

Factsheet: Conductors, Connections and Polarity

It takes a minimum of two wires to have an electrical circuit. Electric *current* involves the flow of electrons. Current is measured in amperes (*amps* for short). It travels from a source, through the device it operates, called the *load*, and then back to the source.

In AC wiring, present in buildings, there is *voltage* present on the "hot" wire (generally at about 120 volts AC). Voltage provides the force that allows electrons to flow in a circuit.

Switches on electrical devices are supposed to be wired only on the *hot* or *live* side of the circuit. The return conductor, known as the *neutral*, is at zero volts because it is deliberately *grounded* at the electrical panel.

The amount of current that flows in a circuit depends on its *electrical resistance*, or opposition to current flow, measured in *ohms*.

In an electrical shock, the amount of electrical **current**, in *amps*, that flows through your body **goes up when resistance** in ohms **goes down**.

The Current in **Amps** = Voltage in **Volts** divided by Resistance in **Ohms**.

Higher voltage = *more current*
 (if resistance remains the same).

Lower resistance = *more current*
 (if voltage remains the same).

Newer electric plugs have blades that are *polarized*, so the hot wire on the device is connected to the hot side of the electrical receptacle, and the neutral wire is connected to the neutral side.

This is done by making the *neutral* blade on the plug *wider* than the hot blade. If you look at a grounded outlet, you'll see that the hot slot is shorter than the neutral slot.

Older plugs may not be polarized, and both blades are the same size. It's best to have an electrician re-wire the device using a polarized plug. The electrician should also ensure that the receptacle is properly wired.

Electricians install *grounded circuits*. They follow OSHA's *Lockout/Tagout* standard when working on them.

Circuits are de-energized and isolated. Stored energy is released and conductors are grounded.

De-activated controls are then locked out and tags are placed at their "off" position.