

Choosing the best wire gauge for the cables in your off grid water system can be confusing. This calculation takes the guesswork out of figuring out the right wire size for your solar water pump setup. You can use this for any low voltage DC wiring in your remote solar power system.

$$\frac{\text{Solar Panel Amps} \times \text{One-Way Distance}}{\text{System Voltage} \times 2} = \text{VDI}$$

VDI	= Gauge
1	16
2	14
3	12
5	10
8	8
12	6
20	4
34	2
49	1/0
62	2/0
78	3/0
99	4/0

Example:

- 5 amps from solar panels
- 100 feet from solar panels to pump
- 24 volts, two solar panels wired in series

$$\frac{5 \times 100}{24 \times 2} = 500 \div 48 = 10.4$$

Nearest gauge to 10.4 VDI is in between 6 and 8, so you go with the larger size gauge and use a 6 gauge wire.

Wire diameter (size) gets smaller as the gauge gets larger.