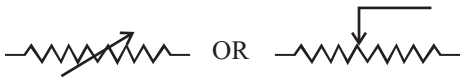
Rheostate–

As we know that

$$V = IR$$

$$1 = \frac{V}{R}$$ { Shows that current through conductor resistor is inversely proportional is its resistance }

So to increase or decrease the current accordingly in the circuit a component is used is called "Rheostat", that regulates the current without changing potential difference. Represented by "Rh"

Its symbol is  OR

it a conductor has less Resistance, then more current will flow through it.

FACTORS ON WHICH RESISTANCE OF A CONDUCTOR DEPENDS–

(1) On its length (l)

(2) On its cross sectional area (A)

(3) On the nature of material

(Resistance) $R \propto l$ (Directly prop. to length)

$R \propto \frac{1}{A}$ (inversely prop to cross-sectional area)

$R \propto \frac{l}{A}$

$$\boxed{R = \rho \frac{l}{A}}$$

Where " ρ " (rho) is a proportionality constant known as resistivity of the material of conductor.

11. **Resistivity** (ρ) – the resistance offered by a wire of unit length and unit cross-sectional area is called resistivity.

Its SI unit is $\boxed{\Omega m}$

[Since $R = \rho \frac{l}{A}$

$\rho \quad \frac{R.A}{l} = \frac{m^2}{m}$

SI unit of ρ Ωm.]

For a material irrespective of length and area, the resistivity is a constant.

lead etc. The alloy should be of low m.pt and high resistivity, fuse is always connected in series circuit. When large current flow through the circuit, the temperature of fuse wire will increase. This melts the fuse wire and break the circuit.

" Fuses" used for domestic purposes are rated as 1A, 2A, 3A, 5A, 10A etc. for various operation depending upon the power of appliance using.

Example- let us consider an appliance "electric Iron" which consume 1KW electric power, at 220V

$$P = VI$$

$$I = \frac{P}{V} = \frac{1KW}{220V} = \frac{100\cancel{0}W}{22\cancel{0}V}$$

$$\boxed{I = 4.54A}$$

In this case a 5A fuse is required.

Electric Power :– In case of electricity, it is defined as the rate of change electrical energy dissipated or consumed in an electric electrical energy dissipated or consumed in an electric circuit.

$$P = VI$$

or $P = I^2R$ ($\because V = IR$ Ohm's Law)

or $P = \frac{V^2}{R}$ ($\because I = \frac{V}{R}$)

or $P = \frac{\text{Electrical Energy (E)}}{\text{time (t)}}$

SI unit of electric power is "Watt" (W).

1 Watt Defined as the power consumed by a device, when 1A of current passes through it at the potential difference of 1V.

$$P = VI$$

$$\boxed{1 \text{ Watt} = 1 \text{ Volt} \quad 1 \text{ Ampere}}$$

29 Electrical Energy–

$$P = \frac{E}{t}$$

$$E = P \quad t$$

[E – Electrical Energy
t – time]