

Cable Voltage-Drop Reference Table

Voltage-drop values (mV/A/m) for copper house wires, with the 3% limit and a worked example.

Long cable runs lose voltage. Keep the drop within about **3% of supply voltage** (≈ 6.9 V on a 230 V circuit). Use the values below with this formula:

$$\text{Voltage drop (V)} = (\text{mV/A/m} \times \text{Current A} \times \text{Length m}) \div 1000$$

Conductor size (sq mm)	Approx. voltage drop (mV/A/m)
1.0	44
1.5	29
2.5	18
4.0	11
6.0	7.3
10	4.4
16	2.8

Indicative single-phase copper values for guidance. Confirm against the APAR datasheet for exact conductor resistance.

Worked example

A 2.5 sq mm wire carrying 20 A over a 30 m run: $18 \times 20 \times 30 \div 1000 = \mathbf{10.8\ V}$ — that is 4.7% of 230 V, over the 3% limit. Step up to 4 sq mm: $11 \times 20 \times 30 \div 1000 = \mathbf{6.6\ V}$ (2.9%) — within limit.

For an instant check across sizes, loads and run lengths, use the APAR Wire-Size Calculator, which applies both ampacity and the 3% voltage-drop rule for you.

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