

Common Electrical Terms

Electricity is the most widely used form of *energy*, ranging from miniature Batteries in your Wristwatch to large Arc Furnaces for melting Steel. The word "electric" comes from the Greek word "amber" and has been used to describe a wide range of related phenomena. We cannot see or smell **electricity**, but we can see its effects (i.e. *light*).

It is important to understand **electricity's** basic terminologies to understand and use it wisely and safely. In this unit we will learn some common electrical terminologies

Energy:

The capacity for, or the ability to do, mechanical work. Electrical energy is measured in kilowatt-hours for billing purposes.

Electricity:

The electricity is one of the fundamental forms of energy. We call it electrical energy. The mystery of electricity lies in an Atom. There are two type of electricity:

1. **Static Electricity:** The phenomenon of electricity which develops due to the imbalance of charges.
2. **Current or Dynamic Electricity:** The phenomenon of electricity which develops due to the movement of charges. There are two types of Current electricity:
 - a. **Direct Current Electricity:** The phenomenon of electricity in which the charges flows in one direction from negative to positive terminal.
 - b. **Alternating Current Electricity:** The phenomenon of electricity in which the charges keep moving back and forth or say keeps vibrating on its position.

Phase:

Classification of an AC circuit usually single-phase, two wire or three wire; two-phase, three wire or four wire; or three-phase, three wire or four wire.

Atom:

All the substances are made of tiny particles. The tiniest part of an element is called "Atom". The atom contains all chemical properties of an element. The atom is made of three sub atomic parts **Electrons, Protons** and **Neutrons**. These sub atomic particles are called charge.

Charge:

The sub atomic particles available in the atom have electrical charge on them. These are fundamental electrically charged particles. On the basis of electrical charge available on sub-atomic parts, there are three types of charges

1. **Positive Charge:** The **Protons** contains Positive electrical charges.
2. **Negative Charge:** The **Electrons** contains Negative electrical Charges.
3. **Neutral (Charge):** The **Neutrons** contains No charges.

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Cell:

The cell is a device which converts **chemical energy** into **electrical energy**.

Battery:

When two or more cells are combined together known as "battery". There are two types of basic combination of cells is possible.

- 1. Series Combination and**
- 2. Parallel Combination.**

Terminal:

The terminal refers to the rod which used to connect the load or electrical devices. There are two types of terminals

- 1. Positive Terminal and**
- 2. Negative Terminal.**

Voltage:

The difference of charge or potential between Positive and Negative terminals is called "**Voltage**". Observe a Pencil Cell you will find 1.5V printed on the body of Cell it refers that the potential difference between +(Positive) and - (Negative) terminal is of **1.5 Volt**.

The electric current supply at our home is very high; it is **220Volt**; the high voltage electricity is very dangerous. Never try to touch the wire carrying high voltage supply.

Volt:

The electrical potential difference or pressure across a one ohm resistance carrying a current of one ampere. Named after Italian physicist Count Alessandro Volta 1745-1827.

Volt Ampere:

A unit of apparent power equal to the mathematical product of a circuit voltage and amperes. Here, apparent power is in contrast to real power. On ac systems the voltage and current will not be in phase if reactive power is being transmitted. Usually abbreviated VA.

Current:

The flow of charges is called the current or flow of current. When we apply a Voltage across any electrical device Charges flows (electrons) in wire and this flow of charges is called current. The unit of current is **Ampere**.

Ampere:

A type of electric current produced by one volt applied across a resistance of one ohm. It is also equal to the flow of one coulomb per second. Named after French physicist Andre M. Ampère 1836.

Power:

The rate at which work is performed or that energy is transferred. Electric power is commonly measured in watts or kilowatts. A power of 746 watts is equivalent to 1 horsepower.

Reactive Power:

The mathematical product of voltage and current consumed by reactive loads. Examples of reactive loads include capacitors and inductors. These types of loads

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when connected to an ac voltage source will draw current, but since the current is 90° out of phase with the applied voltage they actually consume no real power in the ideal sense.

Real Power:

The rate at which work is performed or that energy is transferred. Electric power is commonly measured in watts or kilowatts. The term real power is often used in place of the term power alone to differentiate from reactive power. Also called active power.

Watt:

A unit of power equal to the rate of work represented by a current of one ampere under a pressure of one volt. Named after the Scottish engineer James Watt, 1819.

Wire:

The wire is a device which provides conductive path for the flow of charges through its conductive part. The wire's conductive path remains covered with insulating material to provide better safety and prevention from short circuiting. Two electrical terms are closely related with the wires

1. **Conductor:** the substance which allows the flow of electric current through it. The inner part of a wire is made of a conductor.
2. **Insulator:** the substance which not allows the flow of electric current through it. The outer cover of wires is use to made of insulators.

Cable:

Compare "Wire". A cable is a set of wires, usually encased in an outer protective sheath. A "cord" would be a cable by this definition so far, but a cable is part of a permanent installation; a cord is more flexible and often has a plug end for a portable appliance or lamp. "2-wire cable," such as 14-2 and 12-2 (which indicate wire size) refers to a cable with two insulated wires, not counting any ground wire. Likewise 3-wire cable has three insulated wires, with any ground being additional.

Electric Circuit:

The electric circuit is a circular path which allows the current to flow through it. An electric circuit contains four main parts

1. Electric Supply Source
2. Load (electric Bulb, Fan etc.)
3. Wire
4. Control Unit (Switch etc.)

Supply Source:

The device which provides the potential difference for the flow of charges, such as Cell, Battery, Generator or Domestic electric supply (220 Volt).

Load:

The electrical device; which uses electrical energy to perform some work or change the form of electrical energy is called "Load". Such as Bulb, Fan, Tube Light, Motor, T.V., Washing Machine etc.

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Appliance:

Utilization equipment, generally other than industrial, normally built in standardized sizes or types, that is installed or connected as a unit to perform one or more functions such as clothes washing, air conditioning, food mixing, deep frying, etc.

Device:

A unit of an electrical system that is intended to carry but not utilize electric energy.

Equipment:

A general term including materials, fittings, devices, appliances, fixtures, apparatus, and the like used as a part of, or in connection with, an electrical installation.

Switch:

The switch is a device which makes and breaks the path of flow of electric charges in the wire and control the flow of electric current.

Open Circuit

When the switch of electric circuit is in off or open condition or when due to any reason the path of electric circuit is not completed; it's called open circuit. In this condition the electrical appliance cant work.

Close Circuit

When switch is in On or close condition to complete the path of flow of charges or electric current.

Short Circuit

The short circuit is a condition of fault; when the two terminals of electric supply source comes in direct contact without any load.

Circuit Breaker

A device designed to open and close a circuit by non-automatic means and to open the circuit automatically on a pre-determined over current without damage to itself when properly applied within its rating.

Fuse

The fuse is a specific kind of wire which has low melting temperature. When over current flow through it, the fuse wire melts down and break the circuit to protect other appliances. A device that interrupts current to its circuit by melting apart. It must then be replaced.

Fault:

A short or Open circuit in an electrical system due to which supply of electricity has been disrupted.

Shock:

A sudden painful feeling, when electric current passes through our body, is called shock. The severity of shock depends on the Voltage of supply or touched wire and the area of contact.

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Do remember that both A.C. and D.C. are dangerous. When we have any cut or burn of outer skin; avoid the contact with supply source (Battery too) even of small Voltage.

Alternator:

An electric generator designed to produce alternating current. Usually consists of rotating parts which created the changing magnetic field to produce the alternating current.

Generator:

A rotating machine which converts mechanical energy into electrical energy. In the automotive industry traditional terminology uses generator to refer to only those machines designed to produce dc current through brushes and a commutator (as opposed to alternator).

Inverter:

An electrical device which is designed to convert direct current into alternating current. This was originally done with rotating machines which produced true sine wave ac output. More recently this conversion has been performed more economically and efficiently using solid state electronics. However, except for the most expensive models, these devices usually do not produce perfect sine wave output. This sometimes can result in electromagnetic interference with other sensitive electronic devices.

Uninterruptible Power Supply:

A device that provides a constant regulated voltage output in spite of interruptions of the normal power supply. It includes filtering circuits and is usually used to feed computers or related equipment which would otherwise shutdown on brief power interruptions. Abbreviated UPS.

Ground (Wire):

A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

Grounded:

Connected to earth or to some conducting body that serves in place of the earth.

Overload:

Operation of equipment in excess of normal, full-load rating, or of a conductor in excess of rated ampacity that, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload.

Overvoltage:

A voltage above the normal rated voltage or the maximum operating voltage of a device or circuit. A direct test overvoltage is a voltage above the peak of the line alternating voltage.

Transformer:

A static electrical device which by electromagnetic induction transfers electrical energy from one circuit to another circuit usually with changed values of voltage and current in the process.

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Wiring:

A distribution network of wire that conducts electricity to receptacles, switches and appliances throughout a building/home to provide electricity where needed.