RAMA UNIVERSITY

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FACULTY OF ENGINEERING & TECHNOLOGY

Electrical Machine-ii

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UNIVERSAL MOTOR

- The motors which can be operated satisfactorily on ac as well dc supply is universal motor.
- **Types of universal motors:**

1. Uncompensated type universal motor
2. Compensated universal motor

- **Windings:**
- There are three windings used namely armature, main field and compensating winding.
- Out of which compensating winding is used only for the compensated universal motor.
- All the windings are connected in series with each other since this is basically a series motor.

1. Uncompensated universal motor:

•The operating principle is same as that of dc series motor.

•Field winding produces flux. It is stationary winding. Armature is a rotary winding.

•These motors produces high starting torque but their speed decreases with increase in load. Their speed regulation is not very good.

•These motors having low capacity. Normally it is designed for two pole structure

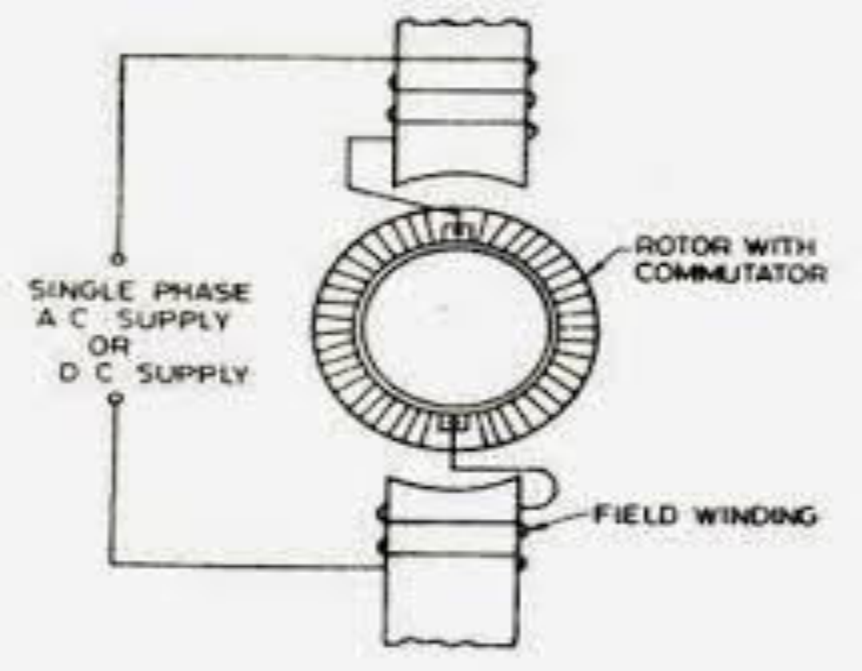

Fig.(1): Uncompensated Universal Motor

2. Compensated universal motor:

- In this motor, main winding and compensating winding are distributed over entire stator.
- Fig.(2) shows the schematic diagram of compensated universal motor.
- This type of motor is better for higher speeds.
- These motors are more expensive due to complicated construction.
- Hence they are preferred for higher capacity loads.

Reversal of rotation:

For universal motors, reversal can be achieved by reversing the connections to either the field or the armature winding.

Applications:

1. Washing machine
2. Mixers and grinders
3. Food processors
4. Small drilling machines
5. Vaccum cleaners
6. Sewing machine
7. Hair driers
8. Electric shavers

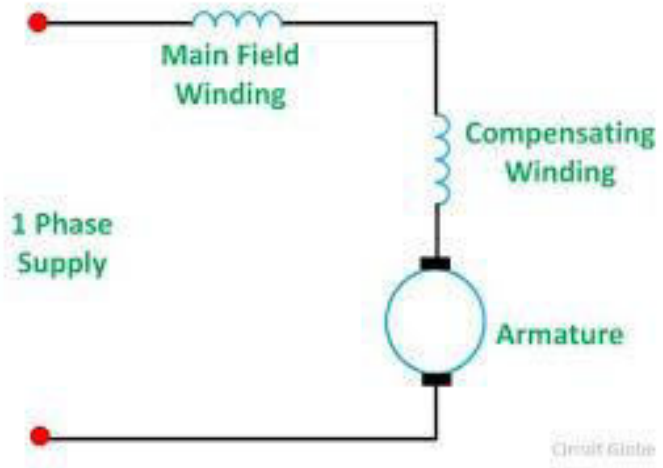

Fig.(2):compensated Universal Motor