

Motors Fundamentals

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What the difference between AC motor and DC motor?

- An **AC motor** is an electric **motor** that is driven by an **alternating current (AC)**.
- A **DC motor** is any of a class of electrical **machines** which converts **direct current** electrical power into mechanical power. The most common types rely on the forces produced by magnetic fields.

What's the difference between 2-phase motor and 3-phase motor?

- The **2 phase motors** operate on a two phase power supply. This means the generator has two coils located 180 electrical degrees apart.
- The **2 phase motors** will run on single phase if you can get it started. The **2 phase motors** rely on the displacement of the coils to impart starting torque
- The **3 phase motors** are most widely used for industrial applications mainly because they do not require a starting device.
- The **3 phase motors** also have very simple and rugged (almost unbreakable) construction, hence they are very reliable and having low cost.
- Lastly the **3 phase motors** have high efficiency and good power factor with minimum maintenance required

But these **3 phase motors** also have some disadvantages, for example: the speed decreases with the increase in load, just like a DC shunt motor and if speed is to be varied, it then sacrifices some of its efficiency.

What's the difference between Stepper, Servo and Linear motors?

- A **stepper motor** is an electromechanical device, which converts electrical pulses into discrete mechanical movements. The shaft or spindle of a stepper motor rotates in discrete step increments, when electrical command pulses are applied to it in the proper sequence. **Stepper motors** are similar to Switched Reluctance Motors (which are very large stepping motors with a reduced pole count).
- A **servo motor** is a rotary actuator or linear actuator, that allows for precise control of angular or linear position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors.

Servo motors are used in positional control, for example: they can be controlled to move to a specific rotational quite accurately.

- A **linear motor** is an electric induction motor which produces straight-line motion (as opposed to rotary motion) by means of a linear stator and rotor placed in parallel. Basically, a Linear motor is an electronic motor that has had its stator and rotor "unrolled", so that instead of producing a torque (rotation) it produces a linear force along its length.

What the difference between brush motors and brushless motors?

- A **Brushed Motors** has a rotating set of wound wire coils called an armature which acts as an electromagnet with two poles. A mechanical rotary switch called a commutator reverses the direction of the electric current twice every cycle, to flow through the armature so that the poles of the electromagnet push and pull against the permanent magnets on the outside of the motor.
- The **Brushless Motors** are synchronous motors, which means that their rotors and stators turn at the same frequency. A typical **brushless motor** has permanent magnets which rotate around a fixed armature, thus eliminating problems associated with connecting current to moving armature.