

Topic Page: [generator](#)

Definition: **generator** from *Philip's Encyclopedia*

Device for producing electrical energy. The most common is a machine that converts the mechanical energy of a turbine or internal combustion engine into electricity by employing electromagnetic induction. There are two types of generators: alternating current (an alternator, such as found in power stations) and direct current (a dynamo). Each has an armature (or ring) that rotates within a magnetic field creating an induced electric current.

Summary Article: **generator**

From *The Columbia Encyclopedia*

in electricity, machine used to change mechanical energy into electrical energy. It operates on the principle of electromagnetic induction, discovered (1831) by Michael Faraday. When a conductor passes through a magnetic field, a voltage is induced across the ends of the conductor. The generator is simply a mechanical arrangement for moving the conductor and leading the current produced by the voltage to an external circuit, where it actuates devices that require electricity. In the simplest form of generator the conductor is an open coil of wire rotating between the poles of a permanent magnet. During a single rotation, one side of the coil passes through the magnetic field first in one direction and then in the other, so that the induced current is alternating current (AC), moving first in one direction, then in the other. Each end of the coil is attached to a separate metal slip ring that rotates with the coil. Brushes that rest on the slip rings are attached to the external circuit. Thus the current flows from the coil to the slip rings, then through the brushes to the external circuit. In order to obtain direct current (DC), i.e., current that flows in only one direction, a commutator is used in place of slip rings. The commutator is a single slip ring split into left and right halves that are insulated from each other and are attached to opposite ends of the coil. It allows current to leave the generator through the brushes in only one direction. This current pulsates, going from no flow to maximum flow and back again to no flow. A practical DC generator, with many coils and with many segments in the commutator, gives a steadier current. There are also several magnets in a practical generator. In any generator, the whole assembly carrying the coils is called the armature, or rotor, while the stationary parts constitute the stator. Except in the case of the magneto, which uses permanent magnets, AC and DC generators use electromagnets. Field current for the electromagnets is most often DC from an external source. The term *dynamo* is often used for the DC generator; the generator in automotive applications is usually a dynamo. An AC generator is called an alternator. To ease various construction problems, alternators have a stationary armature and rotating electromagnets. Most alternators produce a polyphase AC, a complex type of current that provides a smoother power flow than does simple AC. By far the greatest amount of electricity for industrial and civilian use comes from large AC generators driven by steam turbines.

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generator. (2018). In P. Lagasse, & Columbia University, *The Columbia encyclopedia* (8th ed.). New York, NY: Columbia University Press. Retrieved from <https://search.credoreference.com/content/topic/generator>



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generator. (2018). In P. Lagasse & Columbia University, *The Columbia encyclopedia*. (8th ed.). [Online]. New York: Columbia University Press. Available from: <https://search.credoreference.com/content/topic/generator> [Accessed 20 October 2019].

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"generator." *The Columbia Encyclopedia*, Paul Lagasse, and Columbia University, Columbia University Press, 8th edition, 2018. *Credo Reference*, <https://search.credoreference.com/content/topic/generator>. Accessed 20 Oct. 2019.