Electric Circuit Encyclopedia Article

Electric Circuit

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Electric Circuit

An electric circuit is a system of conducting elements designed to control the path of **electric current** for a particular purpose. Circuits consist of sources of electric **energy**, like generators and batteries; elements that transform, dissipate, or store this energy, such as resistors, capacitors and inductors; and connecting wires. Circuits often include a fuse or circuit breaker to prevent a **power** overload.

Devices that are connected to a circuit are connected to it in one of two ways: in series or in parallel. A **series circuit** forms a single pathway for the flow of current, while a parallel circuit forms separate paths or branches for the flow of current. **Parallel circuits** have an important advantage over series circuits. If a device connected to a series circuit malfunctions or is switched off, the circuit is broken, and other devices on the circuit cannot draw power. The separate pathways of a parallel circuit allow devices to operate independently of each other, maintaining the circuit even if one or more devices are switched off.

The first electric circuit was invented by **Alessandro Volta** in 1800. He discovered he could produce a steady flow of **electricity** using bowls of salt solution connected by metal strips. Later, he used alternating discs of copper, zinc, and cardboard that had been soaked in a salt solution to create his voltaic pile (an early battery). By attaching a wire running from the top to the bottom, he caused an electric current to flow through his circuit. The first practical use of the circuit was in **electrolysis**, which led to the discovery of several new chemical elements. Georg Ohm discovered some conductors had more resistance than others, which affects their efficiency in a circuit. His famous law states that the **voltage** across a conductor divided by the current equals the resistance, measured in *ohms*. Resistance causes **heat** in an electrical circuit, which is often not wanted.