



Do I need a UPS?

What a UPS is

UPS stands for uninterruptible power source, a device that sits between a power outlet and a device such as computer. The purpose of an UPS is to prevent undesired interruptions of the power source, such as outages and power surges, from adversely affecting your computer or your network.

What it does

The UPS will help your computers remain temporarily operational when changes to the power supply would otherwise interrupt their function. Having a device that can buy you a bit of "up time" (allow your computers to run temporarily) can prevent damage to or loss of data due to the power loss. If power fails permanently, the UPS provides time for the operator, administrator, or owner to power the equipment down safely without damage to data. Most UPS device have the ability to signal a computer that power is failing and initiate a shutdown procedure, so the process can be automated.

The three flavors

Three different types of devices are commonly referred to as UPSs.

1. Standby power supply (SPS), or an offline UPS. This refers to a supply where power is derived directly from the power line until the power fails. When the power fails with this type of supply, a battery-powered inverter turns on and continues supplying power. The batteries are charged when line power is available.

These devices are cheaper than other solutions. Disadvantages include the switchover time (the time required for the inverter to come online), which varies from one unit to another -- so check this carefully prior to purchase. Another disadvantage is that because the units are generally connected directly to the power line, an SPS provides relatively poor protection from line noise, line spikes, frequency variations, and brownouts. Since 80% of power issues are brownouts, this type of UPS is not recommended.



2. Hybrid or line-interactive UPS systems. Hailed by some to be the most efficient UPS, the line-interactive UPS is one of the most popular designs used today for computer protection. The basic line-interactive UPS has a bi-directional inverter/charger which is always connected to the output of the UPS, and uses a portion of AC power to keep the battery charged. When the input power fails, an electronic transfer switch disconnects AC input and the battery/inverter provides output power. This gives a faster response to a power failure than an offline UPS. Hybrid units combine a ferroresonant transformer that acts as an automatic voltage regulator (AVR) standing between the AC input and AC output. The AVR maintains a constant output voltage regardless of whether the input voltage varies. When the input voltage falls below limits, the UPS switches automatically to draws off the battery. This style of UPS provides very good protection combined with good efficiency and is recommended for most applications.

3. True or online UPSs. These refer to a system that continuously operates from an inverter. This type of UPS provides the highest level of power protection by using a combination of a double-conversion (AC to DC/DC to AC) power circuit with the inverter to continuously power the load.

The upside: no switchover time, extremely consistent power, and the best isolation from power line problems. Disadvantages: cost; more heat generation; and more power consumption.

Do I Need a UPS?

How's your power? An under-voltage of line power known as a brownout is the underlying cause in four out of five power disturbances. The remainder of the time power fails completely, but generally briefly. If you are new to your neighborhood, ask others for insight. A UPS can help by keeping equipment running normally until power returns or an orderly shutdown of equipment can be performed. Consider how much an unexpected power failure would impact your business. Note also that a one-second power interruption might result in 10 minutes downtime as equipment is restarted. Some database systems cannot tolerate un-orderly shutdown and will require lengthy recovery procedure.

Most vendors recommend a UPS be in place at least for each server machine to protect data. Check with your vendors or JCS for advice.



What size UPS do I need?

The power requirements of your computer equipment will determine the size of UPS you will need. Your first step is to decide which equipment will need UPS protection. This depends upon how well your business can tolerate a disruption in power. If, for example you are comfortable with briefly suspending operations during a power disturbance you need not consider printers, monitors and other peripheral equipment. If, on the other hand you want to continue business as usual during disturbances, then consider every piece of equipment, including modems, and network gear. You will probably need several UPSs as the equipment will be in different rooms.

The capacity of UPS units is rated in VA (Volt-Amperes) which you will probably not find anywhere on your electronic equipment. You can check how much power your equipment uses by reading the plate on the back of each device. You then need to convert that figure to VA.

If you are given the current that the device uses in amperes (A), then simply multiply the amperes by the line voltage (120V in USA) to get the VA. For example, if your appliance uses 4A, then multiply 4 by 120 and you will get 440VA.

If you are given the power in watts (W), simply divide the watts by the power factor (0.7 is generally used). For example, if your device uses 320W, then divide 320 by 0.7. This will give you 457VA.

Then simply add up the VA of all the devices that you will be running off each UPS. The next step is to add 25% to the above sum. It is highly recommended that a UPS has a capacity that is at least 25% greater than the total power capacity requirements of the connected equipment. This provides room for expansion, equipment upgrades, and allows for some deterioration of the UPS battery over its useful life.

Here's a simple example: Let's say you have a computer that uses 200W and a monitor that uses 320W that you want to run off a UPS. You would first have to add them together for a total of 520, and divide 520 by 0.7. This will give you a total of 743VA. Then add 25%, which gives you a grand total of 929VA. Your best bet would be to buy a 950VA or 1000VA UPS. Keep in mind that all the above calculations are for single phase UPS units only.

Depending on whether you are protecting many computers, or just one or two, you may decide to connect all the computers to one central UPS instead of using individual UPS units for each station. This may be more cost effective.



A UPS is not generally intended to be an alternative power supply. They are used to protect your systems by warning you of a power problem, and give you time to close down your applications and computers before the inevitable happens. Therefore, most UPS units are designed to provide about ten minutes of backup power (with small differences between manufacturers). This is usually enough time to back up what you need and appropriately shut down the connected equipment. It is advisable to look over the specifications of the UPS you are considering. If you need more time, then you must buy a larger UPS. It must be noted that buying a larger UPS does not always give you more backup time. The size and type of battery used in the UPS has a lot to do with it. UPS batteries are rated in Ah (ampere-hours). Ah represents the amount of energy a battery can hold. This measurement helps determine how long the battery will power the equipment it is used in. The more 'Ah' the longer the run time.

Other tips

The battery in a UPS will last roughly 3 to 5 years. It's a good idea to know where to purchase a new battery before it is needed.

It can be very useful to have power management software that will automatically shut down an unattended machine in the event of power failure. The power management software is usually provided with the UPS, and often comes in more than one version, to provide compatibility with the various operating systems. Be sure that the UPS you choose has an appropriate communication cable (serial, USB) and comes with management software that is compatible with your operating system.

Check the warranty of the UPS. Usually the better quality units have a longer warranty period.

It's a good idea to test out your UPS every so often. A good time to do this would be after doing your scheduled backup and maintenance. Turn off the circuit breaker that controls the UPS to simulate a blackout, and see if the UPS does its job. Please note that the testing is NOT done by pulling out the plug. Electronic equipment should always have a good ground reference. If you unplug the UPS, it's still powered but now has what is commonly called by electricians a "floating ground". Not only is it bad for the electronic device, it can be dangerous too.

Some UPS units have protection for network and telephone lines. This extra protection can help save your computing and electronic equipment.



Don't overload a UPS. It will not work properly when you'll need it the most, and you will shortening it's life span.

When a lighting storm is near, the best way to protect your computers (and other appliances) is to unplug them from the outlets, together with your UPS. A lightning bolt, that can melt holes in steel and jump through kilometers of empty air, isn't going to even notice the "surge protection" electronics in your UPS and it isn't going to be stopped by the tiny air gap inside an on/off switch either. So to be on the safe side, unplug everything. Don't forget to unplug the telephone, cable, network, and antenna connections too.

If possible, don't run your printer, scanner, and other such devices off your UPS unless it is absolutely necessary. These devices will simply add more of a load, causing you to buy a larger and more expensive UPS. Most people really don't need a battery backup that a UPS provides for such devices, and would be better off buying a good surge protector instead.

If all this seems too daunting, just call us.

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