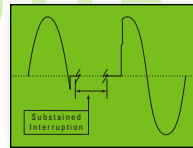


## standby & uninterruptible power supplies

Standby and uninterruptible power supplies are reserve power supplies which are used to power critical or

sensitive electronic equipment during short interruptions in power



sustained interruption

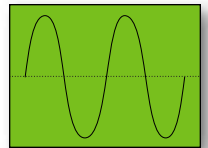
The interruptions, which may last anywhere from less than one second up to several hours, are the result of equipment failures, automobile accidents, objects or animals coming in contact with overhead wires, mother nature and many other unavoidable occurrences. While We Energies has taken steps to limit the number of these events, they will inevitably occur on any electrical system.

The primary role of a reserve power supply is to provide protection against these short-term power interruptions until:

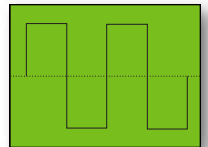
- the outage is over,
- an orderly shutdown of equipment can be accomplished, or
- a backup generator can be started to provide power until the utility power returns.

Since the cost and physical size of a reserve power supply is directly related to the amount of equipment it's required to protect and the length of time this protection is required, only critical equipment such as computers, alarm systems, etc., are typically connected to the reserve power supply.

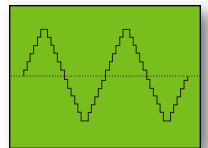
Reserve power supplies do not typically provide a **true sine wave output**.



Instead, these units will provide a **square wave output**, or



**simulated sine wave output**.



While the primary role of the reserve power supply is to provide protection from utility outages, other protection may be provided depending upon their design and mode of operation.

## Modes of operation:

### Standby Mode

The equipment is normally fed directly from the utility, and the reserve power supply is switched in upon the loss of AC power. Because the reserve power supply is not switched in until after the utility power has been lost, the equipment being protected will experience a momentary interruption during the time it takes to switch to the reserve supply.

The length of this interruption is dependent upon the type of sensing and switching equipment being used. If electronic sensing and switching is used, the interruption will last about 4 thousandths of a second, which is typically within the ride-through capability of most electronic equipment. If electromechanical sensing and switching is used, the interruption will last around 20-50 thousandths of a second, which is beyond the ride-through capability of most electronic equipment and will probably result in equipment misoperation or shutdown.

Because this type of reserve power supply is normally off-line, no additional protection is provided with this system. In addition, depending upon the ride-through capability of your equipment, additional equipment can sustain the short outage which occurs when switching to the reserve supply.

### Line Interactive Mode

The equipment is normally fed through the reserve power supply so that the equipment will not experience a momentary interruption when the normal power is lost. Since this type of UPS is continuously in-line, it often provides additional power conditioning and protection. First, at the same time the rectifier is converting the incoming AC power to DC, many UPS's will also clamp any surges or overvoltages present on the incoming power. Second, by feeding the rectified DC signal through the battery prior to converting it back to AC for use by the protected equipment, any voltage sags are eliminated because the output voltage level is stabilized by the battery. During a power outage, the protected equipment is supplied from the battery through the inverter.

This type of system is a true uninterruptible power supply since the protected equipment will not experience a momentary interruption during a power outage.

**With either type of system, the batteries will need to be replaced periodically. The life of the batteries is dependent on the battery type, the number of times the batteries are called upon to supply power, the ambient temperature of the room in which they are stored, and other related factors.**

**A new UPS typically comes with software for adjusting its settings to meet your needs. Often the sensitivity of the UPS is set at the factory so that it activates at the slightest voltage variation, thereby reminding you what a smart investment you have made. We recommend you widen the tolerance bandwidth so that your UPS does not operate unnecessarily.**

## What to look for when purchasing a:

### STANDBY OR RESERVE POWER SUPPLY

Will your equipment ride through the time it takes to switch to the reserve power?

Length of time the reserve power supply can power your equipment.

### UNINTERRUPTIBLE POWER SUPPLY

Continuous rating of the power supply.

Length of time the reserve power supply can power your equipment.

What other protection is provided: surge suppression, voltage regulation, etc.

standby & uninterruptible  
power supplies

