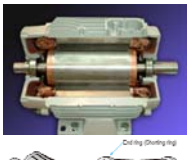
Motor Components

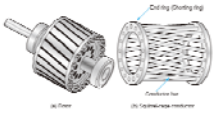
Rotor

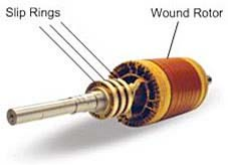
The rotor is the rotating part of the motor's electromagnetic circuit.

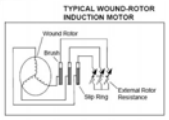
There is no electrical power supplied to rotor conductors in induction motors. Electrical current in rotor flows because of the electromagnetic induction. There two common type of constructions for rotor used in a**n induction motor**.

1. Squirrel cage rotor
2. Wound Rotor









In synchronous motors, the rotor is an electromagnet and a DC power applied to it. In synchronous rotor construction it is common to use a combination of squiirrel cage and wound rotor.

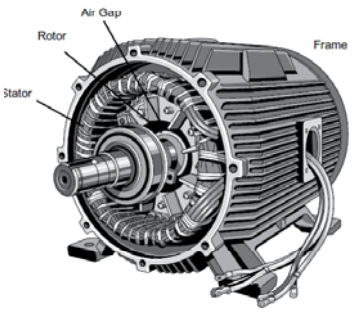
Motor Components

Enclosure

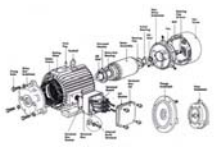
The enclosure consists of a frame (or yoke) and two end brackets (or bearing housings). The stator is mounted inside the frame.

The rotor fits inside the stator with a slight air gap separating it from the stator.

There is no direct physical connection between the rotor and the stator.



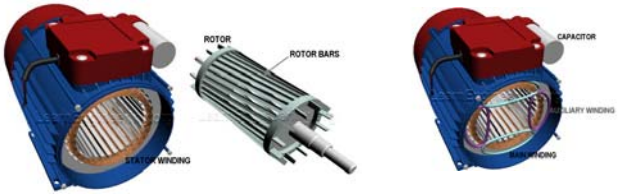
Partially Assembled Motor



The enclosure protects the internal parts of the motor from water and other environmental elements. The degree of protection depends upon the type of enclosure.

Mono Phase Induction Machine

Has only one stator coil. Uses only one phase.
Needs a unit to start to motor: Single phase induction motors require just one power phase for its operation.
Are used in applications needs 3 ~ 4 HP: They are commonly used in low power rating applications, in domestic as well as industrial use. (Fans, washing machines, household devices… etc.)



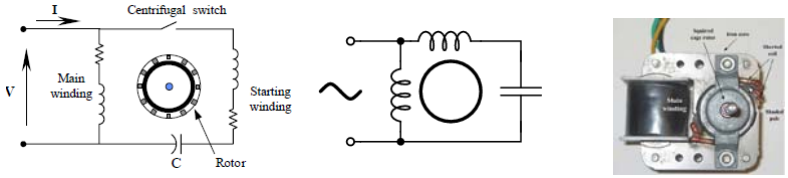
The principle of operation of single-phase induction motor can also be explained by double revolving field theory.
The single-phase supply given to the single-phase winding will produce pulsating field in the air gap. However, any pulsating field can be resolved into two components, equal in magnitude but oppositely rotating

Mono Phase Induction Machine

Starting methods for single phase induction motors:

Single-phase split-phase motor

It shows the auxiliary winding also known as starting winding, in space quadrature with the main winding. The rotor is the squirrel-cage type. The starting winding is made of thin wire so that its impedance is different from that of the main winding. The two windings are connected in parallel to the ac supply. The phase difference between the two winding currents (about 30°) will be sufficient to produce a rotating magnetic field resulting in a starting torque.



Capacitor-start motors

If a capacitor is connected in series with the starting winding, the phase angle between the two winding currents will become more than 30° (about 80°) that is obtained in the split-phase motors. This increase in phase angle will increase the starting torque.

Shaded Pole motors