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Glossary of Terms

Active Power

A measure of the actual power (Watts) dissipated by a load.

Alternating Current (ac)

An electrical current whose electrons flow periodically in one direction to a maximum level before dropping back to zero and then flowing in an alternative direction before the pattern repeats itself. The waveform is that of a sinewave.

Amp or Amperes (A)

A measure of electrical current flow.

Ampere-hour (Ah)

A measure of the number of Amps that a battery set can deliver per hour.

Apparent Power

The current drawn by a load at a given supply voltage measured in VA.

Availability

A ratio of system up time compared to its downtime expressed as a percentage.

Automatic Bypass

A circuit within a UPS (or bypass panel) to transfer the load from and to a bypass supply, which may be relay or static switch-based.

Automatic Voltage Stabiliser (AVS)

A device to stabilise the mains power supply voltage to a load. Also known as an Automatic Voltage Regulator (AVR) or Voltage Regulator (VR).

Autonomy (Runtime or Backup Time)

The amount of time (minutes or hours) that a battery set or other power source will support the load.

Battery Block

A self-contained battery consisting of a number of individual and connected battery cells.

Battery Cell

A simple electrical circuit within a battery block consisting of positive and negative electrodes or plates, an electrolyte and separator.

Battery Set

Comprises of a battery string or a number of battery strings.

Battery String

Comprises of a number of battery blocks arranged in a series to achieve a set Vdc and Ah rating.

Blackouts

A term used to describe a mains power supply failure, also referred to as an outage.

Boost charge

A high charge voltage applied to a battery set.

Booster-Converter

An assembly used within a transformerless UPS to step up the dc supply from a rectifier or battery set to the level required by an inverter.

Break-Before-Make (BBM) Bypass

A bypass that introduces a break when transferring a load from the output of a UPS to the bypass supply, and vice-versa.

Brownouts

Long duration decreases below nominal (the normal mains power supply voltage), which can last for many cycles or longer.

Building Management System (BMS)

A centralised alarm monitoring system usually providing either a visual status indication board or computer monitoring screen.

Bundling

A method of containing liquid spillage from a system, for example, oil or diesel from a standby generator.

Bypass

A power path arrangement normally providing a secondary power supply path in case the primary one fails.

Capacitance

The ability of a circuit to store electrical energy as a charge. The circuit is known as a capacitive circuit.

Central Power Supply System (CPSS)

A type of standby power system used within emergency lighting, security and medical applications the operation of which is similar to that of a UPS.

Circuit-Breaker

A device inhibiting high surge currents over a set stated figure. Under such conditions the breaker will operate and the circuit is isolated.

Clamping level

The level at which a spike or transient protection device clamps the voltage down to a lower level.

Common Mode Noise

A form a high-frequency electrical noise which results from disturbances between the supply lines and earth (phase-to-earth or neutral-to-earth).

Constant Voltage Transformer (CVT)

A type of ferroresonant transformer.

Crash Kits

Spares kits held on-site to enable a fast emergency response to a system failure.

Crest Factor

The mathematical ratio of the peak to RMS value of an ac waveform.

Critical Loads

Systems which directly affect the ability of an organisation to operate and which must be kept running during a mains power supply failure.

Current (A)

The 'volume' of electricity flowing in a circuit and expressed as Amps.

Current Limit

The restriction of the amount of current that can be drawn from any point within an electrical circuit or UPS output.

Deep Discharge

A battery charge state whereby the battery voltage, (Vdc), has dropped below a safe operating level from which it cannot recover.

Direct Current (dc)

Electric current the electrons of which are flowing in one direction only.

Discrimination

The protection around a device within a *Power Continuity Plan* that will disconnect it, if a short-circuit or overload is applied, to prevent it from damaging other devices, and without interrupting their operation.

Displacement Power Factor

The ratio of Real Power (W) to Apparent Power (VA) at the fundamental frequency.

Distortion

A variation in waveform from a true wave shape.

Distortion Power Factor

The power factor produced by the harmonics generated from non-linear loads.

Dry-Contact

See Volt-Free Contact.

Dynamic Stability

The ability of a device to respond to a load-step change and deliver a stable output voltage waveform.

Earth Fault (Ground)

A connection from the live component of a mains power to an earth connection.

Electrical Noise

High frequency noise on a sinewave which may be Common Mode or Normal Mode.

Electro-Magnetic Compatibility (EMC)

The extent to which an electronic or electrical device will tolerate and generate Electro-Magnetic Interference (EMI).

Electro-Magnetic Induction

The production of an electrical potential difference (or voltage) across a conductor, situated in a changing magnetic flux.

Emergency Power off (EPO)/ Emergency Shutdown (ESD)

A signal contact on a UPS which will initiate a total UPS shutdown.

Emergency Response Time

The speed of response specified within a maintenance plan for an engineer to attend site.

Ferroresonance

A term applied to resonant interactions between capacitors and saturable iron-core inductors. During resonance, the inductive reactance increases to match the capacitive reactance and current flow is limited by the system resistance. The phenomenon is used, for example, within ferroresonant transformers of which Constant Voltage Transformers (CVTs) are a configuration.

Ferroresonant Transformer

A voltage regulating transformer using the principle of Ferroresonance.

Fixed Cellular Terminal (FCT)

A communications device that can receive and route telephone calls through a built-in mobile phone capability.

Float Charging

A method of charging a battery set at a steady voltage level.

Flywheels (dc)

A device used to convert Kinetic energy into a standby supply of dc power for a UPS either in place of a battery set or to reduce the initial discharge during momentary interruptions.

Frequency Converter

A device for changing the input frequency to a different output frequency.

Fuel Cell

A device that uses hydrogen as a fuel to generate an ac or dc supply in addition to heat and water.

Gas Discharge Tube (GDT)

An arrangement of electrodes in a gas within an insulating, temperature-resistant ceramic or glass case which switches to a low-impedance when subjected to a spike or transient voltage.

Gas Turbine

A device that converts Kinetic energy generated from combustion into electrical energy to provide an ac standby power source to load.

Generator

A device that converts Kinetic energy generated by combustion into electrical energy to provide an ac or dc power source to load.

Harmonic

A variation of a mains power supply sinewave above the fundamental (50 or 60Hz).

Harmonic Distortion or Total Harmonic Distortion (THDi)

Distortion of a mains power supply sinewave from its fundamental frequency and wave shape.

Harmonic Filter

A device to reduce the harmonic distortion generated by a device and enable it to provide a high power factor to its ac source.

Hertz (Hz)

A measurement of the number of complete cycles per second of a waveform. Normal mains frequency is either 50 or 60 (Hz).

ICC

Short-circuit current.

In

Nominal current.

Incomer

The cable carrying the mains power supply into a building from the nearest substation and Point of Common Coupling (PCC).

Inductance

The generation of an electro-motive force in an inductive circuit by varying the magnetic flux through it.

Ingress Protection (IP) Rating

An IP Number is often used when specifying the environmental protection offered by enclosures around electronic equipment. The first number refers to the protection against solid objects and the second against liquids.

Insulated Gate Bipolar Transistor (IGBT)

A high power switching device used in inverters and rectifiers.

In-rush

The initial surge in current drawn by loads, for example, to charge capacitive circuits.

Inverter

The circuit within a UPS system which converts dc energy to an ac output.

Isolation or Galvanic Isolation

A separation of the input and output supplies to a device in such a way that energy flows through a field rather than through electrical connections.

JBUS

A communications protocol that creates a hierarchical structure (one master and several slaves) from a single RS-232 communications link, similar to MODBUS.

Joule (J)

An energy measurement determined as one Watt per second.

Maintenance Bypass

A bypass supply which is used to power the load during maintenance and which may be internal or external to the device. It is also known as a bypass panel or wrap-around bypass.

Make-Before-Break (MBB) Bypass

A bypass that makes contact between the primary (UPS output) and secondary (bypass supply) power sources before transferring the load.

Linear Loads

A load in which the relationship between voltage and current is constant, based on a relatively constant load impedance.

Load

The system or systems powered from a device.

Load Shedding

The reduction of the total load placed on a device. For example, in the case of a UPS, load shedding (when the mains power supply fails) reduces the total load on the UPS to increase the amount of runtime available from the battery set.

Mean Time Between Failure (MTBF)

A measure of reliability and the average length of operational time between failures. This can be based on monitoring a field population, or calculated for a system based on the known MTBF values of its components to a defined process and standard.

Mean Time To Repair (MTTR)

A measure of the average time taken to bring a system back to full operation following a failure.

Metal Oxide Varistor (MOV)

A device capable of absorbing very high surge currents without damage to itself.

MODBUS

A communications protocol that creates a hierarchical structure (one master and several slaves) from a single RS-232 communications link, similar to JBUS.

Noise Level

Normally measured in decibels (dB) or (dBA). Noise may also be referred to as electrical noise in a circuit.

Non-Essential Loads

Loads that can be dropped during a mains power supply failure because they are not critical or essential to the operation of the organisation.

Non-linear Loads

A load in which the relationship between voltage and current fluctuates based on an alternating load impedance.

Normal Mode Noise

A form of high-frequency electrical noise, that occurs between phase and neutral.

Opto-Isolators

A device that uses a short optical transmission path to transfer a signal between elements of a circuit while keeping them electrically isolated.

Outages

An American term used to describe a mains power supply failure, also referred to as a Blackout.

Overvoltages

Any higher voltage than that agreed as a regulated voltage in a circuit.

Parallel-Capacity System

A type of parallel UPS system where the total load demand is met by operating a number of UPS in parallel without redundancy.

Parallel-Redundancy

A type of parallel UPS system where the total load demand is met by operating two or more UPS in an N+X configuration with all the UPS sharing the load between the equally. If one UPS fails the other supports the load.

Parallel Systems Joiner (PSJ)

A device to join together two independent groups of parallel UPS.

Phase

A single-phase supply consists of a single sinewave at the fundamental frequency. A three-phase supply consists of three waveforms each separated by 120 degrees from each other. Phase is also used to refer to the difference between the voltage and current waveforms when used in relation to power factors.

Phase Power Factor

The ratio of Real Power (W) to Apparent Power (VA) at the fundamental frequency.

Point of Common Coupling (PCC)

The point where a building incomer is connected to the electricity distribution network.

Power Conditioner

A device to stabilise, regulate and filter the mains power supply voltage to a load which may be electronic or transformer-based (Constant Voltage Transformer).

Power Continuity Plan

A plan outlining the methods by which systems that ensure continuity are protected from mains power supply failures and power problems.

Power Factor (pF)

The difference between the actual energy consumed (Watts), and the Volts x Amps in a circuit. Power factor may be lagging, where the current waveform lags the voltage waveform, or leading where the current waveform leads the voltage.

Power Supply Unit (PSU)

The device within a piece of modern electronic hardware that converts an ac waveform into the various levels of dc required to power internal circuits.

Profibus

A type of field bus typically used within control and automation.

Pulse Width Modulation (PWM)

The switching action in an inverter which varies with time, and creates a composite waveform approaching a sinewave.

Radio Frequency Interference (RFI)

Radio waves of sufficient intensity to be absorbed by a circuit and to cause a circuit malfunction.

Reactive Power

A flow of energy (VAr) superimposed back onto the source from which it was drawn.

Real Power

A measure of the actual power (Watts) dissipated by a load.

Recovery Time

The time incurred to obtain a fully regulated voltage after switching loads onto a standby generating set.

Rectifier

An assembly that converts an ac supply into a dc supply.

Rectifier/Charger

An assembly used within transformer-based UPS which converts an ac supply into a dc supply from which to power an inverter and charge a battery set.

Regulation

Control of an ac/dc output voltage to within a set specification.

Resilience

The capacity of a power protection system potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable operation level.

Ripple

An ac element superimposed onto the dc waveform powering a device.

RoHS

Restriction of Hazardous Substances, Directive 2002/95/EC.

Root Mean Square (RMS)

Taking one half of an ac current cycle, RMS is the square root of the average values of all the squares of current and voltage.

Rotary UPS

An Uninterruptible Power Supply that converts Kinetic energy into electrical energy to power a load.

RS-232

A standard interface for synchronous and asynchronous communications up to 20kb/s between two compatible devices (one driver and one receiver) over distances of up to 15m.

RS-422

Similar to RS-232 but up to a maximum transmission rate of 10Mb/s-100Kb/s, up to ten receivers from a single driver and a distance of up to 1000m.

RS-485

Similar to RS-422 but with up to 32 drivers and receivers.

Sags or Dips

Short duration decreases, below the nominal mains power supply voltage, lasting several cycles.

Series-Redundancy

A method of providing redundant power to a load whereby the output of one UPS module is used to supply the bypass or another. If one UPS fails the other automatically powers the load.

Silicon Avalanche Diode (SAD)

A device capable of responding quickly to a high-energy surge or transient and reducing its initial surge current.

Simple Network Management Protocol (SNMP)

A communications protocol that allows hardware with a TCP/IP connection on a network to be monitored and controlled.

Sinewave

The waveform naturally produced by a well designed generator, inverter or UPS.

Single-Phase

A single-phase supply consists of a single sinewave at the fundamental frequency.

Slew Rate

The rate at which a UPS can adjust its output frequency in order to synchronise to the frequency of, for example, a standby ac source such as a generator.

Spikes

Large voltage disturbances superimposed onto the normal ac supply with a short duration.

Static Stability

The ability of a device to deliver a stable output voltage waveform under stable load conditions.

Static Switch

A solid state high-speed switching device that can transfer a load between two ac power sources.

Static UPS

An Uninterruptible Power Supply using solid state electronics and therefore no moving parts.

Super Capacitors

A device for storing electrical charge which can be used to provide applications such as small UPS, with a momentary supply of power in place of a battery set or to reduce its usage during momentary breaks in mains power supply.

Surges

Short duration increases in voltage above the mains power supply nominal, which generally last for several cycles.

Switched Mode Power Supply (SMPS)

A type of PSU with a non-linear current draw, most commonly found within computer, telecommunications and electronic devices.

Switching Time

The time it takes to transfer a load between ac supply sources. Also known as Transfer Time.

Three-Phase

A supply consisting of three single phases, each 120 degrees out of phase from one another

Thyristor

A semi-conductor gate device most commonly used within a rectifier or static switch.

Total Harmonic Distortion (THDi)

A measure of all the harmonics induced in a system compared to a normal sinewave.

Total Power Factor/ True Power Factor

The total power factor including both distortion and displacement power factors.

Transfer Time

The time it takes to transfer a load between ac supply sources. Also known as Switching Time.

Transformer

A wound component consisting of windings around a core, with iron sheet laminates that can be used to change voltage levels and provide Galvanic Isolation.

Transients

High energy burst voltage disturbances, with a short duration, superimposed onto the normal.

Transient Voltage Surge Suppressor (TVSS)

A device using MOVs, SAD/MOVs or GDTs to attenuate a transient or spike.

Triplens (Triple-N)

A multiple of the third harmonic in a waveform.

Under voltages

A voltage below the set regulated voltage for an extended period.

Uninterruptible Power Supply (UPS)

The terminology used to describe a system (either Static or Rotary) capable of maintaining power to a load for a defined time period irrespective of the state of the mains power supply itself – also known as an Uninterruptible Power System.

UPS Group Synchroniser (UGS)

A device to synchronise the outputs from two separate groups of parallel UPS.

Valve-Regulated Lead-Acid (VRLA) battery

A type of Lead-Acid battery commonly used within a UPS.

Volt (V or kV or MV)

A measure of electrical force or pressure, which can be expressed as Vac or Vdc.

Volt Ampere (VA or kVA or MVA)

A measure of Apparent Power and the current drawn by a load at a given supply voltage.

Volt-Free Contacts (VFCs)

A pair of contacts that are normally open (NO) or normally closed (NC). When closed they form a circuit through which a current, and therefore signal, can flow for remote detection.

Watts (W or kW or MW)

A measure of the Real Power drawn by a load.

Waveform

A graphical representation of the shape of a wave.

WEEE

Waste Electrical and Electronic Equipment, Directive 2002/96/EC.