

Answer on Question #42956-Physics-Electric Circuits

750 w electric heater plugged into 240 v power supply. A trolley passing caused insulation distort and reduced resistance between live and neutral to 60 ohms.

1. what is the rate of heat production in watts

Solution

$$N = \frac{U^2}{R} = \frac{240^2}{60} = 960 \text{ W.}$$

2. plug fitted carries 3 amps fuse is this correct for appliance

Solution

This is incorrect:

$$I_{\text{heater}} = \frac{750}{240} = 3.125 \text{ A} > I_{\text{fuse}} = 3 \text{ A.}$$

That's why electric heater wouldn't work.

3. would correctly rated fuse blown as result of fault

Solution

Yes, correctly rated fuse would blow as result of fault because $I_{\text{fault}} = \frac{U}{R} = \frac{240}{60} = 4 \text{ A}$ is bigger than $I_{\text{fusecorrect}} = 3.125 \text{ A}$.