VOLTAGE

WHAT ACTUALLY PUSHES ELECTRICITY ROUND A CIRCUIT?

Start with a question: **what three things make up an electrical circuit?** The answer is **voltage, current and resistance**.

Voltage is the electrical **pressure** that pushes electricity around a circuit. It is measured in **volts, V**.

Symbols	`V` in general formulas. `U` is how voltage is written in electrical books like BS 7671.
U_0	The **UK nominal voltage, 230 V** (line to earth).
U	The line-to-line voltage, **400 V** (three-phase).
EMF	**Electromotive force**, the voltage a source produces (battery, generator, transformer winding). Still measured in volts, and written `E` in formulas. Don't think of it as a force in newtons. It's the push that drives electricity round the circuit.
Potential difference	The **difference in voltage between 2 points**. For example, 230 V on the line and 0 V on the neutral gives a PD of 230 V.

Waterfall analogy

Water at the top of a waterfall has a high potential, and the pool at the bottom a low one. The water only flows because there's a difference and a path between them. Another way to picture it is two cups, one at 230 V and one at 0 V: pour between them and there's a 230 V potential difference. If both cups are at the same level there's no difference, so nothing flows.

Key point: current can only flow when there is a **potential difference**.

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