

Volts, Amps, Watts, Ohms Cheat Sheet

The four numbers behind every circuit, on one page. Stick it above the bench.

Number	Unit	What it is	Hose picture
Voltage	Volts (V)	The electrical push	Water pressure
Current	Amps (A)	The flow. Current is what heats cables	How much water flows
Resistance	Ohms (Ω)	How much something resists the flow	A narrow section or kink
Power	Watts (W)	The rate work is done	The work the water does
Energy	Watt-hours (Wh)	Power used over time	How much water used in total

The formulas

Volts = Amps $\times$ Ohms · **Amps = Volts $\div$ Ohms** · **Ohms = Volts $\div$ Amps**
Watts = Volts $\times$ Amps · **Amps = Watts $\div$ Volts**
Watt-hours = Watts $\times$ Hours · **Watt-hours $\approx$ Amp-hours $\times$ Nominal volts**

Worked examples

Example	Sum	Answer
6 Ω resistive load on 12V	12V $\div$ 6 Ω	2A
2,400W kettle on 240V AC	2,400W $\div$ 240V	about 10A
120W device on 12V	120W $\div$ 12V	about 10A
60W fridge on 12V (running)	60W $\div$ 12V	5A
100Ah battery at 12.8V nominal	100Ah $\times$ 12.8V	about 1,280Wh

Same current, very different power. At 12V even modest loads mean high current, so low-voltage systems need heavier cable.

Common voltages in Australia

AA cell about 1.5V · Vehicle or caravan 12V (sometimes 24V) · Cordless tools 18V or 36V · Household power points 240V AC

Beginner mistakes

- Mixing up amps and amp-hours.
- Comparing batteries by amp-hours alone when their voltages differ.
- Thinking 12V is low-risk. High current can still melt cable and start fires.
- Using Ohm's law on motors or electronics and ignoring the rated current. Use the manufacturer's figures.

240V AC mains can kill. In Australia, work on household mains wiring must be carried out by a licensed electrician. A short across a battery can cause burns, fire or a battery explosion.