

Cable Sizes and Fuse Ratings

3mm	- 7.5A	- 1.13mm ²
4mm	- 15A	- 1.84mm ²
6mm	- 25A	- 4.59mm ²
8B&S	- 50A	- 7.71mm ²
6B&S	- 100A	- 13.5mm ²
3B&S	- 150A	- 26.45mm ²
1B&S	- 200A	- 39.55mm ²
0B&S	- 250A	- 49.00mm ²
00B&S	- 300A	- 64.15mm ²

This is a rough guideline of how to pick the right cable size and will cover you for most installations in an automotive or marine environment. If you have very long cable runs it is a good idea to change to the next size up cable to prevent big voltage drops. If you need to know the exact voltage drop over a cable you can use this formula to calculate it:

Voltage drop in a cable

$$\text{Volts} = (\text{Length} \times \text{Current} \times 0.017) / \text{Area}$$

Volts = Voltage drop.

Length = Total Length of wire in metres (including any earth return wire).

Current = Current (amps) through wire.

Area = Cross sectional area of copper in square millimetres.

0.017 - This figure only applies to copper.

Example

Calculating the voltage drop for a 25A DC/DC charger. We assume the charger draws 30A through a 8m 8B&S twin core cable.

$$V = (8\text{m} * 30\text{A} * 0.017) / 7.71\text{mm}^2$$

$$V = 0.53\text{V}$$

Since we have got a twin core cable which goes 8m to the charger and 8m back from the charger our real cable length is 16m. This will lead to a 1.06V drop over the length of the cable.

How to pick the right fuse

A fuse always needs to be the weakest link in the circuit. Choose the fuse according to the specification for the accessory that you are installing and then choose the right size cable to sustain the current when the fuse gets maxed out.

Often we do not get a fuse rating for accessories. If that is the case, we need to find out the current draw of that part with a current clamp or a multi meter. Once we know we can pick the right fuse and the right cable.

Example:

- If you have a heater that draws 10A when running use a 15A fuse and a 4mm twin core cable to connect it.
- If you have a light that draws 1A use a 3A fuse and 3mm twin core cable. 3A is usually the smallest size fuse available in most shops when using standard blade fuses. Also if you use cable smaller than 3mm twin vibrations can easily brake the strands of the thinner cable if they are not terminated right. So best stick to the bigger cable.
- If you have a compressor that draws 70A max when running use a 80A fuse and 6B&S cable.

In the next episode we will learn how to calculate what electrical system you will need in your offgrid setup.