Vessel Loads Calculator

DC Loads Only

(go to the next tab for DC and AC loads)

Current usage and battery capacity are expressed in Amp hours (Ah).

For example, if you have a 12 Volt appliance which which draws 5 amps and is used for 2 hours/day, then its current draw is:

5 amps x 2 hours = 10 Ah at 12 Volts DC

The sum of all the appliance loads provides you with an estimate of your overall power usage.

Your battery bank can be sized once you know your total load and the length of time you wish to operate your appliances between charging cycles.

Your charging system can be sized based upon the storage capacity of your battery bank (expressed in Ah) and the charge absorption rate of your battery technology.

Choose the appliances at the right which are present on your vessel and estimate their average daily usage (also called duty cycle). If an appliance is not listed, simply add it to the list at the bottom.

The calculator multiplies the current draw and duty cycle, then sums the total to provide you with a total power usage estimate for 24 hours.

Useful equations:

Amphours (Ah) = Amps (A) x Hours (h)

Power (Watts) = Volts (V) x Amps (A)

12 VDC Current Draw (A) = AC Draw (A) x 120 (VAC) / 12 (VDC)

Alternator Size Required = Battery Storage Capacity (Ah)
x Battery Charge Acceptance Rate (%)

Remember, a lead acid-based battery should only be discharged to 50% of its rated capacity, so a 100 Ah battery really only has 50 Ah of usable capacity. Discharging the battery beyond 50% SoC will shorten the battery's life considerably. Marine batteries should last 4-5 years if properly cared for.

Typical 12 VDC Electrical Loads

Device	Current Draw (amps/hour) at 12VDC	Average Daily Use (hours/day)	Total Ah Load per 24 Hours
VHF Standby	0.30	10.0	3.00
VHF Receive	1.00	12.0	12.00
VHF Transmit	1.50	0.5	0.75
SSB Receive	1.50	-	-
SSB Transmit	25.00	-	-
Instr Wnd|Dpth|Knt	0.16	24.0	3.84
Nmea2000 .05a=Len 1	0.20	24.0	4.80
Vesper|ais|gps|wifi 2a,3w	0.50	24.0	12.00
Chartplotter|Gps lite=8	0.70	5.0	3.50
Chartplotter Stndby	0.24	19.0	4.56
Radar	1.67	4.0	6.68
Radar Stndby	0.24	6.0	1.44
Weather Fax	2.50	-	-
Laptop Computer	5.00	1.0	5.00
MS Surface Pro3	3.00	1.0	3.00
Auto Pilot	0.83	6.0	4.98
Steaming Light	1.00	-	-
Running Light	3.00	-	-
Strobe	0.75	-	-
Tricolor	0.13	8.0	1.04
Anchor	0.13	-	-
Bilge Pump	5.00	1.0	5.00
Head	50.00	-	-
Wash Down Pump	10.00	-	-
Refrigerator	5.20	10.0	52.00
Hand Spotlight	1.00	0.5	0.50
Spreader Light	1.00	0.2	0.20
Small TV	8.00	-	-
Large TV	25.00	-	-
DVD Player	8.00	-	-
Satellite Receiver	12.00	-	-
RPI	0.50	4.0	2.00
Cell	0.20	4.0	0.80
	0.00		-
	0.00		-
Total Daily Ah Load			**127**

Step 1:

Verify the Current Draws on Your Appliances in the Red Columns

Step 2:

Add Any Devices Not Listed at the Bottom

Step 3:

Input Your Daily Usage in the Yellow Column (in hours/day)

Step 4:

The Calculator will Add Up your Total Daily Load (expressed in Ah) at the Bottom of the Spreadsheet