Li ion battery nominal voltage

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The nominal voltage of lead acid is 2 volts per cell, however when measuring the open circuit voltage, the OCV of a charged and rested battery should be 2.1V/cell. Keeping lead acid much below 2.1V/cell will cause the buildup of sulfation. While on float charge, lead acid measures about 2.25V/cell, higher during normal charge.

In consumer applications, NiCd and NiMH are rated at 1.20V/cell; industrial, aviation and military batteries adhere to the original 1.25V. There is no difference between the 1.20V and 1.25V cell; the marking is simply preference.

The nominal voltage of lithium-ion is 3.60V/cell. Some cell manufacturers mark their Li-ion as 3.70V/cell or higher. This offers a marketing advantage because the higher voltage boosts the watt-hours on paper (voltage multiplied by current equals watts). The 3.70V/cell rating also creates unfamiliar references of 11.1V and 14.8V when connecting three and four cells in series rather than the more familiar 10.80V and 14.40V respectively. Equipment manufacturers adhere to the nominal cell voltage of 3.60V for most Li-ion systems as a power source.

Some Li-ion batteries with LCO architecture feature a surface coating and electrolyte additives that increase the nominal cell voltage and permit higher charge voltages. To get the full capacity, the charge cut-off voltage for these batteries must be set accordingly. Figure 1 shows typical voltage settings.

Battery users want to know if Li-ion cells with higher charge voltages compromise longevity and safety. There is limited information available but what is known is that, yes, these batteries have a shorter cycle life than a regular Li-ion; the calendar life can also be less. Since these batteries are mostly used in consumer products, the longevity can be harmonized with obsolescence, making a shorter battery life acceptable. The benefit is longer a runtime because of the gained Wh (Ah x V). All cells must meet regulatory standards and are safe.

The phosphate-based lithium-ion has a nominal cell voltage of 3.20V and 3.30V; lithium-titanate is 2.40V. This voltage difference makes these chemistries incompatible with regular Li-ion in terms of cell count and charging algorithm.

The material on Battery University is based on the indispensable new 4th edition of "Batteries in a Portable World - A Handbook on Rechargeable Batteries for Non-Engineers" which is available for order through Amazon .

Comments are intended for "commenting," an open discussion amongst site visitors. Battery University monitors the comments and understands the importance of expressing perspectives and opinions in a shared forum. However, all communication must be done with the use of appropriate language and the avoidance of

spam and discrimination.

My question is about Nominal Voltage:What is the need of having a Nominal voltage when it's half of the peak voltage? Is there a certain use or Servers a certain purpose?

My question is about Float Voltage:I have qty-6 12 volt lead acid deep cycle batteries in series for a 30 amp UPS. The UPS keeps them charged and then goes into a float state. All 6 batteries were purchased at the same time and all are the same part number. When charged and sitting at float, one battery voltage measures 14.7 while all the others measure 13.2 to 13.3 volts.Question: Is this normal and / or OK? And, why would this be the case any why?

Comments from the previous website are not compatible with our new commenting system but we have preserved them so our users can still reference and make use the information in them.

If you"re learning about the world of batteries, you"ve more than likely come across the term "nominal voltage." Don"t be intimidated by its technical-sounding name; it"s a fundamental concept that"s super easy to grasp. In fact, it was designed to make batteries easier to understand for consumers.

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