



Product Description

Velkess L is a 3kW - 15kWh energy storage module designed as a higher performing, longer lasting "drop in replacement" for 48VDC nominal Lead Battery packs.

Based on Velkess' proprietary flexible flywheel technology, Velkess L provides extremely responsive power, excellent round trip efficiency, long lifetime, 100% depth of discharge in a very low cost package that is 100% compatible with all equipment designed to interface with 48V lead batteries.

Velkess L has been optimized for ease of use, seamless compatibility, and significantly higher performance than the lead batteries it is designed to replace. Additionally, Velkess L provides a rich Application Programming Interface (API) which enables rich energy monitoring and tight integration with tomorrow's Smart Grid and Internet Of Things applications.

Energy storage systems of any size can be built by linking 2 or more (n) Velkess L systems together in parallel. Multiple parallel Velkess L modules will self balance and behave as a single energy storage system with performance equal to (1 module) * n.

Technical Specifications

Continuous Power	3kW
Peak Power (60 seconds)	9kW
Nameplate Energy	15kWh ^{note #1}
Depth of Discharge	100%
Interface	48VDC Virtual Lead Acid Buss ^{note#2}
24h Roundtrip Efficiency	>80%
Expected Service Life	10 years
Physical Package meter(inch)	1 x 1 x 1 (40 x 40 x 40)
Weight kg(lbs)	340 (750)
Standard Connectivity	Wi-Fi, Ethernet
Optional Connectivity	CAN Bus, RS-485, Xbee, Powerline, LoRa

Note #1

Defined as energy storage available while maintaining maximum continuous power and efficiency. An additional 5kWh of emergency storage is available at lower power and efficiency levels.

Note #2

Defined Velkess's Virtual Lead Acid Buss will accurately mimic the behavior of a standard 48VDC lead acid battery pack. This makes Velkess L 100% compatible with all equipment designed to work with 48VDC lead batteries allowing head end equipment to precisely determine state of charge in real time.

Application Notes

Velkess L is designed for in non-mobile applications only. Velkess L can be commissioned and decommissioned an arbitrary number of times, but must be decommissioned before it is moved to avoid initiating a non-reversible Safe Shutdown.

Velkess L must be securely mounted to a reenforced concrete pad or other suitable foundation before commissioning. Velkess L must be fully decommissioned before it can be moved to a new location and recommissioned.

During commissioning of Velkess L, 5kWh of "startup energy" must be added to the system before the continuous power rating can be achieved. Startup energy is not available for use during normal operation of the system. Once the startup energy has been stored on the Velkess L, Velkess L is capable of storing an additional 15kWh name plate energy and maintaining rated continuous power and efficiency for the full life of the system. Startup energy can be recovered on decommissioning or in case of special need, but power and efficiency will be lower than specified above.

Velkess L is designed to be fully tolerant of ground movement of up to 15mm, which can be typical during a moderate sized earthquake. Movement greater than 15mm may trigger Velkess L's Safe Shutdown protocol which will initiate an automatic de-energizing and decommissioning of the system. Velkess L will no longer operate after the completion of the Safe Shutdown protocol.