

UTILITY-SCALE ENERGY STORAGE



PowerBlock

INTEGRATED ENERGY STORAGE SOLUTION

ESPB-2H | ESPB-4H

Duration: 1.5 to 4+ hours

Capacity: 4.8MWh to 20+MWh

e-STORAGE is a subsidiary of **Canadian Solar** and a leading company specializing in the design, manufacturing, and integration of battery energy storage systems for utility-scale applications.

The company offers a comprehensive suite of services, including our proprietary LFP battery solution **SolBank**, and innovative solutions designed to enhance grid operations, seamlessly integrate clean energy, and contribute to the creation of a sustainable future. **SolBank** is a containerized energy storage product that uses durable and high-cycle capacity LFP cells.

Together, we are building a brighter, greener future for all.

PowerBlock serves as the core of an optimized Battery Energy Storage System (BESS), prioritizing cost, performance, and bankability. This advanced solution integrates a direct medium voltage AC interface, along with the robust design of the SolBank, the state-of-the-art controls and communication systems facilitate precise operation and seamless connectivity

PowerBlock stands out as a versatile integrated energy storage system platform, capable of grid-tied operations for peak demand reduction, PV peak shifting, and various grid services. Multiple units can be paralleled directly on the MV side to generate utility-scale power output at GWh scales. The meticulous product design and rigorous quality control ensure high efficiency and reliability. Accredited in-house testing facilities guarantee that all components meet the highest quality standards.

Key Features of PowerBlock

Vertically Integrated

Modular building block with system certification including UL 9540, and IEC 62933. Verified through integration test between PCS, SolBank, and EMS to minimize commissioning process onsite.

Dynamic BESS Sizing

Flexible sizing options with BESS level guarantees on power, capacity, RTE, and power factor ratings. Support all typical applications that are crucial in the modern energy sector.

AI-Powered Control and Optimization

Configurable and customizable control and monitoring strategy tailored to specific project needs from each battery cell a a complete system. Optimized control between within and between PowerBlocks of a BESS.

Solution Localization

Continues tracking mechanism on latest standards, , grid interconnection, and fire safety requirements ensures compliance and understanding in practice globally.

PowerBlock System Parameter

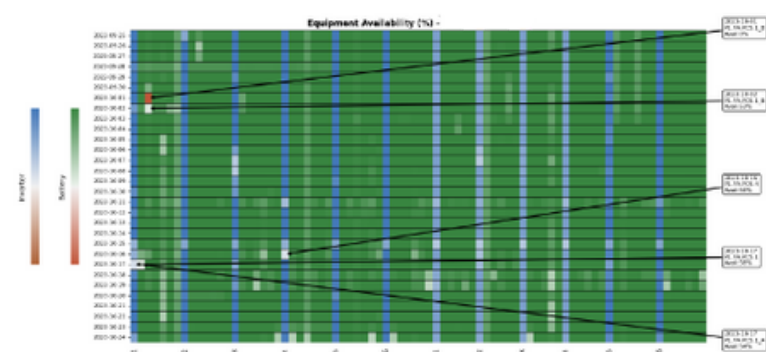
Mechanical		Electrical	
Cooling	Liquid Cooled Battery Enclosure Forced Air PCS	Topology	Turnkey MV Skid
Operating Temperature Range	-30 – 45°C (Rated Power) -30 – 55°C (w. derating)	Rated AC Output Voltage	10/22/33/34.5 kV
Operating Humidity	≤95%	Rated Output Frequency	50/60 Hz
Operating Altitude	2000m (derating above 2000m)	Power Factor	-1 to 1
Installation Type	Pad-mount	AC Round Trip Efficiency (RTE)	≥90%
Protection Degree	Outdoor rated NEMA 3R	Current THD	<5%

Control and Monitoring

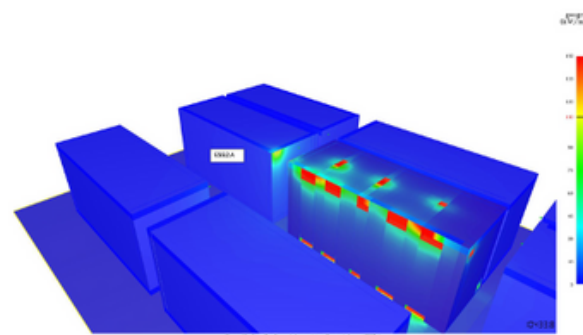
Communication Protocol	Modbus TCP (between components in e-STORAGE PowerBlock)
Communication Interface	Web-based local UI (performance history, remote control, alerts)
Response Time	1s response time guaranteed as standard Optional fast response time down to 150ms with fast metering
Utility Grid Dispatch Integration	Configurable and customizable control and monitoring options for variety grid dispatch requirements
Data Life Cycle Management and Storage	Integrated data life cycle management from generation to interpretation, AWS S3 Bucket long term data storage for the lifetime of the project
BAAP Advanced Data Analysis	Advanced AI and ML algorithms for predictive analysis of systems failures and general event reporting of system states

SITE LEVEL INTEGRATION AND SERVICES

Site Level Studies	Load-flow, short-circuit, arc-Flash studies
PowerBlock Fire Safety Design	Smoke, heat, gas detection, active ventilation for SolBank battery enclosure, local and remote emergency stop, linked action for PCS control
Site Level Fire Safety Design	Heat flux analysis (HFA), Emergency response plan (ERP), Hazard mitigation analysis (HMA)



Site Performance Analysis Example



Heat Flux Analysis Example

The technical specifications in this document are subject to slight variations. Canadian Solar does not guarantee absolute accuracy due to ongoing innovation and product enhancements. We reserve the right to update this technical data without prior notice. Customers should refer to the most recent version of this document when finalizing contracts, ensuring it forms part of the binding agreement.