



Energy Storage

# FREEN-BSL

SODIUM  
Na<sup>+</sup>

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.



your wind your power your way



High Efficiency

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



Long Lifetime

Delivers over 5,000 full charge-discharge cycles for long-term performance and reliability.



Sodium-ion Technology

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



Modular Design

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



Broad Temperature Tolerance

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



Low Upkeep Requirements

Integrated fan-based cooling, robust safety engineering, and smart CAN 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-7.5LV	FREEN-BSL-15LV	FREEN-BSL-22.5LV	FREEN-BSL-30LV	FREEN-BSL-37.5LV	FREEN-BSL-45LV
Cell type	Sodium-ion	Sodium-ion	Sodium-ion	Sodium-ion	Sodium-ion	Sodium-ion
Module quantity	1	2	3	4	5	6
Rated capacity	158 Ah	316 Ah	474 Ah	632 Ah	790 Ah	948 Ah
Nominal energy	7.5 kWh	15 kWh	22.5 kWh	30 kWh	37.5 kWh	45 kWh
Usable energy	7.5 kWh	15 kWh	22.5 kWh	30 kWh	37.5 kWh	45 kWh
Nominal voltage	48 V	48 V	48 V	48 V	48 V	48 V
Operating voltage	40-60 V	40-60 V	40-60 V	40-60 V	40-60 V	40-60 V
Max. charging current	100 A	200 A	300 A	400 A	500 A	600 A
Max. discharging current	100 A	200 A	300 A	400 A	500 A	600 A
Rated charge / discharge power	4.8 kW	9.6 kW	14.4 kW	19.2 kW	24 kW	28.8 kW
Max.charging power	4.8 kW	9.6 kW	14.4 kW	19.2 kW	24 kW	28.8 kW
Max.discharging power	4.8 kW	9.6 kW	14.4 kW	19.2 kW	24 kW	28.8 kW
Dimensions, mm (W / D / H)	952 × 208 × 745	2 x 952 × 208 × 745	3 x 952 × 208 × 745	4 x 952 × 208 × 745	5 x 952 × 208 × 745	6 x 952 × 208 × 745
Battery module weight	123 kg	246 kg	369 kg	492 kg	615 kg	738 kg
Mounting method	Floor moutend	Floor moutend	Floor moutend	Floor moutend	Floor moutend	Floor moutend
Installation location	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor
Storage temperature range	-10 – +35 C°	-10 - +35 C°	-10 - +35 C°	-10 - +35 C°	-10 - +35 C°	-10 - +35 C°
Operating temperature range	Charge -10 – +55 C° Discharge -40 – +60 C°	Charge -10 – +55 C° Discharge -40 – +60 C°	Charge -10 – +55 C° Discharge -40 – +60 C°	Charge -10 – +55 C° Discharge -40 – +60 C°	Charge -10 – +55 C° Discharge -40 – +60 C°	Charge -10 – +55 C° Discharge -40 – +60 C°
Degree of protection	IP65	IP65	IP65	IP65	IP65	IP65
Cooling concept	built-in fan	built-in fan	built-in fan	built-in fan	built-in fan	built-in fan
Communication	Bluetooth	Bluetooth	Bluetooth	Bluetooth	Bluetooth	Bluetooth
Relative humidity	<70%	<70%	<70%	<70%	<70%	<70%
Round-trip efficiency	> 97%	> 97%	> 97%	> 97%	> 97%	> 97%
Life cycle	>5000 times	>5000 times	>5000 times	>5000 times	>5000 times	>5000 times

\* parallel modules connection



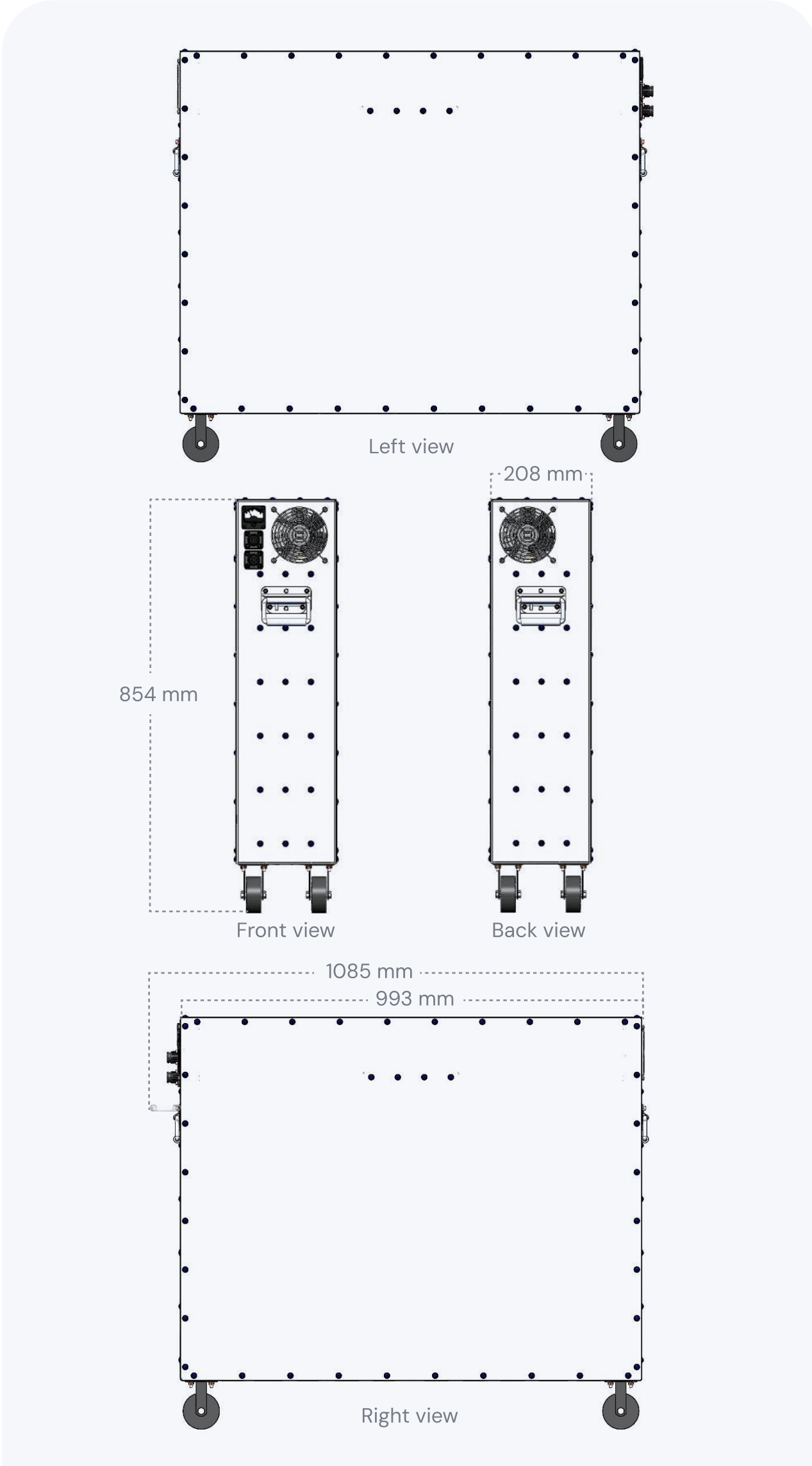
# Custom Configuration Example



## FREEN-BSL-45HV (series modules connection)

BATTERY MODULE	FREEN-BSL
Cell type	Sodium-ion
Module quantity	6
Rated capacity	158 Ah
Nominal energy	45 kWh
Usable energy	45 kWh
Nominal voltage	288 V
Operating voltage	240-360 V
Max. charging current	100 A
Max. discharging current	100 A
Rated charge / discharge power	28.8 kW
Max.charging power	28.8 kW
Max.discharging power	28.8 kW
Dimensions, mm (W / D / H)	952 × 1248 × 745
Battery module weight	738 kg

## 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.

## Contact Us



## Freen OÜ

Arenduse tn 6, Kohtla-Järve, 30328 Ida-Viru maakond, Estonia

[contact@freen.com](mailto:contact@freen.com)

+372 5374 1754

