



## "Motor Characteristics"

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Here is a list of Motor Characteristics

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### **Motor Characteristics:**

**Direct-Current Motors** - DC motors are divided into three classes, designated according to the method of connecting the armature and the field windings as shunt-series and compound wound.

**Shunt-Wound Motors** - This type of motor runs practically constant speed, regardless of the load. It is the type generally used in commercial practice and is usually recommended where starting conditions are not usually severe. Speed of the shunt-wound motors may be regulated in two ways: first, by inserting resistance in series with the armature, thus decreasing speed: and second, by inserting resistance in the field circuit, the speed will vary with each change in load: in the latter, the speeds is practically constant for any setting of the controller. This latter is the most generally used for adjustable-speed service, as in the case of machine tools.

**Series-Wound DC Motors** - This type of motor speed varies automatically with the load, increasing as the load decreases. Use of series motor is generally limited to case where a heavy power demand is necessary to bring the machine up to speed, as in the case of certain elevator and hoist installations, for steelcars, etc. Series-wound motors should **never** be used where the motor can be started without load, since they will race to a dangerous degree.

**Compound-Wound DC Motors** - A combination of the shunt wound and series wound types combines the characteristics of both. Characteristics may be varied by varying the combination of the two windings. These motors are generally used where severe starting conditions are met and constant speed is required at the same time.

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**Squirrel-Cage Induction Motors** - The most simple and reliable of all electric motors. Essentially a constant speed machine, which is adaptable for users under all but the most severe starting conditions.

Requires little attention as there are no commutator or slip rings, yet operates with good efficiency.

**Wound-Rotor (Slip Ring) Induction motor** - Used for constant speed-service requiring a heavier starting torque than is obtainable with squirrel cage type. Because of its lower starting current, this type is frequently used instead of the squirrel-cage type in larger sizes. These motors are also used for varying-speed-service. Speed varies with this load, so that they should not be used where constant speed at each adjustment is required, as for machine tools.

**Single Phase Induction Motors** - This motor is used mostly in small sizes, where polyphase current is not available. Characteristics are not as good as the polyphase motor and for size larger than 10 HP, the line disturbance is likely to be objectionable. These motors are commonly used for light starting and for running loads up to 1/3 HP. Capacitor and repulsion types provide greater torque and are built in sizes up to 10 HP.

**Synchronous Motors** - Run at constant speed fixed by frequency of the system. Require direct current for excitation and have low starting torque. For large motor-generators sets, frequency changes, air compressors and similar apparatus which permits starting under a light load, for which they are generally used. These motors are used with considerable advantage, particularly on large power systems, because of their inherent ability to improve the power factor of the system.

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