

CLASSIFICATION OF A.C. MOTORS

A.C. Motors are classified in to so many groups

The Basis of their principle of operation

(A) Synchronous motors

(i) Plain

(ii) Super

(B) Asynchronous motors

(a) Induction motors

(i) Squirrel cage Motors (single / double)

(ii) Slip-ring Motors (external resistance)

(b) Commutator motors

(1) Series (single phase / universal)

(2) Compensated (conductively / inductively)

(3) Shunt (simple / compensated)

(4) Repulsion (straight / compensated)

(5) Repulsion-start induction Motors

(6) Repulsion induction Motors

On the Basis of type of current

(i) Single phase Motors

(ii) Three phase Motors

As regards their speed

(i) Constant speed Motors

(ii) Variable speed Motors

(iii) Adjustable speed Motors

As regards their structural features

(1) Open Type

(2) Enclosed Type

- (3) Semi-enclosed Type
- (4) Ventilated Type
- (5) Pipe-ventilated Type
- (6) Reverted frame Type etc.

GENERAL PRINCIPLE

- Conversion of electrical power into mechanical power takes place in the rotating part of an electric motor i.e. rotor.
- In D.C. motors; the electric power is conducted directly to the armature (i.e. rotating part) through brushes and commutator.
- Hence, in this sense, a D.C. motor can be called a conduction motor.
- In A.C. motors, the rotor does not receive electric power by conduction but by induction in exactly the same way as the secondary of a 2-winding transformer receives its power from the primary.
- Therefore such motors are known as induction motors.
- An induction motor can be treated as a rotating transformer i.e., one in which primary winding is stationary but the secondary is free to rotate.
- All the A.C. motors the poly phase induction motor is the one, which is extensively used for various kinds of industrial drives. It has the following main advantages and also some disadvantages:

Advantages:

AC induction motors have their own advantages. These includes

- Simplicity of design – simple & cheap to construct.
- Reliability – they have no brushes or commutator and there is little friction to wear parts away.
- They can be built to suit almost any industrial requirement.
- They are economical and efficient to run for most purposes.
- Poly-phase induction motors are self-starting

Disadvantages:

AC induction motors have some disadvantages as well. These include

- They only work on AC.
- Their maximum speed is limited by the supply frequency (a 50 Hz supply limits the motor to about 3000 rpm).
- Starting torque is low – they do not get heavy loads moving very quickly.
- They are not as efficient as some other AC motors when used in heavy industrial applications.

PRODUCTION OF ROTATING FIELD

- An Induction motor operates on the principle of induction.
- The rotor receives power due to Induction from stator rather than direct conduction of electrical power.
- It is important to understand the principle of rotating magnetic field in order to understand the operation of an Induction motor.
- It will now be shown that when stationary coils, wound for two or three phases, are supplied by two or three phase supply respectively, a uniformly rotating (or revolving) magnetic flux of constant value is produced.

Source : <http://mediatoget.blogspot.in/2011/06/classification-of-ac-motors.html>