

Float voltage

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Float voltage is the voltage at which a battery is maintained after being fully charged to maintain that capacity by compensating for self-discharge of the battery.^[1] The voltage could be held constant for the entire duration of the cell's operation (such as in an automotive battery) or could be held for a particular phase of charging by the charger.^[2] The appropriate float voltage varies significantly with the chemistry and construction of the battery, and ambient temperature.^[3]

With the appropriate voltage for the battery type and with proper temperature compensation, a float charger may be kept connected indefinitely without damaging the battery.

Lead-acid batteries

Accepted average float voltages for lead-acid batteries at 25 °C can be found in following table:

Lead-acid battery type	single cell (2V)	3 cell (6V)	6 cell (12V)
Gel battery	2.18	6.53	13.05
Flooded lead–acid cell	2.23	6.7	13.4
Absorbent glass mat	2.27	6.8	13.6

Temperature compensation

Compensation per cell of approximately -3.9 mV per °C (respectively -2.17 mV per Fahrenheit) of temperature rise is necessary.^[4]

Example 1

A 12 V (6 cell) battery at 30°C (86°F) (+5 °C change):
 $(-3.9 \text{ mV}/^{\circ}\text{C}) \times (6 \text{ cells}) \times (5 \text{ }^{\circ}\text{C change}) = -117 \text{ mV}$
 13.4 V (flooded battery float) + $(-117 \text{ mV}) = 13.28 \text{ V}$

Example 2

A 12 V (6 cell) battery at 20°C (68°F) (-5 °C change):
 $(-3.9 \text{ mV}/^{\circ}\text{C}) \times (6 \text{ cells}) \times (-5 \text{ }^{\circ}\text{C change}) = +117 \text{ mV}$
 (13.4 V flooded battery float) + $(117 \text{ mV}) = 13.52 \text{ V}$

Not compensating for temperature will shorten battery life by over or under charging.

See also

- Trickle charging

References

1. Team, M.I.T. Electric Vehicle, *A Guide to Understanding Battery Specifications* (PDF), retrieved 2012-01-12
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4. John A. O'Connor, *Unitrode Application Note: Simple Switchmode Lead-Acid Battery Charger* (PDF), retrieved 2012-11-10

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