

2/50 Voltage Wave

Voltage surge with a virtual front time of 1.2 ms and a time to half-value of 50 ms delivered across an open circuit.

8/20 Current Wave

Current surge with a virtual front time of 8 μ s and a time to half-value of 20 μ s delivered into a short circuit.

AC (Alternating Current)

Current that reverses direction in response to voltage that is changing polarity.

AC Power Interface

The electrical points where an SPD is electrically connected to the AC power system.

Active Tracking® Filter

A Surge Suppressor/Electrical Noise filter device, that suppresses both transient and Low voltage electrical noise found on the AC line.

Active Tracking® Filter Plus:

A device that both divert or clamp high amplitude transients, and attenuate low-energy, high frequency noise.

Air-Cooled

A product cooled by the natural circulation of air.

Ambient Noise Level

The sound level of the area measured in decibels.

Ambient Temperature

The temperature of the air surrounding a product.

Ampacity

The current-carrying capacity of an electrical conductor or device.

Ampere

The practical unit of electric current.

Attenuation

Decrease in signal voltage or power.

Autotransformer

A transformer in which part of one winding is common to both the primary and secondary circuits associated with that winding.

Banked

Two or more transformers connected together to increase kVA.

Basic Impulse Level (BIL)

A measure of the ability of the insulation system to withstand very high voltage surges. For example, a 600-volt class transformer has a 10 kV BIL rating.

Battery Run Time

The amount of time (in minutes) a battery system can support a load.

Blackout

Slang term for the total loss of electrical power for more than one minute.

Breakdown Voltage

The maximum AC or DC voltage which may be applied from input to output and/or chassis of a power supply. *See Hi-Pot.*

Brownout

Slang term for an extended voltage reduction (more than a few cycles) of more than 10%.

Bypass

A mechanical or electronic switch to provide an alternate path for the line current.

CBEMA

An acronym for Computer and Business Equipment Manufacturers Association. Replaced by the Information Technology Industry Council (ITIC).

CE Mark

(Conformité Européenne) - A marking that shows the product meets the fundamental safety, health, environmental and consumer protection requirements of the European Community.

Chassis

The metal framework or case in which an electrical circuit or system is constructed.

Combination Wave

Also called combination surge. A surge delivered by a generator which has the inherent capability of applying a 1.2/50 ms voltage wave across an open circuit and delivering an 8/20 ms current wave into a short circuit. The exact wave that is delivered is determined by the generator's fictive impedance.

Common-Mode Noise

Noise that occurs between the current carrying conductors and ground.

Compensated Transformer

A transformer with a turn's ratio which provides a higher rated voltage at no-load and rated voltage at rated load. Normally used on units rated 2 kVA or smaller.

Constant Current Power Supply

A power supply that regulates its output current for changes in line, load, ambient temperature, and time.

Constant Voltage Power Supply

A power supply that regulates its output voltages for changes in line, load, ambient temperature and time.

Constant Voltage Transformer (CVT)

A power conditioner that provides a stable and regulated sinewave output voltage.

Continuous Duty

The service requirement that demands operation at a constant load for an indefinite period of time.

Control Transformer

Usually referred to as an Industrial Control transformer. Designed for good voltage regulation characteristics when low power factor and /or large inrush currents are drawn (5 to 15 times normal).

Conductor Losses

Losses in the transformer winding that are incidental to the carrying of the load. These losses include those due to resistance as well as to stray and eddy currents.

Core

The steel that carries the magnetic flux in a transformer.

Core Loss

Losses caused by a magnetization of the core.

Crest Factor

The ratio of the peak value and RMS value of a voltage or current waveform.

Cross-Regulation

In a multiple output power supply, the percent voltage change at one output caused by the load change on another output.

Crowbar

An overvoltage protection circuit which rapidly places a low resistance shunt across the power supply output terminals if a predetermined voltage is exceeded.

CSA

Canadian Standard Association

Current Limiting

See *Output Current Limiting*.

DC

(Direct Current) Current that flows in only one direction.

Decibel (db)

A unit used to express the magnitude of a change in signal or sound level, either an increase or decrease.

Delta Connection

A method used for connecting the three windings of a three-phase transformer (or three single-phase transformers). The windings are connected in series, the three-phase supply being taken from or supplied to the junctions.

Delta-Wye

The method of connection for both primary and secondary windings of a three-phase transformer bank.

Derating

The specified reduction in an operating parameter to improve reliability.

Differential Mode Noise

Noise that occurs between the current carrying conductors.

DIN Rail

A standard rail (typically 35 mm wide) that mounts to the chassis and allows other electrical components to be installed and replaced easily.

Distribution Transformer

Any transformer rated between 3 and 500 kVA and a primary voltage of 601 volts or less.

Double Conversion UPS

See *On-line UPS*

Double Wound Transformer

A transformer with double wound coils on both the primary and secondary.

Drift

The change in output voltage of a power supply over a specified period of time, following a warm-up period, with all other operating parameters such as line, load, and ambient temperature held constant.

Drive Isolation Transformer

A transformer designed to withstand the additional heat and mechanical stress caused by DC drives.

Dry Type Transformer

A transformer cooled by a medium other than a liquid, usually through the circulation of air.

Dual Wound Coils

Two part windings that can be connected in series or parallel to adjust the voltage or current.

Dynamic Load Regulation

The ratio of change in output voltage to change in load current.

Eddy Currents

Additional currents caused by a magnetic field.

Efficiency

A measure of energy loss in a circuit.

Electronic Tap Changing Regulator

An electronic switching system used to adjust for changes in line voltage to maintain the output voltage within acceptable levels.

Electrostatic Shield

A grounded conductor placed between the primary and secondary winding to greatly reduce or eliminate line-to-line or line-to-ground noise. Often referred to as a "Faraday shield".

EMC

(Electromagnetic Compatibility) A directive necessary to get the CE Mark, which shows the electrical device will not create high levels of EMI and will not fail due to normal levels of EMI.

EMI

See *Noise/Electrical Noise*.

Encapsulated

A method of sealing a device with epoxy to resist environmental effects.

ESR

Equivalent Series Resistance. The amount of resistance in series with an ideal capacitor which exactly duplicates the performance of a real capacitor.

Excitation Current

The steady rate current that keeps the transformer energized after the inrush has dissipated, with all other windings open-circuited. Also called "magnetizing" or "no-load current."

Faraday Shield

See *Electrostatic Shield*.

FCAN and FCBN Taps

Acronyms for Full Capacity Above Normal and Full Capacity Below Normal.

Ferroresonance

A method of producing a constant voltage by use of a special saturated transformer. Invented and patented by Joseph Sola in 1938.

Ferroresonant Power Supply

A stabilized power supply (CVDC) driven by a constant voltage transformer.

Filter

A device that reduces unwanted electrical noise.

FL

Full-load

Flyback Converter

A power supply switching circuit which normally uses a single transistor. During the first half of the switching period the transistor is on and energy is stored in a transformer primary; during the second half period this energy is transferred to the transformer secondary and the load.

Foldback Current Limiting

A power supply output protection circuit whereby the output current decreases with increasing overload, reaching a minimum at short circuit.

Force Air Cooled

A means of accelerating heat dissipation to lower the temperature rise of an electrical device.

Forward Converter

A power supply switching circuit in which energy is transferred to the transformer secondary when the switching transistor is on. In this circuit minimal energy is stored in the transformer.

Frequency (Hertz)

Cycles per second.

Full Bridge Rectifier

A power switching circuit in which four diodes are connected in a bridge configuration.

Ground Loop

The condition of having two or more ground references in a common system.

Half Bridge Rectifier

A power switching circuit similar to the full bridge converter except that only two diodes are used.

Harmonics Distortion

The distortion of the AC waveform due to the addition of sinewaves of different frequencies being added to the AC voltage.

Hi-Pot Test

High Potential Test. A test to determine if the breakdown voltage of a transformer or power supply exceeds the minimum requirement.

Holdup Time

The length of time a power supply's output voltage remains within specifications following the loss of input power.

Impulse

A high amplitude, short duration spike (milliseconds) superimposed on the normal voltage or current.

Input Line Filter

A low-pass or band-reject filter at the input of a power supply which reduces line noise fed to the supply. This filter may be external to the device.

Input Voltage Range

The high and low input voltage limits within which a device meets its specifications.

Inrush Current

The peak instantaneous input current drawn by a device at turn-on.

Inrush Current Limiting

A circuit which limits the inrush current during turn-on of a device.

Inverter

A power converter that changes DC input power into AC output power.

Isolation Transformer

A transformer in which the input winding and the output winding are not electrically connected.

Isolation

The electrical separation between input and output of a circuit.

Isolation Voltage

The rated AC or DC voltage which may be continuously applied from input to output and/or chassis of a device. See *Hi-Pot*.

kVA Rating

A measurement of apparent power. 1 kVA = 1000 VA.

KW Rating (kilowatts)

A measurement of real power delivered to a load $1 \text{ KW} = 1000 \text{ VA} \times \text{Power Factor}$

Leakage Current

The AC or DC current flowing from input to output and/or chassis of an isolated device at a specified voltage.

Line Regulation

The change in output voltage due to a variation in input voltage.

Linear Power Supply

A power supply that uses a control device, like a transistor, in series (or parallel) with the load. The control device adjusts the effective resistance to give a constant voltage output.

Linear Regulator

See *Linear Power Supply*.

Load Regulation

The change in output voltage due to a variation in load.

Local Sensing

Using the power supply output voltage terminals as the sense points to provide feedback to the voltage regulator.

Low Voltage Transients

High frequency noise

LVD

Acronym for Low Voltage Directive. A European Community directive which shows the device is not a shock or fire hazard.

Maximum Continuous Operating Voltage (MCOV)

The maximum designated rootmean-square (rms) value of the power frequency voltage that may be continuously applied to the mode of protection of an SPD.

Modes of Protection

Electrical paths where the SPD offers defense against transient overvoltages. Examples include Line to Neutral (L-N), Line to Ground (L-G), Line to Line (L-L) and Neutral to Ground (N-G).

MOV

Acronym for Metal-Oxide-Varistor. A voltage sensitive device used to limit overvoltage conditions on AC power and data lines.

MTBF

Acronym for Mean Time Between Failure. The statistical failure rate of a device.

Noise/Electrical Noise

Also called electromagnetic interference, or EMI. Unwanted electrical signals that produce undesirable effects and otherwise disrupt the control system circuits.

Nominal Value

The stated or objective value for a quantity.

Normal Mode Noise

See *Differential Mode Noise*.

Off-Line UPS

A UPS where the inverter is normally off until there is a power failure. Also known as a Standby UPS.

On-Line UPS

A UPS where the inverter is always powering the load. AC is converted to DC to charge the battery then DC is converted to AC to power the load. On-Line UPS are often referred to as a "Double Conversion UPS".

Output Current Limiting

An output protection feature which limits the output current to a predetermined value in order to prevent damage to the device under overload conditions.

Output Voltage

The nominal value of the voltage at the output terminals of a device.

Overload Protection

See *Output Current Limiting*.

Overshoot

A transient change in output voltage, in excess of specified output accuracy limits, which can occur when a power supply is turned on or off, or when there is a step change in line or load.

OVP

Acronym for Overvoltage Protection. A power supply feature which shuts down the supply, or crowbars or clamps the output, when its voltage exceeds a preset level.

Parallel Operation

The connection of the outputs of two or more identical devices to obtain a higher output power.

PARD

Acronym for Periodic and Random Deviation. A term used for the sum of all ripple and noise components measured over a specified band width and stated in either peak-to-peak or RMS values.

PE

Acronym for Protective Earthing. The incoming earthing conductor provided by the utility.

PI Filter

A commonly used filter at the input of a switching supply or DC/DC converter to reduce reflected ripple current. The filter usually consists of two parallel capacitors separated by a series inductance and is generally built into the supply.

Post Regulator

A linear regulator used on the output of a switching power supply to improve line and load regulation and reduce output ripple voltage.

Power Boost™

Describes the advanced overload capability of the SDN and SDP power supplies to power high inrush loads without oversizing.

Power Factor

The ratio of true power (Watts) to apparent power (VA).

Power Fail Detection

A power supply option which monitors the input voltage and provides an isolated logic output signal when there is loss of line voltage.

Pre-regulation

The regulation at the front-end of a power supply, generally by a type of switching regulator, this is followed by output regulation, either by a linear or switching type regulator.

PWM Inverter

Acronym for Pulse Width Modulation. An efficient method of creating sinewave power.

Push-Pull Converter

A power switching circuit which uses a center-tapped transformer and two power switches which are driven on and off alternately. This circuit does not provide regulation by itself.

Rated Output Current

The continuous load current that a device was designed to provide.

Rectification

The conversion of alternating current to direct current.

Redundancy

The addition of extra devices to provide a backup in the event of the loss of one of those devices.

Remote Sensing

The ability for a power supply to sample the load voltage located a distance away, and adjust for the resulting voltage drop.

Return

The name for the common terminal of the output of a power supply; it carries the return current for the outputs.

Reverse Voltage Protection

A feature which protects a power supply against a reverse voltage applied at the input or output terminals.

Ripple

A small AC voltage on the DC output of a power supply that remains after filtering.

Ripple and Noise Perturbations

Small AC voltage on the output of a DC power supply at a specified bandwidth. This is the result of feed through of the rectified line frequency, internal switching transients and other random noise.

Sag

A temporary drop in the RMS voltage, which may last from one cycle to a few seconds.

Short-Circuit Protection

A feature which protects the device from a short-circuit so that the device will not be damaged.

SNMP

Acronym for Simple Network Management Protocol. A standard for LAN management messaging and control of network devices and their functions.

Soft Start

A feature which limits the start-up switching currents of a switching supply and causes the output voltage to rise gradually to its final value.

SPD

Surge Protective Device. Divert or clamp high amplitude transients.

Standby UPS

See *Off-Line UPS*.

Static UPS

See *On-Line UPS*.

Step-Up/Step-Down Transformers

A transformer that either increases or decreases the input voltage.

Swell

A temporary increase in the RMS voltage, which may last from a half cycle to a few seconds.

Switching Frequency

The rate at which the voltage is switched in a DC-DC converter or switching power supply.

Switching Regulator

A high efficiency circuit used to regulate output voltages.

Switchmode Power Supplies (SMPS)

A power supply that uses a switching regulator.

Temperature Coefficient

The average percent change in output voltage per degree Centigrade change in ambient temperature over a specified temperature range.

Temperature Range, Operating

The ambient temperature range within which a device may be safely operated and meets its specifications.

Temperature Range, Storage

The ambient temperature range within which a device may be safely stored, non-operating, with no degradation in its subsequent operation.

Thermal Protection

An internal safeguard circuit that shuts down the unit in the event of excess internal temperatures.

THD

Acronym for Total Harmonic Distortion. The ratio of the harmonic content to the fundamental frequency expressed as a percent of the fundamental.

Transfer Time

The amount of time a device takes to switch from one mode of operation to another.

Transformer

An electrical device that changes AC voltage from one level to another.

Transformer Turns Ratio

The ratio of primary turns to secondary turns.

Transient

A high amplitude, short duration (milliseconds) spike superimposed on the normal voltage or current. Sometimes called a **spike** or a **surge**.

Transient Recovery Time

The time required for the output voltage of a device to settle within specified output accuracy limits following a step change in output load current or a step change in input voltage.

Transverse Mode Noise

See *Differential Mode Noise*.

TVSS

Transient Voltage Surge Suppressor. Also known as SPD

UL

Acronym for Underwriters Laboratories tested.

UL Recognized

Designation given to components that when used properly in an end product are deemed to be safe.

UL Listed

Designation given to products ready for end use.

Undervoltage

See **Brownout**.

UPS

Acronym for Uninterruptible Power Supply. A device which supplies power to the critical load when the existing AC line voltage is not within normal operating values, or fails completely.

VA

Acronym for Voltamp. A measure of power. 1000 VA = 1 kVA.

VFD

Variable Frequency Drive.

Voltage Balance

The difference in magnitude, in percent, between the two output voltages of a dual output power supply where the voltages have equal nominal values with opposite polarities.

Warm-Up Drift

The initial change in output voltages of a device from turn-on until it reaches thermal equilibrium.

Warm-Up Time

The time required, after initial turn-on, for a device to meet its performance specifications.