

Ohm's Law II

AIM: To verify the laws of combination of Resistances.

APPARATUS: Cells, Ammeter, Voltmeter, Rheostat, Key, Resistances, Bread Board, Connecting wires etc

THEORY: At constant temperature, the current passing through the conductor is directly proportional to the potential difference across the conductor.

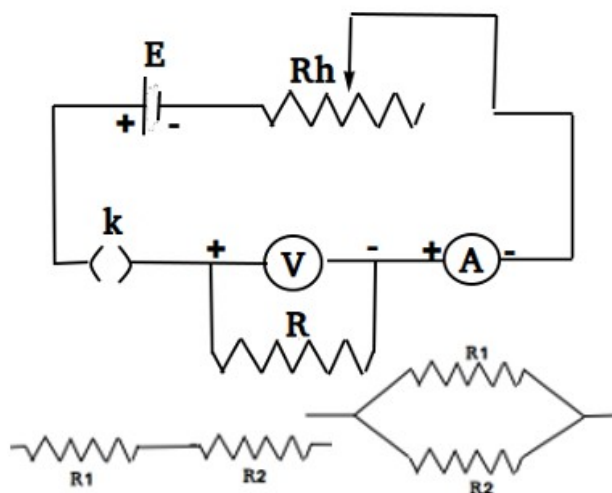
That is $V \propto I$ or $\frac{V}{I} = R$ the resistance of the conductor.

When two resistances R_1 and R_2 connected in series, the effective resistance $R_s = R_1 + R_2$.

When they are connected in parallel, the effective resistance is

given by $\frac{1}{R_s} = \frac{1}{R_1} + \frac{1}{R_2}$

$$\text{or } R_p = \frac{R_1 R_2}{R_1 + R_2}$$



OBSERVATIONS:

Least Count of the ammeter = A

Least Count of the voltmeter = V

Resistance	Trial No	Ammeter Reading (I) Ampere	Voltmeter Reading (V) Volts	$R = \frac{V}{I} \quad \Omega$	Mean R Ω
R_1	1				$R_1 =$
	2				
	3				
	4				
R_2	1				$R_2 =$
	2				
	3				
	4				
R_1 and R_2 in Series	1				$R_s =$
	2				
	3				
	4				
R_1 and R_2 in Parallel	1				$R_p =$
	2				
	3				
	4				

CALCULATIONS:

$$R_1 = \quad \Omega$$

$$R_2 = \quad \Omega$$

$$R_s =$$

$$R_s = R_1 + R_2 = \quad = \quad \Omega$$

$$R_p = \quad \Omega$$

$$R_p = \frac{R_1 R_2}{R_1 + R_2} = \quad = \quad \Omega$$



RESULT:

The laws of combination of Resistances in Series and Parallel are verified.