

# PRIMER ON PURE SINE WAVE TECHNOLOGY

CyberPower™

## LINE INTERACTIVE AUTOMATIC VOLTAGE REGULATION

The average computer is subjected to over 120 power problems each month. Power protection is crucial for protecting computer systems and critical data.

Uninterruptible Battery Back-up Systems with Automatic Voltage Regulation (AVR) from CyberPower not only guard against surges and spikes, but also protect your computer against blackouts, brownouts and sags. CyberPower UPS units with AVR provide lightning protection and will save open files in the event of a power outage.

UPS units with AVR provide consistent, clean power by constantly regulating the incoming voltage. The UPS unit will only switch to battery if the line voltage drops below 85V or exceeds 150V. This means your computer will experience less "lock-ups" and always receives clean, consistent voltage.

## POWER FACTS

Power problems are the second leading, and most preventable cause of computer downtime. *Source: HP Whitepaper: Increasing Single System Availability - Oct. 1998*

Power problems are the leading cause of data loss, 15 times more frequent than computer viruses. *Source: Contingency Planning*

Sags in power supply can cause up to 87% of computer crashes. *Source: AT&T Bell Labs*

In the USA up to 150,000 people are affected by a power loss each day. *Source: Power Planning Institute*

## QUALIFYING QUESTIONS

### Questions to ask customers

- Are you currently using a power protection device for your computer system?
- Do you live in an area with frequent thunderstorms or lightning?
- Do you experience frequent computer lock-ups?
- Do you ever notice the lights dim for a brief period when laser printer, air conditioning, refrigerator or other electrical apparatus is activated?
- Are you concerned about damage to your computer system due to long-term effects of fluctuating incoming voltage levels?
- Does this server / computer contain important or irreplaceable data on the hard drives?

## UPS SIZING

To estimate a UPS load rating, find the VA and Watt rating on any product information label attached to the computer, monitor and other peripheral components. This information may also be listed in the documentation or user manual.

Multiplying the  $V \times A$ , gives a result in Volt-Amperes often stated simply, VA. The Volt-Ampere (VA) is a universally accepted measure of electrical capacity for the UPS industry. VA capacity simply states that a given device may draw so many amps (A) at a particular voltage (V).

Add the VA ratings for all computer components that will be plugged into the battery backup outlets of a UPS to determine a total estimate of the required VA requirement to properly select a suitable UPS unit.

## POWER GLOSSARY

**Amps** An amp is the basic unit of electric current. It measures the amount of current that a device needs to operate.

**Brownouts** A brownout is a reduction of your incoming voltage. Brownouts are the most common form of power problems, accounting for over three-quarters of all power problems. When brownouts occur, the lower voltage causes your computer system to work harder than it has to. This can cause excessive wear and premature failure of critical components.

**Joules** A joule is a unit of work or energy. Joule ratings are given on UPS systems and surge protectors to provide an idea of how much surge protection they provide. Look for units that provide joule ratings of 400 or greater to insure exceptional protection for your system.

**Sag** A voltage sag is another name for a brownout.

**Spike** A spike is an instantaneous increase in voltage. Spikes can be caused by such things as lightning or overloaded power grids. Spikes can cause damage to your computer, modem and other critical components.

**Surge** A surge is a sudden transient increase in your electrical current. Surges are usually caused when items that draw a large amount of electricity (air conditioners, refrigerators, copiers, etc...) are turned off. The extra power that these items were using is then released back into the power lines.

**Volt-Amps** When purchasing a UPS system, you need to know how much capacity you need. This capacity is measured in volt-amps.

## WHAT IS A PURE SINE WAVE?

Like light and sound, electricity travels in waves. A pure sine wave form is a name for the physical rounded shape of the wave the electricity travels in. Utility power comes in sine wave form which allows computer components and electrical motors to run cooler and more efficiently. CyberPower PURE sine wave products are designed for applications which demand perfect power and top of the line power protection.



PURE SINE WAVE

## BENEFITS OF SINE WAVE TECHNOLOGY

- Noise is eliminated which means no more lines on your television and no hum in your sound system
- Computers operate more accurately
- Extends the life of electronic equipment
- Electronic equipment runs cooler, therefore more efficiently
- Eliminates static or hum on telecommunications equipment
- Electronic motors run at their intended speed
- Sensitive electronics operate properly and retain settings

## Tower Style - PP series

3 Year Warranty



PP800

Suggested Retail Price: \$249.95



PP1100

Suggested Retail Price: \$349.95



PP1500

Suggested Retail Price: \$499.95



PP2200

Suggested Retail Price: \$599.95

## Rackmount Style - PR Series

3 Year Warranty



PR1500

Suggested Retail Price: \$549.95



PR2200

Suggested Retail Price: \$649.95



PR3000

Suggested Retail Price: \$869.95

## Features

- Run Times up to 300 Minutes
- Pure Sine Wave Technology
- Line Interactive Topology
- Power Management Software Included
- SNMP / HTTP Adapter (Optional)
- Dual Communication Interfaces
- User Replaceable Batteries
- USB Connectivity
- Optional Rackmount or Stand Alone (PR Series Only)



Includes

### PowerPanel™ Plus Edition

Automatic Shutdown Software

- Saves open files, closes applications and shuts down your computer when a power outage occurs.
- Monitors input voltage, output voltage, battery capacity, load and unit temperature.
- Allows for user-defined scheduled shutdown and startup of computer system.



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Toll free: 877.297.6937 / Fax: 952.403.0009

[www.cyberpowersystems.com](http://www.cyberpowersystems.com)

# PRIMER ON AUTOMATIC VOLTAGE REGULATION

# CyberPower™

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## QUALIFYING QUESTIONS

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Are you currently using a power protection device for your computer system?

Do you live in an area with frequent thunderstorms or lightning?

Do you experience computer lock-ups or does your computer run slow?

Do you ever notice the lights dim for a brief period when laser printer, air conditioning, refrigerator or other electrical apparatus is activated?

Do you have important pictures or data stored on your computer?

Are you concerned about damage to your computer system due to long-term effects of fluctuating incoming voltage levels?

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## WHAT IS AVR?



Automatic Voltage Regulation (AVR) ensure clean and consistent power to your connected devices at all times. In the event that the incoming voltage level drops during a brownout or sag condition, the AVR "boosts" (increases) the output voltage to a safe range of 110 to 120 volts.

Conversely, CyberPower AVR units "buck-down" (decrease) high voltage levels to a safe level for the devices. CyberPower Systems Office Power UPS units with AVR automatically provide backup power when the in-coming line voltage drops below 85V or exceeds 150 volts.

## BENEFITS OF AVR TECHNOLOGY

- Prevents computer system lock-ups by reducing corruption of RAM due to fluctuating power.
- Protects motherboard, hard drive, monitor and other critical system components against damage from prolonged exposure to inconsistent incoming voltage levels.
- Reduces the chance of data corruption due to "dirty" power.
- Does not resort to battery power to "boost" low incoming voltage levels ensuring maximum battery runtime during power outages.

# CyberPower™

## Tower Style - OP series

✓ 3 Year Warranty



**OP650**

Suggested Retail Price:  
\$109.95



**OP850**

Suggested Retail Price:  
\$139.95



**OP1250**

Suggested Retail Price:  
\$179.95



**OP1500**

Suggested Retail Price:  
\$349.95



**OP2200**

Suggested Retail Price:  
\$429.95



Includes

## PowerPanel™ Plus Edition

### Automatic Shutdown Software

- Saves open files, closes applications and shuts down your computer when a power outage occurs.
- Monitors input voltage, output voltage, battery capacity, load and unit temperature.
- Allows for user-defined scheduled shutdown and startup of computer system.



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