



velkess

**Velkess A Datasheet**  
**48VDC 3kW- 15kWh**  
**AC Coupled Energy Storage Module**

Product Description

Velkess A is a 3kW-15kWh AC coupled energy storage module designed to provide plug-and-play energy storage and frequency/voltage regulation to AC micro-grids. Based on Velkess' proprietary flexible flywheel technology, Velkess A provides extremely responsive power, excellent round trip efficiency, long lifetime, and 100% depth of discharge in a very low cost and highly versatile package.

Velkess A can be configured via its secure web interface to manage AC voltage levels to any programmed voltage between 200-260VAC and any programmed frequency between 48-63hz. This configuration capability makes Velkess A compatible with all major AC standards worldwide.

Velkess A secure embedded Linux server and rich Application Programming Interface (API) have access to both energy profiling tools and installed communications protocols. This provides a rich application platform for the development of smart grid, smart metering, energy distribution, and internet-of-things applications.

Velkess A's AC coupling allows easy scaling of micro grid energy storage to any size in a plug-and-play ad-hoc manner by simply adding additional Velkess A modules to an established Velkess managed micro-grid. Additional Velkess A modules do not need to be physically proximate to the other Velkess modules on the micro-grid. As long as 2 or more Velkess A modules share an AC wave form, they will automatically work in concert.

Velkess A is designed for off-grid use only. While Velkess A will not be damaged by connection to legacy power distribution grids at compatible voltages and frequencies, Velkess A may not be approved for on-grid operation in your location.

Technical Specifications

Continuous Power	3kVA
Peak Power (60 seconds)	9kVA
Nameplate Energy	15kWh <sup>note #1</sup>
Depth of Discharge	100%
Interface	200-260VAC @ 48-63hz - Single Phase <sup>note#2, #3</sup>
Frequency and Voltage Regulation	1%
Power Factor Autotune Range	0.6 – 1.4
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

Velkess A systems will provide a centered neutral tap for direct compatibility with standard US household 120VAC – 60hz service.

Note #3

During commissioning the first Velkess A on a new micro-grid must be configured to a single voltage and frequency. Additional Velkess A modules connected to an established Velkess A managed micro-grid will recognize frequency and voltage and automatically configure themselves for compatibility

## Application Notes

Velkess A is intended to be used in non-mobile applications only.

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

During commissioning of Velkess A, 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 A, Velkess A 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 A 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 A's safe shutdown protocol which will initiate an automatic de-energizing and decommissioning of the system. Velkess A will no longer operate after the completion of the Safe Shutdown protocol.