

# Power Conditioning Glossary

**AC: Alternating Current.** The voltage varies constantly above and below zero in a 50 or 60 Hertz sine-wave. Used for power distribution because the voltage can easily be changed by a transformer.

**Ampere (or Amp):** The unit of electric current. An analogy would be the amount of water going over a waterfall.

**Avalanche Diode:** A type of semiconductor component that is normally open circuit until the voltage increases to the point where the device turns on and conducts current. Similar in operation to MOVs but do not degrade with use. Very reliable as long as they are used strictly within their ratings.

**Brown out:** A sustained under-voltage condition which is low enough to cause equipment malfunction. Most equipment can operate from 105V to 135V without serious performance degradation. A voltage lower than 90V will usually cause functional problems.

**Capacitance:** The effect where electric charge is stored. A capacitor is an electronic component made specifically to store electric charge. Capacitors are also used to differentiate between frequencies in applications such as crossover networks. A capacitor has high impedance at low frequencies (open circuit at DC) and its impedance decreases as frequency increases.

**DC: Direct Current.** The voltage is constant and does not vary. Used primarily inside electronic equipment.

**EMI: Electromagnetic Interference.** A general type of electric, radio or magnetic interference which is transmitted by conduction or radiation and can be of a very wide frequency range.

**Hertz:** The unit of frequency in cycles per second. Used to characterize anything from AC power (50 or 60 Hertz) up to cellular phone radio frequencies (Giga-Hertz)

**Inductance:** The effect where energy is stored in a magnetic field. An inductor is an electronic component made specifically to store energy by using a magnetic field. Inductors are also used to differentiate between frequencies in applications such as crossover networks. An inductor has low impedance at low frequencies (short circuit at DC) and its impedance increases as frequency increases.

**Inrush:** The initial current that occurs when a motor or electronic equipment is first turned on. The inrush current is usually several times higher than the normal operating current. In the case of electronic equipment the initial inrush current occurs while the power supply charges up. Equipment with a large current draw can have an inrush current large enough to blow a circuit breaker or damage switches and relays.

**Joule:** The unit of energy (measured over time). One Joule is equivalent to the heat generated during one second when one Volt is driving one Amp around a circuit.

**MOV: Metal Oxide Varistor.** A disc shaped device which is normally open circuit until the voltage increases to the point where the MOV turns on and conducts current. Originally developed to suppress arcing on relay contacts but used extensively in shunt-mode surge protectors. Have a limited lifetime.

**Parallel:** Devices connected together so that the same voltage appears across all devices.

**Power Surge or Voltage Surge:** A short term over-voltage condition. Surges caused by lightning are very high power but extremely short in duration, lasting only for 20 to 50 millionths of a second. Surges caused by equipment switching and other sources are also extremely short lasting typically for less than a thousandth of a second.

**RF interference: Radio Frequency Interference.** Interference which is caused by radio signals.

**Series:** Devices connected together in a chain so that the same electric current passes through all devices.

**Series Mode™:** A brand of surge protector which uses a high-voltage device to prevent surges and transients from being passed to connected equipment.

**Shunt Mode:** A type of surge protector which uses MOVs, avalanche diodes or gas discharge tubes to conduct surge current to the neutral or ground wire.

**Switch-mode power supply:** The power supply inside electronic equipment converts the 120V AC to the DC required by the circuitry. A switch mode supply is smaller and lighter than a traditional power supply because it switches the current on and off very fast to generate the DC using a small high-frequency transformer rather than a larger traditional power transformer.

**Toroidal Transformer:** A transformer that is constructed around a ring of iron. This produces a more efficient, compact design with a tighter magnetic field.

**Transient or Spike:** Similar to a voltage surge in that they cause a very brief over-voltage condition, but are typically less energetic and less damaging.

**Volt:** The unit of electric potential. Voltage drives electric charge around a circuit. An analogy would be the height of a waterfall.

**Voltage Regulation:** A means of maintaining the equipment voltage at a constant level. Domestic AC power is distributed at a nominal 120V but this can vary depending on the load and other factors in the distribution. A voltage regulator adjusts for those variations to provide a constant 120V at the equipment.

**Watt:** The unit of power (continuously generated). One Watt is generated when one Volt is driving one Amp around a circuit.