**THE INDUCTION MOTOR**

An induction motor like any other motor consists of a stationary part, the stator, and a rotating part, the rotor. The rotor of an induction motor is not connected electrically to the source of power supply. The currents which circulate in the rotor conductors are the result of voltage induced in the rotor in the magnetic field set up by the stator. The rotor is fitted with a set of conductors in which currants flow. As these conductors lie in the magnetic field produced by the stator, a force is exerted on the conductors and the rotor begins to revolve. The operation of the motor depends upon the production of a rotating magnetic field. The speed at which the field of an induction motor turns is called the synchronous speed of the field or of the motor.

The induction motor is the simplest of the various types of electric motors and it has found more extensive application in industry than any other type. It is made in two forms – the squirrel cage and the wound rotor, the difference being in the construction of the rotor.

The stator of the induction motor has practically the same slot and winding arrangement as the alternator and has the coils arranged to form a definite number of poles, the number of poles being a determining factor in connection with the speed at which the motor will operate. The rotor construction, however, is entirely different.

The squirrel-cage rotor is a simpler form and has been used in many machines.

Instead of coils the winding consists of heavy copper bars.

The wound-rotor type has a winding made up of well-insulated coils, mounted in groups whose end connections are brought out to fill in rings. The purpose of this winding is to provide for variation in the amount of resistance included in the rotor circuit.

Provision for ventilation is made by leaving passageways through the core and frame, through which air is forced by fan vanes mounted on the rotor. In main cases the motors now built in as an integral part of the machine it is to drive.

There being no electrical connection between the rotor circuits of the induction motor and the stator circuits, or supply line, the currents which flow in the rotor bars or windings correspond to the induced voltages, the action being similar to that of a transformer with a movable secondary. With but a single phase winding on the stator, however, the torques produced in the two halves of the rotor would be in apposition, and the motor would not start. With more than one set of windings two for a two-phase motor, three for a three-phase motor a resultant field is produced which has the effect of cutting across the rotor conductors and induces voltages in them. This field is considered to be revolving at uniform speed.

The term “revolving field” should not be taken to mean actual revolution of flux lines. The magnetic field from the coils of each phase varies in strength with changes in current value but does not move around the stator. The revolutions are those of the resultant of the three, or two, phases, as the case may be.

A motor with a single-phase winding is not self-starting but must be provided with an auxiliary device of some kind to enable the motor to develop a starting torque. The effect of the revolving field is the same as would result from actual revolution of a stator having direct-current poles. As voltages have been induced in the bars or windings of the rotor, currants start flowing as a result of these voltages, and a torque is produced which brings the motor up to speed.

**II. Find in the text the English equivalents for the word combinations given below:**

1) асинхронный двигатель; 2) неподвижная часть; 3) вращающаяся часть; 4) проводник; 5) одновременная скорость; 6) широкое применение; 7) паз; 8) механизм обмотки; 9) трансформатор; 10) вращающий момент.

**III. Complete the following sentences according to the contents of the text**

1. The Induction Motor is …….. of electric motors and is more extensively applied in industry than any other type.

2. The purpose of this winding is …….. for variation in the amount of resistance included in the rotor circuit.

3. The effect of …. is the same as would result from actual revolution of a stator having direct-current poles.

**IV. Answer the following questions:**

1. What parts does the induction motor consist of?

2. What are the names of its rotating and stationary parts?

3. What does the motor operation depend on?

4. How can the difference between stator and rotor construction be explained?

5. What does the term “revolving field” mean?

**V. Translate the sentences from the text paying attention to the Participle Constructions:**

1. The induction motor is made in two forms – the squirrel cage and the wound rotor, the difference being in the construction of the rotor.

2. The stator of the induction motor has practically the same slot and winding arrangement as the alternator and has the coils arranged to form a definite number of poles, the number of poles being a determining factor in connection with the speed at which the motor will operate.

3. There being no electrical connection between the rotor circuits of the induction motor and the stator circuits, or supply line, the currents which flow in the rotor bars or windings correspond to the induced voltages, the action being similar to that of a transformer with a movable secondary.

**VI. Discuss the following points:**

1) The construction of an induction motor;

2) Induction motor operation principle.