

EXPERIMENT NO. 1

Objective: To verify Ohm's law.

Apparatus Required:

| Sr. No. | Apparatus | Quantity | Range /Remark |
|---------|------------------|----------|-----------------------|
| 1 | D.C. Supply | 1 | (.....) V, (.....)A |
| 2 | D.C Voltmeter | 1 | (.....) V |
| 3 | DC Ammeter | 1 | (.....) mA |
| 4 | Resistance box | 1 | R=..... |
| 5 | Multimeter | -- | To Measure Resistance |
| 6 | Connecting wires | -- | |

Circuit Diagram:

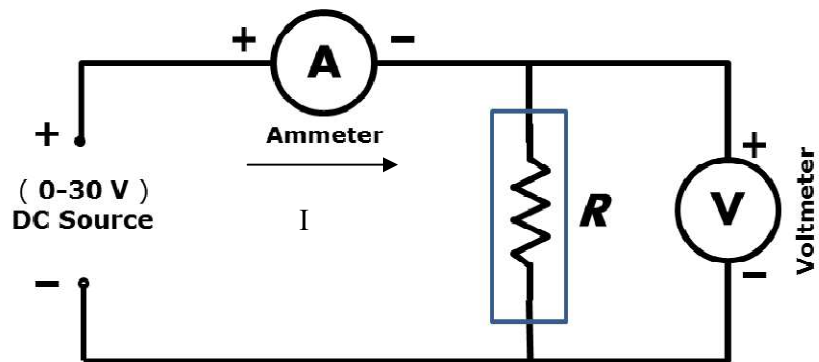


Fig 1 – Ohm's Law Circuit Diagram

Observation Table: Standard Resistance $R_o = \dots\dots\dots$ (Resistance box value as measured by Multimeter)

| S.N. | Applied voltage(V) | I(mA) | $R = V/I(\Omega)$ | Error = $\left(\frac{R_o - R}{R_o}\right) \times 100$ |
|------|--------------------|-------|-------------------|---|
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Theory:

This law applies to electric-to-electric conduction through good conductors and may be stated as follows:

The ratio of potential difference (V) between any two points on a conductor to the current (I) flowing between them, is constant, provided the temperature of the conductor does not change.

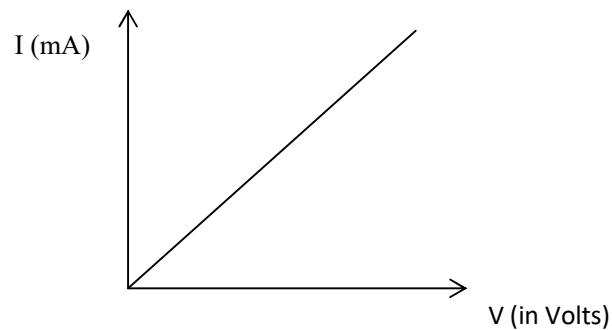
In other words,

$$\frac{V}{I} = \text{constant or } \frac{V}{I} = R$$

Where, R is the resistance of the conductor between the two points considered. Put in another way, it simply means that provided R is kept constant, current is directly proportional to the potential difference across the ends of a conductor. However, this linear relationship between V and I do not apply to all non-metallic conductors.

Model graph:

Graph in between V and I



Result: Ohm's law has been correctly verified.

Precaution:

1. Make the connections properly.
2. Note the readings of voltmeters and ammeters properly avoid parallax
3. Connect the DC supply and ammeter with correct polarity.
4. Avoid loose connections and don't touch wire with wet hand.