Battery Sizing Worksheet

Use this worksheet to determine the total size and capacity, in ampere hours, of the battery or battery bank required for your power system.

Battery size is measured in AMP-HOURS. This is a measure of battery capacity, or the total amount of electrical energy it will hold when fully charged.

Battery voltage is determined by the number of "cells" connected together is series. All individual lead-acid battery cells have a nominal output of 2 volts. Actual cell voltage will vary from about 1.7 volts when discharged to 2.4volts when fully charged.

12 volt lead-acid batteries are made with 6 series connected 2 volt cells. 6 volt batteries are made with 3 series connected 2 volt cells. The operating voltage of a battery is determined by connecting any number of 2 volt cells in series to reach the desired end voltage

If the battery has a large capacity, it will be made with 2 volt cells, or multiples of 2 volt cells, inside a single case. Small capacity batteries are made with all of the 2 volt cells inside a single case.

Connecting batteries together in parallel increases the total amp-hour capacity, but the operating voltage remains con-0stant.

We provide a complete and comprehensive set of battery maintenance and care instructions with all batteries we sell.

Use this worksheet to determine the size of battery(s) required for your system.

1. Solar array amp hours per day required from Systems Load Worksheet, on Page 8, line 9. _____
2. Number of continuous cloudy days expected in your area. (at least 3) _____
3. Multiply line 1 by line 2. _____
4. Divide line 3 by 0.5 to maintain a 50% reserve for extended battery life. If no special condition, skip to line 10. _____

Special Condition #1: Heavy electrical load

5. Maximum amperage that will be drawn by the loads for a period of 10 minutes or more. _____
6. Discharge rate of battery. If unknown, check with battery supplier. _____
7. Multiply line 5 by line 6. _____

Special Condition #2: High Charge Current.

8. Maximum output amperage of the PV array or other charging source. _____
9. Multiply line 8 by 10.0 hours. _____
10. Amp hours from line 4, 7 or 9, whichever is largest. _____
11. If you are using a lead acid battery, select the multiplier below which corresponds to the battery's wintertime average ambient temperature. _____

Battery Temperature	Multiplier
80^0F/26.7^0C	1.00
70^0F/21.2^0C	1.04
60^0F/15.6^0C	1.11
50^0F/10.0^0C	1.19
40^0F/4.4^0C	1.30
30^0F/1.1^0C	1.40
20^0F/-6.7^0C	1.59

12. Multiply line 11 by line 10. This is your optimum battery size. _____
13. Amp-hours of battery chosen: **Yuasa** (model & amp hours), **(85T-19=960 amp hour)** **Crown (GC 225=225amphour)** etc. from page 47 & 48. _____
14. Divide line 12 by line 13. This is the total number of batteries in parallel required. _____
15. Round off to the next highest whole number. _____