



Energy Storage

FREEN-BSL-N

SODIUM
Na⁺

Low voltage sodium-ion battery systems

The new generation of energy storage systems is built on advanced NFPP (Sodium Iron Phosphate-Pyrophosphate) sodium-ion battery technology, delivering exceptional safety, ultra-long lifetime, and outstanding operational stability. Designed for residential and small commercial applications, Freen-BSL-N provides reliable energy storage with industry-leading cycle life, broad temperature tolerance, and minimal maintenance requirements.



your wind your power your way



Exceptional Safety

NFPP chemistry contains no oxygen-releasing cathode materials, significantly reducing the risk of thermal runaway, fire, or hazardous overheating.



Advanced NFPP Technology

Based on sodium, iron, phosphate, and pyrophosphate, NFPP chemistry doesn't require critical minerals (cobalt and nickel) while providing exceptional structural stability, safety and sustainability.



Broad Temperature Tolerance

Reliable operation even in challenging climates. Freen-BSL-N batteries can discharge at temperatures from -30°C to +60°C while maintaining dependable performance.



Stable Power Delivery

The NFPP cathode provides an exceptionally flat discharge profile, enabling stable operation of inverters, ensuring predictable system performance.



Ultra-Long Lifetime

Engineered for more than 14,000 charge-discharge cycles while retaining over 60% of original capacity, Freen-BSL-N systems deliver decades of reliable operation and extremely low lifetime ownership costs.



Low Upkeep Requirements

Intelligent battery management, CAN/RS485 communication, and advanced protection systems ensure reliable operation with minimal maintenance throughout the system lifetime.

While some battery chemistries prioritize maximum energy density, NFPP technology is optimized for what matters most in stationary energy storage: safety, durability, reliability, and lifetime value.

FREEN-BSL-N Specifications



BATTERY MODULE	FREEN-BSL-N
Module quantity ¹	Unlimited
Operating voltage	40-60 V
Nominal voltage	50 V
Rated capacity	150 Ah
Usable energy	7.5 kWh
Max. charging / discharging current	80 A
Max. charge / discharge power	4 kW
Dimensions, mm (W / D / H)	307 × 530 × 548
Battery module weight	108.6 kg
Cell type	Sodium-ion (NFPP)
Installation	Indoor / Floor stand
Operating temperature range	Charge 0 – +55 C° / Discharge -30 – +60 C°
Storage temperature range	-20 – +45 C°
Certificates, Standards compliance	CE, UN 38.3, IEC62619
IP rating	IP20
Cooling	Natural convection
Communication	CAN / RS485
Relative humidity	< 60%
Battery efficiency ²	> 97%
Expected service life ³	> 14000 cycles (60% SOH)

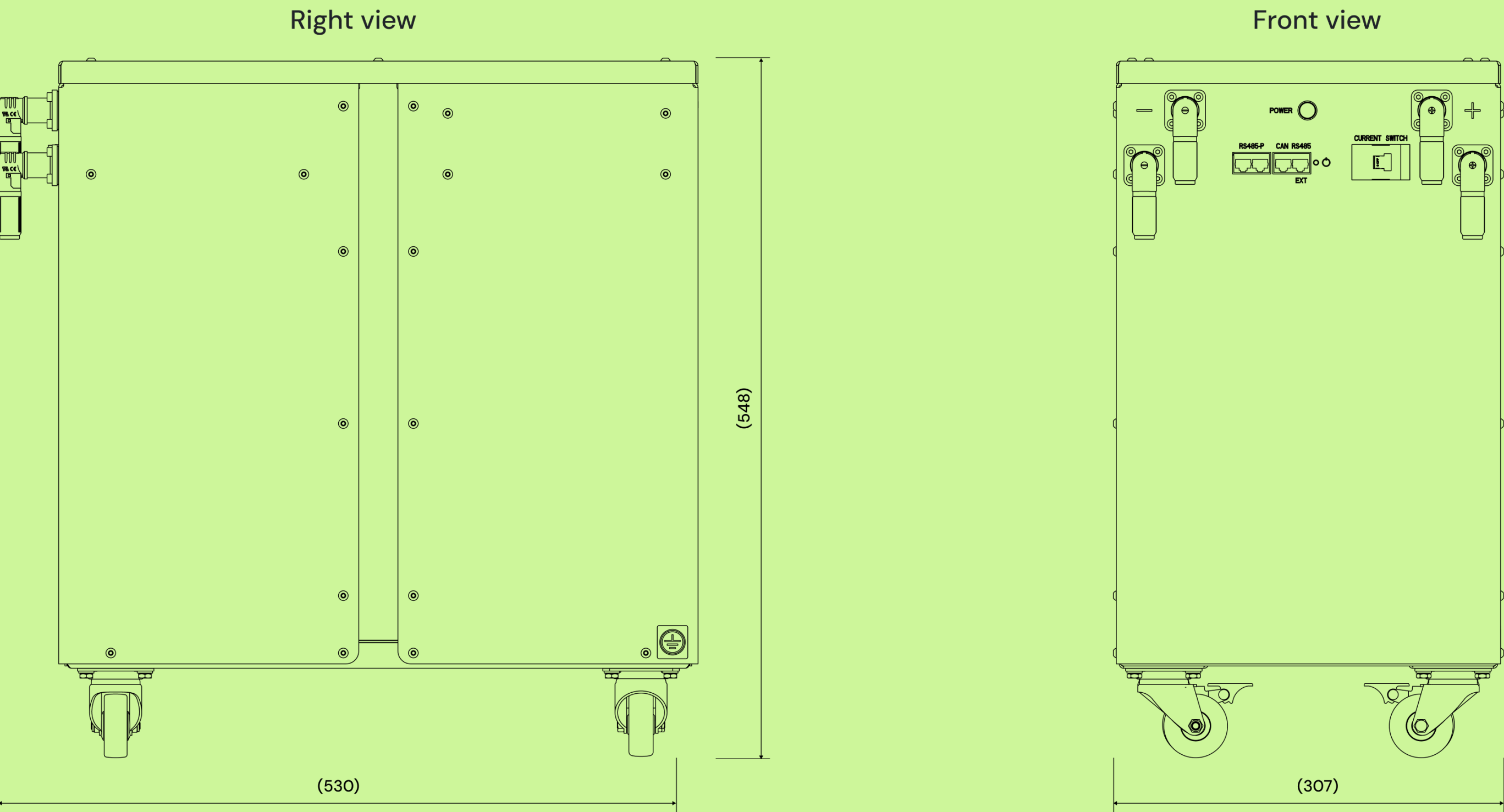
¹ The system can be expanded by connecting multiple Freen-BSL-N units in parallel on the DC side. All battery positives are connected to a common positive bus and all negatives to a common negative bus, allowing total storage capacity and power capability to grow while preserving a standard 48 V architecture. .

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

³ At a charge/discharge rate of 0.5C

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Drawings



Engineered Safety

The intrinsic safety of NFPP chemistry is further enhanced by Freen's battery architecture, intelligent BMS, and robust mechanical protection. Unlike many high-energy battery chemistries, NFPP cathodes do not release oxygen at elevated voltages, significantly reducing the risk of thermal runaway and combustion.

Combined with advanced thermal management and continuous monitoring of voltage, current, and temperature, Freen-BSL-N delivers a safe, reliable, and long-lasting energy storage solution for residential, agricultural, commercial, and critical infrastructure applications.

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