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Potentiometer

It is three-terminal resistor having either sliding or rotating contact that forms an adjustable voltage divider. In order to use the potentiometer as a rheostat or variable resistor, it should have only two terminals with one end and the wiper.

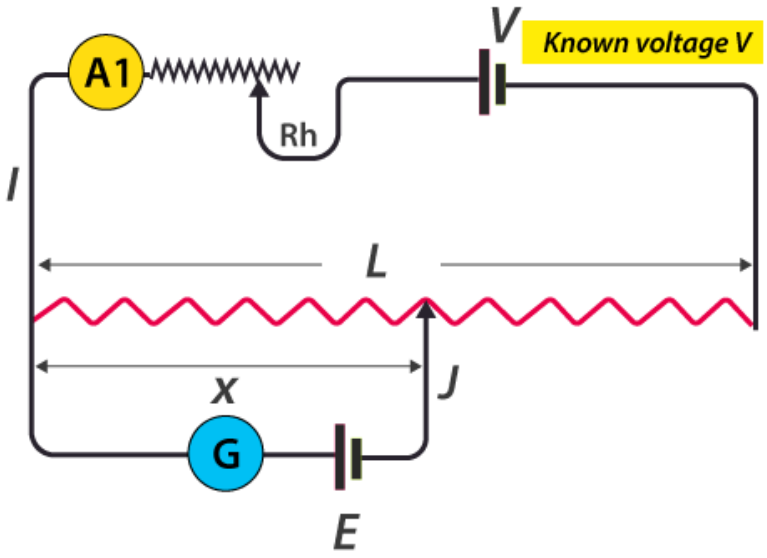
Following are the terms used to describe types of potentiometers:

- Slider pot or slide pot: This can be adjusted by sliding the wiper right or left with a finger or thumb.
- Thumbwheel pot or thumb pot: This can be adjusted infrequently with the help of small thumbwheel which is a small rotating potentiometer.
- Trimmer pot or trimpot: This can be adjusted once for fine tuning of an electric signal.

Working Principle

The potentiometer consists of L which is a long resistive wire and a battery of known EMF V whose voltage is known as driver cell voltage. Assume a primary circuit arrangement by connecting the two ends of L to the battery terminals. One end of the primary circuit is connected to the cell whose EMF E is to be measured and the other end is connected to galvanometer G. This circuit is assumed to be a secondary circuit.

The working principle depends on the potential across any portion of the wire which is directly proportional to the length of the wire that has a uniform cross-sectional area and current flow is constant.



CONTROL SYSTEM COMPONENTS

Application of potentiometer

Audio control: Both linear, as well as rotary potentiometers, are used to control audio equipment for changing the loudness and other audio related signals.
Television: They are used to control the picture brightness, color response and contrast.
Motion control: In order to create a closed-loop control, potentiometers are used as position feedback devices known as a servomechanism.
Transducers: As these give large output signals, they find applications in designing of displacement transducers.

Electrical Tachometer:

- The tachometer use for measuring the rotational speed or angular velocity of the machine which is coupled to it.
- It works on the principle of relative motion between the magnetic field and shaft of the coupled device.
- The relative motion induces the EMF in the coil which is placed between the constant magnetic field of the permanent magnet.
- The develops EMF is directly proportional to the speed of the shaft.
- Depends on the natures of the induced voltage the electrical tachometer is categorized into two types.
    1. DC Tachometer Generator
    2. AC Tachometer Generator