# Off Grid Submersible Pump Cable Sizing Chart

| Sized for 3% power loss in the cable | | | | | |
|---|---|---|---|---|---|
| **Number of 250 Watt, 60 Cell Solar Panels in Series** | **Solar Water Pump Array Watts** | **Maximum Cable Length in Feet** | | | |
| | | **14 Gauge** | **12 Gauge** | **10 Gauge** | **8 Gauge** |
| **2** | 500 | 45 | 70 | 110 | 175 |
| **3** | 750 | 65 | 105 | 165 | 260 |
| **4** | 1000 | 85 | 140 | 220 | 345 |
| **5** | 1250 | 105 | 170 | 275 | 430 |
| **6** | 1500 | 130 | 205 | 330 | 520 |
| **7** | 1750 | 150 | 240 | 380 | 605 |

Formula used to determine submersible pump cable length

$$L = \frac{P \times C \times (V_{mp})^2}{W_p \times .00162}$$

where
L = Length of Cable in Feet
P = Power loss in percent, entered as a whole number such as 3
C = Area of cross section of submersible pump wire in square inches
$V_{mp}$ = Maximum power voltage of the array
$W_p$ = Peak watts
and .00162 is a conversion factor for percentage and cable with copper wire and 2 conductors

| Wire gauge | Wire cross section area, $in^2$ |
|---|---|
| 8 | .012958 |
| 10 | .008184 |
| 12 | .005130 |
| 14 | .003224 |


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