**Alternating current vs Direct current**

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| **Aspect** | **Alternating Currents (AC)** | **Direct current (DC)** |
| **Overview** | - AC reverses direction periodically.  - Commonly used in household power supply and large-scale power distribution. | - DC flows in one direction only.  - Often used in batteries and low-voltage applications. |
| **Voltage levels** | |  | | --- | |  |  |  | | --- | | -Can be easily transformed to different voltages using transformers.  -High-voltage transmission is efficient for long distances. | | - Voltage levels are constant and need conversion for high-voltage transmission. |
| **Generation** | - Generated by AC generators (alternators).  - Commonly produced in power plants. | - Generated by batteries, solar panels, and DC generators. |
| **Transmission** | - Efficient for transmitting over long distances.  - Power loss can be minimized using high-voltage transmission lines. | - Less efficient for long-distance transmission due to power loss over wires. |
| **Applications** | - Used in homes, businesses, and industries for appliances and lighting.  - Electric motors, heating systems, and industrial machinery. | - Used in electronic devices, batteries, and electric vehicles.  - Often found in circuits with low voltage and current. |
| **Advantages** | - More efficient for power distribution over long distances.  - Easier to convert between voltages.  - More commonly available infrastructure. | - Provides a constant voltage level.  - Ideal for electronic devices and charging batteries.  - Less complex circuitry for low-voltage applications. |
| **Disadvantages** | - More efficient for power distribution over long distances.  - Easier to convert between voltages.  - More commonly available infrastructure. | - Less efficient for long-distance power transmission.  - Requires conversion for applications needing AC.  - Can be more dangerous at high voltage levels due to shock risk. |