**Generators**

**Backup Generators**: A backup generator is a standby source of energy usually maintained by a diesel engine. They are used in times of emergencies when there is a shortage or sudden loss of power. They can come on automatically and restore power quickly with a power transfer time between 10 and 30 seconds.

**Diesel generator:** A diesel generator generates electrical power through the use of a diesel engine and an alternator. Used most often as a backup generator, diesel generators are also used at locations with no access to a power grid. Diesel generators are quick and — if for backup purposes — start automatically during power outages.

**Generator:** A generator is a device that converts mechanical energy — a type of fuel using, for example, diesel or natural gas — into electrical energy used to power other machines and places. The electrical current results in either direct current (DC) or alternating current (AC). There are different types of generators with the primary difference being the fuel it uses to power units.

**Genset:** A genset is interchangeable with a generator (a less accurate term), generator set, or engine generator. A genset is an apparatus consisting of four main parts: (1) an engine, (2) alternator or generator end, (3) a control panel, and (4) a skid. It is used to convert energy to electric power.

**Marine generator:** A marine generator is a generator found on larger boats that converts mechanical energy — usually diesel or gasoline — to electrical energy. This electrical energy is then used to power equipment or other appliances on the boat. The primary difference between a marine generator and any other generator is location: land versus the open waters.

**Natural Gas Generator:** A natural gas generator is a generator that converts natural gas into electrical power. These generators are used both as portable generators and as backup generators.

**Portable Generator:** Portable generators are generators that can be moved from one location to another location with relative ease and are not meant for permanent use.

**Rebuilt Generator:** A rebuilt generator is a generator that has been rebuilt and tested in accordance with the original equipment manufacturer’s (OEM) specifications. The manufacturer’s warranty is also usually attached to a rebuilt generator. The advantage of rebuilt generators is cost reduction without losing quality, reliability, and performance.

**Remanufactured Generator:** A remanufactured generator is a generator that can be provided relatively quickly, like hours or days rather than months. If you want to reduce the expense of downtime, a remanufactured generator can get you up and running quickly. These generators are remanufactured to be as close to new as it is possible with all internal components disassembled and inspected against the OEM specifications.

**Stationary Generator:** Stationary generators are also known as standby or backup generators. They are usually permanently located to address business or industrial emergency needs. Stationary generators are usually connected to the main distribution panel and have the option of either being manually or automatically started when needed.

**Used Generator:** A used generator is a generator with a previous owner and/or previous service. The generator is inspected and tested and can be deemed operational or repairable. Price is dependent on its lifespan and, if necessary, the cost to repair.

**Systems**

**Air-Cooled System**: An air-cooled system is a system to cool generators. Generators while operating produce a lot of heat, requiring the interior of the generator to be cooled constantly to protect it from damage. Air circulation is used to bring the interior temperature down. Cool air is taken from the atmosphere and blown into the genset. Relatively smaller generators use an air-cooled system to keep the generator running efficiently.

**Dual Fuel System:** A dual fuel system is sometimes referred to as a bi-fuel generator. It is a genset that can simultaneously operate on diesel and natural gas.

**Liquid-Cooled System:** A liquid-cooled system employs a radiator, water pump, and oil or a coolant to maintain the temperature of the generator’s interior. The pump distributes the cooling liquid to the generator’s engine. A liquid-cooled system is more durable but more expensive.

**Parts & Accessories**

**Alternator:** An alternator is also known as a gen end or generator end. It is the component that converts mechanical energy into electrical power using electromagnetic induction. It can be a stand-alone unit, or it can be part of a genset.

**Battery Charge Rectifier:** A battery charge rectifier is an electrical device used to charge a battery by converting a battery charge winding from AC voltage to DC voltage.

**Bearings:** A bearing is a machine component resembling a wheel that allows the machine to function smoothly. Bearings help limit motion to the desired motion rate and reduce friction between the moving parts. There are many different types of bearing for different purposes.

**Brush:** Brushes are conducting elements controlling sliding electric contact between static and moving elements. They are made of graphite and/or copper and are used only on very small or very large generators.

**Core:** A core is the laminations or bundle of wires in the central portion of the generator.

**Enclosure:** An enclosure is a housing of a genset. It is an assembly used to protect the genset from damage caused by weather, animals, and other harmful elements. Most enclosures are NEMA 3R-rated and are equipped with locks that prevent unauthorized persons from tampering with the genset.

**Flywheel:** A flywheel — a substitute for chemical batteries — is a heavy revolving wheel-like machine that stores rotational energy — the amount of energy stored is proportional to its speed.

**Generator End:** A generator end is also referred to as an alternator or gen end. It is the component in a generator that converts mechanical energy into electrical energy.

**Load Bank:** A load bank is a machine that mimics the real load of a generator to test, support, and determine the generator’s capability to handle its electrical load.

**Lubricator:** A lubricator is a device that supplies lubricant (e.g. oil or other liquid) into a pneumatic system in controlled or metered amounts.

**Magneto:** A magneto is a small generator using permanent magnets to generate current for some internal combustion engines.

**Relay:** A relay is an electrical device activated by a current in a circuit with the purpose of opening or closing another circuit. In other words, it is an electrically operated switch used in control circuits.

**Rotor:** The rotor is the moving or rotating part of the generator.

**Skid:** A skid is a base used to mount the components of a genset.

**Starter:** A starter is a device used to start an engine; it can be manual or electric.

**Stator:** The stator is the unmovable or stationary part of the generator.

**Transfer Switch:** A transfer switch is a switch that either manually or automatically changes an electrical load from its regular and preferred source to an alternative and usually stationary or portable source. A transfer switch is most often used in emergency times when there has been a power outage. Transfer switches can also incorporate controls to do things like setting timers or activating/deactivating the backup generator.

**Uninterruptible Power Supply (UPS):** Also known as a battery backup, a UPS provides power during a power outage or reduction in voltage instantly and automatically. It is used together with a standby generator to ensure that there are no power disruptions. UPSs are often used by data centers, medical facilities, laboratories, process centers, and other professional establishments that would be negatively impacted by an electrical outage.

**Water Jacket Heater:** A water jacket heater is a setup where a water jacket — a water-filled casing around a device — is used to control the temperatures around a piece of machinery. The water jacket is designed with a metal sheath with intake and outlet vents through which water is pumped and circulated to maintain a precise temperature.

**Windings:** Windings are the coils of a generator. In other words, it is wire that has been turned one or more times to form a continuous coil to allow an electric current to pass through it. There are two main windings: stator and rotor.

**Generator Rating Types**

**Continuous Power Rating:** Continuous power rating is used when power load is constant (at 100%) for an unlimited period of time each year. The non-varying load factor is 70%-100% of the published continuous power rating. This power rating system is used when the power grid is inaccessible, especially for applications in the mining and agricultural industries.

**Generator Set Ratings:** A generator set rating is a system of rating generators so that you can purchase or lease the generator that is best suited for your intended purpose. The ratings fit an application’s needs to optimum reliability, costs, and overall performance.

**Emergency Standby Power (ESP) Rating:** An ESP rating refers to a standby generator with a typical usage of up to 50 hours per year. Average variable load factor is 70% of the ESP rating. No overload capability.

**Mission Critical Standby:** The mission critical standby rating means a generator’s typical usage is 200 hours per year and maximum usage is 500 hours per year with varying loads. Average variable load factor is 85% of the Standby rating. No overload capability. Typical applications are data centers and health care facilities.

**Prime Power Rating:** Prime power ratings provide the indefinite running time or the limited running time of generators under the prime power category. Average variable load factor is 70% of the prime power rating. There is a 10% overload availability. Prime power rated generators are used by persons who do not purchase electricity from a public utility but who provide their own electricity.

**Standby Power Rating:** A standby power rated generators are used during power outages to supply emergency power for a specific and limited period of time. Typical use is 200 hours per year and maximum use is 500 hours per year with varying loads. Average variable load factor is 70% of standby rating. There is no built-in overload capability.

**Other Relevant Ratings**

**Emissions Rating:** In the United Kingdom, emissions ratings are used to confirm emission standards are met. There are certain legal requirements that govern air pollutants (such as nitrogen oxides and carbon monoxide) released into the atmosphere via generators

**kW Rating:** A kW rating is based on the horsepower of an engine and refers to the power output a generator is capable of supplying. A kW rating is determined by the horsepower rating of the engine times .746.

**Rated Voltage:** A rated voltage references the voltage measurement a genset can begin operating. The genset’s rated voltage is equivalent to the voltage at which the genset was meant to function according to its specifications.

**Process Terms**

**Alternating Current (AC):** Alternating current is an electric current that occurs when the electric charge reverses direction of movement.

**Direct Current (DC):** Direct current is an electric current that flows only in one direction and is the product of a chemical action or electromagnetic induction.

**Frequency:** Frequency is the number of electrical waves that pass by per second. Frequency is measured in cycles per second known as Hertz (Hz). The UK standard is 50 Hz.

**Generator RPM:** A generator’s revolutions per minute (RPM) is the number of turns in one minute needed to reach the required frequency of 50 Hz. Most generator engines must operate at 1500 or 3000 RPM to produce 50 Hz. Generally speaking, 1500 RPM sets are common for prime generators while 3000 RPM sets are for stationary units.

**Generator Sizing:** Generator sizing is a method a certified electrician employs to help a client determine the size of a generator needed to perform the specific intentions and functions of the client. Determining the size can be complex and difficult and under-sizing can damage equipment and interrupt operations. We’ve put together a [step-by-step guide](https://www.wpowerproducts.com/news/generator-sizing-guide/) to make it as simple as possible.

**Off-peak:** Off-peak is a specific time period when the demand for power/electricity is comparatively low.

**Peak:** Peak is a measurement that defines the maximum load that can be consumed within a specified time period for each respective type of generator.