

Battery Bank Sizing Worksheet

Complete the steps below to determine the battery bank size required to power your AC loads:

1. Determine the daily power needed for each load

- List all AC loads required to run; and
- List the Watt-Hours for each load (see table B-1 for common loads/wattage); and
- multiply by how many hours per day (or a fraction of an hour) each load will be used; and
- multiply by how many days per week you will use the listed loads; and
- divide by seven = **Average Daily Watt-Hours Per Load.**

Average Daily Watt-Hours Per Load				
AC load	watt-hours	(x) hours per day	(x) days per week	(÷7) = total power

2. Determine the total power needed each day for all the loads.

Add the *Average Daily Watt-Hours Per Load* together = **Total Daily Watt-Hours.**

Total Daily Watt-Hours

3. Determine the battery Amp-Hour capacity needed to run all the loads before recharging.

Divide the *Total Daily Watt-Hours* by the nominal battery voltage of the inverter (i.e. 12, 24 or 48 volts); and

(inverter battery voltage)

÷ _____ =

Multiply this by how many days the loads will need to run without having power to recharge the batteries (typically 3 to 5 days of storage) = **Storage Amp-Hours.**

(days of storage)

x _____ =

4. Determine how deeply you want to discharge your batteries.

Divide the *Storage Amp-Hours* by 0.2 or 0.5 to get the **Total Amp-Hours:**

a) 0.2 = Discharges the batteries by 20% (80% remaining), this is considered the optimal level for long battery life; or

b) 0.5 = Discharges the batteries by 50% (50% remaining), this is considered a realistic trade-off between battery cost and battery life.

Total Amp-Hours

Additional compensation:

Low battery temperature: If the batteries are installed in a location that will be exposed to low temperatures, the output current will be less. In these instances, you will need to determine the lowest temperature the battery bank will experience and multiply the *Total Amp-Hours* by the Multiplier below.

Temperature	80F/27C	70F/21C	60F/15C	50F/10C	40F/4C	30F/-1C	20F/-7C
Multiplier	1.00	1.04	1.11	1.19	1.30	1.40	1.59

Inverter efficiency: When the inverter is used in a back-up power application the inverter efficiency will not be a large concern; however if the inverter is the primary AC source for the calculated load, the *Total Amp-Hours* should be multiplied by 1.2 to factor in an average 80% inverter efficiency.