An induction motor is an alternating motor where electricity is supplied to rotor by means of electromagnetic induction. An electric motor rotates because of magnetic pressure exerted among a stationary electromagnet called the stator and rotating electromagnet called the rotor. There are two types of induction motors

1. Single phase induction motor

2. Three phase inductor motor

Single phase induction motor is not a self starting motor. Three phase induction motor is a self starting motor. The main advantage of induction motor is efficiency which is 90%. The main disadvantage of induction motor is its speed varies with the load. There are four types of speed controlling methods for induction motor.

1. Variation of stator supply voltage

2. Variation of stator supply frequency

3. Volts hertz control

4. Variation of rotor resistance

Variation of stator supply voltage:

The torque produced in the motor will be directly proportional to the square of stator supply voltage. If the stator supply voltage is increased then the torque produced in the motor will be e more than the speed of the motor will be increased .Similarly status supply voltage is decrease when the torque produced in the motor will be decreased which leads to reduction of motor speed. So we can control the speed of induction motor by adjusting the supply voltage of the stator bike keeping the supply frequency constant. In this method power factor is poor and mainly used in low power applications like fan.

Variation of stator supply frequency:

In this method speed and torque in the induction motor are controlled by variation of frequency by keeping supply voltage constant. If we decrease the frequency by keeping voltage at constant then the saturation of air gap flux will increases so at low frequency the reactance will be less and the motor current will be high which results to increase the speed of motor. similarly if we increase the frequency by keeping voltage at constant then the air gap flux will be reduced and similarly rotor currents also will be reduced then the developed torque is also very less which results in the reduction in speed of the motor.

Variation of hertz control:

In this method we can vary the speed of the motor by varying the voltage and frequency by maintaining constant torque. If we vary supply frequency at a rated supply voltage then it will vary the air gap flux which will results in variation of stator current and flux wave distortion. If variation in stator current will results the speed variation of the motor. Ratio of voltage and frequency is maintained as constant then flux also remains constant. This method regularly used in industrial applications.

Variation of rotor resistance:

This method can be used in only slip ring induction motor while we can't use this in squirrel cage induction motor due to unavailability of rotor winding terminals to connect external resistance. As we know that the speed of the motor depends upon the rotor circuit current so which depends upon the rotor circuit resistance so in this method we are connecting a variable external resistance to the router by varying it we can control the speed of the motor. If we increase the external resistor applied at the the two terminals of rotor so that the rotor current will be decreased which results to the reduction of torque produced and speed of the motor. Similarly reduction of the resistance in the external resistor applied to the rotor will leads to the increase router currents then the torque produced and the speed of the motor will be increased.