ELECTRICAL MEASUREMENT & MEASURING INSTRUMENTS

UNIT 4 Part (i)

AC Potentiometers

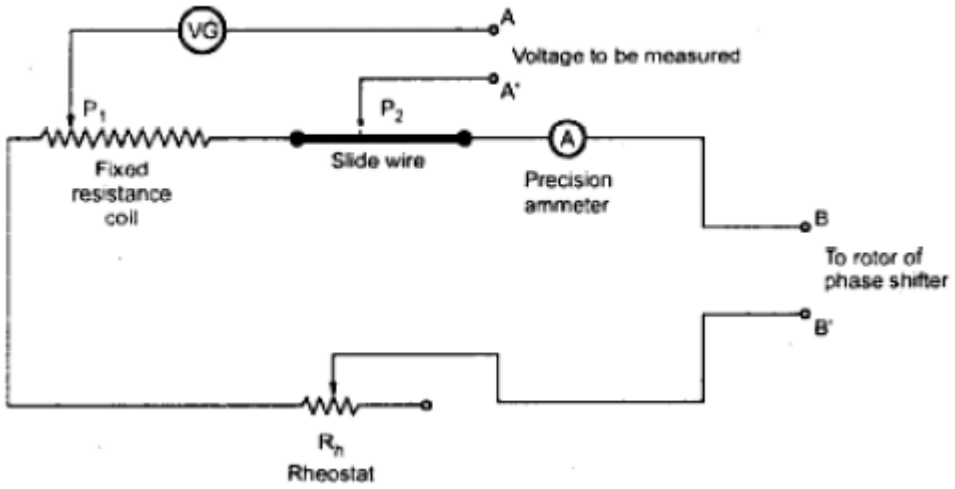
Standardization of Polar AC Potentiometer

- Both d.c. as well as a.c. standardization is done.
- The d.c. standardization is done first by replacing vibration galvanometer by D'arsonval galvanometer.
- A standard cell such as Weston cell is used for d.c standardization.
- Then by adjusting sliding contacts null deflection in galvanometer is achieved.
- The reading of a precision ammeter included in battery supply is noted. During a.c. standardization again vibration galvanometer is used.

Measurement of Unknown E.M.F.

- An emf to be measured connected across terminals A-A’.
- Sliding contacts P1 and P2 and the position of rotor in phase shifter are adjusted simultaneously till the balance is obtained as indicated by the null deflection of vibration galvanometer.
- At balance, the magnitude of the unknown emf is obtained from P1 and P2 and the phase angle is measured from the scale reading which is mounted on the top of the instrument. Thus the unknown emf can be expressed in polar form as $E \angle \theta°$.

Circuit Diagram



GALL TINSLEY CO-ORDINATE TYPE AC POTENTIOMETER

- The in-phase and quadrature potentiometer consist of sliding contacts BB’ and CC’ respectively.
- Rheostats r and R’ are also provided in the respective potentiometers for the adjustment of current.
- By using different arrangement, the supply for the potentiometer are obtained.
- A vibration galvanometer VG is tuned to the supply freq and it is connected in series with a switch K and electrodynamometer type ammeter.

Circuit Diagram