



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 19EE01 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

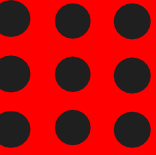
I YEAR /I SEMESTER AI&DS

Unit 1 – Electrical Circuits and Measurements

Energy Meter



ENERGY



Physics says “ Energy is the ability of work done with respect to time”

In Electrical terms Energy is power consumed with respect to time

How do I measure energy ?

What instrument/machine should use?





CASE

- What is he doing?
- How do he calculating?
- Why should he measure?
- Share your experiences!





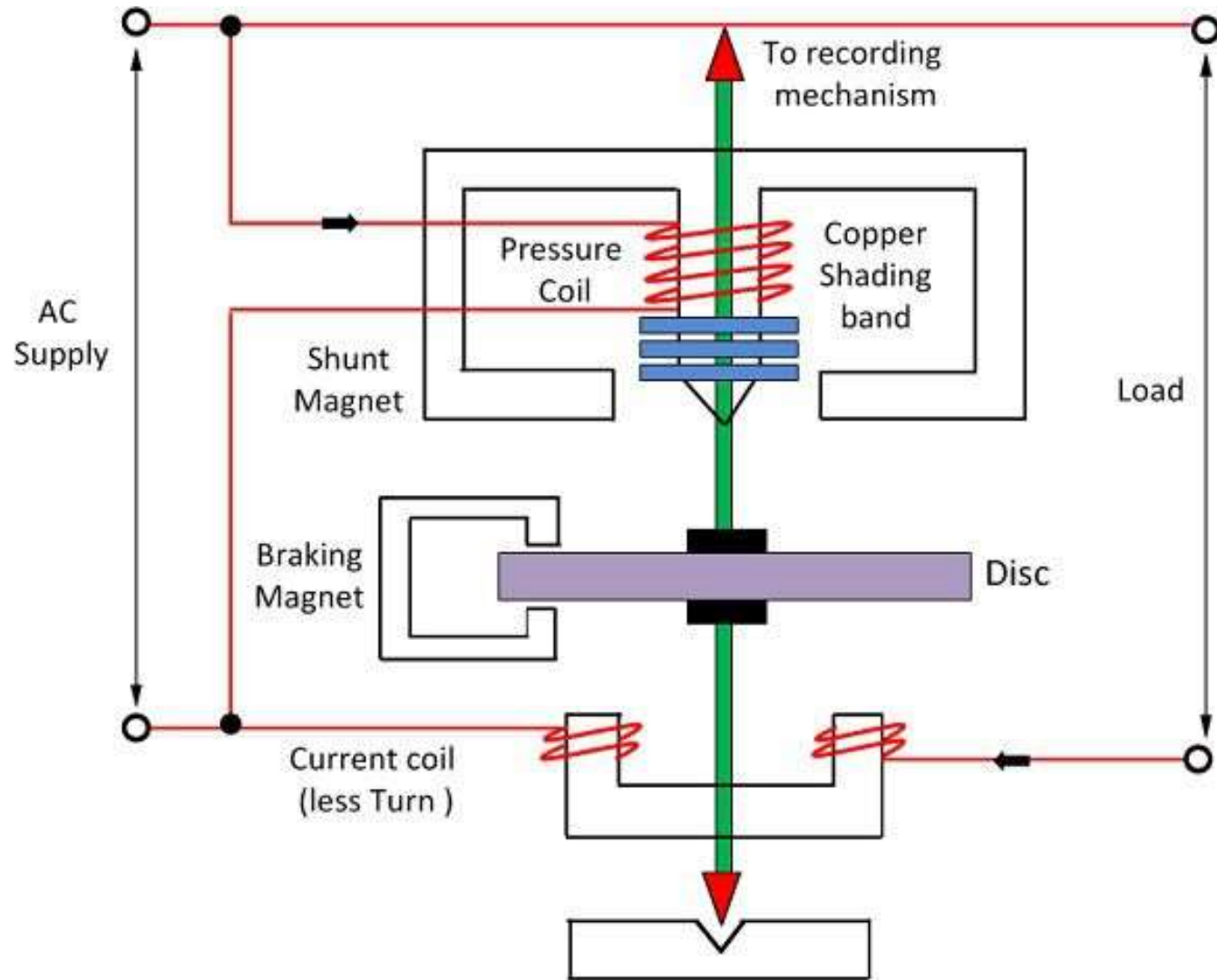
ENERGY METER

- The meter which is used for measuring the energy utilized by the electrical load is known as the energy meter.
- The energy is the total power consumed and utilized by the load at a particular interval of time.
- It is used in domestic and industrial AC circuit for measuring the power consumption.





CONSTRUCTION OF ENERGY METER





ASSESSMENT 1



1. The household energy meter is

- A. An indicating instrument
- B. A recording instrument
- C. An integrating instrument
- D. None of the above

2. The meter constant of single phase energy meter is expressed in terms of

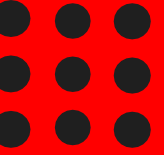
- A. Revolutions/kWh
- B. kW/kWh
- C. Amps/kW
- D. Volts/kWh



MECHANISM IN ENERGY METER

The energy meter has four mechanisms

- Driving System
- Moving System
- Braking System
- Registering System





DRIVING MECHANISM

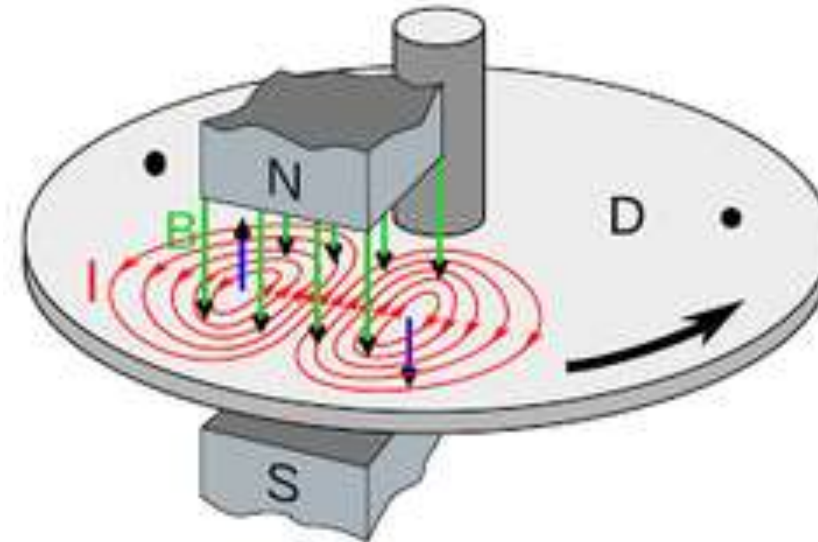
- The electromagnet is the main component of the driving system.
- The upper one is called the shunt electromagnet, and the lower one is called series electromagnet.
- The series electromagnet is excited by the load current flow through the current coil.
- The coil of the shunt electromagnet is directly connected with the supply and hence carry the current proportional to the shunt voltage and called as pressure coil.





MOVING SYSTEM

- The moving system is the aluminium disc mounted on the shaft of the alloy.
- The disc is placed in the air gap of the two electromagnets. The eddy current is induced in the disc because of the change of the magnetic field.
- This eddy current is cut by the magnetic flux. The interaction of the flux and the disc induces the deflecting torque.





BRAKING SYSTEM

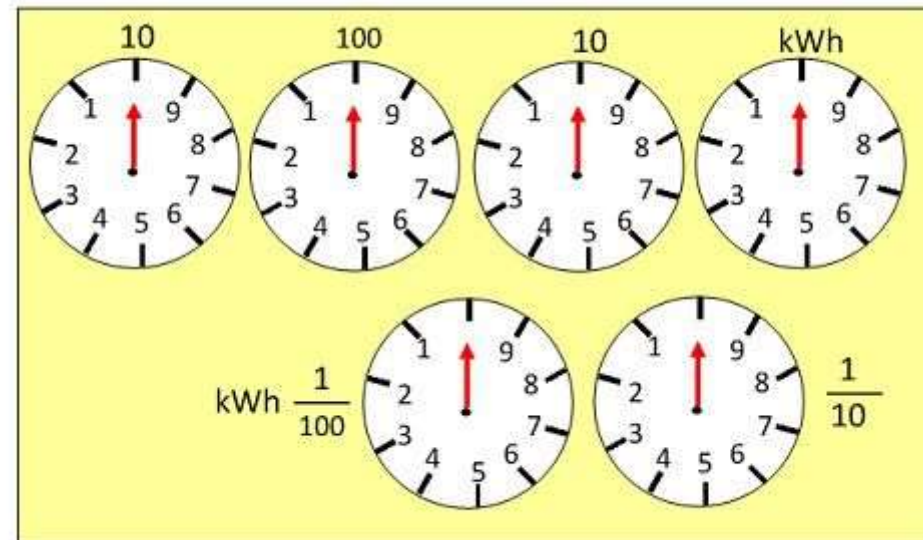
1. The permanent magnet is used for reducing the rotation of the aluminium disc.
2. The aluminium disc induces the eddy current because of their rotation.
3. The eddy current cut the magnetic flux of the permanent magnet and hence produces the braking torque.





REGISTRATION (COUNTING MECHANISM)

1. The main function of the registration or counting mechanism is to record the number of rotations of the aluminium disc.
2. The rotation is directly proportional to the energy consumed by the loads in the kilowatt hour.





Assessment 2

- 1.If voltage supply to the energy meter is more than the rated value, energy meter will run
 - A.Slow
 - B.Fast
 - C.Either of the above
 - D.None of the above
- 2.Aluminium is selected as the material for rotating disc of energy meter because
 - A.It is good conductor
 - B.It is light
 - C.It is indigenously available
 - D.All of the above reasons





REFERENCES

1. Bhattacharya. S.K, “Basic Electrical and Electronics Engineering”, Pearson Education , (2017)
2. Muthu Subramanian R, Salivahanan S,“ Basic Electrical and Electronics Engineering”, Tata McGraw Hill Publishers, (2009)
3. V.Mittle“ Basic Electrical Engineering”, Tata McGraw Hill Publishers, (2017)
4. Nagrath. I.J, “Electronics: Analog and Digital”, Prentice Hall India Pvt. Ltd., (2013)

THANK YOU