

# **ELECTRICAL MEASUREMENT & MEASURING INSTRUMENTS**

# UNIT 4 Part (i)

## **AC Potentiometers**

# A.C. POTENTIOMETER

- Its principle is same as a d.c. potentiometer.
- One very important difference between the two.
- In d.c. potentiometer, only the magnitudes of the unknown e.m.f. and slide-wire voltage drop are made equal for obtaining balance.
- But in an a.c. potentiometer, not only the magnitudes but *phases as well have to be* equal for obtaining balance.
- To avoid frequency and waveform errors, the a.c. supply for slide-wire must be taken from same source as the voltage or current to be measured.

# Types

## Two Types

- ***Polar potentiometers in which the unknown voltage is measured in polar form i.e. in terms of magnitude and relative phase.***
- ***Co-ordinate potentiometers which measure the rectangular co-ordinates of the voltage under test.***

# DRYSDALE POLAR TYPE AC POTENTIOMETER

- It is basic d.c. potentiometers along with some auxiliary components such as, drysdale phase shifter and electrodynamicometer type ammeter.
- When the current flows through stator winding, a rotating field is produced inducing e.m.f in the rotor.
- The phase of rotor current can be changed through any angle relative to stator supply voltage by rotating rotor.
- Thus the change in the phase of secondary e.m.f. is equal to the angle through which rotor is moved from its original zero position.

# Circuit Diagram

