CHICAGO DIGITAL POWER



UPS ONLINE

UPO11-1/1.5/2/3 AX (RT)

Sistema de Energía Ininterrumpible

Manual de Usuario

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Sistema de Energía Ininterrumpible

1. Important safety warning

Please strictly adhere to all warnings and operating instructions in this manual. Keep this manual properly and read the following instructions carefully before installing the unit. Do not operate this unit before carefully reading all safety information and operating instructions.

1-1. Transport

- Please transport the UPS system only in the original packaging to protect it from shock and impact.

1-2. Preparation

- Condensation may occur if the UPS system is moved directly from a cold to a warm environment. The UPS system must be completely dry before being installed. Allow at least two hours for the UPS system to acclimate to the environment.
- Do not install the UPS system near water or in humid environments.
- Do not install the UPS system in places exposed to direct sunlight or near the heater.
- Do not block the ventilation holes on the UPS case.

1-3. Installation

- Do not connect appliances or devices that overload the UPS system (for example, laser printers) to the UPS output receptacles.
- Arrange cables so that no one can step on or trip over them.
- Do not connect electrical appliances, such as hair dryers, to the UPS output sockets.
- The UPS can be operated by anyone without previous experience.
- Connect the UPS system only to a grounded outlet that is accessible and near the UPS system.
- Use only VDE, CE marked (or UL marked for 100/110/115/120/127 VAC) power cord (e.g. your computer's network cable) to connect the UPS system to the building's power outlet (shockproof outlet).
- Use only VDE, CE marked (or UL marked for 100/110/115/120/127 VAC) power cords to connect loads to the UPS system.
- When installing the equipment, you must ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5 mA.
- Temperature Rating: Units are considered acceptable for use in a maximum ambient of 40°C (104°F).

- For plugged-in equipment: the socket-outlet must be installed near the equipment and must be easily accessible.

1-4. Operation

- Do not disconnect the power cord at the UPS system or the building wiring socket (shockproof socket) during operations, as this will cancel the protective grounding of the UPS system and all connected loads.

- The UPS system has its own internal power source (batteries). The UPS output sockets or output terminal block may be electrically live, even if the UPS system is not connected to the building's power outlet.
- To completely disconnect the UPS system, first press the OFF/ON button to disconnect the mains power.

- Prevent fluids or other foreign objects from entering the UPS system.

1-5. Maintenance, service and faults

- The UPS system operates with hazardous voltages. Repairs may only be performed by qualified service personnel.

- Caution - risk of electric shock. Even after disconnecting the unit from the mains power (building wiring outlet), components within the UPS system are still connected to the battery and are electrically live and dangerous.
- Before performing any type of service and/or maintenance, disconnect the batteries and verify that there is no current and no dangerous voltage on the high capacity capacitor terminals, such as BUS capacitors.

- Only persons who are familiar with batteries and the necessary precautions may replace batteries and supervise operations. Unauthorized persons must be kept away from batteries.

- Caution - risk of electric shock. The battery circuit is not isolated from input voltage. Dangerous voltages may occur between the battery terminals and ground.

Before touching, please check that there is no voltage present!

- Caution - Do not dispose of batteries in fire. Batteries may explode.
- Caution - Do not open or mutilate batteries. Released electrolyte is harmful to skin and eyes. May be toxic.

Batteries can cause electric shock and have a high short-circuit current. Take the precautions specified below and any other necessary measures 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 place tools or metal parts on the batteries.
e) Disconnect the charging source and load before installing or servicing the battery.
f) Remove the battery ground connection during installation and maintenance to reduce the possibility of discharge.

- Remove the ground connection if any part of the battery is determined to be grounded.
- When changing batteries, install the same number and the same type of batteries or battery packs.
- For UPS with internally mounted battery:

a) The instructions must contain sufficient information to permit replacement of the battery with a suitable manufacturer and catalogue number.
b) Safety instructions for allowing access by service personnel must be indicated in the installation/ service manual.
c) If batteries are installed by service personnel, instructions for interconnections, including terminal pairing, must be provided.

- Do not attempt to dispose of batteries by burning. This may cause the battery to explode.
- Do not open or destroy batteries. Escaping electrolyte can cause skin and eye injuries. May be toxic.

Replace the fuse only with the same type and amperage to avoid fire hazards.

- Do not disassemble the UPS system.
- WARNING: This is a C2 UPS category product. In a residential environment this product may cause radio interference in which case the user may be required to take additional measures. (for 220/230/240 VAC system only)

For 110/120 VAC system:

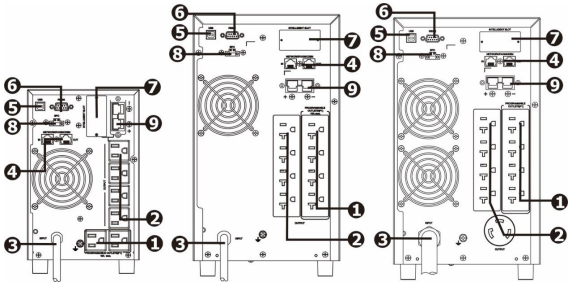
- NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment 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 CONFIGURATION

NOTE: Before installation, inspect the unit. Make sure nothing inside the package is damaged. Store the original package in a safe place for future use.

2.1 Rear Panel View

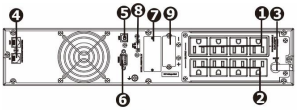
Tower models



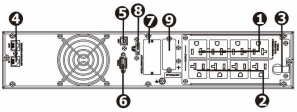
1K/1.5K (AX) **2K (AX)** **3K (A)**

MODEL RT Rack

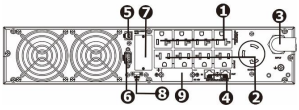
1K/ 1.5K (AX)



2K (AX)



3K (AX)



1. Programmable outputs: do not connect to critical loads.

2. Output receptacles: connecting mission-critical loads.

3. AC input

4. Network/Fax/Modem surge protection

5. USB communication port

6. RS - 232 communication port

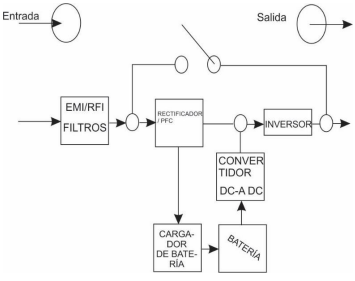
7. SNMP smart slot

8. Emergency Power Off (EPO) function connector

9. External battery connection

2 - 2. Operating principle

The working principle of UPS is shown below

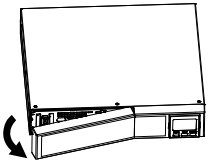


The UPS consists of main input, EMI/RFI filters, rectifier/PFC, inverter, battery charger, DC to DC converter, battery, dynamic bypass and UPS output.

2 - 3. Install the UPS (for RT models only)

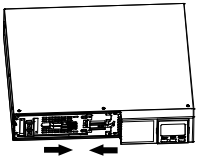
For safety, the UPS is shipped from the factory without connecting battery cables. Before installing the UPS, please follow the steps below to reconnect battery cables first.

Step 1



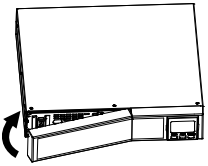
Remove the front panel

Step 2



Connect the AC outlet and reconnect the battery cables

Step 3

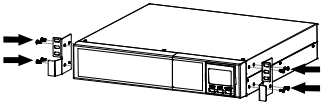


Put the front panel under the unit

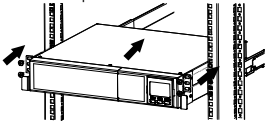
This UPS can be displayed on the desktop or mounted in the 19" rack. Please choose the correct installation to position this UPS.

Rack mount installation

Step 1

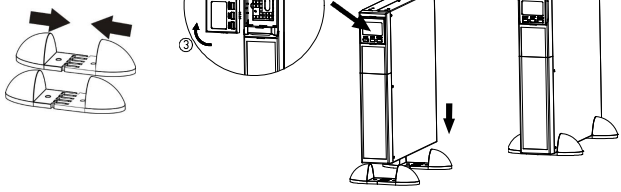


Step 2



Installation of the towers

Step 1 Step 2 Step 3



2 - 4. UPS Settings

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

1. UPS should be placed on the flat and clean surface. Place it in an area away from vibration, dust, moisture, high temperature, flammable liquids, corrosive gases and conductive pollutants. Install the UPS within a clean environment, where it is far away from window and door. Keep the minimum free distance of 100mm at the bottom of the UPS to avoid dust and high temperature.



2. Maintain an ambient temperature range of 0ºC to 60ºC for UPS optimal operation. For every 5ºC above 45ºC, the UPS will degrade 12% of the rated capacity at full load. The maximum working temperature requirement of UPS operation is 50ºC.

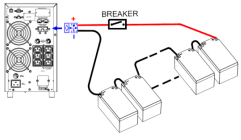
3. It is necessary to maintain the maximum altitude of 1000m to maintain the normal full load operation of UPS. If used in high altitude, please reduce connected load. Altitude power reduction with loads connected by UPS normal operation is listed as below:

Altitude m	Derating factor[1)]
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. UPS:

   It is equipped with cooling fan. Therefore, place the UPS in a well-ventilated area. It is necessary to keep the minimum clearance distance 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



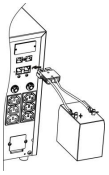
When connecting external batteries, please make sure to connect the correct polarity. Connect the positive pole of the battery to the positive pole of the external battery connector on the UPS and negative pole of the battery to the negative pole of the external battery connector on the UPS. Wrong polarity connection may cause internal failure of UPS. It is recommended to add a switch between the positive pole of the battery and the positive pole of the external battery on UPS to avoid damage to the battery connector from internal failure.

Required Breaker Specification: Voltage≧1.25 x battery voltage/set;≧50A

Please choose the battery size and connect numbers according to the backup time and specification of the UPS. To extend the battery life cycle, it is recommended to use them in the temperature range of 15℃-25℃.

Step 1:external battery connection

Follow the chart on the right to connect the external battery.



Step 2:UPS input connection

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

- For 200/208/220/230/240VAC models: The power cord is supplied in the UPS package.

- For 100/110/115/120/127VAC models: The power cord is attached to the UPS. The input plug is 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 wiring fault indicator lights up on the LCD panel. It will light up when the UPS is plugged into a poorly connected mains outlet (see Troubleshooting section). Also check if there is an over-current and short-circuit breaker between the mains and the UPS AC input for safety operation. The recommended protection value as follows:

For 200/208/220/230/240VAC models: 10A for 1K and 1.5K models, 16A for 2K and 3K models.

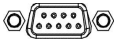
For 100/110/115/120/127VAC models: 15A for 1K and 1.5K models, 20A for 2K model and 30A for 3K model.

Step 3:UPS output connection
There are two types of outlets: programmable outlets and general outlets. Connect non-critical devices to programmable outlets and critical devices to general outlets. During a power outage, you can extend the backup time to critical devices by setting a shorter backup time for non-critical devices.
Step 4: Communication connection.

Communication port:

USB port RS-232 port smart space



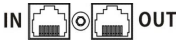




To enable automatic shutdown/startup and UPS status monitoring, connect a communication cable from one end to the USB/RS-232 port and the other end to the communication port of your PC. With the monitoring software installed, you can schedule UPS shutdown/startup and monitor UPS status via PC.

The UPS is equipped with a smart slot perfect for SNMP or AS400 card. By installing the SNMP or AS400 card into the UPS, it will provide advanced communication and monitoring options.

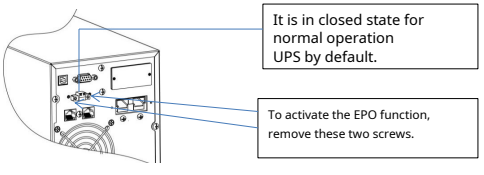
Step 5: Network Connection
Network/Fax/Phone Port



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

Step 6: Disables and enables the EPO function

This UPS is equipped with EPO function. By default, the UPS is delivered from the factory with Pin 1 and Pin 2 closed (a metal plate is connected to Pin 1 and Pin2) for normal UPS operation. To activate the EPO function, remove the two screws on the EPO port and the metal plate will be removed.
Note: The EPO function logic can be configured through LCD settings. Please refer to program 16 in UPS settings for more information.



Step 7: Turn on the UPS

Press the ON/Mute button on the front panel for two seconds to turn on the UPS. Note: The battery is fully charged during the first five hours of normal operation. Do not expect the battery to operate during the initial charging period.

Step 8:install the software

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

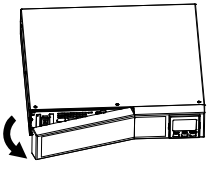
1. Insert the included installation CD into your CD-ROM drive, and then follow the on-screen instructions to continue installing the software. If no screen appears within 1 minute after inserting the CD, run the setup.exe file to begin installing the software.
2. Follow the on-screen instructions to install the software.
3. When the computer restarts, the monitoring software will appear as an orange connector icon located in the system tray, near the clock.

2-5. Replacing the battery (RT models only)

NOTICE: This UPS is equipped with internal batteries and the user can replace the batteries without turning off the UPS or connected loads (hot-swappable battery design). Replacement is a safe procedure, isolated from electrical hazards.
CAUTION!! Observe all warnings, cautions and notes before replacing batteries.

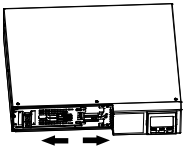
Note: Disconnecting the battery does not protect the equipment from power outages.

STEP 1



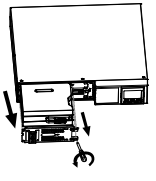
Remove the front panel

STEP 2



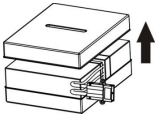
Disconnect the cables from
The batteries

STEP 3



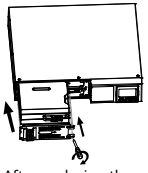
Remove the battery box by removing the two screws on the front panel.

STEP 4



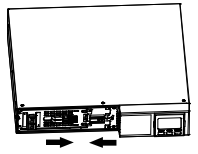
Remove the top cover of the battery box and replace the internal batteries.

STEP 5



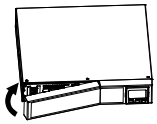
After replacing the batteries, place the battery box back into its original location and screw firmly.

STEP 6



Reconnect the battery cables

STEP 7



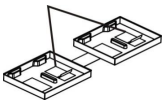
Place the front panel under the unit

2-6. Drum kit assembly (optional for RT models)

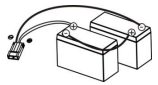
NOTICE: Please assemble the battery kit first before installing it inside UPS. Please select the correct battery kit procedure below to assemble it.

2- drum kit

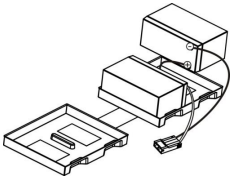
Step 1: Remove the adhesive covers adhesive caps



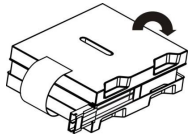
Step 2: Connect all the battery terminals following the table below.



Step 3: Place the assembled battery packs on one side of the plastic covers.

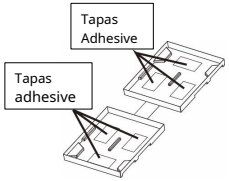


Step 4: Cover the other side of the plastic cover as shown in the table below. Then the drum kit is fine.
assembly.

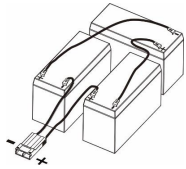


3- drum kit

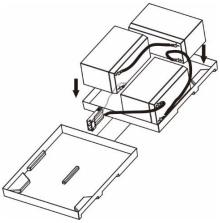
Step 1: Remove the adhesive caps following the table below.
continuation.



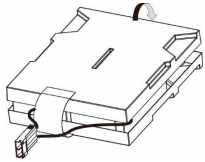
Step 2: Connect all battery terminals



Step 3: Place the assembled battery packs on one side of the plastic covers.

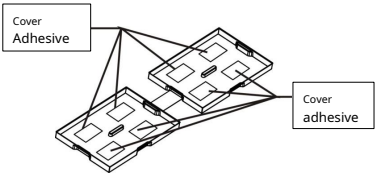


Step 4: Cover the other side of the plastic cover as shown in the table below. Then the drum kit is fine.
assembly.

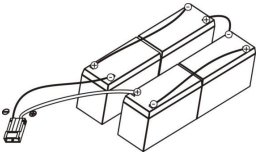


4- battery kit

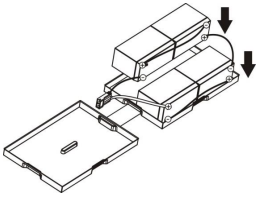
Step 1:remove the adhesive covers



Step 2: Connect all terminals of the battery following the table below.



Step 3: Place the assembled battery packs on one side of the plastic covers.

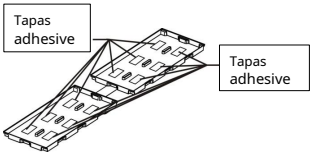


Step 4: Cover the other side of the plastic cover as shown in the table below. Then the drum kit is well assembled.

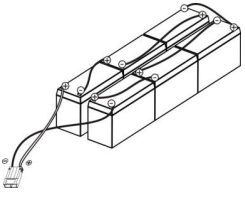


6- drum kit

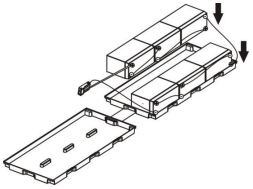
Step 1: Remove the adhesive covers



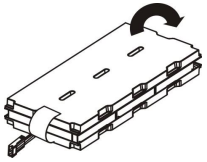
Step 2: Connect all terminals of the battery following the table below.



Step 3: Place the assembled battery packs on one side of the plastic covers.



Step 4: Cover the other side of the plastic cover as shown in the table below. Then the drum kit is fine.
assembly.



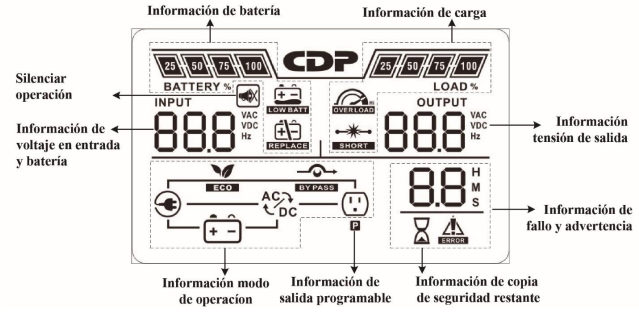
3. Operation

3-1. Operation button

Button	Function
Button on/ Silence	• Turn on the UPS: Press and hold the ON/Mute button for at least two seconds to turn on the UPS. • Alarm Silence: After turning on the UPS in battery mode, press and hold the button for at least 3 seconds to activate or deactivate the alarm. But it does not apply to situations where warnings or errors occur. • Up key: Press this button to display the previous selection in UPS configuration mode. • Switch to UPS self-test mode: Press the Power/Mute button for 3 seconds to enter UPS self-test in AC mode, ECO mode or converter mode.
Button off/ enter	• Turn off the UPS: Press and hold this button for at least 2 seconds to turn off the UPS. The UPS will be in standby mode with normal power or transfer to Bypass mode if the Bypass option is enabled by pressing this button. • Confirmation selection key: Press this button to confirm the selection in UPS configuration mode.
Button Selection	• Switch LCD message: Press this button to switch the LCD message for input voltage, input frequency, input current, battery voltage, battery current, battery capacity, ambient temperature, output voltage, output frequency, charging current and charging percentage. • 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 the next selection in UPS configuration mode.

ON / OFF button silence + Selection	• Switch to bypass mode: When the main power is normal, press ON/Mute and Select buttons simultaneously for 3 seconds. Then UPS will enter bypass mode. This action will be ineffective when the input voltage is out of the acceptable range. • Exit setting mode or return to top menu: When working in setting mode, press ON/Mute and SELECT buttons simultaneously for 0.2 seconds to return to top menu. If you are already in top menu, press these two buttons at the same time to exit setting mode.

3-2. LCD Panel



Screen	Function
Backup time information	
88 H M S	Estimated Backup Time Indicators H: hours, M: minutes, S: seconds.
Configuration and fault information	
88	Indicates the configuration items, and the configuration items are listed in details in section 3-5.
88 ERROR	Indicates warning and fault codes, and the codes are listed in details in sections 3-7 and 3-8.
Operation of silencing	
	Indicates that the UPS alarm is disabled.

Departure information	
OUTPUT 88.8 VAC VDC Hz	Voltage output and frequency output indicators. VCA: AC voltage, Vdc: DC voltage, Hz: frequency
Loading information	
25 50 75 100 LOAD %	Charge level indicators 0-24%, 25-49%, 50-74% and 75-100%.
OVER LOAD	Overload indicators
SHORT	UPS load or output indicators are short circuit
Programmable outputs information	
P	Indicates that the programmable management outputs are operating.
Information in operational mode	
	UPS main connection indicators
	Battery indicators are working
BYPASS	Indicators bypass circuit is working
ECO	ECO mode indicators are enabled
AC DC	Indicators of inverter circuit is working
	Exit indicators are working
Battery information	
25 50 75 100 BATTERY %	Battery level indicators 0-24%, 25-49%, 50-74%, and 75-100%.
REPLACE	Indicators that the battery is failing
LOW BATT	Low battery indicators
Output and battery information	
INPUT 88.8 VAC VDC Hz	Input voltage, input frequency and battery voltage indicators VCA: AC voltage, Vdc: DC voltage, Hz: frequency

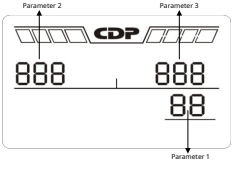
3-3. Audible alarm

Battery mode	It will sound every 5 seconds
Low battery	It will sound every 2 seconds
Overload	It will ring every second
Failure	Continuous sound
Bypass Mode	It will sound every 10 seconds

3-4. LCD expression index

Abbreviation	Screen content	Meaning
ENA	ENA	Enabled
DIS	dIS	Disabled
ESC	ESC	Exhaust
HLS	HLS	High loss
LLS	LLS	Low loss
AO	AO	Open activity
AC	AC	Activity closed
EAT	EAt	Estimated autonomy time.
RAT	rAt	Running autonomy time.
SD	Sd	turn off
OK	OK	OK
ON	On	ON
BL	bL	Low battery
OL	OL	Overload
I HEARD	IH	High output current
NC	nC	Battery not connected
OC	OC	Overload
SF	SF	Wiring fault site
EP	EP	EPO
TP	tP	Temperature
CH	CH	Charger
BF	bF	Battery failure
BV	bV	Bypass output ring
FU	FU	Bypass unstable frequency
BR	br	Replace battery
EE	EE	EEPROM error

3-5. UPS Settings

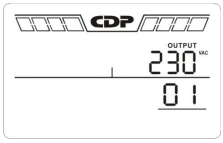
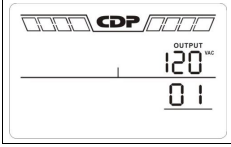


There are three parameters to configure the UPS.

Parameter 1: This is for program alternatives. See the following table.

Parameter 2 and Parameter 3 are the setting options or values for each program.

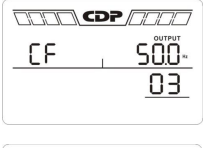
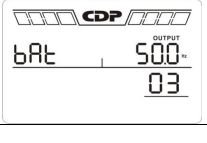
- **01: Voltage output settings**

Interface	Settings
 	**Parameter 2: Voltage output** For 200/208/220/230/240 VAC models, you can choose the following output voltage: **200:**It has an output voltage of 200Vac. **208:**It has an output voltage of 208 Vac. **220:**It has 220 Vac output voltage. **230:**It has 230 Vac output voltage (default) **240:**It has 240 Vac output voltage. For 100/110/115/120/127 VAC models, you can choose the following output voltage: **100:**It has an output voltage of 100Vac. **110:**It has an output voltage of 110Vac. **115:**It has an output voltage of 115Vac. **120:**It has an output voltage of 120Vac (Default) **127:**It has an output voltage of 127Vac.

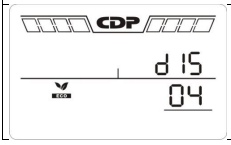
- **02: Enable/disable frequency converter**

Interface	Settings
	**Parameter 2:**enable/disable converter mode. You can choose the following two options: **CF ENA:**enable converter mode **CF DIS:**Disable converter mode (Default)

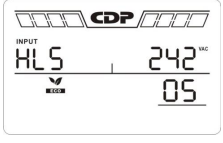
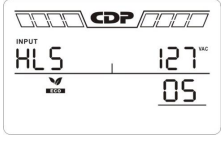
- **03: Frequency output settings**

Interface	Settings
 	**Parameter 2: Frequency output settings.** You can set the initial frequency in battery mode: **BAT 50:** features 50Hz frequency output **BAT 60:**features 60Hz frequency output If converter mode is enabled, you can choose the following frequency outputs: **CF 50:**features 50Hz frequency output **CF 60:**features 60Hz frequency output

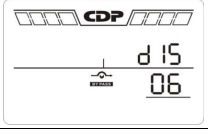
- **04: ECO Enabled/Disabled**

Interface	Settings
	**Parameter 2:**enable/disable the ECO function. You can choose the following two options **ENA:**ECO mode enabled **DIS:**ECO mode disabled (Default)

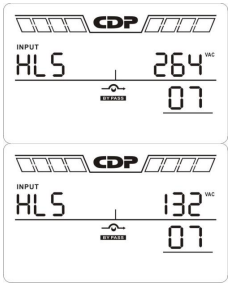
- **05: ECO voltage range settings**

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

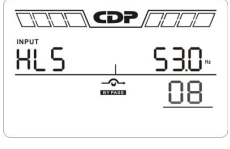
- **06: Enable/disable bypass when UPS is off**

Interface	Settings
	**Parameter 2:**enable/disable bypass mode. You can choose the following two options: **ENA:**Bypass enable **DIS:**Bypass disable (Default)

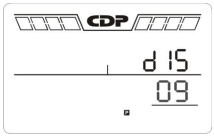
- **07: Bypass voltage range adjustment**

Interface	Settings
	**Parameter 2:**Set the acceptable high voltage point and the acceptable low voltage point for the Bypass mode by pressing the Down key or the Up key. **HLS:**High voltage point bypass For 200/208/220/230/240 Vac models: **230-264:**Setting the high voltage point in parameter 3 from 230Vac to 264Vac. (Default: 264Vac) 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:**Low voltage point bypass 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 For 85Vac to 115Vac models. (Default: 85Vac)

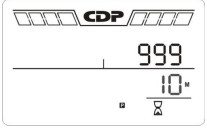
- **08: Bypass frequency range settings**

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

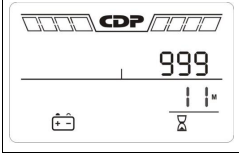
- **09: Enable/Disable Programmable Outputs**

Interface	Settings
	**Parameter 2:**enable/disable Programmable Outputs. **ENA:**enable Programmable Outputs. **DIS:**Disable Programmable Outputs. (Default)

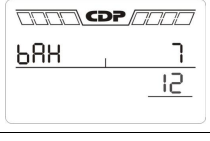
- **10: Programmable output settings**

Interface	Settings
	**Parameter 2:**Set backup time limits for programmable outputs. **0-999:**Setting backup time limits in minutes from 0-999 for programmable outputs that connect to non-critical devices in battery mode. (Default: 999)

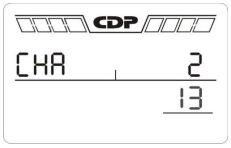
- **11: Autonomy limitation setting**

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

- **12:Total battery AH setting**

Interface	Settings
	**Parameter 2:**Set the UPS total battery AH. **7-999:**Setting the total battery capacity from 7-999 in AH. Set the correct total battery capacity if external battery bank is connected.

- **13: Maximum charging current setting**

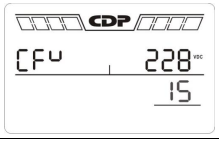
Interface	Settings
	**Parameter 2:**Set the maximum charger current. For low voltage model with 24/36/48VDC. **1/2/4/6/8:**Maximum charger current setting 1/2/4/6/8 amps. (Default: 2A) High voltage models with 24/36/48VDC **1/2/4/6/8/10/12:**Setting the maximum charger current 1/2/4/6/8/10/12/12 in ampere. (Default: 2A) For low voltage and high voltage models with 72/96VDC. Note: Please set the appropriate charger current according to the battery capacity used. The recommended charging current is 0.1C~0.3C of battery capacity as shown in the following table for reference.battery capacity(AH) **1/2/4/6/8:**Setting the maximum charger current 1/2/4/6/8 in ampere. (Default: 2A)

Capacity (AH)	Full charge current (A)
7~20	2
20~40	4
40~60	6
60~80	8
80~100	10
100~150	12

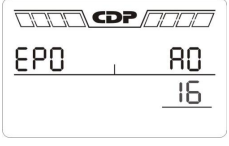
- **14: Charger boost voltage adjustment**

Interface	Settings
	**Parameters 2:**Set the charger boost voltage. **2.25-2.40:**Charger boost voltage setting from 2.25V/cell to 2.40V/cell (Default: 2.36V/cell)

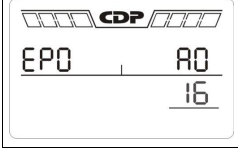
- **15: Adjusting the charger float voltage**

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

- **16: EPO Logical Configuration**

Interface	Settings
	**Parameter 2:**Configure the control logic for the EPO function. **AO:**Active Open (Default). When AO is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in open state. **AC:**Active Closure. When AC is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in closed state.

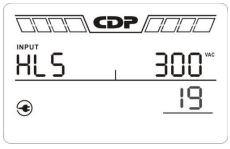
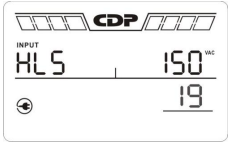
- **17: External output isolation transformer connection**

Interface	Settings
	**Parameter 2:**Allow or deny connection of external output isolation transformer. **ENA:**If selected, connection to an external output isolation transformer is allowed. **DIS:**If selected, it is not allowed to connect to the external output isolation transformer. (Default)

- **18: Screen settings for battery life**

Interface	Settings
	**Parameter 2:**Configure the screen setting for battery life **EAT:**If EAT is selected, the remaining autonomy time will be displayed. (Default) **RAT:**If RAT is selected, it will display the accumulated battery life time so far.

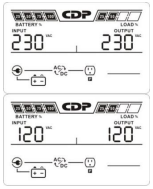
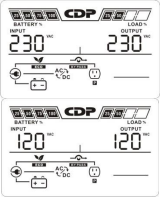
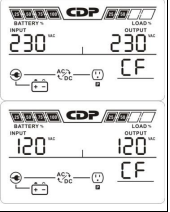
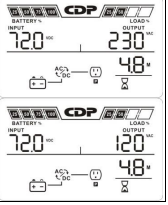
- **19: Acceptable input voltage range adjustment**

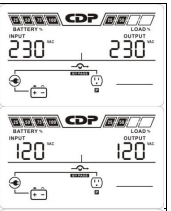
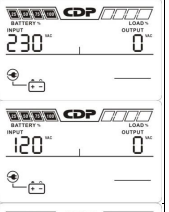
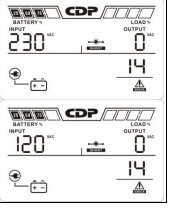
Interface	Settings
 	**Parameter 2:**Set the acceptable high voltage point and the acceptable low voltage point for the input voltage range by pressing the Down key or the Up key. **HLS:**High input voltage point Models: 200/208/220/230/240 VAC **280/290/300:**High input voltage point (Default: 300VAC) For 100/110/115/120/127 VAC models: **140/145/150:**High voltage point setting in parameter 2. (Default: 150VAC) **LLS:**Low voltage point bypass For 200/208/220/230/240 VAC models: **110/120/130/140/150/160:**Low voltage point setting 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: Output settings**

Interface	Settings
	Exit configuration mode.

3-6. Operating mode description

Operating mode	Description	LCD display
Online Mode	When the input voltage is within the acceptable range, the UPS will provide pure and stable AC power for output. The UPS will also charge the battery in online mode.	
ECO mode	Power saving mode: When the input voltage is within the voltage regulation range, the UPS will bypass the voltage at the output to save energy. The UPS will also charge the battery in ECO mode.	
Mode converter of frequency	When the input frequency is within 40Hz to 70Hz, the UPS can be set to a constant output frequency, 50Hz or 60Hz. The UPS will still charge the battery in this mode.	
Battery mode	When the input voltage is out of acceptable range or power failure, the UPS will back up battery power and the alarm will sound every 5 seconds.	

Bypass mode	When the input voltage is within the acceptable range but the UPS is overloaded, the UPS will enter bypass mode or the front panel can set the bypass mode. The alarm sounds every 10 seconds.	
Standard mode	The UPS is off and there is no output power, but the batteries can still be charged.	
Failure mode	When a fault occurs, the ERROR icon and fault code will be displayed.	

3-7. Fault reference codes

Failure	Code of failure	Icon	Failure	Code of failure	Icon
Bus boot failure	01	x	The battery voltage is too high	27	
Bus finished	02	x	The battery voltage is very low	28	
Under the Bus	03	x	Short charger output	2A	x
Inverter soft start failure	11	x	High temperature	41	x
High voltage inverter	12	x	Overload	43	
Low inverter voltage	13	x	Short charger output	45	x
Short inverter output	14		About the input current	49	x

3-8. Warning indicators

Warning	Icon (blinks)	Code	Alarm
Low battery		bL	It will sound every 2 seconds
overload		OL	It will ring every second
About the input current		CL	Sounding 2 beeps every 10 seconds
Battery is not connected		nL	It will sound every 2 seconds
Overload		OC	It will sound every 2 seconds
Wiring fault site		SF	It will sound every 2 seconds
EPO enabled		EP	It will sound every 2 seconds
High temperature		Ep	It will sound every 2 seconds
Charger failure		CH	It will sound every 2 seconds
Battery failure		bF	It will beep every 2 seconds (At this time, UPS is off to remind users that something is wrong with the battery)
Out of bypass voltage range		bv	It will sound every 2 seconds
Bypass unstable frequency		FU	It will sound every 2 seconds
Battery change		bF	It will sound every 2 seconds
EEPROM error		EE	It will sound every 2 seconds

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

4. Troubleshooting

If the UPS system is not working properly, troubleshoot the problem using the table below.

Symptom	Possible cause	Solution
No indication and alarm, although the network is normal.	The AC input power is not connected properly.	Check if the input power cord is firmly connected to the power supply.
	The AC input is connected to the UPS output.	Connect he wire of AC input power to the AC input correctly.
The icon and the code of warning EP flashes in the LCD display and the alarm is ringing every 2 seconds	The EPO function is activated	Place the circuit in the closed position to disable the EPO function.
The icon of and the code of warning SF f flashes in the	The line and neutral conductors of the UPS input	Rotate the mains power socket 180° and then

LCD display and the alarm is ringing every 2 seconds	are inverted.	connect it to the UPS system.
The icons of and flashes in The LCD screen and the alarm are ringing every 2 seconds	The external or internal battery is connected incorrectly.	Check if all batteries are ok connected.
The fault code is displayed as 27 and the icon is on the LCD screen. The alarm sounds constantly.	The battery voltage is too high or the charger is defective.	Contact your dealer.
The fault code is displayed as 28 and the icon is on the LCD screen. The alarm sounds constantly.	The battery voltage is too low or the charger is defective.	Contact your dealer.
The icon of and flashes in LCD display and alarm sounds every second	UPS is overloaded	Remove excess loads from the UPS output.
	UPS is overloaded. Devices connected to the UPS are powered directly through the electrical grid via the Bypass.	Remove excess loads from the UPS output.
	After overloads repetitive, the UPS locks in Bypass mode. The connected devices are powered directly by the mains.	Remove excess load from the UPS output first. Then turn off the UPS and restart it.
The fault code is displayed as 49 and the alarm sounds constantly	UPS is over input current.	Remove excess loads from the UPS output.
The fault code is displayed as is lit on the LCS screen. The alarm sounds constantly	UPS turns off automatically due to an overload at the UPS output.	Remove excess load from the UPS output and restart the UPS.
The fault code is displayed as 14 on the LCD screen and the alarm sounds continuously.	UPS turns off automatically because a short circuit occurs at the UPS output.	Check the output wiring and whether the connected devices are in a short circuit state.
The fault code is displayed as 01, 02, 03, 11, 12, 13 and 41 on the LCD screen and the alarm sounds continuously.	An internal UPS failure has occurred. There are two possible outcomes: 1. The load is still supplied, but directly from AC power via a bypass. 2. The load is no longer supplied by power.	Contact your dealer

Battery backup time is shorter than normal	The battery is not fully charged	Charge the battery for at least 5 hours and check the capacity. If the problem persists, contact your dealer.
	Defective battery	Contact your dealer to replace the battery.
The fault code is displayed as 2A on the LCD screen and the alarm sounds continuously.	The short circuit occurs at the charger output.	Check if the battery wiring of the connected external pack is in a short-circuit state.
The fault code is displayed as 45 on the LCD screen. At the same time, the alarm sounds continuously.	The charger has no output and the battery voltage is less than 10V/PC.	Contact your distributor

5. Storage and maintenance.

Operation

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



Be sure to deliver the used battery to a recycling plant or send it to your dealer in he replacement battery packaging material.

Storage

Before storing, charge the UPS for 5 hours. Store the UPS covered and upright in a cool, dry place. During storage, recharge the battery according to the following table:

Storage temperature	Frequency range	Charging duration
- 25°C - 40°C	Every 3 months	1-2 hours
40°C - 45°C	Every 2 months	1-2 hours

6. Specifications
Tower Models

MODEL		1K 2B AX	1K 3B AX	1.5K AX	2K 4B AX	2K 6B AX	3K AX
ABILITY*		1000VA/1000W		1500VA/1500W	2000VA/2000W		3000VA / 3000W
ENTRANCE							
Range of voltage	Transfer of low line	160VAC/140VAC/120VAC/110VAC ± 5% or 80VAC/70VAC/60VAC/55VAC ± 5% (based on low percentage) 100% - 80% / 80% - 70% / 70 - 60% / 60% - 0)					
	Line return low	175VAC/155VAC/135VAC/125VAC ± 5% or 87VAC/77VAC/67VAC/62VAC ± 5%					
	Transfer of high line	300 VAC ± 5% or 150 VAC ± 5%					
	high return line	290 VAC ± 5% or 145 VAC ± 5%					
Frequency range		40Hz ~ 70Hz					
Phase		A phase with ground					
Power factor		≧0.99 @ full charge					
THDi		≦5% @ 205-245VAC or 100~130VAC THDU < 1.6% @ Input and full linear load condition.					
EXIT							
OUTPUT VOLTAGE		200/208/220/230/240VAC or 100/110/115/120/127 VAC					
AC voltage regulation		± 1% (Batt. Mode)					
Frequency range (Synchronized range)		47 ~ 53 Hz or 57 ~ 63 Hz					
Frequency range		50Hz ± 0.1Hz or 60Hz ± 0.1Hz (Battery Mode)					
Current current ratio		3:1					
Harmonic distortion		≦2% THD (Linear Load) ; 4% THD (Non-linear Load)					
Time of transfer Inc	AC mode to mode Batt.	zero					
	Reverse bypass	< 4 ms					
Waveform (Batt. mode)		Pure sine wave					
Efficiency							
AC mode		≧89% @ fully charged battery			≧91% full battery charge		
ECO mode		≧96% @ full battery charge					
Battery mode		≧88%			≧90%		
BATTERY							
Battery Type		12V/9AH	12V/7AH	12V/9AH	12V/9AH	12V/7AH	12V/9AH
Numbers		2	3	3	4	6	6
Recharge time		3 hours of recovery up to 95% of the internal battery capacity at a charging current of 2A					
Charging current		100/110/115/120 /127 VAC models: default 2A, max. adjustable 8A 200/208/220/230/240 VAC models: default 2A, max. adjustable 12A				Default: 2A, Max: adjustable 8A	
Charging voltage		27.4 VDC ± 1%	41.0 VDC ± 1%	41.0 VDC ± 1%	54.7 VDC ± 1%	82.1 VDC ±1%	82.1 VDC ±1%
PHYSICAL							
Dimensions, DXWXH (mm)		397 X 145 X 220			421 X 190 X 318		
Net weight (kgs)	With battery	11.7	13.0	14.6	20.3	23.2	28.0
	No battery	6.6	6.6	7	9.9	9.9	12.3
ENVIRONMENT							
Humidity		20-95% RH @ 0- 40°C (non-condensing)					
Noise level		Less than 50dBA @ 1 Meter (with fan speed control)					
Smart RS-232 or USB		Supports Windows® 2000/2003/XP/Vista/2008/7/8/10, Linux, Unix and MAC					
Optional		Power management from SNMP manager and web browser					

* Derate to 80% capacity in frequency converter mode and 80% when output voltage is set to 100VAC, 200VAC or 208VAC. For 100/110/115/120/127VAC system, output power ratings are different according to different input voltage. Please refer to the output power rating table for details.
* * Product specifications are subject to change without notice.

RT Model:

MODEL		K RT-2BAX	1K RT-3B AX	1.5K RT AX	2K RT-4B AX	2K RT-6B AX	3K RT AX
ABILITY*		1000VA/1000W		1500VA/1500W	2000VA/2000W		3000VA / 3000W
ENTRANCE							
Range of voltage	Line transfer low	160VAC/140VAC/120VAC/110VAC ±5% or 80VAC/70VAC/60VAC/55VAC ±5% (based on load percentage 100% - 80% / 80% - 70% / 70 - 60% / 60% - 0)					
	Low line return	175VAC/155VAC/135VAC/125VAC ± 5% or 87VAC/77VAC/67VAC/62VAC ± 5%					
	Line transfer high	300 VAC ± 5% or 150 VAC ± 5%					
	high return line	290 VAC ± 5% or 145 VAC ± 5%					
Frequency range		40Hz ~ 70Hz					
Phase		A phase with ground					
Power factor		≧0.99 @ full charge					
THDi		≦5% @ 205-245VAC or 100~130VAC THDU < 1.6% @ Input and full linear load condition.					
EXIT							
INPUT VOLTAGE		200/208/220/230/240VAC or 100/110/115/120/127 VAC					
AC voltage regulation		± 1% (Batt. mode)					
Frequency range (Synchronized range)		47~53Hz or 57~63Hz					
Frequency range		50Hz ± 0.1Hz or 60Hz ± 0.1Hz (Batt. mode)					
Current current ratio		3:1					
Harmonic distortion		≦2% THD (Linear load) ; 4% THD (Non-linear load)					
Time of transfer Inc	AC mode to mode Batt.	Zero					
	Bypass Inverter	< 4 ms					
Waveform (Batt. mode)		Pure sine wave					
EFFICIENCY							
AC mode		≧89% @ full load			≧91% @ full load		
ECO mode		≧96% @ full load					
Battery mode		≧88%			≧90%		
BATTERY							
Battery Type		12V/9AH	12V/7AH	12V/9AH	12V/9AH	12V/7AH	12V/9AH
Numbers		2	3	3	4	6	6
Recharge time		3 hours of recovery up to 95% of the internal battery capacity at a charging current of 2A					
Charging current		100/110/115/120 /127 VAC models: default 2A, max. adjustable 8A 200/208/220/230/240 VAC models: default 2A, max. adjustable 12A				Default: 2A, Max: adjustable 8A	
Charging voltage		27.4 VDC ± 1%	41.0 VDC ± 1%	41.0 VDC ± 1%	54.7 VDC ± 1%	82.1 VDC ±1%	82.1 VDC ±1%
PHYSICAL							
Dimensions, DXWXH (mm)		410 x 438 x 88			510 x 438 x 88	630 x 438 x 88	
Net weights (kgs)	With battery	11.6	14.1	15.5	19.5	23.3	27.5
	No battery	6.6	7.8	8.1	9.4	10.6	12.4
ENVIRONMENT							
Humidity		20-95% RH @ 0- 40°C (non-condensing)					
Noise level		Less than 50dBA @ 1 meter (with fan speed control)					
Smart RS-232 or USB		Supports Windows® 2000/2003/XP/Vista/2008/7/8/10, Linux, Unix and MAC					
Optional SNMP		Power management from SNMP manager and web browser					

* Derate capacity to 80% capacity when output voltage is adjusted to 100VAC, 200VAC or 208VAC For 100/110/115/120/127VAC system, the output power ratings are different according to different input voltage. Please refer to the output power rating table for details.

* * Product specifications are subject to change without notice.

Output Power Rating Table (for 100/110/115/120/127 VAC systems only)

Model name	Entry classification	Exit rating
1K 2B, 1K 3B, 1K RT-2B, 1K RT-3B	110-127Vac, 50/60Hz, 12A, 1Ø	100/110/115/120/125/127Vac, 50/60Hz, 1000VA/1000W,1Ø, 10A
1.5K, 1.5K RT	110-127Vac, 50/60Hz, 12A, 1Ø	100/110/115/120/125/127Vac, 50/60Hz, 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 4B, 2K 6B, 2K RT-4B, 2K RT-6B	110-127Vac, 50/60Hz, 16A, 1Ø	100/110/115/120/125/127Vac, 50/60Hz, 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, 3K RT	110-127Vac, 50/60Hz, 24A, 1Ø	100/110/115/120/125/127Vac, 50/60Hz, 1Ø 3000VA/2880W (@127Vac input) ; 3000VA/2850W (@125Vac input) ; 3000VA/2740W (@120Vac input) ; 3000VA/2650W (@115Vac input) ; 3000VA/2500W (@110Vac input) ; 3000VA/2300W (@100Vac input)

Battery specification

Model	BC-T-18Ah24V	BC-T-18Ah36V	BC-T-18Ah48V	BC-T-27Ah48V	BC-T-18Ah72V
Used with models UPS	1K 2B	1K 3B 1.5K 3B	2K 4B	2K 4B	2K 6B 3K
Battery Type	12V 9Ah	12V 9Ah	12V 9Ah	12V 9Ah	12V 9Ah
Battery Number	4	6	8	12	12
Dimensions (DxWxH) mm	397x145 x 220			421x190 x 318	
Net weight (kgs)	15.8	20.6	26.2	40.4	40.4

OTA: The battery pack must be used with the corresponding UPS.

Model	BC-RT-18Ah24V-280	BC-RT-18Ah24V	BC-RT-18Ah36V	BC-RT-18Ah48V	BC-RT-18Ah72V
Used with models UPS	1K RT-2B	1K RT-2B	1K RT-3B 1.5K RT	2K RT-4B	2K RT-6B 3K RT
Battery Type	12V 9Ah	12V 9Ah	12V 9Ah	12V 9Ah	12V 9Ah
Battery Number	4	4	6	8	12
Dimensions (DxWxH) mm	280 x 438 x 88	380 x 438 x 88		480 x 438 x 88	600 x 438 x 88
Net weight (kgs)	14.9	17.1	21.5	29	41.2

OTA: The battery pack must be used with the corresponding UPS.

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