

The Battery—Amps, Watts, Volts

Amp Hours (AH)-The volume of electricity, capacity.

A battery's storage capacity is measured in amps or amp (ampere) hours. One amp equals one hour of use without recharging - or, in practical terms, how long you can use power on a dark, rainy day. All deep cycle batteries are rated in amp hours. Functionally, it's a way for you to gauge how long you can use that battery at a known usage level without recharging it. The higher the amp hour rating, the bigger the battery. You need to figure your level of use in amps or watts (see below) for any of it to make sense.

Watts - The amount of electricity.

Watts are more often associated with a consuming device than amperes (amps) as in your light bulb has how many watts? You don't often hear, so, your light bulb has how many amps?

It's helpful to know/guess how much electricity you might consume when you're trying to make decisions about battery size. Since batteries typically measure storage capacity in amps and consuming devices typically in watts, you might want to change the amp hour measurement associated with the battery into watt hours as it becomes more like an oranges to oranges comparison. As one amp equals one hour of use, one watt also equals one hour of use. To do this you can change the amp hour measurement associated with a battery into watt hours.

The equation for finding how many watt hours are available in a battery when the amp hours are known is voltage x amp hours. For instance, a 12 volt 105 amp hour (AH) battery can supply 1260 watt hours (12 volts x 105 amp hours = 1260 watt hours). That's at 100% discharge without pumping in new energy (which means, if you actually do that, you've likely ruined your battery - you shouldn't go lower than 80% with 50% being better). So, at say a 50% discharge its capacity might be closer to 630 watt hours (1260 divided by 2). Again, the general equation is watts equal volts x amps.

Going along with the example above, let's say your "very safe" 50% capacity allows that 630 watt hours of total usage mentioned above. Let's further say that maybe the biggest or longest in-use consuming device you want to run is your portable computer and it consumes about 95 watts an hour (look on the label). 630 total watt hours safely available divided by 95 watts used per hour = 6.63 hours usage with no incoming battery charge.

If that's a long enough use time for you, then perhaps in our example, a 105 amp hour battery is big enough for your needs. In reverse, watts divided by volts = amps. Or, 1260 watt hours divided by 12 volts = 105 amp hours, or using our 50% example, 630 watt hours divided by 12 volts = 52.5 amp hours available. How many amps does a portable computer draw? I think mine is around 7 or 8 amps per hour. 52.6 amp hours divided by 8 equals 6.56 amp hours. So, whether you compare by amp hours or watt hours the actual usage time comes out about the same. Comparing using watts is just a bit easier because that's what consuming devices tend to come in.

"Different" Measurement Conversions for a Battery

Deep Cycle Batteries are measured in amp hours and the number of amp hours will usually be listed on it. The following are some approximate amp hour ratings for the different "group sizes" of batteries. Group sizes are established by the Battery Council International, which gives standards for sizes and capacities of batteries.

<u>Group size</u>	<u>Amp hour estimate</u>	<u>Volts</u>
U1(9" long)	34 to 40 amp hours	12 volt
Group 24(10" long)	70 to 85 amp hours	12 volt
Group 27 (12" long)	85 to 105 amp hours	12 volt
Group 31 (13" long)	95 to 125 amp hours	12 volt
4-D (20" long, 8" wide)	180 to 215 amp hours	12 volt
8-D (20" long, 11" wide)	225 to 255 amp hours	12 volt
Golf cart (GC2) (10" long, 10" tall)	180-225 amp hours	6 volt

Source: <http://www.simplesolarsetup.com>