**What are the differences between AC and DC Generator?**

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| **Sl. No.** | **Differentiating Property** | **AC Generator** | **DC Generator** |
| 1 | **Definition** | AC generator is a mechanical device which converts mechanical energy into AC electrical power. |  DC generator is a mechanical  device which converts  mechanical energy into DC  electrical power. |
| 2 | **Direction of Current** | In an AC generator, the electrical current reverses direction periodically. |  In a DC generator, the electrical  current flows only in one  direction. |
| 3 | **Basic Design** | In an AC generator, the coil through which the current flows is fixed while the magnet moves. The construction is simple and costs are less. |  In a DC generator, the coil through  which the current flows rotates in a  fixed field. The overall design is  very simple but construction is complex due to commutators and slip rings.  |
| 4 | **Commutators** | AC generator does not have commutators. |   DC generators have commutators  to make the current flow in one  direction only. |
| 5 | **Rings** | AC generators have slip-rings. |  DC generators have split-ring  commutators. |
| 6 | **Efficiency of Brushes** | Since slip-rings have a smooth and uninterrupted surface, they do not wear quickly and are highly efficient. |  Both brushes and commutators of  a DC generator wear out quickly  and thus are less efficient. |
| 7 | **Short Circuit Possibility** | As the brushes have high efficiency, a short circuit is very unlikely. |  Since the brushes and  commutators wear out quickly,  sparking and short circuit  possibility is high. |
| 8 | **Armature** | In the case of AC generators, the armature is always the rotor. |  In the case of DC generators, the  armature may be either rotor or  stator. |
| 9 | **Rotating Parts** | The rotating part in an AC Generator is low current high resistivity rotor. |  The rotating part in a DC  generator is generally heavy. |
| 10 | **Current Induction** | In an AC generator, the output current can be either induced in the stator or in the rotor. |  In a DC generator, the output  current can only be induced in  the rotor. |
| 11 | **Output Voltage** | AC generators produce a high voltage which varies in amplitude and time. The output frequency varies (mostly 50Hz to 60Hz). |  DC generators produce a low  voltage when compared to AC  generator which is constant in  amplitude and time i.e. output  frequency is zero. |
| 12 | **Maintenance** | AC generators require very less maintenance and are highly reliable. |  DC generators require frequent  maintenance and are less reliable |
| 13 | **Types** | AC generators can of varying types like 3 Phase generators, Single phase generators, synchronous generator, induction generator, etc. |  DC generators are mainly two  types which are Separately  excited DC generator and Self- excited DC generator. According to field and armature connection, they can be further classified as DC series, shunt or compound generators respectively. |
| 14 | **Cost** | The initial cost of an AC generator is high. | The initial cost of a DC generator is less when compared to AC generators. |
| 15 | **Distribution and Transmission** | The output from AC generators is easy to distribute using a transformer. | The output from DC generators is difficult to distribute as transformers cannot be used. |
| 16 | **Efficiency** | AC generators are very efficient as the energy losses are less. | DC generators are less efficient due to sparking and other losses like copper, eddy current, mechanical and hysteresis losses. |
| 17 | **Applications** | It is used to power for smaller motors and electrical appliances at homes (mixers, vacuum cleaners, etc.) | DC generators power very large electric motors like those needed for subway systems. |

These were the main AC and DC generator differences. In the above difference between DC and AC generator.

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