



It's so easy to take electricity for granted – with just the flick of a switch we can watch our favourite television shows, play computer games and cook dinner. But how does it work?

In Australia electricity is distributed to our homes at 240 volts,

which is the standard voltage for electrical appliances in our country.

In our previous project pages we looked at electricity production and how it flows via conductors to a service point which is where the home wiring system begins.

Electricity within the Home

First, the power passes through a meter box that measures the units of electrical energy we use in our homes. This is measured in kilowatts per hour (kWh).

The electricity then goes through a main switch which can be used to cut off the electricity altogether if, for instance, repairs and changes need to be made to the wiring or in emergencies e.g. fire.

Once it has passed through the main switch, the electricity is carried to a fuse board/circuit breaker from where a number of smaller wires or branch circuits carry the electricity throughout the house.



Fuse and Circuit Breakers

We have learnt before that electricity runs in a circuit. All electrical appliances therefore need at least two wires – one (the active) to carry electricity from the generator and the other (neutral) to return the electricity to the generator.

In the board there is a fuse/circuit breaker installed for each circuit, including lights, hot water system, power outlets etc. The fuses or circuit breaker act as safety valves to protect the wiring in the home. Wires can only carry a certain amount of electricity efficiently and safely, and if too much electricity is forced through a wire it can overheat and start a fire. The wire in a fuse will melt if too much electricity is used, causing the fuse to 'blow' and disconnecting the power.



Today, most houses have circuit breakers and a large number of electrical outlets to reduce the risk of overloading.

The most spectacular type of overloading occurs in a short circuit where, for example, the insulation of two wires wore through and two bare wires (active and neutral) touched each other or a bare active wire touched metal or some other object that allowed a path for electricity to go to ground. Most appliances therefore have a third wire, or earth wire, that provides a suitable conductor to earth in case of a current leakage.

If a person accidentally touched a wire that was connected to a power supply, the current can pass through the body with fatal results. It is extremely important to be careful with electrical appliances, and to ensure they are safe to operate.

Simple Safety Rules

1. Use only qualified electricians for all repairs;
2. Never use electrical appliances in a wet or damp situation as water will act as a conductor;
3. Replace all faulty appliances and damaged cords;
4. Do not overload electrical outlets;
5. Do not tamper with switched on appliances;
6. Stay clear of power lines;
7. Make sure everybody in your home knows basic first-aid procedures;
8. Use a safety switch.