

Sample Worksheet for Determining Capacity of a Solar Panel Required to Meet Power Consumption

Input fields in grey custommarineproducts.com

Power Consumption Analysis					
	Amps	Hours at Anchor	Hours on Passage	Daily AH at Anchor	Daily AH on Passage
Refrigeration	5	6	6	30	30
Radar	4		4	0	16
Computer - Laptop	4	1	8	4	32
Autopilot	1.5		8	0	12
Cabin Lights (LED)	1	4		4	0
Nav/Anchor Lights	0.2	10	10	2	2
Stereo	1	3	3	3	3
VHF Radio	0.5	8	8	4	4
Instruments	1		8	0	8
Pressure Water	6	0.25	0.1	1.5	0.6
Phone Charger	1	2	2	2	2
Other				0	0
Other				0	0
				50.5	109.6
Equipment going through an Inverter (Multiply by 1.2 for inverter inefficiency)					
Microwave	80	0.1		9.6	0
Windlass				0	0
Other				0	0
Other				0	0
				9.6	0
Total Amp Hours Consumed per Day				60.1	109.6

AH - Amp Hours - Amps of current consumed in an hour

Windlass is often not considered because engine alternator is running when used

Average Hours of Sun per Day

Note: 5 is a good number for panels mounted horizontal,
7 for panels tilted and rotated.

Rated Panel Amperage Needed (Impp)	12.0	21.9
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Panel Rated Voltage (Vmpp)

Rated Panel Wattage Required (Watts)	216.4	394.6
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Solar Panel Capacity (Watts) Calculation				
	Scenarios			
	A	B	C	D
Power Consumed per Day	30	60	60	110
Days at Anchor	1	3	3	1
Amp Hrs Needed	30	180	180	110
Battery Bank Rated Amp Hrs.	240	240	240	240
Battery Draw Down %	0%	40%	0%	0%
Battery Amps Drawn	-	96	-	-
Amp Hr. Deficit	30	84	180	110
Amp Hr. Deficit per Day	30	28	60	110
Hours of Sun	5.0	5.0	5.0	7.0
Solar Panel Amps(Im) Needed	6.0	5.6	12.0	15.7
Solar Panel Voltage (Vmp)	18.0	18.0	18.0	22.0
Solar Panel Watts Needed				
With PWM Controller	108	101	216	346
With MPPT Controller	90	84	180	236

From Power Consumption analysis

Total Amp Hrs of battery bank

50% Max draw, use 0% to determine full replacement of power used.

Amp Hrs needed - Battery amps drawn

Amp Hr deficit / Days at Anchor

5 typical for horizontal panels, 7 for pole mount

Amp Hr deficit/day / Amps needed

Rated Panel Max voltage

Rough estimate

Rough estimate

- On a mooring with refrigeration
- 3 days at anchor supplement with 40% of battery capacity
- 3 days at anchor no battery supplement
- All power from solar with max power usage

- Determine your daily power consumption
- Assess your battery capacity
- Calculate solar amps needed
- Calculate solar watts needed
- Select solar panel(s) and controller