

Lithium Titanate for Energy Storage

Following on from the previous Technical Update which discussed lithium batteries, this Update will look specifically at Lithium Titanate (LTO) batteries.

Energy storage for either standalone or grid connected installations has become a rapidly growing segment of the energy storage market. There are many energy storage solutions in the marketplace using various chemistries including lead acid, sodium nickel chloride, zinc bromide (flow battery) and various types of lithium.

Each battery type has strengths and weaknesses however one lithium battery, Lithium Titanate, is a standout as it presents a unique group of characteristics:

- Ultra-high cycle life of 22,000 cycles – unmatched by any battery on the market
- Wide operating temperature range of -40°C to +60°C
- High thermal stability (not vulnerable to thermal runaway)
- 100% useable capacity (i.e. 100% DoD OK)
- Lower energy density compared to other lithium chemistries
- Lower cell voltage (2.3-2.5V) compared to other lithium chemistries (3.3-3.8V)
- High recharge efficiency (>98%)

The lithium titanate battery is not new; it was first released commercially in the early 1990's. Applications where LTO batteries have been used include wrist watches (Seiko), Galaxy Bluetooth S-pens (Samsung) and a few electric vehicles (Mitsubishi & Honda). Probably the most popular transport application is electric buses. Battery weight and size is not such an issue for buses however safety, efficient charging, reliable power delivery and cycle life are important characteristics in this type of application.



Australian Innovation

Starting in 2016, an Australian company called Zenaji (pronounced like energy) designed an energy storage battery utilising LTO cells. Zenaji's team of multi-disciplined Engineers came together to design and develop a unique product with the potential to change the way architects and consumers think about energy storage. The Aeon is an extended life energy storage device designed to outlast other product options in the marketplace.



The Aeon battery has the following specifications:

Nominal Capacity	1.93kWh (40Ah)
Dimensions	1635 x 155 x 145mm
Weight	36kg
Nominal Voltage	48.3V
Max. Continuous Charge/Discharge Current	50A (1.25C)
Max. Pulse Charge/Discharge Current	120A (3C)
Battery Management System	Cell balancing. Over & under voltage, over current, over & under temperature protection
Operating Temperature	-40°C to +60°C
Cycle Life (1C, 25°C ±5°C)	22,000 cycles
Depth of Discharge (DoD)	100%
Ingress Rating	IP65
Warranty	≥ 80% original capacity after 20 years or 22,000 cycles, whichever comes first

The outer case of the Aeon has a triangular section - it looks like a giant Toblerone! Each Aeon battery is a standalone device which has its own integrated Battery Management System (BMS). Storage capacity can be increased at any time by simply connecting additional Aeon batteries in parallel as required. The Aeon can be mounted in any orientation and the attractive design enables it to be integrated as an architectural feature.

The Aeon can be used in just about any application where energy needs to be stored and delivered reliably for an extended period. When you calculate the cost per cycle of the Aeon and compare it to the other energy storage options available, the Aeon is a standout. Installation is a simple process as there are only two wires to connect.



R&J Batteries Energy Storage Team are proud to partner with Zenaji and add the Aeon to our comprehensive range of energy storage solutions.

If you have any questions regarding the Zenaji Aeon, please contact either Justin Skaines or Simon Walsh from our Energy Storage Solutions Team.



Aeon Battery

A48-40-01 / A48-40-02

Take charge of your energy. Zenaji's Aeon Battery provides an economically viable lifetime solution for your home energy storage.

Cutting edge battery delivering market-leading technology and economic savings

The Aeon Battery offers the most **robust**, **safest**, **longest life** and most **cost effective** solution available today. With a **no frills** design, the Aeon Battery is **easy** to install and can be **expanded** in the future to provide you with peace of mind in your storage **investment**.

Lifetime Solution

The Aeon battery lasts for 22,000 cycles, and has a tough weatherproof aluminium case providing a lifetime energy storage solution.

Superior Performance

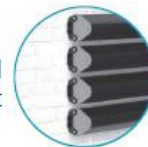
Each Aeon Battery provides 1.93kWh of energy storage. Superior cycling performance allows 3 cycles a day to take full advantage of your energy production and off peak energy pricing plan.

Smart Design

Simple inside or outside installation, easily mounted on a wall, with a space efficient design and modern aesthetics (comes with mounting brackets)



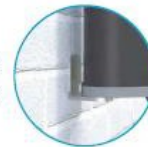
Easy system Expansion



Horizontal mount



Simple lock security



Vertical mount