

G.R.E.C. - Battery Care

The lifespan of a deep cycle battery will vary considerably with how it is used, how it is maintained and charged, temperature, amount of amps charged and discharged and other factors. In extreme cases, it can vary to extremes,

Discharging batteries is entirely a function of your particular application.

However, below is list of helpful items:

*Shallow discharges will result in a longer battery life

* 50% (or less) discharges are recommended

* 80% discharge is the maximum safe discharge for AGM and Traction batteries

Depth of Discharge and Life Expectancy

Batteries don't last forever - their lifetimes are measured in cycles, or how many times they can be discharged and recharged before they will no longer take a full charge. The depth of discharge (D.O.D.) has a major effect on the life expectancy of a battery - discharging only 80% of the total capacity of the battery will typically get you 25% more cycles than total discharges, and discharging to only 20% will make the battery last essentially forever.

State of Charge	24 Volt battery	Volts per Cell
100%	25.4	2.12
90%	25.24	2.08
80%	25.00	2.07
70%	24.74	2.05
60%	24.48	2.03
50%	24.20	2.01
40%	23.92	1.98
30%	23.63	1.96
20%	23.32	1.93
10%	23.02	1.89
0	21	1.75

WARNING: Do not equalize AGM - VRLA batteries

* Verify charger has necessary AGM - VRLA setting

Battery Type	24v Abs. voltage	12v Float voltage	24v Float voltage
Gel/AGM	28.2	13.8	26.7
Flooded deep discharge	28.8	14.0	28
Flooded lead calcium	29.6	14.0	28
Flooded tubular plate (traction battery)	30	14.0	28

Battery Charging

Batteries are a key component in backup and off-grid systems, often serving as the only energy storage device. To guarantee that they function properly it is important that your batteries are maintained. A chief part of this maintenance is proper charging. Your batteries should always be maintained above a 50% level of charge and receive a complete recharge once a month to ensure operation at peak performance. Prolonged use of the battery below a 50% state of charge will adversely affect the long-term health of the battery and can result in premature failure. The multistage charging process uses several regulation stages to allow fast recharging of the battery energy storage system while ensuring a long battery life, high performance and efficient operation of the overall system. The charging process begins with the **BULK** stage, where maximum current is sent to the batteries until the target "absorb" voltage is reached and the absorb stage of the charge begins. During **ABSORB**, the charger provides the batteries with the just enough current to hold at the **FLOAT** stage where they are given a maintenance charge

Battery Mean temperature	Service life decreasing rate
25°C	0%
30°C	30%
35°C	50%
40°C	66%
45°C	75%
50°C	83%

Avoid

Deep discharging of Batteries

Over Charging of Batteries

High temperature has a very negative effect on the Battery life.

Ambient Temperature	Float charge voltage
0 -10	2.28
11-15	2.26
16 - 25	2.23
26 - 30	2.22
31- 40	2.19

Battery Charging Parameters

Bulk Charging Voltage	2.35V/Cell
Charge current limit	0.20C10A
Upper voltage Alarm threshold	2.375V/Cell
Lower voltage Alarm threshold	1.875V/Cell
Temperature compensation coefficient of battery	-3mV/cell*°C
Battery over temperature	35°C