

Solar Sizing Guide

To correctly determine the size of a solar power system, you need the load information, the Typical Winter Peak Sun Hour* rating of the location, and the system autonomy. This step-by-step guide will help you approximate your load. Final system load specifications will be calculated by Solarcraft.

1 Calculating loads

Measure loads with a digital amp meter if possible. If both 12V and 24V devices are used, make the system voltage the same as the dominant load. Calculate 12V and 24V loads separately. Then use a DC/DC converter to power the smaller load.

If a Solarcraft DC/DC converter is used, assume 80% efficiency. (Divide the load by 0.8.)

When using inverters, include both the inverter efficiency and the quiescent current draw, which can be significant with pure sine wave inverters. If you are using a 120 VAC

sine wave inverter, assume 80% efficiency, and 60% at high temperatures.

2 Determining sun hours

Once you have determined your daily load in Ah, locate your site on the Solarcraft Sun Hours Map for the typical winter peak sun hour rating. Round down to the next 0.5 sun hour. For example, the Houston and the Gulf Coast is rated at 3.3, so round down to 3.0 peak sun hours.

3 Using the Solar Sizing Matrix

Noting your daily power consumption in Ah, refer to the Solar Sizing Matrix on the back of this page.

Knowing your peak sun hour rating, scroll down that column until the Ah exceeds your daily load. We normally recommend at least a 10% safety factor on top of that to compensate for long-term system aging.

4 Determining batteries

Battery requirements are based on your daily load (Ah) multiplied by the recommended days of autonomy. Therefore, when calculating autonomy, round up to the next battery capacity. Battery sizes: 98Ah, 110Ah, and 265Ah.

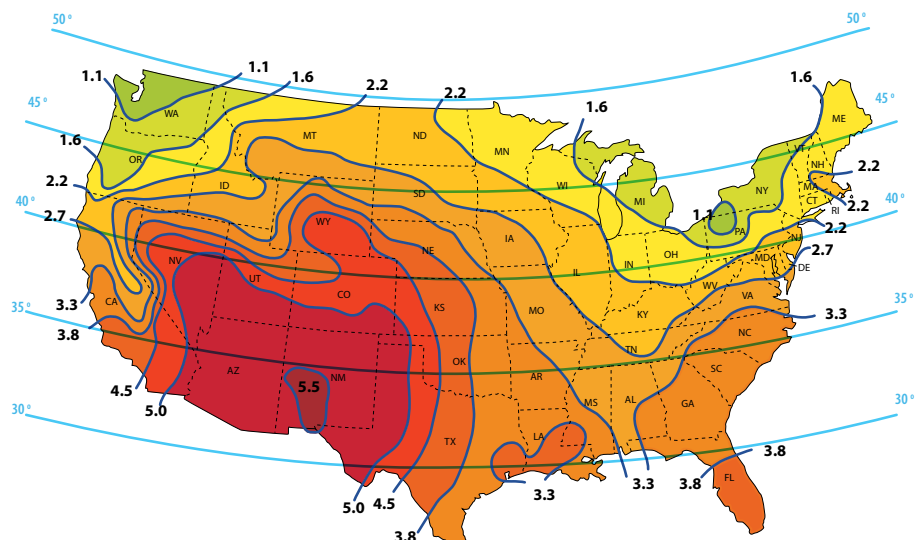


Device	Device name	Amps (A)	Hours/day (h/d)	Load = Ah/day
Device 1				
Device 2				
Device 3				
Communication Device	Receive Mode			
	Transmit Mode			
	Standby Mode			
Total for all Devices	(Add values in Load column)			Ah/day

Sun Hours Map

Typical Winter Peak Sun Hours measured in kWh/M²/day
Solar panel tilt angle: Latitude + 15°

- ▶ Gulf of Mexico: 3.0 peak sun hours
- ▶ Puerto Rico: 4.8 peak sun hours
- ▶ Caribbean: 5.0 peak sun hours



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Solar Sizing Matrix

Module Config.	System Watts	Typical Winter Peak Sun Hours kWh/M ² / day												Module Config.	System Watts
		0.5 hrs	1 hrs	1.5 hrs	2 hrs	2.5 hrs	3 hrs	3.5 hrs	4 hrs	4.5 hrs	5 hrs	5.5 hrs	6 hrs		
1) 10W	10W	0.2 Ah/d 10 mA	0.5 Ah/d 19 mA	0.7 Ah/d 29 mA	0.9 Ah/d 39 mA	1.2 Ah/d 48 mA	1.4 Ah/d 58 mA	1.6 Ah/d 68 mA	1.9 Ah/d 77 mA	2.1 Ah/d 87 mA	2.3 Ah/d 97 mA	2.6 Ah/d 106 mA	2.8 Ah/d 116 mA	2) 10W	20W
1) 20W	20W	0.5 Ah/d 20 mA	1 Ah/d 40 mA	1.4 Ah/d 60 mA	1.9 Ah/d 80 mA	2.4 Ah/d 100 mA	2.9 Ah/d 120 mA	3.4 Ah/d 140 mA	3.8 Ah/d 160 mA	4.3 Ah/d 180 mA	4.8 Ah/d 200 mA	5.3 Ah/d 220 mA	5.8 Ah/d 240 mA	2) 20W	40W
1) 22W	22W	0.5 Ah/d 21 mA	1 Ah/d 42 mA	1.5 Ah/d 63 mA	2 Ah/d 84 mA	2.5 Ah/d 105 mA	3 Ah/d 126 mA	3.5 Ah/d 147 mA	4 Ah/d 168 mA	4.5 Ah/d 189 mA	5 Ah/d 210 mA	5.5 Ah/d 231 mA	6 Ah/d 252 mA	2) 22W	44W
1) 30W	30W	0.7 Ah/d 28 mA	1.3 Ah/d 56 mA	2 Ah/d 84 mA	2.7 Ah/d 111 mA	3.3 Ah/d 139 mA	4 Ah/d 167 mA	4.7 Ah/d 195 mA	5.3 Ah/d 223 mA	6 Ah/d 251 mA	6.7 Ah/d 278 mA	7.3 Ah/d 306 mA	8 Ah/d 334 mA	2) 30W	60W
1) 40W	40W	1 Ah/d 41 mA	2 Ah/d 83 mA	3 Ah/d 124 mA	4 Ah/d 165 mA	5 Ah/d 207 mA	6 Ah/d 248 mA	6.9 Ah/d 289 mA	7.9 Ah/d 331 mA	8.9 Ah/d 372 mA	9.9 Ah/d 413 mA	10.9 Ah/d 455 mA	11.9 Ah/d 496 mA	2) 40W	80W
1) 43W	43W	1 Ah/d 41 mA	2 Ah/d 82 mA	2.9 Ah/d 123 mA	3.9 Ah/d 163 mA	4.9 Ah/d 204 mA	5.9 Ah/d 245 mA	6.9 Ah/d 286 mA	7.8 Ah/d 327 mA	8.8 Ah/d 368 mA	9.8 Ah/d 408 mA	10.8 Ah/d 449 mA	11.8 Ah/d 490 mA	2) 43W	86W
1) 50W	50W	1.1 Ah/d 48 mA	2.3 Ah/d 95 mA	3.4 Ah/d 143 mA	4.6 Ah/d 190 mA	5.7 Ah/d 238 mA	6.8 Ah/d 285 mA	8 Ah/d 333 mA	9.1 Ah/d 380 mA	10.3 Ah/d 428 mA	11.4 Ah/d 475 mA	12.5 Ah/d 523 mA	13.7 Ah/d 570 mA	2) 50W	100W
1) 65W	65W	1.5 Ah/d 62 mA	3 Ah/d 123 mA	4.4 Ah/d 185 mA	5.9 Ah/d 247 mA	7.4 Ah/d 308 mA	8.9 Ah/d 370 mA	10.4 Ah/d 432 mA	11.8 Ah/d 493 mA	13.3 Ah/d 555 mA	14.8 Ah/d 617 mA	16.3 Ah/d 678 mA	17.8 Ah/d 740 mA	2) 65W	130W
1) 80W	80W	1.9 Ah/d 79 mA	3.8 Ah/d 158 mA	5.7 Ah/d 237 mA	7.6 Ah/d 315 mA	9.5 Ah/d 394 mA	11.4 Ah/d 473 mA	13.2 Ah/d 552 mA	15.1 Ah/d 631 mA	17 Ah/d 710 mA	18.9 Ah/d 788 mA	20.8 Ah/d 867 mA	22.7 Ah/d 946 mA	2) 80W	160W
1) 85W	85W	2 Ah/d 84 mA	4 Ah/d 167 mA	6 Ah/d 251 mA	8 Ah/d 335 mA	10 Ah/d 418 mA	12 Ah/d 502 mA	14.1 Ah/d 586 mA	16.1 Ah/d 669 mA	18.1 Ah/d 753 mA	20.1 Ah/d 837 mA	22.1 Ah/d 920 mA	24.1 Ah/d 1004 mA	2) 85W	170W
1) 125W	125W	2.9 Ah/d 120 mA	5.8 Ah/d 240 mA	8.6 Ah/d 360 mA	11.5 Ah/d 480 mA	14.4 Ah/d 600 mA	17.3 Ah/d 720 mA	20.2 Ah/d 840 mA	23 Ah/d 960 mA	25.9 Ah/d 1080 mA	28.8 Ah/d 1200 mA	31.7 Ah/d 1320 mA	34.6 Ah/d 1440 mA	2) 125W	250W
1) 130W	130W	3 Ah/d 123 mA	5.9 Ah/d 246 mA	8.9 Ah/d 370 mA	11.8 Ah/d 493 mA	14.8 Ah/d 616 mA	17.7 Ah/d 739 mA	20.7 Ah/d 862 mA	23.6 Ah/d 985 mA	26.6 Ah/d 1109 mA	29.6 Ah/d 1232 mA	32.5 Ah/d 1355 mA	35.5 Ah/d 1478 mA	2) 130W	260W
2) 80W	160W	3.8 Ah/d 158 mA	7.6 Ah/d 315 mA	11.4 Ah/d 473 mA	15.1 Ah/d 631 mA	18.9 Ah/d 788 mA	22.7 Ah/d 946 mA	26.5 Ah/d 1104 mA	30.3 Ah/d 1261 mA	34.1 Ah/d 1419 mA	37.8 Ah/d 1577 mA	41.6 Ah/d 1734 mA	45.4 Ah/d 1892 mA	4) 80W	320W
2) 85W	170W	4 Ah/d 167 mA	8 Ah/d 335 mA	12 Ah/d 502 mA	16.1 Ah/d 669 mA	20.1 Ah/d 837 mA	24.1 Ah/d 1004 mA	28.1 Ah/d 1171 mA	32.1 Ah/d 1339 mA	36.1 Ah/d 1506 mA	40.2 Ah/d 1673 mA	44.2 Ah/d 1841 mA	48.2 Ah/d 2008 mA	4) 85W	340W
3) 80W	240W	5.7 Ah/d 237 mA	11.4 Ah/d 473 mA	17 Ah/d 710 mA	22.7 Ah/d 946 mA	28.4 Ah/d 1183 mA	34.1 Ah/d 1419 mA	39.7 Ah/d 1656 mA	45.4 Ah/d 1892 mA	51.1 Ah/d 2129 mA	56.8 Ah/d 2365 mA	62.4 Ah/d 2602 mA	68.1 Ah/d 2838 mA	6) 80W	480W
2) 125W	250W	5.8 Ah/d 240 mA	11.5 Ah/d 480 mA	17.3 Ah/d 720 mA	23 Ah/d 960 mA	28.8 Ah/d 1200 mA	34.6 Ah/d 1440 mA	40.3 Ah/d 1680 mA	46.1 Ah/d 1920 mA	51.8 Ah/d 2160 mA	57.6 Ah/d 2400 mA	63.4 Ah/d 2640 mA	69.1 Ah/d 2880 mA	4) 125W	500W
3) 85W	255W	6 Ah/d 251 mA	12 Ah/d 502 mA	18.1 Ah/d 753 mA	24.1 Ah/d 1004 mA	30.1 Ah/d 1255 mA	36.1 Ah/d 1506 mA	42.2 Ah/d 1757 mA	48.2 Ah/d 2008 mA	54.2 Ah/d 2259 mA	60.2 Ah/d 2510 mA	66.3 Ah/d 2761 mA	72.3 Ah/d 3012 mA	6) 85W	510W
2) 130W	260W	5.9 Ah/d 246 mA	11.8 Ah/d 493 mA	17.7 Ah/d 739 mA	23.6 Ah/d 985 mA	29.6 Ah/d 1232 mA	35.5 Ah/d 1478 mA	41.4 Ah/d 1724 mA	47.3 Ah/d 1971 mA	53.2 Ah/d 2217 mA	59.1 Ah/d 2463 mA	65 Ah/d 2710 mA	70.9 Ah/d 2956 mA	4) 130W	520W
4) 80W	320W	7.6 Ah/d 315 mA	15.1 Ah/d 631 mA	22.7 Ah/d 946 mA	30.3 Ah/d 1261 mA	37.8 Ah/d 1577 mA	45.4 Ah/d 1892 mA	53 Ah/d 2207 mA	60.5 Ah/d 2523 mA	68.1 Ah/d 2838 mA	75.7 Ah/d 3153 mA	83.2 Ah/d 3469 mA	90.8 Ah/d 3784 mA	8) 80W	640W
4) 85W	340W	8 Ah/d 335 mA	16.1 Ah/d 669 mA	24.1 Ah/d 1004 mA	32.1 Ah/d 1339 mA	40.2 Ah/d 1673 mA	48.2 Ah/d 2008 mA	56.2 Ah/d 2343 mA	64.3 Ah/d 2677 mA	72.3 Ah/d 3012 mA	80.3 Ah/d 3347 mA	88.4 Ah/d 3681 mA	96.4 Ah/d 4016 mA	8) 85W	680W
3) 125W	375W	8.6 Ah/d 360 mA	17.3 Ah/d 720 mA	25.9 Ah/d 1080 mA	34.6 Ah/d 1440 mA	43.2 Ah/d 1800 mA	51.8 Ah/d 2160 mA	60.5 Ah/d 2520 mA	69.1 Ah/d 2880 mA	77.8 Ah/d 3240 mA	86.4 Ah/d 3600 mA	95 Ah/d 3960 mA	103.7 Ah/d 4320 mA	6) 125W	750W
3) 130W	390W	8.9 Ah/d 370 mA	17.7 Ah/d 739 mA	26.6 Ah/d 1109 mA	35.5 Ah/d 1478 mA	44.3 Ah/d 1848 mA	53.2 Ah/d 2217 mA	62.1 Ah/d 2587 mA	70.9 Ah/d 2956 mA	79.8 Ah/d 3326 mA	88.7 Ah/d 3695 mA	97.5 Ah/d 4065 mA	106.4 Ah/d 4434 mA	6) 130W	780W
5) 80W	400W	9.5 Ah/d 394 mA	18.9 Ah/d 788 mA	28.4 Ah/d 1183 mA	37.8 Ah/d 1577 mA	47.3 Ah/d 1971 mA	56.8 Ah/d 2365 mA	66.2 Ah/d 2759 mA	75.7 Ah/d 3153 mA	85.1 Ah/d 3548 mA	94.6 Ah/d 3942 mA	104.1 Ah/d 4336 mA	113.5 Ah/d 4730 mA	10) 80W	800W
5) 85W	425W	10 Ah/d 418 mA	20.1 Ah/d 837 mA	30.1 Ah/d 1255 mA	40.2 Ah/d 1673 mA	50.2 Ah/d 2092 mA	60.2 Ah/d 2510 mA	70.3 Ah/d 2928 mA	80.3 Ah/d 3347 mA	90.4 Ah/d 3765 mA	100.4 Ah/d 4183 mA	110.4 Ah/d 4602 mA	120.5 Ah/d 5020 mA	10) 85W	850W
6) 80W	480W	11.4 Ah/d 473 mA	22.7 Ah/d 946 mA	34.1 Ah/d 1419 mA	45.4 Ah/d 1892 mA	56.8 Ah/d 2365 mA	68.1 Ah/d 2838 mA	79.5 Ah/d 3311 mA	90.8 Ah/d 3784 mA	102.2 Ah/d 4257 mA	113.5 Ah/d 4730 mA	124.9 Ah/d 5203 mA	136.2 Ah/d 5676 mA	12) 80W	960W
4) 125W	500W	11.5 Ah/d 480 mA	23 Ah/d 960 mA	34.6 Ah/d 1440 mA	46.1 Ah/d 1920 mA	57.6 Ah/d 2400 mA	69.1 Ah/d 2880 mA	80.6 Ah/d 3360 mA	92.2 Ah/d 3840 mA	103.7 Ah/d 4320 mA	115.2 Ah/d 4800 mA	126.7 Ah/d 5280 mA	138.2 Ah/d 5760 mA	8) 125W	1000W
6) 85W	510W	12 Ah/d 502 mA	24.1 Ah/d 1004 mA	36.1 Ah/d 1506 mA	48.2 Ah/d 2008 mA	60.2 Ah/d 2510 mA	72.3 Ah/d 3012 mA	84.3 Ah/d 3514 mA	96.4 Ah/d 4016 mA	108.4 Ah/d 4518 mA	120.5 Ah/d 5020 mA	132.5 Ah/d 5522 mA	144.6 Ah/d 6024 mA	12) 85W	1020W
4) 130W	520W	11.8 Ah/d 493 mA	23.6 Ah/d 985 mA	35.5 Ah/d 1478 mA	47.3 Ah/d 1971 mA	59.1 Ah/d 2463 mA	70.9 Ah/d 2956 mA	82.8 Ah/d 3449 mA	94.6 Ah/d 3941 mA	106.4 Ah/d 4434 mA	118.2 Ah/d 4927 mA	130.1 Ah/d 5419 mA	141.9 Ah/d 5912 mA	8) 130W	1040W
5) 125W	625W	14.4 Ah/d 600 mA	28.8 Ah/d 1200 mA	43.2 Ah/d 1800 mA	57.6 Ah/d 2400 mA	72 Ah/d 3000 mA	86.4 Ah/d 3600 mA	100.8 Ah/d 4200 mA	115.2 Ah/d 4800 mA	129.6 Ah/d 5400 mA	144 Ah/d 6000 mA	158.4 Ah/d 6600 mA	172.8 Ah/d 7200 mA	10) 125W	1250W
5) 130W	650W	14.8 Ah/d 616 mA	29.6 Ah/d 1232 mA	44.3 Ah/d 1848 mA	59.1 Ah/d 2463 mA	73.9 Ah/d 3079 mA	88.7 Ah/d 3695 mA	103.5 Ah/d 4311 mA	118.2 Ah/d 4927 mA	133 Ah/d 5543 mA	147.8 Ah/d 6174 mA	162.6 Ah/d 6774 mA	177.4 Ah/d 7390 mA	10) 130W	1300W
6) 125W	750W	17.3 Ah/d 720 mA	34.6 Ah/d 1440 mA	51.8 Ah/d 2160 mA	69.1 Ah/d 2880 mA	86.4 Ah/d 3600 mA	103.7 Ah/d 4320 mA	121 Ah/d 5040 mA	138.2 Ah/d 5760 mA	155.5 Ah/d 6480 mA	172.8 Ah/d 7200 mA	190.1 Ah/d 7920 mA	207.4 Ah/d 8640 mA	12) 125W	1500W
6) 130W	780W	17.7 Ah/d 739 mA	35.5 Ah/d 1478 mA	53.2 Ah/d 2217 mA	70.9 Ah/d 2956 mA	88.7 Ah/d 3695 mA	106.4 Ah/d 4434 mA	124.2 Ah/d 5173 mA	141.9 Ah/d 5912 mA	159.6 Ah/d 6651 mA	177.4 Ah/d 7390 mA	195.1 Ah/d 8129 mA	212.8 Ah/d 8868 mA	12) 130W	1560W
		33 days	30 days	27 days	25 days	22 days	20 days	17 days	15 days	12 days	10 days	8 days	7 days		
Recommended Days Autonomy															