

Enhanced Protection (K2) Cell Range

New Product Option – 'K2'

All AGM Li-ion cells are now available with enhanced protection features, which can be specified by adding the suffix 'K2' to the standard cell part number.

Technical Description

A 'K2' version cell is fitted with a special top-cap assembly, which incorporates a small protection circuit within the confines of the standard top-cap assembly. This feature adds 0.5g to the weight of the equivalent standard cell.

This protection circuit provides two safety functions:

- Overcharge protection
- Enhanced short-circuit protection

Overcharge Protection

Voltage sensing circuitry is used to monitor for an overcharge condition on the cell. If the cell voltage increases above the detection voltage, then a protection circuit acts to prevent further charging. See Table 1 for operating parameters.

In practice, this protection circuit has two modes of operation:

1. At recommended charge currents, or greater, the action of the protection circuit will create an irreversible open-circuit in the cell, preventing further charging or discharging ^{#1}.
2. At reduced currents (typically less than 1.3A), the action of the protection circuit will be to absorb charger current and to discharge the cell to the release voltage. This will create a cycling action until the charge current is removed.

Enhanced Short-circuit Protection

A lower current, faster acting fuse with a nominal current rating of 8A has been used, see Table 1.

Table 1: K2 Operating Parameters

Parameter	Specification			Unit
	Minimum	Typical	Maximum	
Overcharge detection voltage	4.354	4.450	4.571	V
Release voltage	4.329	4.400	4.471	V
Delay time	1000	1500	2000	ms
Consumption current	–	24	35	µA
Additional circuit resistance	4	8	12	mΩ
Nominal rated current (fuse)	–	8 ^{#2, #3}	–	A

^{#1} The battery protection circuit must be designed to always operate before the in-cell protection.

^{#2} Rated current @ specified temperatures: 9A @ 25°C, 8.5A @ 40°C, 7A @ 60°C.

^{#3} The fuse is also rated to withstand inrush currents of up to 80A/5ms.

At our state-of-the-art factory in Thurso we design, develop and manufacture specialist Lithium-ion cells. Our expertise in this field ensures that our products provide the ultimate in performance, reliability and operational efficiency in the harshest of operating environments.



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