

**MAJORPOWER.COM**

P.O. Box 532, Champlain, New York, USA, 12919

P.O. Box 397, Montreal, Quebec, Canada, H3Z 2T5

**Tel: 514.369.4919**

**Fax: 514.369.4817**

---

## **Sizing an Inverter Battery Bank**



## Example of Amp-Hour Calculations

If the load is to operate for 3 hours:

For a 12-Volt battery: 100 Amps DC x 3 hours = 300 A.H.

For a 24-Volt battery: 50 Amps DC x 3 hours = 150 A.H.

Now, the proper type and amount of batteries must be selected. Traction batteries, (also called deep cycle or golf cart type), should be used in order to be able to handle the repeated discharge/charge cycles that are required.

## Choosing the Correct Number of Batteries

This is a little more difficult due to the rating method used by the battery manufacturers. Also, because of the nature of the battery, the higher the discharge rate, the lower the capacity of the battery.

Battery Capacity	Hours of Discharge
100	20
90	10
87	8
83	6
80	5
70	3
60	2
50	1

Most batteries' A.H. capacity is stated for the 20-hour rate of discharge. This means that a battery has a 100 A.H. capacity if it is discharged over 20 hours, or at about 5 Amps-per-hour (100 A.H. / 20 hours = 5 Amps DC). However, this same battery would last only one hour if the discharge rate was 50 Amps-per-hour (50 Amps DC x 1 hour = 50 A.H.) because of the high rate of discharge.

The chart above indicates that for 3 hours of discharge rate, the battery has only 70% capacity. Therefore, we must have 428 A.H. of battery capacity. (Figured by dividing the A.H. capacity by the percentage of loss, or 300 A.H. ÷ 0.7 (70%)). Therefore we would require 428 A.H. of batteries at a stated 20-hour rate. If the standard 12-Volt battery is 105 A.H., four batteries are needed.

Finally, two more items must be considered. The more deeply the battery is discharged on each cycle, the shorter the battery life will remain. Therefore, using more batteries than the minimum will result in longer life for the battery bank. Keep in mind that batteries lose capacity as the ambient temperature lowers. If the air temperature near the battery bank is lower than 77°F (25°C), more batteries will be needed to maintain the required capacity.