

Line Conditioners

A line conditioner is a fancy word for a special transformer. Most line conditioners provide some isolation by their design. Isolation transformers (covered in the next section) perform both functions but must meet a different set of specifications.

A line conditioner has the ability to make up for low line voltage and does so by storing energy in its coils and components. The Best line of SPS uses this principle of storage in their Ferro transformers.

If you have ever turned off an older TV you will have noticed the picture does not disappear the very instant the AC power is removed. Some energy is stored in the transformers and capacitors inside the TV set. A line conditioner can store electrical energy in the same manner.

Line conditioners not only act like a small store of power for equipment but they can also regulate over voltage down to the desired voltage. They do this within limits, depending upon the degree of over voltage regulation built into their design. One of the less expensive units on the market has input and output voltage limits outlined below.

Voltage Regulation	Input Voltage	Output Voltage
117VAC +/- 5%	92-145	114-126

As you can see this is not a very wide window and the voltage regulation is not close to what a true UPS provides. So where would you use a line conditioner?

Line conditioners are commonly used with devices that have a very high in-rush current. Copy machines are one of the most common uses of line conditioners. When a copy machine starts a cycle it will draw very large amount of power when compared to most equipment. This causes line voltage to drop. The lack of voltage and current can starve the copy machine and any other device on the same circuit. Think about the effect on a computer on the same circuit.

When the copy machine is operating, it requires a great deal of energy and when it stops the resulting power surge can be very high. Remember a copy machine is listed as one of the sources of surges and spikes in a normal office.

Laser printers benefit from line conditioners. It is very common to see large laser printers installed in offices that do not have proper isolated circuits for their operation. A line conditioner can help the other equipment located on the same branch circuit from suffering power starvation during the operation of a copy machine or laser printer.

The line conditioner may contain many of the components of a SPS. Many SPS systems are nothing more than a line conditioner with charger circuit, detection circuit and batteries added.

Line conditioners help equipment that needs power regulation and a source of energy during the cycles of operation. They are commonly found in offices, industrial facilities and manufacturing plants. They should not be confused with isolation transformers as the degree of isolation they provide is minimal at best.

It is common to see a transformer on almost every floor of a multi floor commercial building. This transformer is acting as a very basic line conditioner for the connected equipment. The power requirement of HVAC systems will cause sags in the power to high voltage lighting systems and other equipment. The transformer helps counteract this sudden, large need for power, and by doing so, acts as a line conditioner.

© PSI 1995