

Unit 203: Scientific principles for domestic, industrial and commercial plumbing

Outcome 6

Basic principles of electricity

Principles of electricity

Voltage = V

The unit for electromotive force (emf). The higher the voltage the greater the force is to cause electrons to flow along the conductor (eg 240v for domestic).

Current = I

The ampere is the unit of current, and can be defined as the unit of quantity or volume passing down a conductor. (eg 3 amp fuse).

Resistance = R

The ohm is the unit of resistance, which opposes the flow of current.

Principles of electricity

Watts = W

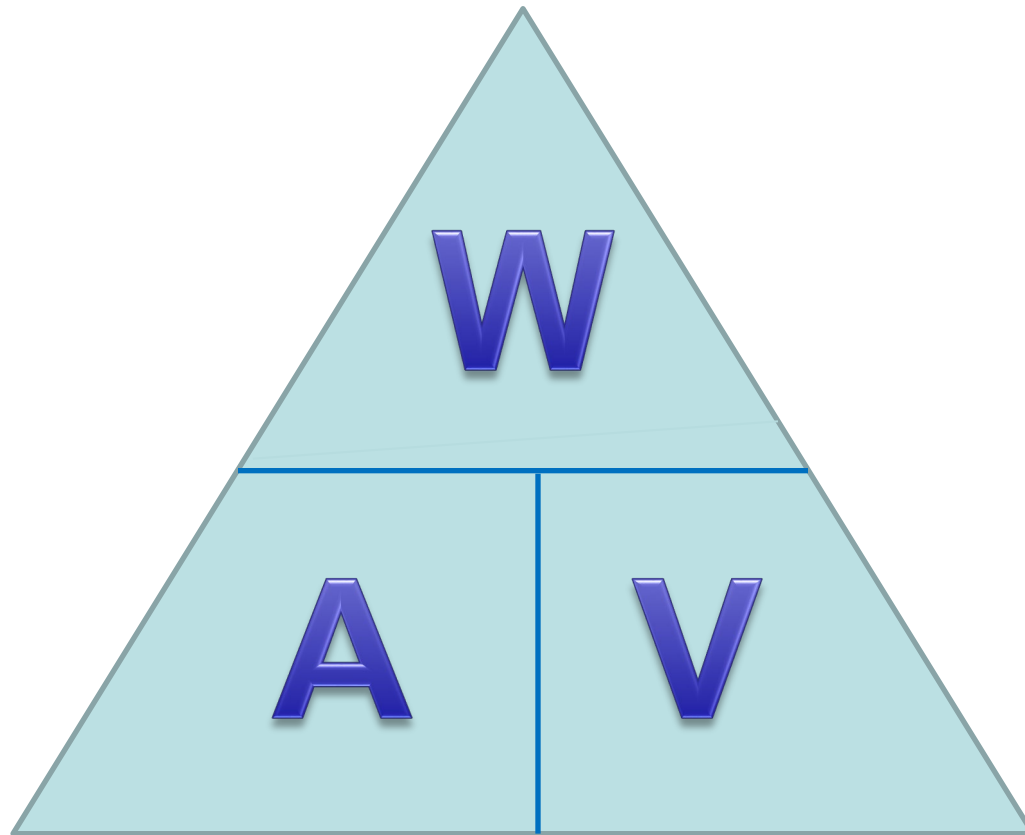
It is the unit of power for an appliance. Power is used to make an appliance work; as some power is absorbed, an appliance is never 100% efficient (e.g 3kW immersion heater).

Joules = J

The unit of electrical energy. As this is so small, it is not generally used. Today it would be measured in the kilowatt hour, which is how electricity bills are measured.

Principles of electricity

The relationship between watts – amps – volts



Try and work out the following...

1. If an appliance needs 3kW in a domestic property, what is the fuse size?

12.5 amp.

2. In a domestic property, an appliance has a fuse size of 3 amp. What is the maximum power rating of the appliance?

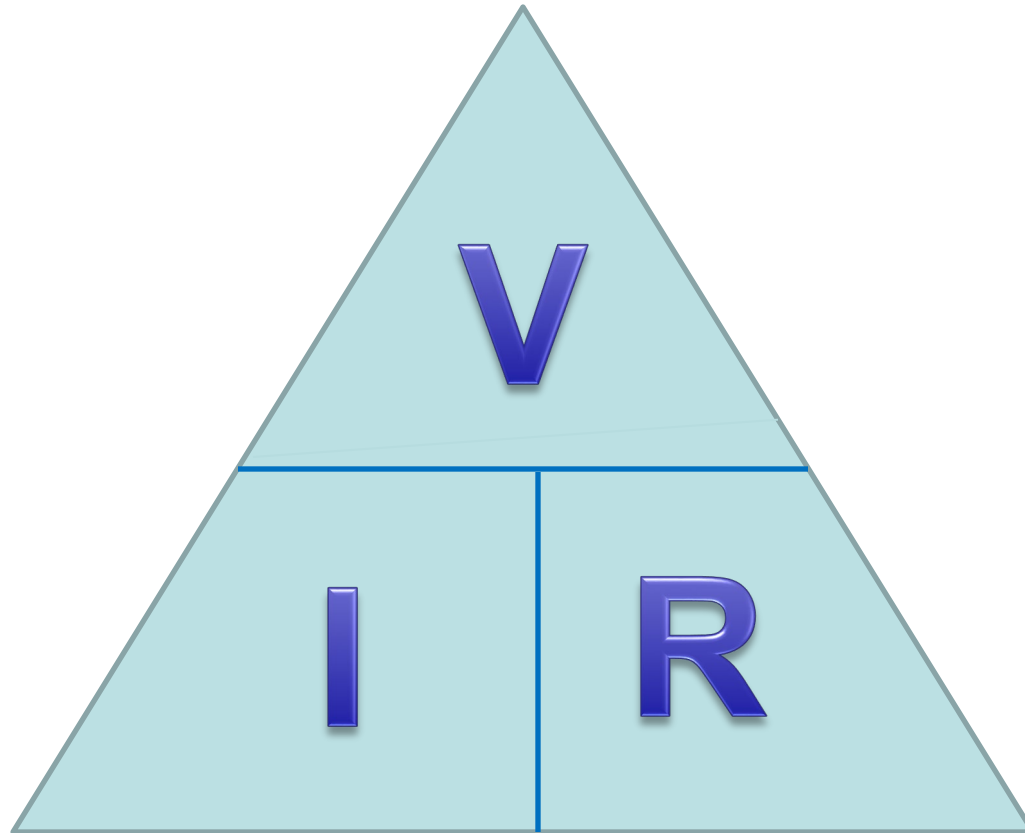
720w or 0.72kW.

3. An appliance has a 5 amp fuse and needs 1.2kW of power. What is the voltage required?

240v.

Electrical components

Ohm's Law shows the relationship between:
voltage – current – resistance



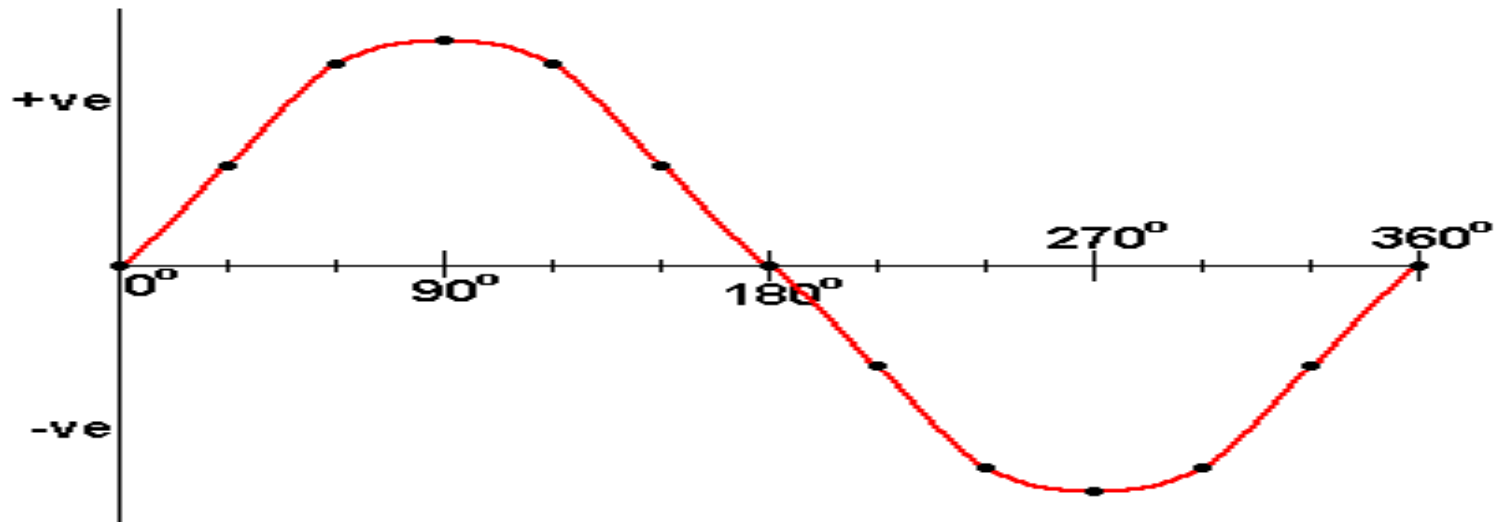
Try and work out the following...

1. What would be the resistance of a domestic appliance if the fuse size was 3 amp?
80 ohms.
2. What is the fuse size for a domestic appliance which has 1,200 ohms resistance?
0.2 amp.
3. If an appliance had a fuse rated at 13 amp and the resistance was 32 ohms, what would the voltage be?
415v.

Principles of electricity

AC = alternating current = mains electricity
(electromagnetically)

www.sciencejoywagon.com/physicszone/otherpub/wfendtgeneratorengl.htm

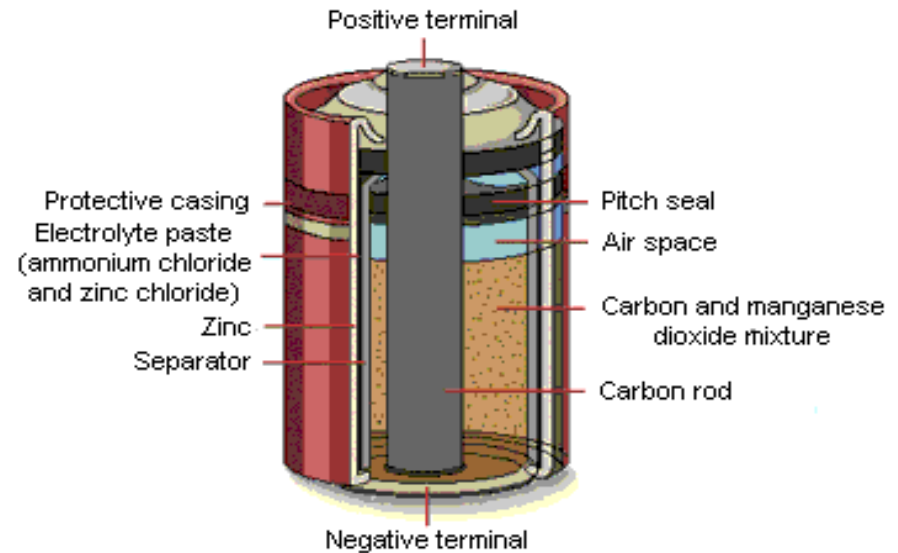
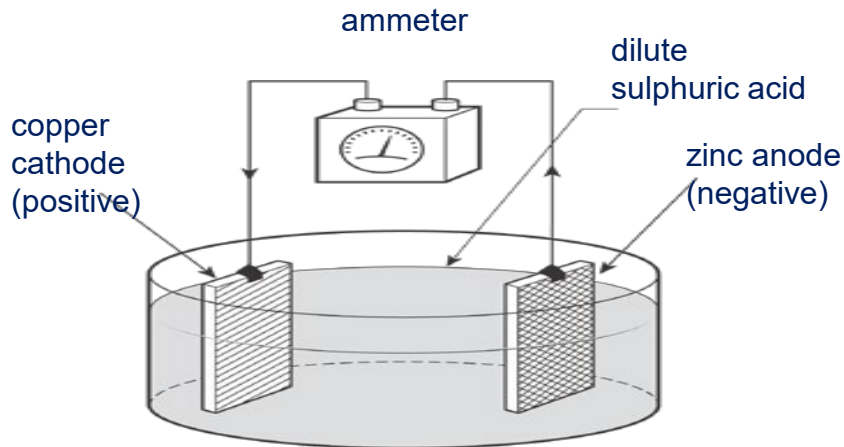


Hz = cycles per second = 50Hz in UK

Principles of electricity

DC = direct current = batteries (chemically).

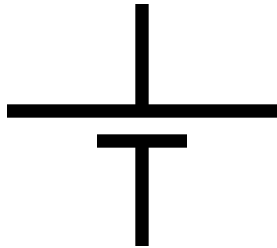
- Dissimilar metals in a dilute acid solution
- Cathode eats away the anode



Principles of electricity



DC symbols



Rectified and battery



AC symbol