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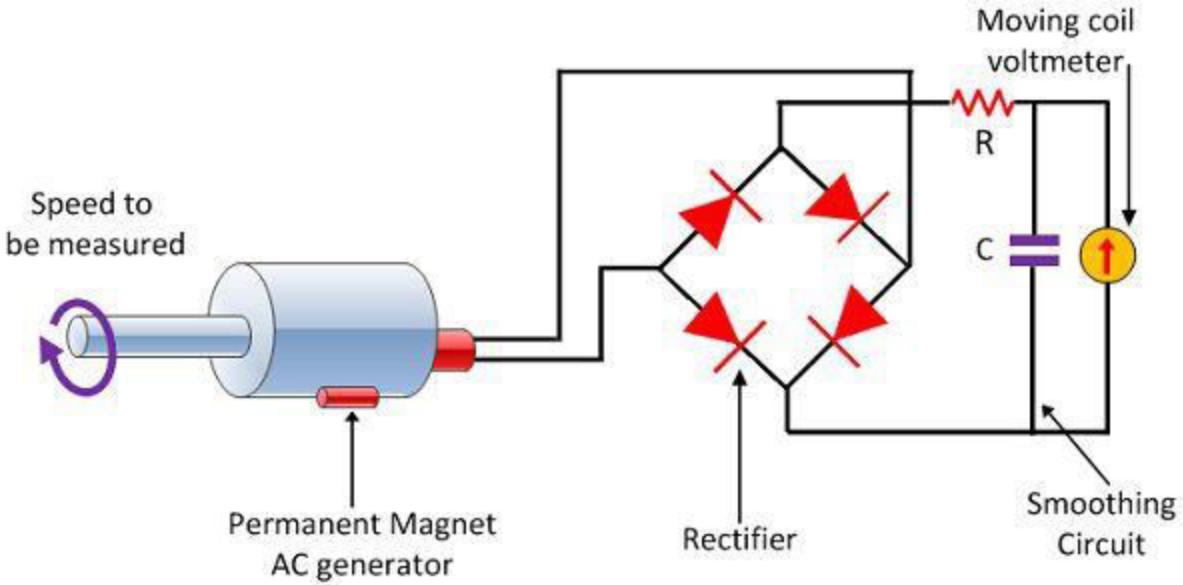
2.AC Tachometer Generator

The DC tachometer generator uses the commutator and brushes which have many disadvantages. The AC tachometer generator designs for reducing the problems. The AC tachometer has stationary armature and rotating magnetic field. Thus, the commutator and brushes are absent in AC tachometer generator.

The rotating magnetic field induces the EMF in the stationary coil of the stator. The amplitude and frequency of the induced emf are equivalent to the speed of the shaft. Thus, either amplitude or frequency is used for measuring the angular velocity. The below mention circuit is used for measuring the speed of the rotor by considering the amplitude of the induced voltage. The induces voltages are rectified and then passes to the capacitor filter for smoothening the ripples of rectified voltages.



Eddy Current Clutches

Eddy current clutches are so named because they in- duce eddy currents into a metal cylinder or drum. One part of the clutch contains slip rings and a winding. The armature or rotor is constructed so that when the winding is excited with direct current, magnetic pole pieces are formed. The rotor is mounted inside the metal drum that forms the output shaft of the clutch. The rotor is the input of the clutch and is connected to an AC induction motor. The motor provides the turning force for the clutch. When direct current is applied to the rotor, the spinning electromagnets induce eddy currents into the metal drum. The induced eddy currents form magnetic poles inside the drum. The magnetic fields of the rotor and drum are attracted to each other, and the clutch turns in the same direction as the motor. The main advantage of an eddy current clutch is that there is no mechanical connection between the rotor and drum. Since there is no mechanical connection, there is no friction to produce excessive heat and there is no wear as is the case with mechanical clutches. The speed of the clutch can be controlled by varying the amount of direct current applied to the armature or rotor. Since the output speed is determined by the amount of slip between the rotor and drum, when load is added, the slip will become greater, causing a de- crease in speed. This can be compensated for by in- creasing the amount of direct current applied to the rotor. Many eddy current clutch circuits contain a speed sensing device that will automatically increase or decrease the DC excitation current when load is added or removed.