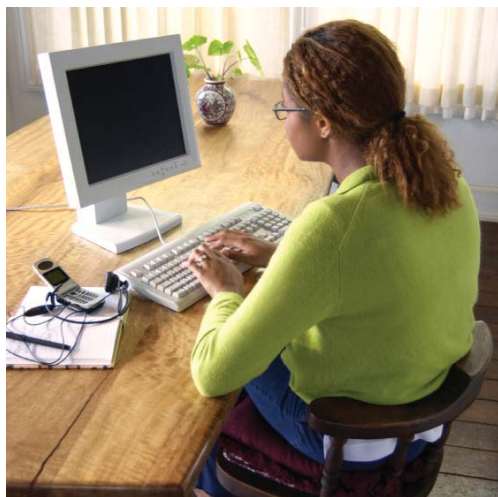


# how to protect computers from power outages



## taking responsibility

Individually, efficient use of energy brings benefits such as lower bills, improved comfort levels and a reduced personal impact on the environment.

Acting together, our individual choices add up – for the benefit of our community, our environment and our energy future. That's the power of working together.

As your community energy company, we are committed to sharing our experience and energy expertise. You can always count on us for:

- Answers to your energy questions.
- Energy efficiency information and advice.
- Help in evaluating energy-saving options.
- Assistance in finding energy-efficient products.

## **More UPS, less downs**

There is a simple way to protect your electronic equipment from the damage—and downtime—that can result from power outages. It's called an uninterruptible power supply, or UPS. This booklet explains how a small investment in a UPS can give you better protection and peace of mind. For more information, visit [mge.com](http://mge.com) or call us at 252-7117.

## **What is a UPS?**

A UPS is placed between the electrical receptacle and the computer. It isolates the computer from an outage. When the UPS senses a change in voltage or a power outage, it switches to battery backup. The batteries provide time to save information and shut down.





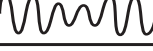
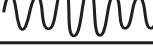
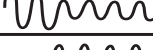
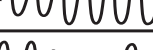
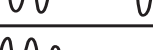

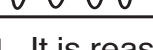
Some models use software that can close and save your files before safely shutting off the computer. This is typically referred to as an unattended shutdown.

## **Where should a UPS be used?**

Electronic equipment that is critical to your home or business should be protected. This includes personal computers, cash registers, phone equipment and programmable logic controllers.

## Can a UPS handle other power problems?

Depending on the type of UPS selected, it can provide protection against many common power problems. The chart provides more information about the types of problems that the UPS can correct.

Power quality condition			UPS
	<b>Transient voltage surge</b>	Line to ground	2
		Line to line	1
	<b>Noise</b>	Line to ground	2
		Line to line	1
	<b>Notches</b>		1
	<b>Voltage distortion</b>		2
	<b>Sag</b>		1
	<b>Swell</b>		1
	<b>Undervoltage</b>		2
	<b>Overvoltage</b>		2
	<b>Momentary interruption</b>		1
	<b>Long-term interruption</b>		
	<b>Frequency variations</b>		1
<ol style="list-style-type: none"> <li>1. It is reasonable to expect the condition can be corrected by a UPS.</li> <li>2. There is a significant variation in UPS performance. The condition may or may not be fully correctable by all types of UPS.</li> </ol>			

## What types of UPS are available?

The three types of UPS are listed in order of the protection they provide and their price:

**Off-line UPS** allows house power to flow until it detects a change in voltage or a power outage. Then it switches the computer from the incoming line to internal batteries. An off-line UPS may or may not provide transient protection. Check to ensure the computer can tolerate the switching time needed to transfer from the incoming line to the internal batteries.

*Pros:* Lowest cost. Most efficient. Quiet.

*Cons:* Direct connection from house power to the computer or other equipment. During the time it takes to switch to battery, the equipment is without power. Since the inverter (converts DC power from battery to AC) only runs during a power outage, it is most likely to fail when needed most.

**Line-interactive UPS** features an internal circuit that interacts with the incoming voltage to increase or decrease the incoming voltage. It does this without resorting to battery power. Regulating the voltage without resorting to battery power helps the batteries last longer and assures they are only used during a power outage. This type of UPS provides some protection against transients.

*Pros:* More line-conditioning than standby type of UPS. Quiet. Efficient.

*Cons:* Complete isolation from house power occurs only during a power outage. Computer is without power during the time it takes to switch to battery power. Since inverter (converts DC power from battery to AC) only runs during power outage, it is most likely to fail when needed most.

**On-line UPS** powers the computer or other equipment from an internal power supply 100% of the time. AC power from the incoming line is converted to DC, converted back to AC and then fed to the computer. This provides the highest level of protection. The incoming power is continually filtered and recreated.

*Pros:* Is the most compatible with emergency generators. Heavy-duty inverter sized to always operate the load. Less likely to fail during a power outage.

*Cons:* Highest cost. Least efficient. Noisiest due to cooling fan.

## **What does MGE recommend?**

MGE recommends a UPS be applied to electronic equipment that could be adversely affected by power problems. These include PCs, PLCs, phone systems, etc.

Choose the type of UPS by how critical the equipment is that needs to be protected.

For more information, call MGE at 252-7222 and ask for a power quality engineer.

## listening. learning.

MGE takes responsibility to provide information and education to serve our customers and stakeholders. We educate customers today to help inform their decision making. We educate tomorrow's stakeholders so they can help plan our energy future.


We're committed to providing reliable power, but encourage you to safeguard your computer-related equipment against power outages and surges. *Working together we can make a difference.*

Contact us for information about:

- Heating/Air-conditioning.
- Insulating/Weatherizing.
- Lighting.
- Other energy-related equipment.

Get more energy information at:

- [mge.com](http://mge.com).
- Home Energy Line 608-252-7117.
- Business Help Line 608-252-7007.
- 800-245-1125.

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