parameter 2: Set up backup time limits for programmable outlets. 0-999: setting the backup time limits in minutes from 0-999 for programmable outlets which connect to non-critical devices on battery mode. (Default: 999)

• 11: Autonomy limitation setting

Interface	Setting	
	 Parameter 2: Set up backup time on battery mode for general outlets. 0-999: setting the backup time in minutes from 0-999 for general outlets on battery mode. DIS: Disable the autonomy limitation and the backup time will depend on battery capacity. (Default) 	
	Note: When setting as "0", the backup time will be only 10	
	seconds.	

• 12: Battery total AH setting

	5
Interface	Setting
	Parameter 2: Set up the battery total AH of the UPS.7-999: setting the battery total capacity from 7-999 in AH.Please set the correct battery total capacity if external battery bank is connected.
<u>688</u>	

• 13: Maximum charger current setting

Interface	Setting	
	Setting Parameter 2: Set up th For low voltage model w 1/2/4/6/8: setting the 1/2/4/6/8 in Ampere. (D For high voltage model w 1/2/4/6/8/10/12: set 1/2/4/6/8/10/12 in Ampere For low voltage and high	ne charger maximum current. with 24/36/48VDC e charger maximum current efault: 2A) with 24/36/48VDC etting the charger maximum current ere. (Default: 2A) n voltage model with 72/96VDC
	1/2/4/6/8: setting the	e charger maximum current
	Note: Please set the app	propriate charger current based on
	battery capacity used. T	he recommended charging current
	is 0.1C~0.3C of battery	capacity as following table for
	reference.	
	Battery capacity(AH)	Total charging current (A)
	7~20	2
	20~40	4
	40~60	6
	60~80	8
	80~100	10
	100~150	12

• 14: Charger boost voltage setting



Setting Parameter 2: Set up the charger boost voltage. 2.25-2.40: setting the charger boost voltage from 2.25 V/cell to 2.40V/cell. (Default: 2.36V/cell)

• 15: Charger float voltage setting

Interface	Setting
	 Parameter 2: Set up the charger float voltage. 2.20-2.33: setting the charger float voltage from 2.20 V/cell to 2.33V/cell. (Default: 2.28V/cell)

• 16: EPO logic setting

Interface	Setting
	Parameter 2: Set up the EPO function control logic. AO: Active Open (Default). When AO is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in open status.
<u>EP0</u>	AC: Active Close. When AC is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in close status.

• 17: External output isolation transformer connection

Interface	Setting
	 Parameter 2: Allow or disallow external output isolation transformer connection. ENA: If selected, it's allowed to connect to an external output isolation transformer.
	DIS: If selected, it's not allowed to connect to external output isolation transformer. (Default)

• 18: Display setting for autonomy time

1, 7, 5	-
Interface	Setting
ERL 0 18 « setting	 Parameter 2: Set up the display setting for autonomy time EAT: If EAT is selected, it will display the remaining autonomy time. (Default) RAT: If RAT is selected, it will show accumulated autonomy time so far.

• 19: Acceptable input voltage range setting

Interface	Setting
	 Parameter 2: Set the acceptable high voltage point and acceptable low voltage point for input voltage range by pressing the Down key or Up key. HLS: Input high voltage point For 200/208/220/230/240 VAC models: 280/290/300: setting the high voltage point in parameter 2. (Default: 300Vac) For 100/110/115/120/127 VAC models: 140/145/150: setting the high voltage point in parameter 2. (Default: 150Vac) LLS: Bypass low voltage point For 200/208/220/230/240 VAC models: 110/120/130/140/150/160: setting the low voltage point in parameter 2. (Default: 110Vac) For 100/110/115/120/127 VAC models: 55/60/65/70/75/80: setting the low voltage point in parameter 2. (Default: 55Vac)

00: Exit setting •

Interface	Setting
	Exit the setting mode.

3-6. Operating Mode Description

3-6. Operating Mode Description								
Operating mode	Description	LCD display						
Online mode	When the input voltage is within acceptable range, UPS will provide pure and stable AC power to output. The UPS will also charge the battery at online mode.							
ECO mode	Energy saving mode: When the input voltage is within voltage regulation range, UPS will bypass voltage to output for energy saving. The UPS will also charge the battery at ECO mode.							
Frequency Converter mode	When input frequency is within 40 Hz to 70 Hz, the UPS can be set at a constant output frequency, 50 Hz or 60 Hz. The UPS will still charge battery under this mode.							
Battery mode	When the input voltage is beyond the acceptable range or power failure, the UPS will backup power from battery and alarm is sounding every 5 seconds.							
Bypass mode	When input voltage is within acceptable range but UPS is overload, UPS will enter bypass mode or bypass mode can be set by front panel. Alarm is sounding every 10 seconds.							
Standby mode	UPS is powered off and no output supply power, but still can charge batteries.							
Fault mode	When a fault has occurred, the ERROR icon and the fault code will be displayed.							

3-7. Faults Reference Code

Fault event	Fault code	Icon	Fault event	Fault code	Icon
Bus start fail	01	х	Battery voltage too high	27	
Bus over	02	х	Battery voltage too low	28	
Bus under	03	х	Charger output short	2A	х
Inverter soft start fail	11	х	Over temperature	41	Х
Inverter voltage high	12	х	Overload	43	
Inverter voltage Low	13	х	Charger failure	45	х
Inverter output short	14	SHORT	Over input current	49	х

3-8. Warning indicator

Warning	Icon (flashing)	Code	Alarm
Low Battery			Sounding every 2 seconds
Overload			Sounding every second
Over input current	\triangle		Sounding 2 beep every 10 seconds
Battery is not connected	<u>∧</u> + -		Sounding every 2 seconds
Over Charge	25% 50% 75% 100%		Sounding every 2 seconds
Site wiring fault	$\land \frown$	SF	Sounding every 2 seconds
EPO enable	\land	66	Sounding every 2 seconds
Over temperature	\land	٤P	Sounding every 2 seconds
Charger failure	\land	CH	Sounding every 2 seconds
			Sounding every 2 seconds
Battery fault			(At this time, UPS is off to remind
			users something wrong with battery)
Out of bypass voltage range			Sounding every 2 seconds
Bypass frequency unstable	\triangle	۴U	Sounding every 2 seconds
Battery replacement	\land	62	Sounding every 2 seconds
EEPROM error	\wedge	88	Sounding every 2 seconds

NOTE: "Site Wiring Fault" function can be enabled/disabled via software. Please check software manual for the details.

4. Troubleshooting If the UPS system does not operate correctly, please solve the problem by using the table below.

Symptom	Possible cause	Remedy	
No indication and alarm even	The AC input power is not	Check if input power cord	
though the mains is normal.	connected well.	firmly connected to the mains.	
	The AC input is connected to the UPS output.	Plug AC input power cord to AC input correctly.	
The icon A and the warning code P flash on LCD display. Alarm is sounding every 2 seconds.	EPO function is activated.	Set the circuit in closed position to disable EPO function.	
The icons of \triangle and \frown flash on LCD display and alarm is sounding every 2 seconds.	Line and neutral conductors of UPS input are reversed.	Rotate mains power socket by 180° and then connect to UPS system.	
The icons of \triangle and $\overline{+-}$ flashes on LCD display and alarm is sounding every 2 seconds.	The external or internal battery is incorrectly connected.	Check if all batteries are connected well.	
Fault code is shown as 27 and the icon is lighting on LCD display. Alarm is continuously sounding.	Battery voltage is too high or the charger is fault.	Contact your dealer.	
Fault code is shown as 28 and the icon is lighting on LCD display. Alarm is continuously sounding.	Battery voltage is too low or the charger is fault.	Contact your dealer.	
The icons of \triangle and \square flash	UPS is overload	Remove excess loads from UPS output.	
sounding every second.	UPS is overloaded. Devices connected to the UPS are fed directly by the electrical network via the Bypass.	Remove excess loads from UPS output.	
	After repetitive overloads, the UPS is locked in the Bypass mode. Connected devices are fed directly by the mains.	Remove excess loads from UPS output first. Then shut down the UPS and restart it.	
Fault code is shown as 49 on LCD display and alarm is continuously sounding.	UPS is over input current.	Remove excess loads from UPS output.	
Fault code is shown as 43 and the icon is lighting on LCD display. Alarm is continuously sounding.	The UPS shut down automatically because of overload at the UPS output.	Remove excess loads from UPS output and restart it.	

Symptom	Possible cause	Remedy
Fault code is shown as 14 and the icon 💒 is lighting on LCD display. Alarm is continuously sounding.	The UPS shut down automatically because short circuit occurs on the UPS output.	Check output wiring and if connected devices are in short circuit status.
Fault code is shown as 01, 02, 03, 11, 12, 13 and 41 on LCD display and alarm is continuously sounding.	 A UPS internal fault has occurred. There are two possible results: 1. The load is still supplied, but directly from AC power via bypass. 2. The load is no longer supplied by power. 	Contact your dealer
Battery backup time is shorter than nominal value.	Batteries are not fully charged	Charge the batteries for at least 5 hours and then check capacity. If the problem still persists, consult your dealer.
	Batteries defect	Contact your dealer to replace the battery.
Fault code is shown as 2A on LCD display and alarm is continuously sounding.	The short circuit occurs on the charger output.	Check if battery wiring of connected external pack is in short circuit status.
Fault code is shown as 45 on LCD display. At the same time, alarm is continuously sounding.	The charger does not have output and battery voltage is less than 10V/PC.	Contact your dealer.

5. Storage and Maintenance

The UPS system contains no user-serviceable parts. If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case, please contact your dealer.



Be sure to deliver the spent battery to a recycling facility or ship it to your dealer in the replacement battery packing material.

Storage

Before storing, charge the UPS 5 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
-25°C - 40°C	Every 3 months	1-2 hours
40°C - 45°C	Every 2 months	1-2 hours

6. Specifications

MODEL		1K RT-2B	1K RT-3B	1.5K RT	T 2K RT-4B 2K RT-6B 3K RT			
CAPACIT	Υ*	1000VA	/1000W	1500VA/1500W	2000VA/2000W 3000VA / 3000VA			
INPUT	INPUT							
	Low Line Transfer	80VAC/70VAC/60VAC/55VAC ± 5 % (based on load percentage 100% - 80 % / 80 % - 70 % / 70 - 60 % / 60 % - 0)						
Voltage	Low Line Comeback	87VAC/77VAC/67VAC/62VAC ± 5 %						
Range	High Line Transfer			150 VA	C ± 5 %			
	High Line Comeback 145 VAC ± 5 %							
Frequency	/ Range			40Hz ~	[,] 70 Hz			
Phase				Single phase	with ground			
Power Fac	ctor			≧ 0.99 @	full load			
THDi			THDU <	≦ 5% @ 10 1.6% @ input an)0~130VAC d full linear load c	ondition		
OUTPUT		•		•				
Output vo	ltage			100/110/115/	120/127 VAC			
AC Voltag	e Regulation			± 1% (Ba	tt. Mode)			
Frequency (Synchron	/ Range iized Range)			57 ~	63 Hz			
Frequency	/ Range			60Hz ± 0.1 Hz	z (Batt. Mode)			
Current C	rest Ratio			3:	1			
Harmonic	Distortion		≦ 2 % TH	ID (Linear Load) ;	4 % THD (Non-lin	ear Load)		
Transfer	AC Mode to Batt. Mode			Ze	ro			
Time	Inverter to Bypass	< 4 ms						
Waveform	n (Batt. Mode)			Pure Si	newave			
EFFICIE	NCY							
AC Mode		≥89% @ full charged battery ≥91% @ full charged battery						
ECO Mode	2	≧96% @ full charged battery						
Battery M	ode		≧88%			≧90%		
BATTERY	(
Battery Ty	/pe	12V/9AH	12V/7AH	12V/9AH	12V/9AH	12V/7AH	12V/9AH	
Numbers	T i	2	3	<u> </u>	4	6	6	
Recharge	Time	3	hours recover to	95% capacity for I	nternal battery@ .	2A charging curre	nt	
Charging	Current		41.0.100 + 10/				02 1 100 1 100	
Charging	voltage	27.4 VDC ± 1%	$41.0 \text{ VDC} \pm 1\%$	$41.0 \text{ VDC} \pm 1\%$	54.7 VDC \pm 1%	82.1 VDC ±1%	$82.1 \text{ VDC } \pm 1\%$	
PHYSICA			172.416.2.4.21	-	17.2 20.1 2	17 2 24	10	
Dimension	1, WXDXH(III)	1/.3 X 16.2 X 3.5 1/.3 X 20.1 X 3.5 1/.3 X 24.8 X 3.			1.8 X 3.5			
Net weigr	Without batton	25.0	<u> </u>	<u> </u>	43.0	51.4 52.4	01.3	
		14.0	17.2	17.9	20.7	23.4	27.5	
Operation	Humidity		20.	-05 % PH @ 0_ 40	°C (non-condensi	na)		
		20-55 % KT ש - 40 C (1011-culluelisily)						
MANAGE	MFNT	1						
Smart RS	232 or USB	Sur	ports Windows®	2000/2003/XP/Vi	sta/2008/7/8/10	Linux, Unix and M	AC	
Optional S	Dopported Mindensey 2000 (2000) (10, 2000) (

* The output power ratings are different based on different input voltage. Please check output power rating table for the details. ** Product specifications are subject to change without further notice.

Model name Input rating **Output rating** 1K RT-2B, 1K RT-3B 110-127Vac, 50/60Hz, 100/110/115/120/125/127Vac, 50/60Hz, 12A, 1Ø 1000VA/1000W, 1Ø, 10A 100/110/115/120/125/127Vac, 50/60Hz, 1Ø 1.5K RT 110-127Vac, 50/60Hz, 12A, 1Ø 1500VA/1450W (@127Vac input); 1500VA/1430W (@125Vac input); 1500VA/1300W (@120Vac input); 1500VA/1270W (@115Vac input); 1500VA/1200W (@110Vac input); 1500VA/1040W (@100Vac input) 2K RT-4B, 2K RT-6B 110-127Vac, 50/60Hz, 100/110/115/120/125/127Vac, 50/60Hz, 1Ø 16A, 1Ø 2000VA/1930W (@127Vac input); 2000VA/1930W (@125Vac input); 2000VA/1850W (@120Vac input); 2000VA/1740W (@115Vac input); 2000VA/1640W (@110Vac input); 2000VA/1500W (@100Vac input) 3K RT 110-127Vac, 50/60Hz, 100/110/115/120/125/127Vac, 50/60Hz, 1Ø 3000VA/2880W (@127Vac input); 24A, 1Ø 3000VA/2850W (@125Vac input); 3000VA/2740W (@120Vac input); 3000VA/2650W (@115Vac input); 3000VA/2500W (@110Vac input); 3000VA/2300W (@100Vac input)

Output Power Rating Table

Battery Pack Specification

Model	BC·RT-18Ah24V-280	BC·RT-18Ah24V	BC·RT-18Ah36V	BC·RT-18Ah48V	BC·RT-18Ah72V
Llead with LIDC Medale	1K RT-2B	1K RT-2B	1K RT-3B	21/ DT 4D	2K RT-6B
Used with UPS Models			1.5K RT	2K KI-4D	3K RT
Battery Type	12V 9Ah	12V 9Ah	12V 9Ah	12V 9Ah	12V 9Ah
Battery Numbers	4	4	6	8	12
Dimensions	200 120 00	200 - 4	20 - 00	100 120 00	600 120 00
(WxDxH) in	280 x 438 x 88	380 X 4	38 X 88	480 x 438 x 88	600 x 438 x 88
Net Weight (lbs)	32.8	37.7	47.4	63.9	90.8

NOTE: Battery pack should be used with corresponded UPS.

7. Service and Warranty

360 Power Quality strives to deliver the top-quality products and services. If you are not satisfied with your product because of a defect or for any reason, please contact us using one of the following methods.

Call: 630-318-0839 Email: <u>sales@360powerquality.com</u>