CyberPower®

PFC SINEWAVE SERIES
OR1500EPFCRT2U
USER'S MANUAL

K01-0000601-00

IMPORTANT SAFETY INSTRUCTIONS

(SAVE THESE INSTRUCTIONS)

This manual contains important instructions. Please read and follow all instructions carefully during installation and operation of the unit. Read this manual thoroughly before attempting to unpack, install or operate the UPS.

CAUTION! The UPS must be connected to a grounded AC power outlet with fuse or circuit breaker protection. DO NOT plug the UPS into an outlet that is not grounded. If you need to power-drain this equipment, turn off and unplug the unit.
CAUTION! The battery can power hazardous components inside the unit, even when the AC input power is disconnected.
CAUTION! The UPS should be near the connected equipment and easily accessible.
CAUTION! To prevent the risk of fire or electric shock, install in a temperature and humidity controlled indoor area, free of conductive contaminants. (Please see specifications for acceptable temperature and humidity range).
CAUTION! To reduce the risk of an electric shock, do not remove the cover, except to service the battery. There are no user serviceable parts inside, except for the battery.
CAUTION! To avoid electrical shock, turn off the unit and unplug it from the AC power source before servicing the battery or installing a computer component.
CAUTION! To reduce the risk of fire, connect the UPS to a circuit with 10 amperes maximum over-current protection in accordance to CE requirement.
CAUTION! The AC outlet where the UPS is connected should be close to the unit and easily accessible.
CAUTION! Please use only VDE-tested, CE-marked mains cable, (e.g. the mains cable of your equipment), to connect the UPS to the AC outlet.
CAUTION! Please use only VDE-tested, CE-marked power cables to connect any equipment to the UPS.
CAUTION! When installing the equipment, ensure that the sum of the leakage current of the UPS and the connected equipment does not exceed 3.5mA.
CAUTION! This is permanently connected equipment and only qualified maintenance personnel may carry out installations.
CAUTION! Do not unplug the unit from AC Power during operation, as this will invalidate the protective ground insulation.
CAUTION! DO NOT USE FOR MEDICAL OR LIFE SUPPORT EQUIPMENT! Under no circumstances this unit should be used for medical applications involving life support equipment and/or patient care.
CAUTION! DO NOT USE WITH OR NEAR AQUARIUMS! To reduce the risk of fire, do not use with or near aquariums. Condensation from the aquarium can come in contact with metal electrical contacts and cause the machine to short out.
CAUTION! DO NOT USE WITH LASER PRINTERS! The power demands of laser printers are too large for a UPS.
CAUTION! DO NOT INSTALL THE UPS WHERE IT WOULD BE EXPOSED TO DIRECT SUNLIGHT OR NEAR A STRONG HEAT SOURCE!
CAUTION! DO NOT BLOCK OFF VENTILATION OPENINGS AROUND THE HOUSING!
CAUTION! DO NOT CONNECT DOMESTIC APPLIANCES SUCH AS HAIR DRYERS TO UPS OUTPUT SOCKETS.
CAUTION! DO NOT USE THE UPS ON ANY TRANSPORTATION! To reduce the risk of fire or electric shock, do not use the unit on any transportation such as airplanes or ships. The effect of shock or vibration caused during transit and the damp environment can cause the unit to short out.
ATTENTION! Dispose of or recycle the UPS after the end of its life, it should be in accordance with local regulations. For more information on recycling, contact the service center.
CAUTION! DO NOT TURN ON OR OPERATE THE UNIT DURING TRANSIT!

INSTALLING YOUR UPS SYSTEM

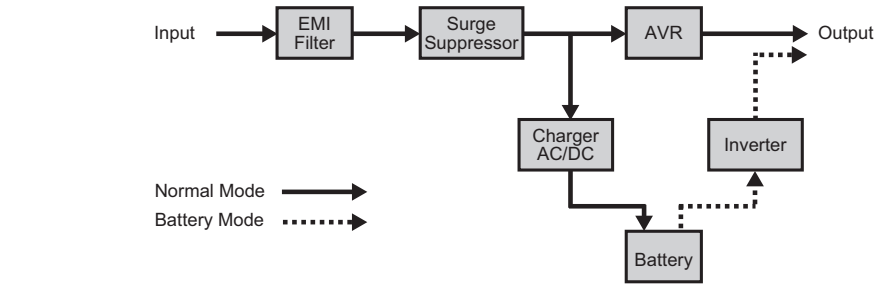
UNPACKING

The box should contain the following:
(1) UPS unit x 1; (2) User Manual x 1; (3) Phone Line x 1; (4) USB A+B type Cable x 1; (5) Emergency Power Off Cable (gray) x 1; (6) Rack mount Brackets x 2; (7) Serial Interface Cable (DB-9) x 2; (8) Power Cord x 2; (9) Model Label x 1
OPTIONAL: 4POSTRAIL

AUTOMATIC VOLTAGE REGULATOR (AVR)

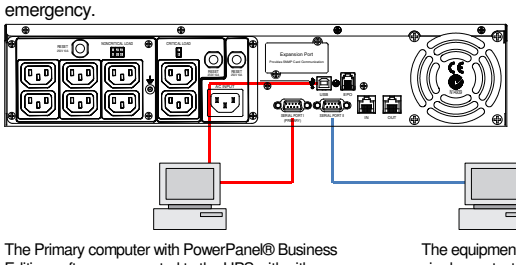
The OR1500EPFCRT2U can stabilize the consistent utility power. The utility power may be damaging to important data and hardware, but Automatic Voltage Regulation helps the computer not experience dangerous voltage levels. Automatic Voltage Regulator automatically regulates low or high voltages to keep equipment working at safe AC power levels (220/230/240V) without switching to battery. Your equipment can operate normally even meet the power problems, such as, shout brownouts and blackouts. The unit's powerful sealed lead-acid batteries will provide power only if the incoming voltage drops below 150V or increases above 300V.

SYSTEM BLOCK DIAGRAM



HARDWARE INSTALLATION GUIDE

1. Battery charge loss may occur during shipping and storage. For the first time the UPS is used, it's strongly recommended to charge batteries for at least 12 hours to ensure that the batteries' maximum charge capacity. To recharge the batteries, simply make the UPS plugged into an AC outlet.
2. When you use the included software, connect either the serial or the USB cable between the computer and the corresponding port on the UPS. Note: If the USB port is used, the serial port will be disabled. They cannot be used simultaneously. The computer with the PowerPanel® Business Edition S/W connects to the USB port or the Serial port on the UPS. It can control the operating schedule, battery test, outlet, etc. and get information on the UPS status. However, other computers with PowerPanel® Business Edition S/W can only get UPS status information via a LAN connection.
3. With the UPS off and unplugged, connect your computer, monitor, and any externally powered data storage device (Hard drive, Tape drive, etc.) into the outlets. DO NOT plug a laser printer, copier, space heater, vacuum, paper shredder or other large electrical device into the UPS. The power demands of these devices will overload and possibly damage the unit.
4. To protect a fax, telephone, modem line or network cable, connect the telephone or network cable from the wall jack outlet to the jack marked "IN" of the UPS. Then, connect a telephone cable or network cable from the jack marked "OUT" on the UPS to the modem, computer, telephone, fax machine, or network device.
5. Press the power switch to turn the UPS on. The Power-On indicator light will illuminate. If an overload is detected, an audible alarm will sound and the UPS will emit one long beep. In order to reset it, turn the unit off and unplug some equipment from outlets. Make sure your equipment carries a load current within the unit's safe range, (refer to the technical specifications), and then turn the unit on.
6. Your UPS is equipped with an auto-charge feature. When the UPS is plugged into an AC outlet, the battery will be automatically charging, even when the unit is switched off!
7. To always maintain an optimal battery charge, leave the UPS plugged into an AC outlet at all times.
8. Before storing the UPS for an extended period of time, turn the unit OFF. Then cover it and store it with the batteries fully charged. Recharge the batteries every three months or so, to ensure good battery capacity and long battery life; further, this might also prevent damage to the unit from an unlikely battery leakage.
9. The unit provides one Primary Serial Port (I), Secondary Serial Port (II), and one USB port, (paired with the Primary Serial Port), to allow connection and communication between the unit and any attached computers. The Primary Serial Port (I) as well as its paired USB port allow for bi-directional communication among the UPS and the primary connected computer running the PowerPanel® Business Edition S/W provided. The UPS can control the computer's shutdown in case of an emergency, and at the same time, the computer can monitor the UPS and alter its various programmable parameters. On the other hand, secondary Serial Port II, only allows the UPS to initiate the connected computer's graceful auto-shutdown in case of an emergency.



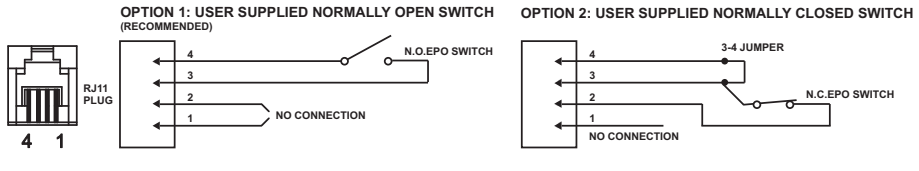
*Dry contact is controlled by the PowerPanel® Software. Please go to www.cyberpower.com for free download.

*Note: USB and Serial port cannot be used simultaneously.

The Primary computer with PowerPanel® Business Edition software connected to the UPS with either a serial cable or USB cable.

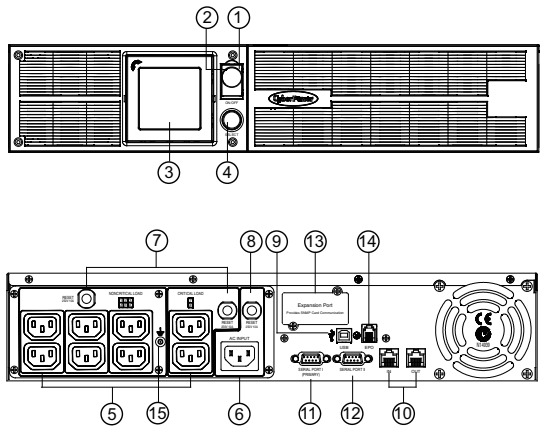
The equipment can read information via dry contact.

10. EPO (Emergency Power Off) Port:
Use the provided gray cable to connect to a special EPO contact switch. Follow the appropriate circuit diagram below to wire the cable to your EPO configuration. The EPO remote switch is a switch installed in an outside area, connected to the unit via an ordinary RJ-11 phone line. In case of an emergency, it can be used to immediately cut-off power from the UPS unit.



BASIC OPERATION

FRONT / REAR PANEL DESCRIPTION



1. Power Switch
Master on/off switch for equipment connected to the UPS.

2. Power on Indicator
Indicate that the AC utility input power's condition is normal and that the UPS outlets are providing power, free of surges and spikes.

3. Multifunction LCD Readout
An LCD that shows various UPS information using icons and messages.

4. LCD Readout Toggle Button
Used to select among a variety of information the LCD can display.

5. Battery Backup, Surge Protected and AVR protected Outlets
This unit provides a total of 8 outlets with battery backup and surge protection. They ensure that connected equipment will keep an uninterrupted operation over a period of time, during a power failure.
Critical / Non-critical
It is possible to program the unit in a way so that the outlet block marked as "non-Critical", (6 ports), will stop the provision of power to connected equipment after a certain period of time, thus making more runtime available for the equipment connected on the outlets marked as "Critical",(2 ports). In other words, the user can establish runtime priority for certain connected equipment, maximizing its «availability» during a prolonged power outage. This type of control takes place with the use of the provided PowerPanel® Business Edition S/W.

6. AC Inlet
Connect the AC Power cord to a properly wired and grounded outlet.

7. Output Circuit Breaker
The circuit breaker serves to provide output overload and fault protection.

8. Input Circuit Breaker
The circuit breaker serves to provide input overload and fault protection.

9. USB port to PC
This is a connectivity port allowing communication and control among the UPS and the connected computer. You should install on your computer the PowerPanel® Business Edition software appropriate to the operating system you are using.

10. Surge Protected Communication Ports - RJ11/RJ45
These ports are being used to protect from various surge-conditions the standard RJ-45/RJ-11 based, (ADSL, LAN, Phone/Modem-Lines), cabling systems.

11. Serial Port I (Primary)
Serial Port I allow for bi-directional communication among the UPS and the computer. The UPS can control the computer's shutdown in case of an emergency, and at the same time, the computer can monitor the UPS and alter its various programmable parameters.

12. Serial Port II (Secondary)
Serial port II allows the UPS to initiate the connected computer's graceful auto-shutdown in case of an emergency.

13. SNMP/HTTP Network slot
Remove the cover panel to install optional SNMP, allowing your UPS be controlled and monitored via a network connection.

14. EPO (Emergency Power Off) Port
Allow for an emergency UPS Power-Off from a remote location.

15. Ground Stud
Use the Ground Stud to ground the UPS.

REMINDER! It is recommended to stick the model label on the LCD module to easily identify the UPS, especially when the UPS unit is placed in a rack.

BATTERY REPLACEMENT

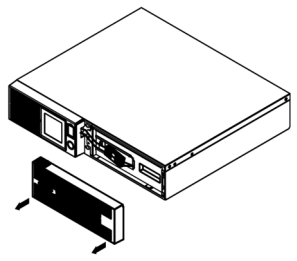
Read and follow the IMPORTANT SAFETY INSTRUCTIONS before servicing the batteries:
Servicing the batteries should only be performed by professionals. Please contact your dealer. Make a note for the replacement battery pack number, (**RBP0109**).

CAUTION! RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. Replace with the same number of the following battery: CyberPower **(RBP0109)** for OR1500EPFCRT2U.
CAUTION! A battery can present a high risk of short-circuits and electrical shocks.
CAUTION! Do not open or mutilate the batteries. Released electrolyte is harmful to the skin and eyes and may be toxic.
CAUTION! Do not dispose of batteries on fire, since they may explode. Follow all local ordinances regarding the proper disposal of batteries.

Take the following precautions before replacing the battery:
1. Remove all watches, rings or other metal objects from your hands.
2. Only use tools with insulated handles.
3. DO NOT lay tools or other metal parts on top of battery or any battery terminals.
4. Wear rubber gloves and shoes.
5. Determine if the battery is grounded. If so, remove source of ground. **CAUTION:** CONTACT WITH A GROUNDED BATTERY CAN RESULT IN ELECTRICAL SHOCK! The likelihood of such a shock will be greatly reduced if such grounding is removed during installation and maintenance.

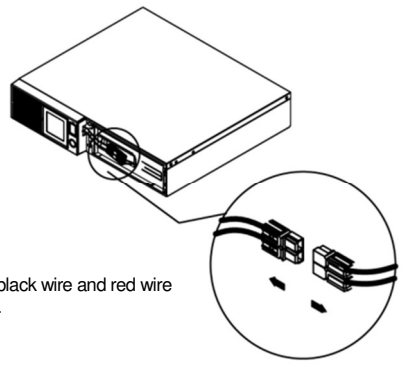
BATTERY REPLACMENT PROCEDURE

1



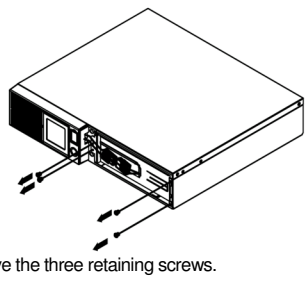
Remove the front panel on the right side.

2



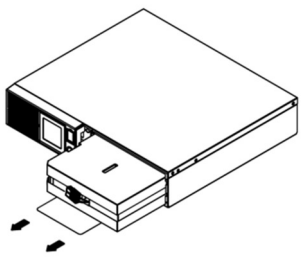
Disconnect the black wire and red wire from the battery.

3



Remove the three retaining screws.

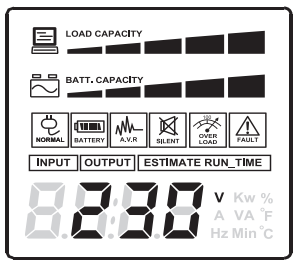
4



Put the new battery packs back into the compartment. Tighten up the screws and replace the cable protection cover and the front panel. Recharge the unit for 12 hours to ensure the UPS performs expected runtime.

REMINDER! The used batteries are considered hazardous waste and must be disposed through recycling. Most retailers that sell lead-acid batteries collect used batteries for recycling, as required by local regulations.

DEFINITION FOR ILLUMINATED LCD INDICATORS



The LCD displays detailed information on the UPS status and current power conditions to alert you to potential power problems before they affect your equipment. Note! All related UPS information is based on that you should turn on the UPS.

Input voltage meter: This meter measures the AC voltage from the wall outlet. The INPUT voltage readout is used to identify the input voltage information. This can be used as a diagnostic tool to identify poor-quality input power. Units are listed in V (Volts).

Output voltage meter: The Output Voltage screen measures, in real time, the AC voltage that the UPS is providing to your connected equipment via the UPS outlets. Units are listed in V (Volts). In the event of a complete loss of power, severe brownout, or over voltage, the UPS relies on its internal battery to back up to supply a consistent 220/230/240V output.

Estimate run time: The Estimated Runtime Screen displays how many minutes of runtime can be expected of the UPS if it were to experience a power outage. When runtime becomes shorted, the battery capacity will decrease; (battery capacity bar indicator will be falling.) Note: The number displayed may be less than actual runtimes for low loads.

Normal icon: This icon illuminates when the UPS is working under normal conditions.

Battery icon: When there is a severe brownout or blackout, this icon will appear followed by an alarm, (two short beeps), indicating that the UPS is now working using its internal batteries. Once the batteries are run out of power, (over a period of time), a constant alarm will sound. If this happens and main power has not been restored, it is recommended that you save your files and turn off your equipment manually as soon as possible.

Automatic Voltage Regulation (AVR) icon: This icon will appear when the unit is automatically regulating low or high AC input line voltage conditions, without resulting to the use of battery power.

Silent mode icon: This icon appearing indicates that the buzzer will not be beeping while in battery operating mode. During Silent mode, the unit's alarm does not sound until the battery reaches low capacity (20%).

Overload icon: This icon will appear followed by an alarm, indicating that an overload condition has been reached. To recover from the overload condition, start unplugging your equipment from the UPS outlets until the icon disappears and the alarm stops.

Fault icon: When activated indicates a system fault error. Please refer to the troubleshooting table for possible causes and solutions.

BATT. CAPACITY: BATT.CAPACITY is shown as a bar char; each segment indicates approximately a 20% of battery capacity.

LOAD CAPACITY: Load CAPACITY is shown as a bar chart; each segment indicates approximately a 20% of load capacity.

LCD SETUP FUNCTIONS

1. General Mode

a. Press the "Display-Toggle" button to check the status of the UPS model:

b. Press and hold the "Display-Toggle" button for 4 seconds.
   - If the machine is in the Battery Mode with active alarm, it will become silent.
   - If the machine is in the Line Mode, a self-diagnostic test will take place.

c. If the "Display-Toggle" button remains untouched for over 30 seconds, the LCD backlight will turn off automatically.

#	Item	Unit
1	Input Voltage	V
2	Output Voltage	V
3	Output Frequency	Hz
4	Load	Kw
5	Estimate Run Time	Min
6	Load Capacity	%
7	Battery Capacity	%
8	Centigrade	°C
9	Fahrenheit	°F

2. Set-up Mode

Step 1: Hold the "Display-Toggle" button for 10 seconds to enter the UPS Set-Up Mode.

Step 2: By pressing the Display toggle, users can switch among setup functions. Some User Configurable functions are as follows:

a. Sensitivity: Set the level of tolerance for UPS. Increase the UPS compatibility for local utility power condition.
   - High: The UPS will turn to battery power more often to provide the steady power supply to the connected equipment.
   - Low: The UPS will tolerate more fluctuations and turn to battery power less often.

b. Voltage Mode: The AC output voltage on battery mode. There are 3 different settings (220,230,240).

These programmable items are sorted by unit as in the following table:

#	Item	Unit
a	Sensitivity	None
b	Voltage Mode (220/230/240)	V
c	Firmware Version	None

Step 3: Press and hold the display-toggle for 4 seconds. When the icons blink, the value of each item is changed by slightly pressing the toggle

Step 4: To save the value and return to general mode, press and hold the toggle for 4 seconds.

Note! If the UPS is left idle for over 30 seconds during setup, it will turn off the backlight and return to general mode automatically.

Note! If the user does not want to save the new settings and return to the general mode, there are two methods:
(1) Wait for the backlight to turn off, or,
(2) By pressing and holding the "Display-toggle" key for 10 seconds.

TROUBLE SHOOTING

Problem	Possible Cause	Solution
Outlet does not provide power to equipment.	Circuit breaker has tripped due to an overload.	Turn the UPS off and unplug at least one piece of equipment. Wait 10 seconds, reset the circuit breaker and then turn the UPS on.
	Batteries are discharged.	Recharge the unit for at least 4 hours.
	Unit has been damaged by a surge or spike.	Contact CyberPower Systems for repair at www.cyberpower.com.
	Non-critical outlets have turned off automatically due to an overload.	Push the toggle button to make the uncritical outlets turn on.
The UPS does not perform expected runtime.	Batteries are not fully charged.	Recharge the batteries by leaving the UPS plugged in.
	Batteries are degraded.	Contact CyberPower Systems about replacement batteries at www.cyberpower.com.
The UPS will not turn on.	The on/off switch is designed to prevent damage by rapidly turning it off and on.	Turn the UPS off. Wait 10 second and then turn the UPS on.
	The unit is not connected to an AC outlet.	The unit must be connected to a 220/230/240V outlet.
	The batteries have degraded.	Contact CyberPower Systems about replacement batteries at www.cyberpower.com.
	Mechanical problem	Contact CyberPower Systems for repair at www.cyberpower.com.
PowerPanel® Business Edition is inactive.	The serial cable or USB cable is not connected.	Connect the cable to the UPS unit. You must use the cable that came with the unit.
	The cable is connected to the wrong port.	Try another port of your computer.
	The unit is not providing power of batteries.	Shutdown your computer and turn the UPS off. Wait 10 seconds and turn the UPS back on. This should rest the unit.
	The serial cable is not the cable that was provided with the unit.	You must use the cable included with the unit for the Software.

Additional troubleshooting information can be found at www.cyberpower.com.

CYBERPOWER GREENPOWER UPS™ TECHNOLOGY

GreenPower UPS™

CyberPower's GreenPower UPS™ Circuit Design is a solution to this problem "Power Loss." When the Utility Power is operating normally, Green Power UPS™ works in Bypass Mode.
Our GreenPower UPS™ design conducts power only through the Relay and still provides normal output voltage. Bypassing the transformer reduces power consumption thereby conserving energy and saving money. When the utility power is abnormal the UPS will operate under Battery or AVR Mode. Under this condition Green Power UPS™ and a traditional UPS would operate about the same.
On average utility power operates 88% of the time and the CyberPower GreenPower Technology will work in its money/ energy saving Bypass Mode.

ENERGY-SAVING TECHNOLOGY

TECHNICAL SPECIFICATIONS

MODEL	OR1500EPFCRT2U
Capacity (VA)	1500
Capacity (Watts)	900
Input	
Input Connections	IEC 320 C14
Nominal Input Voltage	220 / 230 / 240Vac
Input Voltage Range	150Vac – 300Vac
Input Frequency Range	50/60Hz +/- 3Hz (Auto Sensing)
Output	
On Battery Output Voltage	220 / 230 / 240Vac +/- 5%
On Battery Output Frequency	50/60Hz +/- 1%
Transfer Time(Typical)	4ms
Overload Protection	On Utility: Circuit Breaker On Battery: Internal Current Limiting
Surge Protection and Filtering	
Lightning/Surge Protection	Yes
Internet Ready(DSL/Phone/FAX/Modem Protection)	RJ11/RJ45 (One In/One Out)
Physical	
Output Receptacles	(8) IEC 320 C13
Dimensions (cm)	2U Rack, 43.3 x 8.8 x 38.8
Weight (kg)	22.1
Battery	
Sealed Maintenance Free Lead Acid Battery	12 V / 5.5 AH x 4
Hot Swappable	Yes
Warning Diagnostics	
Indicators	Power On, LCD Display (Using Battery, AVR, Load Level, Battery Level)
Audible Alarms	On Battery, Low Battery, Overload
Environmental	
Operating Temperature	32°F to 104°F (0°C to 40°C)
Operating Relative Humidity	0 to 95% Non-Condensing
Storage Temperature	5°F to 113°F (-15°C to 45°C)
Storage Relative Humidity	0 to 95% Non-Condensing
Software	
PowerPanel® Business Edition Software	Windows 10 / 8 / 7 / Vista / XP / 2000, Server 2008 / 2012; VMware ESX/ESXi 5, Citrix; Linux; MAC OS X10.5 or later
Management	
Self-Test	Manual Self-Test
Auto-Charge/Auto-Restart	Yes
COM interface	True RS232 x 1 + Contact closure x 1
Built-in USB Interface	Yes
SNMP / HTTP Networking	Optional

For more information, contact us at:

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www.cyberpower.com

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