CONDUCTORS, AC AND DC

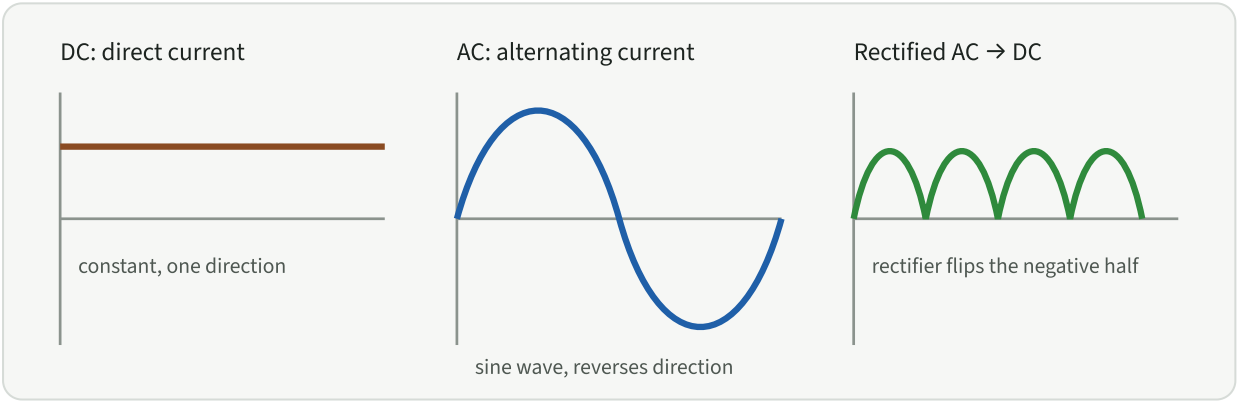
WHAT'S THE DIFFERENCE BETWEEN AC AND DC?

CONDUCTORS AND INSULATORS

- A voltage is put **across** a circuit or load. Current flows **through** it.
- A **conductor** is any material that allows current to flow through it. Good conductors (copper, aluminium, most metals) have **low resistance**.
- An **insulator** is any material that doesn't allow current to flow. Good insulators (plastics, rubber, wood, glass) have **very high resistance**.

A cable uses both: copper conductors to carry current, and PVC insulation and sheath to keep it where it should be.

DC AND AC



Direct current (DC) flows in **one direction** at a steady level. The three most common sources:

1. a battery of cells
2. a DC generator
3. electronics, using a **rectifier**, which converts AC to DC

A battery produces pure DC as long as it has energy left in it.

Alternating current (AC) constantly reverses direction, following a sine wave. The UK mains is AC at **50 Hz**, which is 50 complete cycles a second. AC is what the grid generates and what transformers need.

The **230 V** we quote is the **RMS** (root mean square) value, not the peak. The peak is RMS ÷ 0.707, about **325 V** on a single-phase supply, and 325 × 0.707 brings you back to 230 V.

Rectifier	Converts **AC → DC**. Your phone charger has a small **bridge rectifier** inside the plug to charge the DC battery from AC mains.
Inverter	Converts **DC → AC**. Solar panels produce DC, and an inverter turns it into AC for the home.

If DC isn't fully smoothed you get a **rectified** waveform: humps that stay on one side of zero, because the current never reverses.

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