

Energy Storage

FREEEN-BSL

SODIUM
Na⁺**Low voltage sodium-ion battery systems**

The Freen-BSL series offers scalable, low-voltage rechargeable sodium-ion battery modules ideal for residential and small commercial energy storage systems. With excellent cycle life, high round-trip efficiency, and a robust operating temperature range, these floor-mounted units are designed for performance and reliability — even in extreme climates.

**High Efficiency**

Over 97% round-trip energy efficiency ensures minimal energy loss during storage and retrieval.

**Sodium-ion Technology**

A fire-safe, and sustainable alternative with stable performance across various conditions.

**Broad Temperature Tolerance**

Consistent performance even in the harshest environmental conditions. Capable of discharging between -40°C and +60°C.

**Long Lifetime**

Delivers over 5,000 full charge-discharge cycles with >80% of end capacity for long-term performance and reliability.

**Modular Design**

Scalable architecture allows flexible system sizing to meet different energy storage needs.

**Low Upkeep Requirements**

Integrated fan-based cooling, robust safety engineering, and smart CAN/RS485 communication.

With a nominal voltage of 48 V and modular configurations, Freen-BSL systems are compatible with most inverters, providing high power output, extended cycle life, and dependable operation.

FREEN-BSL Specifications



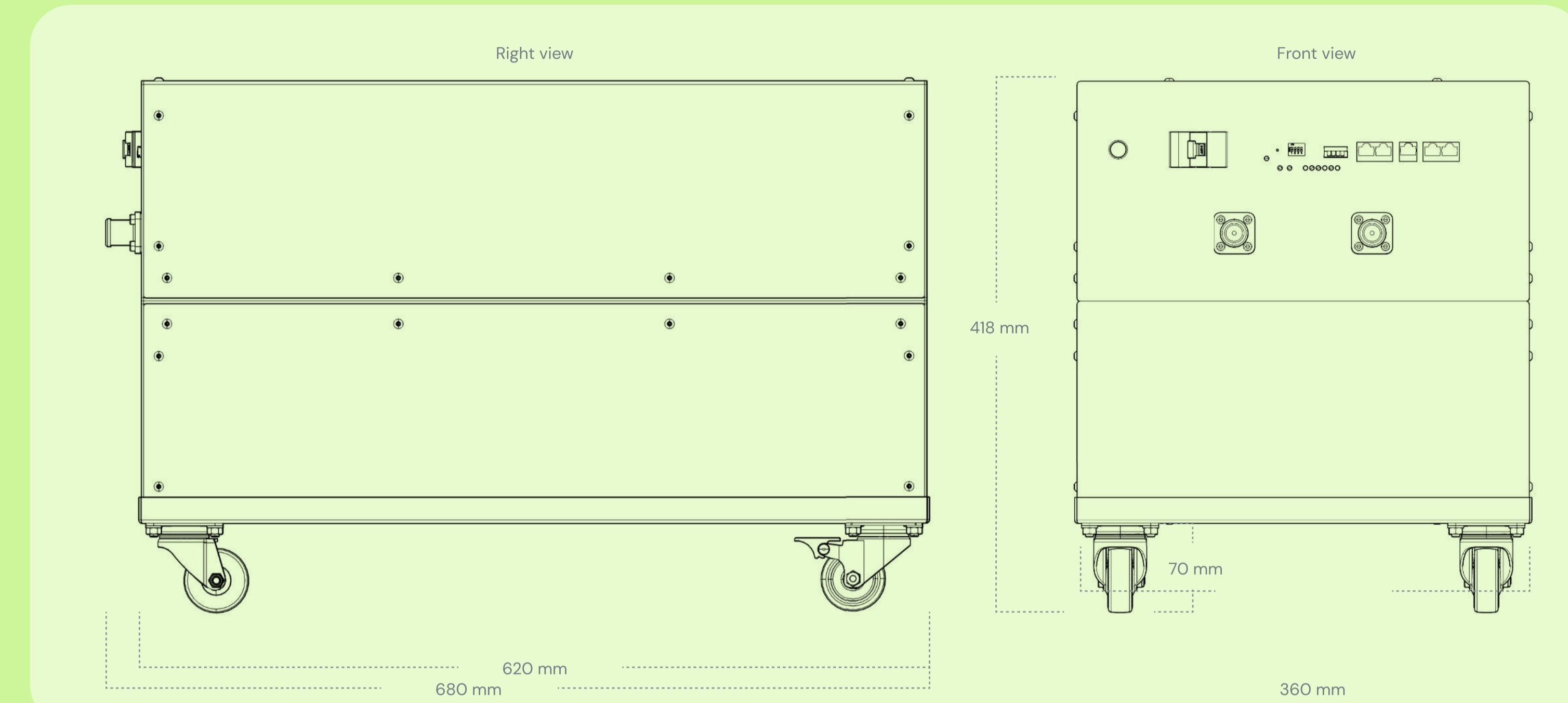
BATTERY MODULE	FREEN-BSL
Module quantity ¹	1 - 16
Operating voltage	40-60 V
Nominal voltage	48 V
Rated capacity	158 Ah
Usable energy	7.6 kWh
Max. charging / discharging current	100 A
Max. charge / discharge power	4.8 kW
Dimensions, mm (W / D / H)	360 × 680 × 418
Battery module weight	120 kg
Cell type	Sodium-ion (Layered oxide)
Installation	Indoor / Floor stand
Operating temperature range	Charge 0 – +55 C° / Discharge -40 – +60 C°
Storage temperature range	-10 – +35 C°
Certificates, Standards compliance	CE, UN 38.5, IEC62619
IP rating	IP20
Cooling	Natural convection
Communication	CAN / RS485
Relative humidity	< 70%
Battery efficiency ²	> 97%
Expected service life ³	> 5000 cycles (80% SOH) or MTE 34.2 MWh

¹ Maximum parallel connection is 16 units, total capacity is 121,6 kWh.

² At a charge/discharge rate of 0.5C, temperature of 25C°.

³ At a charge/discharge rate of 0.5C. The warranty for the battery is that it will retain at least 80% of its Usable energy for 10 years from the date of dispatch from Freen, or until it reaches the Minimum Throughput Energy, whichever occurs first.

Drawings



Engineered Safety

Freen-BSL storage solutions are engineered with safety as a top priority.

To mitigate the risk of internal short circuits, fires, and explosions, we implement a strategy of partial capacity utilization, keeping the battery consistently undercharged and under discharged. This approach significantly reduces the chance of thermal runaway, even under high load conditions.

Our modules are designed to resist mechanical damage that might allow moisture or oxygen to enter the cell, preventing exothermic reactions that could otherwise lead to overheating or ignition.

Freen OÜ

Arenduse 6, Kohtla-Järve, 30328, Ida-Virumaa, Estonia

contact@freen.com

